

## Nurturing a Sustainable Future: Clariant Supports TUM Asia Students with Sponsorship Programmes



Switzerland head quartered chemical company, Clariant, has awarded its first Clariant Industrial Scholarship to a TUM-Asia Master of Science student in Industrial Chemistry, Mr. Simon Maaland). Clariant, being a strong leader in speciality chemicals, recognises the importance of nurturing talent to sustain future

innovation for its customers. It actively supports academic research and is an enthusiastic supporter of scholarship programs that can stimulate links between academia and industry.

Selected from a number of applicants, Mr. Maaland made the cut in 2010 and receive a full scholarship

for his 18 month Master of Science in Industrial Chemistry programme, jointly run by Technische Universität München (TUM) and the National University of Singapore (NUS). The scholarship covers the full tuition fees, living allowances and 8 months industrial attachment and master thesis programme within Clariant as part of the programme.

During his internship this year, Simon will be placed at one of Clariant's Research and Development Centers for hands-on experience of industrial life. As an added bonus for TUM Asia, Clariant will sponsor additional two students from for a practical master thesis work in Frankfurt this year.

"Clariant is committed to sustainable growth, which is derived from its own innovative strength," explains Dr. Martin Vollmer, Chief Technology Officer at Clariant. "Our success is based on the know-how of our people and their ability to identify customer needs at an early stage and to translate the needs into innovative product solutions.

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# Director's Message



2010 was a truly remarkable year for TUM Asia. We saw the launch of our first Bachelor Programme, which is conducted in partnership with the Singapore Institute of Technology (SIT), as well as the start of the TUM CREATE Research Centre for "Electromobility in Megacities".

Year 2011 seems to be just as exciting.

TUM Asia recently signed a Memorandum of Understanding with TÜV SÜD on 18<sup>th</sup> March 2011 during the 3 days TUM CREATE inaugural workshop held from 16<sup>th</sup> March to 18<sup>th</sup> March 2011. Graced by various industry partners, professors and scientists, the two organisations will jointly promote research and development activities in electromobility, green technologies and battery technology. On behalf of TUM Asia, I would like to thank all our guests and industry friends for your support at the event.

To set the stage for more TUM CREATE activities, we had our 1<sup>st</sup> Governing Board Meeting on 22<sup>nd</sup> March 2011. The Board Meeting focused mainly on the legal framework of incorporating TUM CREATE. This meeting gave us a good overview of the company's operations moving forward in the year 2011. We are also excited at the overwhelming interest from scientists and industry partners around the world to be part of this project.

As the company embarks on new challenges for the rest of the year, we look forward to a line-up of exciting events that would take place in the next few months – the BVL Logistics Day will take place at TUM Asia's premises on 14<sup>th</sup> April 2011. This will mark the first time that TUM Asia is organising a logistics event in cooperation with BVL. TUM Asia's 8<sup>th</sup> Graduation Ceremony will take place in July this year, where we will be seeing our biggest ever graduating cohort.

From this issue onwards, the quarterly TUM Asia Digest will also see an extension of the number of pages and articles that we have put together for our readers. Within, you will find more updates and developments from TUM and our industry partners.

I trust you will find this issue a useful and pleasurable read.

**Dr. Markus Wächter**  
Managing Director, TUM Asia

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"Partnering in active sponsorship programs with high quality institutions such as TUM Asia puts us in touch with the talent of the future and gives these talented students the opportunity to drive innovation. Within Clariant, they can put their research into practice in an environment focused on developing world-class products and services that play a key role in adding value to customers' manufacturing processes and their end products."

## Global exposure for talented students

The Master of Science in Industrial Chemistry program administered by TUM Asia has gained its strong reputation among students due to its strong links with industry partners. The unique partnership between TUM and NUS enhances the opportunity for students to gain global exposure for their future careers. "There are rarely many chemistry programs that offer this type of close contact with industry partners, particularly with the level

of international exposure that is offered by TUM Asia," comments Maaland.

## Clariant: exactly your chemistry

Clariant is a global leader in the field of specialty chemicals. Strong business relationships, commitment to outstanding service and wide-ranging application know-how make Clariant a preferred partner for its customers.

Represented on five continents with over 100 group companies, Clariant employs around 16,200 people. Headquartered in Pratteln near Basel, Switzerland, it generated sales of CHF 7.1 billion in 2010. Clariant is organized into ten Business Units: Additives; Detergents & Intermediates; Emulsions; Industrial & Consumer Specialties; Leather Services; Masterbatches; Oil & Mining Services; Paper Specialties; Pigments; and Textile Chemicals.

The new headquarters of BU Textile Chemicals and of Clariant (Singapore) Pte Ltd in Singapore.





# STMicroelectronics Carves Out a Good Learning Experience for Our Graduates from its Internship Offerings and Work after Graduation

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

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

**Name:** Pratyaksha Navaklar  
**Country of Origin:** India  
**Course of study in TUM Asia:** Master of Science Integrated Circuit Design (2010 Graduate)

## 1) Can you share with us your internship experience in STMicroelectronics?

My internship experience was incredible. I learnt about the technologies used in the day-to-day semiconductor industry in the area of verification. I feel that my manager made a huge contribution during my internship due to his consistent support.

## 2) Can you share with us your current position that you are holding in STMicroelectronics?

I am currently an IC Design Engineer at STMicroelectronics, SmartCard Division.

## 3) How have the skills and knowledge that you had received from the Master programmes at TUM Asia been applied to and benefitted your current job?

Currently I am into Digital Design and Verification. The concepts taught in Digital Design and Design for Testability are highly relevant for the kind of work that I am involved in. In fact, the courses taught at TUM Asia are basic fundamentals and it is a must know before getting into the industry.

## 4) What are some of the joint collaborations that you would like to see between TUM Asia and STMicroelectronics?

I think it may be a good idea for STM to sponsor a few MSc Integrated Design candidates and provide industry scholarships to support bright students who cannot afford the hefty price tag of the programme.

## 5) Can you give us some advice to share with current students who are keen to join STMicroelectronics either as an intern or for future placement in the company?

STMicroelectronics is really a good place to start off your career path as a fresh graduate. Since joining STM, my learning experiences have been immense and they still continue to grow. I believe it is a win-win situation

for the company and the employee. I also believe that when a company provides very good trainings and various facilities to the employee, the company will benefit in return from the employee's contribution.

**Name:** Pradeep Saminathan  
**Country of Origin:** India  
**Course of study with TUM Asia:** Master of Science Integrated Circuit Design (2008 Graduate)

## 1) Can you share with us your internship experience in STMicroelectronics?

I was not previously an intern with STMicroelectronics.

## 2) Can you share with us your current position that you are holding in STMicroelectronics?

I am currently an IC Design Engineer at STMicroelectronics, Secure Microcontrollers Division.

## 3) How have the skills and knowledge that you had received from the Master programmes at TUM Asia been applied to and benefitted your current job?

The rich course content and the lecture deliveries from renowned professors and industry experts helped me to sharpen and add depth to the industry knowledge that I already had at the time of taking up the programme.

## 4) What are some of the joint collaborations that you will like to see between TUM Asia and STMicroelectronics?

I would like to see that STM sponsor and provide scholarships for candidates who are interested in this programme. I would also like to see them partnering to provide some PhD programmes.

## 5) Can you give some advice to share with current students who are keen to join STMicroelectronics either as an intern or future placement in the company?

My advice to the current students is to try to gain practical knowledge about the content. Getting an average A+ score is not enough to guarantee a job here. You need to be an all rounder, that includes having a good character and attitude at work.



Our graduates working at STMicroelectronics. Left to right: Pradeep Saminathan, Ying Xiaojun, Bharathwajan Parthasarathy, Ding Zhe, Lim Chern Sia Phillip, Pratyaksha and Mukesh Rao.

**Name:** Mukesh Rao  
**Country of Origin:** India  
**Course of study with TUM Asia:** Master of Science Integrated Circuit Design (2007 Graduate)

## 1) Can you share with us your internship experience in STMicroelectronics?

I have not done my internship with STM.

## 2) Can you share with us your current position that you are holding in STMicroelectronics?

I am currently a IC Design Engineer at STMicroelectronics.

## 3) How have the skills and knowledge that you had received from the Master programmes at TUM Asia been applied to and benefitted your current job ?

It has shaped me into a good analog design engineer and hopefully a manager (long term).

## 4) What are some of the joint collaborations that you will like to see between TUM Asia and STMicroelectronics?

It would be good to have an opportunity for a thesis with STM Singapore or a thesis on a R&D project with ST sites around Europe. This helps in bringing new talent to Asia from Europe after the thesis has been completed.

## 5) Can you give some advice to share with current students who are keen to join STMicroelectronics

## either as an intern or future placement in the company?

STMicroelectronics is a great place to learn. Since it is a big MNC, the other team members can be from various locations & backgrounds. The exposure matches with the experience and potential to the benefit of the students.

## Words from the employers of STMicroelectronics

**Fabien SINCERE** – Senior Administrator, HR (L&D)  
**Jane-lu WANG** – HR Administrator, Staffing  
**Chien Chung CHUA** – Senior Engineer, IC Design  
**Heng-Cheong HUANG** – Senior Design Manager

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

**Fabien SINCERE:** We would like to explore JIP for IC Design Groups, Internships for Design Groups and other opportunities for internship programmes of other master programmes, based on the school's excellent reputation.

**Jane-lu WANG:** TUM Asia may help bridge ST and NTU-TUM Alumni for permanent employment opportunities through an internal network or other potential portal.

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Heng-Cheong HUANG: We are open to exploring JIP and internship programmes.

**2) What is your experience in hiring TUM Asia graduates who have graduated from MSc IC Design and MSc Microelectronics?**

Chien Chung CHUA: They are generally able to learn fast and perform the tasks given.

Heng-Cheong HUANG: So far the experience has been good.

**3) How would you rate TUM Asia's graduate performance in fulfilling the company expectations on a scale from 1 to 10, 1 being the lowest and 10 being the highest?**

Chien Chung CHUA: They should rank 8 out of 10.

Heng-Cheong HUANG: 8

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

Fabien SINCERE: During the interview, we will assess both the technical knowledge acquired at university, and the behaviours shown. On the long run, to build strong competencies, technical knowledge, skills, know-how and behaviours need to be developed. To succeed in the industry, engineers also need to develop their soft-skills.

Chien Chung CHUA: Responsibility and discipline as well as technical skill.

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

Chien Chung CHUA: The 8 months of internship, provides us with great help in exploring or extending new methodology, and a longer internship period is generally more helpful.

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

Fabien SINCERE: Yes, out of 7 current employees graduated from TUM Asia, 5 have done an internship with us. In 2010, all our 3 interns were hired directly as permanent IC design engineer; their confirmation of employment was given before the end of the internship.

**7) Compared to other students that you have interacted with, what makes TUM Asia's MSc IC design graduates stand out?**

Fabien SINCERE: The length of internship provides time to train on the job and it exposes the students to projects so that they will be well-trained and prepared to take on a full time position in the industry.

Chien Chung CHUA: The knowledge they have gained in school is more related to the job requirement.

Heng-Cheong HUANG: Indeed, I prefer the longer internship period provided by the programme.

**8) As an employer, would you share your view on the current situation/need of skilled employees for Singapore's semiconductor industries and how programmes like the MSc in IC design will fit into it?**

Fabien SINCERE: It is critical to nurture the talent pool of engineers in semiconductors for Singapore to remain one of the electronics Mecca WW – at a time when certain profiles are in short supply in the market (IC Designers).

Chien-Chung CHUA: Other than theoretical knowledge, practical/analytical knowledge are needed.

Heng-Cheong HUANG: Many IC designers may, after a few years of experience, change to work in another technical field, therefore we need a constant injection of new IC designers as in the MSc. in IC design programmes.

**9) Would you please share a bit on the company's future planning/direction, especially concerning manpower/skilled employees?**

Fabien SINCERE: We will have growing needs for technical talent working in R&D across our groups and divisions.

**10) Are there any suggestions for us to improve our graduates?**

Chien Chung CHUA: Verification knowledge is very limited based on school subjects.

Heng-Cheong HUANG: More laboratory/hands-on work during the course.

**About STMicroelectronics**

STMicroelectronics is one of the world's largest semiconductor companies with net revenues of US\$ 10.35 billion in 2010. Offering one of the industry's broadest product portfolios, ST serves customers across the spectrum of electronics applications with innovative semiconductor solutions by leveraging its vast array of technologies, design expertise and through a combination of intellectual property portfolio, strategic partnerships and manufacturing strength.

**Who They Are**

The group has approximately 53,000 employees, 15 main manufacturing sites, advanced research and development centers in 10 countries, and sales offices all around the world. Its corporate headquarters, as well as the headquarters for Europe, the Middle East and Africa, (EMEA) are in Geneva. The company's Americas Headquarters are in Coppel (Texas); those for Greater China and South Asia are based in Shanghai; and Japanese and Korean operations are headquartered in Tokyo.

STMicroelectronics was created in 1987 by the merger of two long-established semiconductor companies, SGS Microelettronica of Italy and Thomson Semiconducteurs of France, and has been publicly traded since 1994; its shares trade on the New York Stock Exchange (NYSE: STM), on Euronext Paris, and on Borsa Italiana.

**STMicroelectronics in Singapore**

STMicroelectronics established its operations in Singapore

in 1969. Since then, the Company's Singapore operations have grown dramatically, cementing ST's place as a major industry player in Asia Pacific – the fastest growing semiconductor market in the world.

Today, ST's presence in Singapore comprises the regional front-end manufacturing headquarters; the global back-end manufacturing headquarters; logistics hub; R&D; advanced IC design; application support; front-end manufacturing; sales and marketing; and supply-chain management. In all, ST is one of Singapore's largest private-sector employers, with approximately 6,700 people (including ST-Ericsson employees).

**ST TechnoPark**

The ST TechnoPark, located in Ang Mo Kio, occupies a total built-up area of 180,000m<sup>2</sup> and supports the following activities: Wafer Fabrication, Manufacturing Facilities, IC Design and R&D, ST University and Sales and Marketing.

**Assembly and Test**

Toa Payoh, where ST built its first simple assembly and test plant in Singapore in 1969, is now the headquarters of the Company's Packaging and Test Manufacturing organization. The original plant has recently been converted into an Electrical Wafer Sorting (EWS) facility, a part of front-end manufacturing operations. The EWS output from Singapore accounts for approximately 70% of the Company's global capacity.

**Logistics and Warehousing**

ST's regional logistics and warehousing center was founded in Loyang in 1995, to manage distribution and facilitate just-in-time delivery to customers in Asia Pacific.

**Total Quality and Environmental Management**

ST's technical, marketing and manufacturing strengths are further enhanced by an unwavering commitment to Total Quality and Environmental Management (TQEM). In recognition of these efforts, the Singapore government bestowed the Singapore Quality Award and the Technology Achievement Award upon ST in 1999.

In addition, the Company's support and contributions towards Singapore's environment, which includes ST's re-forestation program, were recognized by the Singapore Green Plan Award 2012 from the National Environment Agency. A heritage tree was also dedicated to the Company by the National Parks Board in 2005.

In 2009, the Company received the President's Award for the Environment, the highest accolade in Singapore, for its exemplary practices in environmental protection, water conservation, and its reduction in the generation of waste and pollution emissions at its wafer manufacturing site in Ang Mo Kio.

**Major Achievements**

Singapore's Economic Development Board Business conferred on ST its Headquarters (BHQ) status in 1994 for the Company's outstanding contributions to the semiconductor industry and for its substantial presence in Singapore. The Company was further honored with the Distinguished Partners in Progress Award in 2000.

In 2003, Mr. Pasquale Pistorio, former President and CEO of STMicroelectronics, was recognized with the Honorary Citizen Award - the highest level of recognition awarded by the Singapore government – for his outstanding contributions towards the growth and development of Singapore.



TUM Asia alumni graduates. Left to right: Ding Zhe, Lim Chern Sia Phillip, Mukesh Rao, Pradeep Saminathan, Bharathwajan Parthasarathy, Ying Xiaojun and Pratyaksha Navaklar.



# TUM Asia has Officially Launched its 2<sup>nd</sup> Bachelor Programme at the SIT Open House Fair Held at MOE Headquarters

The Singapore Institute of Technology (SIT) Open House opened its doors on the morning of 5th March 2011. The open house this year stretched for a period of two days at the courtyard of Ministry of Education (MOE). This is a second year running that SIT is organising an open house for its admission exercise and inviting the various overseas universities for their participation. TUM Asia is proud to be one of SIT overseas universities, and with this in mind, we had launched our second Bachelor programme in collaboration with them. Known as the Bachelor of Science in Chemical Engineering, it will be of a similar course structure as our first Bachelor programme, i.e.: Bachelor of Science in Electrical Engineering and Information Technology. We are expecting a positive take up rate of this new bachelor programme and are confident that there will be a sizable applicant number for the new course.

The Bachelor of Science in Chemical Engineering aims to groom future leaders in areas of technology. This programme equips students with academic proficiency as well as hands-on knowledge required in the field. It is a full time application focused programme that runs over 2.5 years (5 semesters) for students with a suitable polytechnic diploma and 3 years (6 semesters) for A-Levels and internationals students. Students will be awarded a degree upon completion of total 180 credits units.

Candidates holding a recognised technical diploma from local polytechnics will be granted exemptions to complete the programme at a faster pace. As a pre-requisite to start in the main part of the degree programme, students are to attend the Bridging programme and to pass the respective examinations in order to gain exemptions.

This degree programme will be conducted at the Singapore Polytechnic, where SP facilities will be located within the campuses of the polytechnic to harness synergies, access to specialised engineering laboratories. Interested students can apply through the SIT website at [www.singaporetech.edu.sg](http://www.singaporetech.edu.sg). Applicants will undergo a holistic assessment that includes academic criteria, extracurricular interests and the candidate's personal qualities. Work experience will also be a key consideration.

## Tea Session at NTU

In early March, Nanyang Technological University (NTU), School of Electrical and Electronics Engineering organised a little tea session for our Master of Science Integrated Circuit Design students.

Some of the guests who were present include Associate Prof. Siek Liter. He addressed and shared with the students regarding the course curriculum and how they have been coping in the programme.

They touched on topics such as internship attachments, master thesis and programme curriculum as well.

The goal of the tea session was to foster more interaction between the professors and the students. It is also a good opportunity of the students to mingle with all their lecturers and professors in the same room and express any doubts or concerns which they may have.

TUM Asia staffs were also present on that day to show their support for the event.



Dr. Thomas Maul, TUM Asia, Head of Electrical Engineering, giving a presentation at MOE auditorium.



Participants listening to Dr. Maul's presentation.



Dr. Thomas Maul, TUM Asia, Head of Electrical Engineering, in discussion with NTU lecturers.



NTU lecturers in discussion with TUM Asia students.



Nicholas, Manager of Academic Services with Zara, Executive, Academic Services at the fair.



Nicholas, Manager of Academic Services, talking to a potential candidate at our booth.



NTU lecturer (middle) in discussion with our students.



Prof. Siek Liter (right), engaging in a talk with a current student.



# BJ Services Company and W.R. Grace Welcomes TUM Asia Students for an Industrial Site Visit



Mr. James Tan giving a guided tour to the students.

It was an early start on a Thursday morning. TUM Asia staff Punitha, Natalie and Gary were all geared up and getting ready to bring TUM-Asia students for a plant visit at BJ Services Company off Tuas Avenue together with Prof. Plank, our Technische Universität München (TUM) lecturer for MSc Industrial Chemistry programme.

All 15 students were excited to attend a half day tour visit as that was the first plant visit for many of our 10/11 batch of TUM Asia Master of Science Industrial Chemistry students. Everyone was looking forward to it. It started off as early as 8.30am where TUM Asia staff met our students at Pixel Building and chartered a bus to bring everyone to BJ Services Company.

We were warmly welcomed by Mr. Todd Ellis, Engineer, Cementing Asia Pacific, who gathered everyone at a small meeting room and presented to us about the company history, covering their service lines and worldwide operations. Students were also informed about the safety precautions and measures to be taken in the plant by Mr. Richard Seymour before the start of the day's event.

After the presentation, the students were divided into two groups where they took turns to tour the company's laboratories and factories under the guidance of Blending Plant Manager, Mr. James Tan and Mr. Kyi Phay Thant. Our students got to understand the functionality of different instruments and the processes in detail.

We ended off the visit at Raffles Marina where everyone was given a sumptuous lunch treat by our host. As we enjoyed our lunch by the clear blue skies and a fleet of luxurious yachts, we never forget to take a photo as a special remembrance with Mr. Todd.



A technician explaining a chemical process.



Mr. Todd Ellis (4<sup>th</sup> from right), with Prof. Plank (3<sup>rd</sup> from right) posing for a picture with our students.

"We believe that such tours are a good way to educate students about what BJ Services Company does and it is also a good exposure for students (to the industry) too, before they start work. It is a win-win situation for both parties as we too also need an injection of new blood in the industry. This industry will always be here to stay and we are always looking for new talents. We are looking forward to organising more of such tours with TUM Asia students in the future" says Mr. Todd Ellis.

## About BJ Services Company

BJ Services Company is a leading provider of pressure pumping and other oilfield services serving the petroleum industry worldwide. The Company's pressure pumping services consist of well stimulation, cementing, sand control, coiled tubing and downhole tools services used in the completion of new oil and natural gas wells and in remedial work on existing wells, both onshore and offshore. These services are provided through domestic and international locations to customers in most of the major oil and natural gas producing regions of the United States, Canada, Latin America, Europe, Asia, Africa and the Middle East.

## An Insight to TUM Asia's first trip to GRACE

After a fruitful trip to BJ Services Company the day before, the following day, we brought our students to W.R. Grace (Singapore) for another industrial field trip. Needless to say, we were accompanied by Prof. Plank. We were welcomed by Dr. Jiang Jia Biao, Regional Technical Service Manager and Mr Zhang Shu Qiang, Technology Manager, Asia Pacific respectively. Dr. Jiang gave our students an in-depth insight into the company's operations and achievements over the years since its founding in 1854. The students were seen enthusiastically posing questions to Dr. Jiang about the company.

After the presentation, Dr. Jiang led the group to a very comprehensive laboratory tour around the premises. He explained in details to the students regarding the processes and operations of the different equipments and its usage. Dr. Jiang also showed the students some samples of the various end products to give the students a better understanding.

With Dr. Jiang's dedication in his work, the students were grateful for his hospitality and had a clearer understanding



Dr. Jiang Jia Biao (4<sup>th</sup> from right) and Prof. Plank (5<sup>th</sup> from right) posing for a picture with our students.

of the industry. Before bidding farewell, we never fail to take the last shot with Dr. Jiang at W.R. Grace premises.

## About W.R. Grace

Grace Construction Products, based in Cambridge, Massachusetts, USA, is a unit of W. R. Grace & Co. Grace, with its world headquarters in Columbia, MD, is a leading global supplier of catalysts, silica products, specialty construction chemicals, building materials and container sealants. It is traded on the New York Stock Exchange under the ticker symbol [GRA].

Over 1,900 Grace Construction Products employees in more than 125 plants and sales offices around the world have made a commitment to aid in the construction of structures that endure and require less maintenance down the road. The Grace combination of innovative products, a specialized sales force for each product line, sophisticated research and development, technical service and support at the job site long after the competition has gone home – delivers added value that is unprecedented in the industry.

## Notes from Professor Plank

Prof. Dr. Plank, who was in Singapore for a 2-week lecture visit, from TUM, felt very encouraged by BJ Services Company and W.R. Grace initiatives in arranging laboratory tours for students. He said, "Despite attending lectures, I feel that it is very important for students to explore the application aspect of the course on top of the theoretical knowledge that they had gathered during classes." He believes the trip will help students step up in their professional career in the future and gain more insights and looks forward to more of such trips with the students in the near future.



Dr. Jiang explaining to the students about cementing.



# Avishek is Happy with his Decision to Sign Up for TUM Asia Programme as it has Helped Him to Acquire a Solid Foundation in his Current Field of Work

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

I was looking for a course that would give me practical exposure in microelectronics and while searching, I came across this innovative 18 months Master programme in microelectronics from TUM Asia at NTU website.

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

The fascination towards the semiconductor and the advancement in technology of the chip industry inspired me to sign up for this programme. This programme is a unique blend of Asian and European technical excellence that supports the theoretical knowledge gained during the course work with practical exposure during Master thesis.

**Q3. After 18 months on the programme, what are your thoughts about it?**

I am happy with my decision to sign up for this programme as it has helped me to acquire a solid foundation in microelectronics. After completion of my Master programme from TUM, I can certainly say that this programme provides an edge to all those who want to work in the microelectronics industry and play a part in creating a future for a better world.

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

My student life in Singapore was very hectic. I attended lectures from morning 9 am to 5 pm and then spent the rest of the evening in the library solving assignments and understanding the concepts.

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

There was hardly any leisure time but whenever I got some, I used to hang out with my fellow classmates at NTU cafeteria. It was fun discussing novel concepts and ideas during those breaks.

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

I did my internship at Institute of Material Research and Engineering (IMRE). The institute has excellent research facility. It is at IMRE I got exposure to state of the art fabrication and characterization techniques used in the semiconductor industry.

**- What have you gained from the internship experience?**

I was privileged to get hands on experience on the state of art semiconductor fabrication techniques



At TUM Asia 7<sup>th</sup> Graduation Ceremony with Dr. Markus Wächter.

during my internship at IMRE. It was a great learning experience as I got to implement most of the theoretical knowledge gained during the course work. I am currently using most of the techniques learnt during the internship.

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

During the semester break, I went to Bangkok and Phuket with my friends. It was really nice and refreshing break from work and studies.

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

I joined NTUSU-BP student mentoring programme where we used to voluntarily guide the students of local school and helped them realise their potential in their school work as well as in the development of their character.

**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?**

My field of specialisation is Microelectronics. I had been always interested in the technology know how of a semiconductor and its fabrication. This course did match all my expectations.

**Q10. You were awarded the Best Thesis Award in Microelectronics in last year's Graduation Ceremony in July. Tell us how do you feel receiving this award and what is this award all about?**

It was an incredible feeling to win this award. I felt highly honoured and reputed. I did work hard towards my thesis but didn't expect to win the best thesis award. At this moment I would also like to thank my supervisors Dr. G.K. Dalapati and Prof. Wong Kin Shun Terence for their innovative ideas and constant support during my thesis.

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

I am currently working at Solar Energy Research Institute of Singapore (SERIS). My current job scope addresses high cost issue of Si-photovoltaic and focuses on development of a technology that can help make solar cell cheaper and viable. The MSc degree in microelectronics from NTU-TUM has helped me to accrue a solid foundation in microelectronics. The programme is industry focused and it introduced us with different



With TUM Professor, Prof. Koch.

microelectronics devices. There is a compulsory internship as a course curriculum that further supports the theoretical knowledge gained during the course work with practical exposure. I am currently using most of the techniques learnt during my course work and internship.

**Q12. You had graced the recent branding campaign advertisement for TUM Asia 2011. Tell us your thoughts about it.**

I felt honoured when TUM Asia approached me for its branding campaign. It was really a special feeling. I believe that TUM Asia's Master's programme is a perfect blend on industry and academia that prepare one to be a market leader in the field of microelectronics.

**Q13. Do you have advice to share with the potential students?**

Based on my experience, I can certainly say that this programme provides an edge to all those who want to work in the microelectronics industry

**Q14. What are your plans for the years to come?**

I plan to work in the field of Si-Photovoltaic and focus on the development of a technology that can be instrumental in meeting future energy needs of Singapore and the world at large.



# Research Corner

TUM is continuously active in their efforts in electro-mobility excellence. TUM's expertise for more than 20 years in electro-mobility will grow further with the excellence initiative with two projects in its pipeline. The excellence research cluster "Electromobility beyond 2020" brings the multi and interdisciplinary research concept to address challenges towards mass production of electric vehicles. Batteries that are used to store energy and charging stations to supply energy are ultimate necessary aspects in electric vehicles. Together with other reputable universities and companies, TUM is a member of consortium in "Easybat" project to address challenges of using green electricity generated from renewable resources such as wind and sun to supply electricity of electric vehicles

## New round in Excellence initiative TUM with Electro-Mobility and "Risk & Security" in the race

The Technische Universität München (TUM) has reached the next phase at the renewal of the excellence initiative with two of its projects in its pipeline. The proposals from the graduate school "Risk and Security" and the Cluster of Excellence "Electro-mobility beyond 2020" were successful in the preselection of the German Research Foundation (DFG) and the Science Council. With a concept car for the future in mind, TUM will participate in the competition to promote first-class research. In 2006, TUM was first honoured as an Excellence University.

"With these scientifically superior and creatively designed institutions we want to promote the top level research in Germany in socially highly relevant future areas." said TUM-president Wolfgang A. Herrmann. "These two subjects literally suit us as a technical university." TUM will now submit the complete applications for funding, which the Science Council and the DFG will decide in June 2012.

### Graduate School "Risk and Security"

Risk is a complex phenomenon that is found in many ways in all facets of our life. To a large degree it evades the consideration by pure disciplinary measures, "risk-education" and "risk-research" occur mostly isolated inside the particular specialist discipline. The aim of the graduate school for "Risk and Security" is to build an international visible, interdisciplinary centre and to make this centre to a first address of postgraduate education and sustainable research on this most important sector in our modern society.

### Excellence research cluster "Electro-mobility beyond 2020"

With the shortage of fossil energy sources, individual mobility can in the long run be maintained by electric drives by using regenerative produced energy. Currently the available energy stores, vehicle- and mobility concepts are a first step in the right direction. But a sustainable change in the last 125 years shows that mobility behaviour requires much more. Not only new materials for energy storage and energy conversion have to be developed but also new business models, new control systems for intelligent power grids, and new simulation tools for evaluation and further developments

of new concepts. Many ideas are already prototypically realised but the development of methods for the mass production of all components of electric vehicles is a huge task that goes considerably beyond the traditional role of the engineering sciences. The excellence cluster Electro-Mobility undertakes this challenge with a multi- and interdisciplinary research concept. Besides TUM, Universität der Bundeswehr (Neubiberg), the German Aerospace Center (Oberpfaffenhofen) and 17 industry partners participate, including the most important German automobile manufacturer.

In the first phase of the excellence initiative, TUM was honoured in 2006 as a result of its concept of the future "TUM – THE ENTREPRENEURIAL UNIVERSITY" being a university of excellence. Furthermore TUM was successful with the "INTERNATIONAL GRADUATE SCHOOL OF SCIENCE AND ENGINEERING (TUM-IGSSE)". For the excellence cluster "Cognition for Technical Systems (CoTeSys)" and "Origin and Structure of the Universe" TUM is a speaker university, for the excellence cluster in "Center for Integrated Protein Science Munich", "Munich Center for Advanced Photonics", and "Nanosystems Initiative Munich".. Graduate schools promote an international composed groups of young researchers, who are working on high-profile, interdisciplinary projects. Excellence cluster allow top scientists from different disciplines and institutions common research at an international top-level.

## TUM does research in European Electro-Mobility project: Green Electricity for Electric-service stations

In the near future, intelligent current distribution is to ensure that charging stations provide only green electricity.

Engineers of the TUM are currently researching on how clever energy management for the future charging stations can be supplied entirely by green electricity. In this project the scientists are involved with a consortium of European industry and research partners that develop standardised connections for electro-backup batteries. For 2.2 million Euros, the consortium "Easybat" is subsidised by the European Commission.

The low travel range of electro mobiles could in future be resolved by simply changing the battery at the charging stations. The tedious charging of the battery would then go on at the charging station. However, there lies one problem: The amount of current from renewable energy sources like wind and sun varies according to the weather conditions. Electric car charging stations however would need constantly large amounts of renewable energy to prevent that the electro mobile traffic causes indirect emissions. Engineers in the department of Prof. Thomas Hamacher from the Chair for Energy Management and Application Technology work on intelligent energy management systems, which ensure that backup batteries can actually be charged exclusively by green electricity. The researchers in Munich are linked to the project "Easybat", in which eleven European partners develop standards for electric cars. By these standards it should



08.03.2011, Actual notice

become easier for European automobile and battery manufacturer to build electric cars with changeable batteries. It standardise automobile components and interfaces which will be developed by the technology for a battery change that can be integrated in the platforms of electric car in an easy way.

The Easybat-solution will consist of standardised interfaces so it is possible to install and to remove a battery quickly and safely; the connections from the interfaces between car, battery, the communication network and the battery cooling system. The technical data meet hereby the European industry- and security standards. The solution will be integrated into full electric cars and tested when it is installed to so as to ensure that the criteria for serial production and European safety standards are met.

Easybat will have a marketable solution for its backup battery-integration components of the next generation and also construction plans, which is suitable for different kinds of batteries, not just for one single standardised battery. Automobile manufacturer, which would want to concentrate on a company battery technology, can do that but nevertheless integrate their technology in a platform for electric cars with changeable batteries. As part of the Seventh EU-Framework Programme (FP7) Easybat is a two and a half year project that runs until June 2013. The European Commission will contribute 2.2 million Euro towards financing. The members of the consortium include Better Place (Israel) as coordinator of the consortium, Ernst & Young (Israel) as project administrator, Technical University Munich (Germany), Renault (France), RWTH Aachen (Germany), KEMA (Holland), Fraunhofer-Institute for Production Technology and Automation (Germany), Danish Technological Institute (Denmark), TÜV Rheinland (Germany), University of Haifa (Israel), Continental (Germany).

For more press readings:-

[http://portal.mytum.de/pressestelle/meldungen/NewsArticle\\_20110308\\_14052](http://portal.mytum.de/pressestelle/meldungen/NewsArticle_20110308_14052)

[http://portal.mytum.de/pressestelle/pressemitteilungen/NewsArticle\\_20110](http://portal.mytum.de/pressestelle/pressemitteilungen/NewsArticle_20110)



Concept for "Mute", TUM's electric mobile  
02.03.2011, press release



# Announcements

## TUM Asia signs Memorandum of Understanding with TÜV SÜD to promote research and development of green technologies

TUM Asia signed a Memorandum of Understanding (MOU) with TÜV SÜD, a leading global technical services provider on 18<sup>th</sup> March 2011. Through this MOU, both parties will jointly promote research and development activities in various aspects of electromobility, green technologies and battery technology.

This MOU was signed during the first annual TUM CREATE Workshop organised by TUM CREATE

(a separate arm of TUM Asia that focuses on developing innovative systems that incorporate safety and reliability with functionality and energy efficiency in electric vehicles). The three-day workshop brought together industry leaders, government agencies, researchers and scientists to discuss the "TUM CREATE Programme on Electromobility in Megacities" initiative. The main objective of this MOU is to encourage cooperation and knowledge exchange in areas of testing and research on lithium-ion battery technology and the safety (functional, electrical and chemical) of green technologies. TUM Asia and TÜV SÜD will also collaborate in more areas such as educational, training and consulting projects to set up a training service offer for the public and industry.

Being a global player providing testing, inspection, certification, consulting and training services across all industries, TÜV SÜD has gathered valuable insights through interactions with both industry leaders and end-consumers. In addition, TÜV SÜD experts preside on international standardization committees that shape the industry future practices. "With the insights and foresights gathered as a global technical solutions provider, TÜV SÜD is well-placed to support initiatives that will propel the development of green technologies such as electromobility and renewable energy," said Mr Alex Kraus, Assistant Vice President, Strategic Business Development & Sales, and TÜV SÜD Asia Pacific.

"I am confident that TÜV SÜD's extensive industry experience and resources together with GIST-TUM Asia's reputable knowledge and research network will expedite the development of green technologies.", commented Mr Dirk Eilers, Member of the Board of Management, TÜV SÜD AG.

Said Dr. Markus Wächter, Managing Director of TUM Asia, "With the strong knowledge and vast research network that TUM Asia possesses, and collaborating with TÜV SÜD who has the expertise in safety certification, I believe that our collaborations will be a successful one".



Mr. Dirk Eilers, Member of the Board of Management, TÜV SÜD AG (3<sup>rd</sup> from left) seated with Dr. Markus Wächter, Managing Director of TUM Asia, at the MOU Signing Ceremony. Standing left to right: Mr. Peter Bieheim, Training Business Development, PSB Academy, Dr. Harry Hoster, Scientific Director of TUM CREATE and Prof. Lienkamp, Scientific Advisory Director of TUM CREATE.

## Upcoming events

Event	Date
BVL Logistics Day	14 <sup>th</sup> April, 2011
TUM Asia Open House	16 <sup>th</sup> April, 2011
TUM Asia 8 <sup>th</sup> Graduation Ceremony	July 2011

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