

# Annual Report 2019

Presented by the Austrian Board of Trustees  
of the Austrian Member Universities

Chair: o.Univ.-Prof. Dr. Dr.h.c. A Min Tjoa





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## Preface by the Austrian National Coordinator

Prof. Dr. A Min Tjoa

I am pleased to introduce this Annual Report because it reflects a very successful year of cooperation between the academic institutions of our network in staff/student mobility, teaching and research activities. The reporting year 2019 once more shows the impressive commitment of our universities to enhance joint academic activities between Austrian universities and our ASEAN counterparts.

As one of the participants of the 1<sup>st</sup> Meeting of ASEA-UNINET in Ho Chi Minh City in 1994 I can state that this report perfectly reflects one of its founding ideas to serve as a forum and network of excellence providing expertise and initiatives for deepening European - South East Asian academic relations.

One original intent expressed at the first meetings was to assist in forming coalitions of resources for academic activities between member institutions. This year's report convincingly demonstrates by the many joint research projects the success of these original ideas expressed in the nineties. The numerous joint publications in quality journals and leading international conference proceedings as results of the projects are proof of this.

Different manifestations of academic cooperation within the framework of Erasmus or ASEM and the organization of Summer schools are pieces of evidence for the realization of the initial goals set in 1994.

Another important aspect from the very beginning was the development of curricula and joint-curricula as a main driver for human capacity building. The cooperation efforts within ASEA-UNINET to develop a curriculum for a master study "Restoration of Art and Architecture" in Indonesia together with Austrian partners can be considered as a showcase and role model in this area.

Particularly noteworthy is the role of ASEA-UNINET for a successful meritocracy-based selection in the awarding of Ernst Mach scholarships by the Austrian Federal Government. These scholarships finance a considerable number of doctoral scholarships and research stays. The same scheme holds for the selection of scholarships for Pakistan together with the Higher Education Commission Pakistan.

In my function as ASEA-UNINET Coordinator for Technology, Innovation and Sustainability Projects for Europe I am extremely satisfied that, collaboration in sustainable development plays a central role for a large percentage of the submitted projects in 2019. It is worth mentioning that a majority of the basic research projects are also envisioning applications for future innovations to serve the SDGs (e.g. advanced battery research). One could even go further and postulate that in a broader sense all our projects have an SDG-facet. I would very much encourage that all our scientists who are active within ASEA-UNINET projects should spend some time in elaborating the embedding of their work as a contribution to the SDGs.

The comprehensive nature of ASEA-UNINET to include Humanities and Arts in its agenda from the very beginning is again a very important contribution to the SDGs as stated in the UNESCO Hangzhou Declaration “Placing Culture at the Heart of Sustainable Development Policies”. In this year’s report, we can find significant contributions in the area of Humanities and Arts where we often observe a fruitful interdisciplinary collaboration with technical disciplines.

With December 2019 I have terminated my 5 years period as Austrian National Coordinator of ASEA-UNINET.

I want to thank all supporters of our network for the successful academic cooperation in the past years. In the first place, I have to mention the continuous support of the Federal Ministry of Education, Science and Research. Our special thanks go to those personalities of this Ministry and the OeAD, who have been enduringly committed to the goals of ASEA-UNINET.

I would like to cordially thank all members of the Austrian ASEA-UNINET board (“Kuratorium”) for their initiatives, hard work, commitment and excellent cooperation.

It is now the right time and place to thank OeAD (Austrian Agency for International Mobility and Cooperation In Education, Science and Research) and its staff members who are assigned to support and facilitate the administration of ASEA-UNINET for its enduring and wholehearted support in the five years of my work as national coordinator. In the first place, I have to thank Barbara Karahan for her excellent support and total identification with ASEA-UNINET’s work, aims and ideals.

Looking to the future, I am very much convinced that my friend and colleague Gabriele Kotsis as Austrian National Coordinator will pilot us towards a very bright future of the network in the coming years.

Finally, I encourage you to read this Annual Report and appreciate the outstanding progress that was made during 2019.

## Scholarships provided by ASEA-UNINET in 2019

The table below lists the scholarships by category to show the source of funding.

### **A. Science & Technology Grants for South East Asia (TSA Grants)**

2 researchers used a grant within the framework of TSA Grants in Austria (Period: 1.1.2019 – 31.12.2019, including extensions of scholarships awarded in previous years):

Vietnam	2 Ph.D.
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### **B. Ernst-Mach-Grant – ASEA-UNINET**

Indonesia	12 Ph.D., 3 Post-Doc, 1 music grant
Thailand	11 Ph.D., 7 Post-Doc, 3 music grants
Vietnam	13 Ph.D., 2 Post-Doc, 1 music grant
Philippines	5 Ph.D.

### **C. ASEA-UNINET – Project funding**

Including guest residences (1-3 months) within the framework of university projects

Indonesia	5 grants
Thailand	9 grants
Malaysia	1 grant
Austria	1 grant (outgoing)

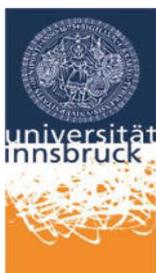
### **D. Other grants managed by ASEA-UNINET**

The Higher Education Commission Pakistan funded 17 Ph.D. grants in Austria for scholarship holders from Pakistan in the year 2019.



*Reports  
of the  
ASEA-UNINET  
Austrian Member Universities*





## **AIC-ATC-APC Joint Labs 2019**

*Following the long-term success in the collaborative activities between the University of Innsbruck (UI) and its partner institutions, the Austrian-Thai Centre for Computer Chemistry (ATC) at the Chulalongkorn University (CU), Bangkok/Thailand and the Austrian-Indonesian Centre for Computational Chemistry (AIC), Universitas Gadjah Mada University (UGM)/Yogyakarta, Indonesia the cooperative activities have been continued in 2019. A key aim conceived in the joint research activities was to enhance the spectrum of computational software with a special focus directed at the United Nations Sustainability Goals (UN SDGs).*

*An effective and lucid strategy to achieve sustainable development in the joint research activities is to eliminate the dependency on licensed third-party software packages employed for instance to execute the quantum chemical calculations. Instead, the use of open source software packages such as ORCA developed by Frank Neese and his team (Max-Planck-Institut für Kohlenforschung), DFTBPLUS by Bálint Aradi and coworkers (Universität Bremen) and the xTB package by Stefan Grimme et al. (Universität Bonn) is envisaged. These packages have been selected based on the availability of open licences for academic use, ease of installation/application as well as the possibility to seamlessly integrate them into the jointly used simulation program QMCF. At the same time the scope of applications is ranging from the treatment of general (i.e. non-periodic) molecular systems (required in the field of biomolecular simulation studies) well as the possibility to treat systems displaying inherent periodicity such as crystalline solids (3d-periodic) and solid-state interfaces (2d-periodic) relevant in the area of computational material sciences. The application of open-source software is in-line with SDGs #9 Industry, Innovation and Infrastructure, #12 Responsible Consumption and Production as well as #4 Quality Education if incorporated into the education in form of a research-oriented classroom environment.*

*A further aspect of this project focused on SDGs is related to the targets of the quantum chemical investigations, which have been chosen due to their relevance in the context of renewable energy technologies. Here, two different but related topics investigated by the experimental partners Dr. Engelbert Portenkirchner (Institute for Physical Chemistry, University of Innsbruck) in collaboration with assoc. Prof. Patchanita Thamyongkit (Department of Chemistry, Chulalongkorn University, Bangkok/Thailand) are envisaged. The topics involve investigations of surface bound substrate molecules with the aim of employing Na-based energy storage as an alternative to commonly employed Li-ion batteries on the one hand and the utilisation of surface-bound, light-harvesters such as porphyrin- and phthalocynine derivatives either for the generation of reduction potentials or in the form of organic solar cells. In both cases, the experimental investigations could be greatly aided via theoretical calculations and enhance the collaboration between the two purely theoretical*

departments at the AIC and UI as well as experimental partners at the UI and CU. With the main targets of the envisaged applications focused on molecular systems relevant in the context of alternative/renewable energy sources, the research activities are linked to SDGs #7 Affordable and Clean Energy as well as #12 Responsible Consumption and Production.

To accelerate the integration of open-source scientific software into the research activities a two-fold strategy was invoked. As a preparatory measure, the PI visited the partner institution to provide a hands-on workshop into the theory and application of density functional tight binding (DFTB) approaches in chemical sciences. In addition, researchers from the UGM was visiting the partner institution in Innsbruck in form of short-term visits to perform research utilising the novel software, in this case DFTBPLUS and xTB. In addition to these main collaboration goals, manuscripts for the dissemination of research results of previous joint activities have been prepared in that time.

Furthermore, future joint collaboration activities with our international partners in 2020 have been formulated. A continued exchange of research staff has been envisaged, however, due to global COVID outbreak, the respective research visits are delayed. Nevertheless, the collaboration is continued, e.g. in form of regular web-seminars held in the group of the PI.

### **1) Curricula Vitae:**

#### Principal Investigator:

Name: assoc. Prof. Dr. Ing. Mag. Thomas Hofer

Institution: University of Innsbruck, Institute for General Inorganic and Theoretical Chemistry

Email: t.hofer@uibk.ac.at

Prof. Hofer graduated from the University of Innsbruck and earned his habilitation in Theoretical and Computational Chemistry in 2010. Since 2011 he is associated professor at the Institute for General Inorganic and Theoretical Chemistry of the University of Innsbruck. His main field of research is in the area of hybrid quantum mechanical/molecular mechanical (QM/MM) simulation studies of liquids systems and theoretical vibrational spectroscopy.

#### Cooperation partners:

Name: Prof. Dr. Harno dwi Pranowo

Institution: Department of Chemistry, Gadjah Mada University

Email: harnodp@ugm.ac.id

Prof. Dr. Harno dwi Pranowo carried out his Ph.D. studies under the supervision of Prof. Dr. Dr.hc. mult. Bernd M. Rode at University of Innsbruck in 2000. Since 2009 he is head of the computational chemistry group at the Gadjah Mada University. The research activities of Dr. Pranowo are focused on the area of hybrid quantum mechanical/molecular mechanical (QM/MM) simulations, biomolecular docking and quantitative structure-activity relations (QSAR).

Name: Dr. Muhammad Saleh

Institution: Department of Chemistry, Gadjah Mada University

Email: muhammad.saleh@mail.ugm.ac.id

Dr. Muhammad Saleh graduated from the University of Innsbruck under the supervision of the PI in the field of Theoretical/Computational Chemistry. Dr. Saleh main area of research is in the field of solid-state QM/MM simulations, being of the first researchers in the collaboration working with the open-source software dftbplus+ to model solid-state interfacial systems.

Name: Dr. W. Dita Saputri

Institution: Department of Chemistry, Gadjah Mada University

Email: wahyu.dita.s@mail.ugm.ac.id

Dr. W. Dita Saputri completed her Ph.D studies in the field of Theoretical/Computational Chemistry under the supervision of Dr. Ria Armunanto and Prof. Dr. Harno dwi Pranowo in 2019. Following her doctoral studies in the field of QM/MM simulations of solvated systems, Dr. Saputri is currently in preparation of a post-doctoral visit in the research group of the PI at the University of Innsbruck.

## **2) Publications resulting from the research conducted in earlier projects:**

The following articles resulting from the respective cooperation activities have been accepted for publication in international peer-reviewed scientific journals.

“Investigation of the preferential solvation and dynamical properties of  $\text{Cu}^+$  in 18.6% aqueous ammonia solution using *ab initio* quantum mechanical charge field (QMCF) molecular dynamics and NBO analysis”

Wahyu Dita Saputri, Yuniawan Hidayat, Karna Wijaya, Harno Dwi Pranowo, Thomas S Hofer  
*J. Mol. Liquids* 275 (2019) 859-866

“A DFTB/MM MD Approach for Solid-State Interfaces: Structural and Dynamical Properties of  $\text{H}_2\text{O}$  and  $\text{NH}_3$  on R- $\text{TiO}_2$  (001)”

Muhammad Saleh, Thomas S. Hofer  
*J. Phys. Chem. C* 123 (2019) 7230 -7245

“Adsorption and dissociation of water molecules at the  $\alpha\text{-Al}_2\text{O}_3$  (0001) surface: A 2-dimensional hybrid self-consistent charge density functional based tight-binding/molecular ”

Niko Prasetyo, Thomas S. Hofer  
*Comput. Mat. Science* 164 (2019) 195-204

“The Jahn-Teller effect in mixed aqueous solution: the solvation of  $\text{Cu}^{2+}$  in 18.6% aqueous ammonia obtained from *ab initio* quantum mechanical charge field molecular dynamics”

W. Dita Saputri, Karna Wijaya, Harno Dwi Pranowo, Thomas S. Hofer  
*Pure Appl. Chem.* 91 (2019), 1553-1565

*“Hydration of Closely Related Manganese and Magnesium Porphyrins in Aqueous Solutions: Ab Initio Quantum Mechanical Charge Field Molecular Dynamics Simulation Study”*

*Zobia Naz, S. Tarique Moin, Thomas S. Hofer*

*J. Phys. Chem. B 123 (2019) 10769-10779*

*In addition, a number of further manuscripts are currently submitted as well as under preparation.*

### **3) Research visit of assoz. Prof Dr. Thomas Hofer in Yogyakarta (12. - 27.07.2019):**

*In this research visit the first steps in implementing the use of the open-source software package DFTBPLUS was carried out by delivering a 3-day hands-on work-shop focused on the theory and application of density functional tight binding (DFTB) theory along with a presentation of recent research results by Dr. Muhammad Saleh and Dr. Aulia S. Hutama. The workshop was hosted by the AIC in the associated computer lab from 13. - 15.07.2020, the total number of participants was 21.*

*In addition to this highly successful teaching activity, simulation results on  $\text{Cu}^{2+}$  in ammonia solution obtained by Dr. W. Dita Sapturi during her Ph.D. studies were analysed and compiled into a manuscript, which was accepted for publication in the international, peer-reviewed scientific journal *Pure and Applied Chemistry* (see above). At the same time, a follow-up project for the  $\text{Cu}^+$  system was formulated, which was subsequently carried out during Dr. Saputris research visit at the University of Innsbruck (see next section). In addition, this visit was also employed to meet Prof. Dr. Paripurna Poerwoko Sugarda, vice-rector of the UGM for Cooperation and Alumni, to plan the activities for the celebration of the 30<sup>th</sup> anniversary of the cooperation between the University of Innsbruck and the Universitas Gadjah Mada in 2020.*



*Fig. 1: Impressions from the DFTB workshop held by the PI at the AIC in August 2019, © T. Hofer /UIBK*

#### **4) Research visit of Dr. W. Dita Sapturi in Innsbruck (01.08. - 30.09.2019)**

Following the research visit of the PI at the UGM the first staff exchange in the research group of the PI was carried out by Dr. W. Dita Saputri. In addition to the continuation of the previously formulated research on  $\text{Cu}^+$  in ammonia solution, the potential application of open-source software in the joint research activities was further explored by investigating the surface binding of anthraquinone on graphite to investigate their potential application in charge storage. The associated surface chemistry is comparably complex and challenging to study via scanning tunneling microscopy and similar experimental techniques. Here, the experimental research can be greatly supported by the results of theoretical calculations, with density functional tight binding (DFTB) approaches implemented in the DFTBPLUS and xTB packages representing a highly adequate compromise between the computational effort and accuracy of results. The respective research is currently ongoing and a manuscript for dissemination is under preparation.

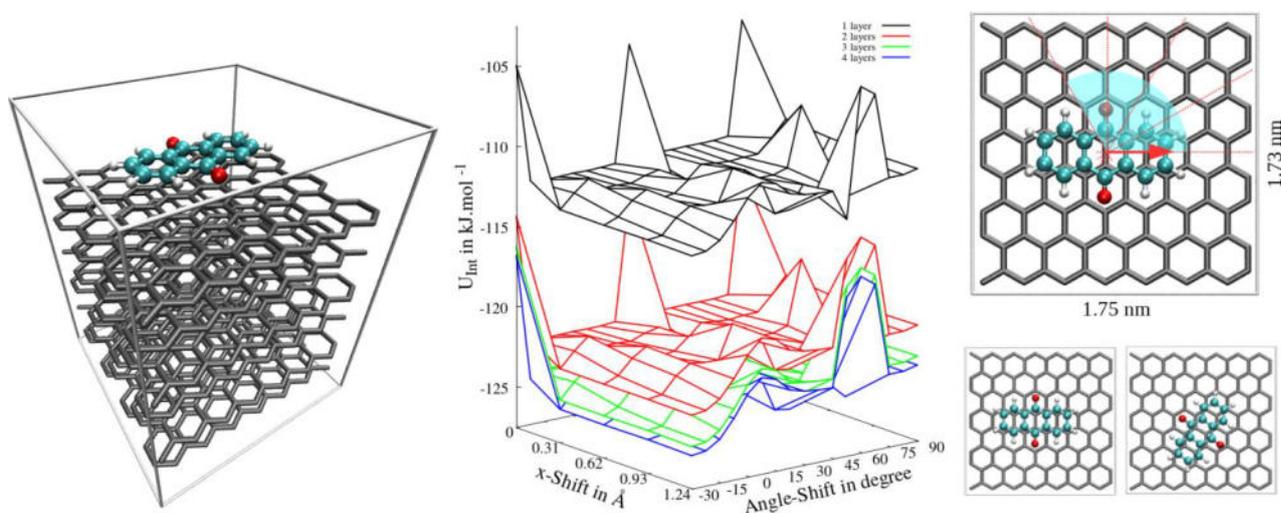


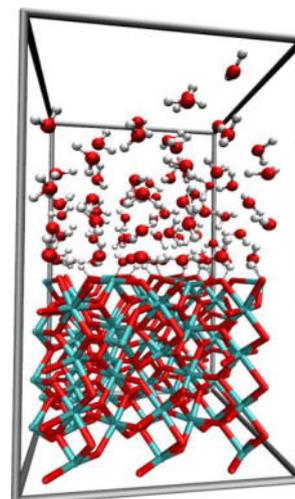
Fig. 2: Exemplary setup to study the adsorption of anthraquinone on a graphite surface (left). Energy profile of the anthraquinone-graphite interaction energy  $U_{int}$  as a function of the number of graphite sheets at SCC-DFTB3 level obtained via energy minimisation from a set of 85 different starting configurations (center). Sketch of the starting configurations along with screenshots of the two most stable configurations (right).

#### **5) Research visit of Dr. Muhammad Saleh in Innsbruck (01.10. - 21.10.2019)**

In preparation to his post-doctoral visit at the group of the PI in the University of Innsbruck Dr. M. Saleh joint for a short-time preparatory visit. In this time the generalisation of the previously developed simulation method was formulated and the required development steps outlined. Dr. Saleh successfully acquired further funding in form of a post-doctoral scholarship issued by ASEA Uninet for the period from November 2019 until July 2020, thus the collaborative research activities are carried out in close supervision with the PI.

*In this project the methodology is extended to accommodate two QM/MM interfaces, enabling the treatment of solid-state surfaces in contact with bulk liquids (see image left) as well as the potential treatment of solid-solid interfaces. In this application again the quantum chemical calculations are carried out employing the open-source package DFTBPLUS. In addition to these development activities, Dr. Saleh is continuing his previous research on Pd/Pt<sup>2+</sup>-complex in aqueous and ammonia solutions, a respective manuscript is currently in preparation.*

*Fig. 3: Screenshot of the newly developed QM/MM methodology for the treatment of solid-state surfaces in contact with bulk liquids or solids. This simulation software is interface to the open-source package DFTBPLUS.*



## Collaboration in Sustainable Development

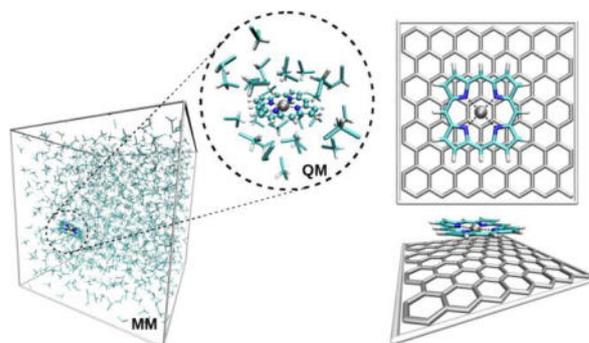
The highly successful collaborative activities between the University of Innsbruck, Austria and the Universitas Gadjah Mada (UGM)/Yogyakarta, celebrating their 30<sup>th</sup> anniversary in 2020, represent a highly inspiring cooperation within the ASEAN Uninet.

Following this great example a strengthening of the collaboration between the Udayana University (UU), Denpasar/Indonesia is envisaged. In November 2011 assoc. Prof. Dr. Thomas Hofer visited the Center for International Programs of the Udayana University under the direction of Dr. Ni Putu Sri Harta Mimba for a symposium to discuss the establishment of a similarly fruitful link within the area of computational/theoretical chemical sciences. After this meeting a tour of the chemistry department of the Udayana University was carried out and a guest lecture was provided, discussing potential long-term collaborative activities with the research conducted by the University of Innsbruck and the Gadjah Mada University serving as a highly lucid primer for future collaborations.



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Upon return to the University of Innsbruck, an additional stop in Bangkok/Thailand was planned to visit another key collaboration partner, namely the Chulalongkorn University (CU). Here, a meeting with the president for research Prof. Dr. Pomthong Malakul and his assistant Prof. Patchanita Thamyongkit was conducted, to promote the collaborative activities in the fields of chemical and economic sciences as well as psychology. In addition, a work meeting with colleagues from the Department of Engineering was held and a guest lecture on possible contribution from theoretical chemistry in area of advanced battery research was provided. A key activity identified in these discussions are investigations of nature-inspired derivatives based on porphyrin and related compounds, which represent promising lead candidates in the increasingly active area of green electronics.



Meeting with the staff members of the Department of Engineering. Following the guest lecture potential contributions from theoretical chemistry in the area of advanced battery technologies have been explored. © Thomas Hofer / UIBK

*These first collaborative activities towards a sustainable development in the collaborative activities represent an initial step towards an intensified contact between the Austrian, Indonesian and Thai partners in the coming years. In addition to promote the research activities and staff exchange, the envisaged topics represent key technologies within area of sustainable research.*

**Curricula Vitae:**

**Principal Investigator:**

*Name: assoc. Prof. Dr. Ing. Mag. Thomas Hofer*

*Institution: University of Innsbruck, Institute for General Inorganic and Theoretical Chemistry*

*Email: t.hofer@uibk.ac.at*

*Prof. Hofer graduated from the University of Innsbruck and earned his habilitation in Theoretical and Computational Chemistry in 2010. Since 2011 he is associated professor at the Institute for General Inorganic and Theoretical Chemistry of the University of Innsbruck. His main field of research is in the area of hybrid quantum mechanical/molecular mechanical (QM/MM) simulation studies of liquids systems and theoretical vibrational spectroscopy.*

**Cooperation partners:**

*Name: Dr. Ni Putu Sri Harta Mimba*

*Institution: Center for International Programs, Udayana University*

*Email: p.mimba@unud.ac.id*

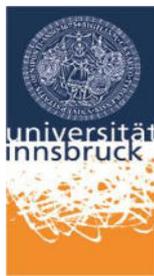
*Dr. Ni Putu Sri Harta Mimba received her Ph.D. in economical sciences from the University of Groningen, the Netherlands under the supervision of Prof. Dr. G. J. van Helden. Presently, she is Prof. at the Department of accounting of the Udayana University, Denpasar/Indonesia and head of the Center for International Programs.*

*Name: Prof. Dr. Patchanita Thamyongkit*

*Institution: Department of Chemistry, Chulalongkorn University*

*Email: patchanita.v@chula.ac.th*

*Prof. Dr. Patchanita Thamyongkit completed her Ph.D. in the field of organic chemistry at the Eberhard Karls University Tübingen under the supervision of Prof. Michael Hanack. After a post-doctoral stay at the North Carolina State University she visited the University of Linz as a Marie-Curie fellow in 2009/2010. At present Prof. Thamyongkit is assistant to the CU president for research Prof. Dr. Pomthong Malakul.*



*Final Report on Project*  
***Bringing Behavioral and Experimental Finance-Expertise to Thailand 2019***

Project Partners:

**Juergen Huber** (e-mail: [juergen.huber@uibk.ac.at](mailto:juergen.huber@uibk.ac.at)) is head of the Department of Banking and Finance at the University of Innsbruck, Austria, and was until 2017 general manager of the Society for Experimental Finance, which he co-founded, and co-editor-in-chief of the *Journal of Behavioral and Experimental Finance*. He studied at Tulane University and University of Innsbruck and was visiting professor at Yale University, University of Vienna, and Universities in Thailand, Vietnam and Indonesia. At the core of his research is behavioral and experimental finance, where he published in all the top journals.

**Tanakorn Likitapiwat** (e-mail: [tanakorn@cbs.chula.ac.th](mailto:tanakorn@cbs.chula.ac.th)) is Lecturer in Finance and the Faculty of Commerce and Accountancy, Chulalongkorn University since 2010. After completing his BA in Electrical Engineering (1996) and Master of Business Administration (2004) at Chulalongkorn University he did a PhD in Finance at the University of Memphis, USA which he completed in 2009. His main areas of interest are investment, market microstructure, and Behavioral Finance.

Report:

After visits in December 2015, as well as July 2016, July 2017 and July 2018 I spent the week July 4<sup>th</sup> to 10<sup>th</sup> 2019 at Chulalongkorn Business School (CBS) to strengthen the ties between University of Innsbruck and CBS through (1) teaching, (2) a research seminar, (3) joint research, and (4) student exchange. Let me briefly state what activities were set in each of the four fields.

Ad (1) teaching: The Department of Finance at the University of Innsbruck has one of the leading groups in the fields of behavioral and experimental finance. We are happy to share this expertise and our experiences, e.g. in experimental research and I thus agreed to give a course on “Foundations of Behavioral Finance” at CBS. The six-day course was attended by 45 students, including six visitors from Vietnam. During the class we covered several of the most important fields of Behavioral finance, and three times we went to the CBS FinLab where we ran experiments on the computers. For example, I had programmed an artificial stock market and students bought different information levels (the better the information the more expensive) and then traded on a continuous-double auction market. This experience was quite instructive for students who experienced trading as in a real stock market and who participated lively. I was also informed by colleagues from CBS that students value these experiences very highly.

*Ad (2) research seminar: CBS asked me to give a research seminar, which I did on July 7<sup>th</sup> on the topic “Bubbles and Financial Professionals”. There were about 40 students, mostly freshmen, and researchers in the seminar and we had an interesting and very interactive time together, as the audience was very eager to learn about the topic and methodology used.*

*Ad (3) joint research: the past three years Dr. Tanakorn Likitapiwat ([tanakorn@cbs.chula.ac.th](mailto:tanakorn@cbs.chula.ac.th)) from the Business School of Chulalongkorn University was in the research seminar I gave then and he was very eager to learn how to conduct experiments in finance to introduce and help advance this methodology in Thailand. Experiments are well-suited to explore the real behavior of people, rather than abstractly modelling it in equations and formulae. Dr. Tanakorn then read some of my (and other people's) papers and we started to design an experiment to elicit the risk and loss preferences of people, namely financial professionals and the general population in Thailand. Recently Dr. Likitapiwat has accepted to supervise a PhD-candidate, Ms. Som Patsi ([som.patsi@gmail.com](mailto:som.patsi@gmail.com)), who will also work in this field. Dr. Tanakorn and I met twice during my stay to discuss the project. The design and the data collection (online experiments) have now been finished. As Dr. Tanakorn has recently become a father and as his workload is very high, progress is not very fast, but we move on step by step.*

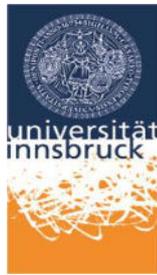
*Ad (4) student exchange: The school of management of the university of Innsbruck and Chulalongkorn Business School (CBS) have in 2017 signed a separate MOU under the Umbrella Agreement of ASEA-UNINET to strengthen the bond between the two schools. This MOU has already been filled with life in its first few years, as Ms. Paulina Dehmer and Mr. Johannes Stempfhuber visited in 2017 and Mr. Thomas Pichler and Mr. Thomas Egger visited last year. This year two more students (Christoph Hadler and Christoph Adolphi will spend a Trimester each in Thailand). We are looking forward to also welcome CBS students in Innsbruck.*

#### *Expected results and publications (Zu erwartende Ergebnisse und (eingereichte) Publikationen)*

*Dr. Likitapiwat has already collected all the data of our jointly designed experiments. Now the results of the experiments are analyzed and then the paper will be written, presented at international conferences and submitted to an international journal. In this process the PhD candidate Som Patsi is involved and she played a central role in actually carrying out the experiments. Given the slow progress so far it will still be about some time until we will have a good working paper.*

#### *Planned activities and cooperations (Geplante Tätigkeiten und Kooperationen)*

*Our main goals are now to continue with the joint research project with Dr. Likitapiwat and Som Patsi and to fill the exchange program with life. In addition I was invited to teach again at CBS in July 2020, which I happily accepted.*



## ***Petrology and geochemistry of the subcontinental lithospheric upper mantle beneath the Southeast Asian peninsula***

### ***Participating Scientists***

- (1) Prof. Dr. Jürgen Konzett (formal project leader) is since 2004 to present associate professor at the University of Innsbruck. He finished his PhD in 2007 at the ETH Zurich and was Postdoctoral Associate at the Carnegie Institution of the Washington Geophysical Laboratory and center for High pressure Research. He is petrologist with a strong background in mantle petrology and geochemistry. Prof. Konzett couldn't participate in the fieldwork due to a broken ankle.*
- (2) Dr. Bastian Joachim Mrosko is since 2015 University Assistant at the University of Innsbruck. He finished his PhD in 2011 at the GFZ in Potsdam and was Postdoc at the University of Vienna (2011), the University of Manchester (2011-2013) and the University of Oxford (2013-2015). He is an expert in high P-T experimental petrology with a special interest in reaction kinetics.*

### ***Report on the fieldtrip to Thailand/Cambodia (01.02.2020-10.02.2020)***

*Aim of the fieldwork related to this project was to find and collect samples of upper mantle xenoliths and their host rocks from Cambodia and Thailand. It is part of an ongoing study covering mantle xenoliths and their host rocks from the southeast Asian peninsula with rocks from Vietnam, Laos and Thailand already characterized. These mantle xenoliths provide information, otherwise unobtainable, on the chemical and mineralogical composition of the Earth's upper mantle and its thermal structure beneath the southeast Asian peninsula. In a next step, a detailed chemical analysis of collected rock samples is required. For this, we will use facilities such as the electron microprobes at the University of Graz and the University of Innsbruck.*

#### ***01.02-02.02***

*Air travel from Innsbruck via Frankfurt to Bangkok*

#### ***03.02***

*Car journey from Bangkok via Chanthaburi to the Thailand-Cambodian border at Banpuggard and further to Pailin in Cambodia.*

#### ***04.02***

*Sample collection in the surroundings of Pailin (Cambodia):*

- (1) Locality: Temple Mount Pailin. Several basalt samples with mm to cm size xenocrysts were collected. However, the basalts did not contain any mantle xenoliths.*

(2) *Sampling at a small sapphire mining site close to Pailin*



Figure 1: *Sapphire mining site near Pailin (© Bastian Joachim-Mrosko)*

*Several basalt rubblestones were collected that contained small xenocrysts but were free of mantle xenoliths.*

(3) *Sampling of an outcrop near Pailin (N12-51.899; E102-33.369). Several fresh basalts with only slightly weathered cm-sized mantle xenoliths were collected.*



Figure 2: *Mantle xenoliths in basalt matrix (© Bastian Joachim-Mrosko)*

*The basalt rocks also contained several idiomorphic xenocrysts, which are separated from the basaltic matrix by clearly observable mm-sized light grey reaction rim or corona structures.*



Figure 3: *Xenocryst (black) surrounded by a reaction rim embedded in a basalt rock sample (© Bastian Joachim-Mrosko).*

## 05.02

Road conditions are often not ideal in Cambodia resulting in long travel times even for short distances. In addition, several potential outcrops are not accessible due to the risk of landmines. Based on these difficulties, we decided to cross the border to Thailand and continue our fieldwork in the provinces of Trat and Chanthaburi. In the afternoon, we visited a large ruby mining site near Trat. This outcrop showed several fresh basalt layers, which were free of mantle xenoliths.

## 06.02

Visit of several potential outcrop localities in the surrounding area of Trat und Chanthaburi

- (1) Garnet bearing river sediments were sampled at this locality (N12-41.962; E102-27.571).
- (2) Sampling of slightly weathered rubblestones in a forest (N12-42.234; E102-27.591), which were identified as basalts, gabbros, diorites und pyroclasts. Several samples showed up to cm-sized xenocrysts.
- (3) Dirttrack next to a small river that contained many rubblestones (N12-42.724; E102-27.591), which were again gabbros and diorites. All examined rocks were free of mantle xenoliths
- (4) Several only slightly weathered basalt rubblestones with mm-cm sized pyroxen xenocrysts (N12-40.876; E102-27.199).

## 07.02

Sampling at two localities near Chanthaburi.

- (1) Road outcrop located in the region of a former mining site (N12-36.515; E102-02.542). Basalts and pyroclasts with mm-cm sized pyroxen-xenocrysts were collected, which are separated by bright reaction rims from the surrounding matrix.



Figure 1: Pyroxen-xenocrysts (black) surrounded by bright corona textures (© Bastian Joachim-Mrosko).

- (2) Visit of a small sapphire mining site (N12-36.328; E102-02.499). Several weathered mantle xenoliths with a size up to 10 cm were collected. Another byproduct of the mining process are heavy minerals separates containing zircon and spinel.

## 08.02-10.02

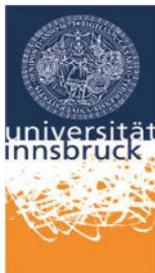
Car journey to Bangkok and flight to Vienna. Arrival in Innsbruck on the 10<sup>th</sup> of February 2020.

### ***Expected Results***

*A detailed chemical and textural analysis of the collected mantle xenoliths will help us to get a better understanding of the compositional variability of the Earth's upper mantle and its thermal structure in Southeast Asia. Growth of reaction rims is dependent on parameters such as pressure, temperature or the chemical composition of a system. This implies that a detailed analysis of the reaction rim structures will allow us to better understand the P-T-t-X history of the collected rock samples. Results of this project are planned to be published in international professional journals.*

### ***Publication from an earlier project***

*Konzett J, Hauzenberger C, Krenn K, Joachim-Mrosko B, Stalder R, Gröbner K, Sieberer A-K, Hoang N, Khoi NN (2020) Neogene metasomatism in the subcontinental lithosphere beneath Southeast Asia – evidence from modal and cryptic phosphorus enrichment in peridotites and pyroxenites from southern Laos. *Journal of Petrology*, doi: 10.1093/petrology/egaa013*



## Project Report

ASEA 2019/ Uni Innsbruck/4a

*Visit of Univ. Prof. Dr. Manfred Husty at Teknologi Sepuluh Nopember (ITS)  
in Surabaya (Indonesien)*

### 1. Participating researcher

**Univ. Prof. Mag. Dr. Dr. h.c. Manfred Husty**, Leopold Franzens University Innsbruck (Austria),  
Unit Geometry and CAD at the Faculty of Engineering

*Short CV: M. Husty is Full Professor of Geometry, got a master degree from TU Graz I 1979, a PhD from TU Graz in 1983, habilitation in Geometry at Montan University Leoben. He was an Erwin Schrödinger fellow at McGill University in Montreal (1993-94) and got an honorary doctorate from Technical University in Cluj Napoca (Romania) in 2013. From 2004 to 2008 he served as dean of the Faculty of Engineering, LFU Innsbruck.*

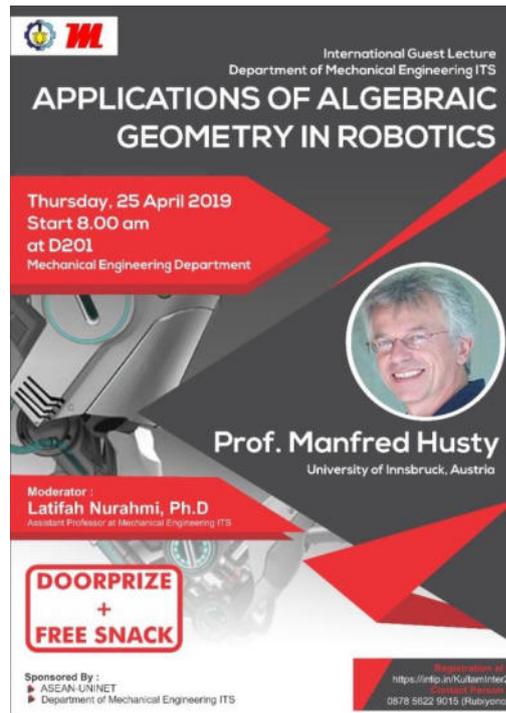
*Main areas of research: Computational kinematics ◦ classical geometry ◦ non-Euclidean geometry  
◦ differential geometry*

**Dr. Latifah Nurahmi, S.T., M.Sc** is Assistant Professor at Dep. Teknik Mesin, Fakultas Teknologi Industri, Teknologi Sepuluh Nopember (ITS). She got a M. Sc. and a PhD (2015) from École Centrale Nantes.

*Main areas of research: Computational Kinematics, design of machines and parallel robots.*

### 2. Detailed Project Report

*The visit of Prof. Husty within the framework of ASEA UNINET had two purposes. The first was to give a lecture at the department of Teknik Mesin (ITS) and the second was to do some joint research on the kinematics of lower degree of freedom parallel manipulators with Dr. Latifah Nurahmi. Let me first report on the first purpose because this turned out to be much more extensive than planned. On Thursday April 25<sup>th</sup> I have given a lecture at the Department of Mechanical Engineering with the title Applications of algebraic geometry in robotics.*



*Announcement of the lecture*



*During the lecture*

*Already in the preparation phase of the visit I was asked by the office of international relations of ITS to hold an additional workshop for graduate students on writing scientific papers. I proposed the title: "How to do scientific research and how to write a scientific paper." This workshop was held on Monday 29<sup>th</sup> April with about 30 participants. The main topics were basics of scientific research, basis of scientific experiments and paper writing. I have been talking also about plagiarism, how to submit a paper to international journals, the peer review process, scientific evaluation, journal impact factors.*

*On Tuesday April 30<sup>th</sup> I was surprisingly invited to give an additional workshop at the Department of Mathematics (ITS). This was because one of the members of this department had listened to my talk at the mechanical engineering department and therefore invited me. The title of the talk in the workshop was "Algebraic Geometry and its Application to*

*Robotics". I this talk I was able to emphasize the mathematics behind my research, whereas in the first tal, mostly to undergraduates in engineering, examples were the focus.*



*Workshop announcement*

*Further meetings with official members of the university:*

*Meeting with Prof. Dr. Ketut Buda Artana, ST., M.Sc. Vice Rector for Innovation, Cooperation, Alumni, and International Relations*



*After the meeting with the Vice Rector*

*Meeting with the head of the library and his staff. Discussion about library system at Austrian universities. Both meetings were organized by the international office if IT*

### *Collaborative scientific work:*

*In the project application it was stated: Depending on the Indonesian lab environment it is planned to investigate design variants of lower degree of freedom parallel manipulators. Unfortunately the lab environment of the main project partner Dr. Latifah Nurahmi is relatively poor. She was only able to build together with two of her master students a functioning mockup of a 3-RUU (3-revolute-universal-universal) parallel manipulator with variable base input which can be used for practical verification of computational results concerning the kinematics and dynamics of this type of lower degree of freedom parallel manipulator. In several hours of joint project work we have been working on the development of a suitable kinematic model to describe this type of manipulator and especially classify the different output parameters depending on the variable location of the first R joints. Constraint equations were established and using these equations the forward kinematics could be solved. It turns out that in the general case this manipulator has 32 solutions of the forward kinematics. This number reduces when geometrically special locations are considered. Further work was done in the derivation of the dynamic equations of a (redundant) 4-CUU parallel manipulator where some inconsistencies of the developed model could be revealed and eliminated.*

*The material and questions which has been discussed and partially worked off is promising to be the foundation of a joint paper, but it cannot be expected that such difficult questions can be solved in three afternoons. We have planned to continue the joint work in remote collaboration and plan to submit a joint paper for the ROMANSY conference (<http://romansy2020.jc-iftomm.org/>) next year in Sapporo (Japan).*

### *Publication:*

*The paper resulting from this project - **TITLE Forward Kinematics and Singularities of a 3-(rR)PS Metamorphic Parallel Mechanism** , **AUTHORS: Latifah Nurahmi, Manfred Husty and Dongming Gan** – was exepcted by 2020 USCToMM Symposium on Mechanical Systems and Robotics and will be published by the Axel Springer Verlag this year.*



*With the participants after the lecture  
Credits of all photos: M. Husty*

# DEVELOPMENT OF BIOMIMETIC ASSAYS FOR SCREENING FOOD-RELEVANT PATHOGENS

ASEAN UNINET INCOMING PROJECT REPORT 2019

## 1. Project Team

**Univ.-Prof. Dr. Peter A. Lieberzeit, University of Vienna, Department of Physical Chemistry (Project Leader):** Full professor since 2011, specialized in the design of novel “artificial antibodies” based on self-organization and the design of mass-sensitive, optical and electrochemical sensors. Currently 134 papers in Web of Science and roughly 200 conference contributions. Holder of the Fritz Feigl Award of the Austrian Society of Analytical Chemistry and the ISOEN Wolfgang Göpel Award. Member of the Editorial Board of “Sensors and Actuators B: Chemical” (IF=7.0). Organizer and General Chair of the “17<sup>th</sup> International Meeting on Chemical Sensors – IMCS2018” and Chairman of the International Steering Committee of IMCS conferences. Collaborations in Southeast Asia since 2009.

**Prof. Dr. Kiattawee Choowongkamon, Kasetsart University Bangkok, Faculty of Science, Department of Biochemistry:** BSc from Chulalongkorn University, Bangkok; MSc in Biochemistry from Lehigh University, PA, USA; PhD in Cell Physiology from Case Western Reserve University, OH, USA. Currently Associate Professor at Kasetsart University, Bangkok. He is mainly interested in Protein Purification, Protein Structure, Protein NMR, Protein Crystallography, Cloning and Expression Protein, Protein Simulation, Biosensors. Currently 96 papers in Web of Science. Broad interest in both fundamental and applied sciences.

**Ms. Sudarat Ledlod** obtained a PhD grant jointly funded by Charoen Pokphand Food (CPF) Food and Beverages Inc. and Srinakharinwirot University. Works on generating highly selective sensors based on detecting amplification products of oligonucleotides that are specific for food pathogens of the *Listeria* family. She has graduated shortly after returning to Thailand and still works on the interface between academia and industry.

## 2. Project Activities and Results

### 2.1. DETECTING DNA AMPLIFICATION PRODUCTS OF DIFFERENT *LISTERIA* SPECIES

This part of the project carried on for an entire year, during which Ms Ledlod stayed in Vienna. One month of it was funded via Asea Uninet to allow her to stay longer than her Thai scholarship would have lasted. During that time, she successfully immobilized target DNA oligomer probes on QCM surfaces via thiol linkage. This comprised binding studies of the thiol-modified probes on the QCM surface, a range of dilution experiments to optimize the surface and finally QCM measurements to assess actual binding between that probe and the target analyte. Finally, she also carried out measurements *in situ* during LAMP amplification, i.e. at elevated temperatures (57°C). Figure 1 demonstrates the resulting sensor characteristic revealing a limit of detection of LoD=22.36 ng/L.

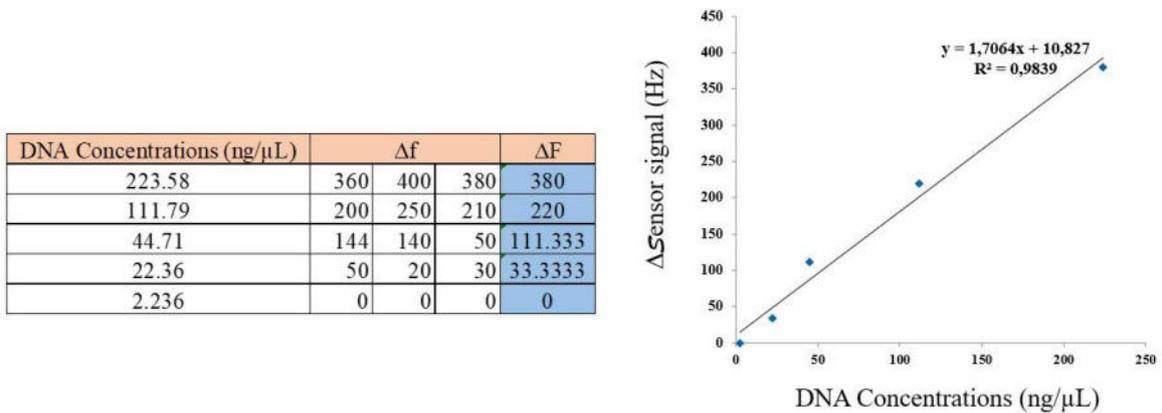


Figure 1: Sensor Characteristic of *Listeria spp.* QCM sensor. © S. Ledlod, P. Lieberzeit/University of Vienna

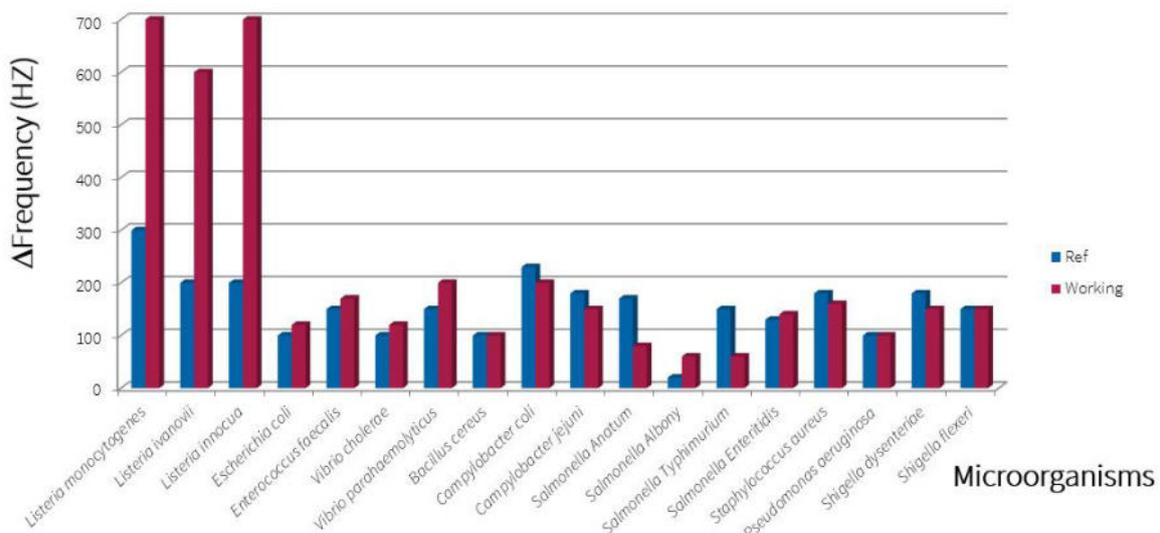


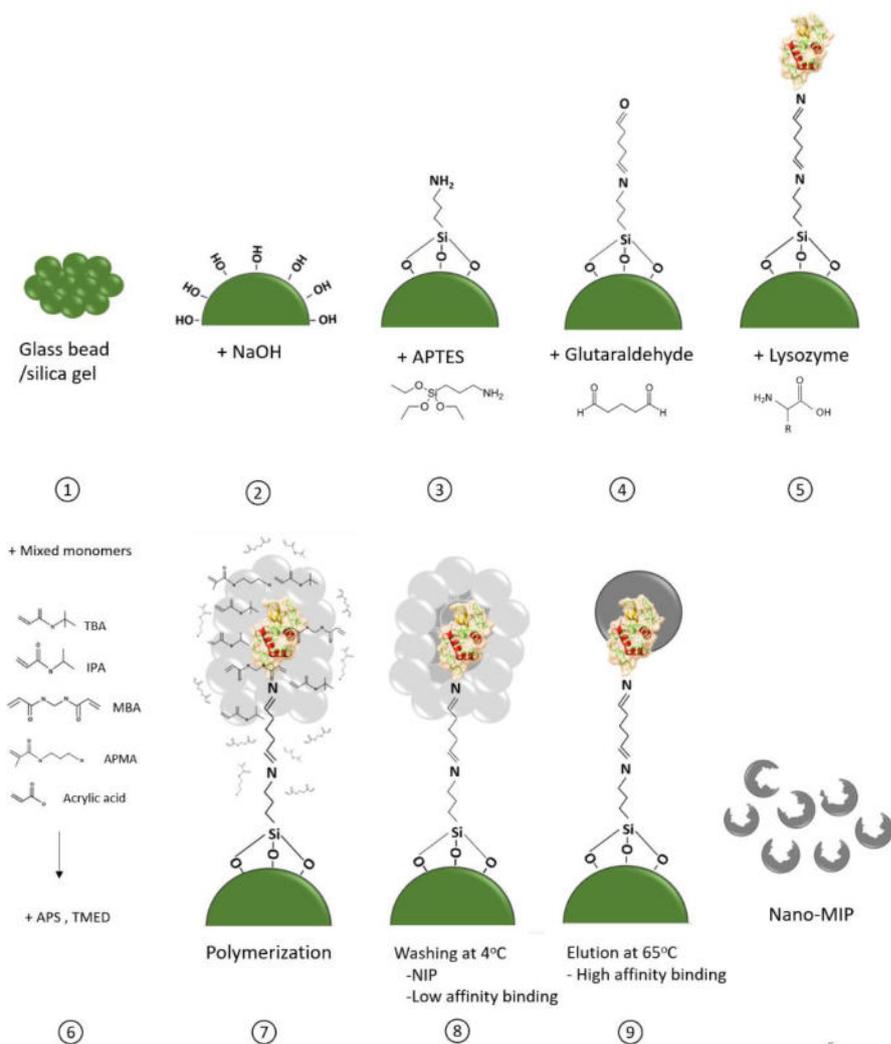
Figure 2: Selectivity pattern of Sensor. © S. Ledlod, P. Lieberzeit/University of Vienna

The systems also revealed very appreciable selectivity compared to other microorganisms (Figure 2). Overall this work led to results that we expect to publish within this year or the next.

## 2.2. NANOMIP-APPROACH FOR PORCINE CIRCOVIRUS (PCV)

This sub-part of the project is about establishing a biomimetic assay format based on so-called molecularly imprinted polymers (MIP). The work started in September 2019 with Ms Supaporn KLANGPRAPAN (not funded by Asea Uninet) returning to the lab at UNIVIE. Her supervisor, Assoc. Prof. Kiattawee Choowongkamon, stayed in Vienna in December for joint discussions and planning. The aim of the work is to generate so-called “NanoMIP” (developed by groups in Leicester and Compiègne) to detect PCV capsid proteins obtained from injection materials. To save on the rather expensive peptide materials, we synthesized nanoMIP for lysozyme according to the strategy laid out in Fig. 3.

This led to successful nanoparticle synthesis for lysozyme that indeed showed appreciable binding



**Figure 3: Nano-MIP synthesis.** © S. Klangprapan, P. Lieberzeit/University of Vienna

characteristics for this protein during fluorescence measurements. The resulting Stern-Volmer plots indicate that particles bind the protein 1:1, which is essential for successfully designing the assay.

### 3. Expected Results and Publications

The following results can be expected from this project within the next 1-1.5 years:

- Paper on Nucleic Acid sensing with the group at SWU. This may be delayed a bit due to the economic problems caused by the Covid crisis (Dr. Ledlod currently works for a company)
- Papers summarizing the outcome of PCV MIP assays.
- Test for application scenarios of these MIP.
- Further collaboration between the groups in Vienna and at KU concerning innovative chemo- and biosensing especially for detecting viruses.

Based on the direct support of Asea Uninet, the two following papers were published in 2019:

- Sroysee W et al, "Molecularly imprinted polymers to detect profenofos and carbofuran selectively with QCM sensors" *Phys. Med.* 7 (2019) 100016;  
<https://doi.org/10.1016/j.phmed.2019.100016> (PL\_paper1.pdf)
- Chunta S et al, "Sensing array based on molecularly imprinted polymers for simultaneous assessment of lipoproteins" *Sens. Actuators B* 298 (2019) 126828;  
<https://doi.org/10.1016/j.snb.2019.126828> (PL\_paper2.pdf)

Two more publications are not directly linked to the program. However, they result from cooperation that were made possible by the fact that the sensor group in Vienna can maintain substantial collaboration in Thailand, which is partly funded by the program.

Furthermore, results from collaborations partly funded by ASEA-Uninet were presented at least at three conferences in 2019, namely:

- "Surface imprinting for label-free detection of biospecies", P. A. Lieberzeit, S. Chunta, A. Strallhofer, W. Naklue, R. Suedee, 2nd European Biosensor Symposium – EBS2019, Feb 18-21, Firenze, Italy
- "Biomimetic Sensors to Assess Pathogens and Clinical Parameters" P. A. Lieberzeit, A. Strallhofer, C. Koitio, S. Klangprapan, K. Choowongkomon, Matrafuered 2019 International Meeting on Chemical Sensors, Jun 16-21, Visegrad, Hungary
- "From Self-Organized Monolayers to Surface Molecular Imprints: Assay Formats Extending Beyond the Obvious". P. A. Lieberzeit, A. Strallhofer, C. Koitio, S. Klangprapan, K. Choowongkomon, 9th International Workshop on Surface Modification for Chemical and Biochemical Sensing (SMCBS 2019), Nov 8-12, Zelechow, Poland

Successful collaborations will be continued in 2020 and beyond, especially with Kasetsart University (C. Sangma and K. Choowongkomon) and Prince of Songkla University, Hat Yai (R. Suedee and S. Chunta), and Ubon Ratchatani University.

# BIOMIMETIC APPROACHES FOR TESTING PHARMACOLOGICAL ACTIVITY

*ASEAN UNINET OUTGOING PROJECT REPORT 2019*

## PROJECT TEAM

**Univ.-Prof. Dr. Peter A. Lieberzeit, University of Vienna, Department of Physical Chemistry (Project Leader):** Full professor since 2011, specialized in the design of novel “artificial antibodies” based on self-organization and the design of mass-sensitive, optical and electrochemical sensors. Currently 130 papers in Web of Science and roughly 200 conference contributions. Holder of the Fritz Feigl Award of the Austrian Society of Analytical Chemistry and the ISOEN Wolfgang Göpel Award. Member of the Editorial Board of “Sensors and Actuators B: Chemical” (IF=7). Organizer and General Chair of the “17<sup>th</sup> International Meeting on Chemical Sensors – IMCS2018” and Chairman of the International Steering Committee of IMCS conferences. Collaborations in Southeast Asia since 2009.

**Prof. Dr. Kiattawee Choowongkorn and Professor Chak Sangma, Kasetsart University Bangkok, Faculty of Science, Department of Biochemistry/Chemistry, respectively:** BSc from Chulalongkorn University, Bangkok; MSc in Biochemistry from Lehigh University, PA, USA; PhD in Cell Physiology from Case Western Reserve University, OH, USA. Currently Associate Professor at Kasetsart University, Bangkok. He is mainly interested in Protein Purification, Protein Structure, Protein NMR, Protein Crystallography, Cloning and Expression Protein, Protein Simulation, Biosensors. Currently 96 papers in Web of Science. Broad interest in both fundamental and applied sciences.

**Professor Dr. Orawon Chailapakul, Assoc. Prof. Dr. Paitoon Rashatasakhon, Chulalongkorn University, Department of Chemistry, Faculty of Pharmaceutical Sciences:** Professor Orawon is one of the leading experts in electrochemical analysis in Asia and worldwide with an outstanding track record in science. Professor Rashatasakhon is based in Organic Synthesis, but has previously spent one month at the group at UNIVIE.

## ACTIVITIES WITHIN THE PROJECT

PL travelled to Thailand between Aug. 2<sup>nd</sup>, 2019 (arrival on 3<sup>rd</sup> in the afternoon), and Aug. 12<sup>th</sup>, 2019 (departure). The next four days were filled with quite intense talks at various universities, partly as foreseen by the project, and partly beyond.

**August 4<sup>th</sup> and August 6<sup>th</sup>** saw talks with the partners at Kasetsart University, mainly Professor Kiattawee Choowongkomon and his group. This took place partly at the department and partly during the annual group excursion of the Kiattwee lab. The main topics there were discussions on the details of Ms. Supaporn Klangprapan's work, who arrived in Vienna a few weeks after that talk and started her work on sensors for Porcine Circovirus 2, which is part of the second Asea Uninet Project of PL in 2019 (incoming). Furthermore, the team discussed the structure and the first details of a manuscript based on work carried out by Chakpetch Koitio in 2017 and Supaporn Klangprapan in 2018 on sensing common swine fever virus (CSFV). By now, a revised version of the manuscript has been submitted to Heliyon – a reputed open access journal. Finally, PL also discussed one further manuscript with Professor Chak Sangma to prepare it for publishing. A first version of that work is close to submission.

PL gave a seminar talk "Recent advances in MIP as sensor layers and sorbents for nano- and micro-sized particles and biospecies" at KU on Aug. 6<sup>th</sup>.

On **August 5<sup>th</sup>**, PL visited Prof. Orawon CHAILAPAKUL, Prof. Sirirat KOKPOL and Prof. Paitoon RASHATASAKHON at the Faculty of Science, Chulalongkorn University. The discussions centered around the work of Ms Atchara LOMAE, one of Prof. Chailapakul's PhD students, who at that time worked in Vienna. Furthermore, it covered possible Bachelor projects in Applied Chemistry to be carried out in the Sensor group at UNIVIE.

PL gave a seminar talk "Self-organization as a tool in biomimetic recognition"

On **August 7<sup>th</sup>**, PL visited Prof. Kosum CHONSIRI and her biosensors group at the Faculty of Medicine, Srinakharinwirot University. The two groups collaborate already for several years. Those talks there were on a manuscript to be submitted by Dr. Sirirat WACHIRALURPAN (who PL and KC jointly supervised). By now, this paper has been accepted and is published in Sens Actuators B. The publication date is in 2020, so the paper will be part of a report in 2021. Furthermore, PL gave a seminar talk "Molecular imprinting of biospecies: potential applications in diagnostics".

On **August 8<sup>th</sup>**, PL visited Professor Duangjai NACAPRICHA at the Department of Chemistry, Faculty of Science, Mahidol University, Bangkok. In addition to the local group, also Dr. Sumana KLADSOMBOON (Mahidol University), Professor Maliwan AMATATONGCHAI (Ubon Ratchatani University), Dr. Panwadee WATTANASIN (Prince of Songkhla University), and Dr. Suticha CHUNTA (Prince of Songkhla University) were present. All of them had spent different amounts of time at the group in Vienna. Talks at Mahidol comprised further possibilities to collaborate with Professor Nacapricha's group and discussions on manuscripts (accepted for publication in 2020) and scholarship/short stay applications with the others. Also, it comprised planning the experiments for the stay of Dr. Suticha Chunta in Vienna in early 2020 as well as for stays of Professor Amatongchai and her student, Nongyao Nontanwong, in Vienna in May 2020. The title of the seminar talk given was "Highly selective polymer-based sensing of bacteria and other diagnostically interesting species."

On **August 12<sup>th</sup>**, PL met with Assoc. Professor Dr. Jaroon JAKMUNEE (University of Chiang Mai) in Bangkok to discuss possible scientific collaboration between the two groups.

## RESULTS AND FURTHER ACTIVITIES

The immediate outcomes of this outgoing project are as follows:

- Dr. Suticha CHUNTA received an Ernst Mach scholarship for carrying out research in Vienna for four months in 2020. That stay was cut short by the COVID crisis.
- As mentioned, three manuscripts immediately resulted from those talks. Two of them are already published (one in *Sens Actuators B*, one in *Analytica Chim Acta*), for one more the decision is close.

ASEA 2019/UniWien/8

Applicant: a.o. Univ.-Prof. Dr. Hermann Mückler

Project leader: Dr. Gabriele Weichart

## PROJECT REPORT

**Project Title: “Disaster on Display”**

**Project partners:**

**Dr. Gabriele Weichart** (Project leader)

University of Vienna, Department of Social and Cultural Anthropology

Email: [gabriele.weichart@univie.ac.at](mailto:gabriele.weichart@univie.ac.at)

Gabriele Weichart is Senior Lecturer at the Department of Social and Cultural Anthropology at the University of Vienna. She completed her PhD at the University of Vienna in 1997. Her current research interests include the anthropology of material culture, cultural heritage and memory; environment, disaster and social/cultural resilience; as well as food and consumption.

**Dr. Bambang Hudayana**

Gadjah Mada University, Department of Anthropology

Email: [bambang.hudayana@ugm.ac.id](mailto:bambang.hudayana@ugm.ac.id)

Bambang Hudayana is Head of Department of Anthropology at Gadjah Mada University. He received his MA degree at the Australian National University and his PhD at Gadjah Mada University in 2011. His main research interests are local politics and civil society movements, the anthropology of development and economic anthropology. Since 2011, he has also carried out extensive research on the economic and socio-cultural consequences of natural disasters.

**Dr. Pujo Semedi Hargo Yuwono**

Gadjah Mada University, Department of Anthropology

Email: [pujosemedi@ugm.ac.id](mailto:pujosemedi@ugm.ac.id)

Pujo Semedi is Head of the Anthropology Graduate Program of the Department of Anthropology at Gadjah Mada University (UGM). He obtained his PhD from the University of Amsterdam in 2001. From 2012 to 2017 he held the position of Dean of the Faculty of Cultural Sciences at UGM. His research has focused on tourism, migration as well as rural economies in Indonesia and Germany.

**Prof. Dr. Ir. Happy Ratna Santosa**

Institut Teknologi Sepuluh Nopember, Department of Architecture

Email: [happysumartinah@gmail.com](mailto:happysumartinah@gmail.com)

Happy R. Santosa is Professor of Architecture and Head of the Laboratory of Housing and Human Settlements at the Institut Teknologi Sepuluh Nopember in Surabaya, Indonesia. She completed her PhD at the University of Queensland, Australia, in 1988. Her research has mainly focused on settlement, housing and the environment in urban and rural areas, and the management of coastal areas.

## **Project description:**

The project carried out in 2019 was part of an ongoing interdisciplinary research programme and collaboration which started in 2011 and connects various academic disciplines (Anthropology, Architecture and Urban Planning) and research fields, such as post-disaster rehabilitation, architecture and regional planning, tourism and heritage studies as well as the politics of remembrance.

In 2019, the collaboration between the Austrian and Indonesian partners included ethnographic field research, workshops and discussion groups, public presentations and publications. Between August and November 2019, the collaboration included three mobilities of project partners:

- 1) 18/08/2020 – 16/09/2020: G. Weichart (Univ. Vienna) travelled to Indonesia
- 2) 04/10/2020 – 19/10/2020: B. Hudayana (UGM) travelled to Vienna
- 3) 03/11/2020 – 24/11/2020: G. Weichart (Univ. Vienna) travelled to Indonesia

## Introduction:

The project links different fields of research, such as disaster reconstruction, tourism, the politics of memory and heritage building. In the empirical research, we investigated the commemoration of natural disasters in the context of Indonesia's growing tourism industry.

Historically, local people's experiences and knowledge regarding natural disasters have been largely unknown to the wider world. But especially since the tsunami of 2004, which had particularly devastating effects on the west coast of North Sumatra, a new politics of commemoration has emerged, motivated by the desire not to forget such collectively tragic and influential events, but to make experiences of disaster accessible and understandable to a wider public. Due to the fact that the country's geographic position and its natural hazards has been a fundamental part of many Indonesians' identity and everyday life for thousands of years, disasters as well as practices of commemoration can be identified as local or even national configurations of natural, social and cultural heritage.

Examples are the Tsunami Museum in Aceh, the 'lava tours' and exhibitions on the slopes of the volcano Mt. Merapi near Yogyakarta in central Java and the stone monuments at the Lapindo mud flow near Sidoarjo in eastern Java.

The empirical research on these sites was carried out by teams of researchers and students from the University of Vienna and Gadjah Mada University. The methods applied in the ethnographic fieldwork included guided as well as narrative interviews, informal conversations, photography and participant observation.

At UGM/Yogyakarta: meetings with researchers and students from the following schools/departments:

- Department of Anthropology
- Center for Tourism Studies
- Center for Southeast Asian Social Studies

At ITS/Surabaya: meetings with researchers and students from the Department of Architecture

## Research stages and areas:

### **1) August 2019: Merapi / Special Region of Yogyakarta**

The research on the slopes of Mt. Merapi, one of Indonesia's most active volcanoes located approx. 25 km north of the city of Yogyakarta in central Java, started in 2018. In August 2019, G. Weichart and two Master students from the Department of Anthropology at UGM, Almonika Cindy Fatika Sari and Ferdy Azmal Fakhrani visited the village Umbulharjo and the gateway to the most frequented tourist sites erected after and in relation to a major eruption in 2010.

The sites comprise two museums, a memorial of the local spiritual leader, a bunker where some people died, a face-shaped rock and two theme parks that only serve for public entertainment. The research team visited all sites with a local tour guide who works for one of the approx. 30 jeep cooperatives that have been set up in Umbulharjo and other neighbouring villages. Furthermore, interviews were carried out with jeep drivers, other community members, NGO activists and local researchers. It was possible to investigate not only the status quo of tourism in the area but to observe new developments and compare structures and activities since 2018.

From the research data collected we could conclude that the local tourism developments had a remarkable influence on the economic and social conditions of the local population. While many local families, who worked in the tourism business (e.g. as drivers, tour guides or in one of the trendy cafes), benefitted economically from the increase in tourism activities and rising tourist numbers, they also had to pay a high price. It meant noise and pollution at their doorsteps, a busy and irregular work schedule, especially on weekends, and a strong dependency on a rather vulnerable enterprise.

### **2) September 2019: Sidoarjo / East Java**

Since 2006, the subdistrict (kecamatan) of Porong, 14 km south of the city of Sidoarjo in East Java, has been severely affected by a constant mud flow from an underground volcano. More than 5000 private houses, factories, schools, mosques and other public buildings, as well as farmlands and fishponds have been submerged and inhabitants of 16 villages have been evacuated. Although it is a "natural" disaster in the sense that the mud volcano is a natural feature, the population as well as most experts interpret it as a human-made disaster for which the Indonesian oil company Lapindo Brantas is responsible.

Until now, the compensation claims for the inundated properties have not been settled yet. Large numbers of the relocated population have not fully adapted to their new circumstances, still live in economically precarious conditions and suffer from their material and symbolic losses. The ongoing negotiations with the company and the local government further add to the victims' mental and emotional stress and are constant reminders of their loss and suffering. Many people therefore find it difficult to re-build their lives in their "new" environments, although they still dwell in relative proximity to their original homes. The loss of their old jobs and lack of new work opportunities for men and women of all age groups are major factors in this scenario of deprivation and disadvantage.

Especially middle-aged men have difficulties on the local job market and some try to make an income as motorbike taxi drivers (*ojek*) that offer tours around the mud lake to visitors. In the

first few years after the beginning of the mud flow, when the disaster was widely covered by the media throughout the country and many visitors were attracted by this unusual spectacle, the business was flourishing and the *ojek* drivers earned good money. These times, however, are well and truly gone. As a rather industrial city, Sidoarjo is not a tourist destination and today only few passers-by stop at the inconspicuous little shelters near the dam that should keep the muddy water under control.

As the Lapindo mud lake and its surroundings fit into the category of disaster tourist attractions, the *ojek* drivers, their families, shop owners and a few others still hope that visitor numbers will rise again and they can make a decent living by showing tourists around or selling food and other local produce. However, in order to become a profitable enterprise, the sites need major investments into the touristic infrastructure. Chances of such investments by the local government or private entrepreneurs are rather low and the local communities do not have the resources themselves.

During their 5 day visit to Porong in September 2019, G. Weichart and the UGM Master student Ferdy lived in local households and therefore could observe and gather information directly from NGO and community members and engage with the *ojek* drivers. The researchers received further support from colleagues from the Institut Teknologi Sepuluh Nopember and the University of Airlangga in Surabaya and the University of Brawijaya in Malang.

### **3) November 2019: Aceh**

In November 2019, G. Weichart spent two weeks in Aceh. During that time, she was joined by the UGM Master student Almonika who stayed for a whole month and returned for another research period towards the end of the year.

In 2004, the Province of Aceh was hit by a strong earthquake in the Indian Ocean which was followed by a devastating tsunami that caused approx. 170,000 deaths and 500,000 homeless in Aceh alone. This tragic event has left its marks in the region and influenced its political, economic and social developments. Contrary to other natural disasters in the past, the 2004 tsunami should not be forgotten. The local government and communities made efforts to honour the dead and keep the memory alive – for their own population as well as for visitors. Due to the worldwide attention the tsunami received, even foreign visitors to Aceh still remember the vivid pictures that circulated through the media at the time and they are interested in visiting some of the original sites of the disaster.

Several major monuments have been erected in and near the capital Banda Aceh. They include the Tsunami Museum, which was opened in 2009, two ships which were flung several kilometres into the city, the Rahmatullah Mosque near Lampu'uk beach, several cemeteries and a few other sites. Although they have been promoted as tourist attractions, the authorities do less identify them as sites of disaster tourism, but rather emphasise their educational potential and their roles as places of worship and remembrance. The Museum and the ships are the best known and most frequented sites. As international tourism in Aceh is still rather low in numbers, most visitors to the tsunami sites are either domestic or come from neighbouring countries like Malaysia or Singapore.

### Preliminary results:

The research has dealt with the politics of “natural” disaster in three different regions of Indonesia. In all cases, local authorities or communities have made efforts, for various reasons, to keep the memories of the tragic events alive and to present them to interested visitors from outside. This has required a minimum of collaboration between different stakeholders and resulted in various forms of commodification of experiences and emotions.

However, there are noticeable differences between those three places, especially when considering their political and economic situations and, hence, the distribution of power and agency within the affected communities but also in relation to local authorities and the national government. Such differences and inequalities have had effects on the potential of developing a tourism industry and promoting the disaster events and their respective sites to outside visitors.

The Province of Aceh and its capital Banda Aceh have undoubtedly been in the strongest position, not least because of an already existing functional infrastructure and substantial financial support through various aid programs after the tsunami. The local and regional governments have been actively involved in the erection and/or promotion of the sites and monuments related to the disaster which have become major sights in the city landscape and of interest to locals as well as to visitors. Although local vendors use those places to sell food or souvenirs to the visitors, only a small percentage of the city population depends economically on the sites. The Tsunami Museum, in particular, sees its main purpose in educating the young people in their communities about tsunami and natural disasters in general. Despite the disastrous effects of the tsunami, the local population’s attitude towards that politics of display and memorisation seems to be generally positive and optimistic. By learning about the past, it will not be repeated in the future.

Different stakeholders have been responsible for tourism developments on the slopes of Mt. Merapi. Many of the more recent investments in “volcano tourism” have been made by the local population and individual leaders. Although many people had to be relocated after the eruption, there is still a fairly strong sense of community cohesion and cooperation which has been needed for establishing and running the “jeep communities” and their Lava Tour packages. These businesses have not only changed the physical appearance of the village and the lifestyle of its inhabitants, but many of the latter have become severely dependent on the rather vulnerable tourism industry. NGO activists and researchers therefore have mixed feelings about these developments. They are critical of the lack of support by the local government and fear that the current forms of volcano tourism are not sustainable and may therefore lead to more economic and social problems in the future. It is most likely that the worldwide COVID-19 crisis has already negatively affected tourism on Merapi.

When compared to the previous examples, the inhabitants of the subdistrict of Porong/Sidoarjo are the economically and politically least powerful and optimistic which has been reflected in their expectations of tourism development at the Lapindo mud lake. The *ojek* drivers would be the primary beneficiaries of a more lively tourist scene. However, they do not see enough potential for themselves to make a substantial contribution to a tourism development that could result in their economic and political empowerment. As the Lapindo company as well as the local government are held responsible for the present weak position and dependency of the relocated

people of Porong, they are also expected to invest in a tourism infrastructure as part of livelihood improvement programs. After thirteen years, there is no light at the end of the tunnel and many negative emotions, like helplessness and frustration, have been hardened. They have led to competition for scarce resources, resignation and weakened community cohesion.

One of the things all three cases have in common, despite their very different scenarios and opportunities, is the desire to keep the memory of the disaster events and the victims alive – for their own communities as well as for outsiders. The motivations range from individual people's immediate economic improvement to long-term disaster mitigation by educating the young generations. Managing and collectivising individual memories of disaster by collective representations may eventually lead to configurations of collective local heritage which is materialised in the objects and sites on display. The commodification of destruction and suffering raises further ethical questions that have to be dealt with by all stakeholders, including the visitors to the sites of disaster.

#### Further activities:

G. Weichart was invited as a speaker at the ASEA-UNINET Joint Program for Inbound Staff Mobility, 9-15 September 2019, co-hosted by the Institut Teknologi Sepuluh Nopember (ITS, Surabaya), Airlangga University (Surabaya) and Udayana University (Bali).

Title of presentation: *"Best Practice in Austrian-Indonesian Collaboration"*

G. Weichart was an invited speaker and moderator at the International Conference on Planning towards Sustainability (ICoPS) 2019, 6-7 November 2019, hosted by the Urban and Regional Planning Program at the Universitas Sebelas Maret in Surakarta (Java).

Title of presentation: *"Diversity and Individuality in Human Settlements"*

#### **Dissemination and further collaboration:**

##### Teaching:

In April 2019, G. Weichart taught about disaster tourism as part of the Erasmus+ International Mobility at the Department of Anthropology, Gadjah Mada University.

In October 2019, B. Hudayana (UGM) gave an introductory lecture about Indonesian culture at the Department of Social and Cultural Anthropology at the University of Vienna.

##### Conference presentation:

G. Weichart was invited as a speaker in the panel "vernacular narratives" at the Conference "Narrative, Architecture and Tradition" held at the University of Leiden on 13 December 2019.

Title of the presentation: "Gunung Merapi: Narratives of a Mountain"

**Photos:**



One of the many jeep communities on the slopes of Mt. Merapi; tourists waiting to be taken on the Lava Tour. September 2019 (photo: G. Weichart)



Lapindo mud lake at Porong/Sidoarjo; shelter erected for the motorbike taxi drivers (*ojek*) when waiting for customers. The dam also serves as a road for *ojek* and tourists when circling around the mud lake. September 2019 (photo. G. Weichart)



Kapal Apung Lampulo, the fishing boat that was flung on top of a house by a massive tsunami wave in 2004. It has become one of the main tourist attractions. Banda Aceh, November 2019 (photo: G. Weichart)

### **Expected results:**

#### Master theses:

Two Master students at the Department of Anthropology at Gadjah Mada University have participated in the research program of this project and carried out further research, including ethnographic fieldwork, for their Master theses on related topics.

- 1) Almonika Cindy Fatika Sari on disaster tourism in Aceh
- 2) Ferdy Azmal Fakhrani on disaster tourism on Merapi

Both of them are expected to finalise their theses and complete their Master studies within the next few months. G. Weichart has acted as one of the supervisors of their theses.

#### Publication:

B. Hidayana (UGM) and G. Weichart (Univ. Vienna) are working as co-authors on an article on Merapi disaster tourism to be published by the Austrian Journal of South-East Asian Studies (ASEAS) towards the end of 2020.

## **Planned activities and collaborations:**

### Collaborations in research and teaching:

G. Weichart has been invited to spend the month of September 2020 as a visiting fellow at the Center for Tourism Studies at Gadjah Mada University in Yogyakarta. Due to the COVID 19 crisis, the fellowship will probably be postponed to 2021.

Further collaboration in research and teaching have been planned with the Department of Anthropology at Gadjah Mada University.

From November 2019 until January 2020, the UGM Master student Evy Gustiana did research at the University of Vienna and carried out ethnographic fieldwork on Vienna's Christmas markets. The supervision was carried out in collaboration with the Department of Geography.

Apart from the teacher and student exchange within the Erasmus+ International Mobility Agreement between both institutions, Indonesian researchers as well as students have planned to do more anthropological research in Austria. We hope that this can be realised in 2021 despite expected cuts in funding due to economic impact caused by the COVID-19 crisis.

Teaching exchanges with the University of Airlangga and the Institut Sepuluh Nopember in Surabaya are further envisaged.

## Project Report ASEA2019/Uni Wien/10

### Project Title

Transcultural lives of Myanmar Migrant children and youths in Thailand: Self-identity and sense of belonging

### Project Collaborators

#### *Project Leader:*

Family Name Stange  
First Name Gunnar  
Academic Degree Dr.  
Institution Institut für Geographie und Regionalforschung der Universität Wien, Österreich  
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Dr. Gunnar Stange currently holds a position as Assistant Professor in Human Geography at the Department of Geography and Regional Research, University of Vienna, Austria. He received his PhD from the Department of Social and Cultural Anthropology, Goethe University, Frankfurt am Main, Germany. His research interests include peace and conflict studies, development studies, and forced migration. His regional focus is on South-East Asia.

#### *Research Collaborator:*

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First Name Kwanchit  
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Institution Mahidol University, Research Institute for Languages and Cultures of Asia  
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Assoc. Prof. Dr. Kwanchit Sasiwongsaroj (host professor) is an associate professor at the Research Institute for Languages and Cultures of Asia (RILCA), Mahidol University, Thailand. Her research interests include cross cultural studies focusing on cultural differences between majority and minority ethnic groups, including migrants, and their consequences for their health and well-being.

## **Project Description**

### *Background*

Globalization and international mobility have led people to settle in vastly different cultural contexts. Transnationally situated families resulting from migration are becoming a more regular feature of children's lives in today's world. The phenomenon of cross border work migration has a long history in Thailand. Thailand is one of three major economies in Southeast Asia and hosts over a half of the region's migrant workers. An influx of migrant workers from neighbouring countries has been noticeable and the flow has increased continuously. Since 1992, Thailand has seen an increased influx of work migrants as the Thai government started to issue "temporary permissions" under Section 17 of the Immigration Act B.E. 2521 (1978) for irregular migrants to work in Thailand temporarily (Sasiwongsaroj, 2014: 60). In 2018, there were three million migrants living in Thailand and an estimated 300,000 of those were children and youths (United Nations, 2019: 99).

It has been noted that migration experiences constitute substantial interferences in children's psychological development and well-being given the environmental and cultural changes they are exposed to (Batista & Wiese, 2010; Devine, 2011; Harttgen & Klasen, 2008). However, despite this trend, very few researches focus on children and youths. Language and language acquisition are central issues in debates about transculturation, cultural identity in transnational migration as well as integration in host countries. Notably, an importance of acquiring the language of the host country is acknowledged and has become a core element of today's integration policies in many European immigration countries. However, this challenge is a largely overlooked dimension of the migration policies of Thailand and several other countries in Southeast Asia.

### **Research Question (RQ) and Project Aim**

*RQ: How do individual migration histories, language acquisition and translocal relations impact on the sense of belonging, identity and self-perceived integration of Myanmar migrant workers' children in the city of Ranong, Thailand?*

This study aims at contributing to current debates on transnational family migration by arguing for the centrality of language in the everyday lives and identities of young migrants. In order to respond to the research question the study 1) investigated the role language plays in everyday lives of Myanmar children and youths (aged 12 - 21) who have migrated to Thailand, and 2) explored the role of language in the processes of enculturation, acculturation as well as ethnic and cultural identity formation.

## **Project Implementation**

Preparatory desk research, study design conceptualization and field research preparations were conducted in Vienna and Salaya from April to June 2019. Additional field work preparations took place in the first and the last week of July 2019 in Salaya. Field work was conducted during the first two weeks of August 2019 in Ranong. Data analysis took place from October 2019 to March 2020. The writing process for a planned publication (see, f) is currently underway.

The field research was conducted in the city of Ranong in Southern Thailand. The geographical position of this middle-sized city at the border to Myanmar makes it a particularly suitable research site as an estimated 60 percent of Ranong's population are migrant workers from Myanmar living in designated compounds. The field research was conducted during the first two weeks of August 2019 by Dr. Sasiwongsaroj and Dr. Stange who were assisted by two translators (Bamar/Englisch). Based on prior and informed consent, 69 guideline-based narrative interviews were conducted with children and youths aged 12 to 21 in groups of two to four students in two privately run Myanmar Learning Centers (MLC) that are exclusively attended by children of migrant workers from Myanmar. One MLC (MLC 1) is run by an Australian charity organization and teaches a primary and secondary Thai curriculum that is taught in Bamar, Thai, and English. Thai language is taught in the extent of one hour per day. The second MLC (MLC 2) teaches a Myanmar curriculum in Bamar language at primary and secondary level. Thai language is taught only once a week for one hour.

## **Project Results**

Research results show that the children attending MLC 2 that only teaches the Myanmar curriculum in Bamar language and offers only one hour of Thai language training a week, have a relatively low command of Thai, have less contact to Thai people, feel a strong sense of belonging to their home country Myanmar and are very regularly in contact with relatives and friends in Myanmar as well as more frequently visiting their places of origin in Myanmar. They mostly imagine their future in Myanmar and aspire either further schooling in Myanmar and/or wish to return to and work in Myanmar in the future. Respondents in MLC 2 felt little integrated in Thai society and in the majority of cases referred to themselves as second class "citizens" and reported regular experiences of everyday (racial) discrimination (all of them had either Myanmar citizenship or at least a Myanmar birth certificate).

Students in MLC 1 that offers trilingual education and daily Thai language training showed a much stronger sense of belonging to the city of Ranong to which a majority referred as their

“home”. The students’ command of Thai language was relatively higher, and a majority stated to have Thai friends and regular contacts to Thai people. A majority of the interviewed students in MLC 1 were born in Ranong and came from families that had migrated to the city 15 to 20 years ago. They reported less frequent contact to friends and families in their places of origin in Myanmar and were less often visiting Myanmar. Furthermore, many students intended to pursue higher education in Thailand and to continue living and working in Thailand in the future. Reports of everyday (racial) discrimination were not as significant in MLC 1 as compared to MLC 2.

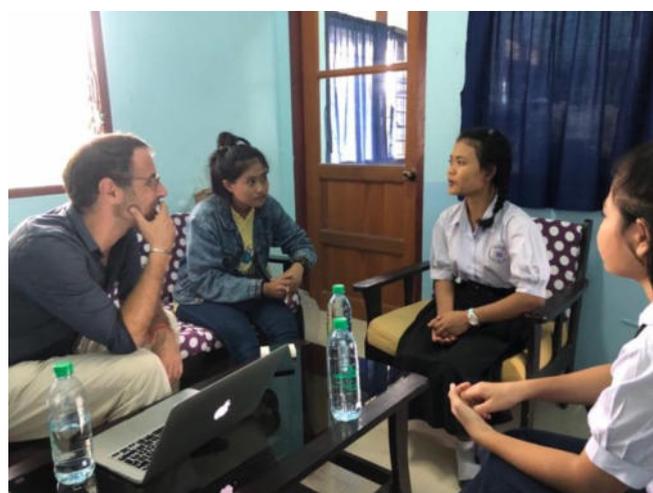
Generally, this research found a strong positive relationship between the students’ command of the Thai language and their local sense of belonging as well as their intention to pursue higher education and a working career in Thailand in the future.

## Publications

The research collaboration between both research institutions is ongoing since June 2018. As a field research that was initially scheduled for September 2018 could not be carried out as planned due to the sudden withdrawal of a collaborating non-governmental aid organization in Ranong, the collaboration partners decided to conduct a desk study on current forced migration research in Southeast Asia. The results of the study were published in the *Austrian Journal of South-East Asian Studies* in December 2019:

Stange, G., Sakdapolrak, P., Sasiwongsaroj, K. and Kourek, M. (2019) “Forced Migration in Southeast Asia”, *Austrian Journal of South-East Asian Studies*, 12(2), pp. 249-265. doi: 10.14764/10.ASEAS-0024.

## Photo Documentation



Interview of Gunnar Stange and a translator with two Myanmar migrant workers’ children in an international Myanmar Learning Center in Ranong, Thailand, 2 August 2019; photo: Kwanchit Sasiwongsaroj



Presentation of preliminary research results by Gunnar Stange at the EuroSEAS Conference in the panel “Recent Politico-Legal Change for the Lives of Labour Migrants in Southeast Asia”, Berlin, 13 September 2019; photo: Ario Seto

## Planned Publications

Following the presentation of preliminary research results at the EuroSEAS Conference in the panel “Recent Politico-Legal Change for the Lives of Labour Migrants in Southeast Asia” on 13 September 2019 in Berlin, the research team was invited to publish the research results in the special issue “New Area Studies” of the *International Quarterly for Asian Studies* (<https://crossasia-journals.ub.uni-heidelberg.de/index.php/iqas/index>) that will be published in October 2020.

## Future Cooperation

The research team plans to extend the qualitative study conducted in August 2019 to a larger quantitative survey in the same research location in summer 2020. A respective research proposal was submitted to ASEA-UNINET in early 2020. Given the current global travel

restrictions due to the Corona pandemic, it remains uncertain whether or not the planned field research can be undertaken as scheduled.

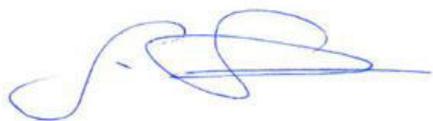
## Literature

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- Hartgen, K., & Klasen, S. (2008). *Well-Being of migrant children and migrant youth in Europe*. Göttingen: University of Gottingen.
- Sasiwongsaroj, K. (2014). Irregular immigrants from Myanmar, Cambodia and Lao PDR in Thailand: Trends and the difficulties they face. In K. Husa, A. Trupp & H. Wohlschlägl (eds.), *Southeast Asian Mobility Transitions: Recent Trends in Tourism and Migration*. Vienna: University of Vienna.
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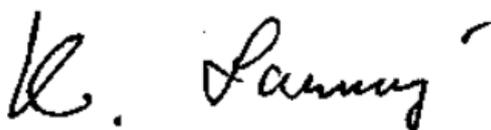
## Signatures



Vienna, 29 April 2020, Univ. Prof. Dr. Patrick Sakdapolrak



Vienna, 29 April 2020, Dr. Gunnar Stange



Salaya, 29 April 2020, Assoc. Prof. Dr. Kwanchit Sasiwongsaroj

## Project Report ASEA2019/Uni Wien/11

### Project Title

Vom Seminarraum ins Feld – Understanding Rural Livelihoods in Thailand

### Project Collaborators

#### *Project Leader:*

Family Name     Sakdapolrak  
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Institution       Institut für Geographie und Regionalforschung der Universität Wien,  
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Patrick Sakdapolrak is Professor of Population Geography and Demography at the Department of Geography and Regional Research, University of Vienna, Austria. His research field is at the interface of population dynamics, environmental change, and development processes, with a focus on the topics of migration and displacement as well as health and disease, mainly in South- and Southeast Asia and East Africa.

#### *Project Collaborator:*

Family Name     Pardthaisong  
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Dr. Pardthaisong is a population geographer and head of the Department of Geography at the University of Chiang Mai. Her research focuses on the issues of demographic changes, population and health, and livelihoods of the elderly. She is also interested and involved in research projects on health and environment as well as disaster resilience.

*Project Collaborator:*

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Dr. Vaddhanaphuti is a lecturer in Geography at Department of Geography, Faculty of Social Sciences, Chiang Mai University, Thailand. He is interested in the human dimensions of climate change with an emphasis on the construction of climate knowledge especially in Thai and Southeast Asian contexts; climate change adaptation; and discourse of climate change.

*Project Collaborator:*

Family Name Borderon  
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Marion Borderon is an assistant professor in geography at the University of Vienna, Austria. Her research interests concern population and development studies. Much of her work focuses on contributing to the development of concepts and methods for the spatial assessment of vulnerability and risk in the context of environmental transformation. She holds a PhD in geography from Aix-Marseille University, France, dealing with malaria in Dakar, Senegal.

## **Project Description**

The joint research summer school of the cooperating institutions focused on the livelihoods of local populations in rural northern Thailand, with particular attention on the nexus natural resources use and migration. The summer school was attended by 12 students from Vienna and 13 students as well as translators from the University of Chiang who jointly cooperated in six research teams working on different small research projects. Additionally, Universitas Gadjah Mada from Yogyakarta, Indonesia, joined the summer school with one lecturer and two students. The research summer school was methodically and empirically embedded in the European Union funded project "AGRUMIG - Leaving something behind. Migration governance and agricultural & rural change in 'home' communities: comparative experience from Europe, Asia and Africa" (H2020-SC6-MIGRATION-2018-2019-202, start: February

2019). Its' component on Thailand and Ethiopia is led by Prof. Dr. Sakdapolrak and Dr. Borderon.

### **Project Aim**

The aim of the joint research summer school was to introduce students to practical geographical development research by means of small research projects that were jointly planned and carried out by students of the cooperating institutions. This included an introduction to the relevant social and scientific research methods, the development of research projects as well as their practical implementation and documentation.

### **Project Implementation**

The research summer school included a preparatory methods and research design class at the University of Vienna (April - June 2019), a preparatory workshop at the University of Chiang Mai, a field research in different villages in Mae Chaem District and a wrap up workshop at the University of Chiang Mai (July 2019). The field research took place for two weeks in different villages of Mae Chaem District, Chiang Mai Province. Students of the University of Vienna conducted the research in tandem teams with master students of geography of the University of Chiangmai, supported by local translators and facilitators. All involved students and translators were hosted by local villagers in their private houses. Three lecturers of the University of Vienna (Prof. Dr. Patrick Sakdapolrak, Dr. Marion Borderon and Dr. Gunnar Stange), three lecturers of the University of Chiangmai (Dr. Liwa Pardthaisong, Dr. Chaya Vaddhanaphuti, and Dr. Yanin Chivakidakarn), and one lecturer of Universitas Gadjah Mada (Dr. Agung Wicaksono) were responsible for the supervision of the research groups before, during and after the research. Raks Thai (Care Thailand), a civil society cooperation partner with a profound experience in the implementation of development projects in the field research sites, ensured access to the research localities and facilitated the logistical management of the research on site.

### **Project Results**

All in all, seven joint student research projects were conducted successfully in seven different villages on topics as diverse as social and financial remittances; youths' aspirations; land use and land cover change and migration; off-farm livelihoods; as well as gender and migration. Three of the participating students continued their research stay in Thailand and, by now, have completed and submitted their diploma theses on their respective topics. The teaching and research cooperation between the University of Vienna and the University of Chiang Mai

produced important knowledge on the nexus of migration and rural resource use in Thailand. The results were discussed and made available to the civil society project partner and the local government of Mae Chaem District.

## **Publications**

See, f) Planned Publications

## **Photo Documentation**

*Credits: University of Vienna, Department of Geography and Regional Research, Research Group Population, Environment, and Development.*



Field research site



Summer school participants prior to field site departure

### **Planned Publications**

Based on the research results and teaching experiences, the project team plans to publish a scientific paper on the didactically innovative approach of tandem research training.

### **Future Cooperation**

Both partner institutions intend to continue joint research teaching activities in the future. Respective activities are currently being discussed between the cooperating institutions.

### **Signatures**

A handwritten signature in blue ink, appearing to read 'P. Sakdapolrak', with a long horizontal flourish extending to the right.

Vienna, 29 April 2020, Univ. Prof. Dr. Patrick Sakdapolrak, University of Vienna

A handwritten signature in blue ink, appearing to read 'Chaya Vaddhanaphuti', with a long horizontal flourish extending to the right.

Chiang Mai, 29 April 2020, Dr. Chaya Vaddhanaphuti, University of Chiang Mai

*Report of the visit at the Chulalongkorn University, Bangkok, Thailand, from November 4th to November 30st 2019.*

*Activities during the visit:*

*Participation at the Summerschool of Theoretical Chemistry (Molecular Dynamics) organized by the Udon Thani University (15.-17.11.2020)*

*Teaching and research activities at the Chulalongkorn University at the Department of Chemistry (Austrian Thai Center), at the institute of Physical Chemistry, as well as at the Department of Biochemistry and the Computational Unit Cell.*

- 1) *Planing of the visit of several scientists at the University of Vienna: Prof. Dr. Vudhichai Parasuk and Prof. Dr. Waraporn Parasuk, Prof. Dr. Chak Sangma, Prof. Dr. Tatiya, -- unfortunately all projects and visits have been cancelled because of the Corona virus epedemia.*
- 2) *Seminars for Master- and PhD students within the frame of several research projects of the research unit of Prof. Dr. Thanyada Rungrotmongkol. Scientific discussions with members of the research group of Prof. Thanyada Rungrotmongkol about common publications and support for PhD works.*
- 3) *Finalization of publications:*
  - K. Sanachai, P. Mahalabutr, K. Choonwongkomon. R. P.Poo-arporn, P. Wolschann, Th. Rungrotmongkol. Insights into the binding recognition and Susceptibility of Tofacitinib toward Janus Kinases ACS Omega 5, 369-377 (2020)*
  - K. Hengphasatporn, A. Garon, P. Wolschann, Th. Langer, T. Huynh Nguyen Thanh, W. Chavasiri, Th. S. Boonyasuppayakorn, Th. Rungrotmongkol, Multiple Virtual Screening Strategies for the Optimization of the Novel Compound Against Dengue Virus: A Drug Discovery Study Scientia Pharmaceutica, 88, 2 (2020).*
  - P. Kammarabutr. P. Mahalabutr, H. Okumura, P. Wolschann, Th. Rungrotmongkol Structural dynamics and susceptibility of anti-HIV drugs against HBV reverse transcriptase J Biomol structure and dynamics (2020)*
  - W. Hotatrat, B. Nutho, P. Wolschann, Th. Rungrotmonkol, S. Hannongbua, Delivery alpha-mangostin using cyclodextrins through a biological membrane: Molecular dynamics simulation Molecules, accepted 28.5.2020*
- 4) *Scientific contacts with Prof. Dr. Supot Hannongbua, Prof. Dr. Sirirat Kokpol, Prof. Dr. Vudhichai Parasuk, Prof. Dr. Siegfried Fritzsche, Prof. Dr.Pornthep Sompornpisut and Prof. Dr. Warinthorn Chavasiri (all Chulalongkorn University), discussion about common research projects.*

*Scientific contact with Prof. Dr. Chak Sangma (Kasetsart University).*

*Scientific contacts with Prof. Rungtiva Poo-Aporn, King of Mongkut University, Thonburi Campus about visits of students and staff members at the University of Vienna, concept for common research projects.*

## Theoretical investigations on Flaviviruses (ASEA 2019/Uni Wien/3) Project Report April 2020

The project is part of a long-standing collaboration on theoretical aspects of virus-host interactions between **Dr. Michael Wolfinger** and **Asst. Prof. Dr. Thanyada Rungrotmongkol**.

**Dr. Michael Wolfinger** (michael.wolfinger@univie.ac.at) is a theoretical chemist at the research group Bioinformatics and Computational Biology, Faculty of Informatics, and the Department of Theoretical Chemistry, Faculty of Chemistry, University of Vienna. His main research field is computational prediction of RNA structure. He is particularly interested in viruses and has been working in virus bioinformatics for more than five years

**Asst. Prof. Dr. Thanyada Rungrotmongkol** (t.rungrotmongkol@gmail.com) is a lecturer in Department of Biochemistry, Faculty of Science, Chulalongkorn University since 2011. Her research career has been devoted to the potential of uniquely detailed, atomic-level insight into biological processes of molecular recognition, structural and dynamics properties of proteins by computational simulations. To date, she has contributed to more than 120 international publications with h-index of 24.

**Nitchakan Darai, MSc** is a PhD student of Prof. Rungrotmongkol at Chulalongkorn University, Bangkok.

**Univ. Prof. Dr. Ivo Hofacker** is the Head of the Department of Theoretical Chemistry, University of Vienna, and acted as the project lead.

### Background

Flaviviruses are an important group of emerging and re-emerging pathogens, including Dengue virus (DENV), West Nile virus (WNV), and Zika virus (ZIKV), which cause millions of infections every year. The outbreak of ZIKV in the Americas between 2015 and 2017 revealed novel, hitherto unknown clinical manifestations, particularly congenital abnormalities including microcephaly in newborns [1]. Relatively little is known about the biochemical principles of flavivirus neurotropism, however, recent experimental evidence suggested an active role of the Musashi family of proteins, a group of host RNA-binding proteins, in promoting ZIKV replication, neurotropism, and pathology [2]. Musashi is a highly conserved family of proteins that typically act as translational regulator of target messenger RNA (mRNA) and is involved in cell proliferation and differentiation. While the two Musashi paralogs in mammals, Musashi-1 (Msi1) and Musashi-2 (Msi2), are expressed in stem cells [3] and overexpressed in tumors and leukemias [4], they are absent in differentiated tissue. Musashi proteins have two RNA recognition motif (RRM) domains, that have been shown to

bind short RNA motifs in a single-stranded structural context, preferentially within the 3'UTR of mRNA [5]. The trinucleotide sequence UAG has been identified as core Musashi binding element (MBE), and its thermodynamic binding specificity was determined by fluorescence polarization assays [6]. In a recent study we investigated the structural properties and binding affinities of MBEs in flavivirus 3'UTRs by means of a thermodynamic model for RNA folding at the level of secondary structures [7]. Specifically, we computed the free energies required to keep certain MBEs in a single-stranded, unpaired structural context. Comparison with a target set of randomized sequences revealed that MBEs in ZIKV 3'UTRs are maximally accessible among flaviviruses, i.e., they represent optimal binding targets for the Musashi proteins in our computer simulations.

### **Objective**

We set out to study the interaction and dynamic behavior of the Musashi-1 protein (Msi1) in complex with RNA. To this end, we performed molecular docking and molecular dynamics (MD) simulations with publicly available NMR structures of Msi1 with RNA, specifically PDB IDs 2RS2 and 5X3Z, which contain both RRM domains in complex with the RNA motif GUAGU.

### **Preliminary Results**

Molecular docking simulations, employing the HDOCK web service [8], allowed us to investigate different binding modes of Msi1 with the target RNA. These initial simulations clearly showed that the RNA-protein interaction is highly favourable. In another series of experiments we set out to confirm our previously published data from thermodynamic modeling of MBE accessibility [7] with MD simulations. To this end, we modified the the core trinucleotide of the RNA motif of PDB structure 2RS2 (Msi1 RRM1 in complex with GUAGU) to GUUGU, GGAGU, and GAUGU. 20 conformation of each system were studied by MD simulations using the AMBER16 software package. MD simulations were performed for 100ns. The root mean square displacement (RMSD) was used to calculation deviation relative to the starting structure. The RMSD pattern of complexes show that all conformations show low fluctuation as compared to their initial structures. Therefore, the last 20ns of the MD trajectories were extracted for further analysis. The root mean square fluctuation also shows that the trinucleotides of GUAGU has lower fluctuation compared to GUUGU, GGAGU and GAUGU. The MMGB/PBSA based binding free energies of Msi1 with GUAGU, GUUGU, GGAGU, and GAUGU were calculated using 100 snapshots from the last 20ns. As expected, the averaged binding free energy of GUAGU is lower than that of GUUGU, GGAGU, and GAUGU. The distance between Msi1 with the core trinucleotide of GUAGU shows that GUAGU is binding tight with Msi1, when compared to GUUGU, GGAGU and GAUGU. To investigate the effect of solvent accessibility between Msi1 and trinucleotides, we performed solvent accessible surface area (SASA) calculation of Msi1 residues within a 3.5 Å sphere of trinucleotides. The SASA calculations show that the GUAGU system has lower solvent accessibility compared to GUUGU, GGAGU and GAUGU systems, in agreement with the binding free energy calculations.

### **Outlook**

Our preliminary results are in line with recently published data of MBE accessibilities within flavivirus 3'UTRs. The new MD data provide valuable insight into the structural and dynamic

traits of the Msi1-RNA interaction. We plan to submit a manuscript entitled "Theoretical simulation of Musashi RNA binding protein 1 in complex with target RNA" (authors Nitchakan Darai, Michael T. Wolfinger, Panupong Mahalapbutr, Peter Wolschann and Thanyada Rungrotmongkol) to Scientific Reports shortly. In parallel, we are currently evaluating the feasibility of our approach for modelling the Msi RRM2-RNA interaction. In the same line, we plan to simulate a more advanced model, combining Msi1 RRM1 and RRM2 in complex with RNA.

## References

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## REPORT / ASEAN European Academic University Network (ASEA-UNINET)

### 1. Research Title

*The study of dehydration of PVA hydrogels both with and without Mesona chinensis extract by attenuated total reflection Fourier transform infrared spectroscopy.*

### 2. Introduction

*Wound dressings have been widely used due to their ability to protect the damaged tissue and to prevent infection and promote a moist environment that stimulates the healing. An ideal wound dressing should be flexible, provide a moist environment to the wound bed, absorb the excess of exudate, protect the wound from infection and exhibit good adhesion and adequate mechanical properties [1]. It also should be antimicrobial, nontoxic and biocompatible [2]. Nowadays, there are many kinds of materials for use as wound dressings currently available in world markets. Among these, hydrogels are one of the best choices to be applied for wound dressing because they are excellent materials and have all the properties required for wound dressings. These are capable of absorbing contaminated exudates and safely retaining them within the gel structure, which provides microclimate that stimulates and regulates all cellular activities and nutritional processes during the individual phases of wound healing [3]. Hydrogels can be removed from the wound without pain, risk of wound irritation, impermeable to bacteria, thermally insulating and soft to the touch. In addition, they also allow proper gaseous and water vapor exchange between environment and wound [4].*

*In this research, hydrogel based on Poly (vinyl alcohol) (PVA) was prepared. PVA is one of the interesting candidates to prepare hydrogel for biomedical applications due to its low toxicity and good biocompatibility [5]. It is hydrolyzed from polyvinyl acetate and produced a high percentage of repeat units which are mainly composed of C-C bonds with pendant hydroxyl groups [6]. However, PVA hydrogel possesses insufficient elastic, stiff membrane, and very limited hydrophilicity characteristics which restrict its use alone as a wound dressing polymeric material. In last decades, the use of polysaccharides has increased intensively, particularly in biomedical applications. This is because of polysaccharides are biological polymers and can be obtained from several natural sources, such as microbial sources, animal sources, and vegetal sources [7]. Mesona chinensis also named Hsian-tsoa, Herb Jelly and Mesona chinensis Benth, is a yearly herbaceous plant containing a distinct flavor from Lamiaceae family. Mesona chinensis polysaccharide (MCP) is an anionic plant polysaccharide found in the extract of the herb Mesona chinensis and is widely used in Asian countries to prepare a gel dessert known as grass jelly. The main constituents isolated from Mesona chinensis are polysaccharides, flavonoids, terpenoids polyphenols, etc. [8].*

*This research focused on the investigation of dehydration of poly (vinyl alcohol) hydrogel both with and without Mesona chinensis extract. The obtained results were implied to the water dehydration which is very important for the characteristic of ideal wound dressing.*

### 3. Objectives

3.1. Confirming the structure of the prepared hydrogels both with and without Mesona chinensis extract

3.2. Investigation of the dehydration of the prepared hydrogels containing different compositions of poly(vinyl alcohol) and Mesona chinensis extract.

### 4. Experimental Section

#### 4.1 The hydrogels preparation

##### 4.1.1 Synthesis of poly (vinyl alcohol) hydrogels

PVA powder was dissolved in distilled water and continuously stirred to form homogeneous mixture with heating at 70 °C made up 5, 10, 15 and 20 % w/v. Potassium persulfate (0.5 % w/v) and glutaraldehyde (0.5 % w/v) were added to PVA solution as an initiator and cross-linking agent, respectively. The polymerization began at 70 °C and carried on for 6 hrs. The prepared hydrogel sheets were then removed from the molds and kept in plastic bags before further testing.

##### 4.1.2 Synthesis of hydrogels composed of poly (vinyl alcohol) and Mesona chinensis extract.

The hydrogel wound dressings were prepared by dissolving the poly (vinyl alcohol) in the Mesona chinensis extract solution and continuously stirred to form homogeneous mixture with heating at 70 °C. PVA in the final solution made up 5, 10, 15 and 20 % w/v. Potassium persulfate and glutaraldehyde 0.5 % w/v were added into this solution under gentle stirring. Then, the mixed solution was poured into mold and polymerized in an oven at 70 °C for 8 hrs. The hydrogel sheet was removed from mold and kept in plastic bag. The hydrogel compositions are illustrated in Table 1.

**Table 1.** Compositions of the prepared Hydrogel

Sample	PVA (g)	Mesona chinensis Extracts (g)	Water (mL)
PVA 5%	5	-	100
PVA 10%	10	-	100
PVA 15%	15	-	100
PVA 20%	20	-	100
PVA 5% + MC*	5	1.3	100
PVA 10% + MC	10	1.3	100
PVA 15% + MC	15	1.3	100
PVA 20% + MC	20	1.3	100

\* Mesona chinensis extract

## 4.2 Methods

### 4.2.1 Hydrogel structural analysis

After polymerization, the hydrogel samples were freed from the mold and cut into samples of  $1 \times 1 \text{ cm}^2$ . The hydrogel samples of each condition were purified by soaking in an excess of distilled water at room temperature which was changed every day for 3 days to remove residual monomer. After purification, the swollen hydrogel samples were dried at  $45 \text{ }^\circ\text{C}$  under vacuum to constant weight. The dry hydrogels were placed on the ATR crystal of an attenuated total reflection Fourier transform infrared spectrometer. Spectra were recorded in the frequency range  $4000\text{-}420 \text{ cm}^{-1}$  at a resolution of  $4 \text{ cm}^{-1}$  using 16 scans for averaging.

### 4.2.2 Dehydration study

The dried hydrogels were put into pure water for 24 h or more to swell and reach an equilibrium state regarding the hydration. After swelling, the hydrogels were placed under pressure on a single reflection diamond ATR crystal (Bruker Platinum) of an Bruker Tensor 37 FTIR spectrometer and spectra were recorded every 10 min for 24 hr..

## 5. Results

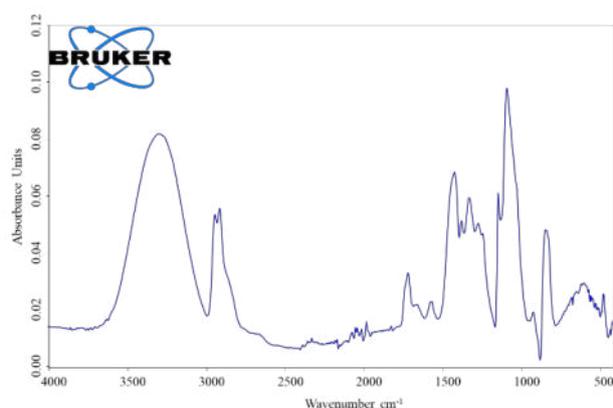
### 5.1 Starting material structure analysis

**Table 2.** The assignments of functional groups in PVA and Mesona chinensis extract [8, 9]

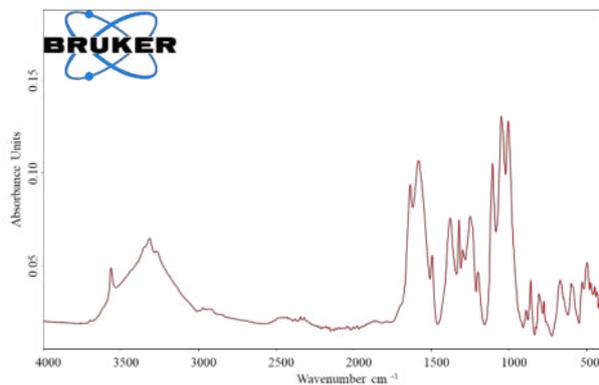
PVA		Mesona chinensis extract	
Functional groups	Wave number ( $\text{cm}^{-1}$ )	Functional groups	Wave number ( $\text{cm}^{-1}$ )
$\nu$ O-H	3281	$\nu$ O-H	3315
$\nu$ C-H	2907	$\nu$ C-H	2923
$\delta$ C-H	1418	$\nu$ C=O	1646
$\delta$ C-H and $\delta$ O-H	1324	$\nu$ C-O	1391
$\nu$ C-O	1142	$\alpha$ -1,6 glycosidic bond	1019
$\delta$ C-H	835	$\delta$ O-H	875

### 5.2. Hydrogel structure analysis

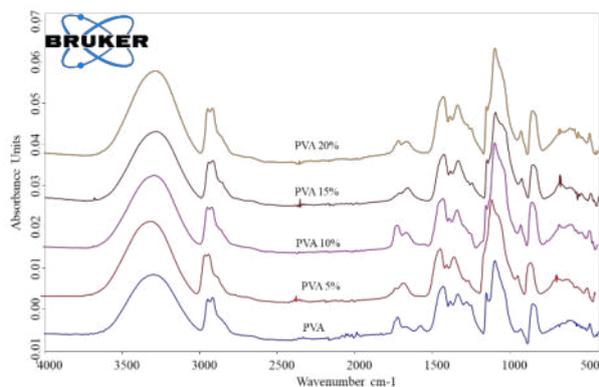
The ATR spectra of PVA, Mesona chinensis extract and PVA hydrogels both with and without Mesona chinensis extract were shown in Figure 1, 2, 3 and 4, respectively. Assignment of measured absorption bands to functional groups of starting material shown in Table 2.



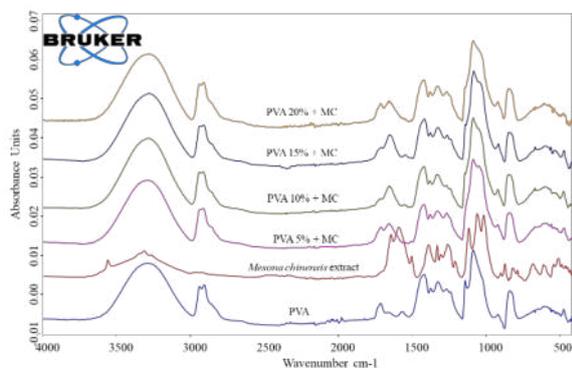
**Figure 1.** ATR spectra of PVA in the spectral range  $4000\text{-}420 \text{ cm}^{-1}$



**Figure 2.** ATR spectra of *Mesona chinensis* extract in the spectral range 4000-420  $\text{cm}^{-1}$



**Figure 3.** ATR spectra of Poly(vinyl alcohol) hydrogels in the spectral range 4000-420  $\text{cm}^{-1}$

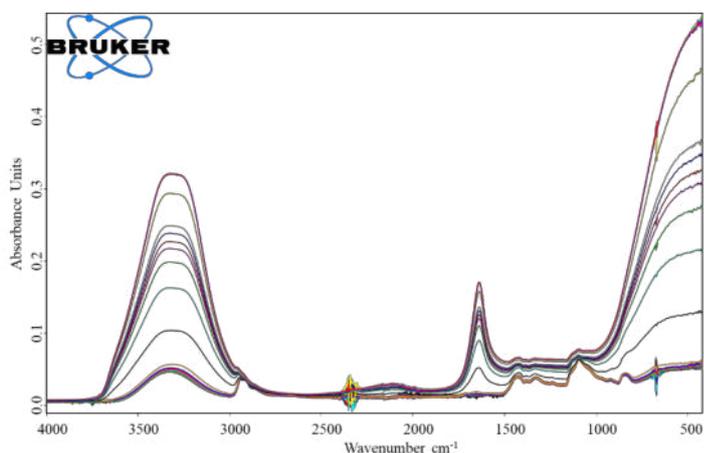


**Figure 4.** ATR spectra of PVA hydrogels with *Mesona chinensis* extract in the spectral range 4000-420  $\text{cm}^{-1}$

The chemical structures of hydrogel were characterized by ATR-FTIR. The infrared spectra of PVA in Figure 1 show characteristic absorption bands at 3650-3000, 1750-1700 and 1300-1085  $\text{cm}^{-1}$ , which are attributed to the  $\nu$  OH,  $\nu$  C=O and  $\nu$  C-O, respectively. In the hydrogel spectrum show the decrease of O-H stretching vibration at 3000-3600  $\text{cm}^{-1}$  and hydrogel reveal two important bands at 2938 and 2858  $\text{cm}^{-1}$  of C-H stretching which relate to aldehydes [10], a duplet absorption with peaks attributed to the alkyl chain can be confirmed the crosslinking of PVA by GA. PVA hydrogel with *Mesona chinensis* extract show the decrease intensity of absorption peaks at 1650  $\text{cm}^{-1}$  and shifted into the higher wavenumber. It can confirm the reaction of hydrogel

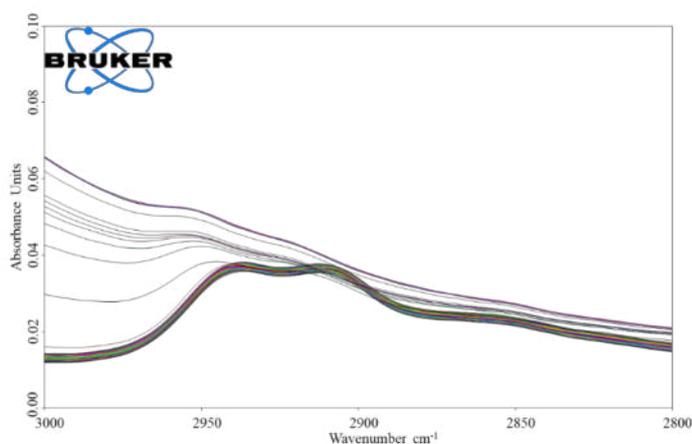
## 5.2. Dehydration study

Fig. 5. Shows ATR spectra of PVA 5% hydrogel in the spectral range 4000-420  $\text{cm}^{-1}$  (144 repeating for 24 hr.) It was found that the intensity of the broad band at around 3279  $\text{cm}^{-1}$  decreases as the time of dehydration increase. This is because the band is associated with the vibration of water molecules. The duplet absorption peaks observed at 2858 and 2938  $\text{cm}^{-1}$  are assigned to the symmetric and asymmetric stretching modes of  $\text{CH}_2$ , respectively. The vibrational frequencies of the O-H and C-H stretching modes decrease as the water content decreases.



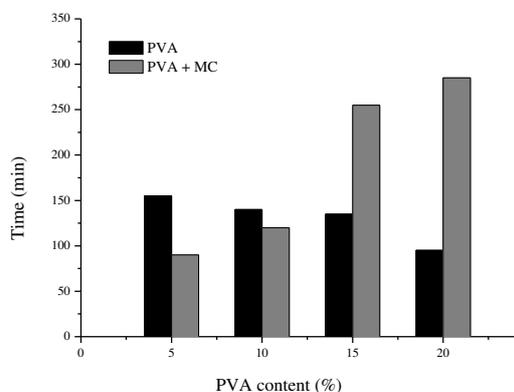
**Figure 5.** ATR spectra of PVA 5% hydrogel in the spectral range 4000-420  $\text{cm}^{-1}$  (144 repeating for 24 hr.)

The time course of the peak area of symmetric and asymmetric stretching modes of  $\text{CH}_2$  was used to determine the dehydration time where the hydrogel maintain about 50% of maximum water content. The low frequency shift observed in the C-H stretching mode is attributed to the decrease in water content. The C-H bonds of PVA are elongated as the relative amount of surrounding free water decreases. The frequency limits for integration were the following: (1) 2990–2880  $\text{cm}^{-1}$  for the asymmetric stretching mode of  $\text{CH}_2$ , and (2) 2870–2820  $\text{cm}^{-1}$  for the symmetric stretching mode of  $\text{CH}_2$ , respectively [11] show in Fig. 6.



**Figure 6.** ATR spectra of PVA 5% hydrogel in the spectral range of symmetric stretching modes of  $\text{CH}_2$  (2870–2820  $\text{cm}^{-1}$ ) and asymmetric stretching modes of  $\text{CH}_2$  (2990–2880  $\text{cm}^{-1}$ ) (144 spectra within 24 hr.)

The results of every composition both with and without *Mesona chinensis* extract appear symmetric and asymmetric stretching modes of  $\text{CH}_2$  absorbance at the same positions. Both, peak areas of symmetric and asymmetric stretching modes of  $\text{H}_2\text{O}$  (???) were integrated and the dehydration time where the hydrogel maintain about 50% water was calculated (Fig. 7).



**Figure 7.** Dehydration time of hydrogel maintain water within structure about 50%.

## 6. Conclusion

The obtained results from FTIR spectra can confirm the successful polymerization and crosslinking reaction of poly (vinyl alcohol) hydrogel both with and without *Mesona chinensis* extract. After calculation the peak area of the symmetric and asymmetric stretching modes of  $\text{H}_2\text{O}$  (???), it indicated that 20% PVA hydrogel with *Mesona chinensis* extract shows the highest dehydration time. The higher level of dehydration time of hydrogel was found with PVA hydrogels with *Mesona chinensis* extract which was attributed to the hydrophilicity of polysaccharide in *Mesona chinensis* extract and PVA. It can be concluded that an incorporation of hydrophilic monomer could increase the polymer hydrophilicity due to the strong interaction via hydrogen bond between water molecules and the hydrophilic groups (OH) in the polymer.

## 7. References

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## REPORT

### ASEA-UNINET-Project

Project number ASEA2019/Uni Wien/2

Assoc. Prof. Dr. Helmut Lukas

#### Project team members

1. LUKAS, Helmut, Assoc.-Prof. Dr., Lecturer at the Department of Social and Cultural Anthropology, University of Vienna & Senior Researcher at the Institute for Social Anthropology (ISA), Austrian Academy of Sciences, [helmut.lukas@oeaw.ac.at](mailto:helmut.lukas@oeaw.ac.at); project director & principal investigator. Main areas of research: Insular and Continental Southeast Asia incl. Southern China. Research interests: cognitive anthropology, hunter-gatherer studies, human ecology, indigenous knowledge. 2015: visiting professor at the Chulalongkorn University. Since November 2018 holder of an official research permit of the National Research Council of Thailand (NRCT) valid until November 2021 and of a multiple re-entry research visa valid up to two years (2019-2021).

2. CHINDARITHA, Pacchira, MA, Institute for Minority Studies, Nanning, PR China. Main areas of research: Continental Southeast Asia (Thailand, Laos, Burma, Cambodia) incl. Southern China (Guangxi, Yunnan). Research interests: ethno-linguistics & cognitive anthropology (esp. colour terminologies). Pacchira Chindaritha was appointed "research collaborator" by the National Research Council of Thailand (NRCT).

**Duration of the research project:** January 11, 2020 - April 16, 2020

Vienna ⇒ Bangkok: January 11, 2020 (OS 25), 23:20; arrival in Bangkok, January 12, 2020, 15:20 (direct flight)

Bangkok ⇒ Vienna: Bangkok, April 13 [in reality: April 14], 2020, 11:00 pm [in reality: 11:00 am] - Frankfurt, April 14 [in reality: April 15], 2020, 06:00 am; Frankfurt, April 15 [in reality: April 16], 2020, 08:30 am - Wien, April 14 [in reality: April 16], 2020, 09:50 am

#### Depiction of the pre-COVID-19 situation in Satun:

Since thousands of years the Maniq live in the forests of the Malay Peninsula (picture 1: map), long before Thai people populated this land. Surprisingly the Maniq could preserve their distinct language, culture and nomadic way of life until today. But now the Maniq culture and way of life is threatened with extinction (ethnocide). Since decades the Maniq and especially the Ai-Kai, the speaker of the so-called "Manang group" (since 23 years my key-informant) are

- (1) fighting desperately for their traditional way of life in the last remaining (and still vanishing) forests of Satun and Phatthalung;
- (2) opposing forced integration into the Thai state;
- (3) resisting the (mainly illegal) invasion of farmers clearing the (officially "protected") forest (which is part of a national park);
- (4) resisting forced sedentarization.

Based on threats and "gentle persuasion" the policy of coerced sedentarization policy established by the health centre, resort owners, the Institute for informal education and other stakeholders - resulted in 2018 in the construction of a permanent village inhabited by 4 to 6 families (ca. 16 - 24 people).

A precursor of this village was a somewhat smaller village-camp "founded" by rubber plantation owners and resort owners in December 2015 and inhabited by 5 families. This village-camp served two functions:

(1) Illegal distillery: Ironically, the Thai villagers used the first-quality cooking pots that I once gave to this Maniq group, to bootleg alcohol ("Mekong Whisky") in the "village-camp". Moreover, the speaker of this group (Ai-Kai), once one among the most skilled hunters and our best key-informant, was then addicted to alcohol!

(2) Human zoo: Since December 2015 or January 2016 this Maniq settlement ("Kai-group") was made accessible for Thai tourists of Wang Sai Thong's tourist resorts (main attraction: kayaking in the La-Ngu river) against payment of an entrance fee. This human zoo business can generate daily revenues of 260 to 400 Euro (astronomical amounts for this region!). Given the extreme fall in prices for rubber in 2015/2016, the local people – mostly owners of small rubber plantations – seem to be forced to switch to other sources of income.

Within few days after our arrival the invasions of tourists led to the outbreak of a Dengue fever epidemic (transmitted by day active mosquitos) among the Kai-group. Consequently we felt obliged to help and organized the transport of the seriously ill and absolutely immobile Maniq people to the hospital. Furthermore, we informed the staff of the health centre of the province and helped them to urge two Maniq groups (including the above-mentioned Kai-group) to come downhill to Wang Sai Thong. Beyond that we helped the Kai-group to leave the infested village-camp and to move to the forest. Afterwards the infested village-camp has been fumigated with pesticides, and blood samples were taken from every member of the two groups (see attachment 1: project report "ASEA UNINET 2016\_text\_report\_engl", incl. pictures).

Already in 2016, full 5 years before the COVID-19 pandemic, I warned against too much (uncontrolled) contact with Non-Maniq, especially tourists, transmitting to the Maniq contagious diseases (such as measles, Dengue fever etc.) to which they have insufficient immunity. As (until recently) little-contacted people, the Maniq are likely very vulnerable towards non-indigenous diseases.

According to the Maniq, to stay in a permanent village outside of the forest is making sick. The Maniq have a strong feeling of attachment to the forest where they can freely move about without any pressure exerted by the outsiders ("Hamiq"). The forest provides them with varied food and gives protection from the outside world which is felt to be hostile. Moreover, the forest provides coolness, whereas the world of the Hamiq is unpleasantly hot and being subject to serious diseases. This contrast between the disease-causing world of their settled neighbours and the healthy forest is probably one of the main causes of the stubborn resistance of the Maniq to the attempts to make them settle permanently. Obviously, the mode of subsistence (hunting & gathering) and the forest where the Maniq move around are essential components of their ethnicity. In the eyes of Maniq, to leave the forest and to settle down, or in other words, to give up the hunting and gathering activities means to become Hamiq, that is to say to become a sedentary villager, i.e. a Thai (cf. Kricheff/Lukas 2015). The human zoo-like exposition of forest people in Wang Sai Thong, where Maniq men, women and children are shown like animals to hordes of ethno-tourists (mostly Thai and Malaysians), is driven by a childish search for curiosity - a stomach-churning spectacle.

In 2019 the German writer and documentary film maker Gabriel Ernst, living in Bangkok, published an article dealing with two ethnic minorities, the Lisu of northern Thailand and the Maniq of southern Thailand, resisting "Thaiification". He interviewed Ai-Kai and provided an apt description of the current situation of the Maniq people:

*Speaker Kai pointedly says of the Thai government, "They want us to settle down, grow food, go to their schools, be like them. We can't live like that". The Thai state has made efforts to control the Maniq including issuing ID cards, which quickly disappear. A forced resettlement project, where they were made to live in permanent housing on a kind of reservation in Phattalung province, was apparently seen as an act of charity by the state. The experiment didn't last long as the Maniq ran away and escaped back into nomadic jungle life. "We don't want charity or help. I just want my kids to grow up like I did. I*

*want them to be Maniq, to live as Maniq," Speaker Kai tells me. "We just want some land to live off of and to be left alone". ... Pessimism about their future is inevitable as the veins of settlers stretch ever deeper over the hills and into the forest. Speaker Kai's message to the outside world rings out: "We want to be left alone". (Ernst 2019, emphasis mine)*

At this point the question arises: "Where is anthropology when our 'study object' needs it?" After 23 years of studying the Maniq, we, Helmut Lukas and Pacchira Chindaritha, feel to have the obligation to support the Maniq in the defence of their rights. It is not an overstatement to say that we are the only outsiders who are fully trusted by the Maniq, especially by Ai-Kai, the vocal spokesman of the so-called "Manang group" (One indication of this is the fact that the Maniq gave me the name "Ita Mayang", lit. "Grandfather Mayang"; *mayang* is a fragrant tree resin). To us, the trust placed in us is both a commitment and a motivation to search for influential allies and to contact public authorities and government agencies (e.g. the governor of Satun), in order to support the Maniq in their wish to conduct a self-determined life.

#### (A) January - mid of February 2020:

- Satun: Field research, **phase 1**. Main research area: (1) Wang Sai Thong; (2) additional research locations (for collecting DNA samples): Thung-Wa, Tam Pet (Manang), Khao Chan (Phatthalung). Here in the deep south of Thailand, the situation is dramatic. Employees of the health centre (from La-Ngu), several resort owners & other stake-holders act together against the Maniq. What is at stake here is an ETHNOCIDE.
- Collection of DNA samples in various locations for Dr. Helmut Schaschl
- NUTRITION & FOOD HABITS of the Maniq: Today there are fewer than 50 hunter-gatherer populations left in the entire world. Only a small fraction of these hunter-gatherers, such as the Maniq, relies solely on hunting & gathering (foraging). Foraging can be defined as "*subsistence based on hunting of wild animals, gathering of wild plant foods, and fishing, with no domestication of plants, and no domesticated animals ...*" (Lee & Daly 1999: 3, emphases mine). The field research was conducted in 2 forest camps. Name of 1<sup>st</sup> camp: *xu'ha? ihôy* & of 2<sup>nd</sup> camp: *hã?yã? pà:ya.ŋ*. Gathering is mainly (but not exclusively) performed by women (see picture 2). We made several digging excursions: Together with Pacchira Chindaritha I followed the Maniq – adult women & girls (I-Ya/Nak I-Pen/37 years, I-Yoy/9 years, I-Dian/7 years) and men & boys (Ai-Kai/50 years, Ai-Diau/8 years, Ai-Ban/5-6 years, Ai-Wee/4 years) – by participating in searching for tubers (*Dioscorea* spp.). We noted how the Maniq differentiate the various varieties of *Dioscorea*. The color of the leaves & many other signs indicate the age, the size & the condition of the tubers. We collected the elaborated terminology associated with the gathering of the tubers. The Maniq use more than 20 different varieties of *Dioscorea* ((There is no generic term for tubers in Maniq language! This and other linguistic peculiarities of the Maniq language impede the questioning). We collected the indigenous names of the different tubers (by using the phonetic transcription according to the International Phonetic Association, IPA). Some yam species containing hydrogen cyanide are poisonous and require pre-treatment before eating, e.g. by burning the leaves of a tree & mix the ashes with the yam, which is first pounded to a pulp. We documented the detoxification of the poisonous tubers (see picture 3). Wild tubers are the most important constituent of daily nourishment. The tubers are never totally exploited. Normally the Maniq take only a part of the tubers and come every now and then to the same places for further use of the roots. Besides tubers the Maniq collect roots of various rattan varieties, Pandanus leaves (for weaving baskets), fruits & small animals as well as herbs & medicine. The habit of eating earth (geophagy) is still widespread. For the most part the Maniq (adult as well as children) are digging for edible earth. The earth is shaped into nuggets & eaten raw or baked on the fire. What was new in this study is that the Maniq like to eat the earth remaining on the *Dioscorea* roots. Since the Maniq believe in the strengthening and healing power of this earth, they don't

remove the earth sticking at the *Dioscorea* roots, but roast the roots together with the earth over an open fire. We do not yet know how the Maniq select the edible soil types as well as the associated terminology or soil as well as the preparation for consumption. Since 22 years - especially between 1998 and 2001 - when we (Mrs. Pacchira and I) followed the Maniq roaming in the forests of Satun and Phatthalung - we collected data about the diet of the Maniq. Already in the nineties we recognized that the traditional diet of the Maniq is varied, balanced and healthy. Our earlier findings were corroborated by our study in January & February 2020.

- research methodology: Gathering (reliable) data among the Maniq is extremely difficult. The by far most suitable techniques for collecting data among the Maniq are the participant observation and loosely structured interviews or, more precisely, "conversational interlocution". The Maniq of Thailand do not easily welcome strangers into their campsites for extended periods of time. Obviously, every encounter with outsiders is for these hunter-gatherer groups unpleasant and embarrassing. Interviews instead of conversational interlocution based on established social ties by restricting the "informants" to give simple answers, that is to supply de-contextualized information, is very unsatisfying for the Maniq. Isolating an informant from the rest of the band and to expect that only he/she speaks at a time, is contrary to the normal social interactions of this society. In the process of data collection we have to prevent as much as possible the violation of cultural norms. Data collection implies that we have to stay (and to move) with an entire band (ranging from 10 to 25 people). If this band is joined by another band – something which does happen quite often – the size of this "composite" band ranging from 20 to 50 people. Sharing food with so many people may prove very expensive!
- Library research in Songkhla & meeting with Prof. Krongchai Hatta (Thaksin Univ.). According to the rules of the NRCT Prof. Krongchai Hatta is the official sponsor of the research on the Maniq. Planning of 2 lectures at the Thaksin University for the 2<sup>nd</sup> half of March 2020. Due to the outbreak of the COVID-19 both lectures had to be cancelled. Due to the recent developments in Satun (forced sedentarization etc.) I decided not to go to Indonesia for initiating research.

#### **(B) mid of February - mid of March 2020:**

- obtaining the research visa (Central Immigration Office, Bangkok)
- I informed Khun Boonserm Rittapirom (who has been appointed as my sponsor & protector during my FWF research project 1998-2001 by the provincial government of Satun) about the current problems in Satun. Khun Boonserm suggested to envisage a meeting with the governor of Satun (provisional date: end of March). However, this meeting had to be postponed indefinitely due to the outbreak of the COVID-19.
- Library research in Bangkok (Chulalongkorn University & Silapakorn University).
- Meeting with Prof. Charith Tingsabadh (Chulalongkorn Univ.), my former sponsor during my FWF research project (1998-2001). Planning of a lecture at the Siam Society for early of April. Due to the outbreak of the COVID-19 the lecture had to be cancelled.

#### **(C) mid of March - April 16, 2020:**

- Satun: Field research, **phase 2**: The research had to be adapted to the current pandemic: Confronted with the dramatic dimensions of the COVID-19 pandemic I decided to discourage any attempt to settle down the Maniq in villages, where they might be exhibited in a kind of human zoo. In view of the pandemic potential posed by the coronavirus, it would be irresponsible to expose the Maniq, "exotic savages" day after day to large number of visitors. Whereas in the pre-COVID-19 era the culture of the Maniq was threatened (threat of ethnocide), it is now their physical survival which is at stake (threat of genocide). My petition to impose travel restrictions for the Manang region, to issue a prohibition order to travel to & to enter the region & to order the closure of resorts in the whole Manang region went unheard, for the time being.

- Collecting data about birth customs, concepts & methods of contraception & strategies to further fertility: Data collection regarding conceptions about new born children/ twins/ child deformities. Rules & prohibitions during pregnancy and after birth etc. Rite the passage ritual for the infants. The data collection on these topics could only be partially realized due to the outbreak of the COVID-19.
- I was surprised to find that the probable origin of the corona pandemic are the rainforests of Southeast Asia & that settled down ex-Maniq (who are not more recognized as Maniq) are involved in the illegal poaching of the protected **pangolins** (*Manis javanica*) which are sold to their Thai patron who in turn sells these animals to wholesale buyers (Note: Pangolins – the most illegally trafficked mammals – are listed as critically endangered by the IUCN Red List of Threatened Species!). Through a long chain of intermediaries these animals are landing at the wet markets in China (esp. in Wuhan). Scientific studies suggest that **nCoV-2019 may be present in trafficked pangolins** (see picture 4) beyond the outbreak epicenter in Wuhan, a metropolis of 11-million people in Hubei province, where market wildlife is thought to have infected traders. Hubei province & Guangdong province are both major nerve centres for China's pangolin trade. Probably the virus originated in bats, with pangolins being the vector (i.e. carrier) into humans. The scientists believe that the bat coronavirus may have "recombined" in pangolins at the Chinese wildlife markets. Presumably, this new coronavirus (nCoV-2019) jumped from pangolins to people. In the past 15 years I've seen that ex-Maniq hunters caught pangolins, which they sold afterwards to their patrons (normally owner of rubber plantations or owners of resorts). Thai farmers can get from 17,000 up to 25,000 Baht (ca. 520-760 Euro) for one pangolin. This is more than the monthly income of a rubber farmer in southern Thailand. The Maniq told me that the pangolins have become very rare. The Maniq possess a vast and detailed knowledge about the habits of the animals being hunted. They observed that the pangolins are solitary animals and get only one child per year (These statements are confirmed by scientific findings). I was told that the Maniq are in need of this animal. But given their rarity they go out for hunting only one or two pangolins for a band numbering around 15 to 20 people, whereby the meat is mainly reserved for the children. Probably a kind of healing or strengthening effect is ascribed to the Pangolin meat. There is a need for further research on the alleged health effects of the pangolin meat. The pangolin is often referred to in the legends of the Semang. According to these legends the pangolin is more powerful than the elephant: Similar legends of the Maniq still need to be recorded and studied thoroughly (It is perhaps no coincidence that the Maniq – children and adults alike – often wear necklaces with pangolin scales). When I showed Ai-Kai the pictures of caught pangolins, he became very angry and told me that he would never have the idea to sell this rare animal to a *Hamiq* (outsider). For thousands of years, the Maniq have been eating animals like **pangolins** (*Manis javanica*), **flying foxes** (*Pteropus vampyrus*) and **masked palm civets** (*Paguma larvata*), which are suspected to be **carriers (vectors) of potentially pathogenic varieties of coronavirus (CoV)**. On this account, the evolutionary anthropologist Dr. Helmut Schaschl hypothesized that the **Maniq have developed immunity to some varieties of the coronavirus!!!**
- From March 23 all resorts of Wang Sai Thong are forced to close by order of the governor. In addition, severe travel restrictions were imposed by the provincial government of Satun (emergency law). People from outside of Manang are now barred from entering this region. Consequently, tourists cannot more visit the Maniq. Finally, our requests are fulfilled. Even us, Pacchira Chindaritha and I, had to leave Manang. Ai-Kai and other Maniq left their camps; Ai-Et and the semi-nomadic Maniq left their village-camp. However, before they retreated into the forest, they received our presents (rice etc.) incl. masks and gloves (for every windscreen one).

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Picture 1: map: Distribution of Maniq (Ten-en speakers) in Thailand (Satun, Phattalung & Trang);  
Published in: Prof. Shuichi Nagata. "Subgroup 'names' of the Sakai (Thailand) and the Semang (Malaysia): a literature survey". In: *Anthropological Science*, Vol. 114, p. 47, Published online 30 November 2005, in J-STAGE, [www.jstage.jst.go.jp](http://www.jstage.jst.go.jp), p. 47.

The spatial distribution of the Maniq in this map is not very accurate. First, there is no reliable evidence that Maniq ("Ten-en" speakers) were living so far in the north as in this map. Second, the "Mos-Tonga" (of Schebesta) have lived much further north than on this map (somewhere between Trang and Phattalung and at the western and eastern side of the Banthat range), but not right on the Thailand-Malaysia border. Third, the two separate distribution areas of the Maniq (here Mos/Tonga & Ten-en) are actually ONE, ranging from Palian (Trang) in the north until Manang (Satun) in the south.



Picture 2: Maniq girl coming back from a "digging excursion",  
© Helmut Lukas / University of Vienna



Picture 3: Detoxification of poisonous *Dioscorea* tubers  
© Helmut Lukas / University of Vienna



Picture 4: Caught pangolin (Wang Sai Thong, 2009)  
© Helmut Lukas / University of Vienna

### **Further steps**

In 2021: primary research article on the Maniq in the (peer-reviewed) *Journal of the Siam Society*  
(together with Dr. Helmut Schaschl & Tobias Göllner, BSc. MSc.)

In 2021: Lecture at the Siam Society: "The Maniq, an endangered hunter-gatherer society in Southern Thailand" (originally this presentation was scheduled for early April 2020. However, due to the outbreak of the COVID-19 the lecture had to be cancelled/postponed).

# Unveiling the genetic history of the Maniq, primary hunter-gatherers in Southeast Asia

## Project Partners:

**Mag. Dr. Helmut Schaschl, Privatdoz.,** Department of Evolutionary Anthropology, University of Vienna. Email: [helmut.schaschl@univie.ac.at](mailto:helmut.schaschl@univie.ac.at)

Helmut Schaschl is lecturer in Human- and Evolutionary Genetics at the Department of Evolutionary Anthropology, Faculty of Life Sciences, University of Vienna (<https://homepage.univie.ac.at/helmut.schaschl/>). Helmut Schaschl's research focuses are on human genomic diversity, including of indigenous peoples, population genetics, neurogenetics, genetic adaptation and immunogenetics in relation to disease susceptibility.

**Dr. Univ. Doz. Helmut Lukas,** Department of Social and Cultural Anthropology, University of Vienna and the Institute for Social Anthropology, Austrian Academy of Sciences. Email: [Helmut.Lukas@oeaw.ac.at](mailto:Helmut.Lukas@oeaw.ac.at)

Social and Culture Anthropology is Helmut Lukas' field of specialization. In accordance with the four-fields approach in anthropology, he combines contributions from social anthropology, linguistics, archaeology, and biological anthropology, in order to answer the pending research questions on the history, culture and the genetic ancestry of indigenous people.

**BSc. MSc. Tobias Göllner,** Department of Evolutionary Anthropology, University of Vienna. Email: [tobias.goellner@univie.ac.at](mailto:tobias.goellner@univie.ac.at)

He is currently a PhD student at the Department of Evolutionary Anthropology. His main focus in his thesis is to understand peopling of Asia, populations genetics, demography and natural selection. He is particular interested in hunter-gatherer genetics, human populations genetics and evolutionary genetics.

## Report:

### Introduction. Why Study Hunter-Gatherers?

Asia is populated not only by large populations, but also by various small ethnic communities and indigenous peoples, including diverse hunter-gatherer communities, who show great morphological, anthropological, cultural and linguistic diversity. However, only a tiny fraction of these diverse indigenous populations has been characterized with genome-wide data so far. In fact, most genomic studies that are mainly associated with diseases and various anthropometric traits are dominated (about 88%) by the participants of European ancestry<sup>1</sup>. We thus have very limited knowledge of the genomic diversity and evolutionary history of most indigenous peoples, especially hunter-gatherer peoples. This is crucial since this form of living presents the primordial way of life in early human societies. It is thought that about 90% of the human history is marked by hunting and gathering as the major form of living<sup>2</sup>. The study of positive selection in hunter-gatherers provides the opportunity to gain insights into the differences in selection pressures between hunter-gatherers and populations that have transitioned to an agriculturalist lifestyle (i.e. the majority of modern societies).

Populations that still practice hunting and gathering as their main source of food income however are rare to find among most present human populations, as there are only very few full-time and nomadic hunter-gatherers left<sup>3</sup>. It

is therefore very timely to acknowledge their way of living and their cultural and evolutionary history. Importantly, many of the hunter-gatherer communities, in many parts of the world, are seriously threatened by deforestation (e.g. in Thailand for rubber plantations), unregulated new settlements, poachers, newly introduced diseases, improved infrastructure (roads, electricity, motorcycles etc.), new technologies (chainsaws etc.), interventions by local authorities (registration and forced settlement) and much more. Provided these developments continue, several hunter-gatherer communities are in imminent danger of extinction as ethnic groups.

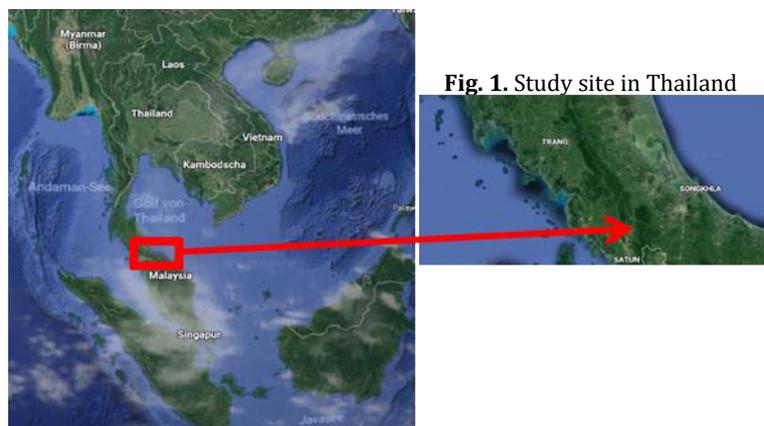
The indigenous peoples of the Malay Peninsula are called “Orang Asli”. Typically, they are split into three groups: the “Semang” in the northern area, the “Senoi”, which are located in the centre, and the “Aboriginal Malay” in the south. Using mtDNA analysis Hill et al.<sup>4</sup> provided first genetic evidence for a deep genetic root (dated ~60,000 years ago) in hunter-gatherers (the Semang and Senoi), but also in Aboriginal Malay, which have a different phenotype. Part of the Semang in this Southeast Asian region are the Maniq. The Maniq are nomadic hunter-gatherers living in the rainforest of Southern Thailand. They are special because they are one of the few remaining primary hunter-gatherer societies in our time<sup>5</sup>. Surprisingly, until today the highly mobile Maniq are the only Semang who have no cultivated plants and no domesticated animals. Therefore, particular attention is given to the special or “peripheral” position of the Maniq within the Semang. In a sense, the Maniq could function as key to open the portal to the ancient past of Thailand and the World.

### Research objectives

So far, there is only one study that included the Maniq in an analysis of mtDNA and Y-chromosome lineages<sup>6</sup>. However, no genome-wide data have been studied from the Maniq, which is crucial to better understand the genetic history of hunter-gatherers and peopling of South-East Asia. The major objectives of this study are to reveal the genetic ancestry of the Maniq, understand how they fit into the Asian population landscape, and to elucidate whether the cultural and linguistic differences of the Maniq correlate with genetic differences to other Semang groups. In addition, we want to understand the genetic adaptation to their hunter-gatherer lifestyle. We test also if there are any signs of admixture, although their contact with outsiders is to our knowledge only minimal. Finally, yet importantly, we aim to support the indigenous communities with scientific data to help them to maintain their cultural integrity and their lifestyle they wish to maintain.

### Research methods

I travelled with Helmut Lukas and Tobias Göllner to Thailand to meet with the Maniq who live in the rainforest of the Thai provinces Satun, Trang and Songkhla (see Fig 1). First, we established knowledge about the recent location of the Maniq because they are highly mobile hunter-gatherers. We needed to obtain also information about the name of the speaker; size of the



**Fig. 1.** Study site in Thailand

respective band; analyse the relationship with villages; assessed which band is still mobile or maybe already sedentary. Helmut Lukas explained the aim of the study to the Maniq and ask them for their consent to use their saliva samples to conduct genomic analysis. We obtained saliva samples from 21 individuals (in addition to 10 individuals from a previous research travel by Helmut Lukas in 2018) and corresponding finger prints for

agreement to this study. In this respect, we have obtained a research permit/research visas from the National Research Council of Thailand (NRCT) and the necessary ethical approvals by the Ethic Committee of the University of Vienna (Ref. No. 00444) and the Ethics Committee of Khon Kaen University (Ref. No. HE622223). For the high-density SNP genotyping we use the Infinium Omni2.5Exome-8 BeadChip (2.6 million variants including >240,000 markers from the Infinium Exome-24 BeadChip array) which delivers comprehensive coverage of common, rare, and exonic SNP (>2.5% MAF) content from the 1000 Genomes Project. The array covers copy number variants, germline variants, indels, SNPs, and structural variants. It encompasses also markers of both sex chromosomes as well as from the mtDNA and allows high coverage of the Human Leukocyte antigen region. The arrays were analysed on an iScan system.

### Preliminary research results

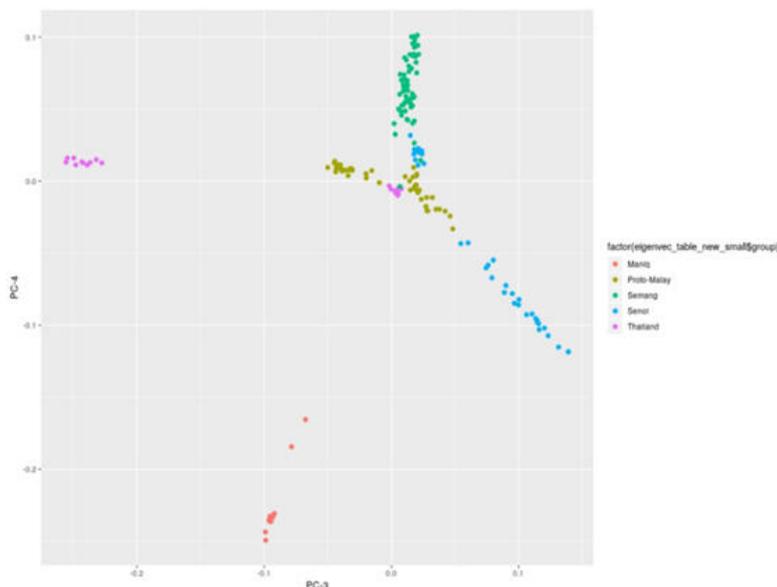
We were able to get in contact with a group of Maniq and to obtain their approval for our study. We stayed with the Maniq at their camp site (Fig. 2). We explained in detail our study and obtain saliva samples and their approval (fingerprints) for this study. We isolated from the saliva samples the genomic DNA and tested the Infinium Omni2.5Exome-8 BeadChip array and obtained high quality genome-wide single nucleotide polymorphism (SNP) data. Thus, this array is highly suitable to study the genomic diversity of indigenous populations. We analysed the obtained genomic data using different statistical methods.



Fig.2 Maniq children and Maniq camp with wind screens. (© Helmut Schaschl)



Fig.3 PCA plot of genomic data from the Maniq, other Organg



The statistical analyses revealed that the Maniq are genetically very unique. The principal component analysis (PCA) shows that the Maniq presented a distinct genetic cluster (Fig. 3, the Maniq are coloured in orange), separated from the other Orang Asli and Thai individuals. The admixture analysis revealed that Maniq show no signs of mixture with other indigenous populations or with the Tahi populations. However, the phylogenetic study suggests that they are closest related to the Bateq people (who are also hunter-gatherers who are living in the rainforest of peninsular Malaysia) from whom they split about 320 generation ago (c. 8.000 years ago).

We aim to increase significantly the number of individuals in order to gain more power for our statistical analysis. Therefore, based on these preliminary results we were able to submit recently (2<sup>nd</sup> of March of 2020) a research proposal to the Austrian Science Fund (Einzelprojekt Projektnummer 30596) which is currently under review. However, we were unable to have any public talks and lectures due to the current Cov19 pandemic situation. We have planned several talks this spring which were all cancelled. Furthermore, in April one lecture about the Maniq was specifically planned for students studying evolutionary anthropology at the University of Vienna. We aim to have the planned talks, presentations and lectures after the pandemic or maybe in autumn this year.

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### Publication

Currently one manuscript is already in preparation and a second publication for autumn is in planning.



*Picture 1* (© Tobias Göller): *The picture shows children with a recently killed rainforest badger, which is often eaten by the Maniq, especially in the rainy season.*



*Picture 2 (© Helmut Schaschl): The research team 2019.*

### **Outlook**

One FWF proposal was submitted on 2<sup>nd</sup> of March 2020 based on this ASEA-UNINET project. We plan to grant proposal to the Research and Innovation Staff Exchange (MSCA-RISE) program to intensify the collaboration with the partner institutions in Thailand (Chulalongkorn University and potentially Khon Kaen University).



## **Final Report on the project „ Development of New Electrochemical Sensors Based on Nano-sized Materials” project # ASEA 2019/Uni Graz/1**

**Applicant:** *ao.Prof. Dr. Kurt Kalcher*

### **Short CVs of Participants**

*Short CV Kurt Kalcher, ao.Prof. Dr. (\*10.02.1955): Associate professor at the Karl-Franzens University Graz, Austria; head of research group Electroanalysis and Sensorics; special research interests: electrochemical sensors and biosensors*

*Short CV Anchalee Samphao, Asst.Prof. Dr. (\*22.02.1974): assistant professor at the Ubon Ratchathani University, Ubon Ratchathani, Thailand; special research interests: electrochemical sensors and biosensors*

*Short CV Van Minh Hai Ho, MSc. (\*06.11.1986) currently employed as a lecturer at Hue University, Hue, Vietnam, working on his PhD thesis supervised by Prof. Khieu and co-supervised by K.Kalcher; specific research interests: metal organic frameworks (MOFs), electroanalysis*

*Short CV Duc Vu Quyen Nguyen, Dr. (\*27.02.1985): accomplished her PhD in 2019 also based on some practical work in Graz under supervision of K. Kalcher; currently assistant at the Chemistry Department of Hue University; special research interests: electrochemical sensors and biosensors, carbon nanotubes (CNTs), modified CNTs*

*Short CV Sudkate Chaiyo (\*22.02.1987): accomplished his PhD in 2016 after 8 months' practical work in Graz under supervision of K. Kalcher; currently assistant at the Institute of Biotechnology and Genetic Engineering at the Chulalongkorn University, Bangkok, Thailand; special research interests: electrochemical sensors and biosensors, microfluidic systems, paper-based analytical devices*

### **History**

*The project has its roots in prior cooperation of the university in Graz (Karl-Franzens University Graz, KFUG, specifically work group of the applicant, EAS – Electroanalysis and Sensorics) with two Thai universities (Ubon Ratchathani University, Chulalongkorn University). Hue University has been included in 2016. With Ubon Ratchathani an even much longer contact exists because the local project coordinator (Dr. Anchalee Samphao) had been a former PhD-student in Graz under the supervision of the applicant.*

*So far, the collaboration between Thai and Austrian universities has been quite successful because quite a few publications has resulted from the collaboration.*

*The project ASEA 2019/Uni-Graz/1 was performed as a combined continuation of the two projects **ASEA 2018/Uni Graz/ 1**, and **ASEA 2018/Uni Graz/ 2**, “Development of New Electrochemical Sensors Based on Nanoparticles with Thai Universities” and “Development of New Electrochemical Sensors Based on Nanoparticles with Hue University”, resp.*

### **Scientific background**

Nano-sized and new materials constitute currently an essential parameter for designing electrochemical sensors. Currently more than 80 percent of publications connected with electrochemical sensors are dealing with this subject. The main focus of most of the papers is centered on the use of nano-sized materials to improve or create amperometric signals with analytes of interest at very low detection levels.

### **General Project Evaluation:**

The project included two outgoing (Kurt Kalcher, project funded) and four incoming mobilities (all project funded):

- Dr. Anchalee SAMPHAO, Ubon Ratchathani University, Ubon Ratchathani; Thailand
- Dr. Sudkate Chaiyo, Chulalongkorn University, Bangkok, Thailand;
- Dr. Duc Vu Quyen NGUYEN, Hue University, Hue, Vietnam;
- MSc. Van Minh Hai HO, Hue University, Hue, Vietnam

The envisaged objectives of the project had been defined as

- Continuation, intensification and prolongation of the well-working scientific cooperation between the universities involved
- Development, characterization and application of new nano-sized materials with electrocatalytic or otherwise new characteristics
- Design of new sensors for the detection of analytes who play an important role in environmental, biological or medicinal chemistry
- Improvement of the teaching standard at the involved Southeast Asian universities, in particular at Hue University
- Improvement of the research level at the involved Southeast Asian universities, particularly at Hue University

The specific goals of the project were

- Improved educational level at the Southeast Asian partner universities involved
- At least two common publications in international journals
- At least one contribution to an international conference
- Improved educational level at the Asian partner universities
- At least two common publications in international journals At least one contribution to an international conference

**Assessment.** It can be concluded that due to the mobilities all the goals have been achieved. The existing scientific collaboration with Thai universities (Ubon Ratchathani University, Ubon Ratchathani, and Chulalongkorn University, Bangkok) was intensified with respect to advising, guiding and common supervision of students in the field of developing new electrochemical sensors and related topics. Scientific research and teaching was strengthened and intensified at Hue University.

Five common publications including authors and co-authors from Thailand have appeared already and represent the main scientific outcome of the project. In this respect it is worth to mention that (ii) was published in one of the highest ranking analytical chemical journals devoted to sensors (Biosensors and Bioelectronics, IF 9.518), and that other publications appeared in journals with impact factors (IF) higher than 3.2.

- (i) Preeyanut Butmee, Gamolwan Tumcharern, Gerald Thouand, Kurt Kalcher, Anchalee Samphao. An ultrasensitive immunosensor based on manganese dioxide-graphene nanoplatelets and core shell Fe<sub>3</sub>O<sub>4</sub>@Au nanoparticles for label-free detection of carcinoembryonic antigen. **Bioelectrochemistry** **132** (2020) 107452 (IF 4.474)

- (ii) Kingkan Pungjunun, Sudkate Chaiyo, Narong Praphairaksit, Weena Siangproh, Astrid Ortner, Kurt Kalcher, Orawon Chailapakul, Eda Mehmeti. Electrochemical detection of NO<sub>x</sub> gas based on disposable paper-based analytical device using a copper nanoparticles-modified screen-printed graphene electrode. **Biosensors and Bioelectronics** **143** (2019) 111606 (IF 9.518)
- (iii) Kanjana Kunpatee, Phuktra Chamsai, Eda Mehmeti, Dalibor M. Stankovic, Astrid Ortner, Kurt Kalcher, Anchalee Samphao. A highly sensitive fenobucarb electrochemical sensor based on graphene nanoribbons-ionic liquid-cobalt phthalocyanine composites modified on screen-printed carbon electrode coupled with a flow injection analysis. **Journal of Electroanalytical Chemistry** **855** (2019) 113630 (3.218)
- (iv) Preeyanut Butmee, Gamolwan Tumcharern, Pranorm Saejueng, Dalibor Stankovic, Astrid Ortner, Juthamas Jitcharoen, Kurt Kalcher, Anchalee Samphao. A direct and sensitive electrochemical sensing platform based on ionic liquid functionalized graphene nanoplatelets for the detection of bisphenol A. **Journal of Electroanalytical Chemistry** **833** (2019) 370–379 (IF 3.218)
- (v) Ivana Zrinski, Kingkan Pungjunun, Sanja Martinez, Janez Zavašnik, Dalibor Stanković, Kurt Kalcher, Eda Mehmeti. Evaluation of phenolic antioxidant capacity in beverages based on laccase immobilized on screen-printed carbon electrode modified with graphene nanoplatelets and gold nanoparticles- **Microchemical Journal** **152** (2020) 104282 (IF 3.206)

One publication has been already accepted for publication, again in a journal with high impact factor (IF 9.518):

- (i) Sandra Oloketuyi, Elisa Mazzega, Janez Zavašnik, Kingkan Pungjunun, Kurt Kalcher, Ario de Marco, Eda Mehmeti. Electrochemical immunosensor functionalized with nanobodies for the detection of the toxic microalgae *Alexandrium minutum* using glassy carbon electrode modified with gold nanoparticles. Accepted on 24 Jan 2020 for publication in **Biosensors and Bioelectronics** (2020) (IF 9.518)

One posters was presented at an international conferences, namely PACCON 2019 (Pure and Applied Chemistry Conference, Feb 3-4, 2019; Bangkok, Thailand) including all participating partners

- (i) Kurt Kalcher, Eda Mehmeti, Anchalee Samphao, Sudkate Chaiyo, Orawon Chailapakul, Thai Long Huang, Hai Phong Nguyen. Electrochemical Sensors and Biosensors with Emphasis on Nano-Structured Materials. PACCON 2019 (Pure and Applied Chemistry Conference, 03 – 04 Feb 2019, Bangkok, Thailand)

The outgoing mobilities covered lectures, seminars, management of publications, discussion, evaluation and planning of the ongoing projects at the target universities in Thailand and in Hue. Lectures were mainly addressed to graduate students as well as for staff members presenting up-to-date technologies of electrochemical sensor manufacturing. Advisory seminars for students (bachelor, master and PhD) seemed particularly positive and prospective because they provided substantial material for the ongoing work within the theses and new directions for future research. All these activities were extremely well appreciated by the partner universities.

The incoming mobilities served mainly for complementary scientific research (Thai universities) as well as a training in nanomaterial technology, electrochemical investigations and research for the characterization of new materials (Hue University).

## **Mobility Details:**

- (i) **Outgoing Kurt Kalcher 05.02.2019 – 18.02.2019**  
Activities in Bangkok (06.02.2019 – 17.02.2019)
- Participation in Pure and Applied Chemistry Conference PACCON 2019
  - Preparation of common publication drafts
  - Seminar “Modern Concepts of Sensors and Biosensors” (Chula Univ.)
- (ii) **Outgoing Kurt Kalcher 18.08.2019 – 16.09.2019**  
Activities in Ubon Ratchathani (27.08.2019-03.09.2019)
- Lecture “Voltammetry – Modern Techniques with Nano-Sized Materials”; 12 Stunden, 8 graduate Students
  - Co-Supervision of Master and PhD Students (Prof. Anchalee Samphao): Discussion on current results in immunosensors and pesticide sensors
  - Advice, planning and discussion on future research
  - Planning of mobilities
- Activities in Hue (04.09.2019 – 08.09.2019)
- Co-Supervision of Master and PhD Students (Prof. Khieu, Prof. Phong): Discussion on current results in and future concepts
  - Seminar “Modern Concepts of Sensors and Biosensors”
- Activities in Bangkok (19.08.2019 – 26.08.2019; 12.09.2019-15.09.2019)
- Evaluation of Research work of common student Kingkan Punjun
  - Publication draft on publication of NO<sub>x</sub> gas sensor in **Biosens. & Bioelectr.**
  - Seminar on “Environmental Analysis with Electrochemical (Bio)Sensors”
- (iii) **Incoming Anchalee Samphao, 15.10.2019 – 15.11.2019**  
Activities            Experimental work on immunosensors
- (iv) **Incoming Sudkate Chaiyo 01.12.2019 – 02.01.2020**  
Activities            Design of a new concept for multi-layered shiftable paper-based analytical devices and experimental work
- (v) **Incoming Duc Vu Qyen Nguyen 01.12.2019 – 26.12.2019**  
Activities            Training on Electrochemical characterization of lab-made carbon nanotubes by voltammetric techniques and electrochemical impedance spectroscopy (EIS)
- (vi) **Incoming Van Minh Hai Ho, 01.12.2019 – 26.12.2019**  
Activities            Training in screen printing technology, characterization with EIS

Graz, 30.01.2020

Kurt Kalcher



## **ASEA-UNINET SCHOLARSHIP REPORT**

**Anchalee Samphao / Thailand**

**Stay from 18th October 2019 to 17th November 2019**

### Short CV:

*Anchalee Samphao, Asst.Prof. Dr.: assistant professor at the Ubon Ratchathani University, Ubon Ratchathani, Thailand; special research interests: electrochemical sensors and biosensors  
[anchalee.s@ubu.ac.th](mailto:anchalee.s@ubu.ac.th)*

### Report:

*From 18<sup>th</sup> October to 17<sup>th</sup> November 2019, I worked as a postdoctoral position under a supervision of Prof. Kurt Kalcher at the institute of chemistry, Karl Franzens University. In these four weeks, I was working on the topic of development of an electrochemical sensor for detection chloramphenicol.*

*The research was done on development of an electrochemical sensor based on nitrogen doped multiwall carbon nanotube-hemin nanocomposite modified on glassy carbon electrode for detection of chloramphenicol. Nowadays, various nanomaterials have been employed to develop electrochemical sensors, such as carbon materials, metal oxides, metal nanoparticles, core-shell nanoparticles and semiconductors. Nitrogen doped multiwall carbon nanotube has attracted much interest in nowadays because of their large surface area, high electrical conductivity, and fast electron transfer rate. Several researchers have proved that N doped-MWCNT can be functionalized easily with numerous materials such as polymer films, ionic liquids, metal nanoparticles, metal oxides and quantum dots. The functionalization of those materials on MWCNT can effectively overcome the problem of MWCNT aggregation and can significantly improve the performances of the immunosensor. Particularly, hemin is one of the most attractive and potential materials that commonly used for fabrication of different kinds of biosensing due to its excellent electrochemical analysis, high specific capacitance and low cost.*

*Herein, the composite of hemin and nitrogen doped multiwall carbon nanotube (N doped MWCNT) was employed to improve electrocatalytic activity of the electrochemical sensor as sensing platform. An electrochemical sensor based on SPCE modified with N doped MWCNT and hemin for the sensitive detection of chloramphenicol was proposed using differential pulse voltammetry (DPV) and electrochemical impedance spectroscopy (EIS) techniques.*

*During I was in Graz, I had been working on drafts of articles which they were accepted on Jurnal of Electroanalytical chemistry and Bioelectrochemistry as shown on following. Taking into account my experiences gathered this year, I was in a good position to adapt and optimize my research even it was short but all of my work were done well and I was successful for the development of electrochemical sensors.*

*To illustrate this report, slides are included and can be found on the next pages.*

## **Abstract 1**

*A novel electrochemical immunosensor has been developed for label-free detection of carcinoembryonic antigen (CEA) as a cancer biomarker. The designed immunosensor was based on CEA antibody (anti-CEA) anchored with core shell Fe<sub>3</sub>O<sub>4</sub>@Au nanoparticles which were immobilized on the sensing surface of a screen-printed carbon electrode modified with manganese dioxide decorating on graphene nanoplatelets (SPCE/GNP-MnO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub>@Au-antiCEA). The screen printed carbon electrode was placed onto a home-made electrode holder for easy handling. The approach was based on direct binding of CEA to a fixed amount of anti-CEA on the modified electrode for the specific detection using linear sweep voltammetry (LSV) and electrochemical impedance spectroscopy (EIS). The LSV and EIS were monitored in a solution containing [Fe(CN)<sub>6</sub><sup>3-/4-</sup>] prepared in 0.1 M phosphate buffer at pH 7.4. The electrochemical signal owing to the redox reaction of [Fe(CN)<sub>6</sub><sup>3-/4-</sup>] was measured, in which the difference in signal response of the SPCE/MnO<sub>2</sub>-GNP/Fe<sub>3</sub>O<sub>4</sub>@Au-anti-CEA before and after interaction with CEA was regarded as the immunosensor response corresponding directly to the CEA concentration. Under optimized conditions, the analytical performance of the immunosensor in terms of the linear response range of 0.001-100 ng/mL, and the detection limits of 0.10 pg/mL (LSV) and 0.30 pg/mL (EIS) was experimentally evaluated. The repeatability (n=5) of 2.3-3.3 %RSD and the reproducibility (n=5) of 4.5-4.9 %RSD were also validated. The applicability of the immunosensor was verified by well-corresponding determination of CEA in diluted human serum samples by electrochemiluminescence (ECL) immunoassay. Judging from the measurements conducted on the real samples, the proposed immunosensor could be suitable enough for a real sample analysis of CEA.*

## **Abstract 2**

*A sensitive and rapid method for the determination of fenobucarb by using screen-printed carbon electrode modified with graphene nanoribbons - ionic liquid - cobalt phthalocyanine (GNRs-IL-CoPc/SPCE) composites based on flow injection analysis (FIA) was developed and applied to vegetable samples. The prepared GNRs-IL-CoPc composite was characterized by Fourier transform infrared spectroscopy (FT-IR), X-ray diffraction (XRD), scanning electron microscopy (SEM), and atomic force microscopy (AFM). Moreover, cyclic voltammetry (CV), differential pulse voltammetry (DPV), and electrochemical impedance spectroscopy (EIS) were used to characterize the electrochemical behavior of the modified SPCE. The amperometric current responses were obtained from the oxidation of 2-sec-butyl-phenol, which is the product of alkaline hydrolysis of fenobucarb. The optimization of chemical variables and instrumental analysis such as composite amounts, pH, applied potential, flow rate, and injection volume were carried out to obtain the best measurement. Under the optimal conditions, the proposed sensor yielded sensitivity of 0.0884 M/A·cm<sup>2</sup>, a wide linear range for detection of fenobucarb from 0.025 to 110 μM with a low detection, and quantification limits of 0.0089 μM and 0.0252 μM, respectively. Additionally, the developed sensor showed good repeatability (RSD = 3.5 %, n = 10 measurements) and good reproducibility (RSD = 3.9 %, n = 5 sensors). The proposed method could be effectively applied for the determination of fenobucarb in vegetable samples.*

## **Scientific and/or societal education results and publications arising from the project**

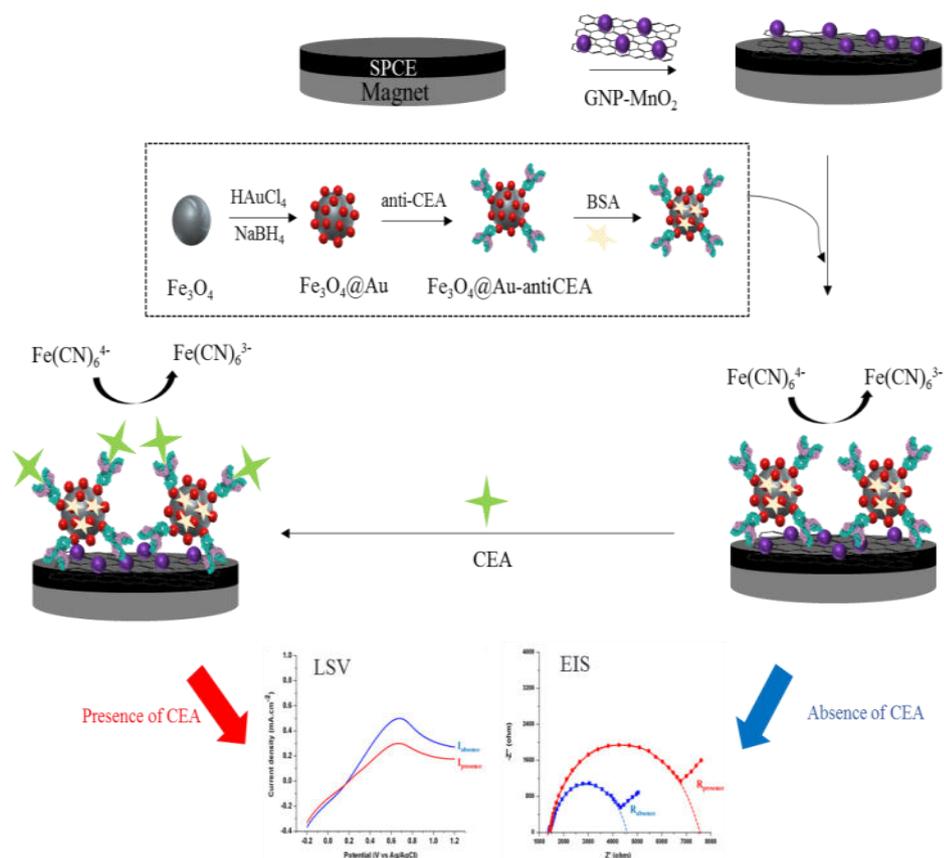
*For scientific results, we do hope to submit the manuscripts entitled "**Development of an electrochemical sensor based on nitrogen doped multiwalled carbon nanotube-hemin nanocomposite modified on paper based- screen printed carbon electrode for detection of chloramphenicol**" in Journal of Electroanalytical Chemistry (IF = 3.218) Attachment (slides of the project)*

**Scientific and/or societal education results and publications arising from the last project**

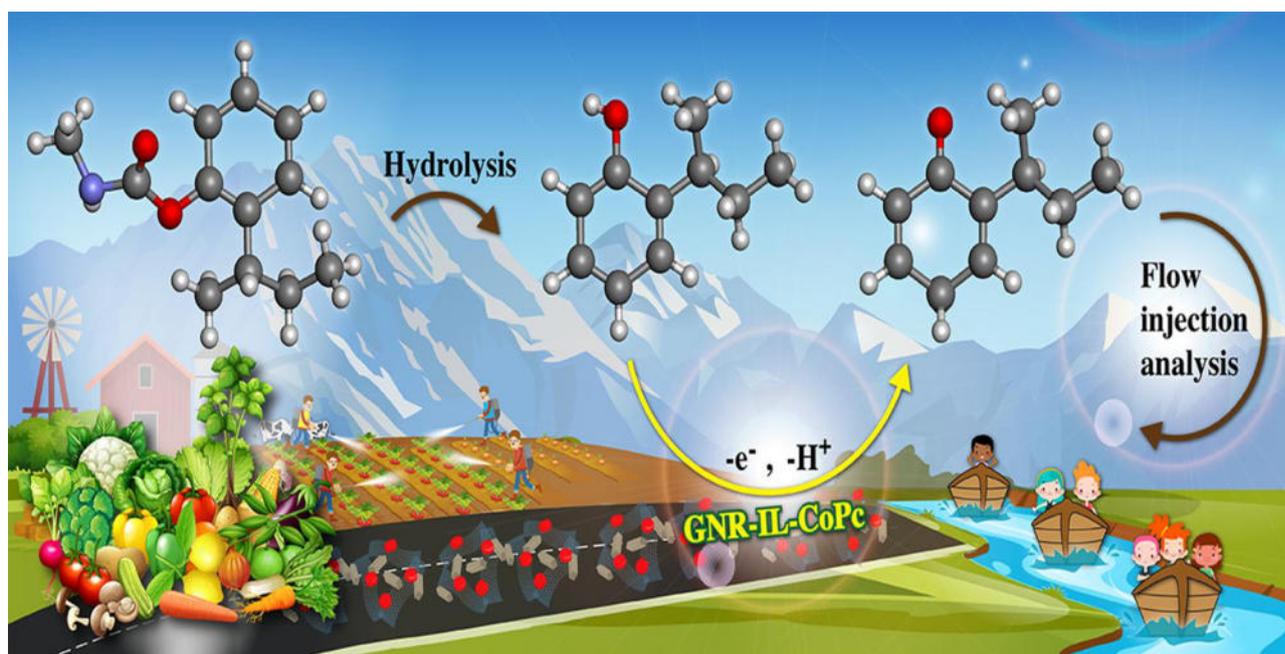
1. P. Butmee, G. Tumcharern, G. Thouand, K. Kalcher, A. Samphao (2020) "An ultrasensitive immunosensor composed of manganese dioxide-graphene nanoplatelets and core shell  $\text{Fe}_3\text{O}_4@Au$  nanoparticles for label-free detection of carcinoembryonic antigen", *Bioelectrochemistry*, 132, 107452 (IF = 4.474)
2. K. Kunpatee, P. Jamsai, E. Mehmeti, D.M. Stankovic, A. Ortner, K. Kalcher, A. Samphao. (2019) "A highly sensitive fenobucarb electrochemical sensor based on graphene nanoribbons-ionic liquid-cobalt phthalocyanine composites modified on screen-printed carbon electrode coupled with a flow injection analysis", *Journal of Electroanalytical Chemistry*, 855, 113630 (IF = 3.218)

**Supplementary document**

1. P. Butmee, G. Tumcharern, G. Thouand, K. Kalcher, A. Samphao (2020) "An ultrasensitive immunosensor composed of manganese dioxide-graphene nanoplatelets and core shell  $\text{Fe}_3\text{O}_4@Au$  nanoparticles for label-free detection of carcinoembryonic antigen", *Bioelectrochemistry*, 132, 107452 (IF = 4.474)



2. Kunpatee, P. Jamsai, E. Mehmeti, D.M. Stankovic, A. Ortner, K. Kalcher, A. Samphao. (2019) "A highly sensitive fenobucarb electrochemical sensor based on graphene nanoribbons-ionic liquid-cobalt phthalocyanine composites modified on screen-printed carbon electrode coupled with a flow injection analysis", *Journal of Electroanalytical Chemistry*, 855, 113630 (**IF = 3.218**)





**Final Report on the project „GCMS as analytical tool  
for monitoring pesticide concentrations in food”**

**project # ASEA 2019/Uni Graz/2**

**Applicant:** Assoc. Prof. Mag. Dr. Georg Raber

**Short CVs of Participants:**

**NGUYEN DANG GIANG CHAU**

*Personal data*

*Date of Birth:* 20.09.1985

*Address* Hue University of Sciences, Department of Chemistry, Nguyen Hue 77, Hue City

*Current position* Lecturer, Vice head of Section of Analytical Chemistry

*Education*

2015 PhD in Agriculture, Univeristy of Bonn, Germany

2010 MSc. Analytical Chemistry, Hue University, Vietnam

2007 BSc. Chemistry, Hue University, Vietnam

*Professional experience*

Since 2008 Lecturer, Department of Chemistry, Hue University of Sciences, Vietnam

2011 – 2014 PhD researcher, United Nations University - Institute for Environment and Human Security (UNU-EHS), Germany

**GEORG RABER**

*Position* Leader Workgroup „Environmental Metalomics“

*Affiliation* Institute of Chemistry, Analytical Chemistry, University of Graz, AUSTRIA

*Personal data*

*Date and place of birth* 29/12/1966, Graz, Austria

*Nationality* Austria

*Career-related activities*

1986 – 1993 Study of chemistry at the University of Graz with specialization in Analytical Chemistry.

1993 – 1996 Ph. D thesis on „New voltammetric methods for the determination of heavy metals using a montmorillonite-modified carbon paste electrode“.

1994 – 1997 Research Assistant at the Institute for Analytical Chemistry at the University of Graz.

1997 – 2000 University Assistant at the Institute for Analytical Chemistry at the University of Graz.

2001 – 2002 Employment at Epcos OHG Deutschlandsberg within the Department for Research and Development.

2002 – 2005 University Assistant at the Institute for sustainable waste management and technology at the Montan University Leoben, Head of laboratory for environmental and process analysis.

2005 - 2015 Assistant professor at the Institute for Chemistry, Analytical Chemistry, at the University of Graz.

03/2015 Habilitation in Analytical Chemistry

Since 03/2015 Associate Professor at the Institute for Chemistry, Analytical Chemistry, at the University of Graz.

**History:**

Since 2016, a cooperation between Hue University and the University of Graz-Analytical Chemistry was established. The focus of this project was to educate staff members and graduate students at Hue University in the field of GCMS to monitor organic pollutants in environmental samples from Vietnam. In 2018 a staff member from Hue University, Dr. Nguyen Dang Giang Chau visited our lab in Graz. During this stay, a sample preparation strategy for the extraction and cleanup of new generation pesticides in food samples was developed. Many food samples from Vietnam were analyzed for PCP's for human health risk assessment.

**Scientific background:**

The analytical laboratory at the University of Hue runs a GCMS instrument for monitoring environmental pollution in Vietnam. The focus of future work will be on the analysis of pesticides in Vietnamese food.

Anyway, the experience on this instrument is rather limited and modern trends in sample preparation for doing GCMS analysis are not established. The aim of this project is to educate the staff doing GCMS analysis in terms of instrument maintenance, sample preparation and GCMS analysis

**General Project Evaluation:**

The project included one outgoing (Georg Raber, project funded) and one incoming mobilities (Dr. Nguyen Dang Giang Chau, project funded). Because of personal problems, Dr. Nguyen Dang Giang Chau could not visit our laboratory in 2019.

**Defined Tasks:**

- Development of analytical methods for the determination of pesticides at trace levels (Graz, Hue)
- Presentation of lectures at the Hue University for research and educational purposes (Graz)
- Co-supervision of students at the Hue University (Graz)

**Expected outcome:**

- Improved research and educational level at the Vietnamese collaborate university.
- One common publication in an international journal.
- At least one contribution to an international conference.

**Assessment:**

It can be concluded that due to the mobilities the goals have been achieved. The existing scientific collaboration with Hue University was intensified with respect to advising, guiding and common supervision of staff members and graduate students in the field of GCMS analysis of organic pollutants and related topics.

**Publications:**

Nguyen Dang Giang Chau, Nguyen Van Hop, Hoang Thai Long, Ngo Thi My Duyen & Georg Raber (2019): Multi-residue analytical method for trace detection of new-generation pesticides in vegetables using gas chromatography–tandem mass spectrometry, *Journal of Environmental Science and Health, Part B*, DOI: 10.1080/03601234.2019.1707585

**Mobility Details:****(vii) Outgoing Georg Raber 30.08.2019 – 07.09.2019****Activities in Hue (04.09.2019 – 07.09.2019)**

- Final data analysis and preparation of publication.
- Seminar "Sample preparation techniques for analysis of pesticides in food samples"



## **Comparison of conventional extraction methods of active compounds from different Thai medicinal plants with microwave assisted extraction**

**PI:** Assoc. Prof. Dr. Adelheid Brantner  
University of Graz, Institute of Pharmaceutical Sciences  
adelheid.brantner@uni-graz.at

Graduated with a PhD at the University of Graz; Assistant Professor specialized in phytochemistry and microbiology; Associate Professor. Post-doc fellowships e.g. Swiss Federal Institute of Technology (ETH), Zuerich, University of Munich, University of Illinois, Chicago, Istituto di Farmacologia e Farmacognosia of the University of Trieste, Dipartimento di Scienze Farmaceutiche, University of Florence. Establishing research cooperations and coordinating international student exchange programs. About 200 publications in international journals; reviewer for the most leading journals in the field of medicinal plant research. *Main fields of scientific interests:* bioassay-guided isolation of active metabolites of medicinal plants and quality assurance; standardisation of herbal medicinal products and functional food. Prof Brantner acts also as principle investigator in international research projects with universities and research institutions in China and Thailand. Supervision of 110 Master and 16 PhD students. Among her numerous professional affiliations her membership of the European Society of Phytotherapy, the Society for Medicinal Plant and Natural Product Research (GA) and the Phytochemical Society of Europe should be especially mentioned. Prof Brantner was negotiating Memoranda of Understanding between the University of Graz and Thai Universities e.g. Mahidol University, as well as Chinese Universities. She is also acting as coordinator of Eurasia-Pacific UNINET for the University of Graz. *Awards:* 2010 The Federal President of the Republic of Austria was conferring the Grand Decoration of Honor in Gold upon Prof Brantner for her special services to the Republic of Austria. 2011 Honorary Professorship from the Pharmaceutical Science University of Mongolia for her outstanding contribution to the development of the pharmaceutical research in Mongolia.

Assist. Prof. Dr. Bancha Yingngam  
Ubon Ratchathani University, Department of Pharmaceutical Sciences, Thailand  
banchaying@yahoo.com

Dr Bancha Yingngam finished his Ph.D. in 2011 at the Department of Pharmaceutical Chemistry and Technology, Faculty of Pharmaceutical Sciences, Ubon Ratchathani University. From 2011 to present he is working as lecturer at the Faculty of Pharmaceutical Sciences, Ubon Ratchathani University. 2006-2009 Dr Yingngam held a fellowship at the Thai Graduate Institute of Science and Technology (TGIST) from the National Science and Technology Development Agency (NSTDA). Since 2012, he published about 18 papers in international peer-reviewed journals and 14 presentations at international conferences. Dr Yingngam is applying phytochemical analysis and working with tissue and mammalian cell cultures, with *in vitro* bioassays, H<sub>2</sub>O<sub>2</sub>-induced oxidative stress in cell cultures and with the Anti-type I collagen glycation assay. He is also optimizing the process of the production of nanoparticles.

## Report

During March 2020 Assist. Prof. Dr. Bancha Yingngam visited in the frame of an ASEA UNINET project the Institute of Pharmaceutical Sciences of the University of Graz. In 2019 he has hosted four Master students of the Institute of Pharmaceutical Sciences University of Graz at the Department of Pharmaceutical Sciences at the Ubon Ratchathani University (UBU). They did research on Thai medicinal plants. The research topics of the students were fitting to the interests of the Institutes in Thailand as well as in Graz. UBU as well as the University of Graz strongly supported this project. Optimized extraction methods for active compounds of plants are important for herbal medicinal products of good quality. Environmental aspects are also essential nowadays. Therefore, a special focus was put on this matter. The results the students used for their Diploma Thesis. The students had the possibility to discuss details of their experiments with Dr Bancha Yingngam during his visit in Graz.

As there is an increasing interest of the students to perform research at a Thai University Prof Brantner organized a meeting for interested students to have the opportunity to get detailed information concerning studies in Thailand and the Thai culture.

During his stay Assist. Prof. Dr. Bancha Yingngam also performed some analytical experiments with different extracts of *Curcuma comosa* rhizomes applying liquid chromatography-mass spectroscopy. After evaluation of the results Prof Brantner and Dr Bancha Yingngam discussed the content of a common paper and prepared a draft on this topic. It was submitted to the international peer-reviewed journal "Chemical Engineering and Processing – Process Intensification".

Although Prof Brantner could not visit Thailand in 2020 because of the Covid pandemic situation worldwide mutual visits of Thai and Austrian researchers were planned for the future to deepen the cooperation and enhance scientific ideas, innovations and expertise. International cooperations are important for the Universities as well as for the students.

## Publications

Bancha Yingngam, Abhiruj Chiangsom, Wandee Rungseevijitprapa, Chutinun Prasitpuriprecha, Adelheid Brantner

Comparative study of Response Surface Methodology and artificial neural network in the optimization of the ultrasound-assisted extraction of diarylheptanoid phytoestrogens from *Curcuma comosa* rhizomes

Chemical Engineering and Processing – Process Intensification (impact factor 3.731) (submitted and accepted, CEP\_2020\_293)

Bancha Yingngam, Adelheid Brantner, Monika Treichler, Nadine Brugger, Abhiruj Chiangsom, Prasit Nakonrat, Chutinun Prasitpuriprecha, Wandee Rungseevijitprapa

Optimization of eco-friendly solvent-free microwave extraction of *Limnophila aromatica* essential oil and evaluation of its potential biological properties in different seasons of the year

Industrial Crops and Product (impact factor 4.244)  
(submitted, INDCRO-D-20-03755)



**Report of the “Unterstützung von Kooperations- und Forschungsaktivitäten im Rahmen von ASEA-UNINET für das Jahr 2019 – Outgoing”**

31/08/2019 – 14/08/2019

**Project number:** ASEA 2019/Uni Graz/4

**Project title:** *Mathematical Theory and Applications of Stabilisation by Noise of Partial Differential Equations*

**Project members**

1. Univ.-Prof.Dipl.-Ing. Dr.techn. Klemens Fellner - Projektleiter

*Institute for Mathematics and Scientific Computing, University of Graz*

*Email: [klemens.fellner@uni-graz.at](mailto:klemens.fellner@uni-graz.at)*

*Prof. Fellner obtained his PhD in Applied Mathematics with highest distinction in 11/2002 at TU Vienna, and his Habilitation in 03/2010 at University of Vienna. Since 06/2011, he is Professor of Mathematics and Computational Sciences at University of Graz. Prof. Fellner is a leading expert in analysis of kinetic equations and reaction-diffusion equations and their applications in physics and biology.*

2. Dr.rer.nat. Quoc Bao Tang

*Institute for Mathematics and Scientific Computing, University of Graz*

*Email: [klemens.fellner@uni-graz.at](mailto:klemens.fellner@uni-graz.at)*

*Dr. Tang obtained his PhD in Applied Mathematics in 05/2015 under the supervision of Prof. Fellner at University of Graz. From 9/2015-12/2015 his was a postdoc at Medical University of Graz and since 12/2015 he is a University assistant at University of Graz. Dr. Tang's research focus is regularity and large time behaviour of reaction-diffusion systems arising from biology and chemistry. His works also deal with infinite deterministic and stochastic dynamical systems.*

3. Dr. Do Duc Thuan

*School of Applied Mathematics and Informatics, Hanoi University of Science and Technology*

*Email: [thuan.doduc@hust.edu.vn](mailto:thuan.doduc@hust.edu.vn)*

*Dr. Do obtained his PhD in 04/2012 at Hanoi University of Science and Technology where he is a lecturer and researcher since 09/2007. He was promoted as Associated Professor in 2017 at Hanoi University of Science and Technology. Dr. Thuan's research focuses on stabilisation and control theory of differential and difference equations.*

### **Project description**

The project is carried out in two weeks visit of Prof. Klemens Fellner from 02/09/2019 to 05/09/2019, and of Dr. Quoc Bao Tang from 31/08/2018 to 14/09/2019, to Hanoi University of Science and Technology. It is a continuation of the collaboration with Assoc.Prof. Do Duc Thuan which was initiated from his visit to Graz in 2017, and the visits of Prof. Fellner and Dr. Tang to Hanoi in 2018. The collaboration's focus is the stabilisation for partial differential equations (PDE) by boundary noise, which has resulted in the joint publication "**K. Fellner, S. Sonner, Bao Q. Tang, D.D. Thuan, Stabilisation by noise on the boundary for a Chafee-Infante equation with dynamical boundary conditions. Discrete and Continuous Dynamical Systems – Series B. 2019, 24(8): 4055-4078.**"

The fact that suitable noise helps to stabilise an unstable system was observed and used in engineering since the sixties of the twentieth century. Its mathematical studies for finite dimensional systems have been initiated in the seventies in pioneering works of Ludwig Arnold. These results were later extended to infinite dimensional systems which arise from e.g functional differential equations or PDE. Typically, it was shown that suitable multiplicative noise acting in the whole domain of a system will help to stabilise the steady state. Moreover, the range of stabilising noise intensities is usually infinite. In many practical situations, it is desirable to stabilise a system with noise acting only on (one part of) the boundary of the domain. Remarkably, this issue has not been addressed in the literature, despite the large amount of works on noise stabilisation, and therefore has remained as an open problem. Our collaboration sheds light on this question and provides pioneering results concerning boundary noise stabilisation. More precisely, we considered in the aforementioned paper a Chafee-Infante equation with stochastic boundary conditions, and shows that there exists a finite range of noise intensities that stabilise the system. This is in sharp contrast with the literature and opens up the potential to study deeper results on boundary noise stabilisation. The main aim of Prof. Fellner and Dr. Tang's visit is to continue the collaboration with Dr. Do Duc Thuan as well as to establish possible new collaborations with other institutions in Vietnam.

### **Project results**

1. 03/09 - 04/09/2019: A two-day mini-workshop entitled "PDE: Analysis and Numerics".

Organisers: Dr. Bao Quoc Tang (Uni Graz), Assoc.Prof. Do Duc Thuan (Hanoi University of Science and Technology), Dr. Ha Phi (University of Science), Assoc. Prof. Doan Thai Son (Institute of Mathematics), and Assoc. Prof. Le Minh Ha (Vietnam Institute for Advanced Study of Mathematics)

Co-funded by the National Foundation for Science and Technology Development (NAFOSTED) and the Vietnam Institute of Advanced Studies in Mathematics (VIASM). <https://viasm.edu.vn/hdkh/pde2019>

*The mini-workshop brings together experts as well as young researchers in analysis and numerical aspects of Partial differential equations (PDE) to discuss recent advances in the fields as well as to establish new research directions. Especially, the workshop aims to increase the potential of collaborations between eager young researchers with experts in PDE.*

**Tuesday 3.9, Morning session**

9.00 – 9.10: *Opening*

9.10 – 9.45: **Tran Dinh Ke** (HNUE)

*Regularity and stability analysis for a class of nonlocal differential equations.*

9.45 - 10.00: **Nguyen Thi Van Anh** (HNUE)

*On the differential variational inequalities of parabolic-parabolic type.*

10.00 - 10.40: **Coffee break**

10.40 - 11.15: **Nguyen Phuoc Tai** (Masaryk, Prague)

*Boundary value problem for semilinear elliptic equations with Hardy potential.*

11.15 - 11.30: **Nguyen Nhu Thang** (HNUE)

*Multiple solutions for Hamiltonian degenerate elliptic systems: the interplay of degeneracy, nonlinearity and weight.*

**Tuesday 3.9, Afternoon session**

14.00 - 14.35: **Dinh Nho Hao** (VIAST)

*Stability results for backward time-fractional parabolic equations.*

14.35 - 14.50: **Phan Xuan Thanh** (HUST)

*Space-time finite element method for determination of a source in parabolic equations from boundary observations.*

14.50 - 15.30: **Coffee break**

15.30 - 16.05: **Le Van Hien** (HNUE)

*On  $l_1$ -gain control of partial difference equations in 2-D positive Roesser model with directional delays: An optimal programming approach.*

16.05 - 16.20: **Ta Thi Thanh Mai** (HUST)

*An adaptive numerical scheme for solving incompressible two-phase and free-surface flows.*

16.20 - 16.35: **Tran Thi Minh Nguyet** (Thang Long University)

*Optimal boundary control of the 3D Navier-Stokes-Voigt equations.*

**Wednesday 4.9, Morning session**

09.30 - 10.05: **Klemens Fellner** (Uni Graz)

*A bi-monomeric, nonlinear Becker-Döring-type system to capture oscillatory aggregation kinetics in prion dynamics.*

10.05 - 10.20: **Luong Thai Hung** (VIAST)

*Transverse (in)stability and asymptotic analysis of the Zakharov-Rubenchik system and related wave type equation.*

10.20 - 11.00: **Coffee break**

11.00 - 11.35: **Doan Thai Son** (VIAST)

*Continuity of some spectral related to random dynamical systems.*

11.35 - 11.50: **Do Lan** (Thuy Loi University)

*Quasilinear parabolic equations in moving domains with  $L^1$  data.*

2. 10/09/2019: A seminar research talk at Institute of Mathematics, Vietnamese Academy of Science and Technology

*Dr. Tang presents the joint-work with Prof. Fellner, Ass.Prof. Dr. Sonner and Dr. Do Duc Thuan.*

10:30 – 11:30: **Tang Quoc Bao** (University of Graz)

*Stabilisation for partial differential equations by boundary noise*

3. *Group working with Dr. Do Duc Thuan (HUST) about possible extensions of the recently obtained results to other important equations and boundary conditions.*
4. *A visit and seminar talk of Dr. Tang to Vietnam National University, Ho Chi Minh City (a member in ASEA-UNINET network). A fruitful discussion with the group of Assoc. Prof. Nguyen Huy Tuan on reaction-diffusion equations and initial data identification for fraction PDE.*

Graz, 05/11/2019

*Klemens Fellner  
Bao Quoc Tang  
Do Duc Thuan*



# ELISA

## Environmental Learning in Southeast Asia

March 2020

### 1. Project Participants

University	City	Country	Coordinator	Contact Info
*University of Graz	Graz	Austria	Dr. Sandra Hummel & Prof. Dr. Rudolf Egger	sandra.hummel@uni-graz.at / rudolf.egger@uni-graz.at
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*Sepuluh Nopember Institute of Technology	Surabaya	Indonesia	Assoc. Prof. Dr. Maria Anityasari	int_off@its.ac.id
Ganesha University of Education	Singaraja	Indonesia	Dr. Dessy Wahyuni	dsy.wahyuni@gmail.com
*University of Mandalay	Mandalay	Myanmar	Prof. Dr. Nyo Nyo	nyonyo@mu.edu.mm
Yangon University of Education	Yangon	Myanmar	Dr. Naing Naing Maw	nnaingsan@gmail.com
Ho Chi Minh City University of Technology and Education	Ho Chi Minh	Vietnam	Dr. Nguyen Vu Lan	lannv@hcmute.edu.vn
*University of Danang	Danang	Vietnam	Assoc. Prof. Dr. Le Quang Son	lqson@ac.udn.vn
Quy Nhon University	Quy Nhon	Vietnam	Assoc. Prof. Dr. Nguyen Quang Ngoan	nguyenquangngoan@qnu.edu.vn
Thai Nguyen University	Thai Nguyen City	Vietnam	Dr. Dang Thi Thanh Huong	huongdt@tmu.edu.vn

\*ASEA-UNINET Partner Universities

### 2. National Project Coordinators

#### **Prof. Dr. Rudolf Egger, University of Graz, Austria**

Prof. Dr. Rudolf Egger is the dean of the Faculty of Environmental, Regional and Educational Sciences, a professor of educational science at the University of Graz (Department of Educational Research) and the head of the Center of Teaching Competencies (ZLK) at the University. Since 2016, he has held the only Austrian professorship for didactics in higher education. His research areas include the didactics of higher education, the organizational structures of learning and teaching, learning cultures and learning communities, learning environments and lifeworld research.

**Dr. Sandra Hummel, University of Graz, Austria**

*Dr. Sandra Hummel is a postdoc researcher with the Department of Educational Science at the University of Graz. She is responsible for the sustainable enhancement of teaching competencies within the University. Working together with Professor Egger, she has developed and designed a comprehensive evaluation tool for the assessment of teaching competencies (Teaching Skills Assessment/TSA) that is applied to the six faculties of the University in the course of appointment procedures for professorships. She functions as an evaluator of didactic qualifications in various national and international universities. In addition, she teaches higher education didactics (Unistart-WISS) at the University of Graz and at the Veterinary University of Vienna.*

**Prof. Dr. Sandra Bohlinger, Technical University of Dresden, Germany**

*Sandra Bohlinger has been a full professor of adult education including further vocational education and training as well as comparative education at TU Dresden since March 2015. Her research interests are in VET, education policy, skills development, recognition of prior learning, teacher education in VET and labor market inclusion. A former Seconded National Expert (SNE) at CEDEFOP in Thessaloniki (the European Centre for the Development of Vocational Training) and a former dean and full professor of vocational education and training research at Osnabrueck University (Germany), she has extensive experience in developing and conducting international and comparative research at regional, national, and international levels.*

**Mr. Irwan Rahadi, Hamzanwadi University, Indonesia**

*Irwan Rahadi has held a Master of Science in applied mathematics at Hamzanwadi University since 2018. He graduated from Mahidol University in Thailand. Currently, he is working as a lecturer in the Department of Statistics, the Department of Mathematics education and the Department of Tourism where he is a program director. His fields of research include medical technology, teaching methods for students with special needs, tourism development, human development, learning environments, machine learning, data science, data mining and deep learning. Irwan also serves as the director of the West Nusa Tenggara Scholarship which focuses on human development by sending the students to study for their degrees overseas, outside of Indonesia.*

**Assoc Prof. Dr. Maria Anityasari, Sepuluh Nopember Institute of Technology, Indonesia**

*Assoc Prof. Dr. Maria Anityasari has actively engaged in non-conventional teaching & learning through MOOCs (Massive Online Open Courses), GPbL (Global Project based Learning), SCL (Student-Centered-Learning) and EXL (experiential learning). She has published various papers related to sustainability issues and wrote a book on reuse and remanufactured products. Currently, she teaches industrial ecology, green manufacturing, and sustainable development goals courses.*

**Dr. Dessy Wahyuni, Ganesha University of Education, Indonesia**

*Dessy Seri Wahyuni is a lecturer and researcher of the Informatics and Education Department, as a part of the graduate program at the Ganesha University of Education. She received her doctoral degree at Yogyakarta State University and the Technical University of Dresden in 2019. She has experience as a research leader of “Vocational Teacher Competencies in Vocational High School.” Her teaching and research focus are related to the curriculum of vocational education and training in the 21st century.*

**Prof. Dr. Nyo, University of Mandalay, Myanmar**

*Prof. Dr. Nyo has a Ph.D. in geography and has been a professor at the Department of Geography and Environmental Studies, University of Mandalay since 2012. From 2007 to 2012 she was a professor at the Department of Geography, Mandalay University of Distance Education. She was also an associate professor from 2005 to 2007 at the Department of Geography, Mandalay University and completed a fellowship for a doctorate from 1999 to 2004 at Bangalore University, J.B Campus in Bangalore, India. Her research interests include human geography and land use geography.*

**Dr. Naing Naing Maw, Yangon University of Education, Myanmar**

*Dr. Naing Naing Maw is a professor of educational psychology at Yangon University of Education. She has been in the teaching profession since 1984 as a primary teacher. After four years, she continued her teaching service as a junior teacher and a high school teacher as well. After graduating with a master’s degree in education from Yokohama National University in Japan, she transferred to Yangon University of Education as a tutor at the Department of Educational Psychology in 1999. She received her PhD from Yangon University of Education in 2007. Now, Dr. Naing Naing Maw is working as a professor, focusing her research area in educational psychology and early child development.*

**Dr. Nguyen Vu Lan, Ho Chi Minh City University of Technology and Education, Vietnam**

*Dr. Nguyen Vu Lan achieved his PhD in the field of mechanical and energy engineering in 2012. His research focuses on the development of energy saving solutions and new and renewable energy. He started teaching in 2004 and has been teaching in both Vietnam and abroad (e.g. Taiwan) at the higher education level. He is currently the deputy head of the Office of Science, Technology and International Affairs at HCMUTE. He is responsible for supervising the implementation of joint projects with foreign partners and in charge of searching for cooperation opportunities and creating and managing connections with cooperative partners.*

**Assoc. Prof. Dr. Le Quang Son, University of Danang, Vietnam**

*Prof. Le Quang Son is the vice president in charge of research and international cooperation at the University of Danang and was the vice rector of the University of Education – a member of UD. He received his PhD degree in psychology studies in 1999 at the Russian Academy of Education and the title of Associate Professor of Psychology in 2011.*

**Assoc. Prof. Dr. Nguyen Quang Ngoan, Quy Nhon University, Vietnam**

*Nguyen Quang Ngoan received his B.A in TESOL from the Quy Nhon University of Education in 1996. He obtained his MA in English linguistics in 2004 from Vietnam National University in Hanoi and his PhD in linguistics in 2009 from the same institution. His research areas include TESOL, applied linguistics, semantics, pragmatics, discourse analysis, research methods, inter-cultural communication, and translation.*

**Dr. Dang Thi Thanh Huong, Thai Nguyen University, Vietnam**

*Dr. Dang Thi Thanh Huong is the deputy dean of the School of Foreign Languages and a local coordinator of Erasmus projects. Her expertise includes developing competencies and skill sets in individuals in order to perform work effectively and efficiently and in a simple and professional way.*

### *3. Project Description*

*ELISA aim is to develop a teacher training program in Indonesia, Myanmar and Vietnam that provides high-quality contemporary education and fosters the achievement of sustainability goals so that students develop new patterns of behavior for the future and become informed, committed and active members of society.*

*Our initial research and discussions with universities, ministries of education and relevant members of the education sector in each of the partner countries gave crucial insight into the current higher education landscape and future opportunities. The research revealed that modernizing teacher education is one of the most pressing problems facing this region. Many teachers do not have access to training, supervision or resources that can help them excel as educators and contribute locally to creating high-quality education systems. The need to address these problems is pressing because appropriate teaching and learning materials and opportunities for specialized training are lacking and challenges presented by the 21st century place these teachers at a disadvantage.*

*Further research showed that the partner countries (in line with the majority of countries around the world) are beginning to recognize the need to adapt to the current and future changes in the global climate. The specific environmental challenges facing Indonesia, Myanmar and Vietnam are multifaceted. Climate change has contributed to the increasing frequency and severity of extreme weather events that have destroyed agriculture, increased*

*the risk of wildfires and contributed to rising sea levels. Events such as climate change and natural resource depletion will require the citizens living in these countries to develop transformative solutions to problems that had not been previously anticipated.*

*Following the in-person discussions with partners, it was agreed upon that ELISA will concentrate on both of these core issues by fusing two approaches: contemporary teaching skills and environmental education (EE). A major facet of contemporary education is the introduction of problem-based approaches which help teachers inspire students to develop transformative solutions and become critical thinkers. EE provides the ultimate lens through which these skills can be presented. Not only is this a very relevant topic in today's society, it also provides many opportunities for teachers to apply their contemporary skills and to encourage students to become lifelong learners and active members of society.*

*In order to achieve significant progress, our partners concurred that more than just knowledge and awareness of the current environmental situation is needed; ELISA must go a step further. Through the strengthening of integral teacher skills, ELISA will:*

- kick start a crucial learning process about the environment and its related challenges;*
- help students develop the competencies to address these challenges; and*
- nurture their cognitive capacity and resourcefulness to help them make informed decisions and take responsible action.*

#### *4. Target Audience*

*ELISA will address the educational and environmental challenges in the partner countries so that teachers are able to acquire the necessary competencies to integrate EE into their teaching at a holistic level. To ensure a comprehensive targeting strategy reaching all touchpoints, students and families will be addressed as well. The three target audiences ELISA will reach are outlined below:*

##### ***Primary Target: Teachers***

*In the partner countries, the absence of appropriate teaching and learning materials, opportunities for specialized educational training and the challenges presented by globalization place teachers at a disadvantage when they enter real classrooms. ELISA will address these gaps by targeting teacher trainers, trainee teachers (university students) and in-service teachers who want to further their own professional development and support environmental literacy in the classroom.*

##### ***Secondary Target: Lower Secondary School Students***

*Through the teacher education program, ELISA will supply students with the necessary skills and competencies to become both environmentally aware and environmentally active. Providing students with action-oriented tasks, helping them*

*develop self-confidence and inspiring their commitment towards improving the environment are all ways in which the project will filter from the teachers to the students.*

### **Tertiary Target: Families**

*Education begins at home long before children are enrolled in school. The influence that family life has on children and how they see the world is crucial to their EE and their practical application of the habits and skills they have learned at school. In order to ensure ELISA provides a comprehensive approach to EE, families of lower secondary school children will be addressed through a mobile application that can be used at home. Making these practical resources available at home will help both children and parents apply what they've learned in real time.*

## **5. Project Elements**

*Four comprehensive project elements will be developed and implemented as a part of the project:*

**1) Online Contemporary Teaching Modules:** *Three separate online modules will focus on the development of central teaching skills that are required for teachers to encourage the critical examination of information and opinions, draw from real-world examples, access and implement modern educational practices and use new digital technologies to engage students.*

**2) Teaching Materials:** *As part of the course work with the modules, teachers participating in the online courses will be encouraged to create unique and engaging teaching materials such as worksheets, activities, games and review sheets. These resources will be open-source and can be used in classrooms in each of the partner countries, essentially creating a shared collective of extremely relevant and useful information in an easily accessible format. To make them even more widely accessible, they will be translated into each national language.*

**3) Train-the-Trainer Program:** *In addition to the online modules, teacher trainers will have the opportunity to take part in a comprehensive Train-the-Trainer (TTT) program. TTT will consist of multi-day workshops within the partner countries and an adapted set of online modules focusing on twenty-first century teaching skills and transdisciplinary teaching and learning in order to strengthen the quality of university teaching. TTT will also offer a tutorial to help teacher trainers assist in-service teachers and trainee teachers who are completing the contemporary teaching modules. Lastly, once the project has been completed, tutors (known as multipliers) will be nominated to continue the program to ensure its sustainability.*

**4) Mobile Application:** *To facilitate the transfer of EE from school to home, a mobile app will be created. The app will feature activities that children can actively participate in with their families at home including topics such as recycling and trash separation, renewable energy sources and water and electricity consumption. Individual learning outcomes are greatly influenced by family involvement; therefore,*

*Integrating the information the children receive at school together with their home life will ultimately enhance the success of the project.*

*ELISA has been specifically developed to enable children in Vietnam, Myanmar and Indonesia to acquire knowledge, values, behaviors and lifestyles that will enable them to enact positive changes in terms of sustainability. The project introduces problem-based approaches that can be used by teachers to encourage the children to develop initial transformative solutions in their immediate living environment and/or recognize the potential for such solutions.*

*Our proposed project will provide teachers with access to this education through the careful selection of strategic partnerships with accredited institutions of higher education (HEIs) and local educational organizations. By participating in ELISA, teachers will have the opportunity to enhance their environmental literacy and encourage their students to act locally to help prevent climate change, develop innovative adaptation skills and mitigation strategies, move forward despite adversity and help their communities adjust to environmental impacts.*

*In essence, ELISA will be a tool that enables teachers to nurture and encourage students to become lifelong learners and active members of society.*

## *6. Detailed Activities*

*Initial meetings were held in the project countries to form a strong working coalition between the eleven partner countries and to begin discussing the details of future research projects. As a result of these initial meetings, project members developed a work plan to successfully execute the ELISA project. The project has been broken down into seven comprehensive work packages, which will be led by different members in the consortium depending on expertise. These work packages will provide a thorough roadmap enabling the implementation of ELISA across the three partner countries.*

### ***Work Package 1: PREPARATION***

*A project guide will summarize key elements related to managing ELISA; A kickoff meeting will bring representatives together for launch; Institutional coordinators will hire staff and consolidate project teams; A comprehensive work plan with detailed task management will highlight deadlines and tasks; An environmental analysis will show the relationship of ELISA to relevant environments and key players.*

### ***Work Package 2: DEVELOPMENT I: CONTEMPORARY SKILLS FOR TEACHERS***

*A target oriented needs analysis will outline how the online modules can best meet the specific requirements of each partner university; A target oriented technical analysis will outline the specific technical environment and needs of each partner university; The pedagogical approach will provide the framework of how to design the modules based on needs analyses and country/cultural specifics; The contents and tasks will be developed and will include the learning objectives, optimal user environment, working materials, methods*

*and the criteria for a positive result; The online design concept will ensure modules are open access and give participants flexibility and remove any barriers to studying; Modules will be realized after testing and optimization.*

***Work Package 3: DEVELOPMENT II: TRAIN-THE-TRAINER PROGRAM: PEDAGOGIC PROFESSIONALIZATION IN HIGHER EDUCATION***

*A target oriented needs analysis will outline the specific needs of teacher trainers in each partner country; A target oriented technical analysis will outline the specific technical needs of teacher trainers and requirements essential for completing TTT program; The pedagogical approach will provide the concept that aligns goals, objectives and strategies of TTT program; The TTT contents and tasks will be adapted online modules specifically for teacher trainers; The TTT tutorial will host information regarding how to use modules from WP2; The workshops at each partner institution will include the TTT modules and the tutorial; The multiplier program will nominate tutors to continue the TTT workshops after project completion.*

***Work Package 4: DEVELOPMENT III: ENVIRONMENTAL EDUCATION MOBILE APP***

*A target oriented technical analysis for the mobile app will determine what technical capabilities students and families have at home to help establish how and when the app can be used; The app contents will be based on expert advice and will feature activities that children can actively engage in with their families at home; The app will be realized after testing and optimization*

***Work Package 5: QUALITY ASSURANCE***

*Internal evaluations will be conducted twice a year to assess the project's progress and co-operation between project partners; Testing of the modules will be done by relevant target groups from WP2; Testing of TTT will be done by relevant target groups from WP3; An external evaluation will assess the project's progress to highlight strengths and weaknesses from an external perspective; An audit will ensure that budgets are being utilized properly and adhere to guidelines.*

***Work Package 6: DISSEMINATION***

*A website for members of scientific community and the general public will be created; A kickoff presentation will be held within the first few months to launch the project including presentations from each partner country; Presentation events will be held at each partner institution in first year to publicize ELISA to all stakeholders; Public relations work will educate various groups in partner countries through traditional media as well as all possible social media outlets; Roadshows at universities and teacher training colleges in partner countries will present the project and propose concrete steps to enable institutional implementation; Final conferences will be held to disseminate the results to all ELISA stakeholders; Academic articles will be published in educational journals twice a year by different members of ELISA*

### **Work Package 7: MANAGEMENT**

*Official documents will be signed; The management of finances and reporting to the coordinator on a regular basis will ensure that spending conforms to guidelines; National coordinators will monitor task completion to ensure that partners meet important deadlines; Annual meetings with all partners to discuss the progress of project and next steps will be held in conjunction with video/phone meetings; Reporting measures will ensure milestones and budgets are tracked and analyzed on a regular basis.*

## *7. Expected Results*

*We expect that participation in these activities will equip these teachers with the necessary pedagogical and didactic skills, training, supervision and resources that will help them develop critical thinkers and environmentally literate students.*

*Students reached through ELISA will be provided with action-oriented tasks that help them develop self-confidence and inspire their commitment towards improving the environment. Helping lower secondary school students not only obtain and strengthen their knowledge about the topic but also foster positive attitudes and encourage them to apply critical thinking skills will expose them to challenges they will face in the world around them and prepare them to take on roles as responsible, informed and active members of society.*

*We expect teachers who have taken part in ELISA to pass the following knowledge, skills and competencies on to lower secondary school students in Indonesia, Myanmar and Vietnam:*

- an interest in becoming more environmentally active;*
- increased self-confidence;*
- increased commitment to improving the environment;*
- increased knowledge about EE;*
- stronger critical thinking skills that can be applied to facing future challenges;*
- an ability to make connections between the natural, social, economic and cultural environment;*
- an improved understanding of the environment based on real-world experiences;*
- greater curiosity about the environment;*
- an increased awareness about and understanding of environmental issues;*
- more interest in participating in hands-on activities to acquire and support basic motor skills; and*
- a heightened interest in becoming responsible members of society.*

## *8. Planned Activities and Collaborations*

*In February 2020, the University of Graz submitted the ELISA proposal to the Erasmus+ Capacity Building in High Education program. If the proposal is accepted, work on the project*

*will begin in January 2021. Discussions and information from the meetings in Indonesia, Myanmar and Vietnam were essential to building a comprehensive proposal and forming a strong partnership.*

*In addition to the ELISA proposal, other future planned activities may include the support of student research within the partner countries, the joint publishing of academic articles, the writing and submission of additional grant proposals and the exchange of ideas and information among universities.*

### *Annex: Photos*

*Below are photos from the initial meetings in Indonesia, Myanmar and Vietnam.*



*Meeting with the lead members of the University of Mandalay, Myanmar, ©Hummel2020*



*Informal meeting with members of the Vietnamese Rectorate, ©Hummel2020*



*Meeting with the dean of the Faculty of Education, University of Mandalay, Myanmar, ©Hummel2020*



*Meeting with project coordinators in Vietnam, ©Hummel2020*



*Classroom visits at Ganesha University, Indonesia, ©Hummel2020*



*Meeting with Dr. Dessy Wahyuni at Ganesha University, Indonesia, ©Hummel2020*



*Report on the project*  
**ASEA 2019/ Uni Graz /5**

**Participating Scientists**

- (1) Prof. Dr. Christoph Hauzenberger is full professor for Petrology and Geochemistry at the University of Graz. He finished his PhD in 1997 at the University of Graz and was Postdoctoral Associate ("C1 Assistent") at the University of Mainz. He is a petrologist with a strong background in metamorphic petrology and geochemistry.

**Report on the visit of Chiang Mai University (21.01. - 23.01.2020) and the fieldtrip to Thailand and Cambodia (02.02.2020-10.02.2020) together with Prof. Joachim-Mrosko from the University of Innsbruck**

Several Master students from Chiang Mai University came to the University of Graz, NAWI Graz Geocenter - Institute of Earth Sciences in the the last two years. Therefore I planned to visit the Department of Geological Sciences, Chiang Mai University during the intended field trip to Cambodia and Thailand. During my visit there on January 22nd and 23rd, I have met Prof. Dr. Burapha Phajuy, Prof. Dr. Weerapan Srichan, and Dr. Boonrika Srithai, who were the principal advisors of the Thai students visiting Graz. Additionally, on January 23rd I gave a talk with the title "Contrasting Lower Crustal Processes Documented in Granulites from the East African Orogen and the Bohemian Massif". From January 24th to 30th I conducted field work with my former PhD student Dr. Prayath Nantasin and his Master students in the Nan area - field work from Jan 24th - Jan. 30th was funded locally.

On January 30th I returned to Bangkok to meet Prof. Sutthirat from Chulalongkorn University and Prof. Wanthanachaisaeng from Srinakharinwirot University for discussion and preparation of field work in Cambodia and SE-Thailand. On February 2nd Prof. Joachim-Mrosko from the University of Innsbruck arrived in Bangkok. Aim of the fieldwork related to this project was to find and collect samples of upper mantle xenoliths and xenocrysts and their host rocks from Cambodia and SE-Thailand. It is part of an ongoing study covering mantle xenoliths and xenocrysts and their host rocks from the southeast Asian peninsula with rocks from Vietnam, Laos and Thailand already characterized. These mantle xenoliths and xenocrysts provide information, otherwise unobtainable, on the chemical and mineralogical composition of the Earth's upper mantle and its thermal structure beneath the southeast Asian peninsula. The collected rock samples will be investigated by electron microprobe and laser ablation ICPMS at the University of Graz and the University of Innsbruck.

## **21.01-22.01**

Air travel from Vienna via Bangkok to Chiang Mai

## **22.01.**

Discussion with Srett Santitharangkun regarding his Master thesis and analytical results which he obtained in Graz during his last 2 visits. Development of a PhD project which he will submit to ASEA-Uninet

## **23.01.**

Meeting at Department of Geological Sciences, Chiang Mai University. Lecture/presentation of "Contrasting Lower Crustal Processes Documented in Granulites from the East African Orogen and the Bohemian Massif"

## **24.01. - 30.01**

Field work in the Nan area with my former PhD student Dr. Prayath Nantasins and his students from Kasetsart University. On 30th afternoon flight to Bangkok.

## **31.01. - 02.02**

Meeting with Prof. Sutthirat from Chulalongkorn University and Prof. Wanthanachaisaeng from Srinakharinwirot University. Preparations for field work.

## **03.02**

Car journey from Bangkok via Chanthaburi to the Thailand-Cambodian border at Banpuggard and further to Pailin in Cambodia.

## **04.02**

Sample collection in the surroundings of Pailin (Cambodia):

- (1) Locality: Temple Mount Pailin. Several basalt samples with mm to cm size xenocrysts were collected. However, the basalts did not contain any mantle xenoliths.
- (2) Sampling at a small sapphire mining site close to Pailin (Fig. 1)



Figure 1: Sapphire mining site near Pailin (© Christoph Hauzenberger)

Several basalt rubblestones were collected that contained small xenocrysts but were free of mantle xenoliths.

- (3) Sampling of an outcrop near Pailin (N12-51.899; E102-33.369). Several fresh basalts with cm-sized mantle xenoliths and idiomorphic xenocrysts were collected (Fig. 2).



Figure 2: Prof. Joachim-Mrosko and our local Thai guide Tan in front of a basaltic breccia with xenoliths and xenocrysts (© Christoph Hauzenberger).

## 05.02

Road conditions and long travel times even for short distances as well as the risk of landmines made sampling of mantle xenoliths and xenocrysts difficult. Therefore, we decided to cross

the border to Thailand and continue our fieldwork in the provinces of Trat and Chanthaburi. In the afternoon, we visited a large ruby mining site near Trat. This outcrop showed several fresh basalt layers.

## 06.02

Visit of several potential outcrop localities in the surrounding area of Trat und Chanthaburi

- (1) Garnet bearing river sediments were sampled at this locality (N12-41.962; E102-27.571).
- (2) Sampling of slightly weathered rubblestones in a forest (N12-42.234; E102-27.591), which were identified as basalts, gabbros, diorites und pyroclasts. Several samples showed up to cm-sized xenocrysts.
- (3) Dirt track next to a small river that contained many rubblestones (N12-42.724; E102-27.591), which were again gabbros and diorites. All examined rocks were free of mantle xenoliths
- (4) Several only slightly weathered basalt rubblestones with mm-cm sized pyroxen xenocrysts (N12-40.876; E102-27.199).

## 07.02

Sampling at two localities near Chanthaburi.

- (1) Road outcrop located in the region of a former mining site (N12-36.515; E102-02.542). Basalts and pyroclasts with mm-cm sized pyroxen-xenocrysts were collected, which are separated by bright reaction rims from the surrounding matrix.



Figure 3: Local small scale sapphire mine close to Chantaburi. Mantle xenoliths as well as xenocrysts could be recovered from this site (© Christoph Hauzenberger).

- (2) Visit of a small sapphire mining site (N12-36.328; E102-02.499). Several weathered mantle xenoliths with a size up to 10 cm were collected. Another byproduct of the mining process are heavy minerals separates containing zircon and spinel (Fig. 3).

## **08.02-10.02**

Car journey to Bangkok and flight to Vienna. Arrival in Graz on the 10<sup>th</sup> of February 2020.

### **Expected Results**

A detailed chemical and textural analysis of the collected mantle xenoliths and xenocrysts will enable us to get a better understanding of the compositional variability of the Earth's upper mantle and its thermal structure in Southeast Asia. Results of this project are planned to be published in international professional journals.

### **Publication from an earlier project**

Konzett J, Hauzenberger C, Krenn K, Joachim-Mrosko B, Stalder R, Gröbner K, Sieberer A-K, Hoang N, Khoi NN (2020) Neogene metasomatism in the subcontinental lithosphere beneath Southeast Asia – evidence from modal and cryptic phosphorus enrichment in peridotites and pyroxenites from southern Laos. *Journal of Petrology*, doi: 10.1093/petrology/egaa013



## **TCC IN EU – Thermal Comfort Criteria in Indonesia and Europe ASEA 2019/ Donau Uni /1**

### **Involved persons**

*DI **Wolfgang Stumpf**, Donau-Universität Krems*

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*Architectural studies at the Technical University Vienna*

*Research associate at Danube University Krems*

*External lecturer at various Austrian universities of applied sciences*

*Head of the International Summer School "Climate Friendly Buildings - then and now" at the INNES Institute Vienna*

*Main research: Buildings, technology and energy for climate-friendly building, building life cycle, building in existing buildings*

*Dr. habil Mag. Akad. Rest. **Patricia Engel***

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*Magisterium in Conservation-Restoration: University of Fine Arts Vienna, Austria*

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*lecturer for building physics at the Department of Architecture and Planning, Gadjah Mada University, Yogyakarta  
Seminars at professional societies and universities on Green Building Concepts and applications*

*Green Consultant at IFC – The World Bank Groups*

*Practice in architecture, urban design and lighting design (National and ASEAN awards in Green Buildings and Energy Efficient Buildings and projects certified by Green Building Council Indonesia)*

*Post graduate education in architectural science, especially in Building Physics, at University of Sydney, Faculty of Architecture*

*Study of bioclimatic designs / passive designs, College of Architecture and Environmental Design, Arizona State University, USA*

*Graduated from Gadjah Mada University, Yogyakarta, Department of Architecture and Planning*

### **Introduction**

*How do we respond to climatic outdoor conditions in the area of indoor thermal comfort in Indonesia and Europe? Which methods do we use in teaching, research and legal standards in climate design? The focus of this ASEA Uninet Project is on knowledge sharing between universities and institutions in Indonesia and Europe. The aim for European team members is a better understanding of the climate in Indonesia and vice versa.*

*During the visit of Yogyakarta, Indonesia, in August 2019, a group of Austrian scientists and lecturers from Danube University Krems and the Vienna University of Technology worked with colleagues, students and interested people from Indonesia in the field of climate and thermal comfort.*

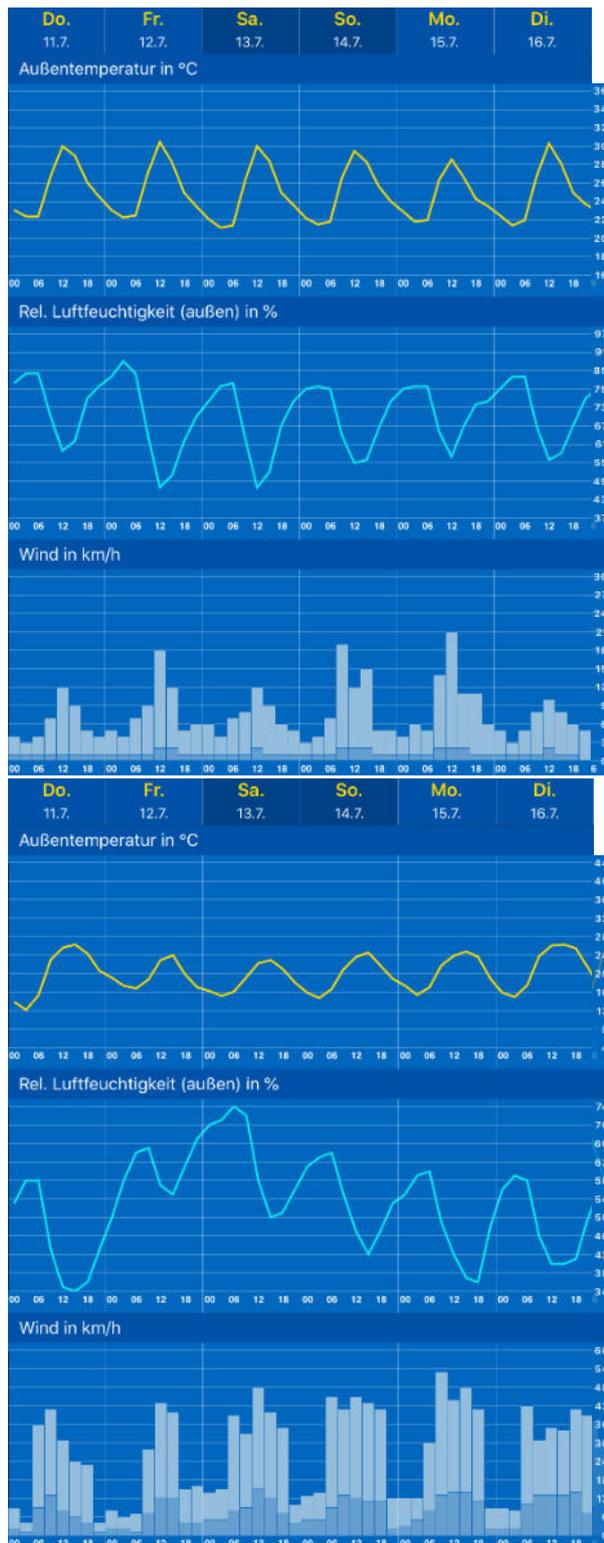


Figure 1: Temperature, relative humidity and wind speed in July in Yogyakarta, Indonesia (left), and Burgenland, Austria.

## Planned aims

Planned activities during the stay in Yogyakarta:

- Installation and maintenance of climate sensors and weather station at Affandi Museum
- Measuring and analyzing the indoor and outdoor climate in Yogyakarta
- Presentation of the results, comparison with the situation in Austria, Europe, discussion with the students and teachers at Universitas Gadjah Mada

- *Workshop on Climate Monitoring, organized by Austrian and Indonesian staff for UGM students at the Affandi Museum*
- *Workshop about a teaching cooperation with Indonesian and European universities*
- *Meetings with the board and staff of the Affandi Museum to find room climate optimization measures in Gallery 1 and manage climate monitoring and data*

### **Monitoring of outdoor and indoor climate at Affandi Museum**

*Ulrike Herbig arranged the installation of sensors and a weather station at Affandi Museum in December 2018. The monitoring equipment was sponsored and handed over by Wolfgang Stumpf to the Affandi Museum. The museum's WLAN system enables permanent worldwide access to current and historical climate data. Wolfgang Stumpf works on the data mining and uses this installation for educational and research purposes and also for his dissertation. He controls the system via App and reports malfunctions or interesting results to the museum management, who take care of the WLAN connection and the energy supply of the sensors. Of course, the museum management, in person Cilla Venetsia Sapto, has a direct access to the monitoring data via app.*

*In Yogyakarta Wolfgang Stumpf adjusted the sensors, checked the system and introduced museum staff to the maintenance of the sensors. The monitoring data provide information about the actual climatic conditions in and around the Gallery 1.*



*Figure 2: Position of sensors inside (white dots) and outside Gallery 1, Affandi Museum.*

*The daily temperature and humidity fluctuations in nose height and in about three meters above the ground (second row of paintings) are in a relatively narrow range. At a first glance, these climate conditions could not endanger the artworks. For a reliable statement, the author will do further literature research and conduct interviews with experts in art storage.*

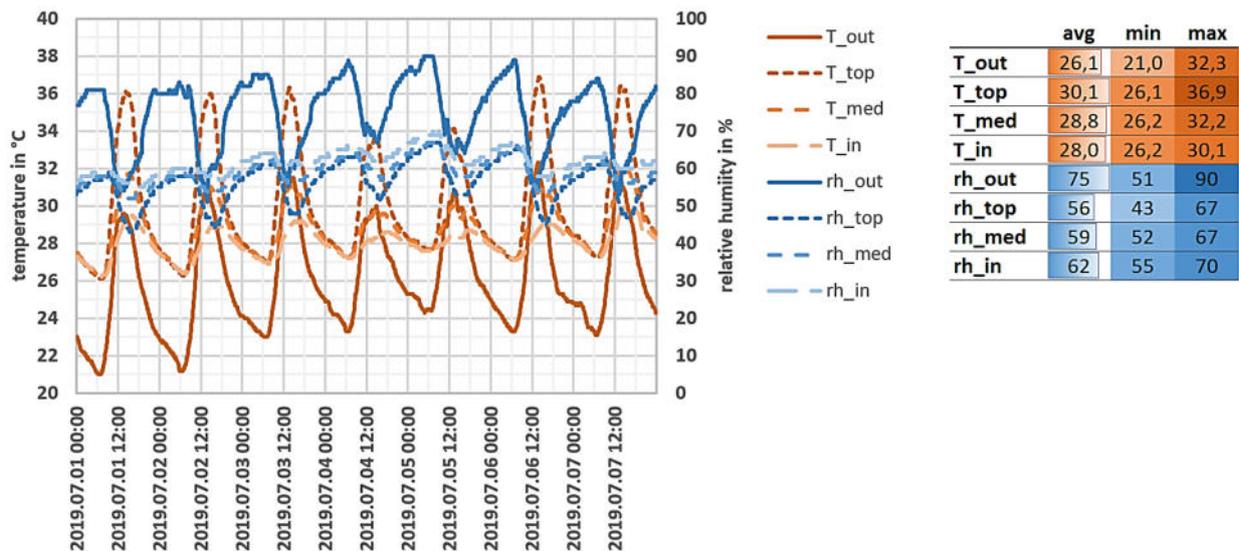


Figure 3: Temperature and relative humidity in and around Gallery 1.

The temperature under the roof is following the outdoor conditions (temperature and solar irradiation) and does not strike the indoor comfort in an essential way. The air accumulation under the roof and the lack of air circulation accelerate the destruction process of the teak shingles in the roof construction. A follow-up project shall work on the definition of restoration measures for the roof construction.

Passive and active air conditioning measures are the result of the study about hygrothermal behavior of Gallery 1 and its interaction with the outdoor climate. In a cooperation between UGM and Wolfgang Stumpf, the computational simulations are still in process. The partners share their results via internet and, if possible, at a next meeting in 2020.

### Lecture TCC IN EU at UGM, Workshop at Affandi Museum

In a first meeting with the team at Universitas Gadjah Mada on August 14<sup>th</sup> the activities until end of August were planned. They agreed on the lecture at UGM with the topic “Thermal Comfort Criteria in Indonesia and Europe” and a workshop at Affandi Museum with the title “Thermal Comfort & Climate Design Aspects of Affandi Museum” (see poster). In the discussion we learned, that the Austrian outdoor climate during summer daytime was even hotter than in Yogyakarta. Compared to Austria, the everyday life of the Indonesian people differs, for example, because of the different opening and working hours in non-air-conditioned buildings. There they often use the smooth wind breezes for natural ventilation in buildings and shaded outdoor areas such as narrow streets and porches. For the evaluation of thermal comfort, they teach and use the adaptive comfort criteria in a very similar way as in Europe.

In Austria the number of periods with extreme heat is rising, so they are focusing on passive cooling measures for existing and new buildings. Beside the comfort criteria for technically conditioned indoor rooms (see EN ISO 7730), in Europe the need for teaching and applying the adaptive thermal comfort criteria (see EN 15251, ASHRAE 55) finds higher attraction.

On Monday 26<sup>th</sup> of August about 22 master students of architecture at Universitas Gadjah Mada took part at the morning lecture “Thermal Comfort Criteria in Indonesia and Europe”, held by Wolfgang Stumpf with the support of Agus and Joned. Participants shared their personal experience of cold and dry climate and their ability to adapt to hot and humid weather. They agreed that this personal experience gives a base for the architectural design belonging aspects of climate friendly buildings.

After the morning lecture the class headed over to Affandi Museum.

In groups of three the students filled in a questionnaire about their individual experience at ten indoor and outdoor places at Affandi Museum. The categories were climatic, visual, acoustic situation, the individual experience of genius loci and suggestions for improvements. At the end they presented and compared their subjective climate

experiences with measured values and discussed the results. Thereafter, Wolfgang Stumpf summarized the results in a PowerPoint presentation and submitted the file to the students and the Affandi Museum.



Figure 4: Poster about the lecture and workshop for master students of architecture at Universitas Gadjah Mada (left). Students posing under a relief from Kartika at Affandi Museum.

### **Workshop “One Week for Restoration Education”**

From August 19<sup>th</sup> to 23<sup>rd</sup> a workshop “One Week for Restoration Education” took place at Universitas Gadjah Mada, Affandi Museum, Museum Nasirun, Borobodur and several other places with historic buildings and art. Members of five Indonesian and two Austrian universities presented and discussed their activities in education and research. The idea of this workshop was a closer cooperation in educating experts in art and building restoration. As a result they will intensify their cooperation with the aim of a curriculum for a master study “Restoration of Art and Architecture” (working title), funded by Erasmus+ Capacity Building for Higher Education, which was initiated by Ulrike Herbig and Patricia Engel and will be handed in under the lead of TU Wien.



Figure 5: Participants of the workshop “One Week for Restoration Education”, Universitas Gadjah Mada.

### Cooperation Danube University Krems and Affandi Museum

In the last week in Yogyakarta Wolfgang Stumpf, Cilla Venetsia Sapto and a museum coworker bespoke the results of climate monitoring and the questionnaire with students from UGM. After an introduction to the functions and graphs of the monitoring app Cilla Venetsia Sapto and her team can take care of the ongoing monitoring and react on the information they get. On the base of the monitoring Wolfgang Stumpf and Cilla Venetsia Sapto will exchange information and ideas to keep the indoor climate in a range that is comfortable for the art and visitors. There is an agreement from Danube University Krems, Universitas Gadjah Mada and Affandi Museum to work on a restoration concept for the roof construction in Gallery 1.



temperature	3,8	high
humidity	3,8	high
airflow	1,1	very low
noise	2,8	okay
shadow	2,3	low
visual quality	3,0	okay
atmosphere	3,0	okay
What would you like to do here? (number of answers)		
6 enjoy	0 read	3 talk
		1 drink
		0 eat
What makes this place special? Adanya panggung, penggunaan kain, skylight. Penataan sesuai dengan alur karir Affandi. Room layout. Roof structure. Light condition for art. Suasana		
What would you like to improve, add to this place? too hot, airflow, lighting. Penghawaan, cat/warna ruang		

Figure 6: Result of questionnaire for Gallery 1, Affandi Museum.

Copyright figure 1, 2, 3, 4 (right), 6: Wolfgang Stumpf, figure 4 (left) and 5: Universitas Gadjah Mada

The museum management implemented the recommendations from the investigations in the year 2018, linen was added under the roof and the size of the roof windows was reduced. Now the visitors experience a calmer daylight atmosphere in the Gallery and a better focus to the exhibited paintings. Changing the routine of operating the back windows improved the thermal comfort, but further adjustment was necessary.

## **Results**

- *The climate monitoring system in Gallery 1 and a weather station were installed, all sensors are functioning well. and deliver data for keeping the indoor climate in a proper range. The monitoring data is the base for further research and provides teaching material to the project partners.*
- *Results from climate measurements and thermal comfort analysis were presented, shared and discussed with the museum management and university staff at Affandi Museum. See presentation “Climate for Art and Visitors in Affandi Museum”, 2019 August 20<sup>th</sup>, file “20190820 Stumpf Climate\_for\_Art\_and\_Visitors\_in\_Affandi\_Museum.pdf”*
- *Research results from research projects, climate and thermal comfort measurements and teaching material were presented, shared and discussed in a guest lecture at Universitas Gadjah Mada in 2019 August 26<sup>th</sup>. A workshop “Thermal Comfort & Climate Design Aspects of Affandi Museum” was carried out at Affandi Museum. See poster “Thermal Comfort Criteria in Indonesia and Europe”, file “20190826 UGM Stumpf Thermal\_Comfort poster.jpg”*
- *Publications about the project results are in preparation: “Sommerliche Überhitzung – messen, simulieren, regeln”, 2019 September 28<sup>th</sup> at Thermografie Tagung in Eugendorf, Austria; “NN”, 2019 May 6<sup>th</sup> at Forum Building Science, Donau-Universität Krems; further international scientific conferences in the year 2020.*
- *Consolidation of the network with five Indonesian, two Austrian universities and institutions for art and building heritage with the aim of a defining a common curriculum for a master’s degree “Restoration of Art and Architecture” (working title).*
- *Contacts and ideas for a follow-up project in 2020 with staff exchange between Austria and Indonesia.*



*Archive and Museum - Conservation concept for paintings on canvas and paper, notebooks, drawings, glass plates, photographs, plans and films of the Museum Affandi and the archives of the temple of Borobudur UNESCO Cultural Heritage site listed as an UNESCO Memory of the World in 2017 as a joint training with building up the department of conservation-restoration in ISI, Yogyakarta*

### **Project leader:**

*Patricia Engel*

*Magisterium, doctorate and habilitation in conservation-restoration of works of art and cultural heritage*

*Donau-Universität Krems, Zentrum für Kulturgüterschutz, Department für Bauen und Umwelt, European Research Centre for Book and Paper Conservation-Restoration, Dr. Karl Dorrekstr. 30, 3500 Krems, Austria [patricia.engel@donau-uni.ac.at](mailto:patricia.engel@donau-uni.ac.at)*

*P. Engel holds a magisterium, a doctorate degree and a habilitation degree in conservation-restoration of works of art and cultural heritage. She is recently heading the European Research Centre for Book and Paper Conservation-Restoration at ZKGS at DBU at DUK. Before she established and headed a chair for conservation at HAWK Hildesheim, Germany, worked at the Prussian State Library and the Austrian National Library. In parallel, P. Engel works as a free-lance conservator since 1984 in various countries including Germany, Switzerland and Austria. P. Engel handed in successfully research projects (EU, Getty, FFG, FWF etc.) one of them ended with a patent. She won several awards amongst them the Liese Prokop award for her work as a researcher in the field of conservation. More information and a list of per publications at <http://www.restauratorenohnegrenzen.eu/erc/>*

### **Report:**

*Since 2016 we now follow a strict line of development and comprehensive logical sequence. All activities had been executed in close cooperation between University for Continuing Education Krems (Donau-Universität) and TU Wien as well as Universitas Gadjah Mada (UGM) and, since 2017 also Institut Seni Indonesia, Yogyakarta (ISI).*

*Main objective of the projects in the beginning of that time was to work on preservation techniques in combining European expertise with local approaches in dealing with the hot and humid climate in conservation and natural hazards.*

*Preliminary projects in cooperation with the Museum Affandi focused on experimental case studies on preservation techniques, building physics and on the reintroduction of traditional methods for insect and mould protection.*

*Working and discussing with researchers, artists and managers at universities and museums showed that there is an urgent need for a training centre at university level for conservator-restorers in which not only the climatic conditions and the traditions of the region are given special consideration, but a generation of well trained conservators is developed.*

*Representatives of ISI Yogyakarta expressed their will to implement such a department at ISI Yogyakarta, representatives of UGM expressed their will to support this new department with expertise in chemistry, wood*

engineering etc., representatives of the Borobudur Conservation Center (Balai Konservasi Borobudur-BKB) expressed their interest in collaborating.

The archive of the Centre needs an urgent conservation-restoration concept which can be a perfect case study for the development of curricula at different universities to work on integrative measures.

The currently proposed steps,

- - presenting the state of the art of conservation -restoration and preservation of archival material, library material and paintings on paper in Europe
- adapting and customizing by the professors of the universities in Indonesia
- creating best practice examples for the time being which are designed in such a way as to allow Indonesian scholars to adopt and apply the methods later and develop new methods themselves where needed.

Were met by:

Sunday, 15 December 2019	8:00	Bedhot Homestay	Visiting program at Wayang Beber Gelaran, Wonosari Participants: 6 people & crew of Visual Communication Design Study Program
Monday, 16 December 2019	9:30	VIP Room Rectorate Building 2nd floor	Formal Meeting with the Rector, Vice Rector for Academic Affairs, and Dean of Visual Arts Faculty
	13:00	Meeting Room Rectorate Building 3rd floor	First discussion with Dr. Patricia Participants: Team of Conservation (3 teaching staffs)
Thursday, 17 December 2019	8:00	Meeting point: Rectorate Building	Visiting program at Balai Konservasi Borobudur
Wednesday, 18 December 2019	9:00	Rectorate Building 3rd floor	Group Discussion with Dr. Patricia Participants: 10 teaching staffs
	14:00	Forestry Faculty, UGM	Meeting with Prof. Dr. Sri Nugroho Marsoem
Thursday, 19 December 2019	9:00	TBD	A Lecture by Ibu Kartika Affandi and Dr. Patricia Engel
	13:00	Meeting Room Rectorate Building 3rd floor	Group Discussion with Dr. Patricia
Friday, 20 December 2019	9:30	Faculty of Mathematics and Natural Sciences, UGM	Meeting with Prof. Dr. Harno Dwi Pranowo
	13:00	Faculty of Cultural Sciences, UGM	Meeting with Dr. Mahirta
Saturday, 21 December 2019			
Sunday, 22 December 2019	7:00	Meeting point: Bedhot Homestay	Visiting program at Wayang Beber Pacitan, Participants: 6 people

As I just returned there are no publications available so far.

**KULIAH UMUM TERBUKA**

UNIVERSITAS GADJAH MADA  
FAKULTAS KEHUTANAN  
MAGISTER ILMU KEHUTANAN

**Fibre Analysis as Aspect of Understanding the Work of Cultural Heritage in the Framework of Conservation.**

**PEMBICARA :**  
**habib. Mag. Dr. Patricia Engel**  
Center for the Protection of Cultural Property  
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Donaus-Universität Krems  
Dr. Karl-Donnik-Strasse 30  
3500 Krems  
Austria

18 DESEMBER 2019

14.00 - 15.00 WIB

RUANG SIDANG PASCASARJANA  
GADJAH MADA

Pembicara:  
1. Mahasiswaa Sarjana (S1)  
2. Mahasiswaa Magister (S2)  
3. Mahasiswaa Doktor (S3)

Pendaftaran:  
QR Code

**KULIAH UMUM TERBUKA**

**Introduction of European Approach towards Conservation of Cultural Heritage**

**Pembicara:**  
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KAMIS  
19 Desember 2019

PUKUL  
13.00 - 14.00 WIB

R. Auvis It. 1  
Gedung Sastra Mural FSR  
Institut Sastra Indonesia Yogyakarta

PENDAFTARAN  
https://fbgwpt.com/spotlight



*Rector of ISI Yoggakarta welcomes P. Engel and discusses the new curriculum with her*



*At the forest department of UGM Prof. Dr. Sri Nugroho Marsuem at UGM (left)*



*At Chemistry department of UGM*

*The results is first and foremost a curriculum for conservation-restoration of works of art (tangible movable cultural heritage) at ISI Yogyakarta. This is legally already established and the title protected. During the stay the curriculum was finalized and will be opened in 2020 for students. In parallel the profession will be protected so that the high quality of conservation measures will be guaranteed from now on in Indonesia.*

*In Feb. 2020 4 scholars from ISI Yogyakarta will come to Krems. There they will primarily focus on learning what a documentation in conservation is.*

*In parallel Prof. Pranowo from UGM will come to Austria in February. P. Engel organized a meeting with Prof. Dr. Schreiner, Akademie der Bildenden Künste Wien, so that Prof. Dr. Pranowo can see how analysis in CH is done in Austria.*



*Family of puppet player Pacetang*



*Puppet player family Wonosari*

*Credits of all photos: P. Engel / Danube-University Krems*



## ***Universiti Kebangsaan Malaysia – Danube University of Krems Higher Education Institutions Meet***

### **CV:**

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### **Introduction:**

The meet is funded by ASEA Uninet, a network of universities with the goal of promoting the continuous internationalization of education and research. The area for academic cooperation in this meet is “Internationalization of Higher Education: A Comparison Between ASEAN and Europe: A Case Study of Malaysia and Austria Higher Learning Institutions”, looking into various aspects of internationalization such as student mobility, internationalization at home, intercultural competencies, quality assurance and potential research work under the ASEA Uninet grant and ERASMUS + for the specific topic on internationalization.

### **Objective:**

The objectives of the meeting are as follows:

- a. To find out the international outlook held by Austrian higher education institution in internationalization
- b. To identify critical areas of concern and segments involved in internationalization
- c. To obtain recommendations based on the results obtained and provide solutions to enhance internationalization in Malaysia

### **Partners Met:**

The host university to assist in the work done is Danube University of Krems in Krems. The professor who is hosting is Associate Professor Dr. Attila Pausits, who is the Director of the Centre For Educational Management and Higher Education Development. During the three weeks spent at DUK, meetings between the respective parties have been organised, in which the persons met are:

1. Associate Professor Dr Attila Pausits, Director of the Centre For Educational Management and Higher Education Development – Danube University of Krems
2. Ms Brigitte Hahn, Head of Service Centre for Quality Management and Teaching Enhancement - Danube University of Krems
3. Ms Ana-Maria Simionovici, Head of Service Centre for International Relations - Danube University of Krems
4. Ms Sabina Erti, Head of Office for Research Services and International Affairs – Danube University of Krems

5. Mr Stephan De Pasqualin & Mr Gottfried Bacher, Austrian Federal Ministry of Education, Science and Research
6. Ms Marlene Koebrunner, Austrian Federal Ministry of Education, Science and Research
7. Rector Friedrich Faulhammer, Rectorate Danube University of Krems

I have also attended a workshop SQELT (Sustainable Quality Enhancement in Higher Education Learning and Teaching) International Evaluation Workshop: Performance Indicators of Higher Education Learning and Teaching in Context: Governance, Quality Management, Learning Theories and Policy. It's a two-day workshop conducted at DUK with the aims to:

- Disseminate and self evaluate intermediate results of SQELT project
- Seek critical advice and evaluation on SQELT
- Gather input from participants critical reflection
- Embed the theme of performance data management and performance indicators into current debates and perspectives on HEI governance and funding and HE politics
- Prepare SQELT project partners for final project phase.

## Meetings and Outcomes

### 17<sup>th</sup> June 2019:

Met AP Dr Attila Pausits and Ms Barbara at DUK. Initial discussion on the plans for the three weeks ahead was discussed and preliminary discussion on the internationalization of HEI in Austria and Malaysia, also regarding higher education management in Austria. Topics on indicators, the concept of “trust”, UNIDATA were also discussed.

**Outcome of the meeting:** Further understanding of the Austrian HE Internationalization landscape and also work conducted in terms of enhancing the management skills of the support staff in promoting internationalization. Several books were given for references and also for writing purposes.

1. Measuring success in the internationalization of higher education EAIE Occasional Paper 22. Editor Hans de Wit. EAIE
2. The European Higher Education Area in 2018. Bologna Process Implementation Report. Publications Office of the European Union.
3. Internationalization of Higher Education: Growing Expectations, fundamental values. IAU 4<sup>th</sup> Global Survey. Eva Egron Polak and Ross Hudson. IAU
4. Higher Education Management and Development Compendium for Managers. Jeroen Huisman & Attila Pausits (eds). Waxmann
5. Internationalization in Higher Education. European responses to the global perspectives. Barbara M. Kehm & Hans de Wit (eds). EAIE.
6. Institutional Research and Planning in Higher Education. Global Contexts and Themes. Karen L. Webber & Angel J. Calderon (eds). Routledge
7. Internationalisation and Quality Assurance. Adinda van Gaalen (eds) EAIE.
8. Positioning Higher Education Institutions. From Here to There. Rosalind M.O. Pritchard, Attila Pausits & James Williams (eds). Sense Publishers.
9. Critical Perspectives on The Internationalising Curriculum in Disciplines: Reflective Narrative Accounts from Business, Education and Health. Wendy Green and Craig Whitsed (eds) Sense Publishers.
10. Internationalizing the Curriculum. Betty Leask. Routledge.
11. Developing the Global Student. Higher Education in An Era of Globalisation. David Killick. Routledge.
12. The Development of Higher Education Research in Europe. 25 Years of CHER. Barbara M. Kehm & Christine Musselin (eds) Sense Publishers.
13. Governing Cross-Border Higher Education. Christopher Ziguras and Grant McBurnie. Routledge

14. Learning Analytics Explained. Niall Scalater. Routledge.
15. Building Capacity in Institutional Research and Decision Support in Higher Education. Karen L. Webber (eds) Springer.
16. Outsourcing Student Success. The History of Institutional Research and the Future of Higher Education. Joseph H. Wycoff. Historia Research Press.

Pictures of the room given:

#### **19<sup>th</sup> June 2019:**

Meeting was conducted with Ms Brigitte Hahn, the Head in charge of Office For Quality Management and Teaching Enhancement. She has provided details on how the evaluation of the professors by the students in order to ensure the quality in teaching and learning. In addition she had also shared some information on the aspects of data management, which is very useful for higher education management perspectives. The good practice conducted in Krems for having the Wiki for all the important documents is essential and can be used as an example to enhance the management of higher education system in Malaysia. In addition she has also provide some important links on the learning strategy and quality management. The links are as follows:

<https://www.donau-uni.ac.at/en/university/about/quality-management.html>

<https://www.donau-uni.ac.at/en/studies/study-organisation/admission.html>

<https://www.donau-uni.ac.at/en/university/about/pedagogical-approach.html>

<https://www.donau-uni.ac.at/en/university/about/lifelong-learning-strategy.html>

**Outcome of the meeting:** There's a good lesson learn or an example that can be taken home to my home institution in which the use of a WIKI to centralise all the documents of each division or schools or institutes in the university. The documents are all kept in a wiki and for each document the reason why the document is there, why is it important, the use of the document, how to use it and how to keep the documents are all well informed. This is a good practice that allows everyone to look at the documents and understand the need why such document is required. In addition as it is all centralized and the access is via the local network, search for documents are made easy without having to go to each different division website to access the documents.

#### **25<sup>th</sup> June 2019**

Meeting was conducted with Ms Ana Maria Simionovici to discuss on the internationalization matters such as internationalization strategy, activities, procedures conducted by the Service Centre for International Relations at DUK. The centre is in charge of mobility, gathering data involving internationalization, plans of actions for promoting internationalization in the DUK campus. It has only been established this year, as DUK has become the public university. Challenges are there as DUK is a continuing education university in which most of the students are adult or matured students who wished to pursue their studies after they have work for a number of years. As the office is still very new, it is in its early stage where a lot of data gathering and formalizing the internationalization in the campus.

**Outcome of the meeting:** Based on the discussion, ideas and strategic planning of UKM has been shared with DUK. This is to assist Ms Ana Maria in establishing the internationalization strategic plan of DUK.

#### **26<sup>th</sup> June 2019**

Meeting was conducted with Ms Sebina Erti. The discussion was on the potential collaboration in terms of research on internationalization between DUK and UKM. The discussion is specific to future research

collaboration especially for ERASMUS and ASEA Uninet research grant. The proposed research work will focus on assessment tools to measure internationalization especially for continuing education or to those who are using electronic learning or digital platform, this is to reduce physical mobility, to promote more on internationalization at home. Another research work proposed is on the higher education management and development, in which DUK has the experts for it.

**Outcome of the meeting:** Based on the discussion with Ms Sebina, a 1-2 page proposal from UKM is required, why such projects proposed is very important, it is also necessary to provide 3 partners from Malaysia and the duration of the project is for 3 years, the pros and cons of the proposal and who is to become the coordinator. It is also required to get the ministry involved. All short proposal and details required are to be submitted by end of August 2019.

It is also learned that DUK has a very good support system when relating to writing research proposal to ensure that all academics re involved and able to get the research grant. There is a pool of in house competence centre who are trained to write good proposals for EU projects and this helps DUK to get a lot of international projects with the partners.

### **27<sup>th</sup> June 2019**

Three meetings were conducted at two places, which are the Austrian Federal Ministry of Education, Science and Research and OEAD Regional Office in Vienna. The first meet was at the ministry and met Mr Stephan De Pasqualin & Mr Gottfried Bacher, followed by the meet with Ms Marlene Koebrunner and the last one with Ms Elisabeth Gion OEAD.

The first meet with both, Mr Stephan De Pasqualin & Mr Gottfried Bach was heavily on the discussion of the internationalization in Austria. The questions given were as follows:

1. Does the ministry has a strategic plan or blue print for internationalisation of higher education in Austria
2. What is the number of international students in Austria and the countries that they come from?
3. The number of students exchange in Austria for higher education institution (inbound and outbound)
4. Which region in Austria has the most number of international students? (Vienna, Lintz, Salzburg, Graz or?)
5. The way forward for internationalisation in Austria
6. What is the task of the ministry in terms of promoting internationalization? Are there funds that are allocated by the ministry to promote internationalization?
7. What are the challenges faced in promoting and executing internationalisation in Austria?
8. Austria best practices in terms of internationalization
9. If the ministry can do it differently compared to now, how will you do it in promoting internationalization?

Therefore the topic of discussion revolves around the questions ask and information on ASEAN and Malaysian practices and numbers were also exchanged. Most of the questions are also available in the EHEA implementation report given. One of the good practice discovered which is used by EU is that they have the HE Mobility Strategy for 2016 – 2020. In addition they have also provided the details to access the data for international mobility, which is via [www.unidata.com](http://www.unidata.com).

During the discussion it is informed that the target percentage for EU students to go abroad is 30% and they have achieved 23% so far. More recent topics of internationalization covered by EU for now is on internationalization at home and internationalization of the curriculum. They have also provided details on the Eurydice website that provides the policies of education in Austria and other countries in Europe.

The second meeting with Ms Marlene is on topics of ASEA Uninet and other funding availability for researchers and also post graduate students. It is discovered that Thailand is the most active in ASEA Uninet followed by Vietnam and Indonesia. There is also another funding body that promotes the collaboration between Austria and East Asia, which is EURASIA-Pacific Uninet.

The third meeting is at OEAD to meet Ms Elisabeth Gion to settle the details of reimbursement of the research expenses.

**Outcome of the meeting:** The outcome of the meeting is the understanding of the Austria internationalization landscape. There are some similarities on the issues faced and the setting of internationalization in both countries. However Austria with the support of EU has far more good practices and documents that provides the information and the data for internationalization. Opportunities to collaborate with the other Austrian universities are also made available via ASEA Uninet. The document given has also helped in providing information on the Higher Education Mobility and the measures taken to improve the quality of mobility in the HEI in Austria.

### **1<sup>st</sup> & 2<sup>nd</sup> July 2019**

The two days are filled with the workshop session on the SQELT International Evaluation Workshop. The attendance for the workshop comes from the partners across Europe namely from Italy, Poland, Germany, UK and Belgium. The workshop conducted has three keynotes speech, which is presented by:

1. Prof. Dr. Claudia Sarrico from the CIPES Centre for Research in HE Policies, Porto, Portugal & OECD, Paris France.
2. Prof. Dr Theodor Leiber from Evalag Mannheim, Germany
3. Prof. Dr Maarja Beerkens from the Institute of Public Administration, Leiden University, The Hague, The Netherlands.

The workshop also includes presentation of SQELT project methodology and selected results, and two workshops on learning analytics and performance indicators in performance data management and the implications for institutional strategy. It ended with the evaluation panel of various stakeholders and plenum.

**The Outcome of The Workshop:** The workshop had provided opportunities for me to get to know other participants from other universities who are involved very much on the performance indicators in ensuring the quality of their university. Most of them comes from the Quality division as the workshop is very much related to their work and also the project that they are in which is the SQELT project. The take home lessons are on the performance indicators and the process of quality management and the latest work on performance indicators in Europe. It is also interesting to look at how performance indicators are mapped using the theories of teaching and learning and how the concept of big data is being used to analyse the performance indicators. Another aspect that is currently being researched and looked into in the performance indicators is on the social media data and how it helps to discover problems. The solution of the problems will certainly assist the university to achieve its indicators.

### **4<sup>th</sup> July 2019**

The meet conducted is between Rector Prof. Fiedrich Faulhammer and AP Dr Attila Pausits. The meet is to provide the Rector the experience of the work conducted at DUK and the possible future collaboration will be. Prof Faulhammer has also give some insights of what DUK is currently doing in terms of internationalization and the division in charge for mobility in Austria.

**The Outcome of The Meeting:** The outcome is to ensure that there will be further work and collaboration between DUK and UKM via the proposed project and work in line with ASEA Uninet aspiration. Further work reported to Prof Faulhammer is on AP Dr Attila's future visit to Malaysia and also two-research grant proposal, alongside with an article write-up for the work being done during this exercise.

## Conclusion

In conclusion, the meetings were successful as it helps me to know the Austrian set up in the Internationalization of Higher Education. The books, documents, reports received and meetings conducted had assisted me to further understand the internationalization way forward in Austria. There are some similarities and a lot of good practices that can be use to further enhance the management of HE in UKM and Malaysia. In addition based on the meeting there is the new knowledge that I believe should be looked into for the enhancement of Internationalization. The new knowledge is on the assessment tool for internationalization. The tool needs to be comprehensive and do not only look into physical movement of the students or academics but also look into internationalization at home that is established via the digital tools. This is one of the matters learned that will be brought forward for further research work and research grant application. I am also able to understand the structure and management of higher education system in Austria and some outputs involving the student mobility in Austria. The discussions were fruitful as a lot of examples and documents were given which will be used for future research grant application.

The second visit has further enhanced my knowledge on the internationalization in Austria, as the first visit last year to Vienna had introduced me to the respective people involved in the internationalization and the second visit to Krems had allowed me to get better insights and more information on the internationalization of HEI in Austria.

The main outcomes of the research attachment are as follows:

1. The draft of the application form Research Visit (Outgoing) SP 24 for AP Dr Attila to come to Malaysia in 2020 for initial work for the research proposed.
2. The initial proposal for research on Managing, administering, and developing higher education: Comparing practices in training and professional development of higher education professionals between Malaysia and Austria. It is targeted that the proposal is submitted to ASEA Uninet in October 2019.
3. The initial proposal for research on assessing outcomes in internationalisation at home: Developing a tool for measurement. It is targeted that the proposal is submitted for ERASMUS research grant in End of September 2019 for the 2020 cycle of ERASMUS application.
4. Article write up to be submitted for journal publication “A comparative study on Internationalization of Higher Education in Malaysia and Austria: Case Study of Student’s Mobility.”

## Pictures



*Meeting with Ms Ana Maria and the team from Service Centre International Relations*  
© UKM / Yazrina Yahya



*Kolping Haus : Accommodation*  
© UKM / Yazrina Yahya



*With Ms Brigitte Hahn, Office For Quality Management and Teaching Enhancement*  
© UKM / Yazrina Yahya



*With Ms SEbina Ert, Office for Research Services and International Affairs  
© UKM / Yazrina Yahya*



*With Mr Stephan De Pasqualin & Mr Gottfried Bach, Austrian Federal Ministry of Education, Science and Research, © UKM / Yazrina Yahya*



*Office at the Danube University Krems  
© UKM / Yazrina Yahya*



*Meet With AP Dr Attila Pausits  
© UKM / Yazrina Yahya*



*Cultural visit to the Monastery  
© UKM / Yazrina Yahya*



*First day of arrival at Kolping Haus, Krems, © UKM / Y. Yahya*



*SQELT Workshop  
© UKM / Yazrina Yahya*



*At the workshop  
© UKM / Yazrina Yahya*



*Meet with Prof Friedrich Faulhammer, Rector of DUK, © UKM / Yazrina Yahya*

## **CLINICAL ELECTIVE EXCHANGE PROGRAM: REPORT 2019**

Between 2<sup>nd</sup> and 27<sup>th</sup> September 2019, three JKU students participated in the clinical elective exchange program. Two students were hosted by the King Chulalongkorn Memorial Hospital, Department of Anesthesiology (Bangkok) and one student did the elective at the Department of Medicine, Public Health & Nursing of the Universitas Gadjah Mada in Yogyakarta.

All three students enjoyed their stay and are grateful for the opportunity to learn about the culture, the country and the health system of Thailand and Indonesia respectively.

## ***Natural Language Processing for Information Extraction over the Web***

### ***Involved Researchers***

**Ismail Khalil** is the deputy head of the institute of telecooperation, Johannes Kepler University Linz, Austria, since October 2002 and Adjunct Full Professor at Faculty of Science and Technology (FST), Syarif Hidayatullah State University Jakarta, Indonesia. He holds a PhD in computer engineering and received his habilitation degree in applied computer science in May 2008.

**Gabriele Anderst-Kotsis** is university professor of Computer Science at JKU Linz. She heads the Department of Telecooperation since 2002, and was Vice Rector for Research from 2007-2015. She holds the Heinz-Zemanek- Award for outstanding scientific publications in Computer Science (1996) and has been recognized as ACM Distinguished Scientist in 2014.

**Ngurah Agus Sanjaya ER** is an Assistant Professor in Informatics Department at Udayana University. His research mainly focuses on automatic extraction of information from semi or unstructured data. He finished his PhD from Télécom Paristech, Paris - France, in which he defended his Doctorate thesis entitled "Advanced Information Extraction by Example" under the supervision of Prof. Talel Abdesslem (Télécom Paristech, France) and Associate Professor Stéphane Bressan (National University of Singapore, Singapore).

### ***Project Description***

The aim of the research is to extend the set expansion approach to the general case of composite seeds and n-ary relations, namely set of tuples expansion (STEP) [1]. Given <Indonesia, Jakarta, IDR, Indonesian Rupiah>, <France, Paris, EUR, Euro>, a system implementing our approach returns relations containing countries with their corresponding capital city, currency code, and currency name. Our approach consists of four steps, i.e. crawling, wrapper generation, candidate extraction, and ranking. To collect web pages, we rely on the Google search engine where the query is the concatenation of the sets of examples.

### ***Papers***

1. Jifang Xing, Ruixi Zhang, Remmy A. M. Zen, Ngurah Agus Sanjaya Er, Laure Sioné, Ismail Khalil, Stéphane Bressan: Microbiological Water Quality Test Results Extraction from Mobile Photographs. iiWAS 2019: 492-501
2. Jifang Xing, Ruixi Zhang, Remmy A. M. Zen, Dewa Made Sri Arsa, Ismail Khalil, Stéphane Bressan: Building Extraction from Google Earth Images. iiWAS 2019: 502-511

***ASEA Uninet Interdisciplinary Faculty Development  
Workshop***

***Integrated Spatial Management with GIScience  
(IntegratedGIS)***

***23rd to 27th September, 2019***

***Project Coordinators:***

***Prof. Josef Strobl***

***Head of Department***

***Interfaculty Department of Geoinformatics - Z\_GIS***

***University of Salzburg***

***Austria***

***Dr. Shahnawaz***

***Interfaculty Department of Geoinformatics - Z\_GIS***

***University of Salzburg***

***Austria***

***Dr. Van Phuc Le***

***Vice Dean, Faculty of Civil Engineering***

***University of Transport and Communications, Ho Chi Minh City Campus***

***Vietnam***

## **SHORT CVs OF THE KEY EXPERTS INVOLVED IN THE PROJECT**

**Professor Dr. Josef Strobl** is Professor at the Interfaculty Department of Geoinformatics - Z\_GIS, University of Salzburg, Austria. He held a number of prestigious leading positions at the university as well as at other institutions and organisations. Currently, he is the head of Z\_GIS as well as the Chair of Commission for GIScience, Austrian Academy of Sciences. His research interests include Geographical Information Science and Systems. Remote Sensing and Image Processing, spatial analysis Internet-based distance education. Active learning in online environments and design of interactive learning materials. Learning with Geoinformation – from spatial awareness to thinking to citizenship.

**Dr. Shahnawaz** is Director of UNIGIS S/E Asia at the Interfaculty Department of Geoinformatics - @capacity building with a number of leading universities in the region. For this purpose, he has implemented about 25 international projects, conducted more than 30 international workshops as well as organised about 20 capacity building sessions in various international conferences providing an opportunity to the young students, teacher and professionals for demonstrating their work, skills and competences.

**Dr. Van Phuc Le** is Vice Dean of Faculty of Civil Engineering at University of Transport and Communications-Campus in Ho Chi Minh City (UTCHCM), Vietnam. He completed his higher studies (i.e. Master's and Doctoral (PhD) degrees) in Civil Engineering from Sejong University, South Korea in 2016. He was a post-doctoral researcher and part-time teacher at the Department of Civil and Environmental Engineering, Sejong University from September 2016 to August 2017. His research interests include overlay design, structural analysis, asphalt pavement material and modelling of asphalt concrete. He has joined about 20 research projects in Korea and 3 research projects in Vietnam.

## **REPORT**

The Interfaculty Department of Geoinformatics - Z\_GIS implemented a week-long Interdisciplinary Faculty Development Workshop on 'Integrated Spatial Management with GIScience (IntegratedGIS)' at the University of Transport and Communications - campus in Ho Chi Minh City (UTCHCM), Vietnam. The workshop was organised jointly by Z\_GIS and UTCHCM from 23<sup>rd</sup> to 27<sup>th</sup> September, 2019. The IntegratedGIS project was co-funded by ASEA Uninet Austria.

The workshop was inaugurated by Dr. Ngo Chau Phuong, Director of Science, Technology and International Cooperation Department of UTCHCM. The opening session also included lectures by Dr. Shahnawaz and selected dignitaries of the UTCHCM presenting institutional profile and sharing valuable information about the education and research activities at various departments of the university.

Dr. Shahnawaz (Z\_GIS) conducted the workshop which included conceptual lectures as well as hands-on sessions. He taught the concepts of Integrated Spatial Management to the participants and trained them in using a range of data sets generated by various satellites and sensors. Having backgrounds in different branches of transport and communication engineering, 14 students and teachers hailing from various parts of Vietnam participated in the workshop. They selected individual areas of applications and explored capabilities of various remote sensing and other data sets. The

hands-on practical tasks were performed with commercial GIS software ArcGIS Desktop. All the participants presented outcomes of their practical work in the concluding seminar.



Dr. Ngo Chau Phuong, Director of Science, Technology and International Cooperation Department, UTCHCM conferred the certificates of successful completion on the participants and congratulated them for having benefitted from this interdisciplinary workshop. He also conveyed his gratitude to Z\_GIS as well as to ASEA Uninet and conveyed the message of the Rector expressing willingness to strengthen and expand the institutional collaboration with Z\_GIS.



The participants of the workshop, © S. Shahnawaz / University of Salzburg

The Coordinating Team acknowledges and highly appreciates various contributions of the following:

- ASEA Uninet, Austria
- Interfaculty Department of Geoinformatics – Z\_GIS, University of Salzburg, Austria
- Faculty of Civil Engineering, University of Transport and Communications-Campus in Ho Chi Minh City (UTCHCM), Vietnam
- The participating students and faculty members
- The details of the participants are attached with this report.

----- XXXXX ----- XXXXX ----- XXXXX -----

## **Urban Ecosystem Services and Socioeconomic Context**

### **Main partners involved:**

#### **JANMAIMOOL PIYAPONG, Ph.D.**

**Instructor**, Environmental Social Sciences Program

Department of Social Science and Humanity, School of Liberal Arts;

King Mongkut's University of Technology Thonburi, Bangkok, Thailand, **Assistant Dean** for Research, School of Liberal Arts

**Educational Background:** Doctor of Philosophy in Environmental Systems Engineering (Environmental Policy and Management), Graduate School of Engineering, Kochi University of Technology, Japan, 2011 – 2014

Master of Arts in Policy Science (Sustainable Development Policy and Planning: SDPP) Graduate School of Policy Science, Ritsumeikan University, Japan, 2008-2010

**Research Focus:** Urban Environmental Planning and Management, Regional Sustainable Development

#### **NYDA CHHINH, Ph.D.**

**Lecturer** Royal University of Phnom Penh, Faculty of Development Studies, Phnom Penh, Cambodia and **Division Chief** Ministry of Education Youth and Sport, Education Research Council (ERC);  
chhinhnyda@gmail.com

**Educational Background:** Doctor of Philosophy, School of Environment, Flinders University, Australia; Graduate Certificate in Environmental Management and Development, (CRICOS Code 013520B), Crawford School of Economics and Government, Australian National University, Australia, Master of Environmental Management, School of Geography, Population and Environmental Management, Flinders University, Australia, Diploma of Mining and Industry, Institute of Technology of Cambodia, Cambodia

**Research Focus:** Sustainable Development, climate change adaptation

### **1. Teaching of the Educational Module Urban Ecosystem Services and Socioeconomic Context**

The overall objectives of this course were to:

- Join efforts in order to enhance higher education on urban environmental management and planning by identifying future and practice-oriented aspects of teaching and exploring possibilities of standardizing courses and credit schemes;
- To enhance and prepare for joint educational activities, collaborative curricula, lecturer and student exchange;

- *To improve and consolidate the existing academic network between Asian and European higher education institutions.*

*The specific objectives of the particular activities (short courses) proposed are to:*

- *Develop an understanding of the city as complex urban ecosystem and exchange according experiences from Asian and European perspective, incorporating interdisciplinary aspects represented by the involved partners;*
- *To exchange innovative and integrated approaches for urban ecosystem management applicable to practical needs – both of relevance to Asia and Europe.*

*King Mongkut's University of Technology Thonburi was the lead partner, supported by Chulalongkorn and Kasetsart University.*

*The Educational Module was covering the following aspects:*

*This Educational Module included presentations and discussions about following aspects:*

- *Urban ecosystem services in socioeconomic context*
- *Urban agriculture (structure, resource consumption / resource flows, land-use);*
- *Urban gardening, evaluation of urban planning strategies;*
- *Ecological aspects of urban planning (innovative, applied approaches to enable a sustainable urban environmental development and management enable sustainable communities)*

*The Educational Module was oriented to develop opportunities available for improving efficiency in urban environments, reduce resource inputs, and reduce waste outputs with the main goal being to improve livability and quality of life for city dwellers. A theme-related 'Planning Site Visit' in Bangkok allowed practical experiences.*

*The Educational Module was organized as a two-days-event jointly supported by the Asian and Austrian colleagues, including a one day field study. The targeted participants were graduate students of different universities in Bangkok.*

*The course helped to develop the participants' teaching perspective about urban ecosystem trends and the challenges of efficient and sustainable management. Also the didactical perspective of understanding of the urban ecosystem as a complex ecosystem was developed. The introduction of innovative urban management and planning approaches from both regions (Europe and Asia), including among others sustainable planning and development principles, encouraged students to engage in further study in the respective field.*

*In particular the field study provided participants with an opportunity to reflect and analyses the ecological aspects of the intense urban development processes ongoing in Bangkok. Resulting effects on the urban environment as well as management approaches (relevant and applicable European and Asian approaches) was explained and discussed.*

*In conjunction with the intended Educational Module, the partner universities intend to deepen the dialogue regarding the further possibilities of academic collaboration, such as:*

- *The establishment of regular student exchange and joint course programs;*
- *The possibility of reciprocal recognition of credits;*
- *The implementation possibilities of a joint curriculum, as well as*
- *The preparation of joint research activities emphasizing of key aspects of urban environmental planning and management.*

Course subjects:

1. *Contemporary urban agriculture development – comparisons world wide (e. g. Europe and Asia)*
2. *Cities as ecosystems (introduction to elements and processes)*
3. *Ecosystem services, dynamics, modeling, impacts and disturbances (focus on human impact and interaction of social, economic, environmental factors in general, including details on problems / disturbances and pollution issues)*
4. *Urban agriculture and gardening and nature as focal element of urban ecosystems*
5. *Planning, policy making and management practices for Urban Agriculture*

Course description:

- *Understanding and application of the concept of urban ecosystems;*
- *Tools, instruments, approaches and practices of urban ecosystem risk management.*

*The course consisted of lectures, seminars, practical cooperative work in a group and a field exercise in Bangkok and planned in Thonburi.*



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## **2. *Project development: Assessing Values of Green Open Spaces in University Campuses in Supporting Students' Well-being and Enhancing Attitude towards the Nature***

*This project was designed during the stay of Dr. Janmaimol 2019 in Salzburg. The partners decided to final develop the subject to a research project proposal to submit it for external funding.*

*The content of the project in development is:*

*The use of green spaces by university students potentially contribute to enhancement of health and well-being, promotion of social relations, and motivation to learn about the nature. However, many green spaces in Thai university campuses have not been used efficiently. This study aims to investigate characteristics of green space use in university campuses, and to identify factors affecting students' behaviors regarding the use of green spaces. Numerous factors have been assumed to have a significant influence on students' motivation to use green spaces. Those are such as a feeling of fear about the danger associated with the nature, characteristics of green space (size and components), quality (dirt or cleanness) of green spaces, attractiveness (amenity) of green spaces, provided infrastructure, atmospheric characteristics in the green spaces, and socio-demographic characteristics of students. Observational surveys for indicating characteristics of green space use will*

be conducted in university campuses' green spaces. In-depth interviews and content analysis will be conducted to gain deeper understanding on what factors greatly shape the ways students use green spaces. In addition, questionnaire surveys will be conducted and statistical tests will be performed in order to provide concrete empirical evidence showing significant factors affecting students' motivation to use green spaces. The results of this study could provide implication for the development of strategies for supporting the use of green spaces among university students.



KMU Campus Green Structure, © J. Breuste



KMU Learning Garden, © J. Breuste

### 3. Development of a research project on “Sustainable Urban and Regional Development – Urban and peri-urban Agriculture”

Dr. Nyda plans to apply for Ernst-Mach-Study Program for a at least six month stay in Salzburg. Prof. Obenaus had 2019 an intensive talk with Dr. Nyda. It is intended that Dr. Nyda applies for Ernst-Mach-Study Program 2020 until 13 April 2020 to start the research stay in October 2020 in Salzburg. The subject will be “Sustainable Urban and Regional Development Urban and peri-urban Agriculture”.

The stay in Royal University of Phnom Penh; Faculty of Development Studies, Phnom Penh, Cambodia was used for deeper discussion on the subject, including colleagues interested in the subject and to get an impression of the abilities of the candidate and the focus in research and education of the institute. A short field survey of some days was added to see possible research sites in neighboring provinces representing different development status form very developed (Siem Reap, Sianoukville) to marginalized provinces in the northeast, Ratanakiri.



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## **Project ASEA 2019/AAU/1 – Travel to Indonesia July and August 2019**

### Project leader:

Dr. Dieter Bögenhold is a university professor who obtained his academic degrees (Diploma 1979, Ph.D. 1984, habilitation 1993) at Bielefeld University, Germany, and he has taught and carried out research at different universities in a variety of countries, currently professor in the Faculty of Economics. He is Head of the Department of Sociology, and Head of different doctoral programs and coleader of the university research cluster on entrepreneurship. His research is in the areas of globalization, interdisciplinary studies, business and society, history of economic thought, economic development, consumption and life-styles, social stratification and inequality. Member of the board of diverse associations and journals. Teaching in faculties of economics, business administration and sociology. He has published more than 200 contributions including numerous books, book editions and papers in refereed journals. His latest book “Unheard Voices” (with Farah Naz) is in press with Palgrave Publishers.

### Report:

The project was proposed and aimed to foster research and cooperation between Alpen-Adria Universität Klagenfurt (AAU) and Bandung Institute of Technology (ITB) and further research institutions.

In order to meet with this proposal Prof. Bögenhold, Department of Sociology, Faculty of Economics & Dr. Parastuty, Department of Innovation Management & Entrepreneurship travelled simultaneously but separately to Indonesia and met their personally only at August 1, 2019, while the other duties and plans were different.

Prof. Bögenhold splitted his journey into two segments, first five days stay at Bandung, then 5 days to Bali to join a conference and to give a further lecture at a different academic institution at Denpasar.

In particular, aim at Bandung was

- to initiate and discuss joint publications with faculty members of SBM ITB,
- to discuss possibilities of joint supervision of PhD and master thesis with faculty members, and
- to meet with people of the Center of Knowledge for Business Competitiveness at ITB
- to evaluate the joint edition of a special issue in a journal or book in the area of management and (social) entrepreneurship.

The aim at the conference at Denpasar (Bali) was to share a paper at a conference and to deliver a speech at a different place, and to do practical networking.

Bögenhold, D.: Digitalization and Gig-Economy. Lessons to Understand, Keynote Lecture at the International Seminar “The War of Digital Industry in the Global Economic Issue”, Comments by Dr. Hary Febriansyah, Indonesian Center of Computer and Information Technology College (STIKI-STIKOM) in Bali, Denpasar, Indonesia, August 8, 2019.

Bögenhold, D.: Digitalization, Creative Destruction and Gig-Economy: New Contours of Self-employment in a Knowledge Economy, Invited Panel Presentation at the Conference “Managing in Business in Digital Disruption Era”, by 4th International Conference on Management in Emerging Markets (ICMEM), and the 11th Indonesia International Conference on Innovation, Entrepreneurship and Small Business (IICIES), Bali, Indonesia, August 7-9, 2019.

Dr. Parastuty visited ITB from 1 to 10 August 2019. During her stay at ITB, she involved in the following activities:

- Discussing research topic with Dr. Nurlaela Arief. A joint publication is on the plan.
- Coaching doctoral and master students on writing scientific publication.
- Being a speaker in the International Graduates Colloquium 2019 (7-8 August 2019).
  - o Session 1: Writing for international publication
  - o Session 2: Academic research coaching

In all, the travel and the stays have met very much earlier expectations and we really hope to be able to continue with these activities. Prof. Bögenhold could meet with several people including the dean and vice-dean of the School of Business and Management at ITB, and experienced a strong interest to arrive at an increased level of cooperation and exchange. The School of Business and Management has just been awarded in a ceremony at Cape Town by a British magazine as best business school in Indonesia.

Prof. Dr. Dieter Bögenhold

### **A collection of photos (taken at Bandung and Denpasar)**





*Credits of all photos: Dieter Bögenhold*



## Ausarbeitung einer Strategie zur Vernetzung verteilter Daten musikethnologischer Sammlungen - Elaboration of a strategy for distributed ethnomusicology data

Alex Hofmann, Ph.D.  
Universität für Musik und darstellende Kunst Wien

In Kooperation mit:  
Prof. Dr. Andreas Rauber  
Technische Universität Wien

Partner in Asien:  
Prof. Joseph Bowmann  
Mahidol University - College of Music

### CVs of involved personel at mdw

#### **Alex Hofmann ([hofmann-alex@mdw.ac.at](mailto:hofmann-alex@mdw.ac.at)):**

Alex Hofmann is a researcher at the Institute of Music Acoustics (Viennese Sound Characteristics) at the University of Music and Performing Arts Vienna. The institute carries out research on acoustics of musical instruments, organology and performance science and holds a data-base with more than 14.000 entries on topics related to organology. His research focus lays on woodwind music performance, instrument acoustics, performance science, and computer music. He also worked as a sound designer (e.g. Native Instruments GmbH, Berlin) and contributed material to the open source software project Csound, where he was one of the initiators of the biannual International Csound Conferences held since 2011.

#### **Ardian Ahmedaja ([ahmedaja@mdw.ac.at](mailto:ahmedaja@mdw.ac.at)):**

Studied composition (with Erich Urbanner) and the theory of music (with Diether de la Motte) at the Hochschule für Musik und darstellende Kunst Vienna. Magister artium in 1995 on the basis of treatises on *Il primo libro di capricci* (1624) by Girolamo Frescobaldi and *Rendering* (1990) by Luciano Berio. Studied European ethnology and musicology at the University of Vienna. PhD in 1999 based on the work *Zur Melodik der albanischen Volkslieder. Eine Typologie der gegischen Lieder* [On the Melody of Albanian Folk Songs. A Typology of Gegë Songs]). Since 1999 researcher at the Institute for Folk Music Research and Ethnomusicology of the University of Music and Performing Arts Vienna. In 2003 initiated the establishment of the Research Centre for European Multipart Music. Research areas up to now have been local practices in Albania and neighbouring countries, maqam, music and minorities, religious and secular musical practice, transcription and analysis, multipart music. Fieldwork in several Balkan and Mediterranean countries, in the European Alpine region and in the USA.

**Hande Saglam ([saglam@mdw.ac.at](mailto:saglam@mdw.ac.at)):**

Hande Saglam got degrees in Composition in Ankara - Bilkent University, Magister in music theory from the University of Music and Performing Arts Vienna (mdw) and received her doctoral degree in Ethnomusicology from the Department of Folk Music Research and Ethnomusicology (IVE), at the same University with the thesis “Differences among Alevi and Sunni Âşiks in Sivas”. Between 2005 and 2017 she has been working at the mdw on different research projects on music and minorities. Since July 2015 she works as head of the institute's archive and deputy director of the IVE at the mdw. Her research interests are Music and minorities, Music from Turkey, Anatolian âşık tradition, bi- and multimusicality, archiving, methodology of fieldwork.

## Introduction

While the South-East Asian musical heritage is particularly rich, it is highly diverse and scattered across multiple countries and regions. The same holds for existing ethnomusicological resources.

Music research involves various kinds of data, ranging from written sources (manuscripts, music sheets, publications, etc) to audio and video recordings in different formats (analogue, digital) with varying additional information (Metadata) about contents and contexts of the performances, the performers, their ideas and viewpoints, musical instruments and the way of their use and so on. Until now, researchers and institutions have developed primarily individual ways to collect and store such data, either digitally or in a card-index cabinet. Data search in such self-contained storages is difficult and searching across multiple storages can be very time consuming. This presents a barrier for conducting contemporary, computer-aided musicological research. For instance, incompatible data structures prevent applying automated data analysis and indexing across music collections to provide new ways to access the data and gain new insights. This includes the use of visualization techniques and state-of-the-art machine learning methods on existing data sets, which may reveal hidden connections between different areas within music research.

## Report of Action

This second research visit to the Mahidol University Bangkok focussed on an exchange of concepts and an in-depth discussion on prototypes for a data infrastructure that would allow future collaborative research. Based on the information gathered in the previous project from 2018 (‘Towards an alliance for distributed ethnomusicology data’), the action included finding open source data systems that would allow all partner institutions to connect their archives. In a public workshop and smaller group exchange meetings, the ethnomusicology and ICT experts from Austria, Thailand, and Malaysia discussed different concepts and challenges in connection with the exchange of research data in ethnomusicology. All gathered information and prepared setups were presented and discussed in the public workshop at the Music Campus for the General Public of the Mahidol University in Bangkok.

In the workshop Dr. Achmedaja (mdw), gave a presentation about the opportunities that lay in such a data alliance. Following his introduction, he led an open discussion on the value of big data-driven research for ethnomusicology researchers and institutions.

Following, a setup for an Opens Source Repository solution was prepared by TU Vienna and presented to the participating institutions. This prototype for an easy-to-setup repository system based on Dataverse and concepts for compatible-meta data exchange were discussed. The discussion was led by Dr. Miksa (TU-Vienna). In the discussion on repository systems, controlled data access turned out to be a crucial point for researchers in the music domain. Whereas meta-data can be shared in most cases, the audio or video recordings can sometimes be subject of copyrights either held by composers, performers or other right holders. Therefore an access management system has been identified to be essential for the system.

**! TU** #4 Enable discovering data and getting access to it

- Data can be accessed directly in the local repository (if open)
- Researchers can request access to closed data

8/23 FACULTY OF INFORMATICS

**! TU** #2 Provide common workspace and facilitate collaboration

	Local							
Manage operations for metadata	✓							
Manage operations for datasets	✓	✓						
Public datasets	✓	✓						
Open datasets	✓	✓						
Open metadata	✓	✓	✓					
Public datasets	✓	✓						
Public dataset drafts	✓	✓						
Open datasets	✓	✓						
Open metadata	✓	✓			✓			
Other uncontrolled metadata	✓	✓					✓	
Other uncontrolled datasets	✓	✓						✓
Uncontrolled files	✓	✓						✓

16/23 FACULTY OF INFORMATICS

Applying Music Information Retrieval technologies to ethnomusicological research content: Subsets of data identified by the participating institutions has been selected to be shared across the network. Extraction of features and learning concepts were tested, results were presented for evaluation and feedback during the workshop. Advantages and challenges of using Music Information Retrieval for the generation of meta-data was discussed, under the lead of Dr. Knees (TU-Vienna).

The exchange sessions and discussions were joined by representatives of the following institutions:

**Indonesia: Ethnomusicology Department Institut Seni Indonesia Yogyakarta: Dr. Citra Aryandari**

Dr. Aryandari presented the data storage at the Department Institut Seni Indonesia Yogyakarta:

- Is confronted with uncurated items of the Jaap Kunst collection
- 6000 Photos
- 40000 Letters and articles
- +500 Musical Instruments
- started publishing Open Data on Youtube, as no Server infrastructure is available at the moment

**Malaysia: Universiti Pendidikan Sultan Idris (UPSI): Dr. Clare Suet Ching Chan**

Dr. Chan is a leading member of the Malaysia National Ethnomusicology research group and presented insights in the current development on data storage across Malaysia.

- National Ethnomusicology Study group in Malaysia is planning on a central data storage for ethnomusicological data
- National project is still in early preparation phase

**Malaysia: Universiti Malaysia Kelantan: Dr. Raja Iskandar Bin Raja Halid**

Dr. Halid is also a member of the Malaysia National Ethnomusicology research group.

**Malaysia: Faculty of Music Silapakorn University: Isabella Pek**

Ms. Pek, a music lecturer who had been teaching at ASWARA Malaysia since 2008. SEAMEX 2018 is supported by the Association of Southeast Asia Directors of Music (SEADOM), an association of institutions in Southeast Asia involved in professional music training.

**Latvia: University of Latvia: Anada Beitane**

Dr. Anda Beitāne is Professor and Vice-Rector for Research and Creative Work at Jāzeps Vītols Latvian Academy of Music and researcher at the Institute of Literature, Folklore and Art at the University of Latvia, Archives of Latvian Folklore.

**Thailand: King Mongkut's University of Technology Thonburi: Sutthiphong Ruangchante, Kachanon Nirunpong**

Mr. Sutthiphong Ruangchante is a researcher and lecturer in the domain of sound studies, affiliated with the College of Multidisciplinary Sciences.

**Mahidol University: Prof. Dr. Boonsit Yimwadsana (ICT), Dr. Krit Buranavitayawut (College of Music)**

- very interested in a further development of the music database and
- would like to find ways to apply for additional funding of the project for infrastructure and personnel.
- offered to help to coordinate such an effort

**Philippines: U.P. Center for Ethnomusicology: Roan Opiso**

- Interested in regular updates on the repository prototype development

**Malaysia: Dr. Pek Lin Chong (private collection)**

- Provided research data (audio+transcriptions) for testing of MIR algorithms

## Future steps

To proceed towards the establishment of a networked research infrastructure for ethnomusicological research three action streams were identified:

1) Repository infrastructure: Based on the prepared Opens Source Repository solutions by TU Wien, institutions were encouraged to contact their IT-services to setup and host own data repositories. These will be populated by each institution with some selected data items to evaluate their fitness for musicological research purposes. Customizations for the GUI Frontend are foreseen to be made before deployment to other institutions.

2) Music IR: Key applications for automatic meta-data extraction from audio content were identified. This involves, automatic segmentation (e.g. speech vs. music), automated instrument detection, pitch detection for solo performances, event detection

3) Policies: adopting policies that establish research data management as a core activity is still an ongoing topic, defining the respective responsibilities and providing the required services. To this end, existing research data management policies as presented during the first workshop (the templates developed by the LEARN project, the specific RDM policy adopted by TU Wien) were brought into the discussions and are shared and discussed at the various institutions, identifying adaptations needed in the local contexts.



2<sup>nd</sup> Workshop on Distributed Ethnomusicology Data and Music Information Retrieval in the Framework of ASEA-Uninet held at the Mahidol University Bangkok, Thailand. (Picture by Tomasz Miksa taken at the Music Campus for the General Public, Mahidol University.)

## Development of the frame for Maintenance and Facility Management Concepts for Museums in Indonesia

### Project Partners:

**Herbig, Ulrike**, DI Dr, TU Wien, Institute for History of Art, Building Archaeology and Restoration.  
[herbig@tuwien.ac.at](mailto:herbig@tuwien.ac.at).

Dr. Ulrike Herbig is Senior Scientists at the Faculty of Architecture and Planning at TU Wien and in charge for the coordination and support of research projects, as well as for international affairs at the faculty. Dr. Herbig studied geodesy and has a research interest in the interdisciplinary recording, documentation and analysis of the built environment.

**Adhisakti, Laretna Trisnantari**, Dr. Eng. Ir., M.Arch., Jurusan Teknik Arsitektur dan Perencanaan Fakultas Teknik Universitas Gadjah Mada (UGM); [laretna@ugm.ac.id](mailto:laretna@ugm.ac.id)

Dr. Adishakti received an engineering degree from Gadjah Mada University in her native Yogyakarta (1982), a master's in architecture from the University of Wisconsin (USA, 1988) and a doctorate in engineering from Japan's Kyoto University (1997). Employed as a lecturer in several disciplines at Gadjah Mada University since 1983, with a focus on heritage conservation. She is engaged in the Indonesian heritage, a member of UNESCO-ICCROM's Asian Academy for Heritage Management and of the International Council on Monuments and Sites.

**DI Wolfgang Stumpf**, Donau-Universität Krems, Department für Bauen und Umwelt; [wolfgang.stumpf@donau-uni.ac.at](mailto:wolfgang.stumpf@donau-uni.ac.at)

- Research associate at Danube University Krems
- Head of the International Summer School "Climate Friendly Buildings - then and now" at the INNES Institute Vienna
- External lecturer at various Austrian universities of applied sciences
- Architectural studies at the Technical University Vienna
- Main research: Buildings, technology and energy for climate-friendly building, building life cycle, building in existing buildings

**Dr. habil Mag. Akad. Rest. Patricia Engel**, Donau-Universität Krems, Department für Bauen und Umwelt, Zentrum für Kulturgüterschutz, European Research Centre for Book and Paper Conservation-Restoration; [patricia.engel@donau-uni.ac.at](mailto:patricia.engel@donau-uni.ac.at)

- Head of the European Research Centre for Book and Paper Conservation-Restoration
- Habilitation in Conservation-Restoration: University of Fine Arts Warsaw, Poland
- Doctorate in Conservation-Restoration: University of Fine Arts Warsaw, Poland
- Magisterium in Conservation-Restoration: University of Fine Arts Vienna, Austria

**M. Eng., Ph.D. Ikaputra**, Universitas Gadjah Mada, Department of Architecture and Planning, Faculty of Engineering; [ikaputra@ugm.ac.id](mailto:ikaputra@ugm.ac.id)

- Dr. Ikaputra studied at the Gadjah Mada University (UGM), Yogyakarta, Indonesia and at the Osaka University, Japan. He works as the program director for architecture at the Faculty for Architecture and Planning at UGM. His research interest are city and environmental planning, cultural heritage and building for disaster.

**Dr. Ir. Jatmika Adi Suryabrata, M.Sc.**, Universitas Gadjah Mada, Department of Architecture and Planning, Faculty of Engineering; [jatmika@ugm.ac.id](mailto:jatmika@ugm.ac.id)

- lecturer for building physics at the Department of Architecture and Planning, Gadjah Mada University, Yogyakarta
- Seminars at professional societies and universities on Green Building Concepts and applications
- Green Consultant at IFC – The World Bank Groups
- Practice in architecture, urban design and lighting design (National and ASEAN awards in Green Buildings and Energy Efficient Buildings and projects certified by Green Building Council Indonesia)
- Post graduate education in architectural science, especially in Building Physics, at University of Sydney, Faculty of Architecture
- Study of bioclimatic designs / passive designs, College of Architecture and Environmental Design, Arizona State University, USA
- Graduated from Gadjah Mada University, Yogyakarta, Department of Architecture and Planning

**Dr. Eng. Agus Hariyadi, ST, M.Sc.**, Universitas Gadjah Mada, Department of Architecture and Planning, Faculty of Engineering; [agus@ugm.ac.id](mailto:agus@ugm.ac.id)

- Expert Assistant (academic staff) at Department of Architecture and Planning, Gadjah Mada University, Yogyakarta
- Doctor, Graduate School of Environmental Engineering, The University of Kitakyushu, Japan
- Master, Architecture, Universitas Gadjah Mada, Indonesia
- Research interests: Environment engineering, Facade design, Thermal and visual comfort in buildings

## Report

Through preliminary projects in cooperation with the Danube University Krems (Dr. Patricia Engel), Universitas Gadjah Mada, the Institute for Building Physics and the Affandi Museum on integrated restorations of art and architecture in Indonesia, the urgent need for training in the field of monument conservation and restoration of art has become apparent.

So far, there are no interdisciplinary approaches for the restoration and / or conservation of cultural heritage or related courses embedded in the curricula of Indonesian universities. Although there are numerous activities in this direction there is no general framework for the education of experts in the conservation of cultural heritage.

The main aim of this particular project is to develop interdisciplinary curricula for the conservation of cultural heritage combining European and Indonesian expertise.

ASEA Uninet projects of TU Wien in collaboration with Danube University Krems focused on the design of a joint project with 5 Indonesian universities to apply for funds to develop curricula that will enable an interdisciplinary and international education in the conservation of cultural heritage. Mutual activities and discussions covered topics from theory and philosophy of conservation, conservation of the built environment on the scales of objects, cities and cultural landscapes, to the restoration and conservation of artwork, the conservation of the immaterial cultural heritage and the interrelation between the different topics.

The work was clustered into 3 parts:

1. In April 2019 activities focused on discussing the framework with potential partners at universities and institutions.
2. In August 2019 a workshop was organized to provide a base to develop the framework of the joint project and to conduct accompanying activities to implement case studies that will be used and continued within the frame of the project.
3. December 2019 and January 2020 were used to compile a proposal to apply at the EU call "Capacity Building in Higher Education" within the framework ERASMUS+.

This report will focus on the activities in August 2019:

Two weeks of preparation in close collaboration with representatives of Universitas Gadjah Mada (UGM) and Institut Seni Indonesia, Yogyakarta (ISI Yogya) included the organisation of the workshop itself but also further research concerning the maintenance of Museum Affandi as well as the studies on the development of traffic in Flores. The last will be summarized in an extra report.

### **Development of the frame for Maintenance and Facility Management Concepts for Museums in Indonesia**

Preliminary work on the Museum Affandi revealed the need for integrated approaches to maintenance and facility management of museums in Indonesia. Based on the data and facts, the framework for the required facility management has already been discussed and prepared in cooperation with the Danube University Krems. This year's visit to Yogyakarta in the context of this specific project focused on management, organizational and administrative issues.

During the stay in Yogyakarta the work concentrated on discussions with representatives of the University of Art, gallery owners and artists who own and manage collections. The topic was dealt with in direct connection with the project on Capacity Building in Higher Education. The sustainable conservation of art as an important part of the cultural heritage requires systematic management. The topic is therefore also important for the development of an interdisciplinary educational concept for the conservation of cultural heritage.

Discussions concerning the maintenance and facility management started with a meeting with representatives of ISI Yogya (Indiri Maharsi, Dona Hapsari), Museum Affandi (Cilla Venetia Supto) and Museum UGM at the museum Affandi. The observation tools and results of the long term observation of the indoor condition of Gallery I at Museum Affandi where base of the discussion. As the measuring of instruments installed by Wolfgang Stumpf (Danube University Krems- DUK) in December 2018 are accessible via internet, it provides a useful base for the monitoring of the condition of this part of the museum. Whereas this kind of monitoring can be facilitated within the framework of a comprehensive facility management concerns about the financing are an important issue. If this challenge can be dealt it is important to embed in into an easy to use system that can be handled by the staff on the long run. Still it is important that all staff working with these kind of systems are aware not only about its handling but also about its advantage for the management of a museum and its contents. In this way this discussion provided the ground for the further discussions on the integration of this topic within the envisaged educational program which is planned to target higher education as well as vocational training for staff.

Furthermore details for the implementation of the workshop concerning development of the framework of the program for Capacity Building in Higher Education for the conservation of cultural heritage have been laid out. In collaboration with representatives of UGM (Sita Adishakti, Ikaputra) and TU Wien (Ulrike Herbig, Doris Grandits, Lukas Stampfer) interrelation between educational programs in architecture and art for the conservation of cultural heritage were discussed at Pakualaman Palace. This palace, home of the vice sultan family of Yogyakarta, represents an outstanding example for the cultural heritage of Indonesia. It includes significant architecture as well as a collection of art, from painting, photographs to batik. A representative of the family expressed interest in the development of a maintenance and facility management system and is willing to provide the premises of Pakualaman Palace as a case study. This was used as a base for discussions on the further collaboration on this topic with representatives of UGM (Jatmika Suryabrata, Agus Hariyadi).

Furthermore this meeting was used to work on the joint

Fine adjustments to the part of the program concerning buildings physics for the workshop as well as further steps for the development of the maintenance and facility management system for museums have been discussed amongst the Austrian representatives (Doris Grandits, Lukas Stampfer, Ulrich Pont, Fabian Sandholzer, Ulrike Herbig) before the start of the workshop.



*Figure 01: Art and architecture at Pakualaman Palace Yogyakarta as perfect case study for integrated maintenance and management concepts, documented by Dr. Ikaputra*

In addition to that intense discussions with Kartika Affandi at her home and Gallery in Pakem added important information about aspects that are needed for the management of a museum in the challenging conditions in a tropical climate. Long term measurements (March to December 2018) of the climate in the buildings used as a gallery in Pakem can be also used as a case study for the development of the system.



*Figure 02: Ulrich Pont in Discussion with Sita Adishakti*

During the workshop itself - which took place from August 19 to August 23 - the maintenance and facility management was an integrative part of presentations and discussions amongst all representatives of the participating universities. Wolfgang Stumpf (DUK) was in charge for the practical part conducting presentations, exercises and discussions at Museum Affandi. Within this frame representatives of ISI Yogya, UGM, Universitas Trisakti, Jakarta, Universitas Udayana, Bali and Universitas Andalas, Sumatra discussed with staff of Museum Affandi about the influence of building physics on the maintenance of art in museums.



*Figure 03: Wolfgang Stumpf presenting at UGM*

Data of the continuous monitoring in the Museum Affandi installed by Wolfgang Stumpf allows us to analyze the indoor environment of Gallery I at Museum Affandi over a significant period of time and to introduce it to the planned system. This data was already introduced into a proposal applied in the call “Beyond Europe” by the Austrian funding agency FFG, by TU Wien (Ulrich Pont and Ulrike Herbig) in collaboration with UGM, Museum Affandi and the Austrian company docu\_Tools GmbH, Vienna. Unfortunately this was not successful, but as partners are still interested, the project idea will be continued.

The importance of the collaboration between architects and artists and gallerists became particularly clear during a visit to the gallery of Nasirun, one of Indonesia's most famous contemporary artists. The rooms of his studio and collection were designed by the well-known architect Eko Prawoto, who designed the design of the buildings in intensive exchange with the artist. All details at the premises of the collection and atelier show the influence of experts from two different disciplines. The environment created by representatives of two disciplines enables the creation of new works of art as well as the sustainable management of a collection of works of art of various kinds. These examples and the willingness of Nasirun to collaborate in future discussions provide a fruitful addition to the ongoing work.



*Figure 04: Nasirun explaining the lighting concept at his gallery to workshop participants*

An important part of the workshop was a meeting at Balai Konservasi Borobudur with a delegation of the consortium. Within the framework of the meeting the challenges for the Office of Conservation at Borobudur dealing with the conservation of all kinds of cultural heritage, from the archive about the restoration of Borobudur, archaeological “Memory of the World” archaeological objects, to architecture, from vernacular wooden skeleton constructions to temples. The director (Tri Hartono) of Balai Konservasi Borobudur expressed his interest in the participation of his office in the endeavors to develop a framework for an integrated maintenance and facility management program, as it would be of vital interest for his office and a base for future educational programs. Details about the further steps for the development of such systems and educational programs were discussed with staff members.



*Figures 06 & 07 & 08: Meeting at Balai Konservasi Borobudur records needing restoration*

**Credits of all photos: Ulrike Herbig**

All discussion and newly opened collaboration possibilities provide an excellent base for the continuation of the efforts to develop sustainable maintenance and facility management systems for museums and galleries adapted to the conditions in Indonesia.

The project is ongoing , as there are a number of interested galleries who want to implement a sustainable maintenance and facility management system for both, premises and art.

The project was submitted to the FFG as part of the "Beyond Europe" initiative, but unfortunately was not approved. However, the application is to be revised and resubmitted.



## Development of the frame for Maintenance and Facility Management Concepts for Museums in Indonesia

### Project Partners

**Herbig, Ulrike**, DI Dr, TU Wien, Institute for History of Art, Building Archaeology and Restoration.  
herbig@tuwien.ac.at.

Dr. Ulrike Herbig is Senior Scientists at the Faculty of Architecture and Planning at TU Wien and in charge for the coordination and support of research projects, as well as for international affairs at the faculty. Dr. Herbig studied geodesy and has a research interest in the interdisciplinary recording, documentation and analysis of the built environment.

**Adhisakti, Laretna Trisnantari**, Dr. Eng. Ir., M.Arch., Jurusan Teknik Arsitektur dan Perencanaan Fakultas Teknik Universitas Gadjah Mada (UGM); laretna@ugm.ac.id

Dr. Adishakti received an engineering degree from Gadjah Mada University in her native Yogyakarta (1982), a master's in architecture from the University of Wisconsin (USA, 1988) and a doctorate in engineering from Japan's Kyoto University (1997). Employed as a lecturer in several disciplines at Gadjah Mada University since 1983, with a focus on heritage conservation. She is engaged in the Indonesian heritage, a member of UNESCO-ICCROM's Asian Academy for Heritage Management and of the International Council on Monuments and Sites. The scientists listed in the table above are trying to establish the topic as an interdisciplinary research group. In this context, the focus is not on the individual person, but on the group, which is why the description of individual persons is omitted.

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### Report

Through preliminary projects in cooperation with the Danube University Krems (Dr. Patricia Engel), Universitas Gadjah Mada, the Institute for Building Physics and the Affandi Museum on integrated restorations of art and architecture in Indonesia, the urgent need for training in the field of monument conservation and restoration of art has become apparent.

So far, there are no interdisciplinary approaches for the restoration and / or conservation of cultural heritage or related courses embedded in the curricula of Indonesian universities. Although there are numerous activities in this direction there is no general framework for the education of experts in the conservation of cultural heritage.

The general aim of the joint projects is to develop interdisciplinary curricula for the conservation of cultural heritage combining European and Indonesian expertise. With activities of TU Wien in collaboration with DUK in 2019 focused on the continuation of ongoing endeavours working on interdisciplinary approaches of the research on cultural heritage, with a focus on the interrelation between art and architecture. Within the frame ASEA Uninet projects of TU Wien in collaboration with Danube University Krems focussed on the design of a joint project with 5 Indonesian universities to apply for funds to develop curricula that will enable an interdisciplinary and international education in the conservation of cultural heritage. Mutual activities and discussions covered topics from theory and philosophy of conservation, conservation of the built environment on the scales of objects, cites and cultural landscapes, to the restoration and conservation of artwork, the conservation of the immaterial cultural heritage and the interrelation between the different topics.

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- In April 2019 activities focussed on discussing the framework with potential partners at universities and institutions.
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- December 2019 and January 2020 were used to compile a proposal to apply at the EU call “Capacity Building in Higher Education” within the framework ERASMUS+.

#### April 2019

In cooperation with representatives of UGM and ISI Yogya the outline of the project for the Capacity Building in Higher Education was developed. Aim of the program is to combine different disciplines to tackle the conservation of tangible as well as intangible cultural heritage. With this holistic approach comprehensive curricula can be developed that provide the base for educating future experts, that can collaborate with Joint with representatives of Trisakti University activities, like the participation at the International day of Monuments and Sites, organised by the Indoensian heritage Trust online provided the opportunity to discuss partners, associate partners and case study sites to be facilitated in the framework of the project.



Figure 4 & Figure 5: Day of monuments and sites 2019 with representatives of UGM Yogyakarta and Trisakti University, Jakarta

This laid the base to fix the cooperation with Trisakti university in a meeting with with representatives Universitas Trisakti at Jurusan Arsitektur, Jakarta (Nurhikmah Budi Hartanti, Hadi Prabowo, Ety Retnowati Kridarso, Ririk Winandari, Jimmy Siswanto, Sri Novianthi Pratiwi, Punto Wijayanto). In collaboration with the management of Batavia, the old town of Jakarta staff of Universitas Trisakti is working on conservation measures of the historic part of the town. These measures have been integrated into the educational program of architecture which will be an important part of the capacity building initiative of the consortium envisaged. An informal meeting with representatives of the Jakara Museum open also the way for a collaboration on conservation measures within the frame of the envisaged project..



Figure 6 & Figure 7: Meeting at Universitas Trisakti, Jakarta

In a meeting with representatives who are in charge of the conservation of the city of Semarang and Benteng Fort Willem I in Ambarawa provided the opportunity to agree on the collaboration in the project to work on site on different topics from restoration measures on objects to planning discussions for the preservation of heritage cities. The envisaged case study objects would provide the work on the scale of objects and heritage cities, integrating the aspects of art with the new and upcoming galleries in Semarang and the socio-cultural layers of the history of use of the fort in Ambarawa.



Figure 8: Meeting at "Spiegel" a renovated coffee house in Semarang

In a meeting with Gam (Ayu) Suartika at Universitas Udayana at Denpasar Campus the educational program related to the conservation of architectural heritage was discussed and the collaboration in the capacity building program fixed in further talks with Oka Saraswati. Focus in research and conservation for the architectural heritage at Udayana is on the vernacular architecture, which is already planned to be intensified in the next few years.

Finally intense discussion with representatives of ISI Yogyakarta Universitas Andalas was chosen as the best collaboration partner for aspects on the conservation of intangible heritage. Whereas there was no possibility for a meeting in person, intense discussions with representatives of Universitas Andalas via Whatsapp and Zoom provided the base for further collaboration.

With this step the consortium for the capacity building programme was completed and a time schedule for the further procedure was fixed. It was agreed to hold a workshop for the development of the joint interdisciplinary programme in Yogyakarta in August 2019. Until December it was planned to work independently on the individual project parts in order to complete the application for a capacity building project in higher education within the EU funding programme ERASMUS+ in December 2019 and January 2020.

### **August 2019**

The workshop in August was prepared in close collaboration with Dr. Sita Adishakti, who offered assistance and working space at UGM. (A special thanks has to expressed to Yeni Paulina Leibo who provided valuable support in all organisational matters). This preparatory phase was also used to discuss with the partners about possible associate partners and case study objects and areas.

Friday, 16.08.2019

In preparation of the up mentioned workshop opportunity arose to meet with the Vice Sultan family of Yogyakarta in Pakualaman Palace. After discussing the possibility of using the palace as a case study and training object, one part of the complex was documented using 3D laser scanning by members of TU Wien (Doris Grandits and Lukas Stampfer). This was strongly encouraged by the Vice Sultan Family and was happily agreed upon to promote good relations with local royalty in prospect of the capacity building program in preparation. At the same time members of UGM, intended to operate a laser scanner soon to be purchased for research and teaching, were introduced into the workflow of how to approach such a task.

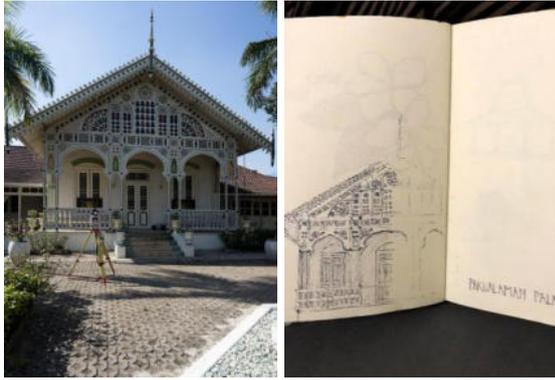


Figure 9 & Figure 10: Documentation work at Pakualaman Palace © Lukas Stampfer (left); Doris Grandits (right)

#### DAY 1 Monday, 19.08.2019 - Getting to Know - Framework

The first day of the workshop was used to determine a collective baseline and starting point for the project proposal. During theoretical sessions hosted at UGM, all representatives of participating research institutions and organisations were introduced.



Figure 11: Participants of the capacity building workshop at UGM © Ulrike Herbig

After Introduction into the outlines of the ERASMUS+ Program: Capacity building in Higher Education by Ulrike Herbig, a ongoing project was presented by Ulrich Pont, to give an understanding on what such a ERASMUS+ project could look like in practice, what can be expected and what are requirements for a successful application. Based on presentations about the current state of training in the field of restoration and monument conservation within higher education at Indonesian Partner Universities as well as outlines of curricula in subjects focussing on cultural heritage at Austrian universities (Doris Grandits: monument preservation and art history - TU Wien; Lukas Stampfer: building archaeology - TU Wien; Wolfgang Stumpf: interdisciplinary methods in graphic art-, book- and document conservation - DUK; Fabian Sandholzer: restoration and urban scale) considerable gaps in the field were identified. However, there is great interest on the part of the universities and also on the part of stakeholders to support a programme for the development of training courses in this field. Discussion was encouraged about expectations of the program. Result from day one was therefore a rough understanding about where the project should be heading, what are the needs in higher education on the subject that need to be addressed.



Figure 12: Presentations about curricula and projects at TU Wien © Ulrike Herbig

DAY 2 Tuesday, 20.08.2019

The second day of the workshop started with a study trip to visit the collection and gallery of artist Nasirun, one of the most renowned contemporary Indonesian artists. Discussion focused on the advantages of interdisciplinary collaborations between artists and architects for the planning and design of buildings designated as workspace and collections. Nasirun gave an insight into his premises, which he developed together with the architect Eko Prawoto and which offer the advantages of a well-designed architecture. The artist's needs for his work have been taken into account, as well as the necessary spatial conditions for the storage and exhibition of Nasirun's extensive collection.



Figure 13: study trip to the collection of Nasirun © Ulrike Herbig

Especially detailed discussions with representatives of ISIS Yogya and Museum Affandi about the restoration of artwork on canvas completed the informative visit. For the afternoon program participants split up in two groups for practical workshops. While the art group met at Museum Affandi to learn about preliminary joint works of architects and art restoration experts (Cilla Ventsia Spato: restoration of the 3 beggars; Ulrike Herbig: "Development of a restoration concept for art and architecture in Museum Affandi"; Wolfgang Stumpf: "Climate measurements at Museum Affandi"; Budi Utomo: "Using traditional methods for pest prevention"), the architecture group met at the district of Kotagede. Led by Doris Grandits and Lukas Stampfer of TU Wien, Omaha UGM, a traditional building that was severely damaged during the earthquake that hit Yogyakarta in 2006, bought by UGM for restoration and is used as a gathering and event location today was visited. Further, requirements of building documentation for traditional Javanese buildings were discussed. To illustrate this, another building close by, which is currently under negotiation for purchase was reviewed for a possible approach for documentation previous to restoration. During a brainstorming process different methods like plan material, room book, different mappings, restoration concepts were considered and challenged for their helpfulness within the local context.



Figure 14: Cilla Venetsia Sapto presenting the restoration of the 3 beggars © Ulrike Herbig

DAY 3 Wednesday, 21.08.2019

Day three started with an excursion to Balai Konservasi Borobudur. Meeting officials there, concepts of integrated restoration and conservation of cultural heritage were discussed. Pak Hartono, head of Balai Konservasi Borobudur expressed his special interest in the collaboration of the development of vocational training for future conservation experts. Aside from the architectural cultural heritage, the Balai Konservasi is in charge as the center for the conservation of archaeological findings, and recently also archives. The Borobudur Conservation Archives could be used as a case study within the frame of the Capacity Building project, which is especially valuable as it was included in the UNESCO Memories of the World programme.

Meanwhile the remaining participants engaged in a hands-on workshop about building documentation at Kotagede hosted by members of TU Wien. Practical introductions into methods like 3D laser scanning, photogrammetry, image rectification and others were given, surfacing advantages and limitations of each method in the context of traditional Javanese architecture. The material collected in the morning was further post-processed in the afternoon to visualize not only the results, but also give insight into the time-consuming process that is involved. To achieve a certain degree of comprehensiveness, the object in focus of the building documentation was recorded and post-processed using 3D laser scanning and photogrammetry in the week previous to the workshop (12. - 15.08.) by members of TU Wien (Doris Grandits, Lukas Stampfer). Therefore complete results were able to be reviewed by participants at the end of the practical workshop.



Figure 15: Building documentation workshop at Omahe UGM 2 Kotagede © Ulrike Herbig

At Museum Affandi, Wiwik Sri Wulandari gave a presentation on the cooperation of the Museum with Donau University Krems and opening discussion on this example as a representative building and collection in regards to building conservation and art restoration.

DAY 4 Thursday, 22.08.2019

The fourth day of the workshop was used to engage more specifically into topics taught within courses at Austrian universities and what would be necessary subjects to be implemented at Indonesian partner universities. Central point was the discussion on where the fields of architecture and art meet and which courses could be shared between the two. To gain an understanding about the possible framework of the expected results of the capacity building program both the approaches of establishing core universities, offering most courses at one university or focus universities, with distributing specific specializations to different Institutions. Resulting from these discussions an outline of the project proposal was established and results debated in consideration of requested elements of a capacity building submission and contributions necessary from different project partners.

DAY 5 Friday, 23.08.2019

For a common understanding of how the proposal should be written, day 5 was used to start working directly on the ERASMUS+ forms and project description. Further, work packages for the continuous compilation of the submission were distributed among the participating institutions and partners. Information needed was gathered, as well as milestones and dates for future meetings agreed upon.

After the ending of the workshop Ulrike Herbig was invited as keynote speaker at a symposium on the cultural heritage of Nias Island. Also here the topic on the conservation of cultural heritage is of high importance, especially considering the attempts of preparing a nomination file for the enlisting of the village of Bawömataluo in the south of Nias on the UNESCO World Heritage List.

#### **Dezember 2019-Februar 2020**

Using Yogyakarta as a base Ulrike Herbig worked on completing the proposal in cooperation with colleagues on site and via whatsapp and online sessions all participating partners. In addition to the writing of the application, the time was used for intensive exchange with associated partners and networking also in the responsible ministries. The directors general for culture (Dr. Hilmar Farid) and higher education (Prof. Ir. Nizam), both under the Ministry for Education and Culture, Indonesia expressed their support with letters of intent, as well as other important stakeholders and authorities. although the team did its best to complete the application on time, the extensive application could not be submitted in the end due to technical problems. All directly involved as well as the associated partners are convinced of the necessity of the project and expressed their interest to continue the started efforts.

The following universities and institutes participated in the workshop:

**Institut Seni Indonesia Yogyakarta (ISI):** Wiwik Sri Wulandari, S.Sn.,M.Sn.; Indiria Maharsi,M.Sn.; Prima Dona Hapsari, M.Hum.; Dian Ajeng Kirana; Alfi Lufinan; Dewi Riza Septriani; Martino Dwi Nugroho,S.Sn.,M.A.; Andi Haryanto,M.Sn.; Warsono, S.Sn.,M.A.; Silvia Anggreni Purba, M.Sn.

**Universitas Trisakti:** Dr. Maria Immaculata Ririk Winandari, ST, MT.; Punto Wijayanto, ST. MT.

**Universitas Gadjah Mada (UGM):** Laretna Adishakti; Dwita Hadi Rahmi; Kadek Indira Diah Kardina, ST.MT.; Nabila Afif, ST.,M.Arch.; Nur Zahrotunnisaa Zagi, ST., MT.; Dwi Rina Utami

**Universitas Udayana (UNUD):** Gusti Ayu Made Suartika

**Universitas Andalas (UNAND):** Donny Eros; Endry Martius

**Museum Affandi:** Selarti; Ima Rohani; Vara Armina; Binarung Mahatmajangga; Rancy Adrian, Cilla Venetsia Sapto



## Assessment of Possibilities for a future sustainable (touristic) development in Labuan Bajo, Flores, Indonesia

### Project Partners:

**Pont, Ulrich**, Dipl.-Ing. Dr, Institut für Architekturwissenschaften, Department für Bauphysik und Bauökologie; [ulrich.pont@tuwien.ac.at](mailto:ulrich.pont@tuwien.ac.at),

Dr. Pont studied architecture at the TU Wien, where he is now working as assistant professor at the Department for Building Physics and Building ecology at the Institute for Architectural Science. His main research interests are the recording and analysis of building performance, and the retrofitting of buildings to improve their indoor environment.

**Fabian Sandholzer**, Inst. of Transportation, Research Center of Transport Planning and Traffic Engineering, [fabian.sandholzer@tuwien.ac.at](mailto:fabian.sandholzer@tuwien.ac.at)

Fabian Sandholzer, MSc works as university assistant at the Research Center of Transport Planning and Traffic Engineering, Institute of Transportation, Faculty of Civil Engineering, TU Wien. He completed his master's at the University of Innsbruck, Austria in the programme "Geography: Global Change - Regional Sustainability" with an in-depth study of urban development, spatial and regional research and development research. His research interests focus on the sustainable development of sensitive areas.

**Herbig, Ulrike**, DI Dr, TU Wien, Institute for History of Art, Building Archaeology and Restoration. [herbig@tuwien.ac.at](mailto:herbig@tuwien.ac.at).

Dr. Ulrike Herbig is Senior Scientists at the Faculty of Architecture and Planning at TU Wien and in charge for the coordination and support of research projects, as well as for international affairs at the faculty. Dr. Herbig studied geodesy and has a research interest in the interdisciplinary recording, documentation and analysis of the built environment.

**M. Eng., Ph.D. Ikaputra**, Universitas Gadjah Mada, Department of Architecture and Planning, Faculty of Engineering; [ikaputra@ugm.ac.id](mailto:ikaputra@ugm.ac.id)

Dr. Ikaputra studied at the Gadjah Mada University (UGM), Yogyakarta, Indonesia and at the Osaka University, Japan. He works as the program director for architecture at the Faculty for Architecture and Planning at UGM. His research interests are city and environmental planning, cultural heritage and building for disaster.

**Takeru Shibayama**, Inst. of Transportation, Research Center of Transport Planning and Traffic Engineering, [takeru.shibayama@tuwien.ac.at](mailto:takeru.shibayama@tuwien.ac.at)

DI Shibayama Takeru is project assistant at the Research Center of Transport Planning and Traffic Engineering, Institute of Transportation, Faculty of Civil Engineering, TU Wien (Austria). He completed his Master Study of Civil Engineering at the University of Tokyo, Japan with a particular focus on policy-making and planning. Currently he is working on his doctoral study at TU Wien in the same field. His research interests lie in the field of mobility mainly in international research projects.

## Report:

### Introduction

Primarily due to its role as a hub for visitors of the Komodo National Park, which has been recognized as a UNESCO World Heritage Site since 1991, Labuan Bajo has experienced a large increase in tourism during recent years. Simultaneously, the town has experienced growth in population, the expansion of the settlement area and traffic problems. The project therefore aims to identify existing challenges and pathways to steer urban development towards UN's Sustainable Development Goal 11 (Make cities and human settlements inclusive, safe, resilient, and sustainable). It draws from previous site visits and work conducted in Labuan Bajo, for example a workshop lead by Ulrike Herbig, connecting students from the Universitas Gadjah Mada and the TU Wien.

### Trip to Indonesia - Activities

During the stay in the summer of 2019 the main goal was to address questions related to the transport system of Labuan Bajo. The increase in traffic, observed during previous stays, is mainly handled by two roads running parallel to the coastline. The road in the centre (see gig, which is closer to the shore, is also the main pedestrian traffic route, which is perceived as quite difficult and dangerous due to the lack of facilities. An improvement of infrastructure for active mobility, especially pedestrian traffic, could lead to a significant improvement in quality for residents and visitors and, with an appropriately clever design, preserve the character of the place.



Figure 1: View of the main road "Jalan Soekarno Hatto". © Ulrich Pont

Thus, on August the 4th, two researchers of the Austrian group (Ulrich Pont and Fabian Sandholzer) travelled to Indonesia to join the Indonesian partners as well as Ulrike Herbig, who already made her way to Indonesia and stayed in Yogyakarta to prepare a joint workshop. The flight schedule called for a stay in Denpasar, which was used to familiarise oneself with the conditions in Indonesia and to clarify organisational matters for the further stay. On August 7th, Ulrich Pont and Fabian Sandholzer set out to Labuan Bajo, while Ulrike Herbig was keeping in touch with the partners at Universitas Gadjah Mada in Yogyakarta.

Throughout the first days of the stay in Labuan Bajo, site visits of the study area were carried out. Since the accommodation during the beginning of the stay was located a little bit outside the centre of Labuan Bajo, the conditions for walking could be experienced first-hand on the daily walk to the city centre. Simultaneously with the first exploratory walks, contacts with stakeholders in the region were established. This was mainly done, following the local etiquette, via online messaging. Ulrike Herbig, who conducted the workshop on the "Flores Friendly Label", prepared contacts to local authorities and stakeholders. Based on the contacts already existing from previous visits, a network could be established and numerous appointments for interviews could be made. The guided expert interviews conducted were aimed at finding out more about the current situation with regard to tourism development, traffic issues and other concerns. A total of twelve qualitative interviews were conducted. These were either recorded, if possible, or documented by noting down the key aspects right

after the interview was done. The interviewees ranged from local authorities, NGOs active in the region, Indonesian and international business people to committed citizens.



Figure 2 (left): Interviewing local authorities part I. © Ulrich Pont



Figure 3 (right): Interviewing local authorities part II. © Ulrich Pont

The second pillar for data collection was a partially standardised questionnaire about pedestrian infrastructure in Labuan Bajo. It was adapted for three different groups. As language barriers always have to be considered when conducting research in foreign countries, the research group was lucky enough to be able to rely on the aid of local consultant Arinta Dea Dini Singgi. In addition to the interviews and the questionnaire, site visits, ad-hoc discussions about mobility with locals, inspections and GPS - tracking of the footpath network as well as a rough measurement of the dimensions of road cross-sections were carried out.



Figure 4: Field research in one of Labuan Bajo's Kampung. © Fabian Sandholzer

The intensive surveys were conducted until the onward journey to the island of Java on 17th August 2019. After a short stopover in Surabaya, the researchers who had previously been working on Flores Island, arrived in Yogyakarta. There they gathered at the Gadjah Mada University, where the Capacity Building in Higher Education. Workshop: "One Week for Restoration Education" was taking place from August 19th – 23rd. The workshop proved to be a great opportunity to strengthen the relationship with the partner university and at the same time to present first impressions of the stay in Labuan Bajo. To conclude, the whole team joined for one last dinner together with the other participants of the workshop, further strengthening the connection between the Indonesian and Austrian universities.



Figure 5: Ulrike Herbig the project team together with the participants of the workshop "One Week for Restoration Education". ©Paulina Leibo



Figure 6: Fabian Sandholzer presenting interrelations between traffic and cultural heritage. ©Ulrike Herbig



Figure 7: Ulrich Pont in discussion with Dr. Sita Adishakti about interaction between natural and built environment

### **Expected results and (submitted) publications**

Abstract accepted for a contribution in the Special Issue: Active Travel and Mobility Management of the journal "Research in Transportation Business & Management"

Accepted conference contributions:

- NECTAR Cluster 2 & 7 joint meeting: "Social and Health Implications of Active Travel Policies" October 15th and 16th 2020, Venice, Italy
- 35th PLEA Conference Sustainable Architecture And Urban Design September 1st – 3rd 2020, A Coruña, Spain.

Report of the ASIA-UNINET Project: **ASEA 2019 / TUGraz / 1**

between

Graz University of Technology, Graz, Austria

and

King Mongkut's University of Technology Thonburi (KMUTT)

Topic of the project:

**Constitutive Modelling of Grain Crushing of Granular Materials**

Persons involved:

**Erich Bauer**, Dipl.-Ing. Dr.techn., habil., Ao.Univ.-Prof.

Institute of Applied Mechanics, Faculty of Civil Engineering at Graz University of Technology, Graz, Austria

Research topic: constitutive modelling of granular materials for soil and rockfills

**Pomkasem Jongpradist**, Dr., Assoc.-Prof.

Head of the Research Center of Geomechanics at King Mongkut's University of Technology Thonburi, Bangkok; Thailand

Research topics: constitutive modelling of granular of grain crushing

**Raksiri Sukkarak**, Dr.

Teaching Assistant in Soil Mechanics, Laboratory Supervisor and Research Assistant in Geotechnical Engineering at King Mongkut's University of Technology Thonburi, Bangkok; Thailand

Research topics: soil testing, constitutive modelling, numerical analysis and simulation

Summary of the project:

The project was motivated by the joint-research interest on constitutive modelling of grain crushing of granular materials which is of great importance in geotechnical engineering. The constitutive models developed at the Geotechnical Engineering Department of Civil Engineering, King Mongkut's University of Technology Thonburi (KMUTT) and at the Institute of Applied Mechanics, Graz University of Technology (TUGraz) are different. The model developed at KTMUTT is based on the Hardening Soil model (Sukkarak et al., 2017; Sukkarak et al., 2018; Sukkarak et al., 2019), while the model at TUGraz is formulated within the framework of hypoplasticity (Khosravi et al., 2018; Bauer et al., 2019; Bauer, 2019). Both models have already been applied to simulate the deformation behaviour of rockfill material under high loads. Relevant practical applications are for instance rockfill dams. The main aim of the project was the exchange of experiences in constitutive modelling and the comparison and evaluation of the performance of the different models taking into account experimental data. The project combined laboratory tests and numerical investigations to examine the deformation of rockfill materials with respect to particle breakage.

During my first visit we discussed the implementation and test procedure of a new large scale oedometer testing device in the laboratory of the Geotechnical Engineering Department of Civil Engineering at KMUTT. The experimental results obtained were used for the calibration the influence of grain crushing on the constitutive parameters of the different constitutive models. The calibration and also the evaluation of the performance of the different models was one of the main topic during my second stay at KMUTT. To this end the concepts of the different constitutive models were

discussed in joint meetings and the capability of the models were investigated using numerical simulations. A challenging task was the calibration of the material parameters involved in the highly nonlinear constitutive equations. This task was continued and also deepened in the research stay of Dr. Sukkarak at TUGraz.

During my second stay I also delivered a course (20 hours) for the scientific staff and graduated students. The special course was on "Constitutive modelling of the long-term behaviour of soils and weathered rockfills". Photos from the course can be found on the webpage:

<http://www2.ce.kmutt.ac.th/main/?p=4199>

In the future it is planned to publish joint results and to continue the collaboration between the two institutes depending on the financial possibilities.



Figure 1 (left): New large scale testing device at KMUTT, © Sukkarak Raksiri / KMUTT

Figure 2 (right): Dr. R. Sukkarak and Prof. E. Bauer in the office at KMUTT, © Erich Bauer / TU Graz

**Special Course**

TOPIC : Constitutive modelling of the long-term behaviour of soils and weathered rockfills

**Erich Bauer**  
Ao.Univ.-Prof. Dipl.-Ing. Dr.techn. (professor)  
Graz University of Technology, Graz  
TU Graz Institute of Applied Mechanics

**Content of the course:**

- Mechanical behaviour of soils and coarse grained rockfills observed in experiments
- Brief introduction to tensor analysis and continuum mechanics
- Classification of constitutive models based on a classical continuum
- Viscoelasticity
- Concept of hypoplasticity
- Pressure and density properties
- Grain damage, creep and stress relaxation
- Limits of classical continuum models and outlook to higher order continuum models

**29 JUL - 2 AUG 2019**

**FREE**

9.30-16.00  
Conference room  
Department of Civil Engineering  
King Mongkut's University of Technology Thonburi

Please contact Dr. Raksiri for more information  
084-894-7596  
Sukkarak.r@gmail.com



Figure 3 (left): Annunciations of the course at KMUTT, © Civil Engineering Department, KMUTT

Figure 4 (right): Participants in the lecture room, © Sukkarak Raksiri / KMUTT

## References

- Bauer, E., Safikhani, S., Li, L. (2019): Numerical simulation of the effect of grain fragmentation on the evolution of microstructure quantities. DOI 10.1007/s11012-019-00953-0, ISSN 0025-6455, *Meccanica*, 54(4), 631-642.
- Bauer, E. (2019): *Modelling Grain Fragmentation in Hypoplasticity*. Springer Nature Switzerland AG 2019, W. Wu (Ed.): *Desiderata Geotechnica*, SSGG, 1-20.
- Khosravi, M., Li, L., Safikhani, S., Bauer, E. (2018): Numerical simulations of the wetting effect on the long-term behaviour of concrete face rockfill dams. *Proceedings of 5th International Symposium on Dam Safety, Istanbul, Turkey*. Tosun, H., Emiroglu, E., Kumcu, Y., Tosun, V. (eds.), ISBN 978-9444-0782-7-6, (II), 989-997.
- Sukkarak, R., Pramthawee, P. and Jongpradist P. 2017. "A modified elasto-plastic model with double yield surfaces and considering particle breakage for the settlement analysis of high rockfill dams." *KSCE Journal of Civil Engineering*. Vol. 21(3), pp. 734–745.
- Sukkarak, R., Pramthawee, P. and Jongpradist P. 2018. "Deformation analysis of high CFRD considering the scaling effects." *Geomechanics and Engineering*. Vol. 14(3), pp. 211-224.
- Sukkarak, R., Jongpradist P. and Pramthawee, P. 2019. A modified valley shape factor for the estimation of rockfill dam settlement. *Computers and Geotechnics*. Vol. 108, pp. 244-256.

Report of the ASIA-UNINET Project: **ASEA 2019 / TUGraz / 2**

between

Graz University of Technology, Graz, Austria

and

Suranaree University of Technology, Nakhon Ratchasima, Thailand

Topic of the project:

**Constitutive modelling of collapse settlements, creep and stress relaxation  
of weathered coarse-grained soil**

Persons involved:

*Erich Bauer, Dipl.-Ing. Dr.techn., habil., Ao.Univ.-Prof.*

*Institute of Applied Mechanics, Faculty of Civil Engineering at Graz University of Technology, Graz,  
Austria*

*Research topic: constitutive modelling of granular materials for soil and rockfills*

*Suksun Horpibulsuk, Prof. Dr.*

*Chair and Director of Center of Excellence in Innovation for Sustainable Infrastructure Development,  
School of Civil Engineering, Suranaree University of Technology, Nakhon Ratchasima, Thailand*

*Research topic: geotechnical engineering*

*Avirut Chinkulkijniwat, Assoc. Prof., Dr.*

*School of Civil Engineering, Suranaree University of Technology, Nakhon Ratchasima, Thailand*

*Research topic: constitutive modelling of unsaturated soil*

Summary of the project:

*The aim of the project was twofold: first, to deliver a course about constitutive modelling of soils and coarse grained rockfills for preparing the theoretical foundation for a joint scientific research co-operation between Institute of Applied Mechanics at Graz University of Technology and School of Civil Engineering at Suranaree University of Technology; and secondly, to develop a concept for experimental investigation of moisture and creep sensitive granular materials. For constitutive modelling good knowledge of continuum mechanics and tensor analysis is required which is usually not dealt with in detail in the standard education for engineers. Therefore, a lot of time was spent practicing these basics. The topic of modelling collapse settlements, creep and stress relaxation of weathered coarse-grained soil is a rather new topic in the scientific community and was also of great interest for course participants as well as in individual scientific meetings at Suranaree University of Technology. In this context particular models based on classical continuum as well as higher order continuum descriptions were presented. For more enhanced constitutive models appropriate concepts for experimental investigations in the laboratory were also discussed. The course was oriented for master students and PhD students and had the following structure:*

- *Mechanical behaviour of soils and coarse grained rockfills observed in experiments*
- *Brief introduction to tensor analysis and continuum mechanics*

- *Classification of constitutive models based on a classical continuum*
- *Viscoelasticity*
- *Outlook to hypoplasticity*

*The project partners are very interested in continuing the co-operation. In the next phase PhD students should carry out experiments on moisture sensitive soils and rockfills in the laboratory at Suranaree University of Technology. Provided scholarship are available, a research stay of PhD students from Suranaree University of Technology is planned at Graz University of Technology.*

สาขาวิชาวิศวกรรมโยธา ศูนย์วิจัยความเป็นเลิศด้านวิศวกรรมโยธา  
และศูนย์เชี่ยวชาญเฉพาะทางด้านนวัตกรรมเพื่อการพัฒนาโครงสร้างพื้นฐานอย่างยั่งยืน  
ขอเชิญผู้สนใจเข้าร่วมการอบรมในหัวข้อ

**Classification of Constitutive Models for Soils and Outlook to an Enhanced Model**

โดย Prof.Erich Bauer  
จาก Institute of Applied Mechanics, Graz University of Technology

โดยมีหัวข้อการบรรยายดังนี้

- Mechanical behaviour of soils and coarse grained rockfills observed in experiments
- Brief introduction to tensor analysis and continuum mechanics
- Classification of constitutive models based on a classical continuum
- Viscoelasticity
- Outlook to hypoplasticity

ติดต่อขอข้อมูลเพิ่มเติมได้ที่ :: รศ.ดร.อวีรุทธิ์ ชินกุลกิจนิวัฒน์  
avirut@sut.ac.th  
044-224353



*Announcement of the course at Suranaree University of Technology,  
© School of Civil Engineering / SUT*



*Celebration of 29<sup>th</sup> SUT Anniversary, Prof. E. Bauer and Dr. A. Chinkulkijniwat,  
© Erich Bauer / TU Graz*



Course participants at Suranaree University of Technology, © Erich Bauer / TU Graz

## References

Bauer, E., Fu, Z. Z. and Liu, S. H. (2012), "Influence of pressure and density on the rheological properties of rockfills", *Frontiers of Structural and Civil Engineering*, 6, 1, pp. 25–34.

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## SEDIMENT AND WASTE PROBLEMS IN RIVER RESERVOIRS

ASEA 2019/TU Graz/4

- A) **PHYSICAL MODEL  
SPILLWAY AND TUNNEL OF FILA TUKUTAHA DAM AT KABUPATEN ALOR PROVINSI  
NUSA TENGGARA TIMUR**
- B) **TITAB DAM**

The problems of sedimentation and garbage that occur in Indonesian hydro (river) plants. We need to obtain alternative solution, so that river reservoir can produce electricity energy and reduce sedimentation that will happen in reservoirs.

For this project we (Institute of Hydraulic Engineering ... ) have intention to organise workshop with CFD software Telemac at ITS Surabaya. Unfortunately Professor Schneider must in last moment cancel his visit. Our workshop must be transferred to Graz for March 2020. I must complete the visiting program in the other way. Together with colleagues of ITS we make analysis for hydraulic modelling concerning two dams in Indonesia; TITAB Dam and FILA TUHUTAKA Dam - the files for both dams are enclosed. Both projects are enabling to initiate cooperation between the institutes.

### ***The participants of this ASEA-UNINET project:***

#### ***Roman Klasinc (applicant)***

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Head of department for Hydraulic Engineering and Environment.  
Former rector of ITS, Surabaya*

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Lector on institute above.  
He made his dissertation at Graz University of Technology, Institute of Hydraulic Engineering and Water Resources Management 6 years ago*

**A) PHYSICAL MODEL  
SPILLWAY AND TUNNEL OF FILA TUKUTAHA DAM AT KABUPATEN ALOR PROVINSI NUSA  
TENGGARA TIMUR**

The purpose of the physical hydraulics model test is to study hydraulic behavior (hydraulic performance) by physically modeling and simulating hydraulics on the design of the spillway and tunnel Fila Tukutaha Dam.

The scope of work includes:

- Create a physical model of side-slope overflow building based on a consultant design with an adequate scale.
- Conducting spillway test models and dam tunnels
- Processing data from the "Spillway Test Model and Fila Tukutaha Dam Tunnel"
- Reviewing the design of the spillway and tunnel for the purposes of carrying out the test model to the perfect condition
- Prepare a study report and detailed drawings of the spillway and tunnel based on the results of the test model from the results of the design review of the spillway and tunnel according to the hydraulic test model recommendations

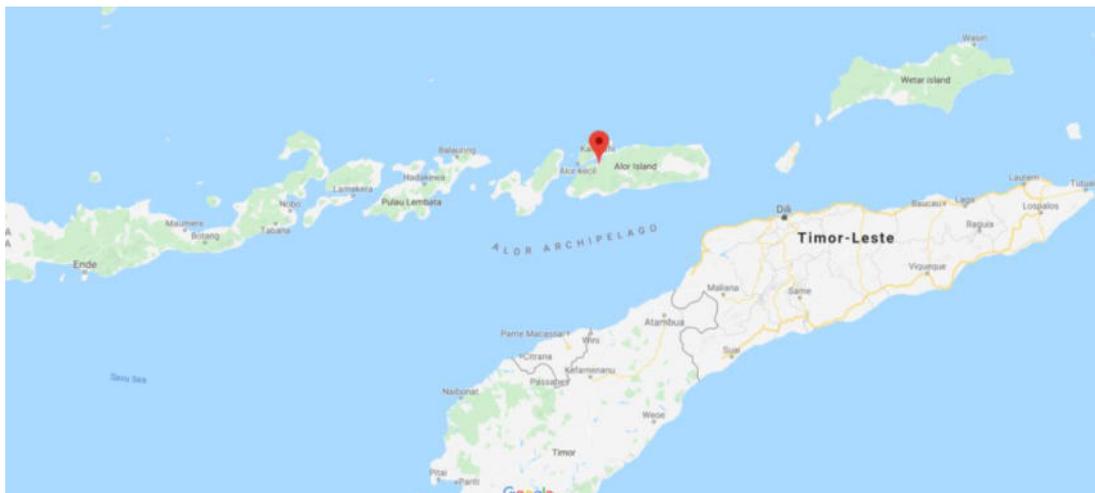


Figure Project location

Scale of Model Fila Tukutaha Dam is **1:50**.

❑ **Geometry Scale**

- Length scale,  $Sc_L = 50$
- Area scale,  $Sc_A = Sc_L^2 = 2.500$
- Volume Scale,  $Sc_V = Sc_L^3 = 125.000$

❑ **Kinematic Scale**

- Time scale,  $Sc_t = Sc_L^{0.5} = 7.071$
- Velocity scale,  $Sc_u = Sc_L^{0.5} = 7.071$
- Acceleration scale,  $Sc_a = 1$
- Discharge scale,  $Sc_Q = Sc_L^{2.5} = 17677.67$

## MODEL DISCHARGE

Parameter	Prototype	Model	
	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(l/s)
Design discharge (outflow) Q <sub>100</sub>	253.80	0.014	14.357
Design discharge (outflow) Q <sub>1000</sub>	326.42	0.018	18.465
Design discharge (outflow) Q <sub>PMF</sub>	694.23	0.039	39.272

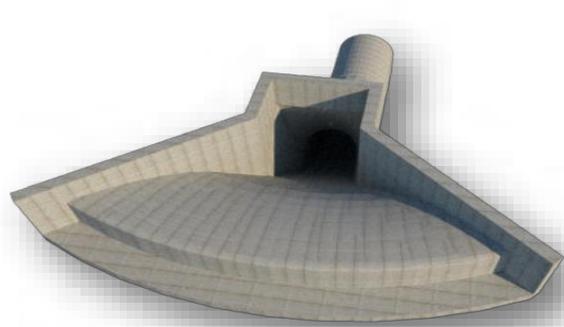
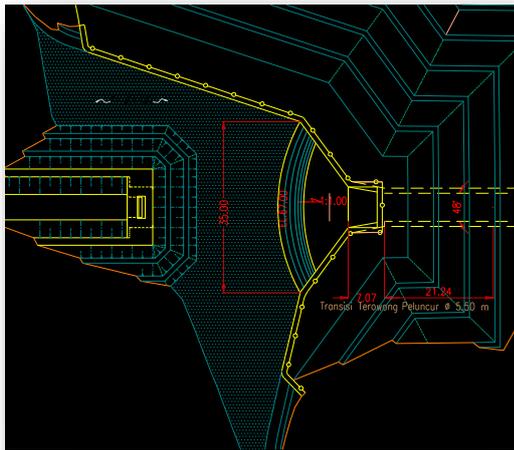
## MODEL DIMENSION

Dimensi	Prototype	Model	
	(m)	(m)	(cm)
<b>PELIMPAH</b>			
Spillway height	253.80	0.014	14.357
Spillway width	326.42	0.018	18.465
Spillway length	694.23	0.039	39.272
<b>Launcher Channel</b>			
Channel length	110.00	2.20	220
Diameter	8.00	0.16	16
	5.50	0.11	11

## SPILLWAY

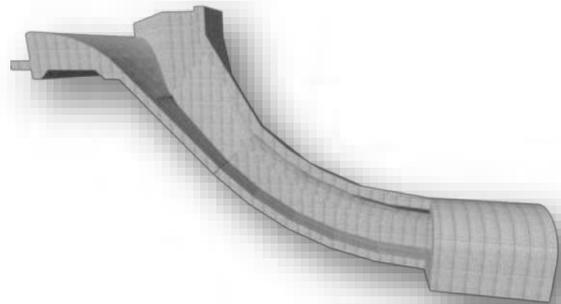
Spillway type : Spillway with tunnel

Cross Type	:	Ogee
Cross elevation	:	+ 78,00 m
Approach Slab Elevation	:	+ 75,00 m
Spillway width	:	35,00 m
Spillway length	:	324,50m



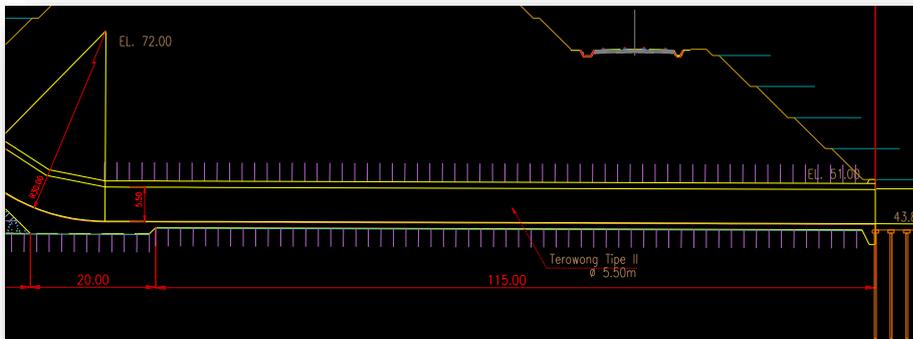
### TUNNEL

Channel length	:	44,17m
Diameter	:	8 ~ 5,5m
Upstream Channel Elevation	:	+ 75,50m
Downstream Channel Elevation	:	+ 43,90m
Slope	:	1 : 1



## CHANNEL OF TUNNEL

Channel length : 115,0m  
Dimension : 5,5m  
Upstream elevation : + 43,90 m  
Downstream elevation : + 43,80 m  
Slope : 1 : 1100



## Launcher Channel

Upstream elevation : + 43,60 m  
Downstream elevation : + 28,00 m  
Channel length : 39,00 m  
Width : 18,00 m  
Slope : 1 : 2,5

## Stilling Basin

Type : USBR Tipe II  
Length : 28,00 m  
Width : 18,00 m  
Elevation : + 28,00 m



### **Transition Channel**

Upstream elevation : + 43,60 m  
Downstream elevation : + 28,00 m  
Length of Channel : 39,00 m  
Width : 18,00 m  
Slope : 1 : 2,5

### **Stilling Basin**

Tipe : USBR Tipe II  
Panjang : 28,00 m  
Lebar : 18,00 m  
Elevasi : El. + 28,00 m



### **OUTLET**

Length till the river : 203,25 m  
Width : 18,00 m  
Elevation : + 32,00 m

## B) TITAB DAM



Dam is located at village Ularan, Ringdikit and Ringdikit village, District Busungbiu and Seririt Bali.

### Technical Data:

Dam type: Random rock fill Dam with vertical core.

Dam height from river bed = 60.3 m

Dam height from excavation bed = 82.4 m

Cress width = 12 m

Length of cress = 210 m

Volume = 12.8 mil. M3

Inundation area :

Minimum = 131.2 Ha

Normal = 156 Ha

Flood = 160 Ha

Volume of reservoir :

Flood = 15.74 mi. m3

Normal = 12.8 mi.M3

Effective = 10.06 mi.m3

Dead storage = 2.19 mi.m3

Construction :

Start ; 2013

Finish ; 2015

Cost ; Rp. 496.000.000.000

### Dam Function :

Irrigation = 1795 Ha

Hydropower = 1.5 MW

Water Supply

Other purpose = Flood control and tourism

### Spillway and diversion channel :

Diversion Channel = 459.22 m3/s

Spillway Discharge design = 1174.34 m3/s

Spillway type = Side spillway

Spillway cress width = 30 m

Spillway cress length = 82m

Elevation of spillway cress = +156





Figure Topographic Map

## PROBLEM



Land slide near spillway

*Image Permissions: Dr. Umboro, ITS Surabaya*

## Advanced Computational Geotechnics

ASEA 2019/TU Graz/10

Project Leader: **Prof. Helmut F. Schweiger, Graz University of Technology**

**Prof. Schweiger** is Head of the Computational Geotechnics Group at the Institute for Soil Mechanics and Foundation Engineering of the Graz University of Technology. His main research interests are the development of multilaminar models for soils and the assessment of the influence of the constitutive model for solving practical problems, in particular deep excavations, deep foundations and tunnels. His research is reflected in more than 200 publications in International Journals and Conference Proceedings and invitations to keynote and plenary lectures at International Conferences on Soil Mechanics and Computational Geotechnics. He is also president of the Austrian Society of Soil Mechanics and Geotechnical Engineering.

helmut.schweiger@tugraz.at

**Ass.Prof. Franz Tschuchnigg** obtained his Ph.D. at the Graz University of Technology investigating the behaviour of deep foundations by means of 3D finite element analysis and holds presently a post-doc position at the Institute of Soil Mechanics and Foundation Engineering at the Graz University of Technology. His main research interests are 3D finite element modelling of geotechnical structures and finite element limit analysis. He was a visiting research fellow at the University of Newcastle in Australia.

franz.tschuchnigg@tugraz.at

**Dr. Indra Noer Hamdhan** is a lecturer and Head of the Geotechnical Laboratory at the National Institute of Technology, Bandung, Indonesia. He held a scholarship of the Government of Indonesia which allowed him to obtain his Ph.D. from the Graz University of Technology. His main research interest is slope stability analysis considering climatic effects such as intensive rainfall events.

indranh@itenas.ac.id

### Short description of course

This course has been a continuation of various courses held in the past in Denpasar and Bandung within the long term cooperation between Graz University of Technology and the National Institute of Technology, Bandung. The content of the course is based on the course "Computational Geotechnics" which is held at the Graz University of Technology within the curriculum for civil engineering in the master programme "Geotechnical and Hydraulical Engineering. In recent years numerical methods have also gained importance in Indonesia because a number of large infrastructure project will be built within the next decades. Many of them involve deep excavations in an urban environment (e.g. Jakarta) and embankments for roads and railways in coastal regions where soft soils prevail. In all these case numerical methods will be applied to predict the behaviour of these geotechnical structures. The course

reflected these needs and besides hands-on training on using a particular code (supervised mainly by Dr. Tschuchnigg) a series of background lectures (given by Prof. Schweiger) have been given. As in previous years the course was well attended, this year more than 30 participants, presenting a mix of students in their final years and practical engineers. It has to be mentioned that some lectures have been given also by our colleagues from Indonesia. In 2019 one day was devoted to dynamic and earthquake analysis and these lectures have been given by Prof. Juamn Pestana from the University of Berkeley, California. Two invited presentations by the outgoing and incoming president of the Indonesian Geotechnical Society have been delivered as special lectures.

After the course Prof. Schweiger delivered a short welcome address at the opening ceremony for the newly established National Centre for Geotechnics at Itenas in Bandung.

There are no publications to be expected from this cooperation because it was a training course for students and practitioners.

<b>INDONESIAN PLAXIS ADVANCED COURSE 2019</b>			
<b>8 to 13 December 2019, BALI, INDONESIA</b>			
<b>Pre-Course Day: Sunday, 8 December 2019.</b>			
<b>Time</b>		<b>CG</b>	<b>Subject</b>
3:00	4:00	CG-A	Introduction to PLAXIS 2D 2019
4:00	5:00	CG-B	Introduction to PLAXIS 3D 2018
			-End-

<b>Lecturers for Indonesian Advanced Course 2019, Bali.</b>			
1	Prof. Masyhur Irsyam	Institute Teknologi Bandung	MI
2	Prof. Helmut Schweiger	TU Graz	HS
3	Prof. Widjojo Prakoso	University of Indonesia	WP
4	Prof. Juan Pestana	Univ Berkeley	JP
5	Dr William Cheang	Design Integration Analysis, Bentley Systems	WC
6	Dr Franz Tschuchnigg	Graz University of Technology, Austria	FT
7	Dr Indra Noer Hamdhan	Institute Teknologi Bandung, Indonesia	IH
8	Mr Ikhya ST	Institute Teknologi Bandung, Indonesia	IS
1. The course is 4 and a half-day in duration. 2. It has a pre-course training/familiarisation component of 2 hours on Sunday			
	No of sessions	9	
	No of modules	30 CGs	
	Lectures	21 CGs	
	Exercises	9 CGs	

## Day 1: Monday, 9 December 2019

Time	CG	Subject		
<b>SESSION 1</b>		<b>GEOTECHNICAL MODELLING 1</b>		
8:30	9:15	CG01	Geotechnical Finite Element Modelling	JP
9:15	10:00	CG02	Linear Elastic Perfect Plasticity Model and Mohr-Coulomb Criterion	HS
10:00	10:15		Tea Break	
10:15	12:00	CG03	Exercise 1: Modelling of a Strip Foundation	WC
12:00	1:00		Lunch	
<b>SESSION 2</b>		<b>GEOTECHNICAL MODELLING 2</b>		
1:00	1:30	CG04	Nonlinear Computation	WC
1:30	3:00	CG05	Critical State Soil Mechanics and Soft-Soil Model	HS
3:00	3:15		Tea Break	
3:15	4:00	CG06	Hardening Soil and HS-small Models	HS
4:00	5:30	CG07	Exercise 2: Calibration of HS model	FT
5:30			-End	

## Day 2: Tuesday, 10 December 2019

Time	CG	Subject		
<b>SESSION 3</b>		<b>GEOTECHNICAL MODELLING 3</b>		
8:30	9:15	CG08	Structural Elements in PLAXIS	IH
9:15	10:30	CG09	Undrained Condition and Consolidation Analysis	HS
10:30	10:45		Tea Break	
10:15	12:00	CG10	Exercise 3: Modelling of an excavation with MC Model	FT
12:00	1:00		Lunch	
<b>SESSION 4</b>		<b>GEOTECHNICAL MODELLING 4</b>		
1:00	2:00	CG11	Modelling of Groundwater in PLAXIS	WC
2:00	2:45	CG12	Concrete Model	HS
2:45	3:00		Tea Break	
3:00	4:00	CG13	Modelling of Excavations in 2D and 3D	HS
4:00	5:30	CG14	Exercise 4: Modelling of an excavation with HS/HS-small Models	FT
5:30			-End	

## Day 3: Wednesday, 11 December 2019

Time	CG	Subject		
<b>SESSION 5</b>		<b>GEOTECHNICAL STABILITY ANALYSIS</b>		
8:30	9:15	CG15A	Initial Stresses, Safety Analysis with Phi-C Reduction	HS
9:15	10:00	CG15B	Slope Stability Analysis	HS
10:00	10:15		Tea Break	
10:15	12:00	CG16	Exercise 5: Modelling of Slope Stabilised with Soil Nail reinforcements	IH
12:00	1:00		Lunch	
<b>INDONESIAN NATIONAL CENTER FOR GEOTECHNICS LECTURE</b>				
1:00	2:00		<b>The New National Earthquake of Design of Buildings and Infrastructures in Indonesia</b> Professor Masyhur Irsyam, Institut Teknologi Bandung, Indonesia.	
<b>SESSION 6</b>		<b>MODELLING OF DEEP FOUNDATIONS &amp; GROUND IMPROVEMENT</b>		
2:00	2:30	CG17	Embedded Beam (3D) and Embedded Beam Row (2D) Elements	FT
2:30	3:15	CG18	Modelling of Deep Foundations	HS
3:15	3:30		Tea Break	
3:30	4:00	CG19	Modelling of Ground Improvements	HS
4:00	5:30	CG20	Exercise 6: Modelling of Pile Foundations in 3D	FT
5:30			-End	

## Day 4: Thursday, 12 December 2019: Dynamics and Earthquake Analysis

Time		CG	Subject	
<b>SESSION 7</b>			<b>GEOTECHNICAL DYNAMIC ANALYSIS</b>	
8:30	9:15	CG21	Fundamental Concepts of Dynamic Analysis	JP
9:15	10:00	CG22	Soil Properties and Damping	JP
10:00	10:15		Tea Break	
10:15	10:45	CG23	Modelling of Dynamic Problems with Plaxis	JP
10:45	12:00	CG24	Exercise 7: Generator on Elastic Foundation	FT
12:00	1:00		Lunch	
<b>SESSION 8</b>			<b>GEOTECHNICAL EARTHQUAKE ANALYSIS</b>	
1:00	2:00	CG25	Geotechnical Earthquake Engineering	JP
2:00	3:15	CG26	Modelling of Seismic Soil-Structure Interaction	JP
3:15	3:30		Tea Break	
3:30	4:15	CG27	Modelling of liquefaction	JP
4:15	5:30	CG28	Exercise 8: 1-D Site Response Analysis	WC
5:30			-End	

## Day 5: Friday, 13 December 2019: Modelling of Rock Related Problems

### INDONESIAN GEOTECHNICAL SOCIETY (HATTI) LECTURE

8:30	9:30		<b>Earthquake Induced Lateral Earth Pressures on Basement Walls with Different Depths</b> Professor Prakoso Widjojo, University of Indonesia.	
<b>SESSION 9</b>			<b>MODELLING OF ROCK IN GEOTECHNICS</b>	
9:30	10:15	CG28	Constitutive models for rock and applications	HS
10:15	10:30		Tea Break	
10:30	11:15	CG29	Modelling of NATM Tunnels	HS
11:15	12:00	CG30	Exercise 9: Modelling of Rock Slope/ Cavern with Hoek-Brown model	IH
12:00	2:00		Lunch	
2:00	3:00		Quiz	

# Abschlussbericht ASEA-Uninet Project DES\_Decarboxylase

Univ.-Prof. Dr. rer. nat. Dipl-Biochem. Robert Kourist, TU Graz

## Participating persons:

### 1. Univ.-Prof. Dr. rer. nat. Robert Kourist (Projektleiter)

Graz University of Technology  
Institute of Molecular Biotechnology  
Petersgasse 14, 8010 Graz, Austria  
Mail: [kourist@tugraz.at](mailto:kourist@tugraz.at)

*Prof. Kourist obtained his diploma in Biochemistry in 2006 and his PhD in biotech in 2008 at the University of Greifswald, Germany. After postdoctoral stays in Yokohama and Munich and a stay as Junior Professor for Microbial Biotechnology at the Ruhr-Universität Bochum in 2012 he has been Full Professor at TU Graz since 2017. His research deals with biocatalysis and enzyme engineering.*

### 2. Prof. Dr. Susan Arco

University of the Philippines  
Institute of Chemistry, College of Science  
Diliman, Quezon City 1101  
Mail: [sdrarco@yahoo.com](mailto:sdrarco@yahoo.com)

*Prof. Arco has obtained her PhD degree in 1997 at the University of the Philippines-Diliman. Post-doctoral training includes: ASEA-UNINET, Graz University of Technology, Graz, Austria, 1 March – 5 April 2005; UP-NSRI-DA-BAR, UP Diliman, 1 June 2002 – 31 May 2003; JSPS, Sophia University, Tokyo, Japan, 15 November – 24 December 1999. She is currently professor at the University of the Philippines. Her research covers the following topics: Development of Organic Reactions in Benign Solvents; Aqueous Diels-Alder as an Alternative Approach to the Anthraquinone Backbone; Aqueous Diels-Alder Methodology Toward Some Selected Monoterpenes; Synthesis of halogen-free ionic liquids based on 1-n-alkyl-3-methylimidazolium as greener solvents for Diels-Alder reaction; Electrochemistry.*

## Project report

### 1. Introduction and objectives

Chemoenzymatic cascade reactions are quite recent, exciting reaction concepts, since they are able to combine benefits of two catalytic fields. Successful chemoenzymatic cascades have been applied e.g. to the production of amino acids, for the dynamic kinetic resolution of secondary alcohols, or for

the generation of polymers. Recently, the group of the applicant demonstrated the coupling of enzymatic reactions to water-tolerant metathesis catalysts (Á. Gómez-Baraibar et al., *Angew. Chem., Int. Ed.*, 2016, **55**, 14823.). The mutual compatibility of all involved catalysts and their reaction conditions, especially the solvent, is a decisive factor that requires the existence of a compatibility window that is often difficult to meet. On the one hand, cascades in aqueous media or bi-phasic systems are limited to catalysts with a pronounced tolerance towards water. This excludes a large number of synthetically useful metathesis catalysts from their application in chemoenzymatic processes. On the other hand, conducting the cascade in organic media requires enzymes that are active under non-aqueous conditions. As only very few enzyme classes tolerate organic media, this approach is not generally applicable.

A very recent approach to conduct enzymatic reactions in non-conventional solvents such as deep eutectic solvents (DES). These systems are formed from a eutectic mixture of anionic and cationic species, typically quaternary ammonium salts with hydrogen donors. Prominent examples are choline chloride/glycerol or choline chloride/levulinic acid. DESs have a very low vapour pressure, and thus are non-flammable. Otherwise than the related ionic liquids, they are non-toxic. After the reaction, they can easily be removed by addition of water. DES often have improved properties regarding the solution of high amounts of substrates and products. Moreover, DES are considered to be highly promising solvents to combine chemical and enzymatic reactions. The Austrian group has established a system to apply DES for the utilization of renewable resources (Schweiger et al., *ACS Sustainable Chemistry and Engineering*, in press). The phenolic acid decarboxylase (PAD) from *Bacillus thuringiensis* converts bio-based ferulic acid into hydroxystyrene. Hydroxystyrene is a building block for high-performance polymers and bio-based antioxidants. A current bottleneck of the enzyme is the limited solubility of the starting material in water. Conducting the reaction in deep eutectic solvents greatly increased substrate solubility. While the Kourist group has all the experimental facilities to produce enzymes and to conduct biocatalysis experiments in DES, an optimization of these systems requires expertise in physical chemistry. Therefore, the Kourist group has joined forces with the laboratory of Prof. Dr. Susan Arco (UP Manila).

The project pursues the following objectives:

- characterization of DES at UP;
- protein engineering of the substrate scope at TUG;
- establishing the biocatalytic reaction in DES at both laboratories;
- exchange of material and analytics;
- mutual training of co-workers.

The investigation of biocatalytic reactions in DES requires an interdisciplinary approach. On the one hand, the handling of enzymes and their optimization by protein engineering requires know-how and equipment in molecular biology. On the other hand, the characterization of DES regarding their physicochemical properties and hence their optimization for biocatalytic reactions requires expertise and equipment in physical chemistry. The laboratory at UP will characterize the solvent systems regarding melting point, viscosity, conductivity, and surface tension. The project *DES\_Decarboxylase* aims to establish a collaboration between the biocatalysis group (Kourist) at the Institute of Molecular Biotechnology, TU Graz with the synthetic organic chemistry (Arco) at the Institute of Chemistry, University of Philippines.

Prof. Arco's current research focuses on the development of organic reactions in benign solvents. This includes non-conventional solvents such as ionic liquids (Double layer micellar stabilization of gold nanocrystals by greener ionic liquid 1-butyl-3-methylimidazolium lauryl sulfate. Judy M. Obliosca; Ian Harvey J. Arellano; Michael H. Huang; Susan D. Arco. *Materials Letters*. 2010, 64, 1109). Moreover, she has experience with biocatalysis, including lipases (An approach to optically active ibuprofen through whole-cell and enzyme-catalyzed transformations Mary Ann A. Endoma; Ma. Celeste R. Tria; Susan D. Arco. *Kimika*. 2003, 19(2), 69-75). Prof. Arco spent a postdoctoral research stay at the TU Graz with Prof. Dr. Guenter Grampp and is therefore familiar with the Austrian academic system.

The applicant's research focuses on chemoenzymatic reactions. The methodical approach bases on the combination of biocatalysis with enzyme engineering. The applicant has established contacts to several groups in South East Asia. He was invited for a keynote lecture on the Keynote Lecture auf dem 20th regional symposium on chemical engineering, Bohol, Philippines, 2013. Currently, he is editor of a special edition on current trends and development in the South East Asian biotechnology sector in the *Journal Biocatalysis and Agricultural Biotechnology*. Current academic collaborations include China (South China University of Technology) and Japan (Keio University) The present project aims to build on the complementarity of the research of both partners and to establish a long-term collaboration in the field of renewable chemicals. Their previous experiences of both applicants with the academic sector of the partner countries are a promising base for a fruitful cooperation.

To establish the collaboration, Prof. Dr. Arco and two coworkers visited the TU Graz in June 2018. She received training in the handling of the model enzyme Phenolic Acid Decarboxylase (Figure 1).

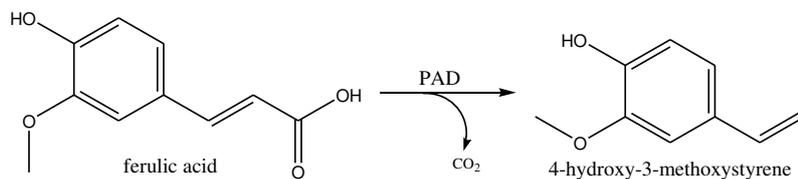


Figure 1. Schematic representation of the conversion of ferulic acid to 4-hydroxy-3-methoxystyrene

The reaction was successfully established in the laboratory at UP. Figure 2 shows the conversion (consumption of starting material) of ferulic acid using wildtype PAD and variant I85A.

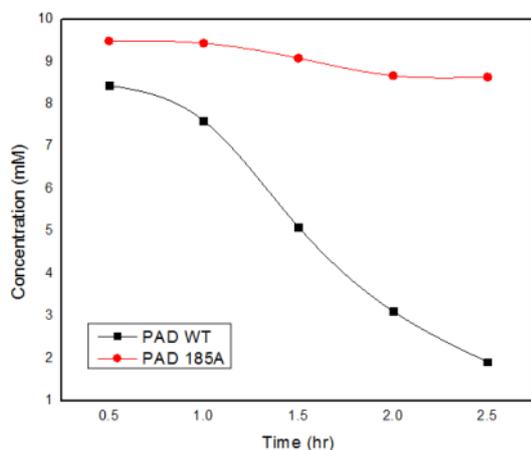


Figure 2. Ferulic acid concentration vs. time graph during the reaction with PAD

The next step will be the characterization of the activity in different deep eutectic solvents, and a correlation of this activity with the properties of the DES.

## 2. Visits

Prof. Dr. Robert Kourist visited the University of the Philippines from September 15 to 20. In this time, he held a three-day workshop on Enzyme Engineering and discussed the progress of the joint project, with the following objectives:

- evaluation of results on the activity of the enzyme in deep eutectic solvents obtained at UP and in Graz;
- planning of further experiments;
- planning of joint publication;
- evaluation of possible joint activities in teaching;
- evaluation of further possibilities for cooperation between UP and TU Graz in the field of biotechnology.

In order to establish contact with researchers at UP, Robert Kourist offered a three-day work-shop at the University of Philippines.

## 3. Results

Prof. Kourist held a three-day workshop to graduate students of University of Philippines and other universities with the following topics (**Fehler! Verweisquelle konnte nicht gefunden werden.**):

- The role of biocatalysis in the chemical industry;
- Biocatalysis for the utilization of renewable resources;
- Structural and mechanistical understanding of enzymes for rational protein design;
- Mutagenesis methods for directed evolution;
- Screening and selection methods to identify improved enzyme variants;
- Success stories: Engineering of enzymes for industrial processes.

The work-shop was held on three days from 9.00-12.00 (12 contact hours in total) with 60 registered participants. Participants received a certificate after participation.

Scientific discussions revealed the following points for further collaboration:

- a) Dr. Arco's group has established procedures for the preparation and characterization of different deep eutectic solvents. This allows to characterize various biocatalysts regarding their performance in deep eutectic solvents, *and to correlate their performance with the physicochemical properties of the enzyme*. Dr. Arco also established a chromatographic analytical method for product quantification. The laboratory lacks, however, installations to produce enzymes in genetical modified organisms.

- b) Discussions with Assoc. Prof. Dr. Irene B. Rodriguez from the Marine Science Institute, University of Philippines-Dilliman, revealed another opportunity for collaboration. Dr. Rodriguez is currently establishing a facility for the production of enzymes by gene expression in genetically modified microorganisms. This creates a demand for her laboratory for researcher with expertise in molecular biology and recombinant enzyme production.
- c) The Kourist laboratory lacks methods and expertise for the characterization of DES.

The approach to establish enzyme production expertise at UP-Dilliman is to host two graduate students from UP at TU Graz for training in molecular biology and enzyme production, with the aim to transfer this expertise to UP-Dilliman. This will facilitate enzyme production for characterization in deep eutectic solvents.

#### 4. Summary and outlook

After two years of collaboration and two mutual visits, both laboratories have now established the generation of deep eutectic solvents and biocatalytic reactions in these solvents.

The next step will be to conduct two joint master theses on the screening of enzymes in different DES (at TU Graz) and the production of these enzymes for physico-chemical characterization of the DES systems (UP-Dilliman). Training of UP graduate students in molecular biology and enzyme production will support the development of an enzyme production facility at UP.

UP-Dilliman has invited Prof. Kourist for a visiting professorship in 2020. For this, both partners agreed to file a memorandum of understanding, which is currently under preparation at the legal departments.

#### 5. Expected results and expected publications

As the project is in a rather initial phase, no publications have been obtained so far. In the long term, a publication on the characterization of the decarboxylase in deep eutectic solvents is expected.

#### 6. Planned actions and collaborations

We plan to continue the collaborative research and plan two sandwich master theses and a visit of Prof. Dr. Arco and Assoc.-Prof. Dr. Rodriguez in 2020 in Graz.

A Memorandum of Understanding and an invitation for Prof. Kourist as visiting professor for 2020 is planned.

## Photo Material



The flyer is a vertical rectangular poster. On the left side, there is a decorative border with a repeating pattern of stylized yellow and red symbols. At the top left, there are two circular logos: the top one is the logo of the Institute of Chemistry, University of the Philippines Diliman, and the bottom one is the logo of the University of the Philippines. The main text is in a clean, sans-serif font. The top right features the TU Graz logo and the text 'Graz University of Technology' and 'Biocatalysis & Protein Engineering'. A photograph of Prof. Dr. rer. nat. Robert Kourist is placed on the right side. The bottom right has a pink box with contact information.

**INSTITUTE OF CHEMISTRY**  
NATIONAL SCIENCE COMPLEX  
UNIVERSITY OF THE PHILIPPINES DILIMAN  
Quezon City, Metro Manila 1101

...cordially invites everyone to

A Seminar-Workshop on  
**ENZYME ENGINEERING –**  
Directed Evolution and Rational Protein Design  
for the Generation of Efficient and Highly  
Selective Biocatalysts

When: **September 16-18, 2019; 09:00AM-12:00NN**  
Where: **Chemrez Room, Institute of Chemistry, UP Diliman**

**ABSTRACT**  
**Enzymes** are the catalysts of nature. Evolution optimized them over millions of years to mediate a wide diversity of reactions in a multitude of biochemical pathways. More than hundred years ago, it was discovered that enzymes outside of the living cell can catalyze chemical reactions. Since then, enzymes have been applied for a number of industrial processes. The fact that enzymes are active in aqueous solution and at mild reaction conditions makes them highly desirable catalysts for environmentally benign industrial processes. Most importantly, enzymes can catalyze many reactions that are very challenging for traditional chemistry. However, the industrial application of enzymes has some limitations, which are related to insufficient activity, stability and selectivity under process conditions.

**Enzyme engineering** has emerged as a powerful method in order to generate tailor-made enzyme variants with improved catalytic properties. Rational protein design uses available structural and mechanistic information to formulate hypotheses that are then verified by site-directed mutagenesis and characterization of the resulting enzyme variants. Directed evolution is based on the genetic randomization of genes, followed by the screening or selection of a large number of clones for the identification of variants with the desired properties. Both methods are complementary approaches and have been successfully applied for the development of a large number of industrial catalysts. The significance of directed evolution was underlined with the Nobel Prize in Chemistry 2018 to Francis Arnold, a pioneer of the directed evolution of enzymes.

**Speaker:**  
**Prof. Dr. rer. nat. Robert Kourist**  
Head of Institute of Molecular Biotechnology  
Graz University of Technology  
Petersgasse 14, A-8010 Graz, Austria

□ The workshop will present the main applications and methodologies of enzyme engineering. In particular, it will focus on:

- The role of biocatalysis in the chemical industry;
- Biocatalysis for the utilization of renewable resources;
- Structural and mechanistical understanding of enzymes for rational protein design;
- Mutagenesis methods for directed evolution;
- Screening and selection methods to identify improved enzyme variants; &
- Success stories: Engineering enzymes for synthetic processes.

Recent activities of Graz University of Technology and the Austrian Centre of Industrial Biotechnology on the generation of tailor-made enzyme variants for the synthesis of active pharmaceutical ingredients and added-value bio-based chemicals will also be presented.

For inquiries, please feel free to e-mail us at [synthorgchem.arco@gmail.com](mailto:synthorgchem.arco@gmail.com). Thank you!

Flyer for the workshop on enzyme engineering



*Photos from the workshop*

*Photos were kindly provided by Jonathan N. Patricio, PhD student in Prof. Arco's laboratory.*

## Structural studies on Guerbet branched-chain glycolipids-water system at low temperatures

This research project has been carried out in February 2019 at the **University of Malaya (UM)** in Kuala Lumpur, Malaysia, and in August 2019 at **Graz University of Technology** in Graz in continuation of an ASEA-Uninet research project from 2018 [1]. It included an outgoing (Austrian project leader to UM) and an incoming (Dr. Noor Idayu to TU Graz) mobility.

Project leaders from Austria were **Manfred Kriechbaum** (Mag., Dr.) from the Graz University of Technology (TU Graz), Institute of Inorganic Chemistry ([manfred.kriechbaum@tugraz.at](mailto:manfred.kriechbaum@tugraz.at)) and from the Malaysian host institution Dr. **Noor Idayu Mat Zahid**, from University of Malaya (UM), Department of Chemistry ([nooridayu@um.edu.my](mailto:nooridayu@um.edu.my)).

Dr Manfred Kriechbaum from TU Graz is currently a Senior Scientist at the Graz University of Technology, and received his PhD at the Karl-Franzens University of Graz. Previously he had worked for over 25 years at the Austrian Academy of Sciences and for 2 years at Princeton University, USA. His research interests cover all aspects of SAXS (Small-Angle X-Ray Scattering) in theory, instrumentation and application, carried out at conventional X-ray laboratories and also at synchrotron radiation facilities (like at ELETTRA, Trieste, Italy).

Dr. Noor Idayu Mat Zahid received her PhD University of Malaya in 2013. She is currently a senior lecturer at UM doing research and teaching at the Department of Chemistry and her fields of expertise are bio-compatible materials (glycolipids, liquid crystals, liposomes), Self-Assemblies and Self-Organized Systems (liquid crystals, thermotropic, lyotropic, biaxial phases). Dr. Noor Idayu Mat Zahid is also the manager of the SAXS-laboratory at UM.

A common research tool we are both are using at our laboratories is Small-Angle X-ray Scattering (SAXS). It is a fundamental scattering method for structure analysis of condensed matter and a powerful technique to gather quantitative nanoscale information from a diverse range of samples from liquids to pastes, powders, and films. The typical length scales probed range from ~1-100 nm, corresponding well to the typical feature sizes of nanoparticles in solutions, nanocomposites, block copolymers, mesoporous materials, protein solutions or liquid crystalline systems and ideal to study self-assemblies and self-organized systems in the nanosize range.

Synthetic branched-chain glycolipids have become of great interest in biomimicking research since they provide a suitable alternative for natural glycolipids, which are difficult to extract from natural resources. These amphiphilic compounds are driven by the microphase separation of two different molecular regions involving a hydrophilic and a hydrophobic moiety. They exhibit highly renowned liquid crystalline structures via self-assembly in dry and hydrated conditions. Moreover, the hydrated mesophases (lyotropic) are known for their applications in various chemical, biotechnological, and medical fields. In this project, we proposed to study Guerbet glycosides (Figure 1) which successfully mimics its corresponding natural product. As such, their lipid nanostructures have increasingly shown suitable to be used as model membranes to study various complex biological processes.

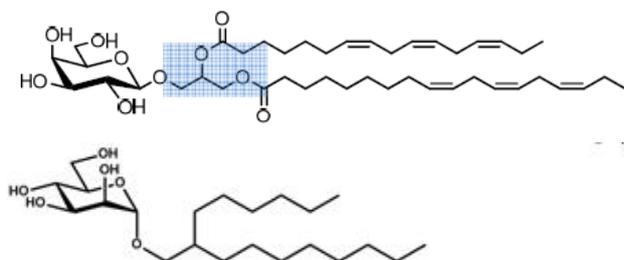


Figure 1: Example of natural glycolipids i.e. monogalactosyl diacylglycerol which is found in chloroplast (top) and example of nature-like glycolipid used in this project i.e. Guerbet mannopyranoside (bottom).

*In order to understand the interactions and organization of their self-assembly, a thorough investigation of their phase behaviour is required. In this investigation Guerbet glycolipids-water systems have been examined at various water concentrations and wide temperatures ranges as extended project to our previous work (2018) which was done only with glycolipids in dry condition (glycolipid without water), focusing now on the phase behavior of the middle chain length Guerbet mannopyranosides stabilizing bicontinuous cubic phases. The main methods that was used to establish the binary phase diagram were optical polarizing microscopy (OPM), binary phase studies and small-angle X-ray scattering (SAXS). The outcome from this study will be crucial for perception of the lyotropic phase behavior as well as for designing nanostructural assemblies for potential applications such as in membrane protein crystallization and drug-delivery system.*

*The workflow in this joint project was structured in the following way: First, we have carried out the synthesis of Guerbet mannopyranosides and phase behaviour investigations which included OPM, binary phase studies and preliminary SAXS measurements at the UM (Kuala Lumpur) followed subsequently by extensive SAXS measurements and SAXS evaluations especially at the low temperature settings in the laboratory at TU Graz.*

*In particular, in this study we have established the water-temperature phase diagram at low temperatures for nature-like branched-chain glycolipids which contains information on the specific nanostructural parameter of their liquid crystalline phases. This basic information may be useful in understanding biologically-related lipidic phase. Together with the results from our previous project (2018) – which complemented the current studies – this work will be published this year.*

*This project has provided a great exposure for UM researcher to improve the understanding and skills on scattering methods. In the longer term, this opportunity strengthens the scientific collaboration between TU Graz and UM which resulted also in an invitation of Dr. M. Kriechbaum by the Malaysian University in form of a Visiting Professorship at UM for the month of February 2020.*

[1] “Guerbet glycolipids from mannose: liquid crystals properties”, Melonney Patrick, N. Idayu Zahid, Manfred Kriechbaum & Rauzah Hashim, *Liquid Crystals*, Volume 45, Issue 13-15, 1970-1986 (2018).

#### **Other academic/research activities** in Malaysia beside the research project:

Invited visit to **UiTM** (Universiti Teknologi MARA, 22.2.2019), Faculty of Chemical Engineering, Shah Alam, by Dr. Nurul Fadhillah Kamalul Aripin to give a seminar talk titled: “Small-Angle X-Ray Scattering (SAXS) - A Modern Tool in Nanostructural Research”

Invited visit to **the Malaysian Nuclear Agency** in Bangi, Selangor, by Dr. Hafizal bin Yazid to perform scattering measurements on their SAXS-instrument, related to a common research project.

#### **Photos:**



*Dr. Noor Idayu from UM and Dr. Manfred Kriechbaum from TU Graz working in the SAXS laboratory at the University of Malaya, Kuala Lumpur (February 2019), © Manfred Kriechbaum and project partners*



*Dr. Noor Idayu from University of Malaya working in the SAXS laboratory at TU Graz (August 2019), © Manfred Kriechbaum and project partners*



*Dr. Manfred Kriechbaum from TU Graz (front row, middle) giving a seminar talk at UiTM (Universiti Teknologi MARA, 22.2.2019), in Shah Alam, Malaysia, hosted by Dr. Nurul Fadilah from UiTM (back row, right), © Manfred Kriechbaum and project partners*

ASEA UNINET Visit Report  
Project No ASEA 2019 / TU Graz / 9

Visit of

Univ. Prof. Dr. Hans **Schnitzer**  
Univ. Prof. Dr. Gerhart **Braunegg**

**from TU Graz**  
**to Vietnam National University, HoChiMinh City, Vietnam**

21 08 2019 until 01 09 2019

Hosts

Director Prof. Dr. techn. (TU Vienna) **Hai Le Than**  
Prof. **Chau Nguyen Xuan Quang**, Vicedirector  
Dr.techn. (TU Graz) **Huyen Do Thi Thu**  
Dr. **Tra Van Tung**  
Mr. **Tran Trung Kien**  
Assoc. Prof. **Ho Quoc Bang**  
Ms. **Nguyen Thi Thu Thao**  
Ms. **Hang**, researcher  
Dr. **Thuy**  
Ms. **Khue**, MSc, researcher  
Mr. **Tam**, MSc

CVs

**aoUniv. Prof. Dipl.-Ing. Dr. techn. Gerhart Braunegg**  
Professor for Applied Microbiology, retired, at Graz University of Technology  
Specialized in biodegradable polymers from wastematerial  
Invited Professor at Ecole Polytechnique Montréal, Canada, Dept. Génie Chimique  
Member of the international expert team „Environmentally Degradable Polymers and Plastics“  
UNIDO, ICS-UNIDO  
Ongoing cooperation with IER / VNU in the ASEA-UNINET program, 15 visits to IER HoChiMinh City, Vietnam

**aoUniv. Prof. Dipl.-Ing. Dr. techn. Hans Schnitzer**  
Professor for Chemical Engineering Fundamentals and Energy Technology, retired, at Graz University of Technology  
Specialized in Engineering Fundamentals, Energy Technology, Cleaner Production and Process Intensification and Innovation Processes.  
Chairman of the private research organization “StadtLABOR”  
Member of the scientific advisory group and Chair of the Board of the private research organization AEE-INTEC (Institute for Sustainable Technologies).  
Ongoing cooperation with IER / VNU in the ASEA-UNINET program, 15 visits to IER HoChiMinh City, Vietnam

**Professor Dr. techn. Than Hai Le, Director**

Head of Department for Environmental Management.

Chair of Post-graduate training (MSc/PhD) program on environmental management

Doctor of Technical Science (PhD) (Environmental Chemistry), 2000 – Technical University of Vienna (TU Wien), AUSTRIA.

Associate Professor in Environmental Technology,

Professor in Construction Technology, 2018

**Quoc Bang HO, Associate Professor on Environmental Sciences**

From 2006 to 2010: Mr. Bang did Docteur ès Sciences (Ph.D.) in Environmental Science (Emission inventories and air quality modelling) at the Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

Bang Q.HO is currently a Director of Air Pollution and Climate Change Research Center (CAPC)/Institute of Environment & Resources (IER)/Vietnam National University, HoChiMinh City (VNU/HCM).

From 2001 to 2011 he has worked at IER -VNUHCM; EPFL (Switzerland) Emission inventory, Modelling of Meteorology and Air pollution, monitoring of air quality, Climate change.

He also works as air quality expert for Clean Air Aisa (CAA) and National Consultant and Regional consultant on Air quality for German Technical Cooperation (GIZ), JICA, Worldbank, ADB, etc.

**Meetings and discussions:**

Freshwater management and sustainable livelihood for soil salinity area: Ba Tri District, Ben Tre province

Ba Tri is a coastal district of Ben Tre province, Mekong Delta

Dr. Tung reports about the problem of antibiotics in animal mass production, which threaten the soil quality and hamper microorganisms in the biogas plant. The problem is well known. The only way around would be to reduce the use of antibiotics, or to limit the dosage to veterinary use. However, the farm is bound by a contract to a Thai company. The company brings the piglets, sells the feed and buys the pigs once they are grown up. The farm has no possibility of influencing the quality of the feed.

The application of solar electricity in shrimp pond in integrated farming system: Case Study of Shrimp Cultivation

The problem deals with a shrimp cultivation far from the electricity grid. Currently the shrimp pond is partly aerated using a series of paddle wheels, propelled by electricity from a diesel generator.

The Austrian scientists gave several advices to improve the situation:

The paddle wheel technology brings very little oxygen into the shrimp pond and is very inefficient. Aeration with nano-bubble is the technology that should be used. The proposed solution of replacing the diesel engine with PV panels for generating electricity will only solve the problem to a certain extent. First of all, during the night, there is not sunlight – hence no electricity from a PV plant and batteries have to be installed. Second, even though green algae do help to increase oxygen in the

water during the day, at night the algae use up the oxygen. So aeration is essential during the night, when there is no light for PV. It is proposed to use wind turbines. Wind turbines are a much cheaper technology, they are easy to construct and to maintain, even by the farmers themselves (example wind turbines in Australian Outback). Since there is basically always wind in the Mekong Delta (data from weather applications) wind turbines can directly be connected to an aeration system without the by-pass of electricity generation.

The simple paddle wheel is not enough to increase the oxygen concentration in the water, especially not at the high temperatures (30°+) when the solubility of O<sub>2</sub> is low. We have to focus to bringing O<sub>2</sub> in at night. Algae run on photosynthesis in the day but consume O<sub>2</sub> in the night.

The next problem is the layer of excrements in the fishpond. While algae take up N and some of the P, but all the carbon the Algae take up is CO<sub>2</sub>. Fish take out O<sub>2</sub> from the water and release CO<sub>2</sub> into the water.

Suggestions:

Monitor the O<sub>2</sub>: how deep go the O<sub>2</sub>– concentrations down during the night? Monitoring the O<sub>2</sub> is simple, take in a sensor. It is strongly advised to use a better device to aerate the water. The windmill systems are very simple. There are peak wind velocities during the night. It can also be used for pumping for irrigation.

The additional advantages: saving money for diesel oil, without green-house gas emissions, simple technology, adapted to the knowledge standard of farmers in the delta.

Utilization of organic materials for fertigating acid soil to horticulture crops:

Establishing an integrated ecological model to sustainable livelihood development upon specific ecosystems on acid sulphate (AS) soil in the Mekong Delta province  
Specific goals

Improve the soil quality of now acid sulphate soils (ASS): soils and sediments containing iron sulphides (pyrite). By the oxidation of sulphide in soils sulphuric acid is generated. Apart from that the soils have a high content in leachable toxic metals.

AS prevents the roots of agricultural plants from the uptake of nutrients, and active aluminium (Al) interferes with biological activities in the rhizosphere, by an associated-P deficiency.

The soil fertility is deterred by its deficiency in essential elements. The major factors are Al, Mn and a low pH in soil, as well as Ca, Mg, P,B and Mo.

Other effects are the lowering of ground water levels.

It is hoped to be able to remediate the soil quality by the following measures:

- Minimisation of disturbance,
- Neutralisation
- Re-flooding,
- Seawater re-flooding,
- Hydraulic separation,
- Bioremediation,
- Cover in-situ soils with clean fill,
- Flooding and intermittent drainage,
- Water table management,
- Deep soil mixing,
- Growing of suitable crops



Figure 16: Irrigation at field with salty and acid soil

Regarding the pH value of the soil: now the farmers buy limestone, and put it around the plant. The Austrian scientists suggest to use the  $\text{CaCO}_3$  from the shells from the shores of Vietnam. Cracked shells will last for 1 – 2 months. However, it may not be easy to increase the pH, it may be much easier and better to use lime milk, which is better soluble than lime.

Farmers now water the acidity away by using the water from the channel. But it is washed again into the channel. Maybe they could use the waste water from the pigsty after the biogas plant, or maybe use the water from some pond.

When iron is mobilized, the question is, what other heavy metals except Fe are mobilized, there must be an analysis of water and soil, because the heavy metals will be in the harvested goods.

In an attempt to introduce a drastically different approach, Prof. Schnitzer suggested to consider mining the pyrite, and increase income to the community by this way. A commercial use for pyrite is as the cathode in lithium batteries.

Integrated approach of catfish pond based farming system sustainable: a case study at one catfish breeding farm in the Mekong delta, Vietnam

The integrated farming system, first developed by Prof. Hai LeThan is now applied in various other farming systems, here we deal with a catfish pond.

The elevation of catfish in Vietnam has the problem of a high antibiotic content, very much sludge at the bottom of the pond, and that it is currently not part of the farming integrated system.

A new model is proposed, where the sludge of the pond is not discharged into the river, but composted, later the compost fertilizes grass, and the farm uses the grass to feed cows. To improve the quality of the pond, the aeration must be checked as to the bubble size. In the effluent of the biogas reactor ammonia can be recovered, which may go to a fuel cell to produce electricity.

The farming system should in the future also include energy, is the advice of Prof. Schnitzer.

The mathematical model for integrated catfish breeding system

The purpose of this study is to obtain some information on nitrogen cycling and nitrogen formation in catfish ponds: What is the effect of regular changing fresh water in the pond, maintaining high dissolved oxygen in pond water by air compressor, and by lowering the feeding rate (feed more times a day).

A comparison between conventional fish breeding in a static freshwater pond system and an integrated catfish breeding with an In-pond raceway system is envisaged.

As to mathematical modelling, in the course of the upcoming visit to TU Graz, Dr. Bettina Muster, will be asked to give a presentation on the modelling software EES (Engineering Equation Solver) she has used during her PhD thesis and for her research work. IER is using EXCEL for modelling purposes, but on the market, there is more comprehensive software, including also data ready to use for balancing processes.

Publications:

The group at IER proposed a great number of possible topics for publication, that revolve around the above questions, and to develop integrated farming / fish elevation / shrimp elevation ...etc. systems.

For the further publication of the Pond-Biogas Reactor-Household-Garden system etc. proposed by Prof. Hai Lethan, Prof. Schnitzer suggests to find an expression, that is more catchy, something like "Waste Is Gold system" etc. This would be better to read for peer reviews journals.

Field trip

Visit to a farm in Long An province, that has the problem of high acidity in the soil.

The farm has 4500 pigs, the solution proposed is to distribute the pig manure to the fields.

The farm was visited in a field excursion.

The antibiotics are not the only threat to the farm. The second problem is the high salinity of the soil. The land is regularly overflowed by saltwater, washing out the salt content with sweet water only helps to a certain extent. The proposed solution is to dig a ditch, to the edge for soil salinity amendment. It is also proposed to treat the soil with the effluent of the biogas plant.

When the Austrian scientists visited the farm, the biogas produced in the biogas plant was not used in any way but released to the environment. The farmers don't need electricity, because electricity is very cheap. Environmentally speaking it would be much better to burn the biogas. In Vietnam every farmer with more than 1000 pigs must have a biogas plant. But the biogas is not utilized.



Figure 17: Methane bubble of the biogas unit

At the pig farm the biogas plant does not work well, because the antibiotics in the pig feed hampers the biogas plant.

The antibiotics later go into the liquid flow for the irrigation, maybe there is also some effect on the plants from antibiotics. Prof. Braunegg believes, this is a question of the concentration of the antibiotics in the effluent. The land is dug into ditches and on top of the ditches banana shrubs were planted in a cultivation test.



Figure 18: Young banana plants

The Austrian scientists suggest the use of a membrane for salinity reduction

The IER scientists aim at reducing the use of chemical fertilizers, farmers recognize the importance of this step, and the use of compost and vermicompost is encouraged.

### Water hyacinth

Floating water hyacinth is a problem for ships. The plant grows very fast and is collected regularly. Grows only in fresh water. Is an invasive plant from South America. If it is washed to the sea, it dies in the salty water and sinks down, jeopardizing the life on the ground of the sea.

One can use it for water treatment, in DaNang it is collected and put it in the middle of the lake, it is used to attract pollutants in the roots, to purify the water. It will take out Nitrogen and Phosphates. This will also reduce BOD. The roots are very long, and they attract more pollutants. In Vietnam water hyacinth is collected and cut with the means of a special machine. The material is used for fertilizing.

When the Vietnamese colleagues come to Graz, we will try to visit among others Komptech, a company in Frohnleiten specializing in composting machines, having a technology for cutting green residues.

Vietnam applies composting in many areas, even with high salinity. However we have to consider how much antibiotics is in the composting – manure from the pig feed. The Austrian scientists don't believe you can compost pig manure alone; for composting one needs structured material since composting is an aerobic process, manure is airtight. If one puts pig manure in the process, the nitrogen content is too high. It would be better to have a biogas plant before the composting step.

### Smart City Approach

In a new city development district (Vinagroup), IER intends to run a smart city approach together with the building company. The issues of a smart city are discussed intensively. One focus laid on waste collection, separation and reutilization. Here too, composting may be one of the possibly solutions, even though in an urban environment, composting may be difficult to operate and the application is small scale.

### Green VNU Campus

In the upcoming visit of the staff of IER to TU Graz, the approach of TU Graz to greening the campus will be presented. The Austrian scientists believe, such a model approach could be a starting point and role model for smart city developments.

Possible topics and approaches:

- Reuse plastic and materials
- Windturbine
- Awareness program
- "No Plastics"
- engage students
- engage small business

This can be a prototype for a smart city. The technologies are all there, but it will be necessary to raise the awareness. The Austria scientists suggest to Prof. Bang to foster a project at the new campus of Vietnam National University: Greening the Campus.

In a separate meeting at the new campus of IER, the Austrian scientists gave introductions

- Cleaner Production
- Zero Waste
- Waste recycling in Austria
- Carbon Capturing and Storage – Economic Model
- utilization of rice straw for biopolyesters
- solid state fermenters leading to ethanol, ethylene, and other chemical processes

#### Outlook

In November it is expected that 3 persons from IER will visit TU Graz in the course of this ASEA UNINET Project.

Prof. Gerhart Braunegg is due to visit IER again in January 2020 on an ASEA UNINET grant to foster the production of environmentally produced and degradable polyesters.

#### Credits

All photos are credit Hans Schnitzer, and ASEA UNINET is welcome to use them for publication purposes.

## **Report of Visit to TU Graz 01 - 07/11/2019 in Graz, Austria**

### **Program of IER team to Austria under ASEA UNINET, Graz University of Technology**

- IER Team:

1. Assoc. Prof. Dr. Ho Quoc Bang - Head of Department of Air pollution and Climate change, Group leader
2. Dr. Tra Van Tung, lecturer - Department of Environmental Management
3. Dr. Pham Quoc Khanh, head of general department

TU Graz Team

Prof. Hans Schnitzer  
Prof. Gerhart Braunegg

### **Visit of TU Graz, Institute for Biochemistry, Food Chemistry Department**

Prof. Michael Murkovic  
Prof. Hans Schnitzer  
Ms. Sibylle Braunegg  
Prof. Dr. Ho Quoc Bang  
Dr. Tra Van Tung , lecturer  
Dr. Pham Quoc Khanh

After an introduction by Prof. Murkovic to the lab for food chemistry, it was discussed, how coffee grounds can be used in agriculture.

Microalgae project for alternative food (using spirulina).

It was also agreed, that Prof. Murkovic should apply for a grant at ASEA UNINET for 2020 to visit IER, HoChiMinh City in 2020.

Prof. Murkovic is currently working on growing mushrooms (pleurotus) on coffee grounds and then analyzing the ingredients. Since Vietnam is the second largest producer of coffee in the world and a lot of instant coffee is produced, it is very interesting whether coffee grounds can be used for further processes, such as growing mushrooms, composting for fertilizer. From coffee grounds 2 – 3 harvests of mushrooms are possible. After the production of mushrooms, the coffee ground is even better as a fertilizer, because the nitrogen value is upgraded and easier available.

A different approach was discussed. Vietnam has very much fruit waste, and Prof. Murkovic suggests producing alcohol.



*Prof. Murkovic and Prof. Schnitzer*



*Mushrooms growing on coffee*

## **TU Graz; Institute of Interactive system and data sciences**

### **Meeting with Prof. Getzinger**

Prof. Schnitzer introduced the purposes of the meeting that IER would like to develop the proposal for smart city, firstly focusing on smart Vietnam National University campus (VNU HCM).

Prof. Dr. Getzinger presented the project that he did in TU Graz focusing on CO<sub>2</sub> emission in TU Graz. The results show that laboratory consume the largest amount of electricity in the campus and therefore release the largest amount of CO<sub>2</sub> in TU Graz. The second most important source of CO<sub>2</sub> emission in the campus is heating and cooling.

Prof. Getzinger suggested a road map to reduce CO<sub>2</sub> emissions for TU Graz. TU Graz focuses on changing the behavior of people: using clean transportation, invest in more PV on the roof of the buildings, etc.

IER team is very interested in the project which can be applied at VNU Campus. Because now the Vietnam National University doesn't apply any method to calculate the CO<sub>2</sub> emission from the university campus. Prof. Getzinger will send the software to calculate CO<sub>2</sub> emission for the campus to the IER team. IER team will apply this system in a pilot project in Vietnam.



*Visit at Prof. Getzinger, in the picture: Prof. Schnitzer, Prof. Getzinger, Prof. Bang, Dr. Tung*

**© all photos: TU Graz / Sibylle Braunegg**

## **Discussion with Prof. Braunegg**

Prof. Braunegg has been granted an ASEA UNINET visit to IER for January. He discussed the lectures on biological polymers that he will give at IER in January 2020.

## **Visit to Plastic Separation Plant**

Plastic waste is a great environmental problem in Vietnam, and it is very interesting to learn, how to separate the waste in an industrial way. The company Saubermacher in Graz is world leading in this aspect, and the site visit is very inspiring for the Vietnamese colleagues.

Saubermacher in Graz has a modern plant to separate plastic waste. This waste is collected separately in Austria in “yellow bins”. Since recently, in Vienna the plastic is collected jointly with metal packaging. Also, this separation is done in Graz. The plastics separated are going to reuse/recycling, as a fuel and only partially to landfills.

## **Visit Thermoteam Retznei**

After visiting the separation plant of Saubermacher, the Vietnamese scientists visit Thermoteam, where the solid waste is incinerated. Also, this visit is very interesting to Vietnamese scientists. Thermoteam gets the plastic waste from the sorting plant in Graz and processes it further. Plastics containing chlorine is sorted out, as well as all kinds of metals (iron and non-iron). The residual waste is chopped into small pieces and transported to the nearby cement factory at Retznei.

This technology is of extreme importance also to Vietnam, since there is a lack of efficient technologies for the processing of waste and the cement industry is still using fossil fuels instead of renewables or waste. The plant could be a blueprint for Vietnam.

## **Visit Composting Plant FCC Halbenrain**

Organic waste is a major issue in Vietnam too. In general, it is landfilled without using it for energy or composting. After having done some work on biogas plants in the recent years, we now concentrate on composting.

Halbenrain is a large composting unit in Austria. Halbenrain can handle 80.000 t of biogenic waste per year.

## ASEA 2019/TU GRAZ/8 2019

## Functional characterization of new CARs from fungal origin

**Project Partners:**

Priv.-Doz. Dr. techn. **Margit Winkler**; Austrian project leader; Institute of Molecular Biotechnology, [margit.winkler@tugraz.at](mailto:margit.winkler@tugraz.at); M Winkler is independent researcher at Graz University of Technology and Senior Researcher at the Austrian Center of Industrial Biotechnology. She studied technical chemistry and completed her PhD in Organic Chemistry. As Erwin-Schrödinger fellow, she joined David O'Hagan at the University of St. Andrews. Margit was Elise Richter fellow and obtained her *venia docendi* in Biotechnology in 2019. Her research focus is on biocatalysis and she is interested to find and to improve enzymes for challenging chemical transformation and to use them in a biotechnological context.

Assoc. Prof. Dr. **Farah Diba Abu Bakar**; Malaysian project leader; Department of Biological Sciences and Biotechnology, Faculty of Sciences and Technology; [fabyff@ukm.edu.my](mailto:fabyff@ukm.edu.my); FD Abu Bakar is Professor at Universiti Kebangsaan Malaysia (the National University of Malaysia) and supervisor of Jonathan Ling's PhD thesis. Her research is mainly in the fields of microbiology, biotechnology, structural biology and molecular omics, with a particular focus on the structure and function of industrially-important enzymes.

**Jonathan Ling**; [P89012@ukm.edu.my](mailto:P89012@ukm.edu.my); J Ling is currently pursuing a PhD in Biochemistry at the Department of Biological Sciences and Biotechnology, Universiti Kebangsaan Malaysia (the National University of Malaysia). His research interest is centered around the chemistry-biology interface and his current research focus is on the structure and function of carboxylic acid reductases as well as other biosynthetic enzymes.

**Chiam Hashem**; C. Hashem is currently pursuing a PhD at the Institute of Molecular Biotechnology, Graz University of Technology; [chiam.hashem@tugraz.at](mailto:chiam.hashem@tugraz.at); His research interest is centered around oxidoreductases and his current research focus is on the structure and function of carboxylic acid reductases as well as the influence of post translational modifications on enzymatic activity.

**Report:**

Biocatalytic conversions of carboxylic acids e.g. from renewable feedstock to the respective aldehydes is an emerging research field. CARs are frequently introduced into cascade reactions *in vivo* or used for the preparation of flavor and fragrance ingredients and pharmaceutical intermediates. Carboxylic acid reductases (CARs) require its two major domains (A domain, R domain) to reduce carboxylic acids to aldehydes at the expense of ATP and NADPH. To understand the structure-function relationship of CARs, a repertoire of characterized key enzymes is needed. Within recent years, various bacterial and few fungal CARs have been described in literature.

Phylogenetic analysis revealed that all experimentally confirmed bacterial CARs are categorized as subtype I and seemed to be relatively conserved, whereas the 7 fungal CARs with very low sequence identities (<25%) fall into three distinct subclasses (1, 2). *Aspergillus terreus* (AtCAR)(3) and *Stachybotrys bisbyi* (SbCAR)(4) belong to the subtype II and are the only CARs so far placed in this same subtype (2). The CAR from the ascomycetes *Neurospora crassa* and *Thermothelomyces thermophila* belong to type III. Like all other CARs (5), *Neurospora crassa* CAR (NcCAR) requires the co-expression of a phosphopantetheinyl transferase. The first CAR of subtype IV was described from *Trametes versicolor* (TvCAR) and was functionally expressed in rather low amounts. Little knowledge of this protein was available although it is the only member of subtype IV and the only recombinant

CAR from basidiomycetes published so far (6). While our project was carried out, two further CARs from basidiomycetes *TvCAR2* and *DsCAR*, respectively, were published.

#### Expression of new fungal CARs

Plasmid constructs for recombinant expression were generated prior to the research exchange. In Bangi, six CARs from *Pycnoporus cinnabarinus* (*PcCAR1*, *PcCAR2*, *PcCAR3*, *PcCAR4*, *PcCAR5*, *PcCAR6*) were cloned from cDNA/RNA. We used the pETDuet-1\_EcPPTase vector (containing the *E. coli* PPTase required for the essential post-translational modification of carboxylate reductase). Expression was observed for all constructs, albeit at differing titres. From six targets, two CARs were significantly over-expressed (*PcCAR2* and *PcCAR4*).

#### Whole-cell bioconversions

In Graz, *PcCAR2* and *PcCAR4* was expressed in the *E. coli* K-12 MG1655 RARE strain and whole-cell biomass was used for the conversion of a number of carboxylic acids (i.e. cinnamic acid, vanillic acid and piperonylic acid), with the bioconversions quantified via HPLC. Successful conversions were observed for all carboxylic acids tested with *PcCAR2*. *PcCAR4*, on the other hand, reduced only cinnamic acid and piperonylic acid.

#### Purification of CARs

Shake flask-scale protein production were carried out in order to obtain protein preparations with high purity. The full-length *PcCARs* were purified via two chromatographic steps. First, IMAC with a HisTrap FF 5 mL (GE Healthcare) nickel pre-packed column was carried out, followed by size exclusion chromatography (with a HiLoad 16/600 Superdex 200 pg (GE Healthcare) column). Protein preparations with purities ranging from ~80-90% were obtained. Protein preparations were characterized by determination of the protein concentrations using a Nanodrop spectrophotometer and by analysis of their purity by SDS-polyacrylamide gel electrophoresis followed by Coomassie Blue staining.

#### *In vitro* functional assays

In Bangi, a spectrophotometric NADPH depletion assay was carried out with pure protein preparations of *PcCAR2* and *PcCAR4*. Initial screenings against a panel of carboxylic acid substrates demonstrated that both *PcCAR2* and *PcCAR4* possessed distinct substrate scopes, where *PcCAR2* accepted a wide range of aromatic carboxylic acids, but not aliphatic acids. *PcCAR4*, on the other hand, preferred sterically-rigid aromatic carboxylic acids such as benzoic acid, but also accepted short to medium chain aliphatic acids.

#### Induction and isolation of new fungal CARs

At UKM in Bangi, we had the opportunity to begin work in isolating new CAR sequences. 5 fungal species known to reduce carboxylic acids to aldehydes/alcohols were cultivated in order to harvest their spores. After an elaborate cultivation protocol using the fungal spores to start the cultures, we obtained mycelia of the 5 fungal species, which was subsequently used for isolation of new CAR-encoding genes. CAR expression in the fungi was induced by addition of appropriate carboxylic acid substrates. Thus, addition of specific substrates to the cultivated mycelia will result in the expression of CAR mRNA. We obtained total RNA extract of these fungal mycelia and we hope to amplify new CAR target sequences from these mRNAs.

As a follow up of our 1-/2-week research stay, Jonathan Ling continued the work to isolate CAR sequences from the mRNA of the 5 fungal species, and has managed to isolate 16 new CAR sequences. The work is currently ongoing to clone many more target sequences obtained from fungal mRNA/cDNA.

#### Expression, purification and crystallization of CAR A domains

Additionally, during our research stay in Bangi, we expressed and purified A-domain truncations of *NcCAR*, *PcCAR2* and *PcCAR4* (that were cloned prior to the research exchange). Again, we obtained protein preparations with purities ranging from ~80-90%, and these preparations were used to set up crystallography experiments. Crystal screening was performed at the Malaysia Genome Institute with commercial screening kits (i.e. Crystal Screen I and II and JCSG+) at nanoliter scale in 96-/288-well intelli-plates using an automated robotic dispenser. Optimization of crystallization is currently still being attempted in order to obtain better, diffraction-quality crystals. With these efforts, we hope that a structure of this CAR domain can be obtained, which would certainly help us in gaining more information of the structure and function of CARs in general.

#### Summary and conclusion

In summary, two novel CAR targets with differing substrate scopes were identified from *Pycnoporus cinnabarinus*. Initial functional characterization of *PcCAR4* was carried out in Graz, and continued and finalized in Bangi. The characterization of *PcCAR2* was also started in Graz and is currently still pursued in Graz. The research exchange provided substantial exchange of experimental procedures and experience with respect to the isolation and induction of CAR expression in fungal systems, as well as in the expression and purification strategy of CARs. These efforts resulted in the identification of several new CAR sequences. Furthermore, we continued onwards with the crystallization work that was supported by OeAD/ASEA-UNINET in 2018, in which we hope that crystals of either full-length or single domains will appear with time (this can take months) and lead to structural insight on this fascinating enzyme class.

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#### Lectures:

1. Margit Winkler (2019) From fatty acids to flavors and fragrances with enzymes and microbes, *International Congress of the Malaysian Society for Microbiology, Royale Chulan Seremban*, Nov 11-14, Seremban, Negeri Sembilan, Malaysia

2. Margit Winkler (2019) Towards flavors and fragrances with enzymes and microbes, *Centre for Biotechnology and Functional Food/Department of Biological Sciences and Biotechnology, Universiti Kebangsaan Malaysia*, Nov 15, Bangi, Selangor, Malaysia

3. Jonathan Ling (2019) Towards understanding substrate specificity of carboxylic acid reductase enzymes, *International Congress of the Malaysian Society for Microbiology, Royale Chulan Seremban*, Nov 11-14, Seremban, Negeri Sembilan, Malaysia

#### Publication:

note: publications are a result of both ASEA 2018/TU GRAZ/8 and ASEA 2019/TU GRAZ/8.

1. Ling, J.G., Mansor, M.H., Abdul Murad, A.M., Mohd. Khalid, R., Quay, D.H.X., Winkler, M., Abu Bakar, F.D., 2020. A functionally-distinct carboxylic acid reductase *PcCAR4* unearthed from a repertoire of type IV CARs in the white-rot fungus *Pycnoporus cinnabarinus*. *J. Biotechnol.* 307, 55–62. doi:10.1016/J.JBIOTEC.2019.09.008

2. Manuscript: Masethabela Maphatsoe, Jonathan Guyang Ling, Chiam Hashem, Melissa Horvat, Karl Rumbold, Farah Diba Abu Bakar, Margit Winkler, Characterization of *Pycnoporus cinnabarinus* CAR Pc2, in preparation

3. Manuscript: Bastian Daniel, Holly Stolterfoht, Chiam Hashem, Jonathan G. Ling, David Gradischnig, Tea Pavkov-Keller, Farah D.A. Bakar, Karl Gruber, Margit Winkler, Crystal structure of NcCAR R Domain, planned

#### Poster:

1. Jonathan Guyang Ling, Muhamad Hawari Mansor, Abdul Munir Abdul Murad, Rozida Mohd. Khalid, Doris Huai Xia Quay, Inge C. Eiteljörg, Holly Stolterfoht, Margit Winkler, and Farah Diba Abu Bakar. (2019). Carboxylic acid reductases in the white-rot fungus *Pycnoporus cinnabarinus*. European Summit of Industrial Biotechnology, Nov.18-20, Graz, Austria.



*Figure 19. Group picture at the Centre for Biotechnology and Functional Food/Department of Biological Sciences and Biotechnology. From left to right: Chiam Hashem, Anis Farhan Fatimi Ab Wahab, Jonathan Ling, Margit Winkler, Nardiah Rizwana Jaafar, Nurain Shahera Hasan ©Margit Winkler*



### **Project Report 1 of 2**

for the activities regarding the two granted outgoing mobilities (July/August 2019; 2 postdoctoral researchers)

**Project number:** ASEA 2019/ BOKU/ 2

**Project title:** Sustainable Soil Management on Ex-Mining Area to Ensure Food Security and Soil Carbon Sequestration

**Authors:** Rosana Kral, Katharina Keiblinger (outgoing mobilities 2019)

### **Involved researchers:**

BOKU Vienna, Austria (outgoing mobilities)

- *PD.in Dr.in Katharina Maria Keiblinger, BOKU Vienna, Institute of Soil Research [katharina.keiblinger@boku.ac.at](mailto:katharina.keiblinger@boku.ac.at)*  
*Dr. Keiblinger has a background in technical chemistry and soil research has been working at the Institute for Soil Research since 2008. She specializes in soil microbiology and chemistry. Dr. Keiblinger has been working in the present research project on soil rehabilitation since 2017 and has published several peer-reviewed articles on soil amendments.*
- *Dr.in Rosana Maria Kral, BOKU Vienna, Centre for Development Research [rosana.kral@boku.ac.at](mailto:rosana.kral@boku.ac.at)*  
*Dr. Kral has a background in chemistry and molecular cell biology and has been working at the Centre for Development Research since 2015. She focuses on sustainable management of natural resources in cooperation between farmers, extension agents, researchers and other stakeholders of rural value chains. She has been working in the present research project since 2017.*

*Besides publishing for a scientific audience, Drs. Keiblinger and Kral both place emphasis on outreach to the general public and on dissemination of results and methodological approaches to relevant stakeholders. Several video documentaries of their work are available online at the YouTube channel of BOKU Vienna.*

BOKU Vienna (without mobility)

- *Project lead Ass.Prof.Dr. Axel Mentler, BOKU Vienna, Institute of Soil Research [axel.mentler@boku.ac.at](mailto:axel.mentler@boku.ac.at)*  
*Dr.Mentler has a background in technical chemistry and agriculture. He has been working at the Institute of Soil Research for more than three decades. In his work, he has focused on three pillars: besides being an outstanding expert of describing and evaluating soils in the field, he has developed and improved analytical methods, e.g. ultrasound applications to measure soil aggregate stability, while at the same time aiming to connect farmers, teaching and academia. He has been leading the present research since its inception and has published numerous peer-reviewed scientific articles, as well as several video documentaries on his work.*

Universitas Gadjah Mada (UGM), Yogyakarta, Indonesia

- *Dr. Murtiningrum, Department of Agricultural and Biosystem Engineering, Faculty of Agricultural Technology, [tiningm@ugm.ac.id](mailto:tiningm@ugm.ac.id)*

*Dr. Murtiningrum has a background in irrigation engineering. She has been a driving force of the present project since its inception. Her work with students in the area has paved the way for the present research. She will benefit from one of the two incoming mobilities of this grant, bringing with her samples for further specialized analysis at BOKU's Institute of Soil Research.*

- *Dr. Ngadisih, Department of Agricultural and Biosystem Engineering, Faculty of Agricultural Technology, [ngadisih@ugm.ac.id](mailto:ngadisih@ugm.ac.id)*

*Dr. Ngadisih has a background in soil and water conservation engineering. She has been involved in the present project for several years, both in the field and in laboratory work. Dr. Ngadisih has also facilitated many of the meetings with officials in the area, a task in which she was supported by Rizki Maftukhah.*

- *Rizki Maftukhah, STP., MSc., Department of Agricultural and Biosystem Engineering, Faculty of Agricultural Technology, [maftukhah.rizki@ugm.ac.id](mailto:maftukhah.rizki@ugm.ac.id)*

*Mrs Maftukhah has a background in agricultural biophysics and has been involved in the present project since the beginning. She has been involved in all field work activities, and she is also involved in all laboratory analyses. She has been supporting Dr.s Murtiningrum and Ngadisih in official meetings with local representatives, but is also responsible for farmer meetings and for facilitating interviews in Indonesian and Javanese for documentation purposes. She is also involved in much of background research that is only possible in Indonesian.*

### **Project description and activities linked to the granted outgoing mobilities 2019**

*The present project links to a previous project that benefitted in 2018 from mobilities under funding through ASEA Uninet. The activities are part of efforts spanning several years and cropping cycles and destined to re-habilitate soil functions in a former mining area. The present ecosystem and natural resources are under increasing pressure, if agriculture is to remain (and increase in importance) as a livelihood option for the local population, urgent action to rehabilitate soils is needed.*

*In the proposal to the present activities we described the workplan as*

*follows: Field experiment*

*We will set up a demonstration plot in this area with rice grown under SRI production. The experiment is planned to be conducted on a longer-term scale (18 months) following the cropping calendar of rice cultivation in Bangka Regency.*

*The existing conventional rice field and the newly set-up plots will be used for plant yield estimations and soil samplings.*

*Data measurement*

*During experiment, we will measure:*

*a. Soil biophysical properties: soil aggregate stability, and nutrient availability, and heavy metal contamination, infiltration rate measurements*

*b. C-sequestration: total Carbon, dissolved organic carbon (DOC), organic Carbon, amino sugars as an indicator for microbial necromass that is suggested to be a major fraction of SOC*

*Using these first two outgoing mobilities, we have first finished harvesting of the previous cropping year (see pictures on cassava harvest). Yields have been documented for both, below ground and above ground biomass. Soil samples and samples of plant material have been taken for later analysis in the laboratory at the Institute of Soil Research at BOKU Vienna. Currently, the samples are being dried and prepared for import to Austria. The samples will be brought to Austria upon customs clearance by our Indonesian colleagues, using at least one of the incoming mobilities granted to the present project. Our Indonesian colleagues will also be involved in laboratory analysis as described in the proposal upon arrival in Vienna.*

*In the project phase for which the two outgoing mobilities have served, Dr.Murtiningrum has led an outreach activity involving the local Department of Agriculture to share findings from the first year and to introduce work planned for the upcoming cropping year. Dr.s Keiblinger, Kral and Ngadisih, as well as Mrs.Maftukhah, S.T.P., M.Sc., have shared preliminary findings, farmer feedback and future work plans with local agricultural research and extension. Activities for the upcoming cropping year were discussed, as well as, challenges, possible synergies with research and government activities at various level (regency, provincial, national).*

*Local media covered the research activities in print and online, and the research team was received by the new governor of Bangka regency, where the experimental site is located, who expressed interest and support. Farmer feedback was positive, interest in continuation of the project is high. The experimental site is located at the border of two villages and received several visits by both village heads, also while the research team was present in July/August (see pictures). Continued support not only from farmers, but also from local authorities is assured.*

*In preparation for the upcoming cropping year, Dr.s Keiblinger and Kral have prepared the experimental site with Dr.Ngadisih and Mrs.Maftukhah, STP, MSc., as well as the local farmers who provided the space to set up the test field. In accordance with farmer wishes and pedological considerations, the research team opted for another short cropping cycle with a legume before thinking about introducing rice. Several bean species were discussed, preference was given to mung bean by both research team and farmers, as the next legume, for agronomic (higher economic profit if surpluses sold) and soil ecological (soil still quite poor in nutrients and structure and not yet able to support plants with higher N-demands) reasons. Planting was completed for the entire experimental site (see pictures). The current set-up was completed by adding on a low-cost experiment for the investigation of organic matter decomposition with tea bags (see pictures).*

*All activities were documented on video as extensively as possible to allow for sharing with a wider audience. The material will be used to produce a short documentary film which will be made available online at the Youtube channel of BOKU Vienna. The video is intended for use as teaching material or to support extension, for donor agencies involved in development work, but also for discussion with a lay audience.*

*The upcoming steps include transfer of all samples from Indonesia to Austria and laboratory analyses, as well as work on the video material to produce a short documentary on the project activities. The second report, due after use of the incoming mobilities, will detail the procedures and some preliminary findings, should these be already available.*

**Pictures:**



*Figure 1. Dr.Keiblinger and one of the farmers implementing the experimental set-up for measuring organic matter decomposition. (Copyright: Rosana Kral)*



*Figure 2. Dr. Kral and one of the farmers seeding mung bean seeds for the coming second year of cropping. (Copyright: Katharina Keiblinger)*



*Figure 3. Dr. Ngadisih and three of the farmers harvesting cassava, the main crop of the first cropping year. Yield was separated according to above-ground and below-ground biomass. In addition to soil amples, also plant material and samples of the tubers were taken for later laboratory analyses. (Copyright: Katharina Keiblinger)*



*Figure 4. Dr.s Ngadisih and Kral weighing harvested cover crop. Farmer Nunuk sorting plant material. (Copyright: Katharina Keiblinger)*



*Figure 5. Dr. Keiblinger showing improved soil structure with more aggregates in one of the supplemented plots. (Copyright: Rosana Kral)*



*Figure 6. Soil sampling in the experimental field site. (Copyright: Katharina Keiblinger)*



Figure 7. Farmers and research team after finishing preparations of the field site. Dr.s Ngadisih (second from left), Kral (third from right), Keiblinger (second from right) and Mrs Maftukhah, S.T.P., M.Sc. (first on the right) (Copyright: Dedi)



Figure 8. Group picture of farmers and research team with both village heads and local media representative in the experimental field site during a break from field preparations. (Copyright: Dedi)

### **Planned activities:**

*Interactive Workshop at Eurosoil 2020 Conference in Geneva of one UGM and one BOKU member of the project. Presentation of scientific project at EGU 2020 Conference in Vienna (poster and/or oral presentation, depending on selection by session committees).*

### **Expected publications:**

*In cooperation with Universitas Gadjah Mada, we envisage the dissemination of results and techniques through community services. Furthermore, we plan to present our work at an international scientific conference, as well as publish a scientific article in a SCI-listed journal. A video documentary will be supplied and available online.*



ASEA 2019/BOKU/3

## **Bacteria from the termite gut as a source of lignocellulose-degrading enzymes**

### **Persons involved in the project**

**Dr. Yekti Ashi Purwestri** ([yekti@ugm.ac.id](mailto:yekti@ugm.ac.id); ORCID: 0000-0002-7032-9253), Assistant Professor at the Faculty of Biology at University Gadjah Mada, Yogyakarta, Indonesia, is heading the Laboratory of Biochemistry and is an expert in proteomics, intermolecular interactions and signal transduction especially in plants, functional food, and she recently also started to work in enzymology. She is currently supervising the work of several Master students who work on the isolation of bacteria from the termite gut, as well as on the biochemical characterization of extracellular enzymes from these bacteria.

**Dr. Clemens K. Peterbauer** ([clemens.peterbauer@boku.ac.at](mailto:clemens.peterbauer@boku.ac.at); ORCID: 0000-0002-8033-198X), Associate Professor at the Department of Food Science and Technology, BOKU University of Natural Resources and Life Sciences Vienna, Austria, is working at the Food Biotechnology Laboratory. He is an expert in molecular biology, molecular biotechnology as well as in enzymology with a strong focus on oxidoreductases.

**Dr. Dietmar Haltrich** ([dietmar.haltrich@boku.ac.at](mailto:dietmar.haltrich@boku.ac.at); ORCID: 0000-0002-8722-8176), Professor at the Department of Food Science and Technology, BOKU University of Natural Resources and Life Sciences Vienna, Austria, is working at the Food Biotechnology Laboratory. He is an expert in food biotechnology, enzyme technology as well as in enzymology with a strong focus on oxidoreductases.

The project was jointly headed by Ass. Prof. Purwestri and Prof. Haltrich.

### **Project description**

Indonesia is well-known as the largest palm oil producer in the world and palm oil plays an important role in Indonesia's economy. Processing of fresh fruit bunches into crude palm oil results in large amounts of lignocellulosic biomass waste in the form of empty fruit bunch fiber (EFBs). Oil palm EFBs contain 37.3 – 46.5% cellulose, 25.3 – 33.8% hemicellulose and 27.6 – 32.5% lignin and are therefore a considerable resource for the production of agro-ethanol (from the cellulose and hemicellulose fraction) as well as for animal feed, biocomposites, furfural, xylitol and others (from the hemicellulose fraction). All these potential applications require the at least partial degradation of lignin and its separation from the polysaccharide fraction. In industry (e.g., pulp- and-paper-industry) this is done with severe chemical and physical (pre)treatments that cause high energy consumption and generate problematic waste streams. Lignocellulose deconstruction under physiological conditions would be a huge step for the biotech industry towards environmentally friendly utilization of such abundantly available resources (Cragg et al. 2015). The biodiversity of, in particular, bacteria, has been largely untapped in this respect, and countries like Indonesia can benefit enormously from these natural resources, which will be an important step towards a sustainable bioeconomy. Lignocellulose is the main component of woody plants' cell walls and has emerged through evolution due to the requirements of both mechanical functionality and physical protection against herbivores and saprobionts (Janusz et al. 2017 and references therein).

*The chemical complexity of lignin has increased during the course of evolution from gymnosperms to the most evolved grasses, in parallel with the evolution of enzymatic systems in microorganisms that are capable of degrading lignin and lignocellulosic composite structures. In the past, studies on these degradation capabilities of lignin have focused primarily on white-rot and brown-rot fungi, which are able to mineralize lignin (Bugg et al. 2011 and references therein). White-rot fungi in particular produce a range of secretory enzymes including heme-dependent lignin peroxidases, manganese peroxidases, versatile peroxidases and Cu-containing laccases. In recent years, a number of bacteria were observed to be able to degrade and metabolize lignin components and derivatives. It is not well understood if bacterial lignin depolymerization follows pathways comparable to those known from white rot fungi.*

*Lignocellulose is the main diet of termites. This recalcitrant composite material is broken down in the termite gut by the help of a range of different bacteria as well as other microorganisms, hence these organisms must be able to synthesis sufficient quantities and activities of enzymes involved in the depolymerisation of cellulose, hemicellulose as well as lignin, yet this aspect is scarcely studied to date (Bugg et al. 2011). Additionally, termites can also cultivate fungi in their nests; these fungi also grow on lignocellulosic material, which is broken down by various enzymes, and form part of the diet of fungus-cultivating termites. Interestingly, enzymes from termite-associated microorganisms have been little studied to date, and thus form an untapped source of potentially attractive novel enzymes. It is the aim of this project to isolate bacteria from the gut of termites indigenous to Indonesia, to screen these isolates for their ability to form a range of different enzyme activities (cellulase, hemicellulases, ligninases, proteases, as well as various other oxidoreductases that are implicated in lignocellulose degradation; pyranose oxidase, aryl alcohol oxidase, cellobiose dehydrogenase and lytic polysaccharide monooxygenases – we showed in a publication in Science that the latter enzymes are a linking activity between lignin and polysaccharide degradation; Kracher et al. 2017)), and to biochemically characterise these enzymes to some extent. In addition to different heme-containing peroxidases that are expected to be involved in lignin degradation we also suggest that a range of auxiliary enzymes that provide hydrogen peroxide to these peroxidases are formed by these bacteria. Our group has studied these auxiliary enzymes, which are summarised as family AA3 enzymes in the CAZy database (<http://www.cazy.org/Auxiliary-Activities.html>), extensively over the last 15 years (Sütl et al. 2018), so we are particularly interested in these enzymes as well.*

*The project partners from UGM collected a number of worker termites from the UGM Forestry Faculty Arboretum, which were identified as *Macrotermes gilvus* by the Entomology Laboratory of the Faculty of Biology, UGM. Their entire stomach and intestinal system were aseptically removed, microbes adhering to these were suspended and extracted and then plated onto suitable agar plates. By applying this procedure pure cultures of 15–20 bacteria were obtained so far. Some of these strains were brought to BOKU in the frame of this project for identification of the respective bacterial species. To this end we will both use methods based on molecular biology using the 16S rRNA gene as a marker as well as proteomic approaches – this latter method is based on matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS). Mass spectra will then be processed by using the Biotyper software and the BioTyper database containing 8223 reference MALDI-TOF MS profiles, which are available at BOKU but not at UGM. Once isolated bacterial strains are assigned to at least a genus (if not a species), genome databases will be searched for the closest related species with a fully sequenced and annotated genome. This information will be used for primer design in order to isolate genes or gene clusters from these bacteria encoding enzymes considered to be involved in lignocellulose degradation.*

*Overall, we are expecting to gain detailed information on the microbiota in the gut of Indonesian termites, and on the presence of lignocellulose-degrading as well as auxiliary enzyme activities in bacteria isolated from termites, which will open up a range of research possibilities in the near future both for our Indonesian partner and ourselves.*

*In addition, the outgoing mobilities included several activities in teaching such as a seminar on enzymology of lignocellulose degradation, the increasing appreciation of oxidative degradation and the Auxiliary Activity Enzymes that are a prerequisite for this (Faculty of Biology), a seminar on cell factories with special focus on food-grade lactic acid bacteria and cell display technologies (Faculty of Biotechnology), as well as discussions and consulting on heterologous expression and enzyme engineering technologies with a project group working on potential PET-degrading enzymes, their production by heterologous expression as well as engineering approaches for increasing stability and kinetic properties.*

### **Cited Literature**

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*Cragg, S.M., Beckham, G.T., Bruce, N.C., Bugg, T.D.H., Distel, D.L., Dupree, P., Green Etxabe, A., Goodell, B.S., Jellison, J., McGeehan, J.E., McQueen-Mason, S.J., Schnorr, K., Walton, P.H., Watts, J.E.M., Zimmer, M. (2015) Lignocellulose degradation mechanisms across the Tree of Life. Curr. Op. Chem. Biol. 29: 108-119*

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*No publications yet from these joint activities, and since this is a novel project / joint activity it might take some time to come up with joint publications. However, the topic as a basic research area has high potential for obtaining results that can be published in international journals.*

## **ASEA 2019/BOKU/1 Project report**

### **Development and Application of Analytical Methods for Speciation of Arsenic and Selenium in Rice**

#### **Key researchers**

Hann Stephan, Assoc. Prof. DI Dr., University of Natural Resources and Life Sciences Vienna, Stephan.hann@boku.ac.at (project leader)

Stephan Hann is deputy head of the Institute of Analytical Chemistry at the University of Natural Resources and Life Sciences (BOKU), Vienna, Austria. His research group "Instrumental Analytical Chemistry and Metabolomics" aims at the development and application of analytical methods in mass spectrometry based metabolomics, elemental speciation and ultra-trace analysis addressing the fields of biotechnology, food sciences and environmental sciences.

Chu Dinh Binh, PhD, Hanoi University of Science and Technology, [binh.chudinh@hust.edu.vn](mailto:binh.chudinh@hust.edu.vn)

Chu Dinh Binh is a lecturer and researcher at the Department of Analytical Chemistry, School of Chemical Engineering, Hanoi University of Science and Technology, Hanoi, Vietnam. His research group is focusing on the development of HPLC-ICP-MS based analytical methods for speciation of toxic compound in environmental, biological and food samples. His group also works on the high resolution mass spectrometry (TOFMS, QTOFMS and Orbitrap MS) based methods for targeted and non-targeted analysis of toxic organic contaminants in environmental, biological and food samples.

#### **Project description and introduction**

Arsenic is an element in the Earth's crust and is present in water, air and soil. Arsenic is naturally occurring in soil and water. but fertilizers and pesticides also contribute to its abundance. Arsenic exists in two forms, organic and inorganic. When encountered in the diet, inorganic arsenic is considered to be the more toxic of the two forms. Rice has higher levels of inorganic arsenic than other food commodities, in part because as rice plants grow, the plant and grain tend to absorb arsenic from the environment more than other crops. In addition, selenium and its compounds are essential for animals and humans [1], [2]. Selenium plays a very important role in maintaining the immune system of human health and reducing the risk of cancer[3]–[5].

Vietnam is one of the top ten countries of the world which produces mainly rice. Rice is also used as a main cereal for Vietnamese meal. However, the contaminants in rice samples is still concerning, especially of some toxic element such as heavy metals, arsenic and selenium. In addition, species of such compounds in rice samples is still interesting topic in term of toxicity and bioavailability.

However, total concentration of arsenic and selenium compounds is not enough for assessment of the toxicity and bioavailability of such compounds in the context with human health[6]. In addition, US-FDA released a new regular for limitation of inorganic arsenic in rice, especially in infant rice cereal[7]. Therefore, it is necessary to have sensitive and selective analytical methods for speciation of these compounds in rice and related samples.

To date, many analytical methods have been introduced for total analysis of arsenic and selenium as well as speciation analysis of these compounds in cereal, especially in rice samples e.g. hydride generation - atomic absorption spectrometry, anodic stripping voltammetry, separation techniques (capillary electrophoresis, liquid chromatography) in combination with X-ray fluorescence, elemental

and molecular mass spectrometry[1], [2]. Among them, liquid chromatography in combination with elemental mass spectrometry based methods is the most popular because of several advantages like multi-elemental analysis, isotope dilution analysis and chemical independent instrumental response. In this study, we will focus on the development of the mass spectrometry based analytical method for speciation and quantification of arsenic and selenium compounds in Vietnamese rice that is sampled from Red River delta and Mekong River delta.

### **Project objectives**

The proposed research project will be focus on the following objectives:

1. Development of high performance liquid chromatography methods for simultaneous separation of arsenic and selenium species and detection of such compounds via elemental mass spectrometry (ICP-MS: inductively coupled plasma mass spectrometry).
2. Optimization of extraction method for isolation of targeted analytes from samples matrices such as rice, soil, agricultural irrigation water and rice root exudate samples.
3. Fully validation of the developed methods by using commercially available certified reference materials e.g. NIST SRM 1568b, ERM-BC211 for arsenic species and inter-laboratory comparison in case of selenium compounds.
4. Apply the validated methods for real samples: rice, soil, irrigation water, rice root exudate samples.

The general goal of the project and future collaboration is to elucidate a pathway how arsenic and selenium compounds accumulate in rice and assessment of human exposure to such compounds [8], [9].

### **Samples**

Total 40 rice samples have been collected from some areas in Red River Delta (RRD) and transferred to the laboratory in Hanoi University of Science and Technology (HUST-Hanoi, Vietnam). In the laboratory, rice samples were further pretreated as follow: Rice samples were rinsed with double distilled water to remove dust and then dried by air flow at room temperature. These samples were then freeze-dried at -50°C in the FreeZone 4.5 Liter benchtop Freeze Dryers (Labconco, MO, USA). Next, rice was ground into powder by using a commercially available blender with stainless steel blades. Finally, the powdered rice samples were kept in sealed plastic bags at 4°C until analysis. 20 rice samples after pretreatment was packed and sent to the Laboratory of Analytical Chemistry, Division of Analytical Chemistry, Department of Chemistry, University of Natural Resources and Life Science, BOKU Vienna (Vienna, Austria) for the inter-laboratory comparison.

### **Analytical method development and application**

In the analytical laboratory at BOKU-Vienna, Austria

The over-all planning of the study including sample preparation and method development has been performed at BOKU-Vienna during the stay of Chu Dinh Binh. Moreover, the samples have been prepared for analysis via ICP-SFMS. As soon as the results of the speciation studies performed in Vietnam are available, the samples will be speciated in Vienna for As and Se in terms of a laboratory inter-comparison. study.

Methods: Microwave assisted acid digestion has been applied for the mineralization of rice samples prior to quantification of total concentrations of As, Se and additional toxic and nutrient elements by ICP-SFMS (Element 2, Thermo Scientific) applying external calibration and internal standardization via In. In brief, 0.1 g of freeze-dried and ground rice sample was digested in 4 mL of double sub-boiled

HNO<sub>3</sub> and 1 mL of H<sub>2</sub>O<sub>2</sub> in the microwave (Multiwave 3000, Anton Paar, Austria) at 1200 W for 10 min. The cooled digests were quantitatively transferred into 10 mL polypropylen vials and gravimetrically diluted with sub-boiled water for analysis.

In the analytical laboratory at HUST-Hanoi, Vietnam:

The analysis of total element concentrations and speciation of arsenic has been completed at HUST. Methods: For the analysis of the total element concentration, rice samples were digested as described above via acidic closed vessel microwave digestion procedure. The obtained solutions were diluted and analyzed for the total arsenic content by ICP-DRC-QMS. Rice-based certified reference material (ERM BC-211) and fish-based certified reference materials (DORM 2, DORM 4 and BRC 627) were used for quality control and validation of the analytical method for total arsenic analysis.

For speciation analysis rice samples preparation followed a procedure as proposed by US-FDA (EAM 4.11) with some modifications. In brief, the samples were extracted at 90 °C in an acidic mixture. The centrifuged and diluted solutions were subjected to analysis via HPLC-ICP-DRC-QMS. Anion exchange chromatography was directly combined with ICP-DRC-QMS via 60 mm PEEK tubing. Arsenic compounds were separated on anion exchange column (Hamilton PRP X100, 150 x 4.6 mm x 5µm) by employing with gradient of mobile phase that compatible with mass spectrometry, including ammonium carbonate, EDTA and methanol as organic modifier. Arsenic compounds were detected via arsenic monoxide tracer (<sup>75</sup>As<sup>16</sup>O<sup>+</sup>) by ICP-DRC-QMS employing with oxygen as the reaction gas. For quality control, rice-based matrix certificated reference material (ERM-BC 211 rice flour, European Union Breaux of Standard; Brussels) was prepared as the same above manner and analyzed at the same time.

## Results

The extraction efficiency was calculated by the comparison between results from measurements and certified values. Practically, the number of quality control and blank samples accounted for 20 % of the total sample subjected for analysis in both total and speciation analysis. The results of the speciation analysis and total analysis of arsenic compounds in rice samples are showed in the Table 1. The chromatogram of arsenic species in standard solution is depicted in the Figure 1.

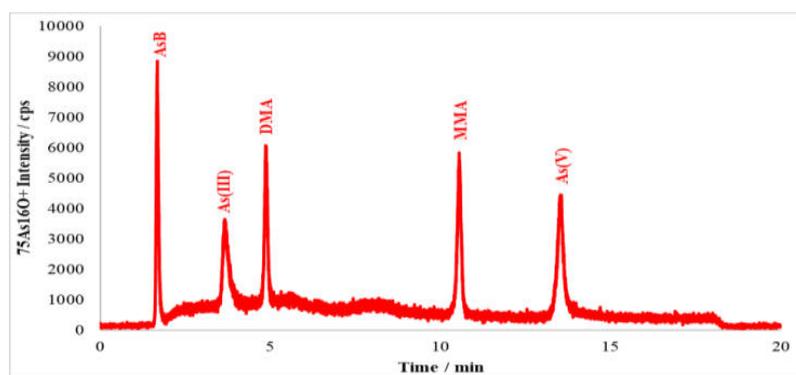


Figure 1. Chromatogram of five arsenic species separating on the Hamilton PRP-X100 strong anion exchange column, concentration of all species 1 ng mL<sup>-1</sup>, © Dr.Dinh Binh Chu/ Hanoi University of Science and Technology.

Table 1. Concentration ( $\mu\text{g kg}^{-1}$  dried weight, mean value  $\pm$  SD,  $n=3$ ) of arsenic species and total arsenic in rice samples

N o.	Sample i.d.	AsB or unretained species	As(III)	DMA	MMA	As(V)	Total iAs*	Total**	Total***
1	R1	41.04 $\pm$ 1.22	132.23 $\pm$ 4.27	133.01 $\pm$ 4.80	2.71 $\pm$ 0.08	53.62 $\pm$ 5.59	185.85 $\pm$ 7.03	362.84 $\pm$ 17.91	407.24 $\pm$ 39.56
2	R2	106.26 $\pm$ 3.17	101.35 $\pm$ 3.27	63.71 $\pm$ 2.30	2.99 $\pm$ 0.09	51.55 $\pm$ 5.38	152.9 $\pm$ 6.3	325.89 $\pm$ 11.94	353.24 $\pm$ 19.75
3	R3	30.29 $\pm$ 0.9	100.24 $\pm$ 3.23	38.47 $\pm$ 1.39	<LOD	1.13 $\pm$ 0.12	101.37 $\pm$ 3.23	170.62 $\pm$ 5.3	154.42 $\pm$ 12.04
4	R4	18.62 $\pm$ 0.56	99.36 $\pm$ 3.21	22.57 $\pm$ 0.81	2.83 $\pm$ 0.09	0.59 $\pm$ 0.06	99.95 $\pm$ 3.21	143.25 $\pm$ 4.64	140.11 $\pm$ 10.93
5	R5	15.9 $\pm$ 0.47	104.14 $\pm$ 3.36	59.44 $\pm$ 2.14	<LOD	0.43 $\pm$ 0.05	104.57 $\pm$ 3.36	180.26 $\pm$ 5.95	179.73 $\pm$ 14.02
6	R6	12.77 $\pm$ 0.38	8.97 $\pm$ 0.29	30.86 $\pm$ 1.11	<LOD	105.2 $\pm$ 10.97	114.17 $\pm$ 11	157.03 $\pm$ 12.19	148.5 $\pm$ 11.58
7	R7	<LOD	99.02 $\pm$ 3.19	36.39 $\pm$ 1.31	<LOD	38.9 $\pm$ 4.06	137.92 $\pm$ 5.2	174.31 $\pm$ 8.38	189.5 $\pm$ 14.78
8	R8	<LOD	12.03 $\pm$ 0.39	30.52 $\pm$ 1.10	<LOD	100.6 $\pm$ 10.49	112.63 $\pm$ 10.5	143.14 $\pm$ 11.77	153.94 $\pm$ 12.01
9	R9	<LOD	79.47 $\pm$ 2.56	14.73 $\pm$ 0.53	<LOD	39.43 $\pm$ 4.11	118.9 $\pm$ 4.84	133.63 $\pm$ 6.95	142.68 $\pm$ 11.13
10	R10	<LOD	111.63 $\pm$ 3.6	17.68 $\pm$ 0.64	<LOD	65.73 $\pm$ 6.86	177.36 $\pm$ 7.75	195.04 $\pm$ 10.84	236.01 $\pm$ 18.41
11	R11	<LOD	93.94 $\pm$ 3.03	33.05 $\pm$ 1.19	<LOD	34.55 $\pm$ 3.6	128.49 $\pm$ 4.71	161.53 $\pm$ 7.56	169.83 $\pm$ 13.25
12	R12	<LOD	75.8 $\pm$ 2.45	8.71 $\pm$ 0.31	<LOD	63.39 $\pm$ 6.61	139.19 $\pm$ 7.05	147.91 $\pm$ 9.18	156.36 $\pm$ 12.2
13	R13	<LOD	94.63 $\pm$ 3.05	13.90 $\pm$ 0.50	<LOD	71.68 $\pm$ 7.48	166.31 $\pm$ 8.1	180.21 $\pm$ 10.82	187.56 $\pm$ 14.63
14	R14	<LOD	86.52 $\pm$ 2.79	46.66 $\pm$ 1.68	<LOD	71.03 $\pm$ 7.41	157.55 $\pm$ 7.9	204.21 $\pm$ 11.68	211.93 $\pm$ 16.53
15	R15	<LOD	84.35 $\pm$ 2.72	20.01 $\pm$ 0.72	<LOD	42.78 $\pm$ 4.46	127.13 $\pm$ 5.2	147.31 $\pm$ 7.73	151.02 $\pm$ 11.78
16	R16	<LOD	68.55 $\pm$ 2.21	26.16 $\pm$ 0.94	<LOD	52.14 $\pm$ 5.44	120.69 $\pm$ 5.9	146.85 $\pm$ 8.38	154.36 $\pm$ 12.04
17	R17	<LOD	93.5 $\pm$ 3.02	25.82 $\pm$ 0.93	<LOD	64.99 $\pm$ 6.78	158.49 $\pm$ 7.4	184.31 $\pm$ 10.52	191.87 $\pm$ 14.97
18	R18	<LOD	98.7 $\pm$ 3.18	41.72 $\pm$ 1.50	<LOD	129.31 $\pm$ 13.49	228.01 $\pm$ 13.9	269.73 $\pm$ 18.02	283.11 $\pm$ 22.08
19	R19	<LOD	84.55 $\pm$ 12.07	21.02 $\pm$ 2.37	<LOD	29.07 $\pm$ 0.76	113.62 $\pm$ 12.1	134.64 $\pm$ 12.3	283.90 $\pm$ 22.23
20	R20	<LOD	86.69 $\pm$ 12.38	10.88 $\pm$ 1.23	<LOD	43.53 $\pm$ 1.14	130.22 $\pm$ 12.4	141.1 $\pm$ 12.5	176.50 $\pm$ 13.82

(\* ) total inorganic arsenic was calculated by sum of arsenite and arsenate, (\*\* ) total arsenic was calculated by sum up five species, (\*\*\*) total arsenic was determined by acidic digestion in microwave oven and measured by total analysis

### Dissemination of results:

A publication on the inter-laboratory study is in preparation and will be finished within 2020.

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Faculty of Economics and Business  
Universitas Gadjah Mada



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## UGM-WU Joint International Summer University Indonesia 2019

September 2019



### **1. Project leader:** Dr. Elisabeth Götze

Dr. Götze is Senior Lecturer at the Department of Foreign Language Business Communication.

#### **Teaching**

Dr. Götze has extensive experience as lecturer in International Marketing and Management at bachelor and master level, both in English and German language. She has taught courses in different Universities in Europe (e.g. GSOM St. Petersburg), America (e.g. Victoria/Canada) and Asia (e.g. Vietnam, Indonesia). Apart from academic teaching, she also trains managers as well as teachers in the respective areas.

#### **Research Interest**

- Marketing to children
- Ethical issues in marketing and business
- Diary method in qualitative research

#### **Professional Experience**

Dr. Götze has gained industry experience as a marketing manager in the fast moving consumer goods industry. Moreover, she has consulted companies such as Blaha Büromöbel, Johnson & Johnson Medical, Museum für Angewandte Kunst, OMV, Raiffeisenbank, Universitätszahnklinik Graz.

**2. General Information:** The Joint International Summer University Indonesia 2019 (hereinafter referred to as Joint ISU Indonesia 2019) was held in Yogyakarta, Indonesia from July 15, 2019 – August 02, 2019 as a joint program of Universitas Gadjah Mada (hereinafter referred to as UGM) and WU (Vienna University of Economics and Business) (hereinafter referred to as WU). The ISU Indonesia 2019 was co-taught by faculty members from UGM and WU; the program focused on “International Management in Emerging Markets”. In total 38 students have been nominated to take part in Joint ISU Indonesia 2019 (17 WU/21 UGM).

**3. Academic Program:** The academic coordination of the Joint ISU Indonesia 2019 was carried out jointly by Dr. Elisabeth Götze (WU) und Ms. Amanda Acintya, M.Sc., Ms. Bita Puspitasari, M.Sc., Dr. Evi Noor Afifah (Ms.) (UGM). The aim of this course was to discuss nowadays challenges international managers face when doing business in foreign markets, with a special focus on emerging economies. In the course, cross-cultural and international management issues were examined and the challenges of managing in an international marketplace were analyzed. Furthermore, cultural diversity and differences, political and economic influences, global market factors, and other contingencies with which management of multinational enterprises must contend, were discussed. Moreover, the course provided insight into management practices of formulating and implementing strategies for international and global operations.

Lecturers teaching for UGM were Dr. Rr Tur Nastiti and Dr. Boyke Purnomo.

Different group assignments within the program had to be solved:

The mixed groups of WU and UGM students had to face an assignment to support various Indonesian SMEs. The students were divided in groups of 7 to 8 students. The first task was to identify problems the SME faces, conduct market research and select different frameworks to work out possible solutions. The findings had to be summarized in a report and presented on the last day of week 3.

The other assignments concerned case studies and articles from challenges companies face in Emerging Markets. The groups had to create a summary of the respective case and article they could choose in the beginning and then present it in front of the participants.

**Guest lectures** contributed additional academic input to enrich the practical orientation of the ISU Indonesia by giving students the opportunity to obtain information about doing business in this very special region of Indonesia or from an ASEAN perspective.

**Company visits** at local companies (around the city of Yogyakarta) were also part of the program. The students visited a bigger company, PT Madukismo, a sugar factory as well as the SMEs they also collaborated with for their group projects.

**4. Course Evaluations:** The Joint ISU Indonesia 2019 was taught by 6 professors, 2 from UGM (Universitas Gadjah Mada) and 2 from WU (Vienna University of Economics and Business) as well as a guest lecturer (University of Notre Dame, Australia). The participants evaluated every professor's class. The course evaluations should assess the quality of the Joint ISU Indonesia courses. The overall perception of the lecturers was good (average score on a 1 (very good) to 5 (very poor) scale). All lecturers taught with great commitment and catered to the students' interest.

**5. Outbound event and welcome evening:** In addition to the interesting teaching program, additional events were organized. On the one hand, a teambuilding event was organized, where the students had to cope with different challenges together in teams. There was also a welcome evening with a traditional Indonesian ballet and typical Indonesian food to give the Austrian students a closer insight into the culture of Yogyakarta. All in all, it was a very good mix of an interesting teaching offer and other additional activities to improve the social relations and cultural exchange of the participants.

**6. Conclusion:** The diverse program schedule, stunning and exotic Indonesia itself (especially Yogyakarta) and the warm welcoming group of students and staff members were the biggest assets of this International Summer University.

The students all benefitted from the intercultural exchange among each other, which is always a great asset of a Joint International Summer University. Working on projects together helps students to broaden their horizon and to understand different perspectives. Through the atmosphere during the program, the students were able to develop friendships and professional bonds among each other.

Working as a team enabled the participants to get to know each other not only on a personal level but also on a professional one. Especially the different cultural backgrounds and the different progress of studies are a challenge. In this way, you learn to work effectively in a team with different backgrounds.

The main lecturers were also very successful in transferring their knowledge. The students found the topics interesting and enjoyed the teaching methods. In conclusion, the Joint ISU Indonesia 2019 was a great success for all participating students, faculties of both universities and the International Office of WU..



Photo credits: National Economics University



# HUST-NEU-WU JOINT INTERNATIONAL SUMMER UNIVERSITY VIETNAM 2019

ASEA Report  
September 2019



**1. General Information:** The HUST-NEU-WU Joint International Summer University Vietnam 2019 (hereinafter referred to as Joint ISU Vietnam 2019) was held in Hanoi, Vietnam from July 08, 2019 – July 26, 2019 as a joint program of Hanoi University of Science and Technology (hereinafter referred to as HUST), National Economics University (hereinafter referred to as NEU) and WU (Vienna University of Economics and Business) (hereinafter referred to as WU). The Joint ISU Vietnam 2019 was co-taught by faculty members from HUST, NEU and WU the program focused on “Managing international business challenges with a focus on global marketing”. In total 34 students have been nominated to take part in the Joint ISU Vietnam 2019 (14 WU/20 HUST&NEU).

**2. Academic Program:** The academic coordination of the Joint ISU Vietnam 2019 from WU side was carried out by Univ. Prof. Dr. Barbara Stöttinger. On HUST side, Prof. Nguyen Tien Dung and Prof. Nguyen Mai Anh and on NEU side, Dr. Dao Thanh Tung and Dr. Nguyen Viet Hung were in charge of the academic coordination and taught in the ISU program.

The Joint ISU Vietnam 2019 program was based on the following pillars:

- The Joint ISU Vietnam 2019 **course program** on “Managing international business challenges with a focus on global marketing” was jointly taught by WU, HUST and NEU faculty members. Classes offered a general overview of international business in the context of globalization with a special focus on international marketing decisions. The aim was to provide students with the required profound knowledge in order to be able to examine, understand and solve challenges in international business.
- Students developed a **group project** within the program. The student groups consisted of a balanced mix of WU and HUST/NEU students. The students were divided in groups of five to six students. The projects were concerned with the development of a strategic marketing plan for introducing a Vietnamese/Austrian product or service into an international market where the product is not present yet. The projects ranged from firms introducing a totally new product to a foreign market, Vietnamese firms expanding their products to the Austrian market or to other countries and Austrian firms entering the Vietnamese market. Students were asked to develop a strategic marketing plan of how the respective firms can succeed in the foreign market. The participants were expected to conduct extensive research through secondary sources. The results were presented on the last day of classes.
- **Company visits** at local companies (in and around Hanoi) were also part of the program. Company visits were included in the academic part of the program with the intention to enrich the courses taught by the lecturers from both universities by adding a practical dimension to the academic program. In addition, they allowed students to experience how local businesses work. In 2019 two company visits were organized: Tecomen Group and DHA Garment Company. The students preferred the company visit to DHA Garment Company, as they could receive great insights to the work of the company. At Tecomen Group, a manufacturing company of Air and Water Purifier students received less insights to the work processes, as the company representatives did not speak clear English. The suggestion from 2018 to organize company visits in the morning and have class in the afternoon, due to high temperatures in the afternoon, was implemented.
- As a non-academic objective, the program aimed at **developing intercultural skills**. Various occasions and activities were used to foster cultural exchange. On July 18, 2019, an International Cultural Evening (ICE) was held. Additionally, students visited the museum of ethnology, the literature temple and the Hoa Lu prison in their Joint sightseeing activities.

**3. Course Evaluations:** Every lecturer’s performance has been subject to evaluation by the participating

students. The overall perception of the lecturers was good. All lecturers taught with great commitment and catered to the students' interest. In accordance with the students' wishes, classes were either practice-oriented, or focused on the Vietnamese economy, culture and history.

**4. Intercultural Evening and Understanding:** In addition to international teamwork on a group project throughout the program, students held an International Cultural Evening (ICE) on July 18th. At the so-called „ICE“, both WU, HUST and NEU students presented their respective culture and student life, especially through dances, videos and food.

**5. Conclusion:** The Joint ISU Vietnam 2019 was a great success for the organizing institutions and the participants in various ways.

The great cultural exchange, vibrant and exotic Vietnam itself, as well as a very diverse and interesting academic program and the motivation and commitment of all students and staff members, can be seen as the most important and crucial aspects for the success of the Joint ISU Vietnam 2019. The students also received practical insights during the company visits. Furthermore, the theoretical knowledge that they acquired during the lectures served as a great input for the project work that all students had to complete. The students learned to work on group projects in intercultural teams and could broaden their horizon by learning about new perspectives to tackle possible problems.

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## **Bericht über eine im Rahmen von ASEA-UNINET geförderte Kooperations-/Forschungsaktivität Durchführungsjahr 2019**

### **Project title:**

FEM Simulation and Experimental investigation on Transient Temperature Distribution and Substrate Distortion of Wire Arc Additive Manufacturing (WAAM) process using 316L Stainless Steel

### **Involved persons:**

Assoc.Prof. Dr. Martin Leitner, MBA (Prof. and project leader at MUL)  
Montanuniversität Leoben, Chair of Mechanical Engineering, Austria

Prof. Dr. Yupiter HP Manurung (Prof. and project leader at UiTM)  
Universiti Teknologi MARA, Faculty of Mechanical Engineering, Malaysia

Dr. Wan Emri Wan Abdul Rahaman (Senior Researcher)  
Universiti Teknologi MARA, Faculty of Mechanical Engineering, Malaysia

Muhd Faiz Mat Muhammad (PhD candidate)  
Universiti Teknologi MARA, Faculty of Mechanical Engineering, Malaysia

Yusuf Olanrewaju Busari (PhD candidate)  
Universiti Teknologi MARA, Faculty of Mechanical Engineering, Malaysia

### **Content of project:**

As shown within the application for the project, the cooperation deals with the numerical simulation of the modern Wire Arc Additive Manufacturing (WAAM) process. The main objectives of the collaborated research are to investigate the temperature and mechanical behaviour of resulted WAAM product made of SS316L. The research starts with finding the suitable welding parameters for this material using pure Argon gas as the shielding gas. It is important to know the transient temperature distribution during the WAAM process to investigate the changes in the mechanical behaviour of the stated material especially the substrate distortion. Further, simulation procedure is to be developed to predict the transient temperature distribution and deformation of substrate on thick WAAM specimen. In this simulation, simplified bead shape is used and two heat source models based on Goldak's double ellipsoid and rectangular shape are to be analysed, whereby the rectangular heat source model is to be written using subroutine within FEM software. Besides the simulation of the WAAM process, emphasis is laid on the fatigue properties as well as crack growth resistance based on numerical and experimental work.

The focus of the project lies on the simulation as well as on the evaluation of the mechanical behavior / fatigue strength / crack growth behavior of Wire Arc Additive Manufacturing (WAAM) materials. The main goal is to assess the advantage of WAAM for stainless steel application. The experimental and numerical simulation work is defined as follows, whereas the content and the outcome of each task are presented in the stated publications, which act as main scientific part of this report:

- Set-up/enhancement of numerical simulation of WAAM process of SS316L as filler on S235 as substrate, see publication (aim achieved):  
Analysis on Substrate Distortion Analysis Induced by Wire Arc Additive Manufacturing of SS316L using FEM Simulation with Simplified Meshing and Different Heat Source Models
- Numerical analysis of grain growth behavior for filler wire SS316L, see publication (aim achieved):  
Grain growth prediction of bead-on-plate with filler wire SS316L using FEM
- Basic investigations to experimentally and numerically assess crack growth behavior in case of steel material, as fundament for further analysis focusing on WAAM materials, see publication (aim achieved):  
Analytical and numerical simulation of fatigue crack propagation under constant amplitude loading on SENT specimen with experimental verification

#### **Publications (attached to this report):**

Within the scientific ASEA-UNINET cooperation, the following papers were published in 2019, which content act as main part of this report:

- Muhd Faiz Mat, Yupiter Manurung, Norasiah Muhammad, Siti Nursyahirah Ahmad, Fetisia H Pengadai, Simon Pruller, Martin Leitner: Analysis on Substrate Distortion Analysis Induced by Wire Arc Additive Manufacturing of SS316L using FEM Simulation with Simplified Meshing and Different Heat Source Models, Proceedings of the 72nd IIW International Conference, 2019.
- Muhd Faiz Mat, Yupiter HP Manurung, Norasiah Muhammad, Anton Ditle, Mohd Syakir Abd Ghani, Martin Leitner: Grain growth prediction of bead-on-plate with filler wire SS316L using FEM, International Conference on Advances in Mechanical Engineering (ICAME), 2019.
- Yusuf Olanrewaju Busari, Yupiter Harangan Prasada Manurung, Ahmed Ariri, Sagir. Alva, Darwin Sebayang, Noridzwan Nordin, Martin Leitner: Analytical and numerical simulation of fatigue crack propagation under constant amplitude loading on SENT specimen with experimental verification, Proceedings of the 72nd IIW International Conference, 2019.

#### **Further work:**

Further work will still focus on the numerical simulation of the WAAM process in order to properly assess the residual stress and distortion condition after manufacturing. In addition, further emphasizes will be laid on the fatigue and crack growth resistance of WAAM materials based on experimental and numerical work. Hence, it is strongly intended to continue this fruitful scientific cooperation within the ASEA-UNINET funding scheme in the future.

The contribution of further participants from UiTM and MUL within this project is scheduled based on the Erasmus+ funding scheme as already successfully performed this year.

Final Report 2019

**ASEA-UNINET Workshop on  
Biopharmaceuticals, Proteomics and Biological Mass Spectrometry  
20-22. Nov. 2019**



*The participants of the Workshop, © University of Medicine and Pharmacy HCMC, School of Pharmacy*

**Project leader:** Univ. Prof. Dr. Ebrahim Razzazi-Fazeli / VetCore Facility for Research / University of Veterinary Medicine Vienna

He is head of the Proteomics Unit at the VetCore Facility for Research / University of Veterinary Medicine Vienna. He studied Biotechnology at the University of Natural Resources and Life Sciences (BOKU) in Vienna and made his PhD at the Medical University of Vienna in the field of therapeutic drug monitoring. He was group leader at the Quality Control department of a biopharmaceutical company (Boehringer Ingelheim Austria). Furthermore, he was at the Hoffman La Roche central research unit / Basel Switzerland before he joined the Vetmeduni Vienna 23 years ago. His main research field is biological mass spectrometry and its application in bioanalysis. He established various proteomics methods and technologies needed in this field at VetCore of the university. At the VetCore Facility, the major field of work focuses on identification and quantification of proteins and peptides using interfacing liquid chromatography with mass spectrometry by LC-MS/MS or MALDI-TOF/TOF.

Itze-Mayrhofer Corina, Dr. / Institute of Animal Breeding and Genetics, Molecular Reproduction, IFA-Tulln / University of Veterinary Medicine Vienna, Vienna Austria.

Corina Itze-Mayrhofer studied biology/genetics at the University of Vienna and acquired profound expertise in proteomics during her PhD at the Institute of Clinical Pathology, Medical University of Vienna and her post-doc work at the Institute of Cell and Molecular Biology, Uppsala University. She is currently a group leader. She works on proteomics in biomedicine, including cancer and reproductive biology. Her research is focused on the secretory activity of epithelial cells from the reproductive tract but she is also undertaking research and development on methodologies for the analysis of post-translational modifications and for subcellular fractionation.

Nöbauer Katharina, Dr.rer.nat / VetCore Facility for Research / University of Veterinary Medicine Vienna

Katharina Nöbauer started working at the Proteomics Unit of VetCore Facility for Research after finishing her studies in biological chemistry at the University of Vienna in 2007. In 2017, she finished her PhD in Biological Analytics at the Vetmeduni Vienna. Her work focus is the identification and quantification of proteins in biological samples of various origin as well as the establishment of protein databases and identification of proteins in uncommon species.

#### **Vietnamese organizers:**

Prof. Dr. Khac-Minh Thai

University of Medicine and Pharmacy / Department of Medicinal/Pharmaceutical Chemistry / School of Pharmacy / Ho Chi Minh City, Vietnam

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Dr. Quoc-Thai Nguyen made his Bachelor in Pharmacy at University of Medicine and Pharmacy at Ho Chi Minh City and his Master of Medical Pharmaceutical Sciences from University of Groningen, The Netherlands. He was selected for a Joint doctoral training at Biomolecular Sciences and Biotechnology Institute / University of Groningen – and Department of Biology and Biotechnology, University of Pavia, Italy. Since 2008 he is lecturer and research fellow at University of Medicine and Pharmacy / Department of Medicinal/Pharmaceutical Chemistry / School of Pharmacy / Ho Chi Minh City.



*The organizers of the Workshop, @ University of Medicine and Pharmacy HCMC, School of Pharmacy*

#### **Introduction**

Nowadays, biological mass spectrometry plays a key role in the pharmaceutical sector, especially in the field of drug discovery and research. Due to its high sensitivity and rapidness, this tool is advantageous and offers an attractive alternative to conventional, more traditional bioanalytical methods.

Likewise, biological mass spectrometry is the core element of different “omics” technologies, namely proteomics and metabolomics. These technologies have substantially contributed to the characterization of biological processes and systems. The use of a proteomic approach not only complements genome as well as transcriptome data but moreover enables a deeper insight into the complex protein profiles of organisms, tissues or cells. Amongst others, this fact makes the approach suitable to evaluate drugs as well as therapeutic molecules (biopharmaceuticals). Moreover, it can provide detailed structural information and the unambiguous identification of proteins.

The ASEA-UNINET workshop on Biopharmaceuticals, Proteomics and Biological Mass Spectrometry at the University of Medicine and Pharmacy / Department of Medicinal / Pharmaceutical Chemistry / School of Pharmacy / Ho Chi Minh City, has provided a comprehensive overview of biopharmaceuticals as well as biological mass spectrometry, its development as well as its important role in bioanalysis and biopharmaceutical analysis. Furthermore, application of this sophisticated technology in biology and proteomics was highlighted. A practical part at the third day was focusing on protein databases and protein identification strategies.

### Project Description

ASEA-UNINET workshop 2019 was hosted at the University of Medicine and Pharmacy, Nov. 20-22, 2019.

Dr. Quoc-Thai Nguyen and Prof. Dr. Khac-Minh Thai from Faculty of Pharmacy, who made tremendous efforts, organized the workshop.

From Austria, Prof. Ebrahim Razzazi-Fazeli, Dr. Katharina Nöbauer and Dr. Corina Itze-Mayrhofer, University of Veterinary Medicine Vienna, held lectures at the workshop.



Talk with Prof. Razzazi, © University of Medicine and Pharmacy HCMC, School of Pharmacy

### Aim of the Project

The project aimed at giving a theoretical introduction into biological mass spectrometry with focus on biopharmaceuticals and proteomics strategies. The program implicated academic staff of Vietnamese partner universities, postgraduates, PhD and master students, researchers as well as pharmaceutical industries. The workshop was an application-based knowhow transfer program. About 45 participants from different universities in Vietnam attended the workshop.

### Day. 1. Preparation of Workshop and Training course

Meeting the dean Prof. Dr. Tran Thanh Dao, Vice Dean of Faculty of Pharmacy / University of Medicine and Pharmacy as well as meeting with the workshop organizing committee Dr. Quoc-Thai Nguyen, Mr. Nguyen Minh Phuong and Prof. Dr. Khac-Minh Thai at the Faculty of Pharmaceutical Sciences in order to discuss details and to prepare workshop for next two days. Emerging points as

well as organizing aspects were discussed deeply. A further activity was to visit the students' labs at Faculty of Pharmacy and a meeting with Dr. Tran Thi Van Anh, who is responsible for the HPLC-MS instrument.



*Groupwork with Dr. Noebauer, © University of Medicine and Pharmacy HCMC, School of Pharmacy*

### **Day 2. Opening, Introduction and Theoretical Part**

Professor Tran Thanh Dao, Vice Dean of the Faculty of Pharmacy, who welcomed the participants and lecturers in the opening ceremony, opened the workshop. Prof. Razzazi gave an introduction and overview on the activities of ASEA-UNINET with Vietnam and the cooperation with the University of Veterinary Medicine in Vienna.

On the first day, the workshop started with an introductory lecture on proteome analysis, which was presented by Dr. Itze-Mayrhofer. She also gave a lecture on fundamentals of 2D electrophoresis. Furthermore, the identification of proteins and biomarkers relevant in drug discovery was discussed. Other topics of the workshop were biopharmaceuticals and biological mass spectrometry, which were presented by Prof. Razzazi.

### **Day 3. Practical part on protein databases and overview of protein identification**

The program of the third day focused on the basics of protein identification and database search strategies. The lectures given by Dr. Corina Itze-Mayrhofer and Dr. Katharina Nöbauer focused on the identification and quantification of proteins using LC-MS/MS. In a "hands-on" part, the participants were introduced to database search strategies.

An interactive session reviewing and highlighting the potential and advantages as well as disadvantages of each method and strategy, respectively completed the workshop.

The organizers want to thank ASEA-UNINET and Dr. Quoc-Thai Nguyen, Mr. Nguyen Minh Phuong and Prof. Dr. Khac-Minh Thai for their contribution to the workshop.

*Prepared by:  
Univ.Prof.Dr. Ebrahim Razzazi-Fazeli  
Dr.rer.nat Corina Itze-Mayrhofer  
Dr.rer.nat Katharina Nöbauer*

## Internship at Kasetsart University in Thailand February 2020

### **Participants:**

Julia Kohlmann and Isabella Grünberger, both students at the University of Veterinary Medicine Vienna

### **Report:**

Although Thailand seems to be a rather unconventional country to do an internship in as European students, we, Isabella and Julia, decided to give it a try. A presentation about the Kasetsart University veterinary faculty made it very interesting for us and we had the feeling, that this internship had a lot to offer. We decided to go to 2 of the 5 campuses offered - two weeks in Bangkok and one week in Kamphaeng Saen.

At the Veterinary teaching hospital in Bangkok, we could choose different units to gain experiences in almost every field they offer there. In the VTH they offer a lot of treatments and diagnostic services. Imaging, Surgery, Outpatient Department (OPD), Cardiology, Neurology, Urology, Rehabilitation center, Critical Care Unit (CCU), as well as exotics are some of the units to name a few.

We were lucky and spent one week at the surgery unit, where we could gain our first clinical experiences in preparation, anesthesia and surgery itself.

In week two we got insights into OPD, Urology, Cardiology and Neurology and got the possibility to learn from some of Thailand's best veterinarians. We are so thankful for that!

Our third and last full week in Thailand was all about large animals at the biggest campus in Kamphaeng Saen. Two and a-half-days were dedicated to ruminants only. We went out with the mobile ruminant vets to treat different cases like tail amputations, mastitis or dehorning calves.

The last two-and-a-half days were spent at the equine clinic with lots of action and emergencies – we got the chance to see two colic operations there as well as horses with neurological diseases.

We both are so thankful that we were lucky enough to go to Thailand for our internship and to learn from so many amazing veterinarians and net nurses. Thailand will always have a special place in our hearts 😊

Isabella & Julia

## Mahidol University – College of Music, Salaya, Thailand Nov. 21st – Dec. 1st, 2019

Projectleader: **em.o.Univ.-Prof. Mag. Dr. Carole Dawn REINHART**

University of Music and Performing Arts in Vienna

Leonard Bernstein Institute

E-Mail: [carole@cdreinhart](mailto:carole@cdreinhart)

Reknowned trumpet soloist Carole Dawn REINHART had an extensive career of concerts with symphony orchestras and chamber orchestras all over the world. In 1983, she was offered a professorship at the prestigious University of Music in Vienna, Austria. She continues teaching as Professor Emeritus, gives master classes around the world (emphasizing the elements of Viennese style), and serves as a juror for solo competitions.

### Report

Since I have been involved in this exchange program for many years, Dr. Joseph Bowman had asked me if I would be willing to participate in an "expertise" panel relating to the international accreditation of the College of Music's Master programs. They were being evaluated by the organization MUSIQUE just a few days before my scheduled work week. Of course I was glad to support the College in its endeavor and so I flew to Thailand earlier than usual. It was an interesting experience to be part of that process, and I was able to give some details of the continual improvements and efforts that I have observed over the years that I have been going there to teach.

My work with the students always involves both class instruction and private lessons, usually with a few "on-lookers". In the Trumpet Studio session, for all trumpet students (college and pre-college), I played works from my newest CD, recorded in 1971, but never before made available. Usually, I had mainly stayed with standard classical trumpet repertoire, but these works use more cornet techniques, lots of fast double tonguing and triple tonguing, as show pieces. The importance of these works is bringing the ease of fast runs and tonguing for use in orchestral or classical solo playing, and also to show that there are other musical areas available professionally. The students and faculty responded with enthusiasm and fascination.

It's especially rewarding to hear the progress and to see the expectation when students come in for their private lessons. The following e-mail is from an extremely talented 19 year-old student, Kunyaporn Wirunpochit (see photo), with whom I had also worked last year. In her very humble English, she expresses the atmosphere and success of my efforts.

*Dear Teacher Carole*

*Merry Christmas Teacher Carole Teacher Joe told me that you want to bring me with you. I feel happy and appreciate to hear that. Thank you for knowledge and inspiration. It's very valuable to me. When I met you and get to know your background these things make me fun and have to courage to play trumpet. Next years, When you comeback in Thailand I will speak english better and play trumpet*

*better I will keep practicing. Because I want to talk to learn to you. You are great musician and good trumpet teacher you give inspiration to me I appreciate it. Wish you happiness. Merry Christmas*



© Carole Dawn REINHART

As much as this e-mail has touched my heart with joy, it also saddens me to know, that due to an arbitrary age discriminating decision, I no longer will be allowed to have the chance to participate in this project. I truly believe that I have opened a new musical world for these students. Not only have I been able to help them technically, but also have taught them the important elements of the "Viennese style" (as I learned from Prof. Helmuth Wobisch) – clean, clear articulation, precise rhythm, and open straight sound, all important for the styling of the Viennese Classical concerti by Haydn, Hummel and Neruda. It's an advantage to work with the students over several years rather than just a one time experience.

It's also worthwhile to observe the available musical venues. The two "Harry Potter" concerts of the Thailand Philharmonic Orchestra in Prince Mahidol Concert Hall, which seats 2,000 people, were "sold out" events. The symphony orchestra played all of the music "live" while the movie was being shown on a big screen. The trumpet parts were demanding and strongly lead by the young solo trumpeter, with whom I've also worked several years. This time, we especially worked on Mahler's Fifth Symphony (for his next TPO concert), and went through the repertoire for an audition for the Hong Kong Philharmonic Orchestra.

As always, I enjoyed a Pre-College concert, under a travelogue theme with "American" jazz and big band music, and the "South of the Border" guitar orchestra. This once a year project of three concerts displays the creativity and fantastic abilities of this preparatory program being integrated on campus with the college program.

I was again able to enjoy an outing with my former ASEA scholarship student and her family. I am grateful for having the opportunity to have been a part of this exchange program.

## THE BASSO CONTINUO-WORKSHOP AT MAHIDOL UNIVERSITY (THAILAND) 29<sup>TH</sup> JULY– 2<sup>ND</sup> AUGUST, 2019

Projectleader: **Univ.-Prof. Mag.art. Dr.phil. Peter Hrcirik**

Professor for composition and aural training at the Anton Bruckner Institute for Choir and Ensemble Conducting as well as Composition in Music Pedagogy

E-Mail: [hrcirik@mdw.ac.at](mailto:hrcirik@mdw.ac.at)

Peter Hrcirik, born in Vienna in 1964, studied music education and instrumental music education (the latter for the subjects of organ and voice) at the University of Music (Musikhochschule) Vienna (graduated with distinction in 1990), also organ concert studies with Prof. Dr. Rudolf Scholz at the same university (concert diploma in 1991). Moreover, complementary composition studies with Prof. Dr. Erich Romanovsky and Prof. Mag. Heinrich Gattermeyer; interuniversity doctoral studies (doctorate in 1996).

Various research and teaching assignments at the University of Music and Performing Arts Vienna (mdw) since 1994; since 2012 junior lecturer for composition at the Anton Bruckner Institute, professorship in 2017. Since October 2018 deputy head of the Institute.

Focus of his teaching and research activities: basso continuo, harmonics, developments and processes of the 18<sup>th</sup> and 19<sup>th</sup> centuries.

### REPORT

The first Basso Continuo Workshop I conducted at the College of Music at Mahidol University in August 2018 has proven to be a successful course. Both my Thai colleague responsible for organizing the course on site and a number of students asked whether there was an opportunity to offer a continuation of this course in 2019. The positive response and especially the demand from the students prompted me to resubmit a Basso Continuo Workshop-“Reissue” for young pianists at the Music college for 2019, and I would like to thank both Mahidol University and ASEA UNINET that my request for a continuation of this course was answered positively.

Initially, for 2019 it was planned to work for two weeks at Mahidol campus in Salaya, firstly to continue the five-day course of 2018 in the first week and secondly to hold a beginner course with six new students the following week, or vice versa. However, it soon turned out that, for organizational and time-related reasons, two courses could not be realized and only two students (from six) of 2018 were able to continue their course.

Because of these circumstances, my colleague Dr. Sornsuang Tangsinmonkong has drawn up a meticulous timetable that, with the exception of a very small subsequent adjustment of two timelines, could actually be kept unchanged, and I am particularly grateful to Dr. Tangsinmonkong for completing this difficult task.

A special feature of the course from 2019 should be mentioned here: The experience of 2018 has shown that a Basso Continuo Workshop, which is about baroque ensemble playing technique and thus ultimately about accompanying technique, should also offer the students the opportunity to actually make music in an ensemble, i.e. in association with other musicians. (At the final concert in 2018 I played the solo passages of all pieces of music as a makeshift with my right hand on a second piano myself, since no musicians who could have performed the solo parts were available.) For 2019, I suggested to invite some additional students or teachers of the College to play or sing the string, wind and vocal parts with my piano students in the ensemble. To my very special pleasure, Dr. Tangsinmonkong also responded to this special proposal and was able to organize two students (a flutist and a violinist) and a vocal teacher of the College to participate in our final recital. The possibility of real baroque ensemble playing meant a significant increase in the content of the workshop compared to the previous year.

The course was held from Monday July 29th to Friday August 2nd 2019.

As in the previous year, I held a two-hour introductory lecture on the technique of baroque figured bass playing with practical examples on the piano and corresponding handouts for the students on the first day of the course from 10 a.m. Likewise, the timetable was again worked out in a tried and tested manner so that both single lessons and group sessions could be held every day (except Monday). While the single lessons naturally focused on developing and deepening the personal playing technique of the individual students, the group sessions focused on demonstrating important basics and stylistic peculiarities of chord playing and musical voice leading on camera screens and practicing together in group playing.



© Dr. Sornsuang Tangsinmonkong / College of Music at Mahidol University, Bangkok

Since eight (instead of six) students took part in the course in 2019 - two advanced students (who continued their course from 2018 with me) and 6 beginners - daily lessons started at 9 a.m. instead of 10 a.m. to ensure a daily half hour single lesson for each student. The group sessions always took place in an afternoon timeline. It should be mentioned that almost every day, in addition to their daily workload, in the late afternoon, some students voluntarily took additional lessons with me.

The final recital took place on Friday, August 2nd, this time not in a concert hall, but, for organizational reasons, in a classroom with tables, but this did not in any way hinder the adequate performance of the audition. This time there was also a much larger audience than in 2018, which motivated the performing musicians in a special way.

The composition of the student group was international in that – in addition to the Thai students – an ambitious Korean master student also took part in the course.

I can say that this time it was really successful to give every student the best possible musical support. The musical program was very broad: pieces by Bach, Handel, Telemann, Loeillet, Geminiani, Rossetti and many other baroque composers were performed.

Only a few special features of the program should be emphasized: Three songs from the Schemelli hymnal (Bach) were performed, and that in special English translations – I could imagine that these songs have probably never been heard in Thailand before; two movements from Bach's very demanding G major trio sonata BWV 1038 for flute, violin and continuo were also played; the Korean student (mentioned above) tried very successfully on an embellished continuo realization of the E minor aria from Handel's rarely heard cantata "Madonna che in ciel" (HWV 233). The continuo parts were mainly played by the students according to the figures, and some of them worked out their realizations in writing.

Leading through the program of the concert afternoon, I tried to use my introductory and conveying remarks to show historical and compositional backgrounds of the pieces in order to deepen their understanding.

The cooperation with Mahidol University, both in the run-up to the organization and in the actual implementation on site, worked perfectly and I would like to thank Dr. Sornsuang Tangsinmonkong once again in a very special way: she is my main contact person, from whom I always feel supported in a pleasant and courteous manner. Thank you very much for that!

The wide range of classrooms, the modern technical equipment on campus as well as the personal care, accommodation and meals of the guest teachers deserve great praise.

The confrontation with European baroque ensemble music, which is certainly not an everyday-topic for Thai piano students, in a concentrated form for a whole week, I believe, can contribute to enriching and deepening the understanding of European music culture by an essential facet.

In 2019 Austria and Thailand celebrated 150 years of friendship in economic and cultural terms. My Basso Continuo Workshop was a cultural contribution to this special year. I consider that gratefully as a fitting historical background, against which a piece of international understanding was allowed to take place.



© Dr. Sornsuang Tangsinmonkong / College of Music at Mahidol University, Bangkok

## Recital, Workshop, Lecture Albert Sassmann, College of Music, Mahidol University

**Project Leader:** Albert Sassmann, M.A., D.M.A.; University of Music and Performing Arts Vienna, Ludwig van Beethoven Department of Piano and Harpsichord in Music Education;  
sassmann@mdw.ac.at

Albert Sassmann studied piano at the University of Music and Performing Arts Vienna with Hans Kann and Peter Efler. He holds a Doctor of Musical Arts degree from the "Gheorghe Dima" Music Academy, Cluj-Napoca. Sassmann has performed as a soloist and chamber musician throughout Europe and in the USA, the Middle East, Australia, and East and South-East Asia. He gives lectures on piano-related topics and master classes at various music institutes, and is a regular guest on juries of youth competitions.

**Report:** There has already been collaboration between the Ludwig van Beethoven Department of Piano and Harpsichord in Music Education and the College of Music, Mahidol University, since Professor Emeritus Harald Ossberger had visited Mahidol University some years ago. The intention of this project was to continue and expand this collaboration.

The project consisted of a Piano recital, a Lecture, a public Masterclass, and two afternoons of individual piano lessons with students of the College of Music, Mahidol University (programme and schedule attached).

- It started on Monday, August 26th, 2019 with the public Masterclass, where three students played the following pieces: Muzio Clementi Sonata in B minor op. 40, no. 2, 1st movement; Ludwig van Beethoven, Sonata op. 27, no. 1, movements no. 1 and 2; William Bolcom, "Seabiscuits Rag" (from Three Popular Rags).

- On Tuesday, August 27th, 2019 the Piano Recital took place in the MUIC Pre-College Program Building, at 7pm. The programme concept was to present a stylistic variety of piano compositions from the First till the "Second" Viennese School.

- On Wednesday, August 28th, 2019 individual piano lessons were given. The following pieces were played: Franz Schubert, Impromptu in F minor, D 935, no. 4; Wolfgang A. Mozart, Piano Sonata No. 12 in F major, K. 332, 2nd movement; Franz Liszt: Liebestraum no. 3; Franz Liszt: Après une Lecture de Dante: Fantasia Quasi Sonata.

- On Thursday, August 29th, 2019 the Lecture was held, the title was: "Contemporary piano works for young learners: some aspects of Pedagogical piano music of our time".

In this lecture I talked about piano pieces for pedagogical use, i.e., pieces that, at appropriate levels of difficulty, have significant didactic potential without being compromised in their aesthetic appeal. The

first part of the lecture took a brief look at historical developments in the field of piano literature written for the pedagogical context. The lecture continued with a detailed presentation of the Mauricio Kagel Composition Competition, which has been organised by the Ludwig van Beethoven Department of Piano and Harpsichord in Music Education of the University of Music and Performing Arts Vienna since 2010 and took place for the fourth time in February 2019. Its aim is to inspire composers to write piano pieces that, while using a compelling contemporary musical language, can be played by children and young adults and can be practically integrated into piano teaching. In addition, the lecture discussed the competition's rules and the unique way in which the competition is conducted. Finally, on the basis of the jury's discussions and various competition pieces, an attempt was made to identify and elaborate upon certain practical aspects and tendencies related to style, pianistic character, and performance practice.

During the lecture several score samples were shown, and music samples were played. After the lecture exemplars of K2010, K2013, and K2016 (publications of the prize winning pieces of the Mauricio Kagel Composition Competitions 2010-2016) were presented to the head of the Piano Department and to the library of the College of Music, Mahidol University.

- On Friday, August 30th, 2019 additional individual piano lessons were given. The following pieces were played: Edvard Grieg, Piano Concerto No 1, 1st movement; Sergei Prokofiev, from Visions fugitives op. 22, no. 15 and 16; Wolfgang A. Mozart, Piano Sonata No.13 in B-flat major, K. 333, 1st movement; and Felix Mendelssohn Bartholdy, Rondo capriccioso op. 16.



*Classrooms at the Mahidol University, Bangkok; © A. Sassmann*

The intention of the project was on the one hand to discuss current topics in piano pedagogy. Here the lecture presented many compositions, contemporary composition- and playing techniques that were new to the students. On the other hand the idea was to present in the Masterclasses different pedagogical approaches and different point of views concerning style, performance practice, editions, practicing methods, and communication.

These different approaches and point of views were discussed during the lessons, and after the Lecture, where I had the opportunity to talk to other piano teachers of the Piano Department.

## Ausarbeitung einer Strategie zur Vernetzung verteilter Daten musikethnologischer Sammlungen - Elaboration of a strategy for distributed ethnomusicology data

Alex Hofmann, Ph.D.  
Universität für Musik und darstellende Kunst Wien

In Kooperation mit:  
Prof. Dr. Andreas Rauber  
Technische Universität Wien

Partner in Asien:  
Prof. Joseph Bowmann  
Mahidol University - College of Music

### CVs of involved personel at mdw

**Alex Hofmann (hofmann-alex@mdw.ac.at):**

Alex Hofmann is a researcher at the Institute of Music Acoustics (Viennese Sound Characteristics) at the University of Music and Performing Arts Vienna. The institute carries out research on acoustics of musical instruments, organology and performance science and holds a data-base with more than 14.000 entries on topics related to organology. His research focus lays on woodwind music performance, instrument acoustics, performance science, and computer music. He also worked as a sound designer (e.g. Native Instruments GmbH, Berlin) and contributed material to the open source software project Csound, where he was one of the initiators of the biannual International Csound Conferences held since 2011.

**Ardian Ahmedaja (ahmedaja@mdw.ac.at):**

Studied composition (with Erich Urbanner) and the theory of music (with Diether de la Motte) at the Hochschule für Musik und darstellende Kunst Vienna. Magister artium in 1995 on the basis of treatises on *Il primo libro di capricci* (1624) by Girolamo Frescobaldi and *Rendering* (1990) by Luciano Berio. Studied European ethnology and musicology at the University of Vienna. PhD in 1999 based on the work *Zur Melodik der albanischen Volkslieder. Eine Typologie der gegischen Lieder* [On the Melody of Albanian Folk Songs. A Typology of Gegë Songs]). Since 1999 researcher at the Institute for Folk Music Research and Ethnomusicology of the University of Music and Performing Arts Vienna. In 2003 initiated the establishment of the Research Centre for European Multipart Music. Research areas up to now have been local practices in Albania and neighbouring countries, maqam, music and minorities, religious and secular musical practice, transcription and analysis, multipart music. Fieldwork in several Balkan and Mediterranean countries, in the European Alpine region and in the USA.

**Hande Saglam (saglam@mdw.ac.at):**

Hande Saglam got degrees in Composition in Ankara - Bilkent University, Magister in music theory from the University of Music and Performing Arts Vienna (mdw) and received her doctoral degree in Ethnomusicology from the Department of Folk Music Research and Ethnomusicology (IVE), at the same University with the thesis "Differences among Alevi and

Sunni Âşiks in Sivas”. Between 2005 and 2017 she has been working at the mdw on different research projects on music and minorities. Since July 2015 she works as head of the institute's archive and deputy director of the IVE at the mdw. Her research interests are Music and minorities, Music from Turkey, Anatolian âşık tradition, bi- and multimusicality, archiving, methodology of fieldwork.

## Introduction

While the South-East Asian musical heritage is particularly rich, it is highly diverse and scattered across multiple countries and regions. The same holds for existing ethnomusicological resources.

Music research involves various kinds of data, ranging from written sources (manuscripts, music sheets, publications, etc) to audio and video recordings in different formats (analogue, digital) with varying additional information (Metadata) about contents and contexts of the performances, the performers, their ideas and viewpoints, musical instruments and the way of their use and so on. Until now, researchers and institutions have developed primarily individual ways to collect and store such data, either digitally or in a card-index cabinet. Data search in such self-contained storages is difficult and searching across multiple storages can be very time consuming. This presents a barrier for conducting contemporary, computer-aided musicological research. For instance, incompatible data structures prevent applying automated data analysis and indexing across music collections to provide new ways to access the data and gain new insights. This includes the use of visualization techniques and state-of-the-art machine learning methods on existing data sets, which may reveal hidden connections between different areas within music research.

## Report of Action

This second research visit to the Mahidol University Bangkok focussed on an exchange of concepts and an in-depth discussion on prototypes for a data infrastructure that would allow future collaborative research. Based on the information gathered in the previous project from 2018 (‘Towards an alliance for distributed ethnomusicology data’), the action included finding open source data systems that would allow all partner institutions to connect their archives. In a public workshop and smaller group exchange meetings, the ethnomusicology and ICT experts from Austria, Thailand, and Malaysia discussed different concepts and challenges in connection with the exchange of research data in ethnomusicology. All gathered information and prepared setups were presented and discussed in the public workshop at the Music Campus for the General Public of the Mahidol University in Bangkok.

In the workshop Dr. Achmedaja (mdw), gave a presentation about the opportunities that lay in such a data alliance. Following his introduction, he led an open discussion on the value of big data-driven research for ethnomusicology researchers and institutions.

Following, a setup for an Opens Source Repository solution was prepared by TU Vienna and presented to the participating institutions. This prototype for an easy-to-setup repository system based on Dataverse and concepts for compatible-meta data exchange were discussed. The discussion was led by Dr. Miksa (TU-Vienna). In the discussion on repository systems, controlled data access turned out to be a crucial point for researchers in the music domain. Whereas meta-data can be shared in most cases, the audio or video recordings can sometimes



**Malaysia: Faculty of Music Silapakorn University: Isabella Pek**

Ms. Pek, a music lecturer who had been teaching at ASWARA Malaysia since 2008. SEAMEX 2018 is supported by the Association of Southeast Asia Directors of Music (SEADOM), an association of institutions in Southeast Asia involved in professional music training.

**Latvia: University of Latvia: Anada Beitane**

Dr. Anda Beitāne is Professor and Vice-Rector for Research and Creative Work at Jāzeps Vītols Latvian Academy of Music and researcher at the Institute of Literature, Folklore and Art at the University of Latvia, Archives of Latvian Folklore.

**Thailand: King Mongkut's University of Technology Thonburi: Sutthiphong Ruangchante, Kachanon Nirunpong**

Mr. Sutthiphong Ruangchante is a researcher and lecturer in the domain of sound studies, affiliated with the College of Multidisciplinary Sciences.

**Mahidol University: Prof. Dr. Boonsit Yimwadsana (ICT), Dr. Krit Buranavitayawut (College of Music)**

- very interested in a further development of the music database and
- would like to find ways to apply for additional funding of the project for infrastructure and personnel.
- offered to help to coordinate such an effort

**Philippines: U.P. Center for Ethnomusicology: Roan Opiso**

- Interested in regular updates on the repository prototype development

**Malaysia: Dr. Pek Lin Chong (private collection)**

- Provided research data (audio+transcriptions) for testing of MIR algorithms

## Future steps

To proceed towards the establishment of a networked research infrastructure for ethnomusicological research three action streams were identified:

1) Repository infrastructure: Based on the prepared Opens Source Repository solutions by TU Wien, institutions were encouraged to contact their IT-services to setup and host own data repositories. These will be populated by each institution with some selected data items to evaluate their fitness for musicological research purposes. Customizations for the GUI Frontend are foreseen to be made before deployment to other institutions.

2) Music IR: Key applications for automatic meta-data extraction from audio content were identified. This involves, automatic segmentation (e.g. speech vs. music), automated instrument detection, pitch detection for solo performances, event detection

3) Policies: adopting policies that establish research data management as a core activity is still an ongoing topic, defining the respective responsibilities and providing the required services.

To this end, existing research data management policies as presented during the first workshop (the templates developed by the LEARN project, the specific RDM policy adopted by TU Wien) were brought into the discussions and are shared and discussed at the various institutions, identifying adaptations needed in the local contexts.



*2<sup>nd</sup> Workshop on Distributed Ethnomusicology Data and Music Information Retrieval in the Framework of ASEA-Uninet held at the Mahidol University Bangkok, Thailand. (Picture by Tomasz Miksa taken at the Music Campus for the General Public, Mahidol University.)*

## Piano master class for regular and young students in Vietnam as well as pedagogical exchange

Date:	September 16. - 20., 2019
Venues:	Vietnam National Academy of Music Hanoi, Vietnam
Project leader:	Prof. Tim Ovens, Ludwig van Beethoven Department of Piano and Harpsichord in Music Education, University of Music and Performing Arts Vienna, Austria
Involved partners:	Prof. Thuyen Nguyen, Dean of the piano faculty Ms. Thi Hayvan Nguyen, in charge for international exchange both: Vietnam National Academy of Music Hanoi, Vietnam

In the course of my stay in Hanoi I gave a masterclass combined with daily meetings and discussions with colleagues and students. So I could check out the conditions, the possibilities, and the interest in possible future cooperations.

In consultation with the other piano professors and via an audition the dean of the piano faculty Prof. Thuyen Nguyen had chosen nearly 30 of the best students of the academy which could take part in the masterclass, which was perfectly organized.

Some of them were in preparation of an international piano competition in Malaysia shortly after the masterclass. Two others were preparing public piano concertos with orchestra, another one preparing a solo recital.

With several students I could work in the course of the master class for two, three or even four times. Every day I gave eight lessons, each of them lasting 45 minutes.



© Vietnam National Academy of Music Hanoi, Vietnam

The audience consisted of both students and colleagues. The audience generally was highly interested and attended the masterclasses very concentrated.

We had time for discussions every day. In these discussion rounds we spoke about the individual abilities and level of the students which took part in the masterclass. There was an interested exchange about aspects of interpreting and practicing the piano.

There also had been discussions about pedagogical and methodological questions, what is for me a very important factor in my activities at a lot of international music academies and universities.

Generally my project was very successful. Worth mentioning is the great interest on the part of the piano professors in raising the skills of their students.

Concerning the level of the students I can say, that there is a high potential especially at the very young students. For example there had been three students in the age between 13 and 14, which played piano concertos and other high demanding works of the piano literature both on a technical and musical remarkable level. The teachers of these young students would be very happy, if later they would have a chance to study at the University of Music and Performing Arts Vienna – what is quite conceivable. Up to now usually the best young students go abroad to study at famous international music academies and universities. But the conditions of the Vietnam National Academy of Music and also the living conditions in Vietnam are growing better. Also master classes like this one will help to raise the attractiveness of the Vietnam National Academy of Music itself, what will help to hold also these highly qualified young musicians in the country, which ever is an aim of my international activities.

I ever can emphasize that the University of Music and Performing Arts Vienna can show with projects like this not only the high level of its teachers but also the importance of the musical pedagogical themes as a base of all musical life. As a side effect we show the Austrian attractiveness as one of the highest ranking locations for studying music.



© Vietnam National Academy of Music Hanoi, Vietnam

## Short-term music scholarships (incoming) in the framework of ASEA-UNINET

**isa** is the **International Summer Academy** of the mdw – University of Music and Performing Arts →Vienna. Each year, over 250 participants from more than 40 different countries receive training geared to highly advanced and talented musicians as part of this programme, which is held south of Vienna in Austria’s Semmering region.

**isa** was established in 1991 as an initiative of the mdw – University of Music and Performing Arts under the leadership of Univ.-Prof. DDr. h. c. Michael Frischenschlager. It was born amidst the euphoria generated by the fall of the Iron Curtain and had as its goal the facilitation of musical encounters and international networking for particularly gifted young students, in particular for those from Central and Eastern European (CEE) countries.



© Stephan Polzer

Beginning with the 15th edition of isa (2005), Univ.-Prof. Dr h.c. Johannes Meissl worked consistently to develop the International Summer Academy into an event that draws its identity from its mix of courses, topically diverse workshops, the associated festival, academic reflection, innovative interdisciplinary artistic projects, and the building of networks based on new friendships. World-class quality and participants from 45 countries around the

globe combined with the overall “isa-experience” have by now made the mdw’s International Summer Academy into an event that is unique the world over.

Master classes, workshops, lectures, interdisciplinary projects, and concerts give rise to a unique creative experience for aspiring young artists. And the intense atmosphere in which all this takes place leads to new friendships and networks.

The key theme for isa19, the International Summer Academy’s 29th edition, was “Just Play!?”. Thanks to the support of ASEA Uninet, two music students from Thailand were invited to participate.



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### **Scholarship Awards 2019:**

Mr. Kittipon Sanboonruang - oboe

Mr. Nattawut Sungkasaro - double bass

***The International Summer Academy of  
 The University of Music and Performing Arts Vienna  
 11 to 25 August 2019***

*Report by: Mr. Kittipon Sanboonruang  
 Princess Galyani Vadhana Institute of Music*

***Education :***

*2016 – Present Bachelor of Music (Oboe), Princess Galyani Vadhana Institute of Music*  
  
*2006 – 2011 Vocational Certificate, The Royal Thai Navy School of Music Certification*  
  
*March, 2017 The Program of Live Sound Engineer, Butterfly Studio Work Experience*  
  
*2015 – 2018 Oboist of Princess Galyani Vadhana Institute of Music Youth Orchestra*  
  
*2016 1st Oboe of The Flying Dutchman Richard Wagner's, Singapore Music Festival*  
  
*2011-2015 Oboist of The Royal Thai Navy Orchestra*

***Master Class***

*Oboe Professor:*

*Christian Wetzel (1st Week)*

*Jean-Louis Capezzali (2nd Week)*

*Accompanists:*

*Jin-Young Lee (1st Week)*

*Kei Hikichi (2nd Week)*

*Repertoire for ISA:*

*Pieces for working on in Master class*

*Francis Poulenc Sonata for Oboe and Piano*

*Saint-saens Sonata for Oboe and Piano Op.166*

*J.W. Kalliwoda Morceau de Salon*





### ***Knowledge and Experience gained***

*The experience I gained from joining the ISA2019 program is one of the experiences that taught me there was more to music than practicing. I also needed to understand what I'm doing. My fellow Oboe players who joined this program were still young but had true talent and skillsets in their specialty. They knew how to play as well as the theories and history behind the songs they chose, which gave me and my musical career quite a push in the right direction.*

*In the first week of ISA 2019, Professor Christian Wetzel taught us. He always reminded us that everything we play in the Oboe was all according to our mindset, the preparation, the speed. It was not just how or what we practiced. When practicing, we shouldn't just play according to the notes, but we should alter it to challenge our abilities and brains' capabilities. It will make our performances more natural when we come back to the original notes. He's also always say "Know what you're playing and who you're playing with." The keys he always recited was 1) Mindset 2) Basic 3) Rhythm 4) Intonation 5) Music.*

*In the second week of ISA 2019, Professor Jean-Louis Capezzali taught us. He put much of the emphasis on the basics. When we practiced, we should warm up with Scales, Tone Exercises, Etude for at least thirty minutes. He gave basic music and various types of practices so that our brains would have a challenge. Both of the professors gave importance to our awareness of our surroundings and what we were doing, as well as playing naturally. They also always referenced string instrument's techniques, as well.*

*The experience I gained from ISA 2019 was huge, in my opinion. All of the people there were really intent in gaining experiences and new connections for themselves.*

### ***Experience***

*Chamber Music for Wind*

*Coffee and Cake Concert 24.08.2019*

*Joseph Haydn (1809-1732),arr. Frans Vester*

*Stücke für die Flötenuhr*

*Menuett Hob. XIX:14*

*Andente Hob. XIX:10*

*Andente Hob. XIX:26*

*Edvard Grieg (1843-1907), arr. David Walter*  
*Norwegische Tänze op.35*  
*2.Allegretto tranquillo e grazioso*  
*3.Allegro moderato alla marcia*

*Lukerya Mishneva, Flute*  
*Kittipon Sanboonruang, Oboe*  
*Calvin Kim, Clarinet*  
*Sergey Khvorostyanov, Bassoon*  
*Arina Mishneva, Horn*



*Credits of all photos: Kittipon Sanboonruang*

## **The International Summer Academy of The University of Music and Performing Arts Vienna**

**11 - 25 August 2019**

Mr. Nattawut Sungkasaro,  
Princess Galyani Vadhana Institute of Music, Bangkok, Thailand.

I was master class with Prof. Jiri Hudec in a week and performed solo with piano Bottesini “La Sonnambula” in Friday 16 at the Sport hotel, As join contemporary music workshop and play contemporary ensemble in concert, And next master class with Prof. Josef Niederhammer the whole week about Viennese Style in Vanhal Concerto for Double Bass and Dittersdorf Concerto for Double Bass and studied double bass ensemble with my colleagues for performing in the concert, Among week I had rehearsal FR. Berwald “Stor Septett” with the ISA professor and performing in the concert, I was well supported by ISA teams in Semmering. That's a good place, good teacher, good support.

I have seen new good friends and find more inspirations to create my music from this camp.



*Credits: Nattawut Sungkasaro*

## Report on the visit to Hanoi, Academy of Music

### Masterclass and concert with Hanoi Philharmonic Orchestra

From November 17 to 24 my colleague Univ.-Prof. Avedis Kouyoumdjian, deputy head of the Joseph Haydn Department for Chamber Music, Early Music and Contemporary Music and dean of instrumental performance studies, and I spent an interesting week in Hanoi.

We were treated with enormous hospitality and had very nice encounters with a number of faculty members and the leadership. The vibrant city with its impressive and appealing mixture of traditional Asian, French colonial and modern architecture and the vivid everyday life culture gave us strong cultural experiences. Our hosts led us to the famous sights but also showed us to places we would certainly not have found on our own.

Apart from the official meetings with the institution's leadership our academic stay consisted of three elements: an audition for the scholarship applicants nominated by the academy, master-classes for piano (Kouyoumdjian) and violin (myself) and the concert performance on November 23 with me conducting and Kouyoumdjian playing the solo part in the Mozart concerto.



Four applicants auditioned (2 pianists, a violinist and a singer). The level was heterogenic -from rather impossible to be integrated into the high quality standards of Austrian performing art universities to actually very adequate.

The master-classes revealed a similar picture: a couple of students out of the about 15 instrumentalists we worked with showed the combination of talent, commitment, accomplishment on the instrument and aesthetic advancement that is nowadays required by international standards in Western classical music performance. Others clearly showed. In particular the young talents seem to benefit from the well-established pre-college the academy is running.

My work with the "Hanoi Philharmonic Orchestra", consisting mainly of teachers and students of the academy, was not only to prepare the programme (Schubert's Overture in the Italian style, Mozart's piano concerto in c minor and Beethoven's 1st symphony) but in the first place forming something like an orchestra from scratch.

After a week of intensive rehearsals and especially in relation to the starting point, the concert in the good-sounding Grand Theatre of the academy went remarkably well and was a big success.



*Credit of all photos: Vietnam National Academy of Music*

As a summary I can say that this week was a partly challenging, nevertheless very important and in all positive experience. There is great potential and at the same time big need for support in order to close the gap between the local situation and the international level.

*Univ.-Prof.h.c. Johannes Meissl  
Vice rector for international affairs and art at mdw*

## Laboratory for new Concert Formats in Classical Music

The project was a visiting lecture by Mag. Andreas Vierziger, currently a lecturer at the University of Music and Performing Arts Vienna (Institut für Kulturmanagement und Gender Studies; Email: [hello@andreasvierziger.com](mailto:hello@andreasvierziger.com)).

Besides his position at the University of Music and Performing Arts Vienna (Institut für Kulturmanagement und Gender Studies) Andreas Vierziger has been lecturing as a guest lecturer and visiting lecturer at universities such as Tokyo University of the Arts, Helsinki Sibelius Academy, Moozarteum Salzburg, Royal Academy of Music Copenhagen, Zurich University of the Arts and Paris-Sorbonne, among many others.

Within his own company he works as artistic and strategic consultant and collaborates internationally with concert presenters, festivals, orchestras, record labels, educational institutions and other partners across the classical music business and beyond. As a former artist manager he worked with several artists of highest international acclaim including GRAMMY winners.

He was a board member of Camerata Salzburg and he judged more than 20 international music competitions such as International Johannes Brahms Competition in Austria, Fulbright Concerto Competition and New York Concert Artist Auditions in the USA and Karol Szymanowski International Music Competition in Poland.

### Report:

Classical music is one of the few art forms that didn't see a lot of change, apart from the compositional form. Exchange between classical music and other artistic fields is much easier nowadays and we see a lot of great projects being developed.

New performative formats in classical music gain increasing acclaim and make room for new markets. Classical music presenters often seek attracting new audiences and making our field more accessible to a broader audience. Especially in Europe many of the presenters are very interested in pushing the format of a concert itself.

The Laboratory for new Concert Formats in Classical Music lead by Mag. Andreas Vierziger contained parts of lecturing on which gave a solid overview, explaining key factors of a classical music concert and how they can be changed. Furthermore he presented numerous examples of new concert formats, using PowerPoint slides, photos and video examples.



© College of Music, Mahidol University

These successful examples mostly got international recognition and created new situations for the audience, conquer new venues, create new content and disciplines and cross borders to other disciplines such as performance, dance, visual and contemporary arts and new technologies.

The contents of this lecture covered alternative venues, adapting the venue and the concert situation, combination of classical music and high-tech and new technologies, combination of classical music and dance, combination of classical music and other disciplines and genres, new scenic productions in classical music, changing the parameters of the content of classical music itself and genre-crossover with classical music and/or classical musicians, installations and projects reaching over to forms of contemporary art.

**Questions being discussed were e.g.:**

Is offering new alternatives for presenting classical music still true to the composers' works? Who will be the performers of these concerts and what can be its content? Do we need a traditional concert hall? Can there be new stages? How can we reach new audiences?

In the workshop parts of the laboratory Mag. Andreas Vierziger had the students participating in five groups. Each group could define an individual topic they wanted to work on.



Within group work new concepts relating to this evolution of new concert formats in classical music were developed, discussed and evaluated. While the projects were being created by the participants, the facilitator of this project Mag. Andreas Vierziger interacted with the participants and guided them along the work process. Each group showcased their results using PowerPoint or Keynote as

presentation tools. The students were asked to focus on the concept and not necessarily on financial feasibility. Nevertheless, this was being discussed anyways in the final presentations of the groups.

One project focused on the combination of traditional Thai performance combined with classical music, another project focused on Beethoven's symphonic music featuring an extensive framework program, a third project was combining a commissioned orchestral composition about Sri Thanonchai, a trickster and antihero from Thai folklore, together with Richard Strauss' composition "Till Eulenspiegel's Merry Pranks Op. 28", another fictional project was conceptualized to take place in Ayutthaya Historical Park, the ruins of the old city of Ayutthaya which is the former capital of Phra Nakhon Si Ayutthaya province in Thailand.

The results of the presentations were fulfilling the tasks given in advance and the projects presented by the students of the College of Music of Mahidol University showed a lot of enthusiasm and creativity. It was the lectures objective to initiate a creative discourse and the dedicated group of roughly 40 students delivered solid results.

## **Cultural Heritage Conservation in Southeast Asia**

### **Hands-on Conservation and Conference on Needs and Challenges**

#### **Project Participants**

o.Univ.-Prof. Mag. Dr. Gabriela Krist, project leader,  
Institute of Conservation, University of Applied Arts Vienna,  
[gabriela.krist@uni-ak.ac.at](mailto:gabriela.krist@uni-ak.ac.at);

Gabriela Krist has been university professor at the University of Applied Arts Vienna since 1999 and is head of the Institute of Conservation. She studied conservation at the Academy of Fine Arts Vienna, as well as art history and archaeology in Vienna and Salzburg. For many years she worked for ICCROM in Rome and at the Austrian Federal Office for the Care of Monuments (Bundesdenkmalamt). She leads education cooperation programmes, conservation campaigns and workshops in India, Nepal, Mongolia and Thailand.

Univ.-Ass. Mag. Ana Stefaner, BA, Institute of Conservation, University of Applied Arts Vienna,  
[ana.stefaner@uni-ak.ac.at](mailto:ana.stefaner@uni-ak.ac.at);

Ana Stefaner has been university assistant at the University of Applied Arts in Vienna since 2018. She studied conservation at the University of Applied Arts in Vienna and history of art and architecture at the University of Vienna. Before working at the University of Applied Arts, she worked as self-employed conservator and art historian.;

Mag. Bernhard Kernegger,  
Department of Studies, University of Applied Arts Vienna,  
[bernhard.kernegger@uni-ak.ac.at](mailto:bernhard.kernegger@uni-ak.ac.at);

Bernhard Kernegger joined the University of Applied Arts after his education as pianist and music pedagogue, where he has been responsible for the university and quality development. Currently he is responsible together with seven division managers for the administrative and strategic operation of the University of Applied Arts. He supervises the fields of studies, international activities and university and quality development.

#### **Project Report**

The cooperation of the Institute of Conservation, University of Applied Arts Vienna and the Silpakorn University International College (SUIC) Bangkok aims at taking measures against the shortage of academic conservator-restorers in South East Asia. Amongst the objectives in this regard are the implementation of capacity building measures, the establishment of a Conservation Centre at SUIC campus in Bangkok and the development of an international Joint Master Programme in conservation

and management of cultural heritage. So far, several conservation workshops could be organized through the generous support from ASEA UNINET and joint meetings were held in Vienna and Bangkok to elaborate the master programme. A graduate of the Institute of Conservation has been employed by SUIC to further support in the built-up of the centre.

In August 2019, practical conservation work started at SUIC's Conservation Centre. With support from senior conservator Ana Stefaner from the Institute the first two paintings were examined and restored. Both painting were in a stable condition, but their aesthetic quality was affected by natural aging processes, dirt or previous treatment. The painting *Light and Shade 4* (1976, acrylic medium on canvas, 111 x 126 x 6 cm) by contemporary Thai artist Preecha Thouthong required maintenance measures, which included dry surface cleaning and retouches. Due to uneven varnish application, the surface gloss was blotchy. A more homogenous appearance was achieved by adjusting the matte areas.

The appearance of the second painting, *Sukhotai Chedi* (1984, oil on fibreboard, 46 x 55 x 2 cm), a river scene with a temple, painted by Thai crown princess H.R.H. Princess Maha Chari Sirindhorn, was impaired heavily by dirt and overpaintings. These overpaintings originally seem to have been applied in order to cover discolouration and dark spots caused by oxidation processes, however, due to insufficient quality of their paint medium, show unpleasant optical changes themselves. Further dark spots and dirt were removed with comprehensive dry and aqueous cleaning. The discoloured overpaintings were reworked with retouches. Both measures succeeded in restoring a clean and uniform appearance.

Apart from practical conservation, meetings were held with potential cooperation partners and institutions, such as national (e.g. Silpakorn University Art Centre) and private collections.

In December 2019, the Silpakorn University organized an international conference entitled "A New Paradigm of Management and Creativity" in Bangkok. One of the core topics was the current situation of conservation and cultural heritage preservation in Southeast Asia. For this thematic scope, the Institute of Conservation supported SUIC in the acquisition of speakers and participants.

At the conference delegates from Thailand, Malaysia, Vietnam, Nepal, Mongolia and India reported on their country's status quo in the field of cultural heritage preservation in order to better understand and get an overview of the current situation, needs and challenges. Additional perspectives were introduced by representatives of UNESCO, who reviewed the organisation's regional objectives. Partner institutions of the Institute of Conservation from Nepal, India and Mongolia, who attended the conference, provided further insights in successful and promising models of cooperation.

SUIC and the Institute of Conservation used the conference also to present the curriculum of their new joint master programme for Cultural Heritage Conservation and Management. This academic programme can help to address the skills shortage in the region and enable to build up capacities in conservation-restoration among young professionals.

The concluding panel discussion yielded that the joint project was received favourably and that the delegates deemed the programme a necessary initiative for the fields of conservation training and heritage preservation in the region.

## Outcome

The established collaboration between the Austrian University of Applied Arts Vienna and the Thai Silpakorn University International College could be further strengthened and intensified with the support provided by ASEA.

The practical conservation work, which was carried out in summer in Bangkok, contributed to capacity-building on site and aimed to test the newly opened Conservation Centre on its practicability.

With the support of ASEA, the International Joint Master Programme between the University of Applied Arts Vienna and Silpakorn University International College could be successfully prepared and presented to the international community in the framework of the conference in December. Admission to the programme is scheduled for summer 2020.

The study programme is deemed as a sustainable measure against the prevailing shortage of professionals in the region. For students in Austria it offers the unique possibility to enhance their skills and competences in conservation and management.

The next important steps are building a network of supporting institutions and partners in Thailand for the programme and identify cultural heritage sites, art objects and collections, which could be accessed in the framework of the study programme.

The cooperation is going to be intensified, once the study programme has started, as a regular staff exchange and mutual visits will be necessary.

## PHOTOS:



*Fig.1 -2: Impression of the International Conference in Bangkok in December 2019, © SUIC*



*Fig.3: Participants of the International Conference in Bangkok in December 2019, © SUIC.*



*Fig.4: View in the Conservation Centre, © Institute of Conservation, University of Applied Arts Vienna.*



*Fig.5: Practical painting conservation in the centre in summer 2019, © Institute of Conservation, University of Applied Arts Vienna.*

## Working Report of Prof. Dr. Michèle Crider for the Hanoi Master Classes – 29.09.-04.10.2019

Michele Crider, Univ.Prof. Hon. D.M.A.  
University Professor in Singing  
MOZARTEUM UNIVERSITY SALZBURG

Michèle Crider is one of today's preeminent dramatic sopranos of her generation. She has been making her mark on both the operatic and concert stages of the world in a remarkably wide repertoire.

Miss Crider is currently professor of vocal performance at the renowned University Mozarteum in Salzburg.

[Michele.CRIDER@moz.ac.at](mailto:Michele.CRIDER@moz.ac.at)



*Prof. Crider and some participants of the Master Classes; © Michèle Crider / MOZARTEUM UNIVERSITY SALZBURG*

**Report:**

My departure was on Sunday, September 29th. After my arrival on September 30th I was scheduled to hold my first Master Class on October 1st. My return flight was scheduled on the evening of October 4th.

October 1st – October 3rd 2019:

Pick up at 8:30 am from my hotel. Upon arrival I was received by Ms. Nguyen Thi Hae Van and the director of the school. Then I was introduced to the students, who participated in the Master Classes. The Master Class began daily at 9:00 am and seven up to thirteen students were actively involved. The Master Classes were conducted in two sessions, from 9:00 - 12:00 and from 2:00 – 5:00 pm.

On the first day I instructed bachelor Students and on the second and third day I taught bachelor and master students.

Summary:

The general factors which I believe needed to be strengthened were:

- Breath Support
- Command for Languages (English, French, German, Italian)
- Pronunciation
- Interpretation

The students seemed to absorb the information that was given to them during this short time and returned to each session more inspired and motivated. I worked individuality on their languages and helped with the historical background of their pieces.

On a whole I experienced very talented singers with potential that should be further developed.

It was a great pleasure for me to have had the opportunity to share my knowledge with the students.

Sincerely,  
Univ.-Prof. Dr. Michèle Crider

## Reflecting on current trends in Audiovisual Composition – Music in the Expanded Field/Gamified Performance/Augmented Reality

Visitor: Univ.Prof. Dr. Marko Ciciliani, [marko.ciciliani@kug.ac.at](mailto:marko.ciciliani@kug.ac.at),  
Kunstuniversität Graz, Institute of Electronic Music and Acoustics

### Bio:

Marko Ciciliani (\*1970, Zagreb) is a composer, audiovisual artist, performer and researcher based in Austria. He is Professor for Computer Music Composition and Sound Design at the Institute for Electronic Music and Acoustics (IEM) of the University of Music and Performing Arts Graz. The focus of his artistic work lies in the composition of performative electronic music, mostly in audiovisual contexts. Interactive video, light design and laser graphics often play an integral part in his compositions.

Ciciliani's works have been performed in more than forty-five countries across Eurasia, Oceania and the Americas. They have been released on five full-length CDs and two multimedia books. In addition, his music can be found on more than a dozen compilation CDs.

Since 2013 he has regularly been invited as coach to the multidisciplinary course LAbO in Antwerp, for which he will serve as Artistic Director in 2020 and 21. Since 2014 he has also been tutor at the “Summer Courses for Contemporary Music Darmstadt”.

Ciciliani was granted funding for an artistic research project titled “GAPPP – Gamified Audiovisual Performance and Performance Practice”. It is funded as part of the PEEK program of the Austrian Science Fund and runs from 2016-20.

<http://www.ciciliani.com>

<http://vimeo.com/channels/cicichannel>

<http://gappp.net>

### Report:

This visit to Bangkok was originally motivated by a tour in South-East Asia that I undertook in 2015, and where I learned that there is a lively scene in the field of audiovisual composition in this area. Since my art and research has focused on audiovisual composition for almost 15 years, I wanted to share my current understanding of trends in audiovisual composition by offering guest lectures and a workshop.

I got in touch with lecturer Dr. Jason Thorpe Buchanon who is teaching composition at Mahidol University in Bangkok and currently holds the position as head of the composition institute. He invited me to visit Mahidol as part of the ASEA Uninet Program. Originally my plan was to extend my

visit to Universiti Teknologi Mara in Kuala Lumpur in Malaysia. Due to my tight teaching schedule in Graz, however, I realized that I could not afford such a long absence. Hence, I had to confine my visit to Bangkok.

Apart from offering Master Classes to individual students, I offered a guest lecture, a lecture-performance and a workshop where I presented three main research interests:

- 1) Since several years, there is a strong increase in the use of visual media in the field of European post-avantgarde composition. In 2017 I analyzed this development in a paper titled “Music in the Expanded Field – on recent tendencies in interdisciplinary composition”. Currently I am also investigating this phenomenon as part of a seminar for Computer Music students at the Kunstuniversität in Graz. As part of a lecture I offered and discussed some of the reasons that have led to this increase of use of visual media in contemporary composition.
- 2) Since 2016 I have led the artistic research project GAPPP “Gamified Audiovisual Performance and Performance Practice” (PEEK project funded by the Austrian Science Fund FWF as AR364-G24) where a small team of researchers and I have investigated the artistic potential of elements from computer games in the context of experimental audiovisual composition. Since the start of the project almost 20 new works have been created, each trying to focus on specific aspects that are relevant for our investigations. As part of a performance-lecture, I presented and discussed two compositions that I developed as part of this research.
- 3) Also in the context of the research project GAPPP I have more recently examined the potential of the use of Augmented Reality in the context of interactive installations. I offered a workshop where the students developed a first basic Augmented Reality application that they could install on an Android device.

During my stay at Mahidol University I also met the lecturer in composition Dr. Tyler Capp, as well as Prof. Joe Bowman.

This visit focussed on teaching, therefore no publication has emerged from this exchange. I think the visit was a success in the sense that the information I offered to the students was mostly new to them. I believe that it opened new aspects to interdisciplinary composition to them and new understandings of contemporary composition.

With the composition department of Mahidol University there are currently no plans for continuing an exchange.

Sincerely,  
Univ.Prof. Dr. Marko Ciciliani

Translocality and Performance  
Workshop on Translocal Performance for Students and Faculty supported by  
ASEA-UNINET

Joint Project between USM and KunstUniversität Graz  
Bilik Mesyuarat, School of the Arts, USM, 12 December 2019

Project Report ASEA 2019/KUG/2

**Languages used during the exchange:** English and Indonesian

**Academic Exchange:** 8 scholarly lectures, 2 computational analysis workshops, 4 film screenings in one evening,

The four visiting academics from KUG included:

Dr. Rafael Caro Repetto

Dr. Babak Nikzat

Denise Schubert (PhD Student)

Dr. Sarah Weiss

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At Universiti Saens Malaysia, Penang we participated in a conference/workshop on translocality and performance that was organized around our visit. During this conference our primary goal as a group was to interrogate the concept of translocality in order to discover if the term is useful for describing the movement of performance genres and ideas across national, linguistic, historical, and cultural borders. The conference included talks from the four KUG visitors and 8 other presenters from the region. Several more faculty and graduate students were present as audience and interlocutors. These participants came from the Departments of Music and Theatre at USM and also from Sunway University in Kuala Lumpur.

The day involved terrific presentations and fruitful debate about the nature of translocality and cross-cultural performance in general. We engaged in serious discussion about and planning for another conference meeting in two years, likely to be hosted by KUG. The research that will be presented at that future conference in Graz will be brought together as an edited volume on Translocality and Performance and published as part of the KUG Institute 13 series. The program and abstracts for the activities at USM- Penang, including a workshop on the uses of Sonic Visualizer, are attached to this report.

At the Instiut Seni Indonesia- Yogyakarta, we participated in an all-day conference featuring contemporary research by faculty and students from ISI-Yogyakarta. The conference was followed directly by a two-hour workshop on the use of the Sonic Visualiser program for music visualization and analysis. On a second evening we participated in a lengthy evening of filmscreenings and discussion. The focus of the evening was the representation of gender through performance in filmic documentaries. Of the four documentaries presented, two were actually made by our Indonesian hosts (Koes Yuliadi and Citra Aryandari). KUG members Nikzat and Schubert presented edited selections from films on performance cultures that they have each researched and that complimented the themes of the other two films. The conversation after the four films was wideranging and fulfilling with interested students from various universities in Yogyakarta participating. The flyers for the various events in Yogyakarta are attached to this report.

#### Other related activities:

In Malaysia we heard a performance of organ music written by Tamil Christians who have long lived on the island. We spoke with the organist about his personal experiences with local Christian ritual music, both as participant and researcher, especially thinking about movement of music across borders from Christian communities in Tamil Nadu, India and other places in the southeast Asian Indian diaspora.

In Yogyakarta we visited the Eco Art Centre Cangkringan where we walked through an extraordinary living museum of artwork made from living bamboo and participated in a performance of Central Javanese gamelan with a local group that was invited to provide entertainment.

The 10 days weeks were packed full of activities and exploring ideas of translocality in everything from food and language to architecture and ritual practices. A more fulfilling and exciting, and productive short excursion could not have been created. Importantly, connections have been made across universities in Austria and Southeast Asia, including a first-time engagement with ISI-Yogyakarta that will certainly yield other opportunities both for faculty and students.

Sarah Weiss

Privatdozentin and Senior Research Scientist

KunstUniversitätGraz – Institut für Ethnomusikologie

### **PROGRAM**

- |              |  |
|--------------|--|
| 9.00 – 9.30  | Folktales, Trans-locality and the Construction of Social Values by Children Mumtaz Begum Aboo Backer (USM)                           |
| 9.30 – 10.00 | Constructing Hybrid Identity through Hybrid Music: Translocal music making of Iranian musicians in Los Angeles<br>Babak Nikzat (KUG) |

- 10.00 – 10.30 Sonic Hybridity and Kroncong in Armijn Pane’s Belenggu (1938): A Historical Case-Study of Musical Translocality  
Sarah Weiss (KUG)
- 10:30 – 11.00 Tea break
- 11.00 – 11.30 Tamil Hip-Hop and the Construction of Hybrid Identities Pravina Manoharan (USM)
- 11.30 – 12.00 Vernacular Music on the Pipe Organ in Penang, Singapore and Hyderabad, India  
Leonard Selva Gurunathan (USM)
- 12.00 – 12.30 Gramophone Music of the 78 RPM Era: Cultural Exchange and Mobility in the Malay Archipelago  
Tan Sooi Beng (USM)
- 12.30 – 2 pm Lunch Break
- 2.00 – 2.30 Translocality and the Javanese Wayang Kulit Heritage in Malaysia Mayco Santaella (Sunway)
- 2.30 – 3.00 Locating the Locale in Wayang Kulit Kelantan  
Christine May Yong (Sunway)
- 3.00- 3.30 Translocality and Identity of Makyung as Performance in Southern Thailand  
A.S. Hardy Shafii, Rosnan Rahman (USM)
- 3.30 – 4.00 Tea break
- 4.00 – 4.30 Batuku: Resistance of Women in Music  
Denise Schubert (KUG)
- 4.30 – 5.00 Shifting Identities through Music as Language  
Johan Othman (USM)

CLOSING REMARKS

## ASEA-UNINET-Report 2019

### Outgoing students

16 students of the Medical University of Graz participated in the 2019 clinical electives at our ASEA-Uninet partner universities in Indonesia, Thailand and Vietnam.

Due to cancelled electives, the remaining budget could be used to refund fees that had been levied at the University of Medicine and Pharmacy in Ho Chi Minh City. The remaining budget was returned to the OEAD.

### Participants

#### Chiang Mai University, Thailand:

- Baumgartner, Jekaterina
- Decker, Friederike
- Glatz, Ulrike
- Hacker, David
- Jost, Viktoria
- Krumphuber, Andreas
- Schlagbauer, Lisa
- Wolkerstorfer, Andreas



*Chiang Mai University (© Friederike Decker)*

### Chulalongkorn University, Thailand:

- Klaes, Leander
- Stell, Linda



Chulalongkorn University (© Linda Stell/Leander Klaes)

### Mahidol University, Thailand:

- Fotohi, Ario

### Gadjah Mada University Hospital, Indonesia:

- Boxler, Matias Steffen
- Zietemann, Laura Greta

### University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam

- Baumann, Clemens-Rafael-Maria
- Nürnberg, Hannah Charlotte
- Zehentner, Paul

### **Incoming Students**

In April 2019 the Medical University Graz could welcome two incoming students from the Mahidol University, Thailand:

- Krittapas Kijkool, Department of Dermatology and Venerology, 15.04.-10.05.2019
- Wankijcharoen Jirawat, Division of Vascular and Interventional Radiology, 15.04.-10.05.2019

In July 2019 the Medical University of Graz could welcome 9 incoming students from the Gadjah Mada University, Indonesia:

- Affiati Siti Aisyah, Division of Plastic, Aesthetic and Reconstructive Surgery, 15.07.-02.08.2019
- Buchari Ummu Kalsum Firdaus, Division of Cardiac Surgery, 15.07.-02.08.2019
- Deya Farihani, Division of Plastic, Aesthetic and Reconstructive Surgery, 15.07.-02.08.2019
- Harsono Safira Kamal, Division of Cardiac Surgery, 15.07.-02.08.2019
- Kianasari Andrea, Department of Paediatrics and Adolescent Medicine, 01.07.-26.07.2019
- Putri Nur Evitasari, Department of Cardiac Surgery, 15.07.-02.08.19
- Rivaldo Reza Ahmad, Department of Ophtalmlogy, 15.07.-02.08.2019
- Syifanie Yaura, Division of Plastic, Aesthetic and Reconstructive Surgery, 15.07.-02.08.19
- Ulimasari Nadira, Department of Paediatrics and Adolescent Medicine, 01.07.-26.07.2019

In September 2019 the Medical University of Graz could welcome one incoming student from the Chiang Mai University, Thailand

- Tantivit Yaowaret, Department of Otorhinolaryngology, 09.09.-20.09.2019, and Department of Radiology, 23.09.-06.10.2019



**Program**  
**Coordinator:**  
Univ.-Prof. Dr. Erich Schmutzhard  
Department of Neurology  
Medical University of Innsbruck  
Anichstr. 35  
A-6020 Innsbruck



## Report on Clinical Elective Exchange Program 2019

As part of the ASEA-UNINET network, 48 students from the Medical Universities of Graz, Vienna, Linz and Innsbruck were able to get to know medical practice at universities in Thailand, Vietnam and Indonesia in 2019.

14 students from the Medical University of Innsbruck each completed four-week stays at Chiang Mai University, Chulalongkorn University, Mahidol University - Faculty of Tropical Medicine, Mahidol University – Ramathibodi Hospital, Gadjah Mada University and the University of Ho Chi Minh City Medicine and Pharmacy.

2 students from the Medical University of Innsbruck each completed four-week stays at Suranaree University of Technology, Institute of Medicine in February 2019,

We had a total of 10 incomings throughout the year. At the University Hospital for Vascular Surgery, the Department of Orthopedics, the Department of Urology, the Department of Internal Medicine, the Department of Neurosurgery, the Department of Anesthesia and the Department for Gynecology and Obstetrics the exchange students could collect their experience in Innsbruck.

***Univ.-Prof. Dr. Erich Schmutzhard***

*Program Coordinator*

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*Medical University of Innsbruck - International Relations Office  
Sonnenburgstrasse 16 / I - A-6020 Innsbruck, Austria*

Report on the ASEA-UNINET project 'Yogyahealth' for the year 2019

## Intercultural Exchange to Observe and Learn New Techniques in Obstetrics and Gynecology

Frauen und Kopfklinik, Medizinische Universität und Tirol Kliniken,  
Innsbruck

Report from the incoming ASEA-Uninet Exchange Fellow  
Dr. Laily Anna Diah Ardi Shinta

**Laily Anna Diah Ardi Shinta, M.D.**

[lailyanna7@gmail.com](mailto:lailyanna7@gmail.com)

### EDUCATION:

Bachelor of Medicine & Medical Profession, Faculty of Medicine/Gadjah Mada University (2012 - 2018)

### WORK EXPERIENCE:

Research Assistant, Obstetrics & Gynecology Research Unit/Sardjito General Hospital/Yogyakarta (2018 - Present)

General Practitioner, Banguntapan 1 Primary Health Care & dr. S. Hardjolukito Air Force Hospital/Yogyakarta (11/2018 - 04/2019), Internship Program by Ministry of Health of Indonesia

### Introduction

Indonesia is a developing country who has 260 million populations with high rate of birth. Family planning is the way to control and manage birth rate in Indonesia, but it hasn't work effectively yet. Nowadays, we're also still facing the high maternal mortality rate that reach 305 per 1000 live births in 2018/2019. According to this situation, we need to consider the strategy, system, and technology to support the quality of care to the patients and reduce the maternal mortality rate.

### Observational Result

I had chance to observe and follow several activities in Obstetrics & Gynecology Department in Medical University Innsbruck. Those activities including:

- Observed and assisted C-section, Laparoscopy, Laparotomy in oncological cases, breast surgery, uro-gynecology surgery and curettage,

- Observed patients' examination in the outpatient clinics of breast and gynecology & obstetrics,
- Observed and followed patient management and follow up in the station (inpatient),
- Observed the ultrasound examination,
- Joined the morning & afternoon report, science presentations.

The points I got from those activities are:

No	Point	Austria	Indonesia
1	Emergency cases in Maternal Room	They have special operating room only for caesarian section. It always standby for any emergency and located just next to the maternal room.	We don't have special operating room only for the c- section
		There is an emergency button for crash cases that happen in the maternal room. All of the necessary staff (including anesthesiologist and pediatricians) will run immediately to the maternal room when the alarm is on. The response time for emergency cases is 7-8 minutes only	We still have a lot of bureaucracy systems and takes more than 30 minutes for emergency cases.
2	Communication system	They provide special hand phone for works that only can be used to call the college or any department and talk immediately about the work at that time. Personal mobile phone is not allowed to use while working.	We use personal mobile phone to communicate each other or the telephone. It takes more time to response and depends of the signal provided.
		They use the electronic medical record. Less paper and comprehensive record of the patient provided in computer file.	Electronic medical record only for the record of additional examination and laboratory result.
		The interdisciplinary team (nurse, midwife, anesthesiologists, pediatricians, operating room staff, obstetricians and gynecologist, student, resident) works effectively. Everyone knows their roles as part of the teamwork and bravely to speak up and communicate effectively while there is problem.	Not all the member of teamwork understood well their roles. Interdisciplinary team need to be improved.
3	Latest Technology & Tumor medicine center	Already certified as the Gynecology Tumor Center by the Austria Certificate Commission	No yet
		Port-A Cath as tools to administer the chemotherapy. The membrane of the port will be inserted to the access of Subclavian Vein and will be connected to the port while administering the chemo drugs. It prevent the damage of peripheral vein as the complication of the chemo.	We use regular iv line to administer the chemo drugs.
		Comprehensive checkup before and after chemotherapy with facilities support such as cooler machine to prevent the chemo reaction to the perifer nerves while administering chemo drugs. There is crash trolley to manage the patient with chemo reaction immediately.	Chemo reaction is managed by symptomatic drugs.
		IOTA (The International Ovarian Tumor Analysis) is applied to diagnose the ovarian tumor cases and minimize the need of surgery. They can easily input the examinations finding to the app and calculate the risk of malignancy and other possibility of tumor.	We haven't apply the IOTA Application

## Activities Documentations

### 1. Visit the patient in the station (in-patient setting)



### 2. Activities in the Maternal Room (Delivery room) with the profesors, midwife, residents and the standby doctors



### 3. Polyclinics settings (Breast clinics, Ultrasound, and Oncology clinics)



4. Operating room (assist the professor in several surgery such us uro-gynecology, laparoscopic and laparotomy tumor surgery, c-section, etc)



5. Scientific Discussion and Regular Patient Report



*© All photos: Matthias Lechner / UIBK*

## **Conclusion**

Direct observational activities in Frauen-Und Kopfklinik Medical University Innsbruck through this program give me a lot of things to see and learn especially in the developed system and technology that already applied in this place. I can learn also from the experiences of the experts to manage the patient in the out or in-patient settings. I hope that i can apply and use the knowledge I got to inspire the research and improve the quality care of the patient, and also help us to discover effective method to reduce the maternal mortality rate in Indonesia.

## 15th Integrated Endocrinology Teaching Week at Suranaree University of Technology (SUT) und 4th Teaching Day at Mae Fah Luang University (MFU) in Chiang Rai, Thailand

Prof. Siegfried Schwarz

### Project leaders

#### Prof. Siegfried Schwarz, MUI

Born 1950, promotion Dr. med.univ. 1975, University of Innsbruck Medical School  
Since then Assistant, later „Dozent“, later Professor at the Institute of Experimental Pathophysiology & Immunology, Biocenter of MUI),  
Habilitation 1983,  
Visiting Associate at the National Institutes of Health, Bethesda, USA, 1986-1988  
Retired 2015,  
Dr. h.c. sci. (SUT) 2016.  
<https://siegfriedschwarz.wordpress.com/2016/01/14/siegfried-schwarz/>

#### Dr. Sanong Suksaweang, SUT

##### Education:

Doctoral: 2005 Ph.D., Pathobiology, Keck School of Medicine at the University of Southern California, Los Angeles, CA, U.S.A.  
Master: 2000 M.S., Experimental and Molecular Pathology Keck School of Medicine  
Bachelor: 1992 B.Sc., Medical Technology, with second class honor from Khon Kaen University

##### Working experiences:

2011 – Present International Clinical Elective Coordinator  
2009 – Present Head of SUT-Medical Technology Clinics for Influenza Research Laboratory  
2007 – Present Design and organization with Prof. Siegfried Schwarz of the annual SUT Integrated Hematology/ Endocrinology Teaching week  
2005 – Present Medical Educator at School of Pathology and Laboratory Medicine, Institute of Medicine, SUT  
2005 – 2006 Secretary for Medical Mega-Project of the SUT  
1995 – 1997 Medical Technologist/Medical Laboratory Scientist, CDC/HIV-AIDS Collaboration Research Unit, Ministry of Public Health, Nonthaburi  
1992 – 1995 Medical Technologist/Medical Laboratory Scientist, Bumrungrad International Hospital Laboratory, Bangkok

##### Awards and credits:

2014 Best Alumni Award for Faculty of Associated Medical Sciences of Khon Kaen University of 2014.

## Report

Seit 2007 fährt der Berichterstatter, Professor für Pathophysiologie am Biozentrum der MUI (seit Okt. 2015 im Ruhestand) an die SUT in Nakhon Ratchasima, 300 km östlich von Bangkok, um eine Teaching Week für Medizinstudierende im 3. Studienjahr abzuhalten, heuer zum 15. Male. Diese beruht auf einem MoU (Memorandum of Understanding)-Vertrag zwischen der SUT und der MUI, der 2011 zu 1. Mal unterschrieben und 2018 für eine weitere 5-Jahresperiode erneuert worden ist, all dies im Rahmen des ASEA-UNINET-Netzwerks, mitgegründet vom Innsbrucker Prof.Dr. Dr.h.c.mult. Bernd Michael Rode.

Darüberhinaus besteht seit 2016 ein MoU zwischen der MUI und der Mae Fah Luang University (MFU) Medical School in Chiang Rai, 800 km nördlich von Bangkok, wo Prof. Schwarz einen Teaching Day abhält, heuer zum 4. Male (eine komplette Dokumentation der Aktivitäten ist am Ende dieses Berichts zu sehen). Was besonders wichtig für unsere Studierenden hier an der MUI zu betonen ist: Beide MoU's ermöglichen den mutuellen Austausch von Studierenden aller 3 Universitäten (MFU, MUI SUT) für Famulatur-Aufenthalte, weiters für Akademiker zu Forschungs- und Weiterbildungszwecken. Viele MUI-Studierenden haben diese Möglichkeit auch schon wahrgenommen, wie vom Auslandsreferat zu erfahren ist.

Die MFU gehört zu Thailands jüngsten Universitäten. Sie wurde von HRH Princess Srinagarindra (im Volksmund Mae Fah Luang genannt), der Urgroßmutter des jetzigen Königs, 1998 gegründet, die sich allgemein um das Schicksal und die Verbesserung der Lebensumstände des Nordens von Thailand verdient gemacht hatte: durch Gründung von Kindergärten, Schulen, Krankenhäusern, landwirtschaftlichen Musterbetrieben etc.. Urwälder, Opiumanbau, Grenzschmuggel („Goldenes Dreieck“ zwischen Myanmar, Thailand, PR China und Laos), Armut und Krankheiten der in verschiedene Ethnien („minorities“) zersplitterten Bevölkerung sind über Jahrhunderte hinweg hervorstechende Merkmale dieser Region gewesen.

More: [https://en.wikipedia.org/wiki/Mae\\_Fah\\_Luang\\_University](https://en.wikipedia.org/wiki/Mae_Fah_Luang_University)

An der MFU hat Prof. Schwarz für heuer ca. 15 Studierenden des 3.Jahrgangs einen ganztägigen Kurs (= Vorlesung + Computerpraktikum) unter dem Titel „Molecules of Life & Mutations“ abgehalten, in welchem diese in die Pathophysiologie der Krankheit Diabetes insipidus eingeführt worden sind, 3 verschiedene genetische Gründe kennenlernten und anhand von PC molecular modelling der Proteine Arginin-Vasopressin und Neurophysin 2 verstehen lernten, warum die eine Mutation rezessiv und die andere dominant ist, wobei beide Proteine das Produkt eines gemeinsamen Gens darstellen!

Für die Bibliothek der MFU übergab Prof. Schwarz ein Exemplar seines Buches „MOLECULES OF LIFE & MUTATIONS“ an Dr. Roger Callaghan. Ein weiteres Exemplar steht seit vielen Jahren in der Bibliothek der SUT.

Da an diesem Tag auch ein Symposium über den Social Impact of Road Accidents ([https://www.rvp.co.th/news\\_en.php](https://www.rvp.co.th/news_en.php)) an der MFU abgehalten worden ist, konnte Emeritus Prof. Nopadol Wora-Urai, Dekan der MFU Medical School, Prof. Schwarz nicht treffen (z.U. von 2018), schrieb ihm aber eine sehr freundliche email und Einladungsschreiben für 2020:

15.11.2019

Dear Professor Siegfried  
Greetings from Chiang Rai!

*I hope this email find you very well.*

*I am so sorry that I did not have the chance to meet you early this week at Mae Fah Luang University School of medicine. I very much appreciate your kind support and your great contribution. However, I think that we should meet and make a plan for much closer collaboration in the future. So I would like to invite you to visit MFU and spend at least one full day, or even better, two days at Mae Fah Luang University during your next trip to Thailand next year. November or December would be a good time to visit Thailand.*

*Looking forward to hearing from you again soon.*

*Best regards*

*Nopadol*

*Lt.Gen. Professor Emeritus, Nopadol Wora-Urai, MD, FRCST, FACS, FRCSEd, FAMS, FRACS(Hon), FICS (Hon), FASA (Hon), FCSSL (Hon),*

*Dean, School of Medicine Mae Fah Luang University, Chiang Rai, Thailand*



*Abschiedsfoto von den Medizin-Studierenden an der MFU. In der Mitte Dr. Roger Callaghan, Koordinator dieses Teaching Days, und Dr. Kaset Chimplee, MD. FRCPT., Instructor in Internal Medicine and Endocrinology, der in 2020 ein Sabbatical an der MUI plant.*  
*Photography Copyright by Siegfried Schwarz*

Daran schlossen sich 3 Tage Lehre and der SUT,

More: [https://en.wikipedia.org/wiki/Suranaree\\_University\\_of\\_Technology](https://en.wikipedia.org/wiki/Suranaree_University_of_Technology)

wie schon in den vorangegangenen Berichten ausführlich dargestellt worden ist. Waren es an der MFU ca. 15 Studierende, sind es mittlerweile an der SUT schon über 120.

*„This university hereby pledges itself to excellence in all its missions: to improve the quality of life and to collect and create knowledge, moral ethos and wisdom for the everlasting development of mankind.“*



*Die „Klasse“ an der SUT Medical School .*

*Photography Copyright by Siegfried Schwarz*

Am **ersten** Tag hielt der Berichterstatter die gleiche Vorlesung über **Diabetes insipidus** (wie an der MFU tags zuvor) ab, mit anschließendem Praktikum im PC-Raum, wo die 120 Studierenden, in 2 Gruppen geteilt hintereinander die Technik des **Molecular Modellings** am PC (mithilfe der Software RasMol) lernten. Am Nachmittag folgte eine 4-stündige Vorlesung über **Mitochondriopathien** (Teil 1/3).



Die „Klasse“ an der SUT Medical School im PC-Raum, links im Hintergrund Dr. Sanong Suksaweang, Koordinator dieser Teaching Week .  
Photography Copyright by Siegfried Schwarz

Der **zweite** Tag begann mit einer 2-stündigen Vorlesung über **Mitochondriopathien** (Teil 2/3). Der Nachmittag war dem Thema **Venipunction** gewidmet: Einführungs-VL (Invasivität, Präanalytik, Postexpositionelle Prophylaxe, Hygiene, die eigentliche Technik der Venipunction), das **Praktikum** in Kleingruppen zu a 10 Studierende mit gegenseitigem Armvenenstechen und Blutabnahme.



Die Blutabnahme-Gruppe unter ständiger ärztlicher Aufsicht  
Photography Copyright by Siegfried Schwarz



links: Dr. Sanong

Am **dritten** Tag wieder eine mehrstündige Vorlesung über **Mitochondriopathien** (Teil 3/3). Danach wurde eine Multiple Choice-Prüfung durchgeführt. Am Nachmittag war noch eine mehrstündige VL über Mitochondriopathien für **Graduate Students** an der SUT angesetzt.



Die „Klasse“ an der SUT Medical School im Großen Hörsaal. Links unten: Dekan Sukij Pampimanas wohnte der letzten VL bei, Dr. Kaset Chimplee von der MFU war in allen VL und Praktikas dabei.  
Photography Copyright by Siegfried Schwarz



Links: Dankes- und Abschiedsrede einer Studentin am Ende der Teaching Week. Auch Dekan Sukij bedankte sich beim Berichterstatter vor der ganzen Klasse mit herzlichen Worten. Rechts: Abschiedsfoto im Büro des Dekans Sukij Pampimanas, mit Dr. Kaset Chimplee von der MFU sowie Dr. Sanong von der SUT.  
Photography Copyright by Siegfried Schwarz

In allen früheren Teaching Weeks an der SUT führen Dr. Sanong und der Berichterstatter zu einem der Provincial Hospitals von entweder Buriram, Surin oder Chayaphum, 3 Städte ca. 150 km von Nakhon Ratchasima entfernt, um den dort die klinischen Jahre absolvierenden SUT-Studierenden eine **akademischen Visitation** zu bieten. Dabei wurden alle Aspekte der dortigen Lehre bzw. des Lernens freimütig mit den Studierenden diskutiert, feedback an den Dekan gegeben und Verbesserungen versprochen bzw. implementiert. Diese akademische Visitation wurde von Prof. Schwarz anlässlich seiner 1. Teaching Week eingeführt und als unbedingt notwendig der damaligen Dekanin Frau Prof. Vanich Vanapruks empfohlen und von dieser gutgeheissen. Mittlerweile wurde vom Rektor der SUT ein regelmäßiges monatliches Treffen der Studienleiter dieser 3 Krankenhäuser mit Professoren und dem Dekan eingeführt, um genau diese **Qualitätskontrolle** zu ermöglichen. Somit mußten Dr. Sanong und Dr. Schwarz nicht mehr diesen Studentenbesuch vornehmen.

Schon am 22.11. 2019 schrieb Dekan Sukij folgendes email:

*Dear Siegi*

*I and all students were appreciated your teaching, it's very interesting biomolecular knowledge and also very clear English. As I said, it's not easy for Thai students to have a good chance like this and most important point is creating inspiration to the students for further learning.*

*We hope to see you again next time and I'll send you an invitation letter earlier.*

*Thank you so much for your great contribution and dedication to our students and our institute.  
Hope you enjoy Korat and Thai food  
Best regards  
Sukij*

*ศาสตราจารย์นายแพทย์สุกิจ พันธุ์พิมานมาศ  
[Prof. Sukij Panpimanmas MD.]  
คณบดีสำนักวิชาแพทยศาสตร์[Dean Institute of Medicine]  
มหาวิทยาลัยเทคโนโลยีสุรนารี[Suranaree University of Technology]  
โทร. 044-223906 E-mail: [sukijpan@sut.ac.th](mailto:sukijpan@sut.ac.th)  
วิสัยทัศน์ (Vision) "เป็นโรงเรียนแพทย์ชั้นนำระดับโลก"  
National Leading Medical School*

Mit diesen Einladungsschreiben für 2020 von Dekan Nopadol von der MFU und Dekan Sukij von der SUT konnte der Berichtschreiber wieder nach Innsbruck heimkehren und das Gefühl mitnehmen, für die Weiterentwicklung des Faches Medizin in Thailand beigetragen zu haben, eine Freundschaft und Verbundenheit gepflogen zu haben und diese noch für einige Jahre – hoffentlich – fortsetzen zu können. Wie schon in früheren Berichten geschrieben: Die Lehrtätigkeit in Thailand ist neben der akademischen vor allem auch eine menschlich sehr bereichernde Erfahrung.

Der Berichtschreiber möchte Prof. Dr. Erich Schmutzhard, Koordinator von ASEA-UNINET an der Innsbrucker Universität, herzlich für die Unterstützung dieser Reise danken.

Innsbruck 25.11.2019

Univ. Prof. Dr. Dr.h.c. Siegfried Schwarz

**Links:**

<https://asea-uninet.org/>  
<http://biocenter.i-med.ac.at/>  
<http://www2.i-med.ac.at/expatho/index.html>  
<http://www.sut.ac.th/2012/en/>  
[http://www2.i-med.ac.at/expatho/sut\\_cooperation\\_partners.jpg](http://www2.i-med.ac.at/expatho/sut_cooperation_partners.jpg)

2018a: <https://www.i-med.ac.at/mypoint/thema/717631.html>

2016/17: <https://www.i-med.ac.at/mypoint/thema/705399.html>

<http://www.i-med.ac.at/pr/docs/Bericht-SUT-2016.docx.pdf>

2015: <https://www.i-med.ac.at/mypoint/thema/696260.html>

2014: <https://www.i-med.ac.at/mypoint/thema/686439.html>

2013: <https://www.i-med.ac.at/mypoint/news/676164.html>

2012: <https://www.i-med.ac.at/mypoint/news/665999.html>

2011: <https://www.i-med.ac.at/mypoint/archiv/2011091502.xml> (MoU)

2010: <https://www.i-med.ac.at/mypoint/archiv/2010102901.xml>

2009b: <https://www.i-med.ac.at/mypoint/archiv/2009101601.xml>

2009a: <https://www.i-med.ac.at/mypoint/archiv/2009012201.xml>

Annual Project between Medical University of Innsbruck and Suranaree University of Technology  
 "A week lecture at SUT" by Univ. Prof. Siegfried Schwarz, MD, Innsbruck, Austria

Date and Time	Activity
<b>Sunday, Nov. 10, 2019</b>	
06.00pm	Departure for BKK via Frankfurt
<b>Monday, November 11, 2019</b>	
03.00pm	Arrival in BKK, flight to Chiang Rai
<b>Tuesday, Nov. 12, 2019</b>	
<b>Mae Fah Luang University (MFU) in Chiang Rai</b>	
9.00 – 12.00am	Lecture Molecules of Life and Mutations
01.00 – 03.00pm	Practicum for Molecules of Life and Mutations
04.00 – 11.00pm	transfer from Chiang Rai to BKK and Nakhon Ratchasima
<b>Wednesday, Nov. 13, 2019</b>	
<b>Suranaree University of Technology (SUT) in Nakhon Ratchasima</b>	
8.00 – 10.00am	Lecture Molecules of Life and Mutations (Prof. Schwarz)
10.00 – 11.00am	Practicum for Molecules of Life and Mutations group 1/2 (Sanong & Prof. Schwarz)
11.00 – 12.00am	Practicum for Molecules of Life and Mutations group 2/2 (Sanong & Prof. Schwarz)
01.00 – 05.00pm	Case Discussion/Lecture on Mitochondrial Diseases part 1 (Prof. Schwarz)
<b>Thursday, Nov. 14, 2019</b>	
10.00 – 12.00am	Case Discussion/Lecture on Mitochondrial Diseases part 2 (Prof. Schwarz)
01.00 – 02.00pm	Lecture on Venipuncture (Prof. Schwarz)
02.00 – 05.00pm	Practicum for Blood Drawing (Sanong & Prof.Schwarz & Team)
<b>Friday, Nov. 15, 2019</b>	
08.00 – 09.00am	Case Discussion/Lecture on Mitochondrial Diseases part 3 (Prof. Schwarz)
09.00 – 09.30am	Quiz (15 MC questions)
10.00 – 10.30am	Wrap up, Farewell words by Dean Sukij Pampimanas, Certificate Handing Ceremony, Farewell words by student, Farewell Picture
10.30 – 11.30am	Correction of quiz, work-up of teaching week
01.00 – 03.00pm	Lecture on Mitochondrial Diseases, condensed version for graduate students (Prof. Schwarz)
<b>Saturday, Nov. 16, 2019</b>	
9.00 – 13.00	Travel to Bangkok
<b>Sunday, Nov.17, 2019</b>	
Leave for Austria	
<b>Monday, Nov. 18, 2019</b>	
Arrival in Innsbruck/Austria	

Dem Berichtersteller ist es wichtig, die auf der homepage der MFU Medical School dargelegte Eigendarstellung hier wiederzugeben, weil darin viele auch für die MUI anwendbare Aspekte enthalten sind.

## History

The School of Medicine was founded by Mae Fah Luang University (MFU) on 18 January 2012 in response to government health promotion policies to raise the quality of universal health coverage, reform medical and public health management and especially to develop and increase the number of doctors to meet the needs of the upper northern region of Thailand. The MFU School of Medicine received approval for the Doctor of Medicine programme from the Medical Council on 7 February 2013 and started accepting students in the 2013 academic year. 32 students were accepted with Prof EmerLTG Nopadol Wora-Urai, Former President of the Royal College of Surgeons of Thailand, as the Dean of the School of Medicine.

## Philosophy

The Doctor of Medicine programme is dedicated to producing talented, expert doctors with a passion for knowledge and self-discovery. Graduates should have the abilities and attitudes appropriate for the medical sciences and medicine, including treatment, health promotion, disease prevention, and rehabilitation. They should be practised in diagnosis, systematic analysis, communication, and the application of knowledge. They should be able to lead with morality and professional ethics, contributing their lives to society. Graduates should put the needs of the majority ahead of their own, being a dependable member of the society.

## Objective

The School of Medicine aims to produce talented, expert doctors with a passion for knowledge and self-discovery, with abilities and attitudes appropriate for the medical sciences and medicine, and with the ability to be a leader and contribute their lives to society, putting the needs of society ahead of their own.

## Vision

The School of Medicine aims to become a leading international-standard national and Greater Mekong Subregion medical institution with the emphasis on family medicine and community medicine, providing a solution to the shortage of doctors in these fields and treating patients and families in the Upper Northern region and the Greater Mekong Subregion.

## Mission

The mission of the MFU School of Medicine is to be a higher-education institution dedicated to the production of medical graduates fully able to research solutions to community and local problems and develop new knowledge, including providing medical services and able to be based in the community. Medical graduates shall become dependable members of the community, contributing their lives to society in response to the demand for high-quality and sufficient human resources (consistent with the mission of the university). Dekan: Emeritus Professor Lt.Gen.Prof. Nopadol Wora-Urai, M.D., nopadol.wor@mfu.ac.th

HISTORY OF SUT - MUI COOPERATIONS as well as MFU- MUI COOPERATIONS		
May 8.	2006	A delegation of rectors, deans and professors of several universities of Thailand visits MUI, organized by ASEA-UNINET. Rector of MUI informs MUI professors to present proposals for possible cooperations. Professor Schwarz presents a practicum for the PC room where students could learn molecular modelling.
June	2006	Professor Schwarz receives a letter of invitation from Dean Vanich Vanaprucks to participate at the Symposium at SUT "Implementation of the Curriculum Emphasizing Primary Health Care".
Aug. 1.-3.	2007	Prof. Schwarz and his wife Dr. med. Rita Schwarz participate at the above mentioned symposium together with Walter Kofler, Harald Hörmann, Rainer Biedermann, Gilbert Reibnegger. Prof Schwarz gives for the 1st time the Molecular Modelling lecture+practicum module at SUT to 1st batch of medical students. A first draft of a cooperation contract between SUT and MUI as well as SUT and the Neurology clinic of MUI is signed.
April	2008	Dr. Sanong spends 3 weeks in Prof. Georg Wick's immuno- + endocrinodiagnostic laboratories, as well as on the Ageing Institute of the Austrian Academy of Sciences and finally in Prof. Reibnegger. Prof. Schwarz and his wife Dr. med. Rita Schwarz participate at the above mentioned symposium together with Walter Kofler, Harald Hörmann, Rainer Biedermann, Gilbert Reibnegger. Prof Schwarz gives for the 1st time the Molecular Modelling lecture+practicum module at SUT to 1st batch of medical students. A first draft of a cooperation contract between SUT and MUI as well as SUT and the Neurology clinic of MUI is signed. s laboratory in Graz. Dr. Sanong gives 2 lectures at MUI for medical students.
Aug.	2008	2. SUT Integrated Endocrinology T.W., Prof. Schwarz dedicates 3 copies of his book "Molecules of Life & Mutations" to the library of SUT., SUT "Appreciation" Document to Prof. Schwarz
July 27.-31.	2009	3. SUT Integrated Endocrinology T.W.
Oct.	2009	Dr. Sanong working for 1 month in Prof. Wick's laboratory, giving lectures to Medical students
Aug. 2.-6.	2010	4. SUT Integrated Endocrinology T.W., 4 professors from Chulalongkorn University in Bangkok also joined the molecular modelling course
Aug. 8.-12.	2011	5. SUT Integrated Endocrinology T.W., student FARFA from SUT being first performing clinical elective at MUI
Sep.09	2011	Signing of MOU at MUI by Rector Lochs
Aug. 26.- Sept. 2.	2012	6. SUT Integrated Endocrinology T.W.
Okt. 19.	2012	Doctoral promotion of 1. batch of Medical students by HRH Princess Maha Chakri Sirindhorn - Article in MEDICUS
Aug. 11.-18.	2013	7. SUT Integrated Endocrinology T.W., Honorary Plaque of SUT given by Rector Prasart Suebka to Prof. Schwarz
Aug. 18.-24.	2014	8. SUT Integrated Hematology T.W., Teaching the teachers of SUT Medical School the method of POL, by order of Dean Vanich Vanaprucks

March 3.-8.	2015	9. SUT Integrated Endocrinology T.W. (same batch as in 8. IHTW), Denise Vorberg being the 1st student from MUI to perform clinical elective at Surin Prov. Hospital
Nov.	2015	10. SUT Integrated Hematology T.W.
March	2016	1. Visitation and POL lectures at Mae Fah Luang University (MFU) in Chiang Rai
March	2016	11. SUT Integrated Hematology T.W. at SUT
Nov., 7.	2016	Honorary Doctoral Degree of SUT to Prof. Schwarz by HRM Princess Maha Chakri Sirindhorn, MUI "Appreciation" Document to Dr. Sanong
Jan. 10.-14	2017	12. SUT Integrated Endocrinology T.W. (same batch as in 11. IHTW)
Feb.16	2017	Signing of MoU with MFU by Rector Helga Fritsch of MUI
Nov. 20.-21.	2017	2. MFU Visitation, "Molecules of Life & Mutations" Lecture & Practicum
Nov. 22.-25.	2017	13. SUT Integrated Endocrinology T.W.
March 7.	2018	Signing of the MoU with SUT a 2nd time, Honorary Plaque of the MUI to Dr. Sanong
Nov. 21.-22.	2018	3. MFU Visitation, "Molecules of Life & Mutations" Lecture & Practicum
Nov. 22.-25.	2018	14. SUT Integrated Endocrinology T.W.
Nov. 11.-12.	2019	4. MFU Visitation, "Molecules of Life & Mutations" Lecture & Practicum
Nov. 12.-16.	2019	15. SUT Integrated Endocrinology T.W.
November	2020	4. MFU Teaching Days (2 days) and 16. SUT Integrated Endocrinology Teaching Days (3 days) on "Molecules of Life & Mutations" and other subjects planned and invited

## ASEA-UNINET Project Report MedUni Vienna 2019

### Clinical Traineeship Project:

Students of the Medical University of Vienna together with all other Austrian Medical Universities/faculties have the opportunity to complete a one-month sponsored clinical traineeship at one of the partner universities in July, August or September within the framework of the ASEA-Uninet programme. The clinical traineeship can be credited as a compulsory traineeship for studies at the Medical University of Vienna.

In an effort to represent Austrian medicine in the Asian region in a uniform and strong manner, the representatives of the Austrian medical universities have agreed on a common approach while maintaining full autonomy.

The Medical Universities assume that a common strategy and approach is needed to position Austria, a relatively small university and science location in Asia, as an attractive and long-term partner for exchange activities. It is therefore in the interest of ASEA-UNINET and the Austrian Medical Universities that, in order to achieve this goal, the Medical Universities act together as far as possible and in the common interest to represent Austrian medical research and education in a targeted manner. This is of course done while respecting the autonomy of each university and the right to pursue individual university interests and activities separately.

With this in mind, the Medical Universities have planned this joint programme for foreign exchange activities within the framework of ASEA-UNINET and have already been carrying out this programme very successfully since the 2004/2005 academic year. Basically, the focus of this program should continue to be on training activities for students. Based on the intensifying cooperation with Asian partner universities, exchange activities at other university levels for students, doctoral candidates, post-docs and scientists are also to be made possible.

The Asian partner universities are:

- University of Gadjah Mada - Faculty of Medicine
- Chiang Mai University - Faculty of Medicine
- Chulalongkorn University - Faculty of Medicine
- Khon Kaen University - Faculty of Medicine
- Mahidol University - Faculty of Medicine
- University of Medicine and Pharmacy at Ho Chi Minh City

Vice-Rector Prof. Dr. Anita Rieder  
*ASEA-UNINET-Coordinator of the Medical University of Vienna*

Reports  
on  
SP 24 Research Mobilities 2019  
in 2019/2020  
(Selection)



## **Biogenic raw materials, Resource Efficiency and in the Mekong Delta**

**Visit of Prof. Gerhart Braunegg to Vietnam National University HoChiMinh City  
Duration of the Stay: 2/1/2020 – 24/1/2020**

### **Project Partners**

- i) Gerhart Braunegg, Prof. Dr. techn.  
PhD in Chemical Engineering, retired University Professor for Bioengineering and Applied Microbiology at TU Graz;
- ii) Hai Le Than; Director of Institute of Environment and Resources, Vietnam National University, Dr. techn. TU Wien
- iii) Assoc. Prof. Dr. Ho Quoc Bang  
2005: Msc degree in Environmental Sciences  
2010: Dr. degree in Environmental Sciences  
Current position: Head of Department of Air pollution and Climate Change
- iv) Dr. Tung Travan  
Institute of Environment and Resources, Vietnam National University,

### **Report about the visit of Prof. Gerhart Braunegg to Vietnam National University HoChiMinh City**

Professor Braunegg was warmly welcomed by Prof. Hai Le Than and the Institute. The focus of the initial days of the visit was to work on the publication of MSc Nguyễn Thị Thu Thảo, "**Analysis of energy efficiency in an integrated agro-ecosystem in an acid soil region: research approach for sustainable livelihood in South-West Vietnam**". The publication will be submitted in February 2020 to Journal of Energy, Sustainability and Society, Elsevier, the collaboration of the universities under the ASEA-UNINET program is mentioned in the acknowledgement.

A further publication entitled Waste treatment and soil cultivation in a zero emission integrated system: a case study at a catfish farming system in Mekong delta, Vietnam, (lead author Tra Van Tung) has also been edited, and the publication is still planned for February 2020, after Prof. Braunegg and Prof. Schnitzer, who has always participated in the collaborative projects so far, have carried out final editing. Prof. Braunegg sees it as one of the most important tasks to place publications of the IER in international journals with a high impact factor in order to consolidate the scientific development of the institute.

Prof. Braunegg lectured at the university in HCMC on

- A critical introduction to the use and disposal of plastic materials, worldwide and in Vietnam
- Possible replacement of fossil plastics in the packaging sector by plastics made from biogenic raw materials and waste materials.

The audience consisted of staff of the IER, as the students were already in their Tet holidays at that time. (Chinese New Year, which is also celebrated in Vietnam).

Further lectures around similar topics, but also stressing the importance of implementing sustainability in

everyday life, were held at An Giang University in the Mekong Delta. His lecture was introduced by Mr. Nguyen Tran Thien Khanh, Head Management and Postgraduate Studies.

The audience were academic teachers and 2nd year students. The discussions at An Giang University with Ass. Prof. Bao-Son Trinh might result in a further cooperation, as Mr. Bao-Son has a close-connection with PRO-Vietnam (<https://www.packaging-gateway.com/news/pro-vietnam-packaging-recycling/>) which is an organization of the top 9-biggest packaging companies in Vietnam (Coca-Cola Vietnam, Friesland Campina, La Vie, Nestlé Vietnam, NutiFood, Suntory PepsiCo Vietnam, Tetra Pak Vietnam, TH Group and URC Vietnam)

Prof. Braunegg will attempt to actively participate in this cooperation and subsequently submit a project under ASEA-UNINET. The Vietnamese colleagues have been informed that ASEA-UNINET will no longer award Incoming Grants in the future, but this would not hinder future cooperation, the Vietnamese colleagues assure.

Furthermore, Prof. Braunegg was asked about his expertise when a shrimp farm was visited which had asked the IER for scientific advice. According to Prof. Braunegg, the problem of the breeding facility was the insufficient oxygen supply, which caused the shrimps to prefer to stay at the edge of the tank. Improved ventilation could result in an increased yield.

The director of IER, Professor Hai Le Thanh, stresses that it is the strong desire to continue the longstanding collaboration between TU Graz and IER, which amounts to now 15 years.

## **Publications**

submitted during the stay of Prof. Braunegg in HCMC

Journal: Journal of Cleaner Production

**Waste treatment and soil cultivation in a zero emission integrated system for catfish farming in Mekong delta, Vietnam** Corresponding Author: Hai Le Thanh

Co-Authors: Tung Tra Van, Dr; Thao Nguyen Thi Phuong, MSc; Vi Le Quoc, MSc; Hieu Tran Thi, MSc; Son Le Thanh, MSc student; Gerhart Braunegg, Prof. Dr.; Hans Schnitzer, Prof. Dr.; Sibylle Braunegg

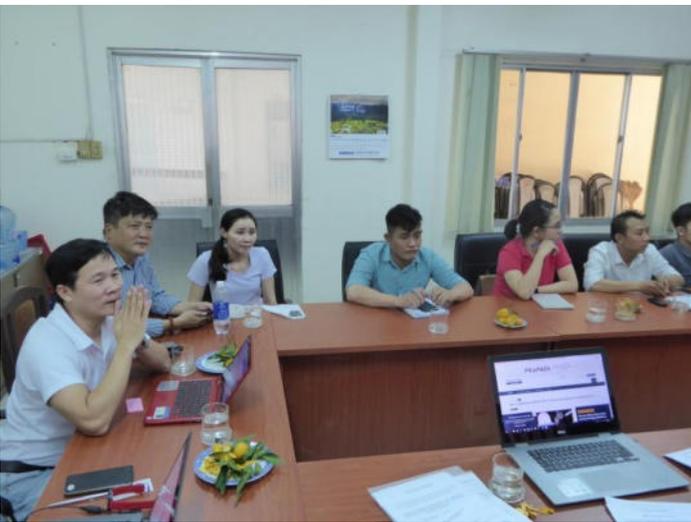
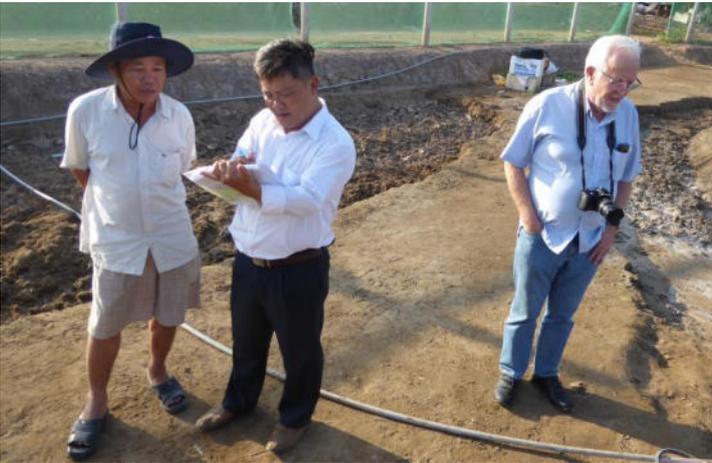
**Analysis of energy efficiency in an integrated agro-ecosystem in an acid soil region: research approach for sustainable livelihood in South-West Vietnam.** to be submitted

**Waste treatment and soil cultivation in a zero emission integrated system: a case study at a catfish farming system in Mekong delta, Vietnam,** to be submitted

At least 2 more papers for 2020 in international journals, under collaboration with Austrian scientists Prof. Gerhart Braunegg and Prof. Hans Schnitzer.

It is planned to continue the cooperation in 2020. Prof. Braunegg and his colleagues from the IER will submit a project on biogenic raw materials as packaging plastics in the next call.

**Photos:**



All Photos: © Gerhart Braunegg

# ASEA-UNINET SCHOLARSHIP REPORT

**Visit period:** 13th January 2020 to 2nd February 2020 (3 weeks)

**Incoming researcher:** Dr. Mohd Almie Alias (Universiti Kebangsaan Malaysia, Malaysia)

**Host Professor:** Prof. John Dunlop (University of Salzburg, Austria)

**Title of project:** Theoretical modelling of the role of geometry on biological tissue growth in curved substrates

## CV:

**Name:** Mohd Almie Alias

**email:** [mohdalmie@ukm.edu.my](mailto:mohdalmie@ukm.edu.my)

Dr. Almie obtained his BSc and MSc in mathematics from Universiti Kebangsaan Malaysia. He then completed a PhD in Applied and Computational Mathematics from Monash University, Australia in 2018. His research mainly focuses on moving interface problems for example in biological tissues and their associated analytical and numerical methods. His research interest also spans other topics for example the Eikonal-type equations, triangulation of irregular domains and finite element method, and discrete models for collective migration of cells. Almie believes that a mastery of theoretical mathematics knowledge, ability to perform computer programs, and communications with experimentalists are important elements to produce mathematical models that are reliable and usable. He is currently working as a lecturer in Universiti Kebangsaan Malaysia.

## REPORT:

This report comprises information about the activities that have been done during the visit, the post-visit follow-up activities that could be done and conclusions.

### Activities:

On the first day, I had a brief introduction to the faculty (various labs, group members, pantry, coffee machine and other facilities). I was given a room specially designated for visitor, with access to internet connection and library portal including access to online journals.

I met Prof. John Dunlop almost everyday (or at least once in two days if there were not a lot of things to be discussed). We normally discussed about my understanding/opinions of his research and how they compare to my research, if there were any related studies in the literature which consequently had brought me to encounter various useful papers, and possible extended projects that take into account both of our research. I also had discussions with the other group members: PhD students and postdoctoral researcher. I also attended a talk presented by a visiting Professor on the '4D

shape-morphing polymeric biomaterials'. I spent my other time reading papers and doing simple computer codes.

Follow-up activities:

Upon my departure from Austria, we will continue communicating through emails and skype. It is hoped that all the ideas can be implemented and studied thoroughly that finally will produce publications and other research output. We could also plan for more collaborations if there is similar funding from OeAD for the year 2021.

Conclusions:

Coming from mathematics department, I am blessed to learnt a lot of things from this research visit, particularly the potentials and limitations of theoretical modelling of tissue growth when compared to lab experiments. I am thankful to the OeAD for supporting the visit which has paved the way for me to go deeper into research. I really appreciate the kindness of Prof. John Dunlop, his research group and University of Salzburg for hosting me during the visit, for suggesting various research topics and reading materials, and for many tips on exploring and surviving in Salzburg. Finally, many thanks to Universiti Kebangsaan Malaysia for endorsing this visit and my study leave.

**Title of the project:**

**Surface display of a bacterial chitosanase in *Lactobacillus plantarum***

**Duration of the stay:**

01/02/2020 – 29/02/2020

**Contact detail:**

1. Dr. Hoang-Minh Nguyen, Department of Biotechnology, The University of Da Nang - University of Science and Technology, 54 Nguyen Luong Bang, Da Nang, Viet Nam
2. Priv.-Doz. Dr. Thu-Ha Nguyen, Food Biotechnology Laboratory, Department of Food Science and Technology, University of Natural Resources and Life Sciences. Vienna, Muthgass 18, A-1190 Vienna, Austria.
3. Dr. Mai-Lan Pham, Food Biotechnology Laboratory, Department of Food Science and Technology, University of Natural Resources and Life Sciences. Vienna, Muthgass 18, A-1190 Vienna, Austria.

**Background:**

Chitosanases (EC 3.2.1.132) release chito-oligosaccharides (CHOS) from chitosan, which are of great interest for many food, feed and biomedical applications due to their nontoxic and high solubility properties. CHOS are used as feed additive to provide positive antimicrobial, anti-oxidative, immunoregulatory, and blood cholesterol limiting effects to pigs. It is expected to successfully anchor a bacterial chitosanase onto the cell surface of *L. plantarum* using non-antibiotic lactobacillal expression system and two truncated forms of the LPxTG cell wall anchor for the development of whole-cell biocatalysts for the production of CHOS.

**Result:**

During this 4-week-visit at BOKU, I performed flow cytometry and immunofluorescent microscopy to confirm the localization of chitosanase on the cell surface of *L. plantarum*. The fluorescent signals in all recombinant strains carrying the plasmids were detected, inferring the successful display of protein on the bacterial surface. These results complete the data needed for this project and we are now preparing a joint- publication.

*Host professor*

Thu-Ha Nguyen

*Researcher*

Hoang-Minh Nguyen

*Vienna, 26/02/2020*

**Composing Across Cultures:  
Exploring techniques for incorporating Javanese and Balinese musical  
processes in orchestral music in historical and contemporary**

by Dr. I Nyoman Cau Arsana, S.Sn., M.Hum.

Name: Dr. I Nyoman Cau Arsana, S.Sn., M.Hum.  
Nationality: Indonesian  
Date of birth: November 7<sup>th</sup> 1971  
Institution: Indonesian Institute of Arts of Yogyakarta (ISI Yogyakarta)  
Stay from: October 14<sup>th</sup> 2019 until November 9<sup>th</sup> 2019  
Contact details: Jurusan Etnomusikologi FSP ISI Yogyakarta  
Jl. Parangtritis Km. 6,5  
Sewon, Bantul, Yogyakarta (55188)  
Indonesia  
+62 274 379133 Ext 373659  
+62 812 270 9841  
Email: namanasra@yahoo.com

Through this report, I would like to extend my appreciation towards OeAD and ASEA-UNINET for making this research project possible. I also would like to pass on my appreciation to Dr. Sarah Weiss as the host of the project, Mr. Febri Karnanta as the music director and organizer of ‘Begegnungskonzert Indonesia meets Austria’ and Kunstuniversität Graz as the host university and Prof. Dr. M. Agus Burhan, M.Hum. as Rector of Indonesian Institute of Arts of Yogyakarta (ISI Yogyakarta) for the permission given to us for to participate in this program.

Below is the summary of activities involving guest lecture, concert participation, class visit and other additional experience enriching events.

1. Guest Lecture: Balaganjur in the Ngaben Cremation Ceremony: a Balinese Musical Composition in a Funeral Ceremony on the Island of Bali, Indonesia.

Wednesday, October 30<sup>th</sup> 2019, 14:00, Kunstuniversität Graz (KUG).

Moderator: Dr. Sarah Weiss

Participants were students and some lecturers from the Ethnomusicology department from the Kunstuniversität Graz. This lecture was a result of my dissertation “Tetabuhan dan Tetembangan in the Ngaben Ceremony in district Abiansemal, Badung, Bali” in order to complete my doctoral degree in Universitas Gadjah Mada (UGM) Yogyakarta in 2017. This event was an important part of dissemination of this research to inform and communicate public about Balaganjur as an ensemble that used in the Ngaben ceremony, from



the conceptual, behavior, and its own sound perspective. During the lecture, the participants were very active in the discussion, asking questions. Indeed, I could learn new perspective from the participants. Most of participants asked about background and meaning from a certain components in the Balaganjur as well as Balinese culture in general for instance, differences

between Javanese and Balinese Gamelan, the importance of the music for local Balinese people and philosophy of behind of the music.

2. Balinese and Javanese Gamelan rehearsals for “Indonesia meet Austria” concert

a. “Karawitan Jawa” practices on 15<sup>th</sup> October 2019 at 18.00 till end, 22<sup>nd</sup> October 2019 at 18.45 – 21.00 and 25<sup>th</sup> October 2019 at 18.00-20.00. The practices were located at KUG.

a. Singgih

b. Balinese gamelan practice for Janger and Nyanyian Negeriku on 16th October 2019 at 16:00 - 18:00; 17th October 2019 at 15:00 - 17:30; 18th October 2019 at 13:15 - 17:30; 19th October 2019 at 10:00 - 11:30; 20th October 2019 at 10:00 - 12:00 (at TUG); 23rd October 2019 at 16:00 - 17:30; 24th October 2019 at 16:00 - 17:15; and on 25th October 2019 at 18:00 - 22:00. Our concept for this particular concert was combination of classical orchestra, Indonesian ethnic music and Balinese dance, for instance, “Nyanyian Negeriku” by Sanjaya that consisted of Balinese gamelan and Indonesian ethnic music. For this purpose, I re arranged the music to be fitted with the music instrument and the ability of musician at KUG. The same concept was applied for “Janger” arrangement by Lius and Febri Karnanta as a mix of classical orchestra and Balinese gamelan.

3. „Balaganjur” practice was done on 17th October 2019 at 18:30 - 20:35; 24th October 2019 at 17:30 - 19:30; 31st October 2019 at 18:30 - 20:30; and on 7 th November 2019 at 18:30 - 20:30 at KUG. I teach melody pattern and rhythm for reyong, kendang and cengeng that had been recorded so it can be used and developed in the future.



Photo by Sarah Weiss/KUG and Tony Day

4. Concert Indonesia meets Austria took place on 26<sup>th</sup> October 2019 at Minoritensaal. The concert went well and received positive response from the audiences.

Short clips were uploaded and could be watched:

<https://www.youtube.com/watch?v=lDogggEegnc> ;

<https://www.youtube.com/watch?v=prxGCAXuW2s> ;

<https://www.youtube.com/watch?v=Fn0v12raFZo>

and news about this concert could be read in the link below:

<https://kemlu.go.id/vienna/en/news/2870/kolaborasi-gamelan-dan-orkestra-pukau-publik-graz-austria>



Photo by Schubidu Quartet



5. Class Visit to post-coloniality, politics and performance on 21<sup>st</sup> October 2019 at 16:00 in KUG. Discussion topics: the politics of being an “outsider” to music that is one’s profession (composing, conducting and performing orchestral music as an Indonesian and performing and teaching gamelan in Austria as an American).
6. On Tuesday, 5<sup>th</sup> November 2019, I was invited by Indonesian Embassy in Vienna to give introduction and lecture for “gong kebyar” to the public, mostly Indonesian embassy staff and Indonesian people. I was able to teach “Gending Gilak Sasak”.

In general, this scholarship gave a lot of opportunity to be involved on multiple events that associated with music and art in Graz as well as to introduce Indonesian ethnic music to local and international students in Graz, Austria. It allowed me to collaborate to orchestra and choir in Graz, have fruitful discussion with ethnomusicology of KUG as well as student from multiple disciplines. Beside these, I was grateful to attend one of the most Austrian Opera “Fledermaus” by Johann Strauss at the Grazer Opernhaus and Viola Festival at Universität Mozarteum Salzburg. It is such as pleasure to have this experience and I am planning to share it to ISI Yogyakarta students in Indonesia.

I hope in the future I will have another opportunity to introduce Indonesian ethnic music in Austria and keep to be involved for future collaboration between Austria and Indonesia.

Graz, November 9<sup>th</sup> 2019

Dr. I Nyoman Cau Arsana, S.Sn., M.Hum.

Confirmed by:  
Graz, 12 November 2019

Privatdozentin Dr. Sarah Weiss, PhD

## Biography

**Dr. I Nyoman Cau Arsana, S.Sn., M.Hum.**



Dr. I Nyoman Cau Arsana, S.Sn., M.Hum. was born Bali in November 1971. He graduated in Bachelor Ethnomusicology at Indonesian Institute of Arts of Yogyakarta (ISI) and in 2004 completed his education for a master's degree program at Gadjah Mada University (UGM) Yogyakarta, and in 2017 completed his doctoral study at UGM.

Beside being as a lecturer, he is also active as a Balinese, Javanese and Javanese gamelan music player who often performs both in Indonesia and abroad. He is also a musical composer for many shows in Indonesia and abroad. In 2004 he was invited to teach Balinese music at the Indonesian Embassy in Moscow, Russia.

*Photo by Dr. I Nyoman Cau Arsana, S.Sn., M.Hum.*

His works have often been displayed both national and international such as Bali, Yogyakarta, Taiwan, China etc. Together with Kua Etnika band, he performed across Asia, Australia and Europe such as Darwin Festival 2008 in Australia, Vienna Jazz Festival 2009 in Austria, Adelaide Oz Asia Festival 2009 in Australia, then followed by a couple performance in Egypt, Taiwan and China during the Islamic Performing Arts Exhibition exhibition ISI Yogyakarta, Kecak Sanghyang stage and Andali composition stage. Currently Nyoman Cau is an active lecturer in the Department of Ethnomusicology, Faculty of Performing Arts at Indonesian Institute of Arts of Yogyakarta.

## ASEA-UNINET Staff Exchange

### One Month Scholarship

<b>Research Project</b>	DeepWaste: Waste Classification and Recycling Rate Estimation Based on Deep Learning Technique
<b>Recipient</b>	Assoc. Prof. Dr. Kitsuchart Pasupa Faculty of Information Technology King Mongkut's Institute of Technology Ladkrabang Bangkok, Thailand
<b>Host</b>	Prof. Dr. Peter Auer Department of Mathematics and Information Technology Montanuniversität Leoben Leoben, Austria
<b>Duration</b>	24 June-23 July 2019 (30 Days)
<b>Supported by</b>	Office of the Higher Education Commission (OHEC), Thailand Österreichischer Austauschdienst (OeAD), Austria Montanuniversität Leoben, Austria

### Summary

#### Research Projects

I have been involved in two research projects that are as follows:

1. ReWaste 4.0

I have been involved in two tasks of this project.

1.1 Waste Classification

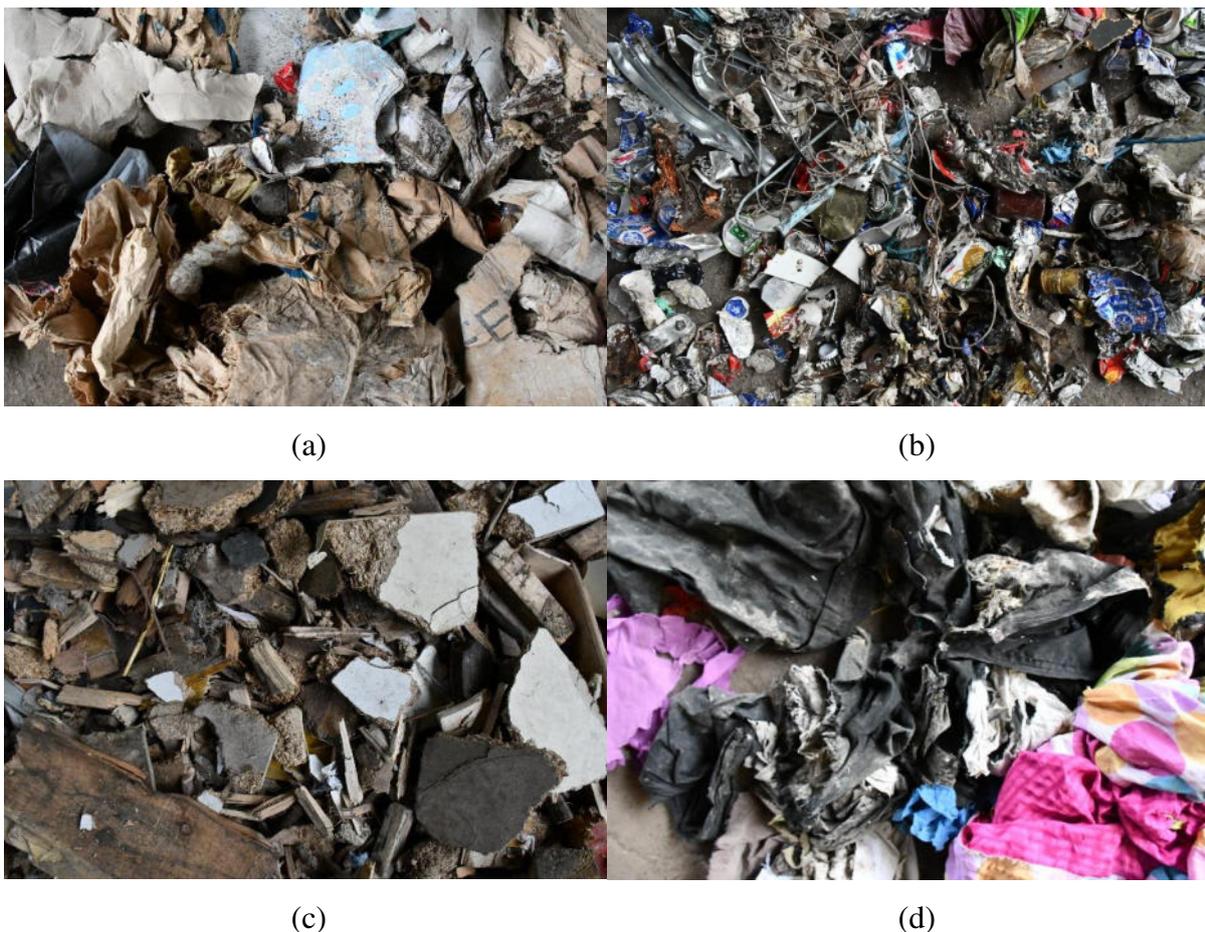
I initially conducted some experiments on a dataset that consist of 543 images of raw waste. The dataset is divided into three class, i.e., raw\_heap\_comm (208), raw\_heap\_elec (150), and raw\_heap\_resid (185). A pretrained VGG-16 Convolutional Neural Network was employed in this experiment and was fine-tuned with a very small learning rate and a few epochs. Image augmentation techniques were also applied in this experiment. Then leave-one-out cross-validation was performed to evaluate the model. The model can only achieve 34.1% accuracy while the baseline accuracy is 38.3%. The baseline accuracy is obtained when the classifier predicts the majority class. Likely, the reason for the low performance is the small size of the dataset and that some of images are not clear. Therefore, I decided to move forward to the next dataset that has been just recently collected.

The new dataset contains 3,149 images of 9 classes – Cartoon (334), Inert (240), Metal (223), Paper (393), Plastic2D (473), Plastic3D (461), Rest (432), Textile (177), and Wood (416). Here, I split the data into training and test sets with the ratio of 70:30. Again, VGG-16 was employed. The accuracy of the model for this task is 99.84% for a single run. Then, I reduced the training sample size into 50% of the dataset. The accuracy reduces to 98.73%. Examples of images are shown in Figure 1.

There are many directions to continue the work on this dataset. I will continue this work after the visit.

### 1.2 Waste Size Estimation

This task aims to estimate the size of waste into 6 categories, i.e., 20-40mm (224), 40-60mm (274), 60-80mm (289), 80-100mm (218), 100-200mm (304), and 200-400mm (227). There are 1,536 images in total. Each image is taken by a camera at the same reference point. Examples of images are shown in Figure 2. I plan to perform image segmentation and collaborate the size of waste into the learning process. I will continue this work after the visit.



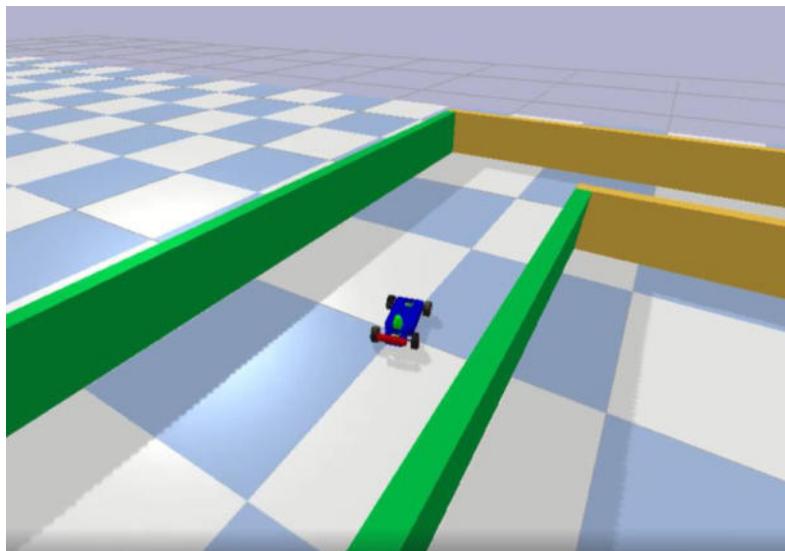
**Figure 1:** Example of Waste Classification Task Dataset: (a) Cartoon, (b) Metal, (c) Wood, and (d) Textile.



**Figure 2:** Example of Waste Size Estimation Task Dataset: (a) 20-40mm and (b) 200-400mm.

## 2. CrazyCar

The idea of this work is to enable a car to learn how to drive the shortest time lap by using reinforcement learning. This can be performed on a simulator. Once the model has been learned, it will be ported into the car. Initially, I successfully setup all the environment of the simulator (as shown in Figure 3) with the help from Dr. Martin Antenreiter. I will continue this work after the visit.



**Figure 3:** Simulator in Python

### Activities

- Attended Lab's Biweekly meeting.

### Future Plans

- Looking for a possibility on staff and student exchange between the two universities.  
Looking for a source of funding where we can apply together.

## Final Report for ASEA-UNINET Scholarship Programme

**Name:** DR LIM SENG JOE

**Scholarship:** Stipendien aus Mitteln des ASEA-Uninet, Projektstipendien SP 24

**Title:** In-depth Structural Characterisation of Functional Polysaccharides from Malaysian Brown Seaweeds

**Duration:** 1 month (1st – 29th February 2020)

**Contact details:**

Department of Food Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, MALAYSIA

+60175585339 (Mobile) +60389214273 (office) Email: [joe@ukm.edu.my](mailto:joe@ukm.edu.my)

**Short biography of persons involved:** (Position, topic and work conducted)

- **Dr Lim Seng Joe:** Senior Lecturer of Department of Food Sciences, The National University of Malaysia. In-depth Structural Characterisation of Functional Polysaccharides from Malaysian Brown Seaweeds. Conducted the monosaccharide profiling and recovery of guluronic acid and mannuronic acid from hydrolysis of sodium alginate.
- **Dr Stefan Böhdorfer:** Deputy Head of Institute of Chemistry of Renewable Resources, BOKU. Monosaccharide profiling of seaweed polysaccharides; Recovery of guluronic acid and mannuronic acid from hydrolysis of sodium alginate. Advised and demonstrated the use GC-MS/FID for monosaccharide profiling; and thin layer chromatography and subsequently flash chromatography for the separation of the uronic acids.
- **Dr Sonja Schiehser:** Coordinator of the laboratory in Muthgasse 18, BOKU, Vienna. Monosaccharide profiling of the polysaccharide from Malaysian brown seaweeds. Advised the methanolysis, derivitisation, and separation using GC-FID, as well as interpretation of the GC-FID data.
- **Dr Markus Bacher:** Senior Scientist of Institute of Chemistry of Renewable Resources, BOKU. Solid state and liquid state NMR spectra of seaweed polysaccharides. Advised and performing the NMR tests necessary. Also performed NMR analysis on recovered mannuronic acid and guluronic acid standards to determine which is which.
- **Dr Josua Oberlerchner:** Post-doc of Institute of Chemistry of Renewable Resources, BOKU. Hydrolysis and separation of sodium alginate into guluronic acid and mannuronic acid. Advised on the hydrolysis process of sodium alginate (sulphuric acid method and trifluoroacetic acid) and separation of guluronic acid and mannuronic acid through TLC methods (suitable TLC plates, eluents, etc).
- **Dr Irina Sulaeva:** Post-doc of Institute of Chemistry of Renewable Resources, BOKU. Molecular weight of polysaccharides isolated from Malaysian brown seaweeds. Performing the gel permeation chromatography (GPC) on the polysaccharide samples.
- **Dr Julien Jaxel:** Post-doc of Institute of Chemistry of Renewable Resources, BOKU. Separation of mannuronic acid and guluronic acid standards through flash

chromatography. Advising and performing the separation and recovery of the uronic acids using the flash chromatography instrument.

- **Prof Dr Thomas Rosenau:** Professor and Head of Institute of Chemistry of Renewable Resources, BOKU. Structural characteristics of functional polysaccharides from Malaysian brown seaweeds. Advised on interpretation of NMR data and its corresponding structural characteristics.

**Work conducted:**

<b>Date</b>	<b>Work performed</b>	<b>Location &amp; person involved</b>
3-7 February 2020	Monosaccharide profiling (methanolysis, derivatisation and separation using GC-FID) of brown seaweed polysaccharides (fucoidan, laminaran and alginate).	BOKU, Muthgasse 18, Vienna. Dr Stefan Böhmendorfer Dr Sonja Schiehser
10 February 2020	Discussion on NMR analysis with Dr Markus Bacher. Deuterated polysaccharide samples passed to Dr Markus for NMR analysis (Solid state and Liquid state)	BOKU, UFT, Tulln. Dr Markus Bacher
11-21 February 2020	Producing guluronic acid and manuronic acid standards from sodium alginate hydrolysis. Sodium alginates were hydrolysed using 2 methods, i.e. concentrated sulphuric acid and trifluoroacetic acid (TFA). The efficiency of hydrolysis were tested using thin layer chromatography (TLC) with different eluents. We successfully separated the uronic acid standards using TFA hydrolysis (2M TFA, 100°C, 5 hours, nitrogen gas evaporation, lyophilisation) through TLC.	BOKU, UFT, Tulln. Dr Stefan Böhmendorfer Dr Josua Oberlerchner,
21 February 2020	Discussion with Dr Irina Sulaeva on molecular weight determination of the polysaccharides using gel permeation chromatography (GPC). Samples were passed to Dr Irina Sulaeva.	BOKU, UFT, Tulln. Dr Irina Sulaeva
24-25 February 2020	Separation of the guluronic acid and mannuronic acid obtained from TFA hydrolysis of sodium alginate using Flash chromatography. The separated standards were then analysed using NMR to determine which is which.	BOKU, UFT, Tulln Dr Stefan Böhmendorfer Dr Julien Jaxel

26 February 2020	Discussion and interpretation of NMR results with Prof Dr Thomas Rosenau and Dr Markus Bacher.	BOKU, UFT, Tulln. Prof Dr Thomas Rosenau Dr Markus Bacher
26-28 February 2020 (planned)	Methanolysis procedures on the guluronic acid and mannuronic acid to determine its presence in the polysaccharide samples.	BOKU, Muthgasse 18, Vienna. Dr Sonja Schiehser

### Results:

- Monosaccharide profiling has established that the polysaccharide samples showed different profile, where fucoidan contained mainly of fucose; laminaran contains mainly of glucose and mannitol; while alginates are expected to contain mainly of guluronic acid and mannuronic acid (the guluronic acid and mannuronic acid standards have yet to be analysed at the time of writing).
- The guluronic acid and mannuronic acid standards were successfully recovered using Flash chromatography, and thus will be applied to methanolysis procedures to obtain their response factors for alginate monosaccharide profile analysis.
- NMR results are still in interpretation stage, where interpretation of the NMR data will be performed when I am back in Malaysia. Molecular weight determination has yet to be performed, but will be performed by Dr Irina Sulaeva next month. I will be in contact with Dr Irina Sulaeva on the results.

### Intended Publications:

- I intend to prepare a manuscript for the work conducted here in Austria for submission to scientific journal. Possible journal: Food Chemistry

Prepared by:

DR LIM SENG JOE

Scholarship Awardee

Checked by:

DR STEFAN  
BÖHMDORFER

Supervisor

Verified by:

PROF DR THOMAS  
ROSENAU

Host Professor



universität  
wien

## **Final report for ASEA-UNINET SP24 – 1-month research stay (2020)**

(4<sup>th</sup> - 31<sup>st</sup> March 2020, University of Vienna, Austria)

Project: "NLP for Disaster Management"

**Contact person: Asst. Prof. Dr.Hathairat Ketmaneechairat**

**Email: [hathairat.k@cit.kmutnb.ac.th](mailto:hathairat.k@cit.kmutnb.ac.th)**

Asst. Prof. Dr. Hathairat Ketmaneechairat is currently a lecturer at the Faculty of College of Industrial Technology, King Mongkut's University of Technology North Bangkok (CIT-KMUTNB). Her main teaching for Bachelor in the curriculums of Information and Production Technology Management. She interested in the areas of Data Mining, Machine Learning and Natural Language Processing.

### **Description of scientific topic**

According to the important of disaster management, we try to find a method that can be used to support the process of management system in terms of social media information extraction. In the past we published a paper related to Natural Language Processing in order to extract information from twitter into a class of object (Name Entity Recognition-NER) and also a class of messages such as announcement, request and support using Condition Random Field-CFR.

The analysis of natural disaster-related multimedia content got great attention in recent years. Being one of the most important sources of information, social media have been crawled over the years to collect and analyze disaster related multimedia content. Satellite imagery has also been widely explored for disasters analysis. However, we discussed how to create the verification engine for cross check the disaster occurs at any time from the social media and satellites. We also plan to write a paper for the conference indexed by scopus, IEEE etc. under the title of **"Verification of Disaster Alert in Twitter Through Satellite Images"**. We are now working on the literature reviews and also collecting data from twitter and satellite image in order to create the verification engine of disaster.

Univ-Prof. Dipl.-Ing.Dr.Dr. Prof.Gerlad Quirchmayr,  
Asst.Prof.Dr.Hathairat Ketmaneechairat



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wien

## Final report for ASEA-UNINET SP24 – 1-month research stay (2020)

(4<sup>th</sup> - 31<sup>st</sup> March 2020, University of Vienna, Austria)

Project: "NLP for Disaster Management"

**Contact person: Asst.Prof.Dr.Maleerat Maliyaem**

**Email: [maleerat.s@it.kmutnb.ac.th](mailto:maleerat.s@it.kmutnb.ac.th)**

Asst.Prof.Dr. Maleerat Maliyaem is currently a lecturer at the Faculty of Information Technology and Digital Innovation, King Mongkut's University of Technology North Bangkok (IT-KMUTNB). Her main teaching for Master and PhD in the curriculums of Information Technology and Data Science. She interested in the areas of Natural Language Processing, Information Retrieval, Machine Learning and Artificial Intelligence.

### **Description of scientific topic**

According to the important of disaster management, we try to find a method that can be used to support the process of management system in terms of social media information extraction. In the past we published a paper related to Natural Language Processing in order to extract information from twitter into a class of object (Name Entity Recognition-NER) and also a class of messages such as announcement, request and support using Condition Random Field-CFR.

Text centroids is a method that has been inspired from the center of mass in Physics. It refers to a specific point as one mass of the system gathered, it is balanced around the center. The average of the weighted coordinates of the distributed mass determines the coordinates and position of the object. To reduce the complexity of calculations, normally this will be replaced with a single mass at the position or the center of mass. However, we discussed how to apply centroid text representative to get the term that can be match to the disaster situation on library holding official guideline. We also plan to write a paper for the conference indexed by scopus, IEEE etc. under the title of "**Centroid-based approach mapping to disaster situation on library holding official guideline**". We are now working on the review literature and also collecting data from twitter in order to create co-occurrence graph and calculate centroid-based text representative. Then try to do mapping with the library holding official guideline in order to prove the concept of term matching using centroid text representative concept.

(Univ-Prof. Dipl.-Ing.Dr.Dr. Prof.Gerlad Quirchmayr)

(Asst.Prof.Dr.Maleerat Maliyaem)

## Universiti Utara Malaysia (UUM) – ASEA-Uninet Universities, Austria

The program is funded by ASEAN European Academic University Network (ASEA- UNINET). ASEA-Uninet is a network of universities, consisting of European and South-East Asian universities with the goal of promoting the continuous internationalization of academic collaborations between the participating countries.

The objectives of the program are as follows:

- a. To explore research collaborations between different universities within the network especially in the area of science and technology.
- b. To identify area of academic collaborations that will promote internalization.
- c. To obtain high impact collaboration and transfer of knowledge between institutions in both countries to further enriched the quality of research among researchers especially in Malaysia.

Potential Collaborators meet up:

The host university is Vienna University of Technology, TU Wien. The professor who is hosting is Univ.-Prof. Dr.Dr.h.c. A Min Tjoa, the national coordinator (Austria) of ASEA Uninet and the Director of the Institute of Software Technology and Interactive Systems at the Vienna University of Technology. During the three weeks spent in Vienna, meetings between the respective parties have been organized, in which the persons met are as follows:

1. Mr. Günther Ahmed Rusznak, CEO of IIDC and Dr. Wafaa Sherif Aly Elewa . The meeting took place in The Islamic Information Documentation and Certification GmbH (IIDC) office, in Linz.
2. Prof. Dr. Dietmar Haltrich, Prof. Henry Jäger and Prof. Konrad Domig, the Department of Food Sciences and Technology, BOKU.
3. Dipl.-Ing. Mag. Dr. Thomas Neubauer from TU Wien Institute of Information Systems Engineering Information & Software Engineering Research Division
4. Professor Dr. Alfred Taudes, Department of Information Systems and Operations Institute for Production Management. Vienna University of Economics and Business.
5. Professor Dr. Birgit Hofreiter, Director Innovation Incubation Center (i<sup>2</sup>c) TU Wien.
6. Professor Dr. Peter Petzelbauer, M.D. (Professor of Microvascular Research), SERD, Medical University Vienna.
7. Dr. Tsung Ping Chung. Chief of Strategic Planning and Coordination Office of Strategic Planning, Coordination and Quality, United Nations Industrial Development Organization (UNIDO)
8. Dr. Monica Carco. Division Chief, Rural entrepreneurship, Job creation, Human security .United Nations Industrial Development Organization(UNIDO)
9. Associate. Prof. Oliver Spadiut from the Integrated Bioprocess Development Biochemical Engineering, TU Wien.

Apart for the mentioned meetings, during the 3 weeks plus stay, I have also conducted a case study research in a company producing spice honey beverage from the 19<sup>th</sup> to the 23<sup>rd</sup> August 2019. The company was located in Kindberg, Austria and I was hosted by the owner of the facility, Mrs. Andrea Knorr-Kohlhofer. The case study is described in detail at the end of this report.

## Meetings and Outcomes 28<sup>th</sup>

August 2019:

Had a meeting with the Islamic Information Documentation and Certification GmbH (IIDC). IIDC is an independent and internationally accredited inspection and certification center for halal foods and services, certifications are offered throughout Europe and extend to all commodities and services. IIDC is also a JAKIM certified certification body. IIDC was represented by Mr. Günther Ahmed Rusznak, CEO of IIDC and Dr. Wafaa Sherif Aly Elewa. In attendance as well, was Univ.-Prof. Dr.Dr.h.c. A Min Tjoa, the national coordinator (Austria) of ASEA Uninet.

### Meeting and Outcomes:

During meeting, there were several projects agreed between the two parties. Among the agreed projects were:

1. Signing of MoU between UUM and IIDC, Austria. The signing of collaboration agreement will include research, publication and collaboration agreement between the parties. (At this point of time, the final draft of the agreement is being reviewed by the UUM legal team). The signing of the MoU is planned for December 2019.
2. IIDC has asked the team from UUM to explore several academic collaborations involving publication on halal science and halal food production. Dr. Wafaa will be coming to Malaysia in December 2019 MoU signing as well as discussing more on this matter. At this point of time we have identify several areas of research that could be explore together.

## 2<sup>nd</sup> September 2019:

Attended a meeting at the Department of Food Sciences and Technology, BOKU. The meeting was attended by Prof. Dr. Dietmar Haltrich, Prof. Henry Jäger and Prof. Konrad Domig. Discussions among the attendees revolved around academic issues such as research and student mobility.

### Meeting and Outcomes:

Several areas of collaboration were discussed with the following conclusion.

1. BOKU is open to hosting of UUM students especially postgraduates. However, UUM must provide the scholarship/fund for such activities, while BOKU will provide the facility for research to be done and the experts whom will supervise the incoming students.
2. Up to 2019 the number of students from Malaysia in BOKU is very low. So, Professor Haltrich suggested that we should start the collaboration with cosupervision of some postgraduate students especially from Malaysia.
3. BOKU also offered to host UUM students with suitable academic programs to conduct research in its facilities, however UUM must provide financial support for the students during their stay.

## 4<sup>th</sup> September 2019:

Attended a meeting with Dipl.-Ing. Mag. Dr. Thomas Neubauer from TU Wien Institute of Information Systems Engineering Information & Software Engineering Research Division. Prof. Neubauer explained about his team and the research focuses especially with regards to sustainability of the agriculture sector through the use of technology.

### Meeting and Outcomes:

1. We have agreed to start looking at conducting a research together, focusing on the use of IoT on agriculture and food supply chain.

2. Presentation was done on the current projects of the research center and how we could further collaborate to enhance possible collaboration.
3. We also discussed the possibility of applying for Malaysia grants for international collaborations. Professor Neubauer is also looking to explore the research grant from Austria side. We discussed the extensive use of technology in recent time and briefly discussed how Malaysia could benefit from similar approach.
4. Professor Neubauer also shared some of his team's work on IoT and their current projects being displayed around the Institute.

6<sup>th</sup> September 2019:

Attended a meeting at WU (Vienna University of Economics and Business), in the Department of Information Systems and Operations Institute for Production Management. I was hosted by Professor Alfred Taudes, who is also the scientific lead in Crypto economy, for Austrian Block Chain (ABC) academy.

Meeting and Outcomes:

1. We have agreed to start looking at conducting a research together, focusing on the use of IoT on agriculture and food supply chain.
2. We have also agreed to prepare a proposal soon and work together with SBA to apply for a research grant together. Professor Taudes has also invited me to join ABC (Austrian Blockchain Academy).
3. We are currently looking for a suitable source of funding and will be Skyping soon to discuss the proposal.
4. Professor Taudes has also extended his invitation for me as a visiting lecturer at Vienna University of Economics and Business.

9<sup>th</sup> September 2019:

Attended a meeting with Professor Birgit Hofreiter, Director Innovation Incubation Center (i<sup>2</sup>c) TU Wien. Various scopes of potential collaboration on commercialization and innovation were discussed. I updated Professor Hofreiter on the progress of my spinoff company as well as sharing of knowledges in regard to similar incubation and innovation program under Oxentia, United Kingdom, which I had attended in December 2017. Professor Hofreiter visited UUM in 2018 and conducted a talk and meeting with Innovation and Incubation Centre in UUM. However due to budget constraint, we could not proceed with further programs. We discussed the possibility of picking up from where we left off since then, conducting the project under the ASEA Uninet umbrella and involving all the member universities in Malaysia instead.

Meeting and Outcomes:

Prof Hofreiter is looking forward to getting involve with ASEA Uninet Malaysia program however further discussion need to be done with national coordinator for Malaysia, Associate Professor Dr. Farizal Rajemi.

10<sup>th</sup> September ,2019

In the morning, a meeting with Professor Dr. Peter Petzelbauer, M.D. (Professor of Microvascular Research), Skin & Endothelium Research Division (SERD) was done at his office in the Medical University of Vienna. We discussed about my existing research on the impact of *Entada spiralis* extract on skin infection and how the research can be explored further. Unfortunately, collaboration between us will require transportation of treated skin cells between the facilities as Professor Petzelbauer can only examined the treated cells in his lab after the initial part of the study is conducted in Malaysia. We look at various other options but found that while this approach is the most feasible for the study, it will prove to be quite risky and could not be done at the moment.

However, we agreed to keep in touch, and continue to look into future potential collaboration in the future.

Later in the afternoon, 2 different meetings were scheduled in the United Nations Industrial Development Organization (UNIDO) office in Wagramer Str. 5, with the support from Prof. Dr. A Min Tjoa. The meetings were with the following heads of units:

1. Dr. Tsung Ping Chung  
Chief of Strategic Planning and Coordination  
Office of Strategic Planning, Coordination and Quality United Nations  
Industrial Development Organization

Dr. Chung briefed me on the function of UNIDO globally and shared the resources available including for Malaysia. We also discussed in detail about several topics which included circular economy, sustainability, agriculture technology as well as industrial development. I presented on several ongoing and completed projects that we are doing as well as our 5 years plan. She shared various information on projects funded and supported by UNIDO, all around the world and discussion was made on how to further collaborate on common ground that will benefit local communities around the world. I was also suggested to share my technical knowledge in setting up food manufacturing facilities with UNIDO so in case any projects need help with HACCP and GMP set up, I could lend a hand. Dr. Chung also shared the contacts of Mr. (Datuk) Raja Adnan Raja Abdul Aziz, Department of Nuclear Safety and Security / Division of Nuclear Security, Director, and Dr Heng Lee Kheng, Section Head of the Soil and Water Management and Crop Nutrition. This was after I expressed interest in the upcoming conference on sustainable livestock June 2020. Dr. Chung also shared the contact information for Malaysia Ambassador to Austria, Dato' Ganeson Sivagurunathan so I could arrange a meeting with them on my next visit.

2. Dr. Monica Carco  
Division Chief, Rural entrepreneurship, Job creation, Human security United Nations  
Industrial Development Organization

Dr. Carco shared her area and unit role in UNIDO and asked about our activities in Malaysia. I shared some of the industrial development projects as well as our community development projects. She expressed her interest in a project involving single mother in rural Kedah and asked for a proposal to be submitted.

#### Meeting and Outcomes:

Following the meetings, several outcomes resulted from it:

- Dr. Carco invited me to send a proposal on our work with single mothers in Kedah. Proposal was emailed to her on the 1st of October 2019.
- Dr. Chung asked me to upload my CV to the UN database so they could match my skills with the required support that UN needs from time to time.
- Dr. Chung also asked me to apply for the post of visiting scholar to UN University in Finland. Application submitted on the 30<sup>th</sup> of September, 2019

#### 13<sup>th</sup> September, 2019:

Following Professor Haltrich suggestion, a meeting was arranged with Assoc. Prof. Oliver Spadiut from the Integrated Bioprocess Development Biochemical Engineering, TU Wien. The meeting took place in his office and we discussed the possibility of working together on a project that I recently started i.e. extraction of a tropical fruit name *Momordica cochinchinensis*, which contain various nutritional benefits that has yet to be explored widely. I did a detail introduction of the projects as

well as discussed on how Professor Spadiut expertise in bioprocessing can further enhance the project.

Meeting and outcomes:

- Prof Spadiut agreed to collaborate on extraction project focusing on stabilization of the extraction, which is very crucial due to the unstable nature of the compound and its active ingredients. I have proceeded to apply for a grant to start off this project and will be looking to apply for the ASEA Uninet grant, as well as Malaysia government MESTECC grant. We are already working on the proposal together.
- A sample of the extract was already sent out to Prof. Spadiut so he can start his groundwork at the laboratory quickly.
- Professor Spadiut has also issued a written agreement for the collaboration, as enclosed.



INSTITUTE OF CHEMICAL ENGINEERING  
Gumpendorferstrasse 1A/4<sup>th</sup> floor  
A-1060 WIEN

Research Area Biochemical Engineering  
Assoc. Prof. Dr. nat. techn. Oliver Spadiut  
Tel.: +43 1 58801 166473  
E-Mail: oliver.spadiut@tuwien.ac.at

To whom it may concern

03.10.2019

**Re: Collaboration with Dr. Risyawati Mohamed Ismail**

Dear Ladies and Gentlemen,

I am Assoc. Professor and Principal Investigator of the research group “Integrated Bioprocess Development” at the Institute of Chemical, Environmental and Bioscience Engineering of TU Wien, Austria’s largest scientific-technical research and educational institution.

I hereby confirm my strong interest in a scientific collaboration with Dr. Risyawati Mohamed Ismail on matters of extraction and characterization of bioactive compounds from plant material.

Please feel free to contact me with any additional questions you may have regarding this collaboration at +43 1 58801 166473 or via email: oliver.spadiut@tuwien.ac.at.

Sincerely,

Assoc. Prof. Oliver Spadiut

## Case Study Report

Apart from the networking and discussions exploring further collaborations between Malaysia and Austrian universities, I had also spent 4 days (19<sup>th</sup>-23<sup>rd</sup> August 2019), working and conducting a (case study) research on a local restaurant focusing on its halal certification process and its international business. The restaurant is Krikac Café located in Kindberg Austria. The restaurant is owned by Knorr-Kohlhofer KG. Krikac cafe is a family owned business, operating for the last 68 years. The café is also the producer of spice honey for 'Met You', a local brand of health beverage made from local honey infused with various high-grade spices. The café functions as the production facility for 'met you' products, thus it is the focal point of halal certification process. I was hosted by the café owner, Mrs. Andrea Knorr-Kohlhofer and Dr. Michael Goritschan, the brand owner of Met You. During the 4 days project, several areas of the operation were examined, among them are:

1. Overall production flow for the spice honey
2. Food quality system, monitoring system as well as product disposition in the facility
3. Supplier management system of the products
4. Facility maintenance and monitoring
5. Quality testing of the finished products
6. Overall compliance to MS 1500

I also studied their business strategy and the future plan. The study resulted in several insights:

1. While the quality of the process is embedded in its daily operation, the production of spice honey is yet to follow any proper standard operating procedure and not being documented.
2. All its suppliers are supplying food grade, high quality raw materials and packaging, however they were not qualified properly as a supplier management program was not in place.
3. All the raw material suppliers except raw honey are already certified halal with proper documentation in place.
4. Based on several interview with the brand owner, halal certification is viewed as the market entrance ticket especially for Muslim concentrated market. As the halal product market is expected to rise to USD 20 billion by 2030, he predicted a significantly wider market opportunity for his products if it manages to obtain the certification.
5. The core business strategy that the company is using is based on quality strategy. Honey has a huge market around the globe especially in the Muslim economy as it is considered one of the healthiest food choices, both scientifically and culturally. Honey is even mentioned as the food of choice of the prophet among Islamic scholars thus elevating its status among the Muslims. However, high quality of honey is a rarity and most of modern honeys contained a mixture of raw honey, flower extract and corn syrup. This is where the high grade pure Austrian honey is viewed as premium product that will capture the potential huge halal market.

At the end of the research, we have managed to help Krikac Café in preparing itself to be upgraded for quality certification (not limited to halal) by setting up a proper system for the production processes. A proper standard operating procedure was complemented and implemented in the

production facility. The key staffs also underwent proper training to ensure that they can sustain the system that was put in place. A complete standard operating manual was also developed and put into implementation. The production facility will operate in conformance with the stated SOPs and by the end of the year will be ready for certification audit. I have also introduced them to the certification body in Austria i.e. IIDC and the SOPs have been submitted for pre audit inspection.

Reported by,  
Risyawati Mohamed Ismail, PhD  
Food Security, Innovation and Development Research Centre, School of  
Technology Management & Logistics  
Universiti Utara Malaysia

## FINAL REPORT

### The ASEA-UNINET ONE MONTH SCHOLARSHIP

# CHARACTERIZATION OF ORGANO-MINERAL COMPLEXES IN SOILS OF GALAPAGOS ISLANDS IN A SOIL CHRONOSEQUENCE

**Duration of the stay:** 27 days during 3 -29 November 2019

**Participant Name:** Assistant Professor Dr. NATTHAPOL CHITTAMART

**Contact Details:** Department of Soil Science, Faculty of Agriculture, Kasetsart University  
50 Ngamwongwan Road, Lat Yao, Chatuchak, Bangkok, Thailand 10900.

**Office Tel.** (+66) 29428104-5 dial 220 **Mobile phone:** (+66) 880686188

**Email address:** [fagrnpc@ku.ac.th](mailto:fagrnpc@ku.ac.th)

### **Austrian Supervisor:**

Univ. Prof. DI. Dr.h.c. mult. Dr. MARTIN H. GERZABEK

Institute for Soil Research, Department for Forest and Soil Sciences. University of Natural Resources and Life Sciences, Vienna.

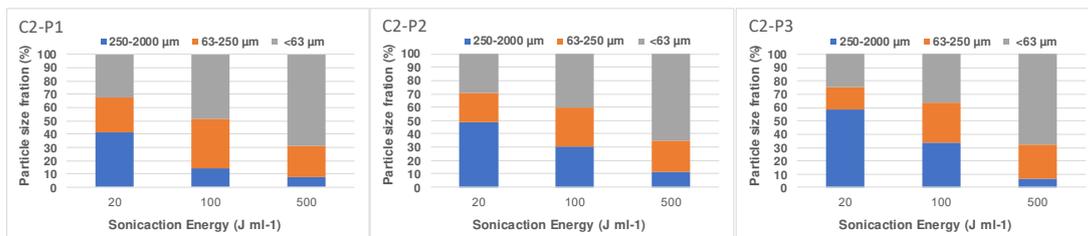
### **Description of the scientific topics and work conducted during the research stay**

Conversion of natural forest to agricultural arable land significantly accelerates depletion of soil organic matter (Don et al. 2011). Thus, the capacity of soils to store organic carbon represents a key function of soils that is not only decisive for climate regulation but also affects other soil functions such as soil structure, soil fertility (Wiesmeier et al. 2019). It has been shown that the stability of organic matter (OM) in soils can be enhanced by the formation of various organo-mineral associations between domains of SOM particles and the surfaces of soil minerals (Kögel-Knabner et al. 2008; Kaiser and Guggenberger 2000). The interactions between organic and mineral constituents create the structural organization of organic and mineral constituents as organo-mineral complexes is an important process for carbon stabilization in soils (Chenu and Plante 2006).

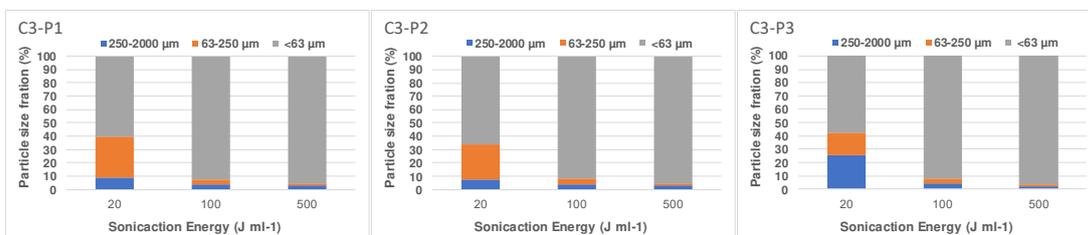
The Galápagos Islands have faced a huge rise in the number of inhabitants and tourists over recent decades. As a consequence, natural forest vegetation has been converted to arable land to meet the increasing demand for agricultural produce. Gerzabek et al. (2019) reported that soil organic carbon stocks in soils of the Galápagos Islands were relatively high even in natural forest and arable cropland. The mineralogical mineral composition of the soils is dominated by allophane, ferrihydrite and halloysite depending on soil parent material and soil moisture regime (Candra et al. 2019). However, the detailed and insightful study on surface-modified clay-sized fractions by soil organic carbon in term of organo-mineral complexes of the soils in Galapagos Island need to be investigated. Therefore, this research proposes to investigate the organo-mineral association in soils derived from chronosequence rock from the 3 inhabited islands i.e. Isabela, Floreana, and San Cristobal in the Galapagos Islands.

## Results

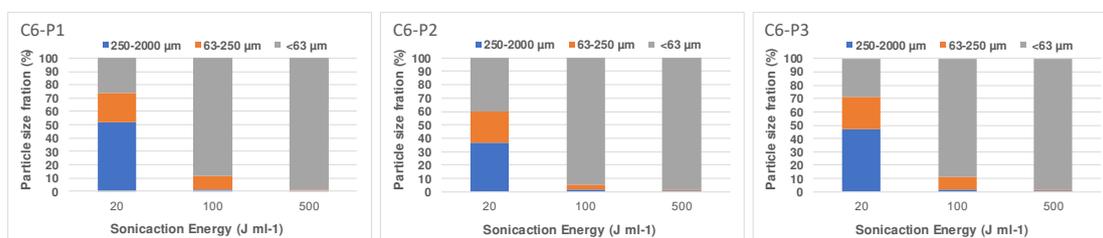
The organic matter in soils is typically associated with mineral fractions in the soil aggregates. Therefore, during one month, we have investigated the energy of aggregate breakdown by three ultrasonication energy (20, 100, 500 J ml<sup>-1</sup>) to separate particle size fractions into 250-2000 μm, 63-250 μm and <63 μm. Soil samples were analyzed for dissolved organic carbon (DOC) by UV-vis spectroscopy released from different kinds of soils with different rock aged from 4.29 ka, 26 ka, and 1070 ka of Andisols, Cambisols, and Oxisols, respectively. The results showed that the relative particle size fraction of 250-2000 μm of all studied soils decreased with increasing sonication energy (Fig. 1, 2 and 3) and the relative finest fraction (<63 μm) increased with increasing sonication energy. The total breakdown was observed by sonication energy of 500 J ml<sup>-1</sup> except for Andisols, their aggregates are more stable than other soils. In addition, the increasing sonication energy enhance dissolved organic carbon released to soil solution especially Andisols and Cambisols (Fig. 3, 4, 5). The lowest dissolved organic matter released was observed in Oxisols due to it is a highly weathered soil. It is possible that organic carbon remains in Oxisols in a more stable form rather than the labile form. Our study implies that



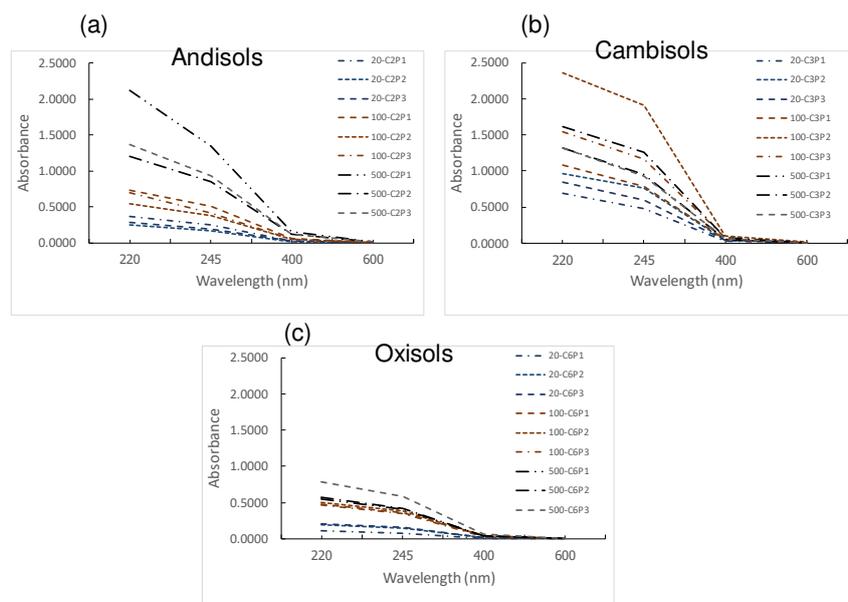
**Figure 1.** Particle size fraction of after sonication of the Andisols derived from scoria rock aged 4.29 ka from the Isabela island in Galapagos islands



**Figure 2.** Particle size fraction of after sonication of the Cambisols derived from scoria rock aged 26 ka from the Floreana island in Galapagos islands



**Figure 3.** Particle size fraction of after sonication of three Oxisols derived from scoria rock aged 1070 ka from San Cristóbal in Galapagos islands



**Figure 4.** Effect of sonication energy on absorbance of dissolved organic carbon (DOC) in (a) the Andisols derived from scoria rock aged 4.29 ka from the Isabela island in Galapagos islands, (b) the Cambisols derived from scoria rock aged 26 ka from the Floreana island in Galapagos islands and (c) three Oxisols derived from scoria rock aged 1070 ka from San Cristóbal in Galapagos islands. *Credits Fig.1-4: N. Chittamart, M. Gerzabek, F. Zehetner and A. Mentler*

#### Laboratory Activity during one month stay



*Credits: Natthapol Chittamart / Kasetsart University*

#### Intended publications (if any)

Our results have the potential to be published after we get additional data e.g. total organic carbon in size fractions and FTIR spectrum.

Natthapol Chittamart

(Univ. Prof. DI. Dr.h.c. mult. Dr. MARTIN H. GERZABEK)

27 November 2019

27 November 2019

## Historical and Cultural Indonesian Research: Wayang Beber

**01<sup>st</sup> February to 21<sup>st</sup> February 2020, University for Continuing Education  
Krems, Austria**

**Wiwik Sri Wulandari, Prima Dona Hapsari, Indiria Maharsi, Warsono**

Email address: [dona.hapsari@gmail.com](mailto:dona.hapsari@gmail.com)

The lecturers of Institut Seni Indonesia Yogyakarta (ISI Yogyakarta) received the grant of SP 24 by the ASEA UNINET to conduct a joint-research program and an art conservation training program at Danube University for Continuing Education, Krems, Austria on February 1<sup>st</sup> – 21<sup>st</sup>, 2020. There were four lecturers who joint this program, and it was facilitated and supervised by habil. Mag. Dr. Patricia Engel. The team of ISI Yogyakarta were Wiwik Sri Wulandari, Prima Dona Hapsari, Indiria Maharsi, Warsono. The report is presented indivisually for the OEAD.

Prima Dona Hapsari is a lecturer at Musicology Study Program, Faculty of Performing Arts, Institut Seni Indonesia Yogyakarta. The topic of conservation is a new insight for her as a lecturer as her background study is language education. By doing the training program at Danube University Krems, Austria under the supervision of Dr Patricia Engel, she received some first steps in understanding and valuable knowledge toward conservation on cultural heritage by using a Wayang Beber for developing a conservation concept. Dr.habil Patricia Engel gave her lectures on several basic understanding of conservation of cultural heritage items, particularly for Wayang Beber.

The training program conducted by Prima Dona Hapsari was done into three categories, i.e. (1) preparation of conservator's documentation and material understanding, (2) environmental standard and proper storage of the artworks, and (3) comparative study of material Wayang Beber. By carrying out the training program, she had more valuable insight and workload focusing on the scientific aspects. There were important lecturers and information facilitated by Dr Patricia Engel as follows:

### **a. Visiting Program and Learning the storing and archiving method of the book collection at the Monastery Zwettl Abbey, February 4-5<sup>th</sup>, 2020**

On Tuesday, 4<sup>th</sup> February 2020 – Wednesday, 5<sup>th</sup> February 2020, the team of ISI Yogyakarta lecturers learned and understood the idea of the world heritage, the book archiving storage, and the environmental standard of the monastery building, and visited the Zwettl Abbey Monastery, in the north of Austria. They met Dr. Andreas Gamerith as the art historian who worked for the monastery. There they found step-by-step procedure for conservators to understand. It was very important for the team in which they could learn how to do the book archiving and understand the environmental

circumstance which supported the storage room for the manuscripts at the Monastery Zwettl Abbey. The idea of this first step was, that the principles in how to observe a collection of items, books or any other items, the method to make a documentation of the artefacts and their condition and the way how to evaluate a room and to decide whether it can be used for a storage is the same, not matter if we have a collection of archival material, books, textiles, paintings or any other. Along with these absolutely basic tasks, the objective was to introduce the first knowledge about paper, parchment and leather, how to distinguish the sorts and how to identify damage.

The followings are some important points for the team of conservation in regards to book archiving:

**(1) To understand the environment appropriate for the book archives and manuscripts at the Zwettl Monastery**

Zwettl Abbey Monastery is a Sistersien order monastery located 3 km northeast of the city of Zwettl in Austria. This monastery was built by Hadmar I of Kuenring in 1137 as a monastery under the Heiligenkreuz monastery. This monastery is very strong with Romanesque and Baroque architectural styles. Baroque elements were added in the 18th century (source: [https://en.wikipedia.org/wiki/Zwettl\\_Abbey#History](https://en.wikipedia.org/wiki/Zwettl_Abbey#History), accessed on March 2<sup>nd</sup>, 2020)

To understand in details about how the conditions of an ideal document and how to do the document archiving was by viewing and observing the manuscripts and book collection of Zwettl Abbey Monastery which were storage in the archive rooms with the following condition:

- They measure approximately 12 x 10 square meters, with a height of between 4-5 meters.
- They are located on the ground floor.
- The outer walls of the archives are very thick and have been confirmed to be far from moisture or water utilities. The strength of the building construction on the ground floor and wall thickness also has a function to provide security guarantees in the event of an earthquake, extreme weather or a threatening fire hazard.
- The floor of the archive room is made of materials that are not prone to moisture. Previously, the floor of the archive room was built using natural stone floors, but they absorbed water from the pores of the stone so that the floor was renovated using concrete which did not absorb water from the ground.
- Archive storage racks use the Roll O Pact Mobile model, which is sized according to the area of the archive room.
- The condition of the archive room environment at Zwettl Abbey Monastery is good in which there is no threat of termites or humidity due to fungus.



Figure 01. The team were working at the storage room of Zwettl Abbey on 4-5<sup>th</sup> February, 2020 (Doc. By Patricia Engel, 2020)

(2) Understanding on the Temperature and Humidity

- hygrometer is used as a humidity level controller for the archive space.
- The archive room is in good condition of air circulation.
- The archive room complies with temperature and humidity standards

(3) Understanding on the Light and Lighting

Light and lighting are not blinding, shaded and very contrasting.

In the archive room, there is a window facing the outside of the building, where direct sunlight does not hit the archive.

(4) Understanding on Wind

- Building foundations are designed to be strong to support strong walls so that they can withstand strong winds, heavy rain, extreme weather or even earthquakes.
- Windows and doors are made with strong, high-quality materials to prevent heavy rain and water exposure.

(5) Understanding on the Rack for storing the archives or books

- The archive rack uses a Roll O Pact Mobile model that is robust and can be moved according to the archive to be searched.
- File racks are made of metal that do not rust easily.
- Archive material is free from termites or pests



Figure 02. The archive rack uses a Roll O Pact Mobile model (Doc. By Wiwik Sri Wulandari, 2020)

#### (6) Archive Security

- There are fire extinguishers in the archive room
- fire alarm system and fire fight system
- fire extinguisher / smoke detection
- Hydrants inside and outside the building

#### **(7) To identify and diagnose the decay of the books and paper as the basic aspect of understanding conservation**

One important thing that needs to be known to further the world of art conservation is understanding the material to be conserved. Likewise, in our art conservation training agenda at Zwettl Abbey Monastery, we were studying book and paper material contained in the monastery's archive room, especially how to identify the condition of the book and the conditions of its damage. Each of us was assigned to identify the condition of the book, including: what materials are made for the volume of the book cover (wood, cardboard, etc.), book binding (vegetable leather, half leather, a quarter bounding, alumn leather, parchment, paper, etc.), writing material of the book (carboon, iron gal ink), analysis on the paper made (machine or handmade paper), and the details of damage causes (ink corotion, insect investation, microorganism, and clasp missing or damaged).

Then, we also analyzed or examined in more detail the damages, such as whether it has ink corrosion, folded paper, mold, or damaged media binding conditions, etc. It was very useful for a conservator before conducting material analysis using laboratory tools. As Dr. Patricia Engel once said, a conservator uses his entire senses to understand the environment of the material under his/her body as far as possible, then recognizes when it is sensitive to

the symptoms that cause damage to the material. The survey with well trained and experienced senses is a valuable tool for a conservator and allows him/her to bring forward a hypothesis for an instrumental analyse if this is needed.

To make a documentation of a collection with a large quantity of items a table is of great help:

BOOK ARCHIVING AT MONASTERY ABBEY ZWETTL AUSTRIA, 4-5 February 2020

BY DONA AND WIWIK

No.	Sort	Wood	Cardboard	Eg Ink	Ink	Others	Handmade paper	Machine Paper	Ink Corrosion	Insect	Mold	Clasp	Ribbon	Condition and Extra
14/142	4		X	X		D	X		X	X				Back book bleaching
14/143	4		X	X		D	X		X	X old	X			Back book bleaching
14/144	4		X	X		D	X		X	X old	X			Book cover bleaching
14/145	4		X	X		D	X		X	X old	X			Back cover damage by insect
14/146	4		X	X		D	X		X	X old	X			Paper inside
14/147	4		X	X		D	X		X					Back book bleaching Paper inside
14/148	4		X	X		D	X		X					Paper inside
14/149	4		X	X		D	X		X	X old				Back book bleaching Back cover torn by insect
14/150	4		X	X		D	X		X					Back book

**Table 01.** Identify and diagnose the decay of the books and paper at the book archive at Monastery Zwettl Abbey by Dona and Wiwik

### (8) Observation on the Art Collection of the Abbey and the Church of Monastery Zwettl Abbey with Dr. Andreas Gamerith

After we carried out the project to identify and diagnose the damage to books and papers in the archive room, we were given an excellent opportunity by Dr. Gamerith as Art Historian to see the works of the Zwettl monastery and the Catholic church collection.



**Figure 03.** Dr. Gamerith showed a number of collections of drawing, painting works which are the collection of monastery and historical Catholic Zwettl church (Doc. By Patricia Engel, 2020)



**Figure 04.** Dr. Gamerith explained the history of the collection of works of painting, stained glass which is a collection of the Zwettl Catholic Church. (Doc. By Wiwik Sri Wulandari, 2020)

**b. One Day conservation exercise at the graphic collection of the Abbey of Heiligenkreuz, Austria, on 10<sup>th</sup> February 2020**

Here is the publication can be search on this website: <http://www.stift-heiligenkreuz-sammlungen.at/>

## **Introduction**

This summary report describes the activities undertaken by four members of the academic staff of Institut Seni Indonesia Yogyakarta (ISI Yogyakarta): Prima Dona Hapsari, Indiria Maharsi, Wiwik Sri Wulandari and Warsono being at the graphic collection of the Abbey of Heiligenkreuz. Under the supervision of Dr. Patricia Engel, the Indonesian scholars who were on internship with Donau-Universität Krems held a practical exercise in surveying a graphic art collection, in this case, the collection of the Abbey of Heiligenkreuz, Austria. The event was organized by three institutions, Institut Seni Indonesia Yogyakarta, Indonesia (ISI Yogyakarta) and Danube University Krems, Austria and the Abbey of Heiligenkreuz under the program of SP24 sponsored by ASEA UNINET.

The work was performed on 10<sup>th</sup> February 2020 in Heiligenkreuz.

## **The task**

ISI Yogyakarta lecturers were tasked with

- (a) Developing a concept of survey of a certain amount of works of graphic art
- (b) Developing categories of items to be used in performing the next task: that of developing a comprehensive conservation concept of a more general level
- (c) Developing a cataloguing system, to encompass description of the material and the condition of prints and drawings

While in Zwettl everything was so to say prepared for going in medias res, in Heiligenkreuz the situation is one step “earlier”, which gave the scholars the opportunity to apply now themselves what they had learned in Zwettl in terms of how to approach a collection and how to find a way through unsorted heaps of Cultural heritage items, how to systematize and categorize and how to cluster damage.

## **The method**

The survey was conducted in visible (direct, raking and transmitted) light, without magnification.

The categorization was based on the material of the artefacts as well as techniques used, such as

1. pencil drawing,
2. aquarelle painting,
3. wood-cut and lino-cut (Hochdruck) technique,
4. intaglio (Tiefdruck) technique,
5. flat printing (Flachdruck) technique,
6. photography,
7. copy technique.

In cases where a number of techniques used by one artist were identified, the corresponding works were kept together and not sorted according to technique or material.

The reason for choosing this categorizing approach is because the different works of art need certain conservation approach: drawings are most sensitive to abrasion, aquarelles are extremely vulnerable to light exposure, intaglio has fine surface relief, wood-cut and lino-cut also have sensitive surface, while the flat printing, as a more recent technique, involves using contemporary paper which is more sensitive to mould attack and tearing. Photographs need specific storage conditions.

The approach carried out was to observe the art, to perform the separation of the works based on the techniques used, group them by artists and dispose of folders and wrappers which are harmful for the articles.

We selected this method because each category needs different treatment in all aspects of conservation.

#### **Observation results:**

1. We observed all art works which were on top of the drawer closed and known now how many individual pieces representing each artistic techniques exist in this bundle.
2. We found there are famous artists' works in the collection, such as prints after Albrecht Duerer, Paul Rubens, Tizian, Mark Chagal, and others.
3. We prepared the next steps by developing the method and system, which now can be applied to the entire collection.

#### **Next steps:**

1. We suggest that the whole collection be classified according to the system suggested.
2. We recommend developing a catalogue and documentation system or model.
3. We recommend preparing a description of the types of decay present in the collection.

The report was given to the monastery. This way a win win situation was created.



Figure 05. Indonesian lecturers were in frame with the Priest of the Abbey of Heiligenkreuz and Dr. Patricia Engel. (Doc. Abbey of Heiligenkreuz 2020)



Figure 06. Indonesian lecturers analyzed the condition of the graphic arts collection of the Abbey of Heiligenkreuz with Dr. Patricia Engel. (Doc. Abbey of Heiligenkreuz 2020)



Figure 07. Indonesian lecturers observed the graphic arts collection of the Abbey of Heiligenkreuz with Dr. Patricia Engel. (Doc. Abbey of Heiligenkreuz 2020)



Figure 08. Dr. Patricia Engel showed the Indonesian lecturers how to record the data for each collection. (Doc. Abbey of Heiligenkreuz 2020)

**c. The understanding of graphic art conservation at Sainkt Florian, Linz, Austria on 11-12th February, 2020**

There are also important things we learned when doing the work at Saint Florian Monastery, Linz, Austria. In order to understand the graphic art, the conservator should also be aware of the condition of each collection, particularly when they are the old collection of the Abbey and Monstery which are very valuable annd must be conserved.

The over arching idea to the visit in St. Florian was: after the first step in Zwettl, where everything was new and had to be introduced from scratch, and the application of the new information at the comparatively small Graphic Collection of Heiligenkreuz, where the fact that the same principles of conservation can be applied to archival material and graphic art, not in St. Florian, the team did concrete conservation work in a huge and important collection of art. Finally there was the opportunity to make a conservation concept for 2 prints and a charter made of parchment as well as a copy. This was the end of the practical session and gave the opportunity to get feedback on what the team had learned.

The followings are the step in doing the graphic art conservation:

1. Observing and analysing the condition.
2. Unframing the art works to clean.
3. Cleaning the molds and ensure the environment of the Graphic Art Collections are safe by using the special sponge made of latex.
4. Cleaning the frame and cover glass properly with special cloth and glass cleaner.
5. Pulling out the broken nails and change the new ones.
6. Framing the artworks.
- 7.

Besides that, the team was shown the special collection of Albrecht Duerer's Graphic Art Works to analyze and the details of his collection to observe.



Figure 09. One of the lecturers of ISI Yogyakarta was framing the collection after cleaning (Doc. By Wiwik Sri Wulandari, 2020)



Figure 10. One of the lecturers of ISI Yogyakarta was cleaning the dust and dirt of the collection.(Doc. By Wiwik Sri Wulandari, 2020)



Figure 11. The team were analysing the damage of the collection at Saint Florian Monastery.(Doc. By Wiwik S. Wulandari, 2020)

#### **d. Lectures in Krems**

Amongst the lectures in Krems was the one together with Prof. Dr. Harno Dwi Pranowo in which a documentation of a manuscript was demonstrated and the involvement of material analysis was discussed. Furthermore, the lecturers of ISI Yogyakarta received valuable information of how to handle the old manuscript, figure out the damage.



Figure 12. The Indonesian lecturers received the understanding on material analysis of the manuscript from Dr. Patricia Engel.(Doc. Harno Dwi Pranowo, 2020)

#### **e. Microscope Understanding**

Besides receiving information on material analysis, the lecturers were shown how to use the microscope for fibre analysis.

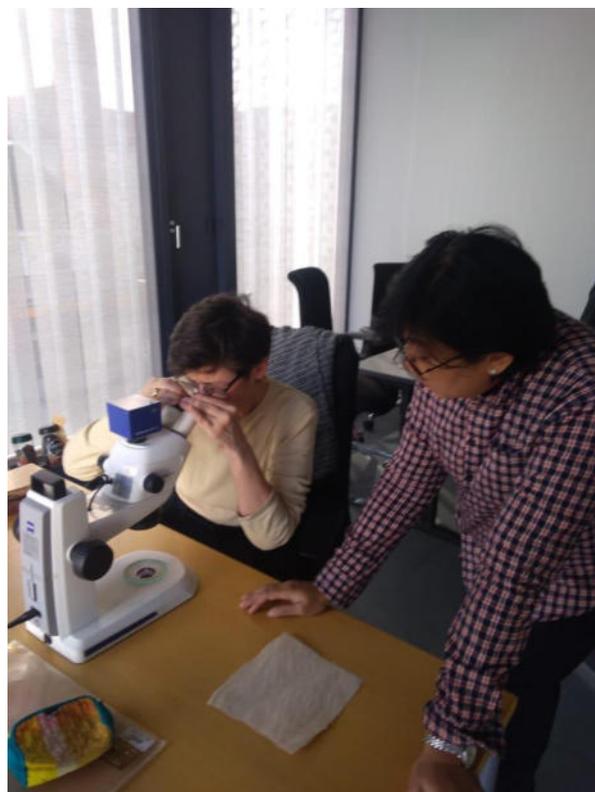


Figure 13. One of the Indonesian lecturer and Dr. Patricia Engel observed the object by using the microscope.(Doc. By Warsono, 2020)

**f. Comparative material study of Wayang Beber collection at Volkenkunde Museum, Leiden, the Netherland**

The original of Wayang Beber is also found in Volkenkunde Museum, Leiden. There are six scrolls of Wayang Beber Leiden. Based on the Carbon Analysis from Tokyo University Museum, the Wayang Beber of Leiden was made estimated around 1516 – 1596. Mostly, they are all made of Daluang/Daluang with the particular condition that a conservator had conserved them by using the non-daluang paper to restore the damage found on the surface of the scrolls. The damage of each scroll is different. Furthermore, the scrolls of Wayang Beber Leiden do not have the storage box or a wooden box to keep like what is found for the Wayang Beber Wonosari and Wayang Beber Pacitan.

An interview with a conservator of Wayang Beber Leiden in Volkenkunde Museum, Ms. Irina Tsjeroenova on February 17th, 2020 was carried out by the authors to find the information that the Wayang Beber Leiden had already been conserved before. It was confirmed by finding out the paper glued on each scroll which makes it looked thicker. Ms. Irene does the conservation method regularly, such as cleaning the dust regularly, scrolling each scroll by inserting the acid-free paper to maintain the coloured surface free from the more damage and any continuing acidification. Moreover, to maintain the stable condition in storing them, there is a cotton rope on each edge of the scroll to tie it up. To keep them all in a proper storage box, the conservator uses the excellent quality of cardboard.

Based on the information given by Ms. Tsjeroenova, Prof. Sakamoto from the Tokyo University Museum had carried out the carbon fibre analysis for the six scrolls of the Wayang Beber Leiden. However, there was not any analysis for the colour pigment of the Wayang Beber Leiden by Prof. Sakamoto.

There are some hypotheses found from the observation. The authors found some important things as follow:

- a. The damage on each scroll, such as discolouration, bend, stain, torn, gold-coloured is peeling off, there are some painted parts on the scroll to cover the hole.
- b. According to the story of Wayang Beber Leiden, it has a similar story as Wayang Beber Wonosari, that is 'Remeng Mangunjaya', but the visual depiction of the scenes is different.
- c. The drawing style is similar to Wayang Beber Wonosari with few ornaments found in the background.
- d. The colour of each scroll still looks bright and clear, particularly the red colour; however, the yellow colour is derived from the gold which has already been peeled off.
- e. The coloring technique looks similar to the Wayang Beber Wonosari which is seen from the sketching, inking, and coloring.
- f. Each scroll consists of four panels or in Javanese term it is 'pejagong'.



Figure 14. The team of ISI Yogyakarta was observing the collection of Wayang Beber in Volkenkunde Museum, Leiden, the Netherland.(Doc. By Warsono, 2020)



Figure 15. The Indonesian team and Dr. Patricia Engel were doing the observation on Wayang Beber collection at the Volkenkunde Museum, Leiden with the conservator of the Volkenkunde Museum, Ms. Irina Tsjeroenova.(Doc by Warsono, 2020)

### **g. Visiting Program at the Welt Museum Wien**

On February 20<sup>th</sup>, 2020 a meeting with experts in the area of conservation, preservation, and restoration in Weltmuseum was undertaken. The visiting program was very valuable and fruitful to foster the understanding of bark cloth materials of cultural heritage and how to do the preservation on it. Daluwang, the carrier of the Wayang beber is a bark cloth material. The Weltmuseum has a rich collection of this material from all over the world.

The visit was to meet Mag. Roswitha Zobl, an expert on bark cloth at Weltmuseum Wien. Mrs. Zobl showed various bark cloth pieces, discussed the various sorts and how to distinguish them. She furthermore explained what would be the focus on bark cloth

conservation and what tools are used for doing the conservation on the bark cloth as well as how the tools are used properly.

Besides having a look at some examples of old bark cloth, Mrs. Zobl also showed the collection of Indonesian heritage kept at the Museum since the beginning of 20<sup>th</sup> century. They came in Austria as the gifts and private collections of the Austrian emperers.



Figure 16: Indonesian Researchers were shown one of the bark clothes from Indonesia by Mag. Roswitha Zobl at Welt Museum Wien.(Doc. By Wiwik Sri Wulandari, 2020)



Figure 17. The Indonesian team was in frame with Mag. Roswitha Zobl and the French student at Welt Museum Wien.(Doc. By Wiwik Sri Wulandari, 2020)

## Scientific Report

### Predictive maintenance using machine learning and SPC methods to optimize end-mill utilization

Name Mr. Md. Nizam Bin ABD RAHMAN  
Country of origin MALAYSIA  
Dates of scholarship 16.02.2020 - 07.03.2020  
Host professor: Univ.Prof. Andreas RAUBER / TU Wien

#### **Executive Summary of Research Proposal**

Implementation of IR 4.0 in manufacturing environment will enable the collection and digitization of the in-situ equipment data in cyber-space. These data are readily available to be utilized for the main benefit of IR 4.0 implementation which are the improvement of the productivity and efficiency of the manufacturing system. Peripheral benefits can and should be realized from the readily available digitized data. One of the potential benefits that can be harnessed from such environment is the Predictive Maintenance (PdM) system which can predict when the maintenance should be performed based on in-situ data acquisition. PdM approach is superior than routine or time-based Preventive Maintenance (PM) with regards to cost saving and optimization of part utilization. In general, acquisition of sensory data and machine learning approach is adopted to predict equipment component health, such as bearing and tool wear, without conducting physical inspection on the component. The predicted data will then be used to predict condition of the component. The current approach does not take into consideration on the inherent variability of the sensory data which affect the predicted component condition accuracy. The aim of this research project is to propose a new framework on the implementation of PdM for milling cutting tool using hybrid approach of machine learning and SPC in components health determination. At the end of this research project, the proposed predictive maintenance framework should be able to define the parameters that need to be collected to provide early fault detection, fault detection, and time to failure prediction. The framework will be evaluated on the prediction of cutting tool condition during machining.

#### **Problem Statement:**

In large, the current practice in cutting tool replacement is based on cutting time or cutting length. Such practice is aligned with the conventional PM concept. The setback of PM is the possibility of not maximizing the useful life of the replaced parts. On the other hand, the risk of not performing the PM is the possibility of inconformity of the machined surface quality. There are some published works on the modeling of cutting tool wear monitoring system using artificial intelligent (AI) approaches. The modelling of cutting tool wear, predict the wear on cutting tool based on the monitored variables such as vibration, power consumption, etc. However, such modelling lack of guidance on the influence of process variabilities that are necessary to determine the trigger limit to initiate the maintenance. Preventive maintenance based on SPC has been reported as an approach for tool wear management system. Such PdM using SPC requires the measurement of tool wear which will interrupt the production. PdM using SPC approach is lacking in the intelligent to forecast the tool wear based on other process variables. Wholistic PdM framework using both AI and SPC is lacking.

Objectives of the Research:

- I.** To propose new predictive maintenance framework that combines the machine learning and SPC
- II.** To evaluate the proposed new predictive maintenance framework in predict the wear of milling cutting tool.
- III.** To validate the accuracy of the framework.

Methodology:

Phase 1: Experimental Design and Data Collection

- The experiment is going to be conducted using CNC milling machine
- The sensory process data to be collected are vibration, temperature, cutting force, power and acoustic. These data can be collected in time series while the process is running. The generated data collected will be tool wear and surface roughness measurement. The process needs to be interrupted during this data collection. 100 experimental runs will be conducted base on run to failure condition.
- The cutting tool and workpiece materials are tungsten carbide and D2 steel respectively.

Phase 2: Development of Prediction Model and SPC

- The initial part of the development of prediction model is the preprocessing of data, using R programming, where the raw data need to be cleaned in terms of removing duplicates, correct errors, deal with missing values, normalization, data type conversions, randomization, etc. The data then is split into training and evaluation sets.
- Appropriate algorithm will be selected to train the model based on the behavior of the collected data using Python programming. The model is then trained to make prediction correctly as often as possible. For example, for linear regression model, the algorithm needs to learn values for intercept and slope. The trained model will be evaluated against the collected evaluation data sets.
- The sensory data variabilities will be analyzed. Variance of the sensory data variability will be used to predict the variability of the generated data (tool wear and surface roughness) using the developed predictive model. Trigger limit will be recommended based on these analyses using SPC approach.

Phase 3: Validation

- Validation run to test the predictive model and the trigger control limit will be conducted. Error percentage will be calculated to ascertain the validity of the predictive model and approaches.

The proposal is based on discussion with:

- Ao.Univ.Prof. Dr. Andreas Rauber, Head of Research Unit, TU Wien, Institute of Information System Engineering
- Anahid Naghibzadeh- Jalali, Scientist, Information Management, Center for Digital Safety and Security, Austrian Institute of Technology.
- Alexander Schindler, Scientist, Information Management, Center for Digital Safety and Security, Austrian Institute of Technology
- Gerhard Reisinger, Institute of Management Science
- Thomas Trautner, Research Associate, IFT, TU Wien

## FINAL REPORT

### Evaluation of defects in Mg-doped AlGa<sub>N</sub> layers by electron-beam-induced current technique.

#### Duration:

22 days (4<sup>th</sup> Feb until 25<sup>th</sup> Feb 2020)

#### Contact details:

Name: Norzaini Zainal, PhD

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#### Details of report:

My program at TU Graz has focused on investigating defects characteristics in Mg-doped Al<sub>x</sub>Ga<sub>1-x</sub>N samples using electron beam induced current (EBIC). The samples were grown at Universiti Sains Malaysia (USM) beforehand. This is my first experience of conducting this measurement as the tool is not available in my country.

The measurement started with a series of green LED samples that consists of Mg-doped GaN layer. One of the LED samples has the Mg-doped GaN layer which was grown at 980 °C, while for the rest of the samples, the GaN layer was grown at 1020 °C. From optical-electrical measurements which were conducted at USM, the LED sample with 980 °C grown Mg-doped GaN shows a better performance than its counterparts. The reason is that growing the Mg-doped GaN layer at high temperature of 1020 °C will destroy the multiquantum wells (MQWs) active region of the LED, thereby leading to degradation of the LED performance. In contrast, the EBIC current was found to be higher for the LEDs with the 1020 °C grown Mg-doped GaN layer than the one with 980 °C grown Mg-doped GaN layer. At higher growth temperature, high quality Mg-doped GaN layer can be obtained. Hence, the formation of defects can be suppressed, resulting more EBIC current.

Subsequently, another set of semipolar and non-polar LED samples with Mg-doped GaN layer were measured. As opposed to conventional growth direction; that is in *c*-plane direction, growing LEDs in semipolar or non-polar direction will eliminate the polarization and spontaneous effects. Such effects always degrade the performance of LEDs. Unfortunately, the samples measured in this work do not show a good diode behavior. This is in turn giving weak signals in the EBIC measurement. The result indicates that the Mg-doped GaN layer in the semipolar and non-polar direction was grown under non-optimized conditions.

The last set is DUV LED samples with Mg-doped AlGa<sub>x</sub>N layer. Due to poor conductivity of p-type and n-type, diode characteristic is hardly seen and therefore, EBIC current is very low. The progress of developing the LEDs still at early stage and many works need to be done for improvement. Recently, we have successfully grown a working DUV LED, which gives a good diode characteristic. Unfortunately, the LED was grown after I arrived in Graz. We plan to send this LED to Graz for the EBIC measurement soon.

Overall, I found that EBIC measurement is an interesting tool to further understand the properties of the Mg-doped Al<sub>x</sub>Ga<sub>1-x</sub>N layers. Such understanding would be helpful for us to take further step towards increasing the performance of our LEDs. Apart from improving the material quality of the samples, we should improve the electrical contact in order to generate more EBIC current and subsequently, leading to more accurate data. To do this, we will fabricate the samples through a series of lithography, etching and deposition process. We will start this work after our fabrication facilities is ready.

Other than conducting the EBIC measurement, I had a chance to give a talk related to my work in Malaysia to researchers at TU Graz in the second week of my program. In the talk, I introduced and shared some scientific results of my research works at USM and our future plan for sustaining nitrides research in Malaysia. I also took an opportunity to visit CVD lab which is under supervision of Dr. Anna Maria Coclite. Her team has setup a home-made atomic layer deposition (ALD) system for depositing monomers layer on silicon substrate. I was excited to learn that she also has deposited AlN films using the system.

After this program, I intend to share my experience on conducting EBIC measurement to researchers at USM, including introducing EBIC measurement to our students. Through my communication with Prof. Peter Hadley and his colleagues alongside posters hanging around the department, I am aware of other research works that are running at TU Graz. Interestingly, my colleagues in Malaysia are also doing similar works. I expect that my visit would initiate more collaborations between USM and TU Graz in future.

### **Short biography of participating persons:**

Prof. Peter Hadley is a professor at Institute of Solid-State Physics, TU Graz. His current research interest is to study defects in semiconductor materials and thermal behavior of OLEDs. He is the person who establish EBIC setup at TU Graz.

Dr Anna Maria Coclite is an associate professor at Institute of Solid-State Physics, TU Graz. She is an expert in growing materials using chemical vapor deposition (CVD) technique. Due to her outstanding research work, she has received awards from various organizations.

Confirmed by,

Norzaini Zainal, PhD  
Universiti Sains Malaysia

Confirmed by,

Prof. Peter Hadley  
Institute of Solid-State Physics,  
TU Graz

**Title of Project:**

Expressionism in Austrian and Indonesian Poetry: A Case Study of the Poems of Georg Trakl and Chairil Anwar

**Duration of Stay:**

from 01.02. 2020 to 26.02.2020

**Biography of all relevant participating:**

(1) Prof. Dr. Achim Hermann Holter, M.A., Department Comparative Literature, University of Vienna, Sensengasse 3a, Phone 43-699-12288725, Email: [komparistik@univie.ac.at](mailto:komparistik@univie.ac.at), Head of Department of Comparative Literature and Supervisor; (2) Dr. Mag. Stefan Albert Kutzenberger, Department Comparative Literature, University of Vienna, Sensengasse 3a, Email: [stefan.kutzenberger@univie.ac.at](mailto:stefan.kutzenberger@univie.ac.at), as partner of research in Austria.

Expressionism is an artist's tendency to distort reality with emotional effects. Expressionism can be found in literary works, films, paintings, music, and architecture. Expressionism emerged as part of the reaction to impressionism and classical academic art which had reached an established artistic peak which was considered too rigid because it only imitated the nature. Expressionism was very much inspired by the flow of symbolism in 19th century art.

This research aims to compare the style of expressionism in poetry in Austria and Indonesia by taking samples of poem by Georg Trakl from Austria and Chairil Anwar from Indonesia. The two poets are alike in expressionism. Both poets are equally famous in their respective countries. In their work they talk about silence or loneliness, anxiety, and death. Georg Trakl and Chairil Anwar's poetry about seems to be a prediction of their death. They both died young but with different cause. This research uses a comparative literature approach. In this case, the comparative literature focuses on the study of literature from different cultures, context, and nations.

The results showed similarity and difference between Georg Trakl's poetry and Chairil Anwar. Theme raised about death, anxiety, solitude, and despair. The theme like that is found in Trakl's poetry "Nahe des Todes", "Amin", while in Anwar's poetry this theme is found in poetry entitled "Nocturno", "Nisan", "Kapada Kawan" (to Friends). Both of these poets feel close to the death because Trakl is a cocaine addict and has psychiatric problems so he always feels lonely, hopeless, and suffering. Anwar also felt close to death and hopeless because of the threat of various diseases he suffered. Because the themes raised are related to the gloom in the poetry, the dominant atmosphere is night, black, and dark. In addition, the two poets also pointed out that the poem was addressed to certain individual. However the individuals mention in Trakl's poetry are fictitious, like Helian figure

whereas in Anwar's poetry the individual actually do exist, for example "Sajak Buat Basuki Resobowo" (Poetry for Basuki Resobowo).

In his poetry Trakl very rarely uses character "Me" because he more often appears implicitly through the characters in his poetry, such as Helian, Holderlin, the Grandchild, the daughter, and so on. Trakl hid himself behind the characters. Anwar tends to use characters "Me" in his poetry because character 'Me" here is used as a strategy for his poetry to escape the Japanese invaders censorship which prohibits the circulation of poetry that contain propaganda.

In Trakl's poetry, the feeling of pessimism is very much felt. Nevertheless, the pessimism and gloom in Trakl's poetry is beautiful conveyed. In this case, there is an esthetikation of pessimism and gloom. On the contrary, in the Anwar's poetry in the silence and gloom that is depicted there is great optimism, as in poetry "Siap dan Sedia" (Ready), "Saya Kembali Ada" (I'm Back), "Jangan Berhenti di Sini" (Don't Stop Here). The optimism behind the expression of silence and gloom is related to the use of metaphors in the form of colours that dominate Anwar's poetry, namely black and white. Trakl also uses a more various color, such as blue, yellow, orange, but the dominant on remained black so that the gloom and pessimism seemed clearer.

Researcher

Dr. Novi Siti Kussuji

## Scientific Report

Study project	Determination of chloramphenicol residues in shrimp products from Thailand
Name	Dr. Piyada Songsermsakul
Country of origin	Thailand
Dates of scholarship	1-31 October 2019

### Participating persons in the project:

1. **Piyada Songsermsakul** (Dr.rer.nat. from faculty of chemistry, University of Vienna in 2006)

Current position: Assistant professor at department of toxicology, faculty of pharmaceutical sciences, Khon Kaen University, 40002 Thailand

Email: [spiyad@kku.ac.th](mailto:spiyad@kku.ac.th)

2. **Ao.Univ.Prof. Ebrahim Razzazi-Fazeli**

VetCore Facility for Resaerch

Veterinärmedizinische Universität (Vetmeduni Vienna)

Veterinärplatz 1

1210 Wien

Email: [Ebrahim.Razzazi@vetmeduni.ac.at](mailto:Ebrahim.Razzazi@vetmeduni.ac.at)

3. **O.Univ.-Prof. Dr.med.vet. Dr.h.c. Frans J.M. Smulders**

Institute of Meat Hygiene, Meat Technology and Food Science

Department of Farm Animal and Public Health in Veterinary Medicine

Veterinärmedizinische Universität (Vetmeduni Vienna)

Veterinärplatz 1

A-1210 Vienna

Email: [Frans.Smulders@vetmeduni.ac.at](mailto:Frans.Smulders@vetmeduni.ac.at)

### Project description:

Chloramphenicol is a broad spectrum antibiotic. It is used for treatment and prophylaxis in aquaculture. The presence of this antibiotic in aquaculture products is a worldwide problem. Chloramphenicol has been detected in shrimp imported into Europe. The use of this antibiotic in aquaculture has been reported in some countries such as the Southeast Asian countries, Bangladesh, India and China. The impact of chloramphenicol used in the aquaculture industry was shown on both environment and human health. Chloramphenicol residue in food can lead to the development of drug resistance, hypersensitivity and aplastic anemia. The European Agency for the Medicinal Products concluded that acceptable daily intake (ADI) for chloramphenicol cannot be established. Therefore, the maximum residue limit (MRL) cannot be calculated either. These mean zero tolerance for chloramphenicol residue in food and it has been banned from food production in EU.

**The aims of the study:**

1. To develop a method for determination of chloramphenicol in shrimp based on LC-MS/MS (triple quadrupole)
2. To develop a sample preparation method by solid phase extraction of chloramphenicol in shrimp products
3. To monitor the contamination of chloramphenicol in shrimp products from Thailand and the imported products in Austria.

**Methods used:**

liquid-liquid extraction plus solid phase extraction and analyzed by LC-MS/MS (triple quadrupole)

**Work plan:**

First week	Second week	Third week	Fourth week
Experience on software in LC-MS/MS instrument	Optimization of the MS condition Development of sample preparation SPE	Measurement of samples	Method validation and discussion

**Results and expected results:**

The optimization of MS condition has been completed. The standard calibration curve of chloramphenicol has been set up with satisfactory parameters such as sensitivity and linearity. Sample preparation in real shrimp sample has been conducted. However due to the instrument problem the samples cannot be analyzed. We are on the process of solving the LC-MS/MS problem.

**Intended publication:**

Shrimp samples have been purchased from both Thailand and Austria. The method development and survey results in this study could be possibly published in a scientific journal. However further work will have to be done for the completed results. The journal title to publish the data will be discussed when the laboratory work is completed.

We would like to grateful thank ASEA-UNINET for this 1 month opportunity to conduct the research and cooperate work between Khon Kaen University and University of veterinary medicine Vienna.

## **A Project of WAYANG BEBER, a unique cultural heritage of Indonesia - conservation concept**

**17<sup>th</sup> June 2019 to 19<sup>th</sup> July 2019, University for Continuing Education Krems,  
Austria**

**Prima Dona Hapsari**

Email address: dona.hapsari@gmail.com

Prima Dona Hapsari is a lecturer at Musicology Study Program, Faculty of Performing Arts, Institut Seni Indonesia Yogyakarta. The topic of conservation is a new insight for her as a lecturer as her background study is language education. By doing the training program at Danube University Krems, Austria under the supervision of Dr Patricia Engel, she received some first steps in understanding and valuable knowledge toward conservation on cultural heritage by using a Wayang Beber for developing a conservation concept. Dr Patricia Engel gave her lectures on several basic understanding of conservation of cultural heritage items exemplified particularly for Wayang Beber.

The training program conducted by Prima Dona Hapsari was given into two categories: (1) artistic aspects and preparation of conservators' documentation and (2) material analysis. In this training program, she had more valuable insight and workload focusing on the scientific aspects. There were important teachings facilitated by Dr Patricia Engel who taught:

- a. Basic conservation understanding from European perspectives: Conservation is defined as the momentum of understanding a work of art in its aesthetic and historic dimension and its material as to be able to forward it to future generations. (Cesare Brandi)
- b. To find some important web-links on preventive conservation, conservation and restoration, i.e. ICOM (International Council of Museums) –Committee for Conservation) and ICOM – CC (International Council of Museums – Committee for Conservation), E.C.C.O (European Confederation of Conservator-Restorers' Organizations), ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property), IADA (International Association of Archive, Book and Paper Conservators), IFLA (The International Federation of Library Associations and Institutions), IIC (International Institute for Conservation of Historic and Artistic Works Austria) etc. These web-links are useful to stay updated and access general information and on publications, events in the field.
- c. About the importance of web links concerning the analysis of works of art, ICOM – CC (International Council of Museums) – Committee for Conservators special working groups such as: documentation, paintings, preventive conservation, theory and history of conservation etc., and CIMA (Centre of Image and Material Analysis in Cultural Heritage).
- d. About the importance of bibliographies and search engines for literature as well as how to stock own literature collections such as KVK (Karlsruhe Virtueller Katalog), BCIN (Bibliographic Database of Conservation Information Network), MULIBINE (Multi-Lingual Bibliography Network), Paperpile as an online system for formatting citations and bibliographies in Google Docs which allows collaborative editing of academic papers. The

researcher can save and share any links of references and bibliography throughout this reference management software.

- e. About the far distance loan. More detailed information was provided by the library of Danube University Krems, Austria. Thanks to the team of the library the scholars understood the far distance loan system, which is: The researcher can get access to read and download any books, articles, and journals shared by the libraries in the loan community. Dr. Engel recommended to install this at ISI Yogyakarta.
- f. General approaches toward conservation, such as the analysis of meaning and use of the work of art, the analysis of its appearance and value, the analysis of its material, the analysis of its decay, the requirements for preservation and conservation.
- g. The benefit of the protection of heritage by providing proper storage and maintenance.

To get a first understanding of what is needed to establish a faculty for conservation, to understand the complexity of the discipline, the time needed to gain the proper knowledge to be able to teach and to identify a best possible conservation concept for the Wayang Beber there were excursions to the Weltmuseum in Vienna and the Papyrus Collection of the Austrian National Library, the Akademie der Bildenden Künste Wien (Prof. Dr. Schreiner), Montanuniversität Leoben (Prof. Dr. Prohaska) and the manuscript collection of the National Library. Below are the details of the excursion programs.

## **1. Visit at Welt Museum Wien**

On June 25th 2019 a meeting with experts in the area of conservation, preservation, and restoration in Welt museum was undertaken. The visiting program was very valuable and fruitful to foster the understanding of bark cloth materials of cultural heritage and how to do the preservation on it. Daluwang, the carrier of the Wayang beber is a bark cloth material. The Weltmuseum has a rich collection of this material from all over the world.

The first visit was to meet Mag. Roswitha Zobl, an expert on bark cloth at Welt Museum Wien. Mrs. Zobl showed various bark cloth pieces, discussed the various sorts and how to distinguish them. She furthermore explained what would be the focus on bark cloth conservation and what tools are used for doing the conservation on the bark cloth as well as how the tools are used properly.

Besides having a look at some examples of old bark cloth, they found special bark cloth which was indicated as daluwang, the main material of Wayang Beber. It came to Austria in 1879 and was originally from Java and Madura islands, Indonesia. The finding was surprising for everyone in the team.



Picture 1: Indonesian Researchers were in frame with Mag. Roswitha Zobl at Welt Museum Wien

## 2. Visit at CIMA (Centre of Image and Material Analysis in Cultural Heritage) Vienna, Austria

The second visit was to meet Professor Dr. Manfred Schreiner at the Institute for material analysis in art at the Akademie der Bildenden Künste Wien and his team who have successfully managed and organized the CIMA which became an important place to analyse the image and material of cultural heritage. They explained and shown the materials and instruments which are useful to analyse a certain object of cultural heritage, in particular are X-ray fluorescence (XRF) analysis, UV/Vis spectroscopy, and FTIR Reflection and Raman spectroscopy.

There are a lot of instruments used for capturing, identifying, and analysing the object material. Besides that, how they work was shown to the teachers in informative ways of presentation. Prof. Dr. Manfred Schreiner gave them important and valuable information for setting up a conservation study program at Indonesia Institute of the Arts Yogyakarta. The important points from his explanation were the followings: First, making any documentation for the objects. Second, making a collection of materials used to identify and analyse the objects. And third, making any cooperation with relevant counterparts to get further access on conservation projects, material analysis, instruments, experts, and funding.



Picture 2: Indonesia Researchers with Prof. Dr. Manfred Schreiner at the Akademie der Bildenden Künste Wien

The visiting program was tremendously informative and valuable for these two Indonesian teachers to follow up any information concerning conservation, preservation, and restoration of cultural heritage for important references, particularly in Indonesia.

### **3. Visit in St. Florian Monastery Library on July 8th, 2019**

St. Florian Monastery is one of the largest monasteries in Upper Austria. The library of this monastery belongs to the most ancient and most impressive ones in Austria. It has manuscripts and printed books which come from the 10th to the 21st century. Looking at the collection of the Monastery library became very important for the researchers as the old books are well-managed and well-treated by the librarian, Dr. Buchmayr, head of the library, the book conservator and the volunteers who maintain them on a regular basis.

As a part of book conservation the researchers learned how the books should be cleaned from the dust and – in case there are any - insects, how and where to place insect traps inside the bookshelves, and how to put the book ends in the appropriate and necessary location. These three important learnings are very much needed to understand, and it is necessary to find out why they should be carried out as a part of book conservation and preservation. The followings are the description of each action based on what had been seen and experienced by the Spanish ERASMUS student, Sara Bote, who was also in the team.

#### **a. Cleaning the books**

The dust which comes from the outside of the library is found on the surface of the books, in particular on the heads of the books. However, the dust is also found on the first page of the book together with the powdery frass of insects which have eaten the cover of the book. The cover of the old book treated was made of leather

or parchment. Cleaning is done by lifting the book out of the shelf by pushing the next books back and holding it with both hands, bringing it to the table, starting dusting the head by using a clean cloth made of microfibers from the headband towards the front edge and finally opening the book at the first page of the book where the frass should be cleaned out of the fount by using a soft brush made of goat hair.

#### **b. Cleaning the insects off the books (the living or dead insects)**

The insect, either alive or dead, is something crucial for book conservation. It can cause decay for the book as it may put eggs, which hatch and eat the paper and boards as larvae. Dead insects were found in some pages of the books and it was particularly found in the books which were put in the shelves close to the windows. The existing windows can support any living organism from outside to get into the room to find shelters, particularly: moth, carpet beetles, anobium. The technique to clean the books from them is by using a soft brush.

#### **c. Putting insect traps inside the bookshelves**

The trap is made of paperboard with sticky surface holding pheromones on it, and which is designed to attract insects. The traps are made to monitor an infestation, not to fight it. The trap is put in a certain level of the bookshelf which is considered as the attractive location for the insects to approach, for instance, and systematically distributed over the library: bookshelves by the windows, the dark shelves, the middle level of the shelves, etc. There should be a date note to indicate once the trap is used, a number and a plan which holds the numbers to find those traps which are hidden behind the books. In St. Florian library, no harmful insects were found in the insect traps.

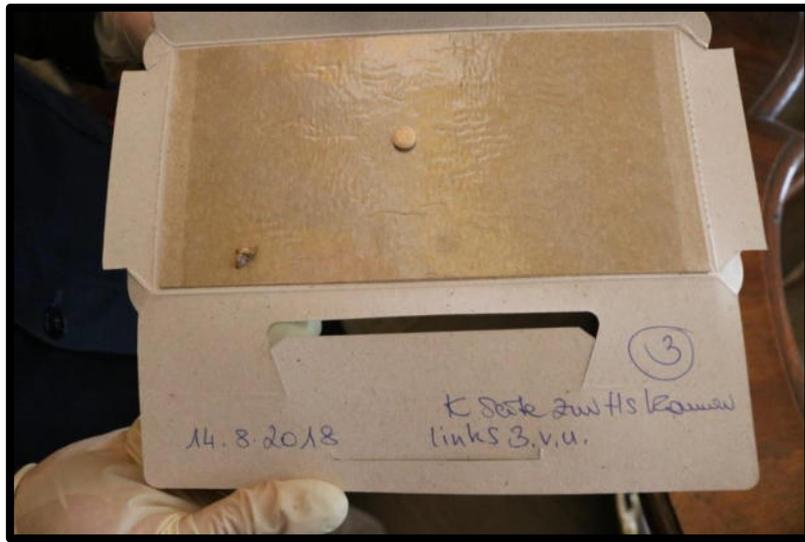
d. Putting the book ends in the appropriate and necessary location

The book ends, with different sizes, is one of the important part for book conservation. The size of book ends represents the size of the book itself. In the bookshelf, the book end is used particularly to support and sustain the books and to minimize the damage, which occurs due to the book-block falling to one side and tearing the fould loose. It should be put in the shelf where some books are missing and therefore the other books fall over and do not stand upright, and in the one with unbound books which are brittle and need support.

The work was not finished, but on the papers left in the monastery, we indicated how far we came.



Picture 3: Indonesian Researcher, Ms. Sara Bote, a Spanish Student, and Dr. Patricia Engel at St. Florian Monastery Library – Cleaning the dust and insects



Picture 4: An Insect trapped in the Insect Trap



Picture 5: Ms. Sara Bote, a Spanish ERASMUS Student at DUK, Dr. Patricia Engel, and the Indonesian Researcher at St. Florian Monastery Library – Observing the decay of the book

#### 4. Visit in Montan Universität Leoben on July 11th, 2019

The visiting program was aimed to meet Prof. Thomas Prohaska and his team at Montanuniversität Leoben. Prof. Thomas Prohaska is a professor for analytical chemistry. The researchers were invited to meet him and discuss the basic principle for the laboratory and instruments used for material analysis in conservation. His explanation was very interesting as the researchers are the representative of their institution which will set up the new department of art conservation. In his point of views, once the new department is ready to set up, the basic instruments for doing the material analysis in conservation should be prepared, or the institution can also make a cooperation with other institution to manage the instruments and the laboratory system. It must be started step by step throughout its development. Furthermore, he welcomed any further opportunity for cooperation. The researchers were also invited to see the clean laboratory for doing the analysis of isotopes, a special research field of Prof. Prohaska.



Picture 6: Indonesian Researchers observed the clean laboratory at Montan Universität Leoben



Picture 7: Indonesian Researchers were in frame with Ms. Sara Bote, Dr. Patricia Engel, Dr. Jahanna Irrgeher, and Prof. Thomas Prohaska

### 5. Visit of the Papyrus Museum, Austrian National Library, (Österreichische Nationalbibliothek) on July 9th, 2019

The Papyrus Museum is located in the Austrian National Library, Vienna. It provides an important papyrus collection which mainly came from Egypt from the 15th century B.C to the 16th century A.D. The researchers visited the papyrus conservation specialist, Mag. Andrea Donau. The purpose of the visit was to discuss the by then developed conservation concept for Wayang Beber with Mrs. Donau, because also papyrus can be understood as bark cloth.

It is known that the characteristics of papyrus and daluwang are almost similar. The followings are the characteristics of them:

- a. They are made from beaten tree bark
- b. They are used as writing material in ancient time
- c. They are often rolled up into scrolls

Each of papyrus and daluwang has its own unique concept to conserve. Papyrus is a writing material made from the pith of the papyrus plant, *Cyperus papyrus*, which is usually found along with the land of Nile. It is durable when preserved in a dry climate, but when it is kept in humid storage it can be destroyed. There are various methods to safely store papyrus collections. However, it is important that storage conditions do not change. It is important to store papyri within a climate- controlled room in which the temperature and humidity are maintained at a constant level of 17-23 degrees Celsius and 50-60 per cent relative humidity. There are various methods for storing papyri. The first and most common of these is to use two frames of glass and seal the edges with a cloth tape. This is very common in order to be able to handle the fragment and make it accessible from both sides. As organic materials, papyri are also susceptible to mould. Therefore, the traditional method in papyrus storage is to place the papyri between two sheets of glass and then seal the edges with a cloth tape. Today Mag. Donau does not seal them anymore. The rooms are well kept, therefore she uses a paper to prevent sliding of the papyrus between the glass plates and a plastic mechanism as it is used to hold together paper to fix the edge. That way the sandwich can be opened easily.

We discussed our conservation concept with Mrs. Donau. She was happy with it. It includes:

- a. Cleaning of the daluwang with latex sponge (she also recommended an eye scalpel)
- b. Mending tears with Kozo fibre paper, as adhesive Cellulose ethers (she recommended Klucel G and L, the latter for consolidation)
- c. Filling lacunae with daluwang thinner than the original and freshly made
- d. Spreading open the scrolls of Wayang Beber to regenerate the creases in the high humidity of Indonesia
- e. Finding a new storage method (if possible, if not then not)

Daluwang, which is the main material of Wayang Beber is made from the bark cloth of the inner layer of the mulberry tree and has almost similar concept as papyrus for its conservation. It must be kept in a storage room within a climate-controlled room in which the temperature and humidity should be maintained stable. This is actually the case in the place where it is kept now.



Picture 8: Visiting the Conservation Studio of the Papyrus Collection, Austrian National Library

## 6. Visit in the Manuscript Collection of the Austrian National Library, July 16th, 2019

On 16th July we were invited to meet with the head of the manuscript collection of the Austrian National Library, Prof. Dr. Fingernagel. We discussed the perception of the work of the conservator by the art-historian. Dr. Fingernagel in particular said that the material analysis would become of ever-rising interest to the historian and historian of art, because the incidental knowledge of the material composition would hold further information on the place where a certain pigment etc. would have come from, which clearly adds to the knowledge the historian etc. can pull out of the material of the manuscripts. So this would be another benefit of the establishment of a material analytical department at the department for conservation in ISI. Furthermore, Prof. Dr. Fingernagel said there were numerous associations, which might be of interest for our ideas, such as IFLA (The International Federation of Library Associations and Institutions) or CERL (Consortium of European Research Libraries).



Picture 9: Indonesian Researchers were in frame with Prof. Dr. Fingernagel, the Head of the manuscript collection of the Austrian National Library, and Ms. Sara Bote

The report has been made for OeAD by Prima Dona Hapsari as a researcher and acknowledged concerning its content by Dr Patricia Engel as a mentor and supervisor of the training program.

Acknowledged by  
Yours,

Sincerely

Dr. Patricia Engel

Prima Dona Hapsari

**Report on an Outgoing Research Visit**  
**ASEA-UNINET (SP 24)**  
**2019 by Prof. Ruben Sommaruga**

Title: Assessment of microbial indicators and water quality of the river basin system in the Eastern Economic Corridor

Duration (3 weeks): 4th-24th January 2020

Participants Biographies (see short CV): Dr. Chantima Piyapong, Ph.D in Biology, Staff of the Department of Biology, Faculty of Science Burapha University, Thailand. 8 Scientific Articles.

Prof. Dr. Ruben Sommaruga, Ph.D in Limnology, Director of the Department of Ecology, University of Innsbruck. 134 ISI Publications.

The stay started by visiting on Monday 6<sup>th</sup> the Deputy Dean for Research and Strategic Affairs of the Faculty of Science, Burapha University, Dr. Songklod Sarapusit to talk about future cooperation activities within the project “Assessment of microbial indicators and water quality of the river basin system in the Eastern Economic Corridor” and beyond. In this meeting, also other international advisers to this project such as Dr. Emanuel Paradis (Univ. of Montpellier, France) and Prof. Marco Celli (Univ. of Trento, Italy) were present including the Dean of Faculty of Science (Photo 1). The project with Dr. Piyapong as Principal Investigator is the largest one of the Burapha University regarding budget in the fiscal year 2019.

Then, a second meeting on the same day was done to discuss methodological problems in obtaining environmental DNA from river samples. Problems at the stage of sample concentration were detected and new filters and filtration sets were recommended to buy. This meeting took place with Dr. Nitcha Chamroensaksri, Dr. Piyapong’s co-investigator, from National Center for Genetic Engineering and Biotechnology (BIOTEC) responsible for DNA extraction and the molecular analysis of those samples. At a later stage, Dr. Chamroensaksri discussed with me about the results of the improved measures to collect and extract environmental DNA. She also plans to apply for ASEA-UNINET mobility program to work about the metagenome analysis with me and my colleague in Austria after finishing all the fieldwork and the laboratory of the above project.

On 7<sup>th</sup> January, I got in contact with students working at the Dept. of Biology and involved in the project to discuss related scientific publications.

From 8<sup>th</sup> to 9<sup>th</sup> January, a small workshop was organized to discuss problems of young scientists to write scientific articles and publish them.

From 10<sup>th</sup> to 23<sup>th</sup> January, field trips took place first to the upstream (Kao Yai National Park, World Heritage), then to the middle stream and finally to the mouth of Bangpakong River which is the main river in the Eastern Region of Thailand and is the heart of the above project (Photo 2). In all cases, I supervised Dr. Piyapong on how to plan the sampling, on what criteria to use to select the sampling points and also on how to collect water samples properly. On each occasion and after the field trip, work started at the Laboratory in Burapha. At the laboratory, I revised the protocols to filter the water samples (type of filter, type of filtration unit) in order to improve filtration efficiency and thus, obtain enough environmental DNA.

Finally and together with Dr. Chamroensaksri, we tried a new method to extract DNA from microbial communities for all six stations along the river in order that the above project can be accomplished. The changes made resulted in the first successful recovery of DNA from this river after one year of different trials.

24<sup>th</sup> January: departure to India

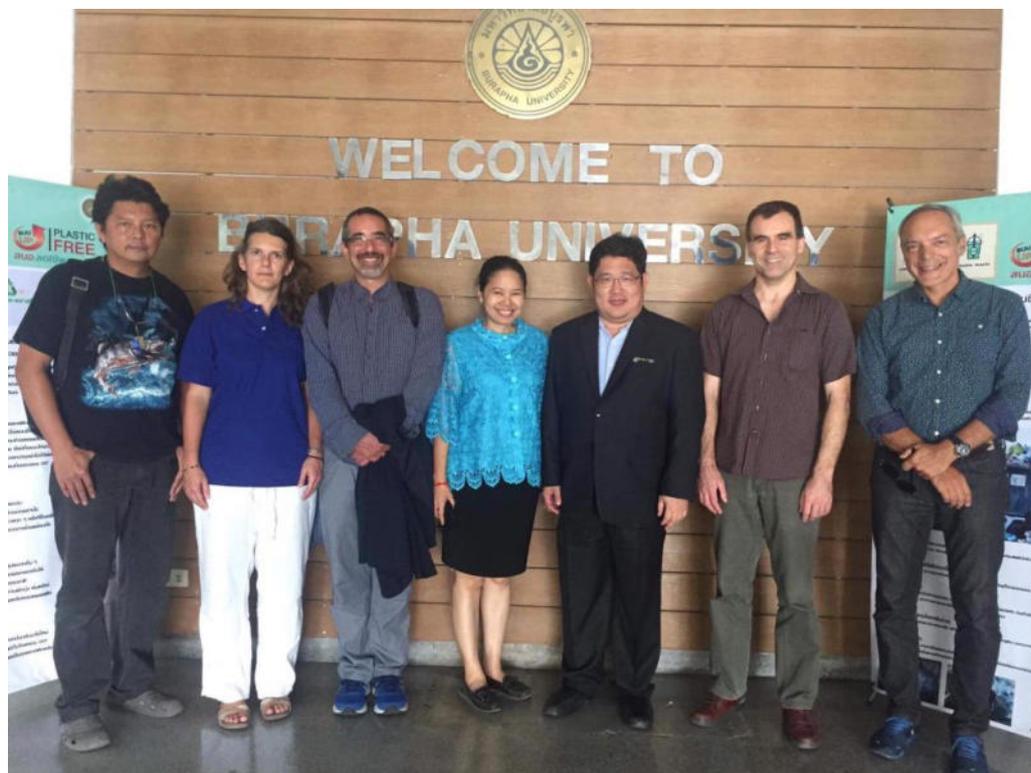


Figure 1. Meeting with the Dean of Faculty of Science, Burapha University  
Credit: Assist. Prof. Dr. Songklod Sarapusit, Associate Dean for Research and Strategy, Faculty of Science, Burapha University, Thailand.

From left to right: From Left to Right:

Assist Prof. Pachoenchoke Jintasaeranee, Department of Aquatic Sciences,  
Faculty of Science,

Burapha University, Thailand

Dr. Clara Tattoni,

University of Florence, Italy

Prof. Dr. Marco Ciolli,

Univerity of Trento, Italy

Dr. Chantima Piyapong, Department of Biology, Faculty of Science,  
Burapha University, Thailand

Assist. Prof. Dr. Ekarath Srisook, Dean of Faculty of Science,  
Burapha University, Thailand

Dr. Emmanuel Paradis, Research Director from

French National Research Institute for Sustainable Development (IRD), France

Prof. Dr. Ruben Sommaruga, Department of Ecology,  
University of Innsbruck, Austria



Figure 2. Fieldtrip to the river mouth of Bangpakong River  
Credit: Assist Prof. Pachoenchoke Jintasaeranee

Dr. Chantima Piyapong, Department of Biology, Faculty of Science,  
Burapha University, Thailand

Prof. Ruben Sommaruga, Department of Ecology,  
University of Innsbruck, Austria

# SHORT CV

## Ruben SOMMARUGA

Department of Ecology, University of Innsbruck  
[ruben.sommaruga@uibk.ac.at](mailto:ruben.sommaruga@uibk.ac.at)  
<https://www.uibk.ac.at/ecology/staff/persons/sommaruga.html.en>  
ResearcherID: E-5335-2011

### Personal data

Citizenship: Austrian  
DOB: 27.4.62  
Affiliation Address: Technikerstr. 25, 6020 Innsbruck, Austria

### Academic qualifications and employment history

<b>2012-2011-present</b>	Director of the Department of Ecology, University of Innsbruck Full Professor of <i>Limnology</i> , Department of Ecology, Univ. of Innsbruck.
<b>1999-2011</b>	Associate Professor (with Tenure), Institute of Ecology (formerly Institute of Zoology and Limnology), University of Innsbruck, Innsbruck, Austria.
<b>1999</b>	Habilitation in <i>Limnology</i> at the University of Innsbruck. Austria. External Reviewer Panel: Prof. Dr. Robert G. Wetzel† (USA), Prof. Dr. Otto Siebeck (Germany), and Dr. Gerhard J. Herndl (The Netherlands).
<b>1998</b>	Assistant Professor, Institute of Zoology and Limnology, University of Innsbruck, Innsbruck, Austria.
<b>1994-1996</b>	Postdoctoral researcher: Spain (University of Barcelona, Mountain Research Center), Italy (Institute of Hydrobiology at Pallanza).
<b>Mar-Jun 1994</b>	Visiting researcher, Scripps Institution of Oceanography, UCSD, La Jolla, California. USA.
<b>1993</b>	Doctor in Natural Sciences ( <i>Suma cum laudae</i> ), University of Innsbruck. Major subjects: Limnology and Plankton Ecology.
<b>1990</b>	M.Sc. in Zoology, University of Innsbruck, Austria.
<b>1988</b>	International Postgraduate Training Course in Limnology. Austria

### Honors & Awards (partial)

- International Prize on Recognition of Professional Excellence in Limnetic Ecology (2000), ECI-International Ecology Institute.
- Scientific Award from the Principality of Liechtenstein, 2007
- Elected Fellow of the Association for the Sciences of Limnology and Oceanography, 2018
- Swarovsky Prize, University of Innsbruck, 1998.
- Appointed member of Faculty of 1000, Biology, 2010
- Elected Board Member of the Austrian Science Foundation (Environmental Sciences, FWF), September 2011 to present.
- Tonolli Award of the International Association of Theoretical and Applied Limnology (SIL), 1992.

### Publications (September, 2019)

• Total number of publications:	134
• h-index (ISI Web of Science/Google Scholar)	41/49
• Citations: (ISI Web of Science/Google Scholar)	5069/7649

## Curriculum Vitae:

**Name:** Chantima Piyapong

**Nationality:** Thai

### Current contact information:

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Faculty of Science, Burapha University  
Chonburi, 20131, Thailand

Tel: +66 (0) 87333-7915  
Fax: +66 (0) 3839- 3489  
Email: chantimap@gobuu.ac.th

### Education:

- IV. Sukhothai Thammathirat Open University, Thailand (Certificate in English for Specific Careers (Teaching)), 2011
- V. University of Leeds, Leeds, United Kingdom (PhD in Biology), 2008
- VI. Chulalongkorn University, Bangkok, Thailand (MSc in Zoology), 2000
- VII. Chulalongkorn University, Bangkok, Thailand (BSc in Zoology), 1996

### Working experience:

- Lecturer, Department of Biology, Faculty of Science, Burapha University, Thailand (March 2012-present)

### Recent Research grants:

- Analysis, monitoring and prediction of water quality for sustainable land use of the river basin system in Eastern Economic Corridor (EEC): assessment of microbial indicator system and water quality of the river basin system in Eastern Economic Corridor based on metagenomics analysis (Year 2019) funded by National Research Council of Thailand (NCRT) (PI)
- Dynamics of microbial community profiles corresponding to metagenomics analysis and water quality of the river basin system in Eastern Economic Corridor (Year 2019) funded by National Research Council of Thailand (NCRT) (PI)
- Analysis of ecosystem services in organic rice paddy fields in Nakhon Nayok province (Year 2018) funded by National Research Council of Thailand (NCRT) (PI)

### Recent Awards:

- ASEA-UNINET (Ernst Mach Grant-ASEA- UNINET: Post-doc Grant) at the University of Innsbruck (March-June 2017)
- Newton Fund for Professional Development Mid-career Researchers (training in Bangkok (Thailand) and London (United Kingdom)) in 2015-2016 (10 days)

## Scientific Report

Study project	Research	
Name	<b>Ms. Thi Ngoc Lien TRAN</b>	
Country of origin	VIETNAM	
Dates of scholarship	From: 06.02.2020 -	To: 27.02.2020

### 1. Title of the project:

Higher Education Program Management: Experience from Austria

### 2. Host institution:

Program Management and Teaching and Learning Support, Vienna University of Economics and Business (WU)

Address: LC Building, Level 5, Welthandelsplatz 1, 1020 Wien, Austria

### 3. Contact details:

#### - Dr. Oliver Vettori (*main contact*)

Dean, Accreditations & Quality Management

Director, Program Management and Teaching & Learning Support

Email: oliver.vettori@wu.ac.at

Phone: + 431 31336 - 5503

Dr. Oliver Vettori is currently in charge of the Program Management and Teaching & Learning Support. He has strong expertise in higher education research and management, as well as organization culture and theory.

#### - Dipl.-Kffr. Katrin Althammer

Accreditations

Email: katrin.althammer@wu.ac.at

Phone: +43 1 31336 - 6181

#### - Dipl.-Ing. Laura Bauer

Teaching and Learning Development

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Phone: +43 1 31336 - 6146

#### - Judith Ivancsits, MA

Program Development and Policy

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**- Dr. Karl Ledermüller**

Head, Evaluation and Quality Enhancement

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**- Petra Oberhuemer, MSc MAS**

Head, Digital Teaching Service

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Phone: +43 1 31336 4446

During my stay at WU, I was working with Dr. Oliver Vettori and his staff on the following topics:

- Digital Teaching Services
- Teaching and Learning Development; Learning Ergonomics
- Accreditations
- Evaluation and Quality Enhancement
- Program Management and Policy
- Teaching Coordination

With greatest support from Dr. Oliver Vettori and his staff during my visit, I have gained very deep insights about the functions of the host institution, how the programmes are managed and how the teaching and learning activities are implemented and supported within the university. We discussed a lot about the similarities and the differences regarding the program management, teaching and learning development, accreditations, etc. between the two universities.

The visit was extremely fruitful which has been resulting in a few proposals together. In which, a project application in E-learning will be certainly submitted in the autumn of 2020. We hope there will be more collaboration between the two universities in the very near future.

Finally, I would like to thank OeAD (Austrian Agency for International Cooperation in Education and Research) for providing us with this excellent opportunity through this grant. Particularly, I would like to send a big thanks to Dr. Oliver Vettori and his staff for their utmost assistance during my stay at WU. The visit was actually more successful than expected.

Hue, 01.03.2020



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(Thi Ngoc Lien TRAN)



## Characterization and application of bacterial fucosyl transferases, enzymes for the production of health-related oligosaccharides

Duration: February 1 – February 29, 2020

### Contact detail:

1. Univ. Prof. Dipl. -Ing. Dr.techn. Dietmar Haltrich. Department of Food Science and Technology. University of Natural Resources and Life Science, Vienna. *Email: dietmar.haltrich@boku.ac.at*

2. Priv.- Doz. Dr. Thu – Ha Nguyen. Department of Food Science and Technology. University of Natural Resources and Life Science, Vienna. *Email: thu-ha.nguyen@boku.ac.at*

3. Le Vu Khanh Trang. Faculty of Biology-Environmental Science – The University of Danang, University of Science and Education, Vietnam. *Email: levukhanhtrang@gmail.com*

**Background:** Human milk is special since it is the only food an infant may take in during the first months of its life, and it contains all the essential nutrients needed by the infant to develop and grow. Moreover, it contains ingredients that go beyond traditional nutrients in that they provide certain health benefits to the infant. Galacto- oligosaccharides (GOS) are recognized as one of the most viral prebiotic oligosaccharides and of the special interest to human nutrition based on the presence of structurally related to oligosaccharides together with different complex structures in human breast milk. (V. Sangwan, S. K. Tomar, R. R. B. Singh, A. K. Singh, and B. Ali, *J. Food Sci.*, 76, R103-R111 (2011)). In order to increase the functionality of these oligosaccharides, the project has been carried out with the aim at attaching fucosyl residues onto these oligosaccharide structures. Currently, we are expressing genes coding for fucosyl transferases recombinantly, and characterize these enzymes biochemically.

**Results:** During a month joining this project, I accumulated a lot of knowledges and experiences related to enzyme technology including:

- Cloning and expression of fucosyl transferases encoding genes - Purification fucosyl transferases by IMAC

# Final Report for ASEA-UNINET

by Dr. Mohamad Reza Mohamed Afla

## **Title of the project**

Spatial Assessment of Muslim Cemeteries in Vienna: Negotiating Between Sacred Space and Hybrid Function.

## **Duration of the stay**

From 2nd February to 29th February 2020

## **Host professor**

Dr. Roland Tusch

## **Participating persons**

Participating persons will be decided later during the preparation of the manuscript for the publication. Identified persons will be interviewed through offline mode pertaining to the inquiry of burial practices at Islamic sections.

## **A description of the scientific topics**

The research is examining the position of cemeteries within the urban context. Especially in today's context where cities' population are growing rapidly at a faster rate. This study will be exploring the potential of the Islamic cemetery as part of the city's green infrastructures. The purpose of this project is to argue whether Islamic cemeteries should remain exclusively for burials rather than be part of Vienna's urban fabrics. This is because urban cemeteries could offer an extra role to serve as a part of public spaces in the city.

Another reason is to examine the possible role of Islamic cemetery as a space that could stimulate integration between Viennese Muslims and predominantly Western societies in comparison to its counterpart which is the Islamic Cemetery Altag in Vorarlberg. The recent development observed that newly open Islamic cemeteries have been built outside the Central Cemetery within Vienna's suburbia particularly in Inzersdorf. This study is also expected to reveal the motives for local Muslim communities choose to have a segregated and dedicated burial space rather than being placed among other faiths within the same ground which has been practiced in the Central Cemetery.

## **Work conducted during the research stay**

During the research stay, I have conducted a site visit to several sites around Vienna. Observation was recorded by taking photos and videos recording. I have also visited the library of TUW and University of Vienna to get access into their archives.

## **Expected Results**

The expected outcomes from this study are such as follows:

### **Pre-visit**

1. To demonstrate ways of integrating Muslim's sacred space as part of Vienna's civic space through landscape design.
2. To promote the integration of Muslim migrants into predominantly Western culture through a better understanding of their local identity and cultural space.
3. The findings may be replicated in other European cities which serves as a basis and approach to incorporate Islamic cemetery as part of the city's green infrastructures.

## **Post-visit**

1. To identify the gaps in integrating Islamic cemeteries as part of Vienna's civic space through a better understanding of their burial practices and cultural identity.
2. To examine the feasibility and implementation of hybrid function at Islamic cemeteries as a space that can stimulate cultural tolerance between the local Muslims and Viennese society. Muslim sections at the Central Cemetery was chosen as an example in comparison to its counterpart, which are Islamic cemeteries in Inzersdorf, Vienna and in Altsch, Vorarlberg.
3. To draw a comparison between Muslim cemeteries in Vienna and Kuala Lumpur, and how this can contribute further understanding towards striving for sustainability through the inclusion of desirable features and characteristics in the development of urban cemeteries.

## **Results**

This aim of this study is to evaluate the feasibility and flexibility of Islamic cemeteries as an integrated public space by taking the example of Vienna. The case studies of Vienna have offered me a different perspective in understanding the other side of Islamic cemeteries within the geographical and social background of Austria. The findings of this research are expected to contribute to knowledge exchanges through research collaboration by drawing the comparison from the case studies between Kuala Lumpur and Vienna.

Here are some of the things that can be learned by Kuala Lumpur based on the site observation that has been conducted around Vienna. The old cemetery can be integrated into a new development of a neighbourhood park. In the case of Vienna, people are aware of the existence of these old cemeteries within the park. However, users don't seem to be mind because it has been gated from public access and remain untouched. The protected area is rich in terms of its biodiversity and natural greeneries which helps to concealed it naturally from the public's eyes.

My research visit is also beneficial in providing input to the ongoing research which is currently pending for the data collection due to Covid-19 lockdown in Malaysia. The title is Establishing the Requirements for Urban Cemeteries as Public Open Spaces in the Metropolitan Area of Kuala Lumpur.

## **Intended publication**

The manuscript will be submitted to be considered for publication in the Journal of City and Environment Interactions, under Elsevier.

The manuscript is still in the writing process and I expect to submit by September 2020.

## Report on ASEA-UNINET Project

### “DFTB studies of Graphene System”

#### Summary

In the September 2019, W.D. Saputri visited the research group of Assoc. Prof. Thomas Hofer at the Institute of General, Inorganic and Theoretical Chemistry of the University of Innsbruck. The research activities in this one month period, she was focused on testing applicability of Density Functional Tight Binding (DFTB) for graphene systems.

#### Short biography

Wahyu Dita Saputri was born on March, 21<sup>st</sup> 1993 in Indonesia. She is a graduate of the Doctoral Program in Chemistry, at the Austrian-Indonesian Centre for Computational Chemistry of the Universitas Gadjah Mada under the supervision of Prof. Dr. Harno Dwi Pranowo, alumni of the University of Innsbruck. Her research expertise is in the field of computational chemistry specifically on the application of Quantum Mechanical Charge Field (QMCF) molecular dynamics simulation framework to investigate the ion solvation.

#### Contacts details

Email: wahyu.dita.s@mail.ugm.ac.id

Tel: +628563233528

Address: Perum. Mastrip C\19 Nganjuk, Jawa Timur, Indonesia.

#### Result

During the research visit, two topics focused on graphene system have been investigated:

1. Molecular dynamics of pure graphene. In the first part the applicability of the DFTB parameterisation 3ob and mio with and without dispersion correction have been the main focus. A supercell consisting of 112 carbon atoms in a  $1.7 \text{ nm} \times 1.7 \text{ nm}$  simulation system was employed (see Figure 1a), and the properties have been characterized in terms of radial and z. distribution functions as well as the vibrational power spectra of the compound.

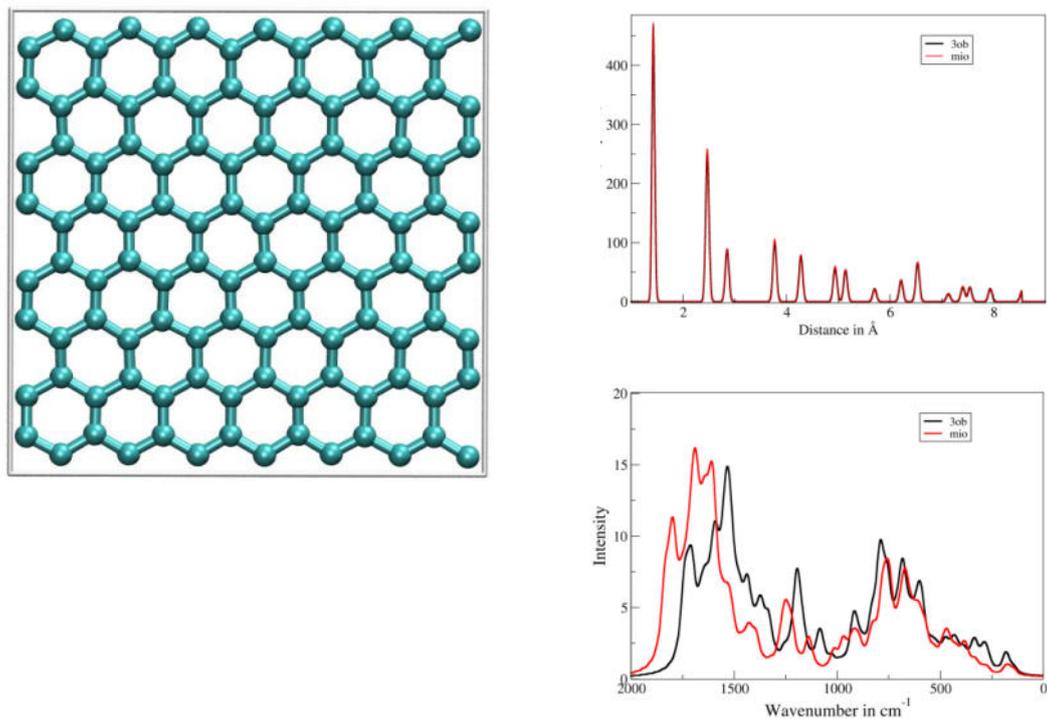


Figure 1. (a) Simulation system consisting of 111 carbon atoms (b) Radial distribution functions (RDFs) of graphene, and (c) power spectra of graphene at DFTB level employing the 3ob and mio parameter sets

The radial distribution functions (RDFs) of the C-C graphene system are presented in Figure 1 (b), it can be seen that both employed parameter sets yield in a highlight similar structural description of the system. The average C-C distance of 1.42 Å in excellent agreement with the experimental value obtained via high-resolution photo electron spectroscopy being reported as 1.421 Å [1].

The power spectrum shows 3ob and mio have similar shape, except the power in wavenumber 2000-1250 cm<sup>-1</sup> indicating graphene using mio parameter can generate blue shift in this range wavenumber.

## 2. Anthraquinone adsorption on graphite as model for charge storage

Anthraquinone is an aromatic organic compound, and its derivatives are promising compounds for in renewable charge storages [2]. The systems modeled in this study are anthraquinone, Na<sup>2+</sup>-anthraquinone<sup>-</sup>, and 2Na<sup>2+</sup>-anthraquinone<sup>2-</sup>.

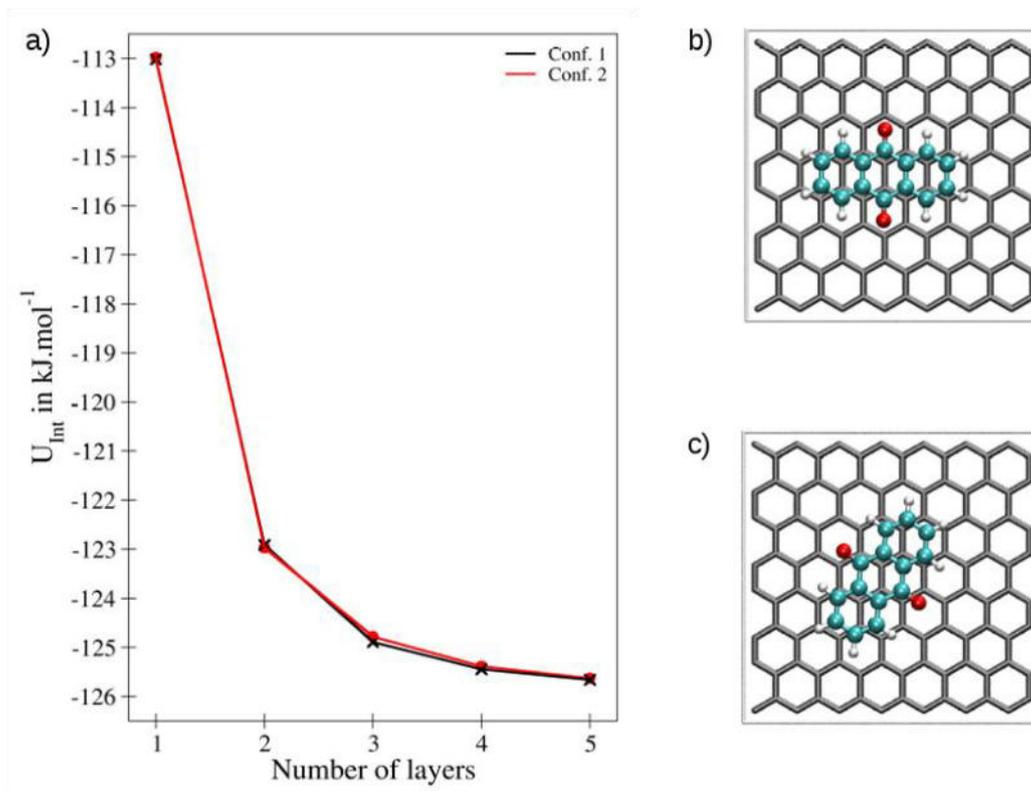


Figure 2. (a) Interaction energy ( $U_{int}$ ) associated to confirmations 1 and 2 shown as snapshots in (b) and (c) upon variation in the number of graphite layers

The conformations of anthraquinone in Figure 2(b) and (c) were obtained after successive energy minimisation of the system employing a total of 85 different starting configurations generated by shifting/rotating the substrate at the surface of the graphite support. Next, the number of layers was increased until convergence of the interaction energy could be observed. Both conformations have similar internal energies as function of the number of layers with little variation of n-layers in the supporting material. The respective deviation in energy is below  $1 \text{ kJ mol}^{-1}$

The research data can be combined with results of the group of Dr. Engelbert Portenkirchner from the Institute of Physical Chemistry of the University of Innsbruck who perform experimental measurements on this type of systems, following the preparation of a manuscript for dissemination in an international peer reviewed scientific journal focused on physical chemistry and/or material sciences.

Further collaborative activities between W.D. Saputri and the University of Innsbruck will focus on the enlargement of the unit cell, the stacking of several anthraquinone molecules at the surface as well as the application of the novel GFN-xTB method developed by Grimme et al, and the possibility to continue the research activities in the near future are currently explored.

## References:

- [1] P. Lacovig, M. Pozzo, D. Alfe, P. Vilmercati, A. Baraldi, S. Lizzit. *Phys. Rev. Lett* **103**, 4 (2009)
- [2] B. Huskinson, M. P. Marshak, C. Suh, S. Er, M. R. Gerhardt, C. J. Galvin, X. Chen, A. Aspuru-Guzik, R. G. Gordon, M. J. Aziz. *Nature* **505**, 195 (2014)

# Final Report

## Stipendien aus Mitteln des ASEA-Uninet, Projektstipendien SP 24

**Reference number:** ICM-2019-16105

**Title of the project:** Quaternary (CZTS) alloy nanostructure grown on different substrates: Analysis and characterisation

**Duration of the stay:** 08.02.2020 - 29.02.2020

**Academic supervisor:** Univ.Prof.Dr. Günther RUPPRECHTER

Place of study: Vienna University of Technology, Institut für Materialwissenschaften und Technologie Karlsplatz 13, 1040 Vienna

**Awardee Scientist:** Prof. Dr. Yarub Al-Douri

Nanotechnology and Catalysis Research Center, University of Malaya, Malaysia

Yarub Al-Douri is Professor in University of Malaya. He has initiated Nanotechnology Engineering MSc Program and Nano Computing Laboratory, the first in Malaysia. He has received numerous accolades. Al-Douri is Editor-in-Chief of Experimental and Theoretical NANOTECHNOLOGY, Editor-in-Chief of World Journal of Nano Science and Engineering and Associate Editor of Nano-Micro Letters (Q1).

**Researcher:** Univ. As. Dipl. -Ing. Dr. Techn. Nevzat Yigit is a post-doc researcher at Institut für Materialwissenschaften und Technologie and working in RUPPRECHTER's group. He has 12 publications.

### Description:

Date	Person	Description
Saturday 8/2/2020	Arrival to Vienne at mid-day	
	Univ.Prof.Dr. Günther RUPPRECHTER	I have met afternoon Univ.Prof.Dr. Günther RUPPRECHTER afternoon, he has welcomed me and did short-visit to the laboratories available in Institut für Materialwissenschaften und Technologie with Scientific discussions
Sunday 9/2/2020	Weed-end	
Monday 10/2/2020	Dr. Nevzat Yigit	I have resumed my work at TU Wien including receive magnetic card and my office. Additionally, visit to the laboratories available

		in Institut für Materialwissenschaften und Technologie
Tuesday 11/2/2020	OeAD Regional & Housing Offices Vienna	I have visited both offices for receiving my scholarship and registration
Wednesday 12/2/2020	OeaD Housing Officer	I have registered my residence at Wipplingerstrase 8, Ground floor, Kundenservicecenter
Thursday 13/2/2020	Dr. Nevzat Yigit	Scientific discussions to prepare a paper for publishing
Friday 14/2/2020		
Saturday 15/2/2020	Weed-end	
Sunday 16/2/2020	Weed-end	
Monday 17/2/2020	Univ.Prof.Dr. Günther RUPPRECHTER	Scientific discussions
Tuesday 18/2/2020		Seminar 1: Colloidal metals oxides nanoparticles
Wednesday 19/2/2020		Scientific discussions
Thursday 20/2/2020		Seminar 2: Optical studies of Quantum dots
Friday 21/2/2020		Scientific discussions
Saturday 22/2/2020	Weed-end	
Sunday 23/2/2020	Weed-end	
Monday 24/2/2020	Univ.Prof.Dr. Günther RUPPRECHTER	Scientific discussions, meetings with scientists, researchers, students. In addition to prepare a paper for publishing
Tuesday 25/2/2020		
Wednesday 26/2/2020		
Thursday 27/2/2020	OeaD Housing Officer	I have de-registered my residence at Wipplingerstrase 8, Ground floor, Kundenservicecenter
Friday 28/2/2020	Univ.Prof.Dr. Günther RUPPRECHTER	Last meeting and farewell
Saturday 29/2/2020	Departure to Kuala Lumpur	



Prof. Dr. Yarub Al-Douri  
Awardee Scientist

Reports  
on  
Bernd Rode Award 2019  
Mobilities  
in 2019



## Report of use for ASEA-UNINET funds (Bernd Rode Award 2019)

by Univ.-Prof. Dr. Annette Ostendorf

### CVs:

#### **Professor Dr Ruhizan Mohammad Yasin, Universiti Kebangsaan Malaysia, Malaysia**

Ruhizan Mohammad Yasin is a Professor in the Faculty of Education at the Universiti Kebangsaan Malaysia (National University of Malaysia) in Kuala Lumpur. Her field is Technology and Vocational Education (TVET) specialising in curriculum and evaluation. She obtained her PhD from the University of Minnesota, USA. Her research interest is in education for sustainable development and Lifelong Learning. Other than ASEM LLL Hub member, she also involved with international research collaboration with universities in China, Germany and Ireland in the EU Asia Link's DCCD (Design and Implementation of Curriculum on Curriculum Development) project.

#### **Associate Professor Dr. Chompoonuh K. Permpoonwiat, Srinakharinwirot University, Thailand**

Chompoonuh K. Permpoonwiat is an Associate Professor in Economics at School of Economics and Public Policy, Srinakharinwirot University, Bangkok. She received her Ph.D. in Economics from the University of Utah (USA) specializing in public economics, economics of gender and development, and quantitative methods. Her research interests are in public policy analysis related to local public finance, transportation, human resource development, and natural resource and environmental issues. She has been also appointed to be one of the management committees among other leading economists in Thailand for the Program in the Advanced Certificate Course in Public Economics Management for Executives at the King Prajadhipok's Institute.

**Report:**

Of the total prize money of 3000 euros, 2000 euros were called up in November 2019. The money was used to finance the short-term stay (scholarships) of two professors at the University of Innsbruck from 4-6 November 2019. The two professors (Prof. Dr. Chompoonuh Permpoonwiwat from the Srinakharinwirot University in Bangkok and Prof. Dr. Ruhizan Mohammad Yasin from the Universiti Kebangsaan Kuala Lumpur), with whom I have had scientific contacts for several years and who have also published with me, used the stay in Innsbruck to deepen our cooperation. We are all members of the ASEM Research Network (RN2: workplace learning, see: <https://asemlllhub.org/researchnetworks/workplacelearning/rn2members/>), which held a network meeting during the stay of the two scholars. We discussed new joint research projects in Innsbruck together with other international researchers. In particular, we discussed the coordination of data collection and the refinement of the research design for the two projects "Employer engagement in vocational skills development and lifelong learning for young people" and "Global learning spaces: understanding learning in cross-national/cross-cultural workplaces".

The personal exchange made it much easier to discuss critical points of data collection and to define the approach more precisely. We normally use Skype, but due to the great distance, communication is always interrupted and more intensive discussions can hardly take place.

The programme of the network meeting is attached to this report. Also included was a company visit to Swarovski in Wattens. This could be used especially for the Thai colleague to establish contacts to the Swarovski plants in Thailand. Here, there may also be opportunities for cooperation in the context of research projects.



Asia Europe Meeting (ASEM) Research Network Conference 2019

Workplace Learning in the Digital Era

University of Innsbruck, Austria – version 08/2019

4<sup>th</sup> to 6<sup>th</sup> of November 2019, SOWI-Building, Universitätsstrasse 15, 6020 Innsbruck

**Conference Day 1 (Monday, Nov. 4<sup>th</sup>)**

- 14.00 – 16.00 Introduction to the conference theme and the aims of the meeting (Karen Evans)  
The ASEM network: current situation and future steps (Seamus O' Tuama)
- 16.00-17.00 Working sessions for research groups  
Idea Workshop for developing the work of RN2 (for non RG 1-3 members)
- 17.30-19.00 Guest lecture Karen Evans: "What's new about lifelong learning?" with discussion  
Lecture room 2, SOWI
- Afterwards Dinner, Italian, l'Osteria (old town)\*

**Conference Day 2 (Tuesday, Nov. 5<sup>th</sup>)**

- 9.00 – 12.00 Presentations on current work and open questions
- RG 1: Employer engagement in vocational skills development and lifelong learning for young people  
RG 2: Global learning spaces: understanding learning in cross-national/cross-cultural workplaces  
RG 3: Professional identity of young adults who learn in the workplace as part of their vocational education
- Lunch break* Catering
- 13.30 – 15.00 Idea workshop for further research cooperation
- Coffee break*
- 15.30 – 16.45 Idea workshop for further research cooperation
- 17.30 – 19.00 BritInn Guest lecture Natasha Kersh: "Fostering inclusion and participation through workplace and vocational learning: enhancing the life chances of young adults through economic and social integration." Seminar room 12, 3<sup>rd</sup> floor.
- Afterwards Dinner, Old Town, Hotel Goldener Adler\*

**Conference Day 3 (Wednesday, Nov. 6<sup>th</sup>)**

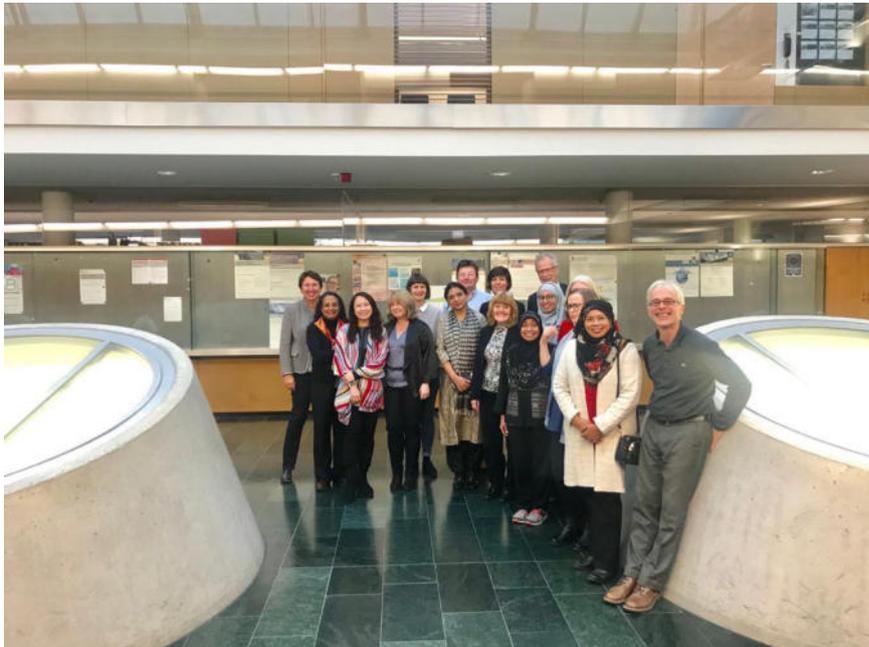
- 8.15-13.00 Company visit at SWAROVSKI (Plant visit, Vocational school, Training Center, Discussion with Trainers/HRM), with lunch  
<https://en.wikipedia.org/wiki/Swarovski>  
Attention: we won't visit the crystal world but the company!
- 14.00 Departure/leisure time

\* on own expenses

**Enclosed two photos for documentation:**



Ruhizan Mohammad Yasin, Annette Ostendorf, Chompoonuh Permpoonwiwat,  
© Annette Ostendorf/UIBK



ASEM Netzwerk ‚workplace learning‘, Universität Innsbruck, SOWI  
© Annette Ostendorf/UIBK

## Scholarship Report for

# Bernd Rode Award 2019

**Name:** Apinun Kanpiengjai, Ph.D.

**Project Title:** Purification and Properties of Tannase from *Sporidiobolus ruineniae*, a Tannin-Tolerant Yeast Isolated from Fermented Foods of Northern Thailand

**Scholarship type:** Junior Grant

**Duration:** June 3 to 28, 2019

### Relevant participating persons and position:

Apinun Kanpiengjai, Dr.

Division of Biochemistry and Biochemical Technology, Department of Chemistry, Faculty of Science, Chiang Mai University, 50200 Thailand

Dietmar Haltrich, Professor Dr.

Food Biotechnology Laboratory, Faculty of Food Science and Technology, BOKU University of Natural Resources and Life Science, Vienna 1190, Austria

Thu-Ha Nguyen, Dr.

Food Biotechnology Laboratory, Faculty of Food Science and Technology, BOKU University of Natural Resources and Life Science, Vienna 1190, Austria

Saisamorn Lumyong, Professor Dr.

Microbiology Section, Department of Biology, Faculty of Science, Chiang Mai University, 50200 Thailand

Chartchai Khanongnuch, Assistant Professor Dr.

Division of Biotechnology, Faculty of Agro-Industry, Chiang Mai University, Chiang Mai 50100, Thailand

### Description of the scientific topics and work conducted during the research stay:

Tannin acyl hydrolase (EC 3.1.1.20) or tannase is enzyme that catalyzes the hydrolysis of the galloyl ester bond of tannins and releases gallic acid and glucose. Tannase plays an important role in various industries such as the food, chemical, and pharmaceutical industries.

It also is known to have an important function in breweries, in the treatment of effluent in tanneries, and especially in the production of animal feed. Tannins in animal feed is commonly known to have negative effects on animals. Supplementation of animal feed with tannase is required and believed to improve intake and production of animals, nutrient utilization and growth performance of animals. As has been previously reported before, tannase is produced predominantly by filamentous fungi such as *Aspergillus* sp., *Penicillium* sp., *Fusarium* sp., and *Trichoderma* sp. followed by bacteria such as *Enterobacter* sp., *Bacillus* sp., and *Lactobacillus* sp. as opposed to yeasts. To date, there are only *Arxula adenivoran* and *Candida* sp. that have known their enzyme properties. In our previous study, various tannin-tolerant yeasts were isolated from fermented tea-leaf, some yeast isolates including *Debraryomyces* sp., *Cyberlindnera* sp., and *Sporidiobolus ruineniae* (pigment-producing yeast) displayed positive results for tannase activity. It has been hypothesized from our previous published results that tannase may associate with biotransformation of tannins in tea leaves into functional phytochemical compounds particularly catechin and its derivatives such as epicatechin, epigallocatechin, and epigallocatechin gallate. Tannase as the key factors underlying the mechanism must be elucidated. Our current experiment found that the best tannase producer is *S. ruineniae* which is a pigment producing yeast but its tannase properties is still unknown. As previously mentioned, very few studies have been carried out on production, purification and characterization of tannase from yeast. Therefore, the aim of this research study was to purify and biochemically characterize tannase obtained from *S. ruineniae*, a newly isolates from Miang, a traditional fermented tea leaves of northern Thailand. *S. ruineniae* was cultured in the Yeast-Malt (YM) broth containing 5 g/L tannic acid, on a 160-rpm rotary shaker at 30°C. After 24 h, cell pellet and culture broth were harvested by centrifugation at 6,000 rpm, 4°C for 20 min. The cell was washed at least twice by 20 mM sodium phosphate buffer pH 6.0 and resuspended by the same buffer. To assay tannase, culture broth, cell extract and whole cells were used as crude enzyme. The result showed that tannase activity was undetectable from culture broth in contrast to whole cells and cell extract. Under the culture conditions, *S. ruineniae* produced whole-cell tannase of 873 mU/L and this amount was achieved from cell extract after cell disruption by a French Press technique (80% tannase activity) and then cell debris extraction by 0.5% Triton X-100 in 20 mM sodium phosphate buffer pH 6.0 (20% tannase activity). This evidence confirmed that tannase is a cell associated enzyme. The tannase was purified to homogeneity by anion-exchange chromatography. Briefly, a total of 2,289 mU tannase activity with a specific activity of 368.5 mU/mg protein was applied onto Q-sepharose that was equilibrated with 20 mM sodium phosphate buffer pH 7.0 and eluted with a linear gradient of 0-1,000 mM sodium chloride in 20 mM sodium phosphate buffer pH 7.0. After this step, the enzyme was purified 77.9-fold, with 93% recovery and a specific activity of 28,715 mU/mg. The purification protocol resulted in an enzyme preparation of apparent homogeneity since SDS-PAGE gave only a single protein band with a molecular weight of 88.5 kDa. Whole cells and purified tannases were biochemically characterized. Both showed a similar profile of pH and temperature optima (optimal pH at pH 7.0 and optimal temperatures at 40-50°C). Whole cell tannase was significantly more stable than the purified tannase. It was stable from 4 to 70°C for 1 hour while the purified tannase was stable at a narrower range of temperature from 4 to 50°C for 1 hour. Both tannases were not stable at 30°C for 30 min in the presence of various organic solvent at 20% (v/v) concentration including ethanol, methanol, propanol, butanol,

hexanol and octanol. They were partially inhibited by  $\text{Cu}^{2+}$  (40% relative activity) and  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$  did not affect the enzyme activity. Similar profile of cation effects was also found in the purified enzyme and whole cell tannase. Under the standard assay conditions, (12.5 mM methyl gallate in 100 mM sodium phosphate buffer pH 6.0, 30°C, 10 min), the  $K_m$  value of the purified enzyme was  $2.7 \pm 0.4$  mM which is non-significantly different to that of the whole cell tannase ( $2.6 \pm 0.4$  mM), indicating that whole cell tannase has similar substrate affinity to the purified tannase. The results revealed that removing tannase from its natural habitat (cell wall) triggered some biochemical properties of tannase especially its thermostability. Whole cell tannase seems to be more useful and may be serve a broader range of applications than the free tannase. Furthermore, whole cell thermostable tannase will be very valuable for feed application. To the best of our knowledge, supplementation of tannase and pigmented-producing yeast as feed supplements would provide broader beneficial effects on animal performance than the tannase alone and might lead to development of animal feed formulation industry.

### **Intended publications:**

First Report of Thermostable Tannase from *Sporidobolus ruineniae*: Characterization and Application for Gallic Acid Product



# Appendix



# Approved ASEA-UNINET Projects Proposals 2019

Classified by the Austrian member universities

Callout: TH Thailand  
 PK Pakistan  
 VN Vietnam  
 RI Indonesia  
 MAL Malaysia  
 MMR Myanmar  
 RP Philippines

## University of Vienna

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institut für Publizistik- und Kommunikationswissenschaft	"Pictorial Affect!" – exploring identity creation and body images on social media. A follow up study among young people living in Malaysia, Vietnam, and Austria.	University Kebangsaan Malaysia, School of Media and Communication National University Ho Chi Minh City, Social Sciences and Humanities			x		x		
Institut für Kultur- und Sozialanthropologie	NUTRITION & FOOD HABITS of the Maniq (Southern Thailand)	Chulalongkorn University, Centre for European Studies	x						
Institut für Theoretische Chemie	Theoretical Investigations on Flaviviruses	Chulalongkorn University, Department of Biochemistry	x						
Department für Evolutionäre Anthropologie	Unveiling the genetic history of the Maniq, primary hunter-gatherers in Southeast Asia.	Chulalongkorn University, Centre for European Studies	x						
Institut für Physikalische Chemie	Development of biomimetic assays for screening food-relevant pathogens	Srinakarinwirot University, Faculty of Medicine, Department of Microbiology Kasetsart University, Faculty of Science, Department of Biochemistry	x x						
Institut für Physikalische Chemie	Self-assembly as a tool for selective bio- and chemoassays	Srinakarinwirot University, Faculty of Medicine, Department of	x						

		Microbiology Kasetsart University, Faculty of Science, Department of Biochemistry	x							
Institut für Theoretische Chemie	Computational studies on molecular associations and drug receptor interactions	Chulalongkorn University, Austrian Thai-Center, Department of Physical Chemistry Chulalongkorn University, Department of Chemistry, Center of Excellence in Computational Chemistry Chulalongkorn University, Faculty of Science, Program of Biotechnology	x x x							
Institut für Kultur- und Sozialanthropologie	Tourism between Disaster and Heritage	Universitas Gadjah Mada, Department of Anthropology Institut Teknologi Sepuluh Nopember (ITS), Department of Architecture				x x				
Institut für Physikalische Chemie	Structural study of hydrogels wound dressing based on Mesona chinensis and poly(vinyl alcohol) by using attenuated total reflectance Fourier transform infrared spectroscopy.	Chiang Mai University, Faculty of Science, Department of Chemistry	x							
Institut für Geographie und Regionalforschung	Transcultural Lives of Myanmar Migrant children and youths in Thailand: Self-identity and Sense of Belonging	Mahidol University, Research Institute for Languages and Cultures of Asia	x							
Institut für Geographie und Regionalforschung	Vom Seminarraum ins Feld – Understanding Rural Livelihoods in Thailand	University of Chiang Mai, Faculty of Social Sciences, Department of Geography	x							
Department für Lithosphärenforschung	Geochronologische-petrochronologische Arbeiten in NW und S Thailand	Chulalongkorn University, Faculty of Science, Department of Geology	x							
<b>12 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Vienna University of Technology (TU Wien)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institute of Information Systems Engineering	Elaboration of a strategy for distributed ethnomusicology data <i>Project in cooperation with the University of Music and Performing Arts Vienna</i>	Mahidol University, College of Music	x						
Institute of History of Art, Building Archaeology and Restoration, Research Group of History of Architecture and Building Archaeology	Development of the frame for Maintenance and Facility Management Concepts for Museums in Indonesia in collaboration with the project: "Thermal Comfort Criteria in Indonesia and Europe (TCC IN EU) proposed by DUK" <i>Project in cooperation with the Danube-University Krems</i>	Universitas Gadjah Mada, Faculty of Engineering, Department of Architecture and Planning Institut Seni Indonesia Yogyakarta				x			
Institute of History of Art, Building Archaeology and Restoration, Research Group of History of Architecture and Building Archaeology	Integrative Restoration of Art and Architecture as a Base for Perspectives in Education (In collaboration with the project: Archive and Museum - Conservation concept for paintings on canvas and paper, notebooks, drawings, glass plates, photographs, plans and films of the Museum Affandi and the archives of the temple of Borobudur UNESCO Cultural Heritage site listed as an UNESCO Memory of the World in 2017 as a joint training with building up the department of conservation-restoration in ISI, Yogyakarta) <i>Project in cooperation with the Danube-University Krems</i>	Universitas Gadjah Mada, Faculty of Engineering, Department of Architecture and Planning Institut Seni Indonesia Yogyakarta				x			
Institut für Architekturwissenschaften, Abteilung Bauphysik und Bauökologie	Assessment of Possibilities for a future sustainable (touristic) development in Labuan Bajo, Flores, Indonesia <i>Project in cooperation with other departments of TU Wien</i>	Universitas Gadjah Mada, Faculty of Engineering, Department for Architecture and Planning				x			
Institute of Information Systems Engineering	Head in the Clouds – Digital Learning in Indonesia	Institute of Technology Bandung (ITB), Data and Software Engineering Research Group, Programming Lab				x			
<b>5 projects</b>	<b>number of participations of each ASEAN partner country</b>		<b>1</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Vienna University of Economics and Business (WU)

Applicant	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Dean for International Affairs	Joint International Summer University (ISU) Indonesia 2019	Universitas Gadjah Mada, Faculty of Economics and Business				x			
Dean for International Affairs	Joint International Summer University (ISU) Vietnam 2019	Hanoi University of Science and Technology (HUST), Inspection and Legislation Office  National Economics University, International Cooperation Department			x				
<b>2 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

### University of Natural Resources and Life Sciences, Vienna (BOKU)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institut für Bodenforschung (IBF)	Sustainable soil management on ex-mining area to ensure food security and soil C-Sequestration	Universitas Gadjah Mada, Faculty of Agricultural Technology, Department of Agricultural and Biosystem Engineering				x			
Department für Chemie	Entwicklung und Implementierung von analytischen Methoden zur Spezierung von Arsen und Selen in Reis	Hanoi University of Science and Technology, Department of Analytical Chemistry			x				
Institut für Lebensmitteltechnologie/Lebensmittelbiotechnologie	Bacteria from the termite gut as a source of lignocellulose-degrading enzymes	Universitas Gadjah Mada, Faculty of Biology, Laboratory of Biochemistry				x			
<b>3 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

### University of Veterinary Medicine, Vienna

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
VetCore Facility for Research	ASEA-UNINET Workshop on Proteomics and Biological Mass Spectrometry	University of Medicine and Pharmacy Ho Chi Minh City, Department of Medicinal/Pharmaceutical Chemistry			x				
VetCore Facility for Research	Famulatur (Pflichtpraktikum) im Rahmen des Diplomstudiums Veterinärmedizin	Kasetsart University, Faculty of Veterinary Medicine	x						
Institut für Fleischhygiene	Networking for project application on "Campylobacter in wild populations of the Red Jungle Fowl and the comparability to commercial broiler and layer population"	Universitas Gadjah Mada, Faculty of Animal Science				x			
<b>3 projects</b>	<b>number of participations of each ASEAN partner country</b>		<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Medical University of Vienna

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Vizerektorat für Lehre / International Office for Student & Staff Affairs	Famulaturprogramm mit Universitäten in Thailand, Vietnam, Indonesien	Chiang Mai University, Faculty of Medicine	x						
		Chulalongkorn University, Faculty of Medicine	x						
		Mahidol University, Faculty of Tropical Medicine, Faculty of Medicine	x						
		Khon Kaen University, Faculty of Medicine	x						
		Gadjah Mada University Hospital, Faculty of Medicine					x		
		University of Medicine and Pharmacy Ho Chi Minh City				x			
<b>1 project</b>	<b>number of participations of each ASEAN partner country</b>		<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

## University of Music and Performing Arts Vienna (mdw)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institut Leonard Bernstein - Bläser und Schlagwerk	Master Class for Trumpet	Mahidol University, College of Music	x						
Vizerektorat für Außenbeziehungen	Incoming Musik Stipendien (ISA - Internationale Sommerakademie)	Mahidol University, College of Music Vietnam National Academy of Music Hanoi Academy of Theatre and Cinema	x		x x				
Institut Anton Bruckner	BASSO CONTINUO – WORKSHOP I für PianistInnen (Einstiegskurs) BASSO CONTINUO – WORKSHOP II für PianistInnen (Aufbaukurs)	Mahidol University, College of Music	x						
Institut 22 - Musikalische Akustik	Elaboration of a strategy for distributed ethnomusicology data <i>Project in cooperation with the TU Wien</i>	Mahidol University, College of Music	x						
Joseph Haydn Institut für Kammermusik, Alte Musik und Neue Musik	Masterclass and concert with Hanoi Philharmonic Orchestra	Vietnam National Academy of Music			x				
Ludwig van Beethoven Institut für Klavier und Cembalo in der Musikpädagogik	Klavierkurs, Vortrag, Klavierabend - Albert Sassmann	Mahidol University, College of Music	x						
Ludwig van Beethoven Institut für Klavier und Cembalo in der Musikpädagogik	Klavierfortbildung für reguläre Studierende und Jungstudierende in Vietnam sowie pädagogischer Austausch	Vietnam National Academy of Music, Institut für Klavier			x				
Institut für Kulturmanagement und Gender Studies	Laboratory for alternative Concert Concepts and performative Models in Classical Music	Vietnam National Academy of Music			x				
Max Reinhardt Seminar	Richard III. Part 2: Shakespeare on Stage: Contemporary methods of acting and directing	Hanoi Academy of Theatre and Cinema, Department of Theatre and Cinema			x				
<b>9 projects</b>	<b>number of participations of each ASEAN partner country</b>		<b>5</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### University of Applied Arts Vienna

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Rectorship	Cultural Heritage Conservation in Southeast Asia - Symposium on Needs and Challenges	Silpakorn University, International College	x						
<b>1 project</b>	<b>number of participations of each ASEAN partner country</b>		<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Montanuniversität Leoben

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Lehrstuhl für Allgemeinen Maschinenbau	FEM Simulation and Experimental investigation on Transient Temperature Distribution and Substrate Distortion of Wire Arc Additive Manufacturing (WAAM) process using 316L Stainless Steel	Universiti Teknologi Mara, Faculty. of Mechanical Engineering					x		
<b>1 project</b>	<b>number of participations of each ASEAN partner country</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>

### University of Graz

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institute of Chemistry	Development of New Electrochemical Sensors Based on Nano-sized Materials	Ubon Ratchathani University, Department of Chemistry Chulalongkorn University, Department of Chemistry Hue University, Department of Chemistry	x  x		  x				
Institute of Chemistry - Analytical Chemistry	GCMS as analytical tool for monitoring pesticide concentrations in food	Hue University, Department of Chemistry			x				
Institut für pharmazeutische Wissenschaften – Pharmakognosie	Evaluierung der mikroskopischen Strukturen von verschiedenen relevanten thailändischen Arzneipflanzen sowie Vergleich von konventionellen Extraktionsmethoden mit der mikrowellenunterstützten Extraktion	Ubon Ratchathani University, Department of Pharmaceutical Sciences	x						

Institut für Mathematik und wissenschaftliches Rechnen	Stabilisation for partial differential equations by boundary noise	Hanoi University of Science and Technology, School of Applied Mathematics and Informatics			x				
NAWI Graz Geocenter, Institut für Erdwissenschaften	Petrologische Untersuchungen von Mantelxenolithen sowie Klinopyroxen, Zirkon, und Saphir Xenokristallen in Kambodscha	Vietnam National University Ho Chi Minh City, Department of Petrology & Mineral Resources Chulalongkorn University, Department of Geology	x						
<b>5 projects</b>	<b>number of participations of each ASEAN partner country</b>		<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Graz University of Technology (TU Graz)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institute of Applied Mechanics	Grain crushing of rock fill material and its constitutive modelling for deformation analysis of a rockfill dam	King Mongkut's University of Technology Thonburi (KMUTT), Research Center of Geomechanics	x						
Institute of Applied Mechanics	Constitutive modelling of collapse settlements, creep and stress relaxation of weathered coarse-grained soil	Suranaree University of Technology, Centre of Excellence in Innovation for Sustainable Infrastructure Development	x						
Institute of Inorganic Chemistry	Structural studies on Guerbet branched-chain glycolipids-water system at low temperatures	University of Malaya, Department of Chemistry					x		
Institut für Bodenmechanik, Grundbau und Numerische Geotechnik	Advanced Computational Geotechnics: A 5-days course for students, post docs and practical engineers	Institute of Technology Bandung (ITB), Civil Engineering Department				x			
Institut für Wasserbau und Wasserwirtschaft	SEDIMENT AND WASTE PROBLEMS IN RIVER RESERVOIRS	Institut Teknologi Sepuluh Nopember Surabaya (ITS)				x			
Institut für Wasserbau und Wasserwirtschaft	Application of numerical models for hydro-morphological questions and reservoir sedimentation processes	Institut Teknologi Sepuluh Nopember Surabaya (ITS), Laboratory of Hydraulics and Coastal Engineering				x			
Institut für Molekulare Biotechnologie	Functional characterization of new CARs from fungal origin	Universiti Kebangsaan Malaysia, Faculty of Sciences and Technology,					x		

		School of Biosciences and Biotechnology							
Institute for Molecular Biotechnology	Biocatalysis in non-conventional solvents	University of the Philippines, College of Science, Institute of Chemistry							x
Institut für Physikalische und Theoretische Chemie	Time-Resolved Optical Spectroscopy using LEDs	Hanoi University of Science and Technology (HUST), School of Chemical Engineering, Department of Analytical Chemistry			x				
Institut für Prozess- und Partikeltechnik	Ressourceneffizienz und Klimaschutz im Mekong Delta	Vietnam National University of Ho Chi Minh City, Institute of Environment and Resources			x				
<b>10 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>

### Medical University of Graz

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Vizerektorat für Studium und Lehre	Clinical Elective Exchange Program	Chiang Mai University, Faculty of Medicine	x						
		Chulalongkorn University, Faculty of Medicine	x						
		Khon Kaen University, Faculty of Medicine	x						
		Mahidol University, Faculty of Medicine	x						
		Gadjah Mada University, Faculty of Medicine				x			
		University of Medicine and Pharmacy HCMC, International Relations			x				
<b>1 project</b>		<b>number of participations of each ASEAN partner country</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

### University of Music and Performing Arts Graz (KUG)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institut für Elektronische Musik und Akustik	Academic Exchange: Audiovisual Composition and GAPPP	Mahidol University, College of Music Universiti Teknologi Mara, Faculty of Music, Music Composition Department	x				x		
Institut für Ethnomusikologie	Academic Exchange and Planning for Inter-institution Joint Project entitled Translocality and Performance	Universiti Sains Malaysia, School of the Arts, Department of Music Institut Seni Indonesia Yogyakarta, Theatre Department				x	x		
<b>2 projects</b>			<b>number of participations of each ASEAN partner country</b>						
			<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>

### University of Klagenfurt

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institut für Soziologie	Intensivierung von international-vergleichender Forschung zwischen Österreich und Indonesien im Themenfeld Entrepreneurship	Institute of Technology Bandung (ITB), School of Business and Management				x			
<b>1 project</b>			<b>number of participations of each ASEAN partner country</b>						
			<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Danube-University Krems

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
European Research Centre for Book and paper Conservation-Restoration, Zentrum für Kulturgüterschutz	Archive and Museum - Conservation concept for paintings on canvas and paper, notebooks, drawings, glass plates, photographs, plans and films of the Museum Affandi and the archives of the temple of Borobudur UNESCO Cultural Heritage site listed as an UNESCO Memory of the World in 2017 as a joint training with building up the department of conservation-restoration in ISI, Yogyakarta	Universitas Gadjah Mada, Faculty of Engineering, Department of Architecture and Planning Institut Seni Indonesia Yogyakarta				x			
						x			

Zentrum für Bildungsmanagement und Hochschulentwicklung	Activity 1: Internationalization of Higher Education: A Comparison Between ASEAN and Europe: A Case Study of Malaysia and Austria Higher Learning Institutions Activity 2: The Perspectives and Initiatives of Internationalization of Higher Education: State of Art in ASEAN and Austria	Universiti Kebangsaan Malaysia, International Relations Centre, UKM Global					x		
Department for Building and Environment	Thermal Comfort Criteria in Indonesia and Europe (TCC in Europe)	Universitas Gadjah Mada, Faculty of Engineering, Department of Architecture and Planning				x			
<b>3 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>

### Johannes Kepler University Linz (JKU)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Department of Telecooperation	ASEA-UNINET Clinical Elective Exchange Program	Chiang Mai University, Faculty of Medicine	x						
		Chulalongkorn University, Faculty of Medicine	x						
		Khon Kaen University, Faculty of Medicine	x						
		Mahidol University, Faculty of Medicine	x						
		Gadjah Mada University, Faculty of Medicine					x		
		University of Medicine and Pharmacy HCMC, International Relations				x			
Department of Telecooperation	Natural Language Processing for Information Extraction over the Web	Udayana University, Faculty of Math and Natural Sciences				x			
		Universitas Gadjah Mada, Faculty of Math and Natural Sciences				x			
		Prince of Songkla University, College of Computing	x						
<b>2 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

## University of Salzburg

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Interfaculty Department of Geoinformatics - Z_GIS	GIScience for Intelligent Spatial Management	University of Transport and Communications Hanoi, Faculty of Civil Engineering  Chiang Mai University, Department of Geography  Chulalongkorn University, Department of Geography  Universitas Indonesia, Department of Geography  Bogor Agricultural Universtiy, Department of Computer Science  University of the Philippines, Department of Geography  Universiti Putra Malaysia, Department of Geography  Universiti Putra Malaysia, Department of Biological and Agricultural Engineering  Universiti Kebangsaan Malaysia, Department of Geography	x		x				x
Department Geography and Geology, Division Urban and Landscape Ecology	Urban Ecosystem Services and Socioeconomic Context - Urban Agriculture and Urban Gardening  Educational Module  Focus Area of Cooperation: Economic and Social Sciences, Asian Study Programs	Chulalongkorn University, Social Research Institute (CUSRI)  Kasetsart University, Faculty of Architecture, Division of Urban and Environmental Planning  King Mongkut's University of Technology Thonburi, Environmental Social Sciences Program, School of Liberal Arts	x						
<b>2 projects</b>		<b>number of participations of each ASEAN partner country</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>

### Mozarteum University Salzburg

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Department für Gesang	Master class entitled „Singing function and interpretation“	Mahidol University, College of Music	x						
Department für Gesang	Master class entitled „Singing function and interpretation“	Vietnam National Academy of Music			x				
<b>2 projects</b>	<b>number of participations of each ASEAN partner country</b>		<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### University of Innsbruck (UIBK)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Institut für Allgemeine, Anorganische und Theoretische Chemie	Joint-Lab: Austrian-Indonesian Center for Computational Chemistry 2019	Universitas Gadjah Mada, Departement of Chemistry				x			
Institut für Banken und Finanzen	Bringing Behavioral and Experimental Finance Expertise to Thailand	Chulalongkorn University, Business School (CBS)	x						
Strategisches Management, Marketing und Tourismus / KMU und Tourismus	Innovation processes in tourism destinations	Vietnam National University of Ho Chi Minh City, Center for Vietnamese and Southeast Asian Studies			x				
Grundlagen der technischen Wissenschaften	Parallel Manipulators	Institut Teknologi Sepuluh Nopember (ITS), D. Teknik Mesin				x			
Institut für Mineralogie und Petrographie	Petrology and geochemistry of the subcontinental lithospheric upper mantle beneath the southeast Asian peninsula	Vietnam National University of Ho Chi Minh City, Department of Petrology & Mineral Resources  Chulalongkorn University, Department of Geology	x		x				
<b>5 projects</b>	<b>number of participations of each ASEAN partner country</b>		<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Medical University of Innsbruck (MUI)

Applying department	Project title	ASEAN partner universities	T H	P K	V N	R I	M A L	M M R	R P
Univ.-Klinik für Neurologie, Neurologische Intensivstation	ASEA-UNINET Austauschprogramm	Chiang Mai University, Faculty of Medicine	x						
		Chulalongkorn University, Faculty of Medicine	x						
		Mahidol University, Faculty of Medicine	x						
		Khon Kaen University, Faculty of Medicine	x						
		Universitas Gadjah Mada, Faculty of Medicine				x			
		University of Medicine and Pharmacy HCMC, Faculty of Medicine			x				
Univ.-Klinik für Neurologie, Neurologische Intensivstation	ASEA-UNINET Austauschprogramm	Suranaree University of Technology	x						
Univ.-Klinik für HNO	Weiterführung und Ausbau des Präventions- und risikospezifischen Krebsfrüherkennungs- und Kooperationsprogrammes "Yogyahealth" für das Jahr 2019	Universitas Gadjah Mada, Department of ENT and Head and Neck Surgery				x			
Biozentrum, Sektion für Experimentelle Pathophysiologie und Immunologie	15th Integrated Endocrinology Teaching Week at Suranaree University of Technology (SUT)-Institute of Medicine, 18. - 24. November 2019	Suranaree University of Technology (SUT), Institute of Medicine	x						
<b>4 projects</b>			<b>6</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Sum of approved projects in 2019: 74</b>									
<b>Total number of participations of each ASEAN partner country: 118</b>			<b>52</b>	<b>0</b>	<b>24</b>	<b>30</b>	<b>10</b>	<b>0</b>	<b>2</b>

## SP24 Mobilities 2019

### including 1-Month Staff Mobilities (Thailand)

SP 24 Gesamtbudget 2019							Bewilligt
		Land	Universität Österreich	Stipendium	Heimatusiversität/Gastuniversität	Periode	
1	TECHATO, Kuaaman	Thailand	Universität Graz	1-Month Staff	Prince of Songkla University	27.03.-23.04.19	
2	PHAIRUANG, Worradorn	Thailand	Universität Wien	1-Month Staff	Prince of Songkla University	01.06.-30.06.19	
3	JARUKAMJORN, Kanokwan	Thailand	Universität Wien	1-Month Staff	Khon Kaen University	01.06.-30.06.19	
4	CHOKBUNPIAM, Tatiya	Thailand	Universität Wien	1-Month Staff	Ramkhamhaeng University	01.07.-31.07.19	
5	PASUPA, Kitsuchart	Thailand	Universität Leoben	1-Month Staff	King Mongkut's Institute of Technology Ladkrabang	24.06.-27.07.19	
6	WISAWAPIPAT, Worachart	Thailand	BOKU	1-Month Staff	Kasetsart University	01.06.-30.06.19	
7	ZILLI, Pattamawan Jimarkon	Thailand	Universität Salzburg	1-Month Staff	Thammasat University	01.06.-30.06.19	
8	JANMAIMOOD, Piyapong	Thailand	Universität Salzburg	1-Month Staff	King Mongkut's Institute of Technology Thonburi	01.05.-31.05.19	
9	KAEWSUK, Jutamas	Thailand	BOKU	1-Month Staff	Maharakham University	01.04.-30.04.19	
10	SAPUTRI, Wahyu Dita	Indonesien	Uni Innsbruck	SP 24	Universitas Gadjah Mada	01.09.-31.09.19	
11	HAPSARI, Prima Dona	Indonesien	Donau Uni	SP 24	Institut Seni Indonesia	17.06.-19.07.19	
12	MAHARSI, Indiria	Indonesien	Donau Uni	SP 24	Institut Seni Indonesia	17.06.-19.07.19	
13	SONGSEMSAKUL, Piyada	Thailand	Vetmed	SP 24	Khon Kaen University	01.10.-31.10.19	
14	SOMMARUGA, Ruben	Österreich	Uni Innsbruck	SP 24 (Outgoing)	Burapha University	01.01.-31.01.20	
15	MOHAMED ISMAIL, Risyawati	Malaysia	TU Wien	SP 24	Universiti Utara Malaysia	16.08.-16.09.19	
16	ALIAS, Mohd Almie	Malaysia	Uni Salzburg	SP 24	University Kebangsaan Malaysia (UKM)	13.01.-02.02.20	
17	YAMSAENGUNG, Ram	Thailand	BOKU	SP 24	Prince of Songkla University	09.03.-02.04.20	
18	SANJAYA, Singgih	Indonesien	KUG	SP 24	Indonesia Institute of The Arts (ISI) Yogyakarta	13.10.-09.11.19	
19	ARSANA, I Nyoman Cau	Indonesien	KUG	SP 24	Indonesia Institute of The Arts (ISI) Yogyakarta	13.10.-09.11.19	
20	BRAUNEGG, Gerhard	Österreich	TU Graz	SP 24 (Outgoing)	Vietnam National University	02.01.-24.01.20	
21	ABD RAHMAN, Md Nizam Bin	Malaysia	TU Wien	SP 24	Universiti Teknikal Malaysia Melaka (UTeM)	Feb/Mrz 2020	
22	HAPSARI, Prima Dona	Indonesien	Donau Uni	SP 24	Institut Seni Indonesia	01.02.-21.02.20	
23	MAHARSI, Indiria	Indonesien	Donau Uni	SP 24	Institut Seni Indonesia	01.02.-21.02.20	
24	WARSONO	Indonesien	Donau Uni	SP 24	Institut Seni Indonesia	01.02.-21.02.20	
25	SRI WULANDARI, Wiwik	Indonesien	Donau Uni	SP 24	Institut Seni Indonesia	01.02.-21.02.20	
26	CHITTAMART, Natthapol	Thailand	BOKU	SP 24	Kasetsart University	01.11.-30.11.20	
27	MAMAT, Kritsada	Thailand	TU Wien	SP 24	King Mongkut's University of Technology North Bangkok	01.03.-31.03.20	

28	KUTZENBERGER, Stefan Albert	Österreich	Uni Wien	SP 24 (Outgoing)	Universitas Airlangga, Surabaya	09.02.-03.03.20	
29	LIM, Seng Joe	Malaysia	BOKU	SP 24	Universiti Kebangsaan	27.01.-23.02.20	
30	MOSLEMZADEH TEHRANI, Pardis	Malaysia	JKU	SP 24	University of Malaya	20.01.-20.02.20	
31	NGUYEN, Hoang Minh	Vietnam	BOKU	SP 24	University of Danang	01.02.-29.02.20	
32	TRANG, Le Vu Khanh	Vietnam	BOKU	SP 24	University of Danang	01.02.-29.02.20	
33	AL-DOURI, Yarub	Irak	TU Wien	SP 24	University of Malaya	08.02.-29.02.20	
34	ZAINAL, Norzaini	Malaysia	TU Graz	SP 24	Universiti Sains Malaysia	04.02.-25.02.20	
35	MOHAMED AFLA, Mohamad Reza	Malaysia	BOKU	SP 24	Universiti Sains Malaysia	02.02.-29.02.20	
36	TRAN-VAN, Hieu	Vietnam	BOKU	SP 24	Vietnam National University	02.03.-29.03.20	
37	TRAN, Thi Ngoc Lien	Vietnam	WU Wien	SP 24	Hue University	06.02.-27.02.20	
38	HO, Thi Huong Lan	Vietnam	Donau Uni	SP 24	Hue University	15.02.-14.03.20	
39	SITI KUSSUJI, Novi	Indonesien	Uni Wien	SP 24	University of Gadjah Mada	01.02.-26.02.20	
40	KETMANEECHAIKAT, Hathairat	Thailand	Uni Wien	SP 24	King Mongkut's University of Technology North Bangkok	04.03.-31.03.20	
41	MALIYAEM, Maleerat	Thailand	Uni Wien	SP 24	King Mongkut's University of Technology North Bangkok	04.03.-31.03.20	

**Number 17 and number 27: postponed scholarships**

## Bernd Rode Award (BRA) 2019 – Winners

### Junior Category

Dr. Bao Quoc Tang	University of Graz, Austria	€ 2.500,-*
Apinun Kanpiengjai, PhD.	Chiang Mai University, Thailand	€ 2.500,-*
Anh-Dung Tran, MsC .	Technical University of Vienna, AT	€ 2.500,-*

### Senior Category

Pongtip Sithisarn, PhD.	Mahidol University, Bangkok	€ 2.500,-*
Weena Gera, PhD.	University of the Philippines Cebu	€ 2.500,-*
Manuel Joseph C. Loquias, Dr. Math.	University of the Philippines Diliman	€ 2.500,-*

### Project Excellence

Dr. Anchalee Samphao	Ubon Ratchathani University, Thailand	€ 3.000,-*
Assoc. Prof. Tran Thi Dinh	Vietnam National University of Agriculture	€ 3.000,-*
Univ.-Prof. Dr. Annette Ostendorf	University of Innsbruck, Austria	€ 3.000,-*

\* Financial Award must be reinvested into ASEA-UNINET projects