

September 2008-March 2009

News from F10NA

Volume 3, Issue 1

The Newsletter of the School of Chemistry UNSW

Research Students Take Centre Stage

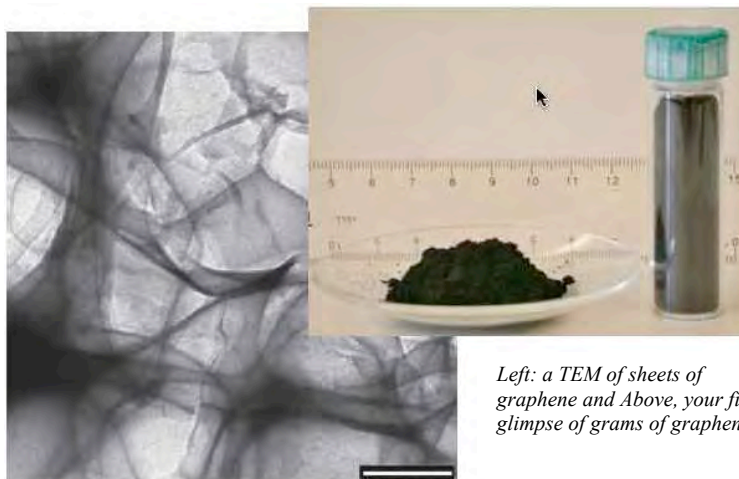
Welcome to the first issue of the School newsletter for quite some time - it has been a particularly busy six months with many successes. As you read the pages that follow you will see a lot has happened. As part of our active outreach program organized by Associate Professor Naresh Kumar we hosted 150 students from Sydney Girls High School along with four of their teachers. The girls spent a full day at the Chemistry laboratories and the Analytical Centre. They took an active part in chemistry experiments, which involved fatty acid analysis of an oil sample, preparation of biodiesel, and the magic bottle and luminol reaction demonstrations. The girls showed a great enthusiasm in Chemistry and asked a lot of questions. The school also hosted, in late November, a conference organized by Justin Gooding as the chair of the Electrochemistry Division of the Royal Australian Chemical Institute.

We were also very proud to learn that Justin Gooding was awarded a Vice-Chancellor's Teaching Award for Postgraduate supervision. There have also been many other awards in the school including Dr Kris Kilian being UNSW's first ever recipient of the RACI Cornforth medal for the best Chemistry PhD in Australia for 2007, Dr. Palli Thordarson being presented with a Young Tall Poppy Award, Barry Ward winning a UNSW Professional and Technical staff award and two honours students, David Hvasanov and Jarred Shein, winning the first two University medals ever awarded to Nanotechnology students. We won many grants at the end of last year and published lots of papers. Most notable was a paper from the Stride group that was published in *Nature Nanotechnology* in early 2009. That got the year off to a great start. 2009 promises to be an even more successful year than 2008.
- Barbara Messerle

UNSW Chemist's Make the World Take Notice

PhD student Mohammad Choucair, under the supervision of John Stride, recently made a discovery that was listed as one of the major achievements in Chemistry in 2008 by the Royal Society of Chemistry's popular science magazine *Chemistry World* (January issue). What made the world take notice was a paper in *Nature Nanotechnology* (M. Choucair, P. Thordarson, J.A. Stride, *Nature Nanotech.* 4 30-33 (2009)) on the chemical synthesis of gram scale quantities of graphene from ingredients no more complicated than ethanol and sodium using a solvothermal process. The discovery is so important because graphene is being touted as the material which may well be the future of electronics. Graphene is a single atom thick sheet of carbon with excellent conductivity, strength and flexibility. The problem to date has been how to produce it in sufficient quantities to make the material viable for commercial applications. Previously, graphene was prepared by ripping layers of carbon from graphite using

'sticky' tape, not exactly a commercially viable approach. John and his team are now in a unique position to explore the viability of many of the potential applications of graphene including for hydrogen storage, supercapacitors and nanoelectronics. The school congratulates Mohammad and John on their achievement.



Left: a TEM of sheets of graphene and Above, your first glimpse of grams of graphene.

Research students coming and going

The School of Chemistry had a bumper year with regards to both graduate student intakes and graduate student completions in 2008. This has also continued into 2009. By the end of 2008, Douglas Lawes, supervised by Graham Ball, and Mark Lewin, supervised by Mike Guilhaus, completed their PhD studies in addition to the 10 PhD completions for 2008 reported in previous newsletters. These 12 completions have been replaced by over 20 new students in 2008 with a further 11 new students in semester 1, 2009. Graduate students we would like to welcome to the school from late 2008, early 2009 are Santosh Rajput, Samuel Kutty, Rui Chen, Kitty Ho and Adeline Lukmantara who are all joining the Kumar/Black group, Rima Khoury and Ellaine Munton working with Brynn



Peta Di Bella

New Recruits for the School

The technical staff in our School play such a vital role in us being successful by providing enormous amounts of teaching, admin and research support. They do a fantastic job and over the last couple of years have had to work exceptionally hard with changes in building and an increase in the number of laboratory classes needing to be run. So it is with some relief that we have been able to supplement our staff numbers by the additional of two new people Peta Di Bella and Ray Arnhold. Peta joined us from the University of Queensland where she did an honours degree in Chemistry and was also a tutor. She has also spent time in the QA/QC departments of the pharmaceutical companies Alphapharm and GlaxoSmithKline. Peta has a range of experience in analytical and general



Ray Arnhold

Hibbert, as well as David Hvasanov (Thordarson), Sam Furfari (Cole), Fehmida Kanodarwala (Stride), Marina Timerbulatova (Messerle), Ryan Gilbert-Wilson (Field) and Camille Rosella (Ball). A particularly encouraging aspect of the new intake is that they are spread across many groups. The school welcomes all the new graduate students and wish them every success in their research. We also welcome and wish success to all the new honours students. The new honours cohort comprises 23 students, 11 from the Chemistry program and 12 from the Nanotechnology program. These students are housed in 10 research groups which again highlights that high quality research attractive to students is being conducted across the entire school.

chemistry which is already been valuable in her role the teaching labs.

Many of you will have met Ray Arnhold who joined the School late in 2008 to provide IT support. Ray comes to us with a broad range of IT experience, including working in the Law Courts and radio stations, and running his own IT consultancy. Ray's time is shared with the Schools of Aviation and Optometry and he is in Chemistry on Monday and Tuesday mornings, and Thursday and Friday afternoons. He is also here on Wednesdays switching between mornings and afternoons on alternate weeks. Peta and Ray's experience and willingness to help have already made a big difference in the school – we welcome you both!

Sabbatical Visitor

For much of the first 6 months of 2009 we have had the pleasure of hosting Associate Professor Donal Leech from the National University of Ireland in Galway. Like many high quality scientists, science has seen Donal and his family travel the globe, having started his research career in Ireland before spending time in New Mexico, doing a post-doc in Hawaii and taking up his first academic position in Canada before

returning to Ireland. So in some ways it seems only normal for his first sabbatical to be in Australia. Donal has expertise in biosensors, bioelectronics and biofuel cells so it will come as no surprise that he is interacting with the Biosensors and Biodevices research group led by Justin Gooding. We welcome Donal and hope he has a successful research time as well as a great time in Sydney.



Donal Leech enjoying life at UNSW

Our Publications from September 2008 to March 2009

Papers in really high impact journals such as *Chem Comm*, *Angew. Chem.* and *Acc. Chem. Res.* are marked in blue. Even more special attention is placed on a paper published in *Nature nanotechnology* from the Stride group which is marked in red.

From Molecular Devices cluster

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Beyond our Walls

UNSW chemists have continued to travel extensively to either present their science to international audiences or conduct research in leading laboratories around the world. In the last few months the most frequent travelers have been Brynn Hibbert and Justin Gooding. In November Brynn gave a well received lecture entitled "Metrological Traeability of Measurements Results in Chemistry: Concepts and Implementation" at a workshop organized by the Chinese Academy of Sciences. He didn't stay back in Sydney long though as Brynn was soon off to Chiang Mai in Thailand in February to give another keynote lecture. Palli Thordarson also spent time in Chiang Mai in early 2009 as a part of a UNSW delegation led by our own Roger Read. The trip was part of UNSW's international strategy to develop strong links with specific universities. Justin Gooding did a bumper trip where he presented invited talks at conferences in Seville in Spain, Chicago in the USA and then back to Europe for an invited conference talk in Dobogókő Hungary which is located near Budapest. Callie Fairman, A PhD student in the Gooding group, also went with Justin to Seville for the International Society of Electrochemistry Conference. Callie's trip was supported by the UNSW Research Student Support Scheme. Other students to

Student Prize Night

On Wednesday March 11th we honoured our undergraduate and postgraduate student high achievers with prizes and scholarships based on their performance in 2008. The evening, splendidly organized by Anne Jordan, was held in our old home of the Heffron Building in a space we all knew previously as the library. The evening kicked off with nibbles and drinks before Barbara addressed the attendees followed by an excellent presentation from Dr Sarah Wren, a PhD graduate from the Messerle group. Sarah told us about the skills she learnt in her PhD and how they have helped her as well as the sorts of skills that are useful in the workplace. The Deputy Vice Chancellor, Professor Les Field, then proceeded to award all the prizes. The prize winners are shown in the photo opposite with Les, Barbara and Sarah. A special mention must be given to Amanda Zhou (Sydney Girls), standing next to Barbara, who is the 2009 School of Chemistry Prize winner for Excellence and Enthusiasm in Chemistry for Year 10 students. We were also very privileged to have Vyt Garnys from CETEC

win travel scholarships from UNSW include Kasey Wood and Frank Qu from the Kumar group. Jason Harper also spent time in the US on a lecture and laboratory visits tour. Jason visited five universities which were the University of Notre Dame, Georgetown University and George Washington University in DC, the University of Chicago and Boston College. The latter is where Jason will spend his sabbatical in 2009. Roger Bishop, also continued his travels with a visit to Osaka in Japan where he presented a paper on 'Five alternative crystal forms produced by recrystallisation of a simple alicyclic dialcohol' at XXI Congress of the International Union of Crystallography. Naresh Kumar also ventured across the ocean to give an invited conference lecture at International Conference on New Developments in Drug Discovery from Natural Products and Traditional Medicine in Chandigarh, India.

There has also been a lot of activity across Australia with staff and students presenting research at the RACI One-Day Natural Products Group Symposium in Lismore, the RACI Electrochemistry Division two day symposium at UNSW, the Australian new Zealand Conference on Magnetic Resonance (ANZMAG) 2008 in Couran Cove Queensland, the Reactive Organometallics Symposium at ANU (ROMS).

present the CETEC prize for the best performance in Honours Thesis won by David Hvasanov and Ellaine Munton, Stephen Angyal to present the Angyal Prize for Best Performance in Chemistry Honours to Ellaine Munton and Professor David Black to present the Black Scholarship for the highest ranked commencing international PhD student to Samuel Kutty. The other prize winners were Erika Davies, Henry Cullen, Peter Zarzour, Alasdair McKay, Michelle Dunn, Yevgeny Stadnik and Alexander McSkimming. Post-graduate teaching scholarships were also awarded to Ruth Devakaram and Maggie Ng, The School congratulates all the prize winners!



Brynn Hibbert giving his lecture in Chiang Mai

End of Year Grant Success for UNSW Chemists

The announcement of the successful outcomes from the Australian Research Council grants for funding in 2009 were announced in late September last year. As always it is a bittersweet time for a school and academics. For the School of Chemistry there was however a considerable amount of success to celebrate. We celebrated four new Discovery grants for Steve Colbran, Palli Thordarson, Margaret Harding and Michael Paddon-Row. We also celebrated a successful Linkage grant for Naresh Kumar. A week later the ARC announced their major equipment (LIEF) grants and there was more good news with Barbara Messerle being the first named applicant on a 1 million dollar Nuclear Magnetic Spectrometer grant, Justin Gooding leading a \$500,000 grant for a new X-ray Photoelectron spectrometer and Mike Guilhaus leading a successful mass spectrometer bid. Graham Ball and John Stride were also applicants on successful LIEF grants for facilities housed at UTS and ANSTO respectively. Before the year was out there was even more grant news to celebrate as Palli Thordarson won a NSW Cancer Institute grant. Congratulations is extended to all the successful applicants and commiserations to those that were not successful this year.

ARC Discovery Projects

S.B. Colbran 2009-2011 (\$320K),
Understanding biological nitrogen fixation:
an investigation of multi-electron reduction
catalysis at novel iron-sulfur clusters

M.M. Harding 2009-2011 (\$325K),

Editorial Board Appointments

Three UNSW Chemists were appointed to editorial boards of journals recently. Most significantly perhaps is Barbara Messerle was appointed to the editorial advisory board of the ACS journal *Inorganic Chemistry* which is the top journal in the inorganic chemistry discipline. The *Australian journal of Chemistry* recently changed its editorial structure and added Justin Gooding as a handling editor and Palli Thordarson as a commissioning editor. This means Justin handles papers and Palli commissions articles for special focus issues.

Targeting DNA with Dynamic Combinatorial Chemistry

P. Thordarson, 2009-2011 (\$220K) Smart bio-mimetic self-assembled gels for biomedical applications

M Sherburn (ANU), M.N. Paddon-Row 2009-2011 (\$590K) Experimental and Computational Investigations into Enantioselective Domino Sequences

ARC Linkage

N. Kumar *et al* 2009-2011 (\$390K),
Development of novel environmentally benign technologies for the control of bacterial biofilms in industrial applications

ARC LIEF

BA Messerle, LD Field, GE Ball and others (\$1000K), High Field Solid State and Multinuclear NMR Spectrometer for Structure/Function Analysis of Materials.

JJ Gooding, P Thordarson, A Buckley and others (\$500K) State of the Art Surface Characterisation Facility for the Sydney Basin.

M Guilhaus, DB Hibbert, LD Field, BA Messerle, JJ Gooding, MM Harding and others (\$357K), High Resolution LC/MS and MALDI for Molecular and Macromolecular Characterisation.

NSW Cancer Institute

P. Thordarson, P. Braet (USyd) 2009 (\$50K) Self-assembled gels for local anti-cancer drug deliver.

Marcus's Big Day

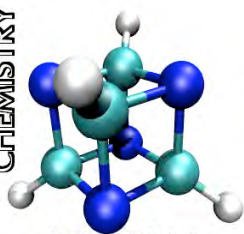
In March our newest academic Marcus Cole also became the most recent member of the school to get married. The School gave the happy couple a set of Royal Doulton crystal wine glasses which (see photo opposite) they were clearly very pleased about it. We all extend our congratulations to Jo and Marcus and wish them much happiness for the future.



Students from Sydney Girls High School enjoying their time visiting UNSW Chemistry



Jo and Marcus on their big day



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Isa Chan in Shanghai



Our newest Tall poppy

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Students win prizes galore

2008 was an excellent year for student successes in the School of Chemistry at UNSW with the prizes continuing to flood in towards the end of the year. Dr. Kris Kilian a former PhD student in the Gooding group, who is now an NIH fellow at the University of Chicago, won the 2008 Royal Australian Chemical Institute's Cornforth Medal. This is the most prestigious prize for post-graduate chemistry students being the prize for the best PhD thesis in a given year; 2007 in Kris's case. This is the first time a UNSW student has ever won this prize. There were however more RACI prizes for our students. Isa Chan, a PhD student in the Bishop group, was awarded the RACI Jim O'Donnell International Travel Award for 2008 at the annual National Awards Dinner held at the University of Melbourne on 28 November. Isa used this support to attend the 10th International Symposium for Chinese Organic Chemists (ISCO-10) held in Shanghai, China over 27-31 July, where she gave both oral and poster presentations on her research work. Her attendance at this large international meeting was also assisted through the UNSW Postgraduate Research Student Support Scheme. Isa however cannot stop winning as her crystal structure cited in *Acta Crystallographica Section E* (see last School Newsletter) was subsequently chosen as the *Acta E* paper of the quarter and then also highlighted in the *International Union of Crystallography Newsletter* Vol. 16, Number 2, 2008. This

Prize for Barry Ward

Barry Ward (School of Chemistry) has been selected as a joint winner in the Excellence in Leadership and People Management category of the UNSW Professional and Technical Staff Awards for 2008. Barry's roles in the school are many and varied. Barry has an overseeing role for the technical and professional staff in the school. He also has looked after the spectroscopy lab for many years from both a teaching and research perspective which has meant demonstrating classes, preparing classes and helping research students from not only our school but across the entire university. He is the school SECO, often mans the store, sits on the School Advisory committee and does much much more. The school would really be at a loss without him and this award is recognition of the fantastic work Barry does on so many levels across the school and the university.

publication is distributed to some 17,000 crystallographers world-wide. See: www.iucr.org/news/newsletter. This keen interest in Isa's work relates to the high degree of enantiomer separation observed in the solid state after crystallisation of her racemic ketoalcohol molecule.

Reference: Chan IYH, Bishop R, Craig DC, Scudder ML, Yue W, 8-Methyl-5-methylidene-2-oxotricyclo[5.3.1.1^{3,9}]dodecan-*endo*-8-ol, *Acta Crystallographica*, **E64**, o841 (2008).

Other students to win conference prizes were Simone Ciampi from the Gooding group and Brad Man from the Messerle group. Simone won the poster prize at the RACI Electrochemistry Symposium held at UNSW on November for his poster entitled "Silicon electrodes resistant to oxidation in aqueous solutions: Preparing redox assemblies via click chemistry on acetyl silicon(100) surfaces". Brad Man won his poster prize at the Australian New Zealand Conference on Magnetic Resonance held in December in Couran Cove in Queensland.

A number of PhD students in Chemistry also won places in the UNSW Commercialisation Training Scheme (CTS) for postgraduates. The lucky 5 recipients were Daniel Goldstein, Thomas Ellis, Renxun Chen, Nam Trung Tuong and Maggie Ng.

Congratulations from all the school is extended to all our prize winners.

Tall Poppy Award for Palli

On October 23rd 2008 the NSW Young Tall Poppy Awards were announced by Her Excellency, NSW Governor Professor Marie Bashir and the Minister for Science and Medical Research the Hon. Tony Steward MP at a ceremony at NSW Parliament House. Our very own Palli Thordarson was one of the recipients. The Young Tall Poppy awards are for intellectual and scientific excellence. As part of the Tall Poppy initiative the 13 recipients from 2008 will make visits to schools to present their science and hopefully inspire the next generation of scientists.