

German-ASEAN Conference, Electromobility in Megacities Takes Flight Again in Singapore



Prof. Dr. Meng, Vice President of TUM (centre) next to Dr. Markus Wächter posing for a picture with TUM Asia and TUM CREATE staff.

The second German-ASEAN Conference took place in TUM Asia's premises on 1st June this year. Singapore marked the second stop for this conference. We were very honoured to have Prof. Dr. Meng, Vice President of Technische Universität München (TUM) here with us at the conference. This conference was part of a travelling conference which started in Kuala Lumpur on 30th May and ended in Ho Chi Minh City on 3rd June with Singapore as a country for discussion platform. The conference was targeted to include regional experts and government

representatives, engineers, managers from public and private institutions who are engaged in the field of electromobility.

The main focused areas of this conference covered topics about electromobility and its future implications on how these will contribute to the sustainable development of megacities, where clean and sustainable environmental technologies play a key role in shaping our future landscape. The call for a better quality of life is crucial especially in Asia. With the problems

of a fast growing population, an increasing demand for mobility can only be mastered by the rapid implementation of clean transport technologies. In order to reduce the consumption of primary energy and CO² emissions by 50%, electric energy storage for electric vehicles and the use of electric power-trains will be the solution to this problem. This contributes towards the quality of life especially in big cities. These electric propulsion vehicles have to be fundamentally redesigned and a large number of components have to be significantly re-invented.

In this conference, the three German-ASEAN Science and Technology (GAST) institutions – TUM Asia Singapore, Mercator @ UKM Kuala Lumpur and VGU HCM City are teaming up to provide a broad overview on modern technology and education "Made in Germany" in regards of electromobility, supplemented by local expert views.

Our PhD students from TUM CREATE Centre for Electromobility were present at this conference. When asked about their thoughts of the conference, said Nora Martiny, "The German-ASEAN Travel conference

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Director's Message



We have come to the mid of year 2011.

The past three months have been a busy period for TUM Asia. With the inaugural event of the BVL Logistics Day which took place at Pixel Building, I am thankful for the support that many top notch logistics companies had given us during this event and the distinguished speakers who had shared their valuable knowledge with the participants.

We also witnessed the German-ASEAN Conference Electromobility in Megacities which was held the second year running with Singapore as the second leg of this conference. We were honoured to have Professor. Dr. Meng, Vice President of Technische Universität München (TUM) as the Guest of Honour for this event. The main focus covered topic of this conference covers areas about electromobility and its future implications on how these will contribute to the sustainably development of megacities, such as Singapore. This conference gave significant exchanges of ideas among participants which these ideas will be a great input for our TUM CREATE research team.

Chancellor of Germany, Dr. Angela Merkel was on her two days visit in Singapore and had delivered her speech at the 31st Singapore Lecture. In this, she mentioned about the TUM CREATE research project in Electromobility. We believe that with this recognition and acknowledgement from the Chancellor, TUM CREATE will continue to attract more talents.

Lastly, as our institute embarks on more challenges in the next half of the year, we look forward to the upcoming 8th Graduation Ceremony that will be held at the Civil Service College on 22nd July. We will be graduating the biggest cohort of students as well as our group of students who are sponsored under the Singapore Workforce Development Agency (WDA)'s Professional Conversion Programme (PCP). The success of this programme has enabled these students to graduate with a Master degree with TUM Asia.

With this, I hope you find this issue an insightful read.

Dr. Markus Wächter
Managing Director, TUM Asia

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Prof. Meng (top left picture) addressing the participants during the conference.

on Electromobility in Megacities was a great opportunity for me to learn about other projects in this field and research that is going on in neighbouring countries like Malaysia or Vietnam. Getting the impression from both researchers and industry partners about the life and mobility in these countries was a great input for our work within TUM CREATE Centre for Electromobility, Singapore. I hope

that in future many events like this will give us the possibility to exchange knowledge and ideas with others." In addition, Steffen Schlüter commented, "The German-ASEAN conference on Electromobility in Megacities gave me a good opportunity to gain insights into ongoing research activities in the field of electromobility in Germany as well as in Asian countries like Vietnam or Malaysia. Especially the mixture

of presenters from industry and research made this conference worth attending. Personally, as a chemist, the focus on vehicle components and the implementation of electric vehicles in tropical megacities gave me a look beyond my particular topic. I'm looking forward to the next conference to get another chance to exchange ideas and thoughts with researchers in the field of electromobility."

AMD Carves Out a Good Learning Experience for Our Graduates from its Internship Offerings and Work After Graduation

This month onwards, we will be covering interviews with various industry partners or organisations that our alumni have been working in since graduation from TUM Asia. Some of these students progress into full time employment after their successful internship attachment in these companies. We will have a sneak peak on their life after graduation and find out from them how they have been coping in the real world.

In addition to this, we will also give you insights of what the employers think about TUM Asia's students and how well they fit into the working culture in AMD.



Amit Jakati (left) and Samuel Wei (right).

Name: Samuel Wei
Country of Origin: Singapore
Course of study in TUM Asia:
MSc. Microelectronics (2011 Graduate)

1) Could you share with us your internship experience in AMD?

I am able to link what I have learnt in class to industrial situations. Different etching processes that are used in the industry are taught to me in class theoretically, while AMD provides me with the practical experiences and the use of industrial equipment to enhance the understanding of the concepts. AMD also provides learning opportunities and allows me to explore new ideas for my project. I am able to try out different processes with different combinations and variations to develop a process for my project. My colleagues are

helpful and willing to share their vast knowledge and experiences with me which speed up my learning process.

2) What is your current position at AMD?

I am currently working as a Device Analysis Engineer.

3) How does the skills and knowledge that you have received from the Master programme at TUM Asia benefit your current job?

TUM's modules are more academically focused which also provides insights to the Microelectronics industry. However, there is a gap between the knowledge that is taught in class and the real industrial practices. TUM tried to close this gap, by arranging for industrial visits and workshops. The professors had also helped by constantly relating what we have learnt in class to what the industry is doing and also keeping us updated with the latest industry practices. TUM had provided me with the necessary foundation and some industrial insights to make the transition easier.

4) What are some of the joint collaboration that you would like to see between TUM Asia and AMD?

TUM Asia can arrange for more networking sessions with different industry players to help build rapport with them. In addition, AMD can provide more training sponsorships and scholarships on the key quality programmes offered by TUM Asia as well. This in turn can help build the internal technical capabilities of AMD workforce.

5) Could you give some advices to share with current students who are keen to join AMD either as an intern or future placement in the company?

As AMD is a company which is in the forefront of the technology, it is important for students to be independent learners, who will take initiatives to explore new ideas and areas. It is important for students to be academically strong and be confident in themselves. It is important as you will be facing constant challenges to meet the expectations of the new technology nodes.

Name: Amit Jakati
Country of Origin: India
Course of study in TUM Asia:
MSc. Microelectronics (2011 Graduate)

1) Could you share with us your internship experience in AMD?

My internship at AMD gave me a very fruitful experience. AMD provided me with great opportunities to put the concepts I was learning about semiconductors to use. The hands-on approaches, which characterises AMD's philosophy towards their interns, allowed me to do everything from investigating on how a new project is developed, how resource planning is made, as well as how to stick to the time-line.

I learnt enormous ways to handle pressure, talk to project counterparts in the United States and now it is a pleasure working as a full time employee.

2) What is your current position at AMD?

I am currently working as a Device Analysis Engineer. My work plays an important role to bring up a new product free of defects as well as support the production.

3) How does the skills and knowledge that you have received from the Master programme at TUM Asia benefit your current job?

It was indeed a pleasurable journey through my Master programme at TUM Asia. It allowed me to learn the concepts quickly; the reason being the structure of the programme where each module is taught for two weeks and we attended exam the following week. The knowledge gained at TUM Asia is of very high standards.

4) What are some of the joint collaboration that you would like to see between TUM Asia and AMD?

It is always good to approach AMD Human Resources to seek any internship positions well in advance. There is always a need of high talent and inviting AMD engineers to TUM Asia to show their facilities would certainly strengthen the collaboration between the two.

5) Could you give some advices to share with current students who are keen to join AMD either as an intern or future placement in the company?

Current students should be ready to showcase their talents at any time they are called. AMD needs only high talented students and TUM Asia is already one such source that provides quality students. I would advise students to keep high hopes and work for it. Starting your career in an MNC like AMD should be every engineer's dream. Work hard, stay fit, and stay cheerful! Good Luck.

Name: Hariharasubramanian Ramasubramanian
Country of Origin: India
Course of study in TUM Asia:
MSc. Microelectronics (2010 Graduate)

1) Could you share with us your internship experience in AMD?

My internship with AMD was a strong learning experience. Since this was my first encounter with corporate life and culture before actually stepping into it as a full time employee, it not only served me as an eye opener to its technical aspects, but also helped me to understand the way a corporate works and what is expected. In short, the internship helped me in grooming myself to enter the next stage of my life as an employee.

2) What is your current position at AMD?

As a simple overview, the department in AMD in which



Winson Lua (left) and Hari (right).

I currently work in does reverse engineering of the products for identifying failures. I perform various types of testing and failure analysis to identify failures and suggest corrective actions.

3) How does the skills and knowledge that you have received from the Master programme at TUM Asia benefit your current job?

The knowledge inculcated in my Microelectronics course does help to a certain extent. Especially when it comes to electrical failure analysis, basics of device physics helps.

4) What are some of the joint collaboration that you would like to see between TUM Asia and AMD?

It is good to see a close collaboration between TUM Asia and AMD with students doing internship here every year.

5) Could you give some advices to share with current students who are keen to join AMD either as an intern or future placement of the company?

Those who want to join AMD should have a flair for challenging work. AMD DA Lab is the place for people who want to nurture their organisational, presentation and leadership skills. People who have excellent communication skills and research interests are well appreciated at AMD. AMD being a frontrunner in semiconductor technology, it is a good place for anybody willing to come on board to keep themselves updated with the latest information in semiconductors and the related fields.

Name: Winson Lua
Country of Origin: Malaysia
Course of study in TUM Asia:
Msc. Microelectronics (2011 Graduate)

1) Could you share with us your internship experience in AMD?

It was a great experience to do my internship in AMD. In general, most of the AMD staffs were willing to share their expertise with the interns, which provide a great opportunity to apply our knowledge gained from our Master programme to the real working environment.

2) What is your current position at AMD?

I am currently working as a device analysis engineer.

3) How does the skills and knowledge that you have received from the Master programme at TUM Asia benefit your current job?

This Master programme enabled us to stand ahead of the technology frontier as compared to others. With all the skills and knowledge gained, we are able to pick up the job faster, as well as having a more in-depth understanding on the current technology metrology.

4) What are some of the joint collaboration that you would like to see between TUM Asia and AMD?

It would be great if TUM Asia and AMD could offer some social networking events that could help the students to have a better connection with AMD.

5) Could you give some advices to share with current students who are keen to join AMD either as an intern or future placement in the company?

It is important for students to take initiatives to pick up challenging tasks during their internship. AMD is also expecting all interns/staffs to be able to work with minimum supervision, therefore students are encouraged to be more independent and be a dedicated learner as well whilst working in AMD.

Words from the employers of AMD

1) What are the current and future possible partnerships between TUM Asia and AMD?

Our current partnerships include internship programmes and recruitment collaborations with TUM Asia. We are also exploring stronger collaborations through TUM Asia's industry scholarships and PhD programmes.

2) What is your experience of hiring TUM Asia graduates who had graduated from our Master degree programmes, Master of Science in Integrated Circuit Design/Microelectronics?

The quality of the graduates we have hired is high, in terms of matching our required skills and experience to the positions. They were able to translate key applications from their programmes towards the expected level of performance, while learning more from their section managers about their job requirements.

3) How will you rate TUM Asia graduates performance in fulfilling the company expectations on a scale from

1 to 10, 1 being the lowest and 10 being the highest?

We would rate their performance in fulfilling the company expectations at 8 out of 10.

4) What are some of the requirements that are expected from the graduates when it comes to hiring them for placement of positions?

Certainly the required set of technical knowledge and skills is the basic pre-requisite. We assess their core values, attitudes and characters for a good fit into our AMD environment. It is important that they display good understanding of the current industry trends and practices. From talent acquisition perspective, we also assess their growth potential in terms of communication, planning and thinking abilities.

5) Could you share your experiences of having TUM Asia students as interns in your company for 8 months?

The experiences have been positive. 8 months is a good time frame for both the students and the company. The students get to settle down and hands-on on specific projects and assignments as part of their learning exposure, as well as to demonstrate their learning abilities and delivery of expected performance. For the company, we get fresh ideas and practical support on specific projects, as well as a suitable timeframe to assess the students for future employment.

6) What are some of the company views/opinions on internship/industrial attachment (8 months) programme and for students, who had done their internship previously with AMD; do they have a higher chance of being hired by AMD as permanent staff upon graduation?

Based on positive evaluations by both the students and our section managers on the students' internship/industrial attachment, there are indeed higher chance of being hired by AMD as permanent staff upon graduation. Suitable interns are favoured for permanent hire due to positive factors such as reduction in assimilation, clear understanding of AMD business and work environment and good rapport with the relevant work teams.

7) Compared to other students that you have interacted with, what make TUM Asia's graduates stand out?

The internship provides strong exposure for the graduates to be well-prepared for the real work environment and expectations. The degree programmes are also well designed to equip the graduates for immediate applications to real work challenges.

8) As an employer, would you share your view on current situation/need of skilled employees for Singapore's semiconductor industries and how such programs will fit into it?

There is a growing need of skilled employees for Singapore's semiconductor industries. Apart from sourcing within Singapore, the industries do look at tapping on foreign talents to fill the urgent manpower gaps. Programs such as Master of Science in Integrated Circuit Design/Microelectronics are integral to nurturing the needed skilled workforce for the industries.



Left to Right: Amit Jakati, Winson Lua, Samuel Wei and Hari.

9) Would you please share a bit on company future planning/direction, especially in manpower/skilled employees?

Singapore has been developing itself into human capital hubs for the technology industry for the last 2 decades. AMD Singapore does focus on building its engineering excellence to lead the next engineering innovation for our continuous leading edge. Bringing in the right talent is one of the key steps towards this.

About AMD Singapore

Singapore is a manufacturing base for AMD as well as its Asia Pacific regional headquarters for AMD sales and marketing.

Established in 1984, AMD Singapore offers a high value-added back-end manufacturing environment for the company's microprocessors, and it is a premier test

center for microprocessors and technical and operations engineering services. Its facility located at Chai Chee Lane occupies a total area of 594,000 square feet, including 469,000 square feet for production.

AMD Singapore actively taps into the large talent pool from the region. Today, its highly sophisticated and efficient Manufacturing Operations, Product Engineering, Testing and Packaging production environments are equipped with high-end engineering laboratories that support Device Analysis, Reliability Testing, Surface Mount Board Assembly Evaluations, Packaging Characterisation, Platform Validation and Hardware Debug.

AMD Singapore strives to recruit and retain the best talent, making it not only a great place to work but also an integral part of the AMD family by continuing to contribute significantly to AMD's success.

Introductory Event of the BVL Regional Group Singapore

The introductory event of the BVL Regional Group Singapore was conceived at TUM Asia's premises on 14th April this year. TUM Asia was very honoured to be the partnering host with the German Logistics Association (BVL) for this inaugural event. It was a unique occasion for both BVL and TUM Asia. The conference provided some of the latest knowledge, news and research studies in the logistics and supply chain management industries in Singapore and South East Asia.

The BVL Regional Group Singapore aims to provide numerous opportunities to exchange knowledge and to address the many challenges across industries in Singapore from manufacturers, suppliers to logistics service providers as well as associated initiatives and organisations. The advantage of having this group is to have the ability to bring leaders together and allow them to experience practical examples from many well-known companies.

This conference saw many speakers from well noted companies and institutions such as Dr. Philipp Biermann from Simon-Kucher Partners Consulting, Mr. Amadou Diallo, CEO DHL Forwarding, Africa, South Asia Pacific and Singapore and Prof. Dr. Peter Klaus from University of Erlangen-Nuremberg.

The speakers covered topics that ranged from pricing strategies to current issues, perspectives and opportunities of an Asian market for logistics services and lastly a comparative study of the logistics performances of various nations and its services providers. Through this event, many participants brought back many useful insights of today's logistics and it was also a good networking session. As our Master students from the Transport and Logistics programme were invited to this event as well, it was a good opportunity for them to build rapport amongst the industrial participants and at the same time for the industrial participants to get familiar with our courses and students of TUM Asia.

Said one of our Transport and Logistics student, Felix Baumgartner, "Additionally to the theoretical logistics knowledge acquired from lectures, professionals from the industry were presenting recent topics in logistics, such as power pricing or the perspectives and opportunities for logistics services in the Asian market. The possibility to expand my network, get in touch with potential future employers and discuss logistics related topics were other benefits for me during this event."



Dr. Rau and Dr. Zeltinger engaging in a conversation.



"I am very excited about this new network that BVL is forming in Singapore and I look forward to more such networking sessions in the near future so that we could have this opportunity to exchange great ideas with one and other", said one of the participants at the event

About the BVL Regional Groups

BVL known as 'Bundesvereinigung Logistik' is a platform for the logistics managers with more than 10,000 members in the top echelons of industry, trade, service and science. It gives inspirations and ideas for cross-industry and future-oriented logistics concepts to ensure the competitiveness of enterprises at home and abroad.

The BVL is the forum for the national and international ideas and experiences between leaders through contact with like-oriented organisations. It optimises the logistical awareness through its various services. The bodies of the BVL are the highest caliber and represent a cross section of logistics functions from business to science. All committee members are volunteers. In December 2008, BVL founded its regional group in Shanghai, the first group of its kind outside Germany. A group was set up in Beijing subsequently in 2010 and till date, there are 29 regional groups with around 160 events per year.

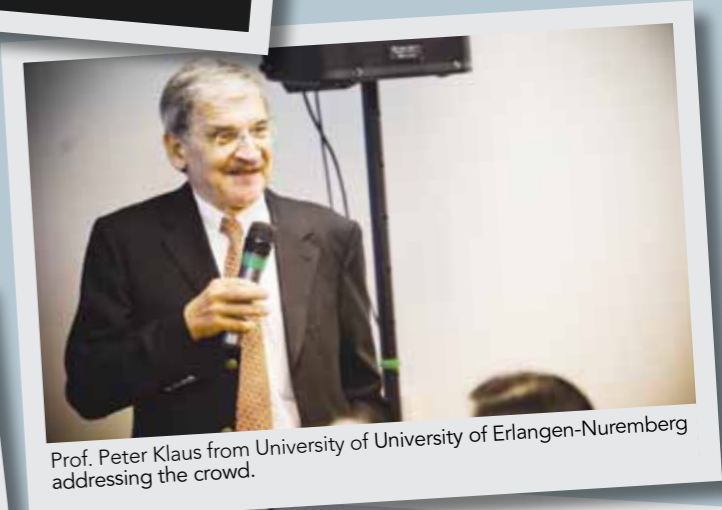
Lastly, we would like to take this opportunity to extend a very special thanks to our guest speakers: Dr. Philipp Biermann, Simon-Kucher Partners Consulting; Mr. Amadou Diallo, CEO DHL Global Forwarding Africa & South Asia Pacific; and especially to Prof. Peter Klaus, who is a noted lecturer at our institution for arranging this eventful event.



Mr. Amadou Diallo, CEO DHL Forwarding, Africa, South Asia Pacific and Singapore during the presentation.



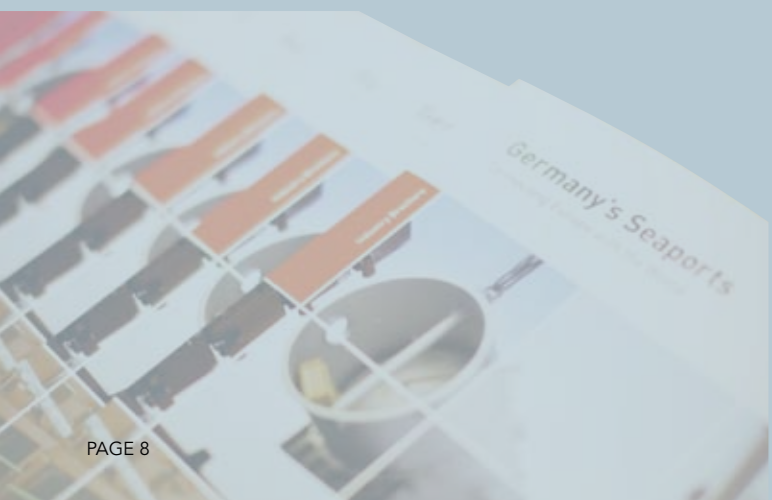
Ms. Rita Marzian, Head of International Relations, BVL making an opening speech.



Prof. Peter Klaus from University of University of Erlangen-Nuremberg addressing the crowd.



Dr. Philipp Biermann from Simon-Kucher Partners Consulting making his presentation.



TUM CREATE Welcomes PhD Students and More are Expected to Join this Family

The past one year had been pretty fast paced for TUM Asia's first research project group – TUM CREATE. It is a five year research programme that is sponsored by the Singapore National Research Foundation (NRF) and jointly performed by the Technische Universität München (TUM) and Nanyang Technological University (NTU). Its main focus area is to research on electromobility and how to develop innovative technologies and transportation concepts to support the fast growing and ever changing tropical megacities. Within this one year, I had witnessed the growth of TUM CREATE. From the signing of the Memorandum of Understanding (MOU) between NRF, TUM and NTU last June to the official opening of the TUM CREATE corporate offices in Pixel Building and NTU last October, TUM CREATE office has seen an immense growth in its corporate staff strength as well as the influx of PhD students of different culture background. With this issue, I have put together an interview with three PhD students who will share with us on how they feel about travelling 10,000km from Germany to a megacity called Singapore.



Left to Right: Maximilian, Nora and Florian.

Name: Nora Martiny

Age: 26

**Area of Focus in TUM CREATE project:
Thermal management and safety management
of battery cells and packs**

Q1: What makes you choose TUM CREATE research project on electromobility as your area of research for your PhD studies?

I think electromobility is a real future technology that gains more and more importance. Having the possibility to work in an interdisciplinary and international environment and also to work in an awesome city like Singapore is a great offer for me that makes the decision to take the chance quite easy.

Q2: How do you feel about working in a multinational culture among your peers?

Working in a multinational project gives important inputs to my work as I have the opportunity to experience things from a different perspective than I am used to.

Q3: Could you share with us one interesting experience you have encountered in Singapore?

The most interesting thing in Singapore for me is the safety and honesty of people. I once was at McDonalds and saw people reserving their place by putting their iPhone on the table. In Europe, the table and iPhone would have been taken by others.

Q4: What will you say to you friends back home about your experiences in Singapore?

I think it is a really great time that we are spending here in Singapore with a lot of very experienced and also really

kind people. I would recommend my friends to go abroad especially to Asia, as being in Singapore is an important input to my individual development.

Q5: What do you miss most about Germany?

Good bread, good coffee, the mountains and the seasons and of course my family and friends.

Q6: Have you travelled out of Singapore, if so, where are the places that you have visited? Are there any interesting experiences to share?

I have been to Malaysia and some different places in Indonesia. For me, the greatest travels so far were visiting Taman Negara and Java. The beautiful landscapes such as the rain forests, rice terraces and volcanoes were new experiences for me and I really enjoyed it a lot. When I think of Taman Negara it always feels a bit like from the movie "Avatar" and also seeing Gunung Krakatau, one of the most known volcanoes in the world, was just amazing.

Q7: Lastly, quote me some local terms that you have learnt in Singapore.

"Can, lah!" "Oh-so can!" and "This bus go where?"

Name: Florian Sagstetter

Age: 26

**Area of Focus in TUM CREATE project:
Embedded Systems, FlexRay Bus**

Q1: What makes you choose TUM CREATE research project on electromobility as your area of research for your PhD studies?

I wrote my Master thesis at the Nanyang Technological University (NTU) and was thinking about starting my career in Singapore before I heard about TUM CREATE. During my Master thesis, I was developing an actuator for a robot fly and found especially the biological parts of my research very interesting and fascinating. However I also realised that I do not want to work on a very specific topic, but in a field of great significance for the future. Therefore, TUM CREATE is the perfect opportunity for me, as I am able to work in Singapore in a field of great significance for the future.

Q2: How do you feel about working in a multinational culture among your peers?

During my previous stay in Singapore, I was already doing research in a multinational team of engineers. I truly enjoyed the experiences and hoped to be able to work in a multinational team in the future as well. Therefore I am

happy that through TUM CREATE, I am able to continue this experience and learn more about different cultures and working methods around the world.

Q3: Could you share with us one interesting experience you have encountered in Singapore?

As I have been staying in Singapore for quite a while, I have specific stalls which I patronise nearly every day and I enjoy that the owners recognise and chat with me. They are so familiar with me that when they see me approach their stalls, they already have my breakfast prepared for me without the need of taking my orders.

Q4: What will you say to you friends back home about your experiences in Singapore?

I have told them so much about all my good experiences here that they are already getting tired about listening to more stories from Singapore.

Q5: What do you miss most about Germany?

Skiing. Besides that only my family and friends.

Q6: Have you travelled out of Singapore, if so, where are the places that you had visited? Are there any interesting experiences to share?

In Asia, I have been to China, Vietnam and short trips to Cambodia, Indonesia and Malaysia. I saw a lot of fascinating places, but what I enjoyed most was spending time with local friends. When I flew to China, a Chinese friend, whom I knew from Munich, was guiding me round. But on the day of my arrival, she, who stayed in Beijing, could not pick me up and I was due to fly into Tianjin. She sent her friends to fetch me from Tianjin airport and bring me to the train in Beijing. At the Beijing station, another friend was waiting to bring me to her place. I was handed like a package from one person to another, but to be honest I strongly doubted that I would have been able to make my way without the help of her and her friends. Her friends were amazingly friendly and would not even let me pay for the train tickets!

Another nice experience was in Vietnam. The chaotic traffic in Vietnam could be pretty nerve racking. I was always amazed by how four people could ride on one scooter. I met a Vietnamese friend, whom I used to study with in Munich, who showed up in his scooter and took me and two of my friends to a local club. The four of us ended up riding on his scooter through Vietnamese traffic, which I considered could be quite suicidal at that moment.

Q7: Lastly, quote me some local terms that you have learnt in Singapore.

Also can!
No lah! You do it lah!

Name: Maximilian Tschochner

Age: 29

**Area of Focus in TUM CREATE project:
Vehicle Simulation**

Q1: What makes you choose TUM CREATE research project on electromobility as your area of research for your PhD studies?

The opportunity to conduct high level research in an intercultural environment within the framework of two renowned world class universities interests me. Furthermore, the high future potential of the research topic itself and the chance to take part in shaping sustainable, smart mobility of the future. Last but not least, my deep interest in Asia fostered by long stays in China during my studies, which makes Singapore a desirable place to stay.



TUM CREATE PhD students at NTU.

Q2: How do you feel about working in a multinational culture among your peers?

I experienced different points of view and opinions amplified by different cultural backgrounds which result in rich discussions with my colleagues here in Singapore, during and after working hours. With our diverse team, it is more likely we come up with extraordinary solutions and finally products which will prevail not only in Singapore but around the world.

Q3: Could you share with us one interesting experience you have encountered in Singapore?

It is great to watch how people of different cultures live and work together and how they successfully overcome the cultural hurdles. It often amuses me to listen to people having conversations and constantly changing the languages they use between English, Chinese, Malay and others. Some even change in between the sentence. An outcome of this is Singlish and thereby representing the diversity of Singapore also in the spoken language.

Q4: What will you say to you friends back home about your experiences in Singapore?

Not everything goes the same way as in Germany, however, this doesn't mean it is neither better nor worse. I also try to give them an impression about Singapore by photos and stories. However, Singapore has such a lot of aspects and might be in general best described by its diversity.

Q5: What do you miss most about Germany?

Although I appreciate the large variety of food available in Singapore, as a cheese lover I sometimes wish it would be easier and less expensive to get it in Singapore. Moreover, starting off from Germany I thought it would be great to have summertime weather all over the year, however, I discovered the variety of seasons is also nice to have. Of course I miss family and friends in Germany, which is however partially compensated by the lots of great people I already meet while being in this project.

Q6: Have you travelled out of Singapore, if so, where are the places that you had visited? Are there any interesting experiences to share?

So far I travelled from Singapore to Indonesia and Malaysia. Before my time at TUM CREATE, I stayed in China for one and a half years. I had good experiences with the people I met during my journeys. However, when I asked for non-spicy food, it often turned out otherwise. I discovered perception is a lot different in this respect.

Q7: Lastly, quote me some local terms that you have learnt in Singapore.

"Can lah!" which is a universal expression for something being possible. Addressing the taxi driver with "uncle" seems still quite strange to me, but it is being polite.

"Do Not Be Limited by the Opportunities Put Forth to You, Take Courage to Create Your Own!" – Ivy Lim



Ivy (front row first left) with her classmates and lecturer.

Q1. Can you share with us how you come to know about the Master programme at TUM Asia?

I got to know about the programme through my Applied Chemistry seniors when I was still an undergraduate student at the NUS.

Q2. What made you decide to sign up with the programme?

I was excited about learning from the Professors at TUM and I found that the range of coursework offered was highly interesting.

As I had the intention to pursue my doctoral studies in Germany, the possibility to spend 8 months in Germany for internship and master thesis was very attractive for me.

Having the coursework based in Singapore was good for my husband and me as it gave us ample time to prepare for our marriage.

Q3. After two years on the programme, what are your thoughts about it?

I find that the programme gave me an excellent introduction to the various fields of chemistry and gave me a clear idea of the area I would like to see myself in the future. The opportunities and contacts gained through the programme certainly opened up new options for my future career.

Q4. Can you please share with us your student life in Singapore?

– Do you attend lectures on a daily basis?

Yes. Classes were quite intensive and normally take up the entire day.

– Any interesting story to share?

My course mates were very nice and we mingled well with one another. We had the culture of celebrating birthdays and would plan it in such a way as a surprise to the person. A delicious cake and a card filled with warm greetings are the basics.

We also had great chemistry with our lecturers and some of them even brought us out for meals.

I must say, the 10 months of coursework spent together was sweet and memorable.

Q5. What do you do during your leisure time while studying here?

As our classmates were all foreigners (my husband and I were the only Singaporeans), we would often plan outings for local food or visits to many places. We had fun introducing Singapore (and Malaysia) to our friends and also at the same time, learning about their cultures.

I remembered that we had this classroom at the NUS dedicated for the programme and we would often leave the top right corner of the whiteboard



Ivy (far right) at a dinner with Dr. Markus Wächter (third from right) and Prof. Warzelhan, Vice President of BASF Ludwigshafen (far left).



Ivy (third from left) at a classmate birthday celebration.

for noting upcoming events. Our technical English teacher once commented that she was glad to see the class being so active and getting along so well.

Q6. Can you please share with us your internship experience?

– What did you do there?

My internship was based at BASF in Ludwigshafen, Germany. My research involved catalytic polymerisation of carbon dioxide and epoxides. Basically, I was required to do catalyst synthesis, design catalytic systems and use them for polymer synthesis.

– Do you enjoy the internship experience?

I definitely enjoyed myself! I got to know many friendly scientists and technicians and also improved on my laboratory skills. BASF really taught me what it means to be resourceful and how to do science in a creative manner.

– What have you gained from the internship experience?

The internship was an eye-opener for me as I got to experience firsthand how industrial research works. It encouraged me to think "out of the box" and apply the knowledge I have acquired in the classroom.

Q7. Did you manage to do some travelling around Asia/Europe during your internship and studies?

As I knew that I would be back in Germany soon, travelling was not my priority. I spent my free time visiting German friends at their hometowns and hosting people with home-cooked Asian meals. I also took time to experience the life there, from picking strawberries in the field with my landlord to putting fireworks in front of the house on New Year's day.

Q8. Going back to your university days, could you share with us some of the extra curriculum activities that you were involved in?

I must say that I was not actively involved in school based extra curriculum activities but took the initiative with my husband to help out our juniors. We gave introductory talks to newcomers of the Applied Chemistry course and provided advice and tips for them. I was also involved in organising interviews and resume writing workshops for students who were preparing for internships.

Q9. Regarding your course of study, could you share with us which area you specialised in? Were you interested in any particular area of study back then?

Currently, my research involves the investigation of solid state formation for zeolitic materials. It is from a more fundamental perspective of material formation which I hope to eventually apply the findings into controlled and defined material synthesis.

Previously, I was working more on catalysis, polymers and application based projects. I do have a passion in those areas but I felt that my training was too industrial driven. Through this new field I am pursuing in inorganic chemistry, I hope to train myself more in fundamental research and sharpen up my skills in solving more theoretical problems. I believe this would help build a solid foundation for my research career in future.

Q10. You were awarded the Best Student Award in Industrial Chemistry and Excellence Prize Award during



Ivy (far right) with her classmates at an outing.

your Graduation Ceremony. Tell us how do you feel receiving this award and what is this award all about?

To me, the awards came as an encouragement. They affirmed me of my choice in choosing a scientific career path. I am definitely not the brightest student in my cohort but it certainly tells us that we should not be afraid to dream big, even though we may not be equipped with the best.

Q11. Where are you currently working at and how has studies at TUM Asia helped you in the job/studies that you are having today?

I am doing my doctoral studies at the Max-Planck-Institut fuer Kohlenforschung (Max-Planck-Institute for Coal Research) in Germany under the supervision of Prof. Ferdi Schueth. I believe the course gave me a broad understanding in industrial chemistry which enabled me to apply my knowledge in an interdisciplinary way.

The degree attained from TUM Asia (GIST during my time) is well recognised in Europe, especially in Germany. So it puts the student on equal standing with other European students.

Q12. Do you have advice to share with the potential students?

Do not be restricted by the knowledge in your notes, take initiative to learn more! Do not be limited by the opportunities put forth to you, take courage to create your own!

Do not be consumed by the competitions, take time to invest in the lives around you! And of course, have fun! =)

Q13. What are your plans for the years to come?

I am thinking of a post doctoral position directly after my Ph.D. My passion is in R&D and I am open to both academic and industrial research.

Research Corner

This month, TUM Research Corner highlights two excellent research activities. The Flexible Reconfigurable Cave (FRAVE), has the capability to allow the user to be deeply immersed in a virtual explorative world. This is made possible due to its flexible and modular structure. Researchers at the TUM Faculty of Informatics has created this new system that is more cost effective compared to the previous CAVE (Cave Automatic Virtual Environment) that was used to create realistic images in real time. In the second article, some researches from TUM have developed a new method for visualising previously invisible brain structures. This new approach can provide valuable information for research on neurodegenerative diseases which has been reportedly affecting the aging population in a number of countries.

FRAVE: Flexible Virtual Reality System

Product developers, vehicle design engineers and trainee pilots increasingly utilise 3D worlds, operating in virtual space created by realistic images in real time. For this purpose they use a Virtual Reality System. Researchers at the Faculty of Informatics of Technische Universität München (TUM) have now created precisely such a new system. The Flexible Reconfigurable Cave (FRAVE) offers a wealth of advantages over the previously established CAVE (Cave Automatic Virtual Environment). The FRAVE is flexible, features a modular structure, has more favourable costs and a smaller footprint.

Product designers harness time-consuming procedures in prototype construction. Only then are they able to assess the results of their work in a comprehensive manner. In a three-dimensional model world, they are able to do so instantly and can experience how the product fits into its natural surroundings. Design alterations can be visualised immediately, saving time and cutting the costs associated with the development process.

Up to now, the so-called CAVE has been used. This consists of between three and six projection surfaces that create a walk-in space. Video projectors are used to visualise the calculations and applications in real time and in 3D. The nearly-closed space allows for intense immersion in virtual reality.

The FRAVE can do more

The FRAVE also offers this degree of so-called immersion. However, it is capable of even more: it can be used in a variety of ways and thanks to its flexible, modular structure. "An engineer wants to enter the 3D world to be able to envisage the interior design of a vehicle. A researcher wants to visualise his or her measurement or simulation data, while a manager uses it as a presentation space," said Dr. Marcus Tönnis, scientist at the TUM Faculty of Informatics explains.

The FRAVE is made up of ten plasma screens with a screen diagonal of 65 inch which can be arranged in different ways. When they form a floor and an enclosure on three sides, the user is immersed deep in a virtual explorative world. The screens at the sides can be opened wide, with a tracking system on the screens automatically adapting the image display to the movement of the side sections. The side sections can even be disconnected from the system entirely. "In a meeting, I can simply push the screens up to the table to demonstrate a 3D view. In this way, the system comes to users and not the other way round," says Tönnis.



Credit: Andreas Heddergott / TUM

With her cyber-gloves the researcher is able to navigate and to modify superimposed simulation or infrastructural data. Unlike a CAVE, which needs a special building, the FRAVE can be brought to the place where it is needed.

Standard hardware makes virtual reality systems more affordable

As the FRAVE consists of end user devices, it is significantly less expensive than the CAVE, an advantage that could promote more widespread use of Virtual Reality Systems. Another important benefit of the FRAVE is it is a smaller footprint. Since the CAVE normally uses back projection, a lot of room is needed behind the projection surfaces. It requires at least 8 x 8 x 8 meters, while a space of 3 x 3 x 3 meters is sufficient for the FRAVE, thereby facilitating installation and relocation.

Researchers at the TUM Faculty of Informatics use the FRAVE to view simulation data. For example, the landscape of Saudi Arabia is displayed virtually as part of a project being run in collaboration with the King Abdullah University of Science and Technology (KAUST). Unlike existing virtual globes, like Google Earth, this system is able to show images above and below the earth's surface. As part of another joint research project, the FRAVE is being used to simulate CO₂ separation and storage processes in order to optimise crude oil extraction.

Technical data

Screens:	10 3D full HD (1920x1080) plasma screens Panasonic TX-P65VT20E
Graphic cards:	6 NVidia QuadroPlex 7000 with Fermi architecture for graphics and 6 Tesla C2070 CUDA graphic cards for simulation data
Computer:	6 Dual Quad Core with 24 GB RAM each and an 8 TB hard drive

New insights into neurodegenerative diseases: New X-ray CT method with molecular sensitivity

Researchers including members from the Technische Universität München (TUM) have developed a new method for visualising previously invisible brain structures. The new method exploits the fact that different molecular structures affect the detailed signature of the x-ray scattering pattern. The new approach can map, for example, the myelin sheaths of nerve cells, and can provide valuable information for research on multiple sclerosis and Alzheimer's disease. The results have been published online ahead of print in the scientific journal, *NeuroImage*.

The myelin sheaths of nerve cells in the human brain are lamellar membranes surrounding the neuronal axons. The myelin layers are important to the central nervous system as they ensure the rapid and uninterrupted communication of signals along the neuronal axons. Changes in the myelin layers are associated with a number of neurodegenerative disorders such as cerebral malaria, multiple sclerosis, and Alzheimer's disease.

"The development of these diseases is still not fully understood," says Franz Pfeiffer, Professor for Biomedical Physics at TUM, "but is thought to be related to the damage of the myelin layers, so that messages from the brain reach the various parts of the body poorly or not at all. It is like an electric cord where the insulating material has been damaged and the current short circuits. In order to find methods to prevent or treat the diseases it is important to understand the connection between the myelin changes and the diseases."

The new development is based on conventional X-ray computed tomography (CT). The principle is well established – CT scanners are used every day in hospitals and medical practices for the diagnostic screening of the human body. In the process the human body is X-rayed while a detector records from different angles how much radiation is being absorbed. In principle it is nothing more than taking multiple X-ray pictures from various directions. A number of such pictures are then used to generate digital 3D images of the body's interior using image processing.

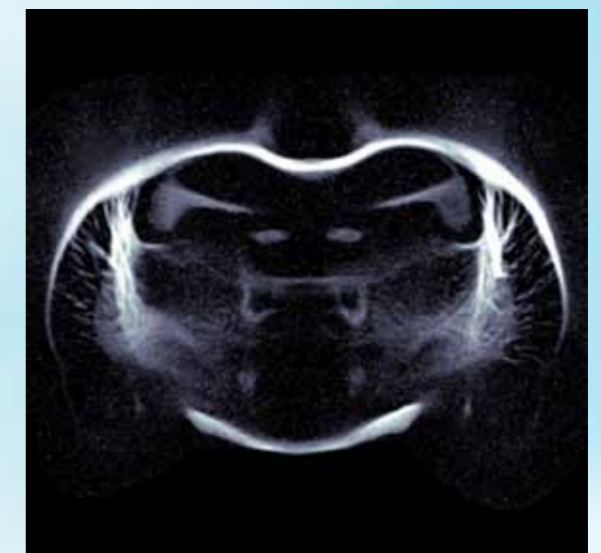
"The new aspect of our molecular X-Ray CT method", explains TUM researcher Dr. Martin Bech, "is that we do not only measure the overall beam intensity absorbed by the object, but also those parts of the X-ray beam that are deflected in different directions – 'scattered' in the language of physics. Such a scattering pattern is generated for every point in the sample and every angular projection. This supplies additional information about the molecular structure in every volume element of the reconstructed CT image."

The scattering patterns are then processed using an algorithm developed by the team. Torben Jensen, researcher at the Niels-Bohr-Institute and lead author of the article, explains: "We developed an image reconstruction algorithm that generates a high-resolution, three-dimensional image of the sample using typically

several hundred thousand x-ray scattering patterns. This algorithm takes into account not only classical X-ray absorption, but also the scattering signature of X-rays that reflect the molecular structure."

A showcase example of the new technique was the examination of the brain of a laboratory rat – with surprisingly exact results. "We can see the myelin sheaths of the neuronal axons and we can distinguish the layers which have a thickness of 17.6 nanometers", details Prof. Robert Feidenhans'l from the Niels-Bohr-Institute in Copenhagen. "Up until now, you had to cut out a little sample in order to examine the layers in one area and get a single measuring point. With the new method we can examine 250,000 points at once without cutting into the sample. We can get a complete overview over the concentration and thickness of the myelin and this gives of the ability to determine whether the destruction of the myelin is occurring in spots or across the entire sample", he explains.

The research has been carried out in an international collaboration with researchers in Germany, Denmark, Switzerland, and France. The experiments took place at the cSAXS synchrotron beamline of the Swiss Light Source at the Paul Scherrer Institute in Switzerland. In future the technique shall also be transferred to novel, laser-based X-ray sources, such as the ones currently under development at the cluster of excellence "Munich-Centre for Advanced Photonics" and at the recently approved large-scale research project "Centre for Advanced Laser Applications" on the TUM campus Garching.



Myelin concentration of a rat brain.

For more press readings :

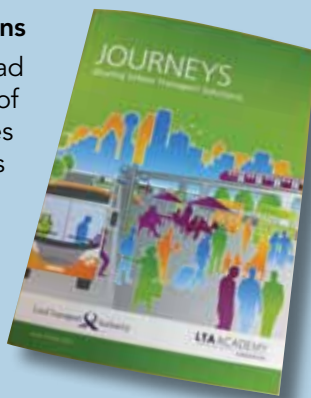
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http://portal.mytum.de/pressestelle/pressemitteilungen/NewsArticle_20110523_085811

Announcements

JOURNEYS: Sharing Urban Transport Solutions

Two of our PhD students from TUM CREATE had their papers published in a biannual publication of LTA Academy. Known as JOURNEYS, it provides a platform for the Academy to showcase its urban transport trends, policies, technologies and challenges in different cities. It is also one of the key resources to enhance learning for the participants who are in the Academy's programmes. In this book, Andreas Schwab and Nora Martiny shared some of the aspects of their current research on how some aspects of electromobility can better serve tropical cities. For more readings, log on to: www.LTAacademy.gov.sg



Welcome Orientation for our first batch of Chemical Engineering bachelor students.

After months of application, selection and interviews, we will be officially receiving our first batch of bachelor students for our Bachelor of Science Chemical Engineering programme at the Singapore Polytechnic on 1st July. The orientation will be attended by representatives from TUM Asia, SIT (Singapore Institute of Technology) and Singapore Polytechnic. To our freshmen, we look forward to seeing you soon!

Student recruiters out on the move.

Our Student Recruiters are travelling again these three months. Catch them at the following cities and bring in your burning questions regarding our courses.

Date (Day)	Time	Event	Country, City	Venue
2 & 3 July (Sat to Sun)	09:00-18:00	2011 Guangzhou International Education Exhibition	Guangzhou, China	Dongfang Hotel
16 & 17 July (Sat to Sun)	9:00-16:30	The 12th China (Liaoning) International Education Exhibition	Dalian, China	Dalian Xinghai Convention & Exhibition Center
16 to 18 Sep (Fri to Sun)	10:00-19:00	Post Graduate Education Fair 2011	Malaysia, Kuala Lumpur	Mid Valley Exhibition Centre
21 Sep (Wed)	10:30-17:30	World Education Fair	India, Pune	Le Meridien
25 Sep (Sun)	10:30-17:30	World Education Fair	India, Hyderabad	Taj Deccan
27 Sep (Tue)	10:30-17:30	World Education Fair	India, Bangalore	Vivanta by Taj, Taj Residency
29 Sep (Thu)	10:30-17:30	World Education Fair	India, Chennai	Taj Coromandel

Upcoming events

Event	Date
TUM Asia Bachelor Orientation	1 July 2011
TUM Asia 8 th Graduation Ceremony	22 July 2011
TUM Asia Master Orientation	5 & 6 August 2011

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Printer:
The Neu Print Pte Ltd

MICA (P) 236/03/2008