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EDITOR:

Prof Lee Hian Kee

CO-EDITOR:

Ms Tan Lee Hoon

Please direct enquiries to:
Assoc Prof Chin Wee Shong
Chemistry Alumni Network
Department of Chemistry
National University of Singapore
3 Science Drive 3
Singapore 117543

Email: chmcws@nus.edu.sg

We welcome contributions from Chemistry alumni. Alumni who are interested, please kindly contact us at the above email address.

Our dear colleague and friend Emeritus Professor Goh Suat Hong retired from the Department of Chemistry in June 2008. Generations of students will remember his humour and self-effacing demeanour. Apart from this, as colleagues we know him as an excellent polymer and physical chemist. He also contributed selflessly his services to the department, faculty and the university. We hope to hear more stories from him in these pages from time to time. For now, he deserves a break, to travel the world.
- Editor

Reminiscences

by Emeritus Professor Goh Suat Hong



It seemed as if it was only yesterday that I heard Prof Rayson Huang reminiscing at a dinner function in 1972. Professor Huang is a distinguished organic chemist who had the distinction of serving the University of Malaya, Nanyang University (Nantah) and the University of Hong Kong as Vice-Chancellor. I recently retired after spending more than 40 years at the Departments of Chemistry in the University of Singapore (SU) and the National University of Singapore (NUS). Time really flies – it is now my turn to reminisce!

Recent batches of NUS students will undoubtedly remember me as the one who taught thermodynamics and polymers. They will be surprised and perhaps shocked to learn that my first teaching assignment in 1966 included a course in inorganic chemistry for Year 3 students. It was indeed a challenging job to teach coordination chemistry. At the end of the semester, I thought I did a fairly good job.

(I don't have feedback score to substantiate my claim as student evaluation started only in the late eighties!) and had learned quite a lot of coordination chemistry (a case of teaching-to-learn). At the final examination (or was it end-of-term examination? In the old days at Nantah, examinations were held at the end of each semester – very much like the current NUS system - whereas SU only held one final examination at the end of the academic year), I went into the examination hall to distribute question papers. The chief invigilator (someone from the Faculty of Arts) chased me out thinking that I was a student!

When SU and Nantah merged to form NUS in 1980, there were 22 of us in the Department of Chemistry (8 organic, 5 physical, 4 inorganic, 3 polymer and 2 analytical chemists). I was the last of that batch to retire. The department occupied only Blocks S8 and S9 (now we have also Block S5, and some of Block S7, plus some other space here and there).



The most valuable instrument in the department was a 60-MHz Perkin-Elmer nuclear magnetic resonance (NMR) spectrometer. Except for a few senior staff members, each of us was allocated half a laboratory consisting of one fume-hood and one bench. My office was then at Block S9, level 3. That office was designed and built as a balance room. Unlike a regular staff office, that room had two concrete benches intended for balances. For some unknown reasons, the Head of Department then put me there (but not the balances!). Nevertheless, the name-plate on the door read: "Balance Room – Dr. Goh Suat Hong." It appeared that I was the one looking after all the balances in the department! Nevertheless, after several rounds of protest, the name-plate was finally changed to: "Senior Lecturer – Dr. Goh Suat Hong." I moved to my present office at S7, level 4 in 1988 after the department was allocated this level of the building. (I say "present office" because, although I have retired from NUS, I've been accorded Emeritus Professor status, and the department has saved my old office for me.)

As compared to students in the eighties, present batches of students are well taken care of by the department and the university.

In the old days, only first year students enjoyed 'regular' tutorial sessions (once a week rotating among organic, inorganic and physical chemistry). For other students, there were no regular tutorials. At the end of the academic year, the coordinator of the Year 1 course would give us one hour each to conduct a mass tutorial. There were no Powerpoint lecture notes uploaded before the lectures, and there were no programmes for students as SEP (Student Exchange Programme), UROPS (Undergraduate Research Opportunities Programme in Science), and two others initiated by the department, CHIP (China Immersion Programme) and EURIP (Europe Immersion Programme), etc. How times have changed. The students of today have so many opportunities to make their experience at NUS (and abroad) a truly enriching one.

I told my last batch of CM1131 students several months ago that I have had a very enjoyable and satisfying career. I sincerely hope that every student will have a bright future and a successful career. You'll never walk alone!

Honours Experience

By Miss Ang Kailian Priscilla, Chemistry Alumnus , Honours Class of 2008



My research experience during the Honours Year in NUS would not have been as exciting if it was not for the state-of-the-art research facilities provided by NUS, coupled with the privilege of getting good supervisors of high calibre, namely my principle supervisor, Assoc Prof Loh Kian Ping and co-supervisor, Assoc Prof Thorsten Wohland.

My passion for research was ignited when I took the step of faith and participated in the Undergraduate Research Opportunities Programme in Science (UROPS), which is an excellent alternative to fulfilling modular credits for Year 3 curriculum. UROPS enticed me to aspire to greater challenges and aided me in my transition into the Honours Year.

My Honors project gave me a whole-new experience – a multidisciplinary research. I touched fields encompassing biology, chemistry and physics such as biophysical chemistry and ion-sensitive field-effect transistor (ISFET) theory. This thrilled me as I could exploit different techniques to investigate a certain problem from different perspectives even if it meant adventuring into areas outside my comfort zone. Long hours spent in the laboratory was worth it because each failed experiment is a step towards success and each successful experiment is a good pat on the back.



This is why research is so inspiring and rewarding. Without the invaluable research advice and motivations from my supervisors, I would not have achieved my research goals and in the process gained recognition. With my Honours Project, I have won the Outstanding Undergraduate Researcher Prize for Academic Year 2007/2008 as well as the Lijen Industrial Development Gold Medal. To bring my Honours project to a nice closure, major parts of my research was re-formatted into a journal paper entitled "Supported Lipid Bilayer on Nanocrystalline Diamond: Dual Optical and Field Effect Sensor for Membrane Disruption" and submitted to a high impact journal called Advanced Functional Materials. All these serve as an enhanced motivation for me to strive towards greater challenges ahead and are made possible only through the vibrant research culture and multi-disciplinary programmes which the NUS Faculty of Science and the Department of Chemistry have carefully constructed for its students.



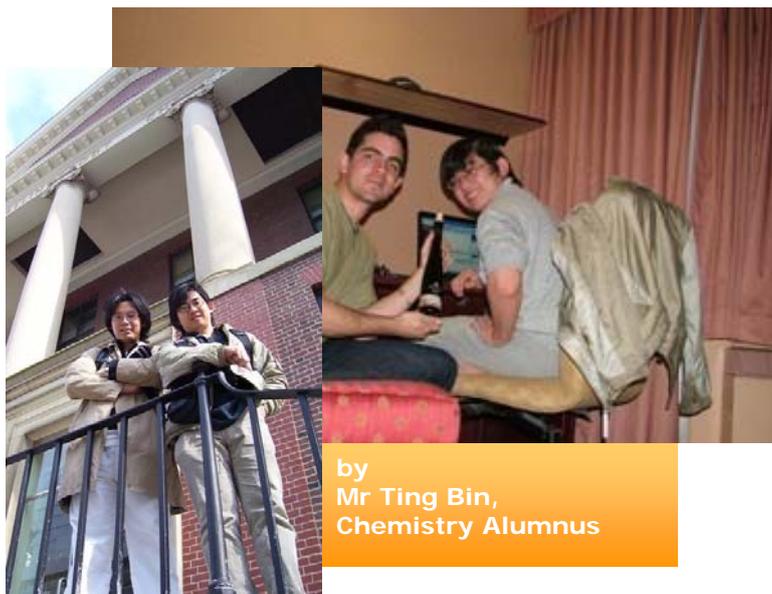
Work aside, the Department of Chemistry also consists of fun-filled academic and administrative staff. The Chemistry Annual Dinner (which in 2008 was held at the Raffles Town Club) and the Chemistry Graduation Dinner are two must-go annual events because not only are they good networking sessions, we catch a glimpse of who our professors and administrative staff members are really like outside NUS.

I have fully enjoyed being part of the Department of Chemistry, which nurtures students to become a scholastic person with the boldness and confidence to network and present ideas professionally and convincingly – qualities that are highly sought after regardless of the fields graduates venture into.

An introduction to my graduate work at the University of Toronto

Reaction dynamics is basically the study of the fundamental chemical event: what exactly happens when reactant molecules and/or species come together in a so-called 'chemical reaction', usually an exchange of atoms, to form the product species. It is the field of study that attempts to understand the process of the chemical reaction from bottom-up, that is, if we have certain starting molecules, what is the landscape of possibilities (often represented by potential energy surfaces) that exists for their reaction? What are the consequences of the features of this landscape that we can explore?





by
Mr Ting Bin,
Chemistry Alumnus

In working on research of such a fundamental nature, I've come to realize that for me, the most important thing I need to learn is not really about how to find an answer to the questions facing me, but how to recognize and find the questions that I want to ask next. I see this clearly in how my supervisor (now a pretty staggering 79 years old!) looks at the results of our experiments, and the direction of the group's research: though he has moved in the direction of surface science, his questions are still firmly rooted in the reaction dynamics of the systems involved. In order for me to move forward in my current desired career as an academic, I must find my own path of questions to ask. I hope that when I do find that path, I will be able to have the wisdom and drive, like my supervisor, to build it into my life's work and something that I can truly be proud of.

International Chemistry Olympiad: A Festival for Young Talented JC Students



by Dr Chanbasha Basheer,
Lecturer, Department of Chemistry

The Singapore Chemistry Olympiad is jointly organised by the Department of Chemistry, NUS, the Singapore National Institute of Chemistry, and the Ministry of Education, with sponsorship by LANXESS (named as the exclusive official sponsor from 2008). It is the prelude to the IChO. This local event provides the opportunity for talented chemistry students from junior colleges to engage in a two-day competition, in which they undergo a grueling theory test and a practical test, each lasting up to five hours. From these, four top students are selected for the following year's international competition.

I was really pleased when Prof Andy Hor, our Head of Department assigned me as a mentor for the Singapore Chemistry Olympiad in 2006. My colleague Dr Karen Mak and I have since taken the Singapore team to Korea for the 38th IChO, Russia (39th IChO) and Hungary (40th IChO). Singaporean students have done very well in these competitions. At the 2008 event, for example, gold medallist Yeong Li Qian of Raffles Junior College was placed second in terms of individual world ranking.

The IChO is professionally organized and Singapore will no doubt be a host country one day. I'm looking forward to being involved in the organisation, and helping to put Singapore on the map.

The International Chemistry Olympiad (IChO) is an international festival for talented young chemistry students. The IChO provides a competitive platform for the best high school students in Chemistry from more than 73 nations. Participating students would have already gone through a number of tough competitions at their respective national-level events, and only the top four go on to compete at the IChO proper. The IChO serves to distinguish the top talents who are capable of bringing science to a new level. Singapore joined the 20th IChO in 1988 for the first time when the competition was held in Finland.

8th Singapore National Crystal Growing Challenge

2008 champions, and 1st and 2nd runners-up for each category:

Junior:
New Town Secondary School,
Springfield Secondary School and
Greendale Secondary School



Senior:
Yishun Junior College,
Hwa Chong Institute and
Singapore Polytechnic



In the photographs, posing with the winners are (left to right) Prof Lee, Dr Chan and Assoc Prof Lim

The Singapore National Crystal Growing Challenge was started more than ten years ago jointly by the Department of Chemistry, National University of Singapore (NUS) and the Singapore National Institute of Chemistry (SNIC) for secondary school, junior college and polytechnic students. The aim of this competition is to provide students with an opportunity to exercise their creativity in growing something beautiful (chemically), and to learn scientific skills and techniques through this fun activity. Participating in the 8th Crystal Growing Challenge (CGC08) held from 25-27 September 2008 are 154 teams from 68 secondary educational institutions in Singapore.

The exhibition and award ceremony on 27 September was hosted by Assoc Prof Chuah Gaik Khuan (Department of Chemistry, NUS), and it began with a welcome address by Prof Lee Hian Kee (Deputy Head, Department of Chemistry, NUS), followed by a special address from Dr Peter P.K. Chan (a SNIC council member and also an adjunct professor in our department).

Guest-of-Honour, Assoc Prof Lim Tit Meng (Asst. Chief Executive, Singapore Science Centre, and also a faculty member of the Department of Biological Sciences, DBS, NUS) gave the guest address and presented certificates and awards to the winning teams.

The judging panel consists of six members from the Department of Chemistry and Department of Biological Science: Assoc Prof J.J. Vittal, Assoc Prof Thorsten Wohland and Dr Han Vinh Huynh for the junior category (95 teams), and Dr Jayaraman Sivaraman (DBS), Assoc Prof Ryan Bettens and Dr Xue Feng for the senior (28 teams), and open (31 teams) categories. As always, picking the winning entries was a challenge in itself.

This year's competition was sponsored by Bruker Singapore Pte Ltd (which has been a sponsor since 1997) and Oxford Diffraction Ltd, UK, and supported by the Faculty of Science of NUS.

Open: Temasek Junior College, NUS High School of Math and Science and Anderson Junior College



Organization of the event was led by Dr Xue Feng and his team comprising Juliana Mohamed, Carrie Wong, Joyce Chor, Emaiza Bte Mohd Arif, Suriawati Binte Saad, Tan Geok Kheng, April Ong, Hong Yimian, Adeline Chia, Patricia Tan, Rajoo, Yew Kok Guan and Tan Khai Seng.

Graduate student volunteers namely Goutam, Mir, Jeremiah, Wei Lee and Mangai.

(The complete list of winning teams can be found in <http://www.chemistry.nus.edu.sg/events/ncgc/index.html>).

Singapore Chemical Science Fair (SCSF)



SCSF-2 1st place (Junior) – Team from Hwa Chong Institution with the project “Characterisation of LPS-binding species in areca catechu (betel nut) extract” with one of the judges (Visiting Professor Brian Heaton)

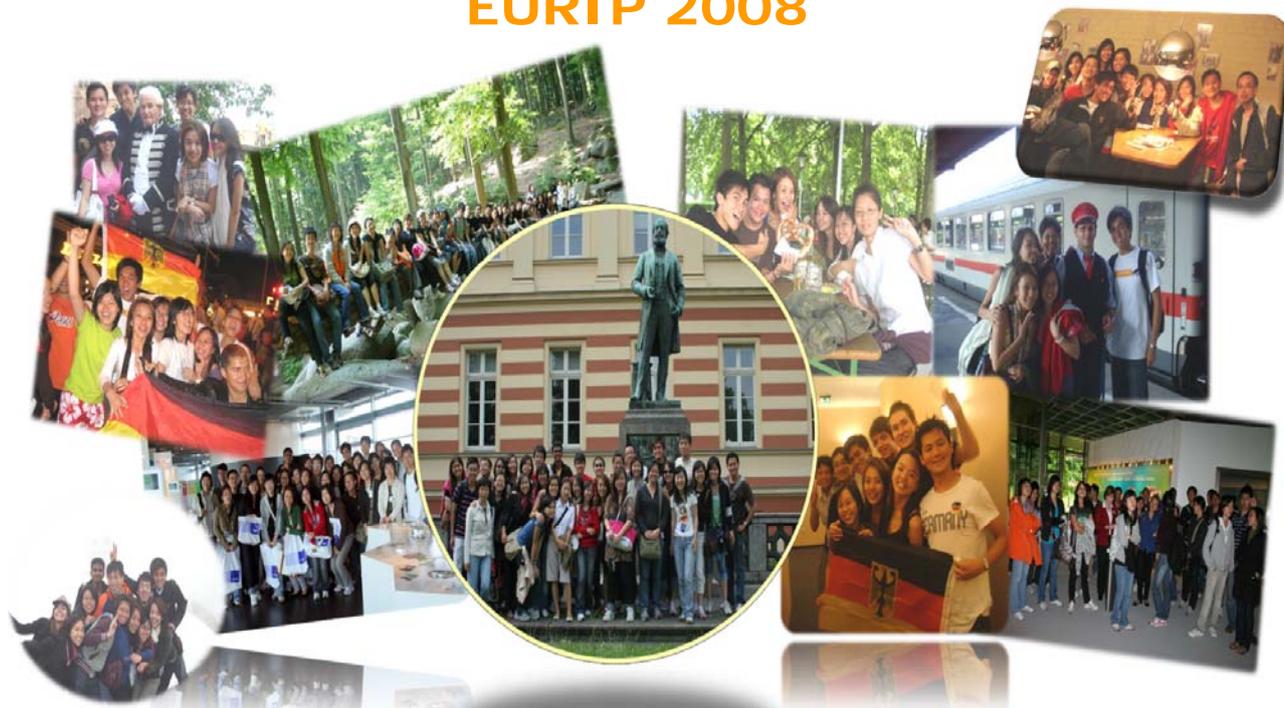


SCSF-2 1st place (Senior) – Team from Nanyang Polytechnic with the project “Titanium dioxide nanospunges as molecular sensors” posing with another of the judges (Visiting Professor Leonard Lindoy)

The SCSF is an annual competition organized by NUS Department of Chemistry with the objective to promote and support chemical science research project in schools and polytechnics in Singapore. Teams of 3 – 5 students under the supervision of teachers propose projects mid-year, carry out their projects over a six-month period and present their posters to judges in March the following year at the fair. In turn, NUS provides library access to all participants and also complimentary analysis services. Currently, the department is hosting the SCSF for the third time, with a record number of 42 teams participating from 22 schools and polytechnics. At SCSF-2 in March this year, Hwa Chong Institution dominated the junior category (secondary schools) by winning 1st, 2nd and 3rd place, whereas for the senior category (junior colleges and polytechnics) 1st place went to Nanyang Polytechnic, 2nd was to NUS High School and 3rd was to Hwa Chong Institution. These winners were out of the total of 29 teams which participated.

SCSF Committee:
Dr Emelyn Tan, Dr Chanbasha Basheer,
Juliana Binte Mohamed, Lai Hui Ngee and
A/P Lai Yee Hing (Advisor)

EURIP 2008



by
Dr Zhao Jin,
Lecturer, Department of Chemistry

The Europe Immersion Programme (EURIP) was launched in 2006, as part of the Department's aspiration to provide invaluable overseas scientific and cultural experiential opportunities for its students. EURIP III (2008) took place between June 1-21. Thirty Chemistry and Applied Chemistry students visited universities, chemical research institutes and chemistry industries in Germany and Austria. The delegation was led by Dr. Zhao Jin and Dr. Karen Mak.

The students visited three universities, Technische Universität München (Munich) (one of Germany's top universities), Universität Bonn (one of the oldest) and Universität Potsdam (one of the youngest).

Two research institutes were on the itinerary. The Research Center in Juelich and the Leibniz Institute for Catalysis in Rostock are leading research institutes in Germany. From the laboratory tour and scientific seminars, our students were exposed to their vibrant research environments.

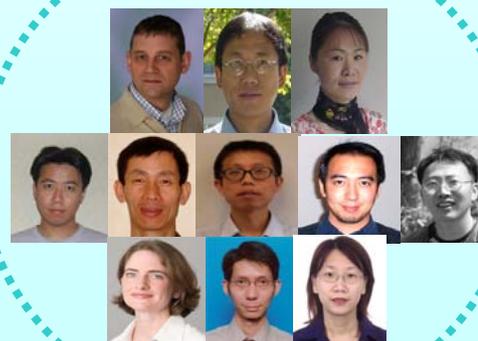
Besides the giant chemical companies, such as BASF, Bayer and Lanxess, a small company located in Innsbruck in Austria, call UgiChem impressed the students a lot. This small company is pursuing a big dream, having successfully developed a drug against HIV, although only a handful of researchers were involved. Research is the fundamental key to the success of a company, no matter how big or small it is.

Some students have graduated since EURIP III. For them this trip was a most unforgettable experience during their time in NUS, as their feedback testified. Planning for EURIP IV is now in progress.

New Faces

The department extends its warmest welcome to the following new faculty members

- Assoc Prof Thomas Walczyk
- Asst Prof Wu Jishan
- Dr Chi Chunyan
- Assoc Prof Chang Young-Tae
- Asst Prof Huang Kuo-Wei
- Asst Prof Liu Shao Quan
- Asst Prof Zhang Chun
- Asst Prof Chan Yin Thai
- Assoc Prof Tanja Weil
- Asst Prof Yeung Ying Yeung
- Asst Prof Chua Lay Lay



My Experiences at the University of Illinois Urbana-Champaign

In 2007/2008, I was a postdoctoral fellow at the Department of Chemistry of the University of Illinois Urbana-Champaign (UIUC), which has one of the top programmes in this discipline in the US.

When I recall my life in UIUC, the first word that comes to my mind is "tough", although the university has a beautiful campus. There you can easily find squirrels spending the warmer months preparing for winter by finding and hiding food, the rabbits playing games on the grass, the corn fields extending as far as the eye can see...

My first few days in UIUC were very memorable as "rush hours": busily registering; buying a cell phone; finding an apartment; opening bank accounts; searching for food; getting lost on the street and having no one to ask for directions.

I needed to adjust many things - not only my life style but also my way of thinking. For instance, I was not allowed to dry my clothes on the balcony and I had to get used to saying or to be greeted with "hello" by people I did not know, like joggers. There were almost no taxis but there was free public bus service in the city.

For research scholars, the most important part of life was doing research. All research students there work every hard to "survive". Most of them really enjoyed their lives doing research not only to pursue the degree but also for the fun of it. One could achieve many things on his own as long as he wanted it. I met some awesome "movers and shakers" in chemistry during my time there, and I have to admit that I learned many things from these folks.

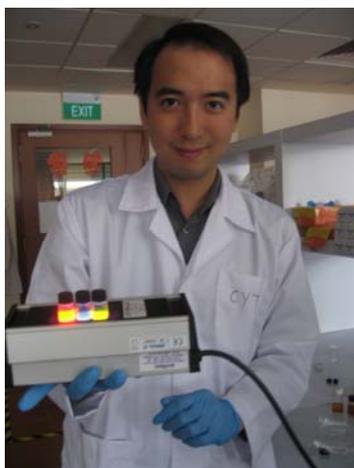


Research Fellow,
Department of Chemistry

I was really impressed by their extensive knowledge and experimental techniques, and they knew well what frontier in chemistry needed to be developed and gave insightful comments on the research in their field of expertise. Admittedly, I also had some negative experiences but I also learned from them.

In all, although my life was rather busy in UIUC, I enjoyed it. That is a great place for the proactive person and I miss it even now!

Introducing Chan Yin Thai



Dr. Chan Yin Thai obtained his B.S. in Chemistry from the University of California at Berkeley and his Ph.D. in physical chemistry from Massachusetts Institute of Technology, USA. Under the supervision of Prof Mounji G. Bawendi, Dr. Chan completed his doctoral work on semiconductor quantum dots in optical microcavities, demonstrating the existence of fluorescence and stimulated emission from multiexcitonic states in quantum dots.

He then did a relatively short postdoctoral stint in the laboratory of Prof Stephen R. Quake at Stanford University in USA, where he utilized multilayer microfluidics to address the various challenges of gene assembly. Dr. Chan joined NUS in 2008 as an Asst Prof in the Department of Chemistry. His research interests lie primarily in the areas of nanomaterials and microfluidics, where he will focus on exploring the optical properties of novel nanomaterials and exploiting them within the context of microfluidic applications.