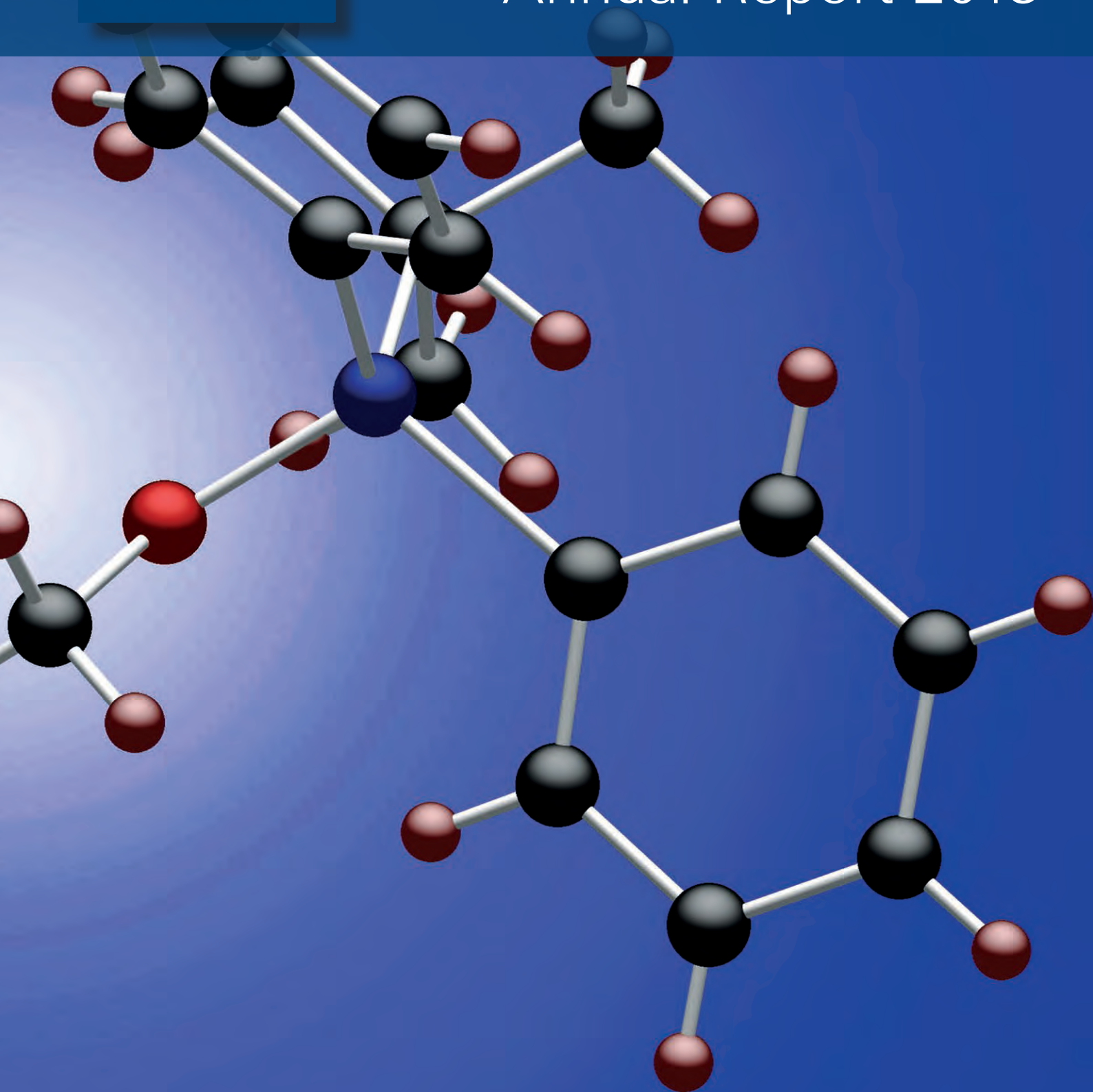




THE UNIVERSITY OF  
MELBOURNE

# SCHOOL OF CHEMISTRY

## Annual Report 2013



## SCHOOL OF CHEMISTRY

Annual Report 2013

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### CONTACT THE SCHOOL

Chemistry Building

The University of Melbourne

Victoria 3010 Australia

+61 3 8344 6567

[www.chemistry.unimelb.edu.au](http://www.chemistry.unimelb.edu.au)

Compiled by Jenny Long

[longj@unimelb.edu.au](mailto:longj@unimelb.edu.au)

### FRONT COVER IMAGE

From work by Sonali Wickremasinghe, Christian Gunawan, Jonathan White and Mark Rizzacasa. *X-ray structure of a key iodide intermediate in the synthesis of the complex natural product spirangien A.*

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# INTRODUCTION FROM THE HEAD OF SCHOOL

It is once again my pleasure to introduce the Annual Report for the School of Chemistry and to showcase our contributions to society during 2013 in research, learning and teaching, and engagement.

The reputation of the School of Chemistry remains strong both nationally and internationally and is supported by the outcomes of the 2013 QS World University Ranking with the University of Melbourne placed highest in Australia for study of chemistry.

The School performed strongly in research during 2013, particularly in the Australian Research Council (ARC) grant schemes. Staff members Dr Paul Donnelly, Associate Professor Spencer Williams, and Dr Wallace Wong all received ARC Future Fellowships, whilst Dr Lars Goerigk was successful with an ARC Discovery Early Career Award. In addition, Professor M. Ashokkumar was successful as a chief investigator on two ARC Industry Transformation Research Hub grants. The School also took much pride as Dr Brett Patterson accepted one of the prestigious Victorian Postdoctoral Research Fellowships through the State Government of Victoria.

The excellence of researchers from the School of Chemistry was acknowledged through several peer recognition awards in 2013: Dr Colette Boskovic and Dr Angus Grey-Weale were both awarded Royal Australian Chemical Institute (RACI) Lectureships, whilst Associate Professor Michelle Gee was recognized with the McAulay-Hope Prize for Original Biophysics by the Australian Society for Biophysics. School of Chemistry staff were also successful with University of Melbourne awards: Dr Brett Patterson was the recipient of the Kaye Merlin Brutton Bequest grant; Dr Chris Ritchie received the Selby Research Award; and Professor

Spas Kolev was awarded the Grimwade Pride in Industrial Chemistry. During 2013 Jonathan White was promoted to Professor and Professor Andrew Holmes became President-elect of the Australian Academy of Science, which is a wonderful achievement that acknowledges Andrew's remarkable contribution to science in Australia.

To maintain the research excellence of the School of Chemistry, we have committed to a long term plan for refurbishing the teaching and research labs in the Chemistry Building. The last phase of the plan commenced in 2013 with the labs in Level 2 East. An official opening of this wing is planned for mid-2014. Upon completion, all research groups in the School of Chemistry will be equipped with state-of-the-art research laboratories.

During 2013 School of Chemistry staff were again busy with outreach activities that continued on campus and at schools throughout Victoria. Professor Paul Mulvaney and Dr Tich-Lam Nguyen presented the RACI 2013 Hartung Youth Lectures. It was very rewarding that the Melbourne University Chemical Society (MUCS) launched the book, *'From Chalk & Talk to Powerpoint'*, a history of MUCS written by the late Dr Valda McRae.

The performance of the School during 2013 is briefly summarized in the following pages, and reflects another memorable year for all staff and students of the School of Chemistry.



A handwritten signature in cursive script that reads "Frances".

**Professor Frances Separovic FAA**



# OUR PEOPLE

## ACADEMIC

### Head of School

Frances Separovic

### Professors

Muthupandian Ashokkumar  
Evan Bieske (APF)  
Ken Ghiggino  
Franz Grieser (APF)  
Spas Dimitrov Kolev  
Robert Lamb  
Richard Alfred O'Hair  
Mark Antony Rizzacasa  
Carl Herbert Schiesser

### Associate Professors and/or Readers

Brendan Francis Abrahams  
Michelle Louise Gee  
Craig Hutton  
Trevor Alexander Smith  
Jonathan Michael White  
Uta Wille  
Spencer John Williams

### Senior Lecturers

Stephen Peter Best  
Colette Boskovic  
Paul Donnelly

### Lecturers

Angus Anthony Gray-Weale  
Alessandro Soncini

### ARC Laureate Fellow and Professor

Paul Mulvaney

### Laureate Professor

Andrew Bruce Holmes

### Future Fellows

Rachel Caruso  
John Gehman  
Georgina Such

### ARC Research Fellow

George Khairallah

### ARC Australian Postdoctoral Fellows

Linda Feketeova  
Christopher Ritchie (DECRA)

### Tutors

Penelope Commons  
Sonia Horvat  
Michael Moylan (Outreach Fellow)

### Research Associates

Sneha Abraham  
Klaus Boldt  
Gojko Buncic

Nahid Chalyavi  
Maryline Chee Kimling  
Dehong Chen  
James Cochrane  
Jade Cottam  
Christopher Dean Donner  
Augustine Doronila  
Viktoras Dryza (ASI ARENA Fellow)  
Alex Duan  
Maria Ines Gameiro SA Almeida  
Catrin Goeschen  
Amber Hancock  
Xiaotao Hao  
Clare Henderson  
James Hickey  
Timothy Hudson  
David John Jones  
Yvonne Kavanagh  
Shea Fern Lim  
Marco Lista (McKenzie Fellow)  
Tich-Lam Nguyen  
Adabelle Ong  
Brett Paterson  
Christopher Ritchie  
Tatiana Pinedo Rivera  
Marc Antoine Sani  
Colin Skene  
Willem Van den Huevel (McKenzie Fellow)



Chemistry Staff & RhD students enjoying the end of year get together at The Fairfield Boathouse, Melbourne.

Phillip Van der Peet  
Krista Vikse  
Huabin Wang  
Xingzhan Wei  
Keith White  
Christian Wichmann  
Wallace Wong (ASI Fellow)  
Alex Wu  
Zhiguang Xiao  
Yanlin Zhang

## HONORARY APPOINTMENTS

### Emeritus Professors

Donald William Cameron  
Francis Patrick Larkins

### Professorial Fellows

Robert Catrall  
Roger Francis Martin  
Ezio Rizzardo  
Richard Robson  
Peter Robert Taylor  
John Desmond Wade  
Robert Oliver Watts  
John Webb  
Anthony Gordon Wedd

### Principal Fellows

Christopher Burns  
William David McFadyen  
Ian McKelvie

Peter McTigue  
Richard Morrison  
Geoffrey Scollary  
Peter Tregloan  
Charles Young  
Senior Fellows  
Robert Craig  
Valda May McRae

### Fellows

Richard David Harcourt  
Akhter Hossain  
John Lambert  
Alessandro Martucci  
Anastasios Polyzos  
Suzanne Reichman  
Denis Scanlon  
Gerard Wilson

### Visitors

Peter Baeuerle  
Philip Blower (Wilsmore)  
Daryl Bornhop  
Adelia Maria Lima da Silva  
Michael Grunze (Wilsmore)  
Terry Lybrand  
Patrick Masset  
Christine McKenzie  
Elena Mena-Osteritz  
Cathal O'Connell  
Ron Steer  
Hermin Sulistyarti

Ken Suslick (Wilsmore)  
Regine von Klitzing  
Gerhard Wagner (Harvard Fellow)

## PROFESSIONAL

### West Precinct Manager

Eugene Fredericks

### West Precinct Facilities Manager

Paul Beardsley

Renee Beale  
Vicki Burley  
Gregory Ellis  
Robert Gable  
Sue Hickey  
Ross Lineham  
Jenny Long  
Brendan Mangan  
Bryan McGowan  
Alf Meilak  
Elizabeth Mills  
Peter Mills  
Des Odgers  
Jennifer Scott  
Alexandra Strich  
Doug Taylor  
Joe Tyler  
Sioe See Volaric



Laureate Professor Paul Mulvaney's group



# NEWS

From time to time, School of Chemistry staff and students make the news! Below are excerpts from, and links to news stories and articles from 2013 about the School of Chemistry, from print and electronic media.

## MELBOURNE RESEARCHER GRANTS AWARDED TO CHEMISTRY

Congratulations to Dr Colette Boskovic, Assoc. Prof. Rachel Caruso and Assoc. Prof. Uta Wille who were successful in the MRGSS this year. Their grants will fund the following projects in 2014:



*Colette Boskovic, "Smart materials for sensors, displays and nanoscale devices"*



*Rachel Caruso, "Solution based printable mesostructure solid-state thin film solar cells"*



*Uta Wille, "Oxidative damage of airway surfaces: understanding the synergistic effects arising from exposure to the air pollutants, nitrogen dioxide and ozone"*

## AINSE FUNDING FOR ANALYTICAL CHEMISTRY

Congratulations to the Kolev Lab on the success of their AINSE application for 2014 entitled "Cellular localisation of mercury (Hg) and gold (Au) in selected plant species grown in substrates composed of mine tailings and heavy metal contaminated biosolids using micro-PIXE".

## ALAN SARGESON LECTURESHIP FOR COLETTE BOSKOVIC

Congratulations to Dr Colette Boskovic on her receipt of the Alan Sargeson Award from the Inorganic Chemistry Division of the RACI. This prestigious early career researcher award acknowledges significant and innovative individual contributions to the field of inorganic chemistry. The award takes the form of a lecture tour of Australia and New Zealand, which Colette will undertake in 2014.

## FEUTRILL AWARDS TO PHD STUDENTS

Congratulations to the following Chemistry PhD students who received Feutrill awards to participate in an international conference related to organic chemistry: Stephanie Bellmaine, Lucie Bradley, John Karas, Vinojini Nair and Sonali Wickremasinghe.

## RACI PHYSICAL CHEMISTRY LECTURESHIP TO ANGUS GREY-WEALE

Congratulations to Dr Angus Gray-Weale who received the RACI Physical Chemistry Division Lectureship, which is awarded to an outstanding early- and mid-career physical chemist to travel around Australia and present the results of their research work.

## MMI GRANTS TO TICH-LAM NGUYEN AND WALLACE WONG

Congratulations to: Dr Tich-Lam Nguyen who received funding for her work with nanocrystals for upconversion laser chips; and Dr Wallace Wong for his work with fullerene molecular peapods as organic semiconductors.

## YOUNG INVESTIGATOR AWARD TO JOHN KARAS

Chemistry PhD student, John Karas, was the recipient of a young investigator award at the recent RACI Peptide Users' Group symposium for his oral presentation entitled: "2-Nitroveratryl as a novel thiol protecting group for directed synthesis of insulin and other cysteine-rich bioactive peptides".

## EDDIE NAGUL RECEIVES HOPE TRAVEL AWARD

PhD student Edward (Eddie) Nagul, from the Kolev lab, has been nominated by the Australian Academy of Sciences to participate in the Sixth HOPE Meeting with Nobel Laureates in Tokyo in March 2014. The Japan Society for the Promotion of Science has approved Eddie's nomination. Eddie is one of six Australian young researchers who will participate in this meeting.

## ASB 2013 POSTER PRIZE

PhD student, Anna Mularski, was awarded the student poster prize at the Australian Society for Biophysics conference held at RMIT in November. Well done Anna!

## MCAULAY-HOPE PRIZE FOR ORIGINAL BIOPHYSICS

Congratulations to Assoc. Prof. Michelle Gee who was awarded the McAulay-Hope Prize for Original Biophysics. Michelle was given the award by the Australian Society for Biophysics at its recent annual meeting where she presented a talk entitled, 'The Mechanobiology of Bacteria'.

## MMI INDERDISCIPLINARY SEED GRANT TO GEE LAB

Assoc. Prof. Michelle Gee, together with Dr Xuehua Zhang and Dr Huabin Wang, were awarded an MMI Interdisciplinary Seed Funding grant for their project 'Graphene thin films with tailored nano-architectures – a new class of antibacterial coating'.

## FRONTIERS IN CHEMICAL BIOLOGY EDITORIAL BOARD

Assoc. Prof. Michelle Gee has been appointed to the editorial board of the new journal, *Frontiers in Chemical Biology*. Congratulations also to the new editor, Professor John Wade, who is an honorary member of the School of Chemistry.

## ARC GRANT SUCCESS

Researchers in the School of Chemistry were successful in the recent Australian Research Council (ARC) grant schemes. Future Fellowships were awarded to Dr Paul Donnelly, Assoc. Prof. Spencer Williams and Dr Wallace Wong and Dr Lars Goerigk received a DECRA fellowship. Discovery Project grants were awarded to Assoc. Prof. Craig Hutton, Prof. Mark Rizzacasa, Prof. Carl Schiesser and Prof. Frances Separovic, who also was lead investigator on a LIEF grant.

## FELLOWSHIP PROGRAM BACKS HARVARD INNOVATORS

Innovation is front and centre of Australia-Harvard Fellowship grants. In the latest round of applications, Harvard Club Australia (HCA) Foundation makes it very clear that they favour applicants whose collaborative research can "demonstrate strong potential for break-through impacts", and value highly projects which will use the funding as 'seed capital'. Incoming Fellow for 2013, Professor Gerhard Wagner, is a world expert in the field of biomedical research using nuclear magnetic resonance (NMR) and will be working at the School of Chemistry, University of Melbourne with Professor Frances Separovic in determining protein structure that can lead to new drug discoveries. Earlier this week, Professor Wagner gave a lecture entitled "A structural approach to inhibit protein interactions in transcription and translation for targeting human cancer" at the Bio21 Institute and will be here until 20 December 2013.

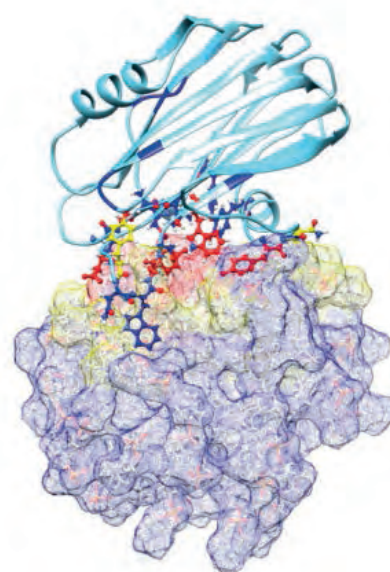


*Photo Credit: Helen Varnavas, Bio21 Institute. Professor Gerhard Wagner (left) is presented with his citation by John Turner, Chairman, Australia-Harvard Fellowship Program Harvard Club of Australia Foundation on 7 November 2013.*

## PORE ME ANOTHER: HOW TOXINS TARGET & OVERCOME MEMBRANES



Chemistry researchers, Professor Frances Separovic (Melbourne) and Professor Terry Lybrand (Vanderbilt), discuss the biology of membranes, how toxins interact with membranes, and how these processes can be modelled. Presented on Up Close by Dr Shane Huntington.

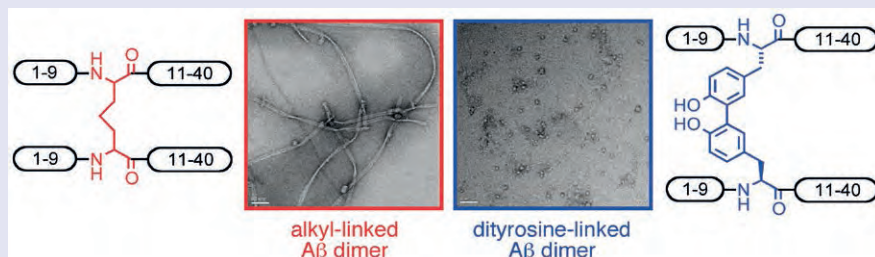


*Image by Daniel Weber. Snapshot obtained from simulation of EqtII with a DPC micelle (left). Residues are colour-coded according to the magnitude of chemical shift perturbation identified from NMR studies, with red (strongest), yellow (moderate) and blue (weakest). DPC surfaces are coloured with respect to their RMSD values over 100 ns, red (< 1 nm), yellow (< 5 nm) and blue (> 5 nm).*



## PEPTIDE DIMERS: DOUBLE THE EFFORT FOR DOUBLE THE EFFECT

Research led by Assoc. Prof. Craig Hutton (Chemistry, Bio21 Institute) and Assoc. Prof. Kevin Barnham (Bio21 Institute, Florey Institute, Pharmacology) has culminated in the synthesis of dityrosine cross-linked amyloid- $\beta$  peptide dimers and investigation of the possible role of these peptides in Alzheimer's disease. The findings were recently published in *Chemical Science*.



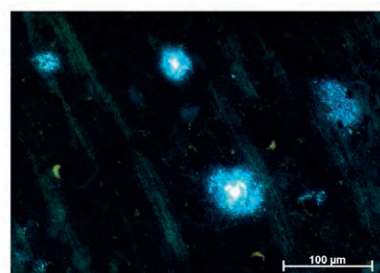
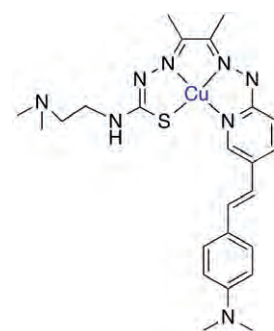
Charles Sturt University received the 'Best Poster Award' at the 2013 In Vino Analytica Scientia conference held in Reims (France) in July for the poster entitled 'A novel glutathione-hydroxycinnamic acid product generated in oxidative wine conditions'.

## IN VINO ANALYTICA SCIENTIA CONFERENCE SERIES

Geoff Scollary (Honorary Principal Fellow) has accepted the invitation to the position of President of the Presidium for the In Vino Analytica Scientia (IVAS) conference series. The IVAS conferences are established under the auspices of the EuCheMS Divisions of Analytical Chemistry and Food Chemistry. The Presidium is composed of the elected president as well as the chairs of the two EuCheMS divisions. Geoff is the first person outside Europe to hold the position of President.

## DIAGNOSTIC IMAGING AGENTS FOR ALZHEIMER'S DISEASE

Work of James Hickey, Paul Donnelly and colleagues aimed at making new imaging agents to aid the clinical diagnosis of Alzheimer's disease has been published in the *Journal of the American Chemical Society*. The article has also been highlighted in the "News" section of *Chemical & Engineering News*.



## MNI ID SEED FUNDING TO HOSSAIN & SEPAROVIC

Dr Akhter Hossain, Professor Frances Separovic and Dr Joe Ciccotosto were awarded funding in the recent Melbourne Neuroscience Institute Interdisciplinary Seed Funding Scheme for their project entitled, "Correlating membrane binding and toxicity of amyloid beta peptide from Alzheimer's disease."

## ANDREW HOLMES - PRESIDENT AUSTRALIAN ACADEMY OF SCIENCE

Congratulations to Professor Andrew Holmes, Laureate Professor of Chemistry, who has been elected as the next President of the Australian Academy of Science (AAS). Andrew will assume the role after the next Annual General Meeting of the AAS in May 2014. The current President of the Australian Academy of Science, Professor Suzanne Cory said, "Professor Holmes will lead our Academy with great distinction, energy and integrity. As Foreign Secretary, he has worked tirelessly on behalf of the Academy and its programs, with the deep conviction that Australia's future prosperity depends on strong research and education in science and mathematics and in further developing international science linkages."

## CHEMISTRY MSc STUDENT PROFILED IN CHEMISTRY IN AUSTRALIA

Andrew Ryan, former MSc student in Chemistry, was featured in the November issue of the RACI magazine, *Chemistry in Australia*. The article, "Sampling a cross-section of chemistry", can be viewed [here](#).

## PROFESSORIAL PROMOTION FOR J WHITE

Associate Professor Jonathan White has been promoted to Professor as of January 1st 2014. The School of Chemistry appreciates Jonathan's many contributions and achievements, particularly in terms of research and teaching. Please congratulate Professor White on this well deserved recognition of his achievements as a scholar and teacher.

## CHEMISTRY PHD STUDENT FEATURED IN RACI MAGAZINE

Michael Leeming, PhD student in the O'Hair lab, was recently featured in the October issue of the RACI magazine, *Chemistry in Australia*.

## BEST POSTER PRIZE

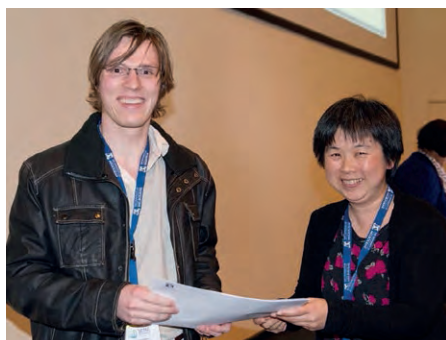
Daniel Dias (formerly School of Chemistry, now Metabolomics Australia), Geoff Scollary (Honorary Principal Fellow) and co-authors from

## NMR PRACTICALS IN UNDERGRADUATE CHEMISTRY

The new bench top NMR which was trialled in our higher level undergraduate practical classes was a resounding success and will continue into the future. A description of the program was published in 'Lab Asia' recently. A article in 'Putting NMR in the hands of the undergraduate chemistry student'.

## SETAC PRIZE TO CHEMISTRY PHD STUDENT

Edward (Eddie) Nagul, a PhD student in the Kolev group, has been awarded the prize for best research presentation by a PhD student or early career researcher in environmental chemistry at the SETAC (Society for Environmental Toxicology & Chemistry) 2014 conference in Melbourne.



## DEVELOPMENT OF THERAPY FOR PARKINSON'S DISEASE

The University of Melbourne has entered an agreement with US start-up company Procypra Therapeutics LLC to develop a class of drugs for treating neurological diseases such as Parkinson's disease. The research was led by Dr Paul Donnelly (School of Chemistry, Bio21 Institute), Assoc. Prof. Kevin Barnham (Bio21 Institute, Florey Institute of Neuroscience & Mental Health, Department of Pharmacology) and Assoc. Prof. Anthony White (Department of Pathology).

## HEALY AWARD TO ERWIN TOLAVA

Congratulations to Erwin Rodriguez Tolava, PhD student with Rachel Caruso's research group, who was awarded a T.W. Healy Travel Award to attend the 7th Asian Conference on Electrochemical Power Sources in Osaka, Japan, in November 2013.

## CASS FOUNDATION TRAVEL GRANT TO VIK DRYZA

Congratulations to Dr Viktoras Dryza who was awarded a CASS Travel Grant to enable him to attend the 6th International Conference on Hybrid Inorganic-Organic Photovoltaics being held at Swiss Tech Convention Centre, Ecole Polytechnique Federale de Lausanne, Switzerland, in May 2014.

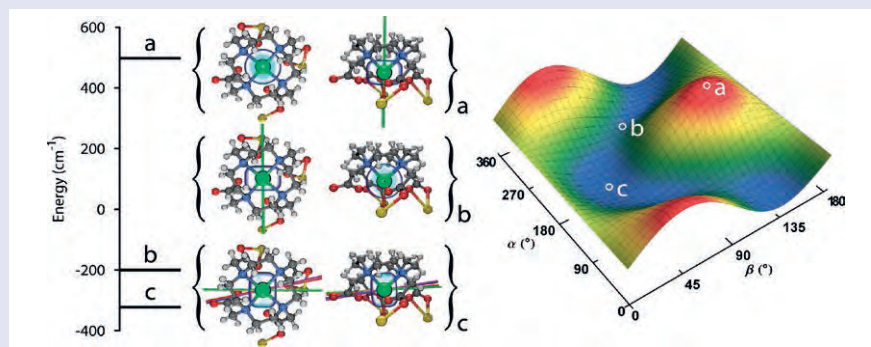
## PHD STUDENT FEATURED IN 'CHEMISTRY IN AUSTRALIA'

Caroline Kyi, PhD student in the Schiesser group, was recently featured in the September issue of the RACI magazine, Chemistry in Australia in the article, "Putting culture into chemistry".



## NATURE COMMUNICATIONS PAPER BY ALESSANDRO SONCINI

Congratulations to Dr Alessandro Soncini for his publication in *Nature Communications*, in collaboration with an experimental inorganic chemistry group from the University of Manchester. The article (Chilton et al., *Nat. Commun.* 4, 2551 (2013), doi: 10.1038/ncomms3551) reports a theoretical model based on classical electrostatics that is capable of predicting the direction of the magnetic easy axis in low-symmetry dysprosium complexes. The direction of the magnetic axis in complexes with little or no symmetry is a crucial piece of information for the design of efficient single-molecule magnets. Before this work, magnetic axes could only be determined by means of intricate and time consuming high-level *ab initio* calculations, providing little insight into structure-properties relationship. Dr Soncini and his Manchester collaborators managed to map the intricate *ab initio* quantum chemistry problem into a back-of-the-envelope classical electrostatic energy minimization procedure, which takes seconds to run, and provides a clear and chemically intuitive link between atomic charges on the ligands as determined by pencil-and-paper resonance Lewis structure arguments and the direction of the magnetic axis in the complex. These results will prove useful to devise synthetic strategies to control the axis direction and engineer efficient lanthanide-based single molecule magnets.

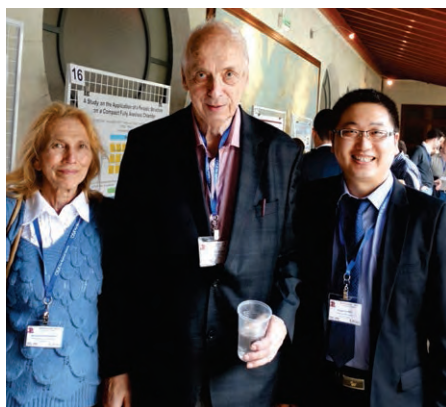


## VICTORIAN RESEARCH FELLOWSHIP TO BRETT PATTERSON

Six early career researchers have been awarded a Victorian Postdoctoral Research Fellowship, to study overseas and bring their expertise back home. Announcing the Fellowships, Minister for Innovation, Services & Small Business, Louise Asher said the Victorian Government's Postdoctoral Research Fellowships program aims to strengthen Victoria's innovation capability and global networks. The three-year Fellowships program involves Fellows spending two years abroad as guest researchers in leading research institutes or universities and a year working with their Victorian host organisations, applying their learning and expertise. Dr Brett Paterson from the School of Chemistry will work at University of Melbourne and Kings College London to develop radiopharmaceuticals for detection and treatment of cancer.

## XINGZHAN WEI AT METAMATERIALS 2013 CONFERENCE

Dr Xingzhan Wei of the Nanoscience Research Lab (NSL) met Professor Victor Veselago, who firstly proposed the negative refractive index material. Dr Wei represented the NSL at the 7th International Congress on Advanced Electromagnetic Materials in Microwaves & Optics, 'Metamaterials 2013', in Bordeaux, France.



## IAN POTTER TRAVEL AWARD TO INES ALMEIDA

An Ian Potter Travel Grant was awarded to Dr Ines Almeida to participate in the 18th International Conference on Flow Injection Analysis in Oporto, Portugal, from 15 to 20 September 2013. Ines will present a talk entitled, 'Paper-based microfluidic device using a polymer inclusion membrane as sensor'.

## CAMPUS REVIEW TOP 5 INNOVATORS: 'REINVENTING SOLAR POWER'

Dr David Jones is producing extra-large solar cells that have the potential to make solar power much cheaper. David is leading a team of researchers from the University of Melbourne, CSIRO and Monash University in producing the largest flexible solar cells ever to be printed in Australia. He is the project coordinator of the Victorian Organic Solar Cell Consortium (VICOSC) – a partnership of research and industry Associates. After six years of working on the development of printed organic solar cells, David and his team discovered a way to print organic photovoltaic cells the size of an A3 sheet of paper.

## ANGEW CHEM JOURNAL COVER ON MASS SPECTROMETRY WORK

*Angew Chem* journal cover introduces a new superhero, Mass Spectrometry Man: The O'Hair, Donnelly and White Labs have had a paper published in *Angew Chem* where they have used mass spectrometry to direct the synthesis of a novel silver hydride cluster that was isolated and fully structurally characterized.

## VC STAFF ENGAGEMENT AWARD TO AUGUSTINE DORONILA

Congratulations to Dr Augustine Doronila who was awarded a Vice-Chancellor's Staff Engagement Grant for a phytoremediation project in the Philippines.

## CCIF AWARD FOR HIGH PERFORMANCE MATERIALS

Congratulations to Dr David Jones on his success with the Carlton Connect Initiatives Fund (CCIF) – Facilitation stream. His submission entitled "Smart Selection of High Performance Materials for Organic Photovoltaics" has been approved for funding.

## PUBLICATION IN SCIENCE FOR GEORGINA SUCH

Congratulations to Dr Georgina Such for her publication in *Science* with Frank Caruso's Nanostructured Interfaces & Materials Science Group. The article (Ejima et al., *Science* (2013) 341: 154-157) reports on a new surface assembly technique based on the one-step coating of various interfaces with complexes of natural polyphenols, most notably tannic acid, with Fe(III) ions. The film formation is initiated by the absorption of the polyphenol and stabilised by pH-dependent, multivalent coordination bonding by the Fe ions. This assembly technique can be performed on a range of templates and is extremely rapid, requiring less than 10 seconds for film formation. The ease, low cost and scalability of this process make it attractive for biomedical and environmental applications.

## GEE PUBLICATION ON BIOFILMS IN PNAS

Congratulations to Assoc. Prof. Michelle Gee and Dr Huabin Wang from the Soft Matter & Cell Biophysics group on publication with their collaborators in *Proc Natl Acad Sci USA*, which shows that the self-organisation of bacteria during cell migration when forming biofilms is facilitated by extracellular DNA.



## SUPERBUG BREAKTHROUGH FEATURED IN THE AGE -

Work published in *Nature Scientific Reports* earlier this year was featured in an interview with Assoc. Prof. Michelle Gee in *The Age*. Michelle's team showed how a class of antimicrobial peptides get into bacterial cells using experiments with live bacteria.



## CTRL+P: PRINTING AUSTRALIA'S LARGEST SOLAR CELLS

VICOSC project co-ordinator and University of Melbourne researcher, Dr David Jones, discusses printing of organic photovoltaic cells the size of an A3 sheet of paper in *The Voice*.

## PAUL MULVANEY APPOINTED ASSOCIATE EDITOR OF ACS NANO

Congratulations to Paul Mulvaney who has been appointed Associate editor of the journal *ACS Nano*. Published monthly, *ACS Nano* is an international forum for the communication of comprehensive articles on nanoscience and nanotechnology research at the interfaces of chemistry, biology, materials science, physics and engineering. Moreover, the journal helps facilitate communication among scientists from these research communities in developing new research opportunities, advancing the field through new discoveries, and reaching out to scientists at all levels. *ACS Nano* received the 2008 Association of American Publisher's Award for Best New Journal in the category of Science, Technology & Medicine.

## VLSCI RESOURCE GRANT TO CHEMISTRY

Congratulations to Daniel Weber, PhD student, and Frances Separovic who were awarded computer time on BlueGene Q for their project, Membrane structure of equinatoxin II.

## EMBL TRAVEL GRANT & NH SCHUSTER SCHOLARSHIP AWARD

Congratulations to PhD student, Quinn Besford, who received two prestigious scholarships for his work on glycogen and highly branched polymers. One of these, the 2013 EMBL Australia Travel Grant, will support a trip to the European Molecular Biology Laboratory in Hamburg. The other is the 2013 Norma Hilda Schuster (nee Swift) Scholarship for outstanding research into biochemistry.

## GETTING CHEMISTRY RIGHT BETWEEN RESEARCHERS & REGULATORS

Marine biofouling is a major environmental and economic problem costing the shipping industry alone \$60 billion/annum. A highly successful workshop on biofouling management was held at the Melbourne Convention Centre, 6-9 May 2013. It brought together over 120 key stakeholders from Australia, New Zealand and across the Pacific who are involved in identifying, promoting and developing effective and practical biofouling management strategies. The first two days centred on risk, requirements and regulations with the final half of the workshop focusing on the science and technology of biofouling management and in

## CHEMISTRY HOSTS ART MYSTERY EVENT

On June 6, the School of Chemistry hosted a 'Chemistry Art Mystery' evening presented by the ARC Centre of Excellence for Free Radical Chemistry & Biotechnology and Quantum Victoria. The event was attended by around 50 University of Melbourne alumni who donned detective coats for the evening to solve an art forgery mystery with chemistry experiments and information about the history of the paintings in question. The event was modelled on a program developed by the Free Radical Centre and Quantum for secondary school students.



Photo Credit: Recalcitrant Productions.

particular the ecology and chemistry of marine antifouling coatings. The unique mix of presentations were delivered by an international line up of speakers and rounded off with panel discussions featuring some amazingly productive discussions and debate. Ensuring shipping and other maritime industries in the region can continue to underpin trade, security and economic development with minimal environmental impact is critical. This meeting has laid the foundations for what will become a major interdisciplinary biennial forum. Major sponsors included the University of Melbourne, Office of Naval Research (Washington DC) and the Institutes of Defence Science (Melbourne) and Marine Engineering, Science and Technology (London). Further details from the co-organisers: Dr Alex Wu and Prof. Rob Lamb, School of Chemistry.



## SELBY RESEARCH AWARD TO CHRIS RITCHIE

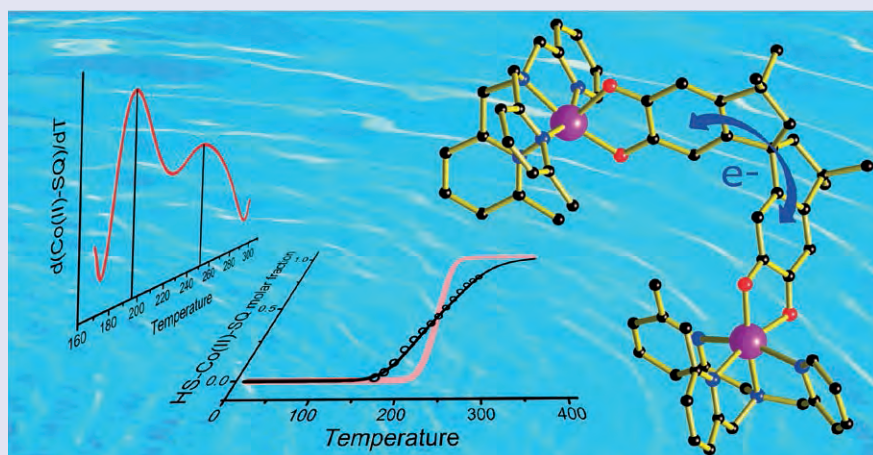
Congratulations to Dr Chris Ritchie who has been awarded the 2013 Selby Research Award for his project entitled, 'Photoresponsive Polyoxometalate Diarylethen Hybrids'.

## JOURNAL COVER FOR CARUSO GROUP

Postdoctoral fellows Andreas Ide and Jon Choi from the Caruso group have had their research images featured on the cover of the *Journal of Materials Chemistry A*. Their article describes the preparation of webs of fibrous titanium zirconium oxide using an electrospinning technique; the fibres were studied for the adsorption of heavy metal ions in water.

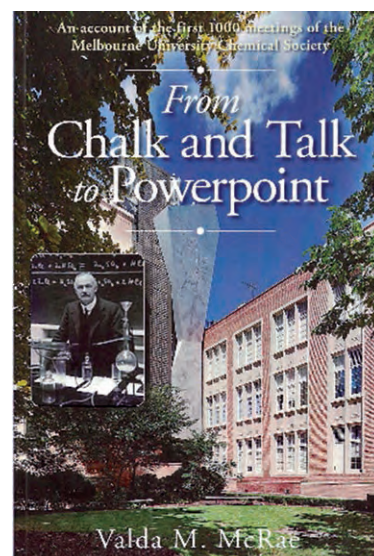
## JOURNAL OF AMERICAN CHEM SOC PAPER FOR BOSKOVIC LAB

Congratulations to Kerwyn Alley of the Boskovic Group for publication of some of his PhD research in the *Journal of the American Chemical Society*. The article entitled, Redox Activity and Two-Step Valence Tautomerism in a Family of Dinuclear Cobalt Complexes with a Spiroconjugated Bis(dioxolene) Ligand, provides important insights into the molecular origins of two-step valence tautomeric transitions, which has implications for the design of switchable molecules for display devices and molecular electronics.



## MUCS BOOK LAUNCH OF 'FROM CHALK & TALK TO POWERPOINT'

The 1020th MUCS meeting was a huge success, with excellent attendance from both current and previous members of the School of Chemistry. Dr Valda McRae's book, "From Chalk and Talk to Powerpoint", was launched by the Provost, Prof. Margaret Sheil. The books were on sale after the meeting, and Valda spent much of the evening signing! The President of MUCS, the atomically smooth Professor Rob Lamb, spoke about the challenges of turning science into technology, and the development of non-stick and self-cleaning surfaces. The talk generated considerable interest and will be written up in the science press.





## MATERIALS FOR ENERGY - PRINTABLE, FLEXIBLE SOLAR PANELS

*The Age* featured the work of Dr David Jones (Chemistry, Bio21) as part of his collaboration with Dr Scott Watkins at the CSIRO. The collaboration, which includes more than 50 researchers from Melbourne, Monash and CSIRO, has enabled for the first time the large scale printing of flexible solar panels.



## CHEMISTRY COLLABORATION PUBLISHED IN CELL

Congratulations to Assoc. Prof. Michelle Gee, whose collaboration with researchers at WEHI has resulted in a recent publication in the journal, *Cell*, entitled Cell-Cell Communication between Malaria-infected Red Blood Cells via Exosome-like Vesicles.

## NH SCHUSTER AWARD TO VINOJINI NAIR

Congratulations to Vinojini Nair, PhD student with Prof. John Wade and Prof. Frances Separovic, who was awarded a 2013 Norma Hilda Schuster award.

## W EVANS VISITING FELLOWSHIP TO MARK RIZZACASA

Professor Mark Rizzacasa has been awarded the William Evans Visiting Fellowship from the University of Otago. Mark will take up the fellowship in Sep - Oct this year.

## CHEMISTRY IN TOP 25 QS WORLD RANKING

The 2013 QS World University Ranking for Chemistry lists the best universities in the world to study chemistry. University of Melbourne comes in highest in Australia and at 23 in the world.

## LEARNING & TEACHING INITIATIVES: ROUND 2 GRANT OUTCOME

Congratulations to Stephen Best, Colette Boskovic and Michelle Gee, who were successful in obtaining funding in the latest Learning & Teaching Initiative grant round for their project: 'ChemBytes Back – LabDots: Empowering students in the Lab.' This will see the creation and on-demand delivery of skills-based video materials to support self-paced progress through the undergraduate laboratories.

## GEOFF SCOLLARY - ASSOC. ED, AUST JOURNAL GRAPE WINE RESEARCH

Geoff Scollary (Honorary Principal Fellow) has been appointed as an Associate Editor with the Australian Journal of Grape & Wine Research, which is the highest impact factor journal in the wine science field. Geoff's appointment is to provide expertise in grape and wine chemistry, areas which are expanding with increasing submissions to the Journal. Geoff left the School in 1997 to take up the dual roles of foundation Professor of oenology and foundation director of the National Wine & Grape Industry Centre at Charles Sturt University. He returned to the School in honorary capacity in 2008 following his retirement from CSU. If you haven't done so already, check out Geoff's monthly wine column in Chemistry in Australia.

## INDUSTRY TRANSFORMATION RESEARCH HUB: TWO AWARDED

Prof. M. Ashokkumar is a chief investigator on two ITRH (Industry Transformation Research Hub) grants totalling more than \$10M awarded to the University of Melbourne. The ARC introduced this new research grant scheme late last year in order to encourage collaborative R&D projects to address challenging industry issues. *Dairy Innovation Hub: transformational research to underpin the future of the Australian dairy manufacturing industry* is with industry partner, Dairy Innovation Australia Ltd; and *Unlocking the food value chain: Australian food industry transformation for the Association of Southeast Asian Nations (ASEAN) markets*, is with Kraft Foods.

## KAYE MERLIN BRUTTON BEQUEST GRANT TO BRETT PATERSON

Congratulations to Brett Paterson who was awarded funding from the Kaye Merlin Brutton Bequest for 'Metal complexes as molecular imaging agents of cancer'.

## TW HEALY TRAVEL AWARD TO PHD STUDENTS

The T.W. Healy Travel Award 2013 (round 1) has been jointly awarded to PhD students: Quinn Besford from the Gray-Weale group, and Lu Cao from the Caruso group. Quinn will attend the 11th International Conference on Biology & Synchrotron Radiation in Germany, Sep 2013; and Lu will go to the 7th International Conference on Materials for Advanced Technologies in Singapore, Jul 2013.



## ADVANCE GLOBAL AUSTRALIAN AWARD TO RUSSELL HOWARD

Science alumnus, Russell Howard, was awarded an Advance Global Australian Award and was the overall winner for his global impact on the biotechnology field and green chemistry. The 2013 Advance Global Australian Awards Forum and Ceremony was held at the Museum of Contemporary Art in Sydney on 21 March 2013. Russell, Founder and CEO of Oakbio Inc., has selected Chemistry student, Peter Hall, to be his mentee as part of the Advance Mentoring Program.

## JOURNAL COVER FOR BOSKOVIC GROUP

Congratulations to Susanna Mandic, Merinda Healey, Jan Gotthardt, Kerwyn Alley, Robert Gable, Chris Ritchie and Colette Boskovic for their artwork featured on the cover of a special issue of the *European Journal of Inorganic Chemistry* dedicated to Polyoxometalates. The article communicates studies of an unusual polyoxometalate-based coordination polymer.

## SCIENCE NATIONAL SCHOLARSHIPS FOR CHEMISTRY MSC STUDENTS

Congratulations to Tessa Evans and Stacey Rudd each of whom has been awarded a Science National Scholarship in recognition of outstanding results. Both are undertaking MSc (Chemistry): Tessa with the Lamb group and Stacey with the Donnelly group.

## SCIENTIFIC REPORTS ARTICLE ON ANTIMICROBIAL PEPTIDES

Congratulations to Michelle Gee and Matthew Burton of the Soft Matter & Cell Biophysics group for their paper published on 27 March in Scientific Reports on imaging the action of antimicrobial peptides on living bacteria. The work shows the mechanism by which antimicrobial peptides disrupt the cell membrane of bacteria leading to cell death.

## 2013 HARTUNG YOUTH LECTURE SERIES

Professor Paul Mulvaney and Dr Tich-Lam Nguyen presented the RACI 2013 Hartung Youth Lectures. The lectures were attended by ~350 students in years 9-12 and held at La Trobe University in Albury-Wodonga, Bendigo and Bundoora campuses.



## CHEMISTRY 'IDEAS THAT COULD CHANGE YOUR LIFE'

The Age Melbourne Magazine (March issue) and online on 22 March - David Jones and the VICOSC team's work to produce thin, flexible solar cells featured in the news. The Bio21 Institute was also included in The Age Melbourne Magazine's Profile of institutes within the Parkville Precinct along with 'Top Toys', the OMX Blaze and 800 NMR.

## MICHAEL LEEMING AWARDED 2013 E & V PUZEY SCHOLARSHIP

The School of Chemistry congratulates PhD student Michael Leeming from the O'Hair research group on being the Faculty of Science recipient of the prestigious Elizabeth and Vernon Puzey Scholarship for 2013. The scholarship aims to 'retain the services of well qualified citizens of Australia from leaving Australia' and is in honour of the late Elizabeth and Vernon Puzey of Toorak.

## GRIMWADE PRIZE IN INDUSTRIAL CHEMISTRY

The Faculty of Science 2012 Grimwade Prize in Industrial Chemistry has been awarded to Professor Spas Kolev for his research on "The development of novel polymer inclusion membranes (PIMs) and their application in chemical analysis, industrial separation and the manufacturing of monolayers of metallic nanoparticles". Congratulations Spas!

## ASI POSTDOCTORAL FELLOWSHIP TO VIK DRYZA

Congratulations to Dr Viktoras Dryza, who has been awarded a postdoctoral fellowship from the Australian Solar Institute. His research project, entitled 'Guiding the rational design of organic dye sensitizers for solar cell technologies', aims to isolate organic dye molecules in the gas phase and investigate their spectroscopy and photophysics using advanced laser-based techniques.

# SOCIETIES

## CHEMISTRY POSTGRADUATE SOCIETY 2013

President: Nicholas Kirkwood

Treasurer: Luke Gamon

Secretary: Alessandra Bestetti

General Committee: Alex McDonald, Rebecca Szabadai, Chris Kingsbury, Sarah Jaber, Sean Collins, Gautam Jain, Rob Johnston, Paul Ionescu, Liz Mills

## PRESIDENT'S REPORT

Throughout 2013 the CPS continued to organise social events for postgraduates and staff to engage with each other outside of the lab environment. Several "Friday Frothies" drinks, two barbeques, an ultimate Frisbee championship and a trivia night were run. In addition the CPS helped out the MUCS committee with drinks following each MUCS lecture.

The Friday Frothies were very well attended this year, probably because they were less frequent and advertised well in advance. They remain the simplest but most effective event the CPS runs. The integration with MUCS was an interesting concept but most CPS committee members felt that the groups serve very different functions and should be kept separate, as the time commitment required to run MUCS events detracted from our ability to run CPS events.

Despite being a huge success in 2012, the 2013 Ultimate Frisbee Championship failed to attract large numbers and as a result the teams were set as "Mulvaney vs The Rest". "The Rest" won 6-3. To ensure a good turn-out this year team leaders will be chosen in advance to prepare their teams.



Back (from left): Nicholas Kirkwood, Chris Kingsbury, Alex McDonald, Alessandra Bestetti.

Front: Liz Mills, Sean Collins, Rebecca Szabadai, Rob Johnston, Sarah Jaber.

Free food once again proved to be a winner with both CPS barbeques in 2013 generating large crowds, and the Trivia Night was a huge success with well over a hundred people attending. The Clyde proved very easy to work with but in future I would suggest setting a cap at around 80 people (8 tables) as there were too many people to fit into the pub!

Last but not least the "Homebrew Showcase" has been discussed for a long time but not yet run. The idea is an event where chemists show off their beer-brewing skills. Perhaps the 2014 committee can realise this idea and we wish them all the best!

## MELBOURNE UNIVERSITY CHEMICAL SOCIETY (MUCS)

### Program of Events for 2013

**President:** Prof. Rob Lamb

**Secretary:** Dr Angus Gray-Weale

**Treasurer:** Dr Wallace Wong

**Student Representatives:**

Nick Kirkwood, Quinn Besford, Luke Gamon



Dr Valda McRae's book, "From Chalk and Talk to Powerpoint: the first 1000 lectures of the Melbourne University Chemical Society", was launched on 29 May 2013. Left to right: Rob Lamb, Valda McRae and Margaret Sheil.

### March 27th

(Lecture 1019) 5.15 pm; Cuming Theatre, Chemistry Building

Professor Prof. Philip Blower  
King's College London

*The nuclear chocolate box: the periodic table in nuclear medicine*

### May 29th

(Lecture 1020) 5.15 pm; Cuming Theatre, Chemistry Building

109th President's Address: Prof. Rob Lamb, University of Melbourne

*Making non-stick coatings out of thin air: Guiding science through to technology with the Australian Synchrotron*

### July 31st

(Lecture 1021) 5.15 pm; Masson Theatre, Chemistry Building

Stranks Lecture: Prof. Cameron Kepert  
University of Sydney

*Shrinking crystals - achieving extreme thermomechanical properties through a molecular materials approach*

### November 23rd

(Lecture 1022) 5.15 pm; Masson Theatre, Chemistry Building

Feutrill Lecture: Dr David Jones  
University of Melbourne

*Printed Power - The development of printed organic solar cells in Victoria*



# CHEMISTRY BUILDING REDEVELOPMENT

These new laboratories will house the Kolev and Gee research groups and also include a major general instrumentation laboratory. Photos of the refurbished laboratories on this level before occupation by the research groups in early 2014 are appended to this report. The completion of these works marks an important milestone in the building program as all teaching and research laboratories in the Chemistry Building will have been redeveloped as envisaged in the original Chemistry Building Plan initiated in 2007. While a final phase of the program will involve renovations of offices and general usage building spaces, the initial vision to refurbish the Chemistry Building complex for modern laboratory teaching and research has largely been achieved.

4 levels of the East Wing of the Chemistry Building now house School of Chemistry research groups while teaching activities (teaching laboratories, lecture theatres and multipurpose learning spaces) have been consolidated into the redeveloped Chemistry West Building. Services to provide power, heating and chilled water together with required gas reticulation and fumehood infrastructure to all levels has also been installed. A continually updated record of the progress of the building refurbishments from 2007 is available on the School website

at <http://www.chemistry.unimelb.edu.au/chemistry-building-redevelopment>.

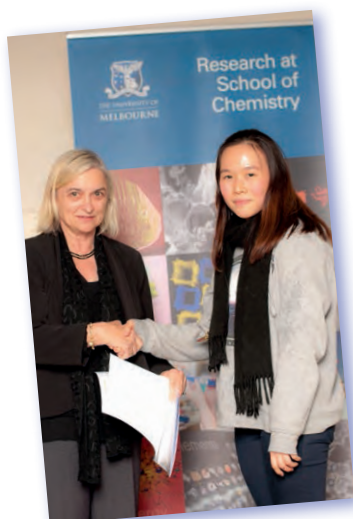
A new Chemistry Master Plan developed during 2012/2013 in conjunction with Property and Campus Services will guide future development of the Chemistry building. This will include the update of several areas in the Chemistry West Building including office, public access areas and some teaching spaces so the building continues to provide appropriate facilities for modern teaching and research in chemistry. The Chemistry Building Working Group has met regularly throughout 2013 to provide guidance and feedback to Property and Campus Services personnel on the building works and maintenance issues within the building.

The membership of the Chemistry Building Working Group in 2013 was: Stephen Best, Ken Ghiggino, Franz Grieser, Spas Kolev, Bryan McGowan, Frances Separovic, Paul Beardsley (Faculty of Science Precinct Facilities and Operations Manager, West), Laurence Sugar (Property and Campus Services).

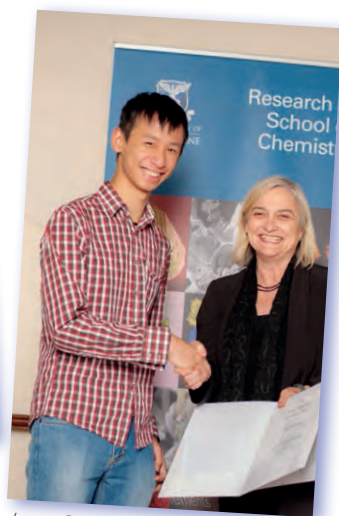
**Ken Ghiggino**  
**Chair, Chemistry Building Working Group**







Stephanie Quah



Josés Grady Nathanael



Claire Baillie



Calvin Lee



Anton Zalewski



Marcus Giansiracusa



Tessa Young



Athanasios Zavras



Ognjen Belic



Liselle Atkin



Luke Wilson

# STUDENT PRIZES AND AWARDS

## AGILENT AWARD FOR EXCELLENCE

**Calvin Lee**

Awarded to the student with the highest marks in the third year Chemistry research subject, with preference for student projects related to spectroscopy.

## J S ANDERSON PRIZE

**Claire Baillie**

Awarded to the student enrolled in the BSc (Honours), MSc or Postgraduate Diploma Chemistry, who is majoring in Chemistry and displays the greatest aptitude and potential for research.

## JAMES CUMING MEMORIAL SCHOLARSHIP

**Major: - Scott Fletcher**

**Minor: - Marcus Giansiracusa**

Awarded to students who have fulfilled the requirements of the Bachelor of Science and who are enrolled to undertake further studies in the School of Chemistry through the BSc (Honours), MSc or Postgraduate Diploma Chemistry.

## DULUX AUSTRALIA PRIZE

**Tessa Young**

Awarded by a selection committee to a Chemistry student who has completed the BSc. and is in the final year of the BSc (Honours), MSc or Postgraduate Diploma Chemistry.

## DWIGHT PRIZE

**Wenxiao Yue**

Awarded annually to the student with the highest aggregate marks in first year Chemistry subjects.

## EXHIBITION PRIZE

**Stephanie Quah**

Awarded annually to the student with the highest aggregate marks in first year Chemistry subjects.

## THE THOMAS HEALEY AWARD

**Lu Cao, Quinn Besford & Erwin Rodriguez**

These PhD travel awards are given to enable students to attend a conference of international standing, at which the student will present the results of their research.

## THE HUNTSMAN AUSTRALIA PRIZE

**Liselle Atkin**

Awarded for an outstanding performance by a second year chemistry student proceeding to a major in 3rd year Chemistry.

## THE ANDREW KIRBY AWARD FOR RESEARCH EXCELLENCE

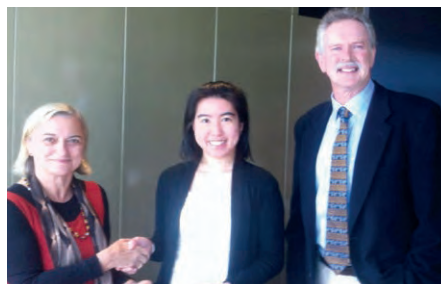
**Athanasios Zavras**

Awarded to a Chemistry student entering a PhD in the School of Chemistry who has demonstrated excellent research potential in the BSc (Honours), MSc, MPhil or Postgraduate Diploma Chemistry who are continuing on to a higher degree in the School of Chemistry.

## THE MONICA ELIZABETH REUM MEMORIAL PRIZE

**JiaYing Linda Chan**

Awarded to a PhD student who submits for assessment an outstanding thesis in an area of Organic Chemistry.



*Prof. Frances Separovic & John Wade (WEHI) present JiaYing Chan (centre) the Monica Elizabeth Reum Memorial Prize.*

## RONALD RISEBOROUGH PRIZE

**Ognjen Belic**

Awarded for the best research report in field of Applied Chemistry based on results achieved in BSc (Honours), MSc or Postgraduate Diploma Chemistry.

## FRED WALKER SCHOLARSHIP

**Josef Grady Nathanael**

Awarded to a 3rd year student majoring in chemistry based on their averaged weighted third year results in Chemistry subjects, and who are continuing on in a BSc (Honours), MSc or Postgraduate Diploma in Science in the School of Chemistry.

## C A TAYLOR PRIZE

**Luke Wilson**

Awarded to the most outstanding student in 2nd year Chemistry who is intending to major in Chemistry.

## THE DR REX WILLIAMSON & FAMILY SCHOLARSHIP

**Anton Zalewski**

Awarded to a 3rd year student for academic merit as determined by the highest third year BSc results in Organic Chemistry.



# CHEMISTRY OUTREACH

This year we worked with just over 22,000 students from Prep – Year 12, engaging these students in chemistry and supporting 1,609 of their teachers with interesting curriculum-relevant activities and Professional development sessions.

Highlights this year included being asked by the producers of *Masterchef* to put together a demonstration on food science and acid base indicators for use at the beginning of one of their episodes. As part of the National Youth Science Forum, we also hosted students who came into Chemistry for sessions on identifying chemical elements and the behaviour of gases.

The biggest outreach events of the year are the *Analytical Instrument Workshops*, where Year 12 students travel in to the University to study and use some of our instrumentation and detect and measure components of food. This year they measured the amount of salt in soy sauce, the caffeine concentration of coke and the calcium content of seawater.

The workshops are invaluable experience for students, allowing them the chance to see and use instruments that they would otherwise only read about and are especially useful for small and regional schools. We had schools travel in from all over Victoria including Portland Secondary College, Wodonga Secondary College, Swan Hill College and Bairnsdale College. We had three classes with only 1 student visit from each of Kaniva Secondary College, Tyrrell College (Sea Lake) and Rushworth P-12 College.

The year finished with a *demonstration-a-thon* that trained teachers to perform spectacular (but safe) classroom demonstrations. Chemical examples can give teachers fabulous and attention-grabbing ways to illustrate concepts.

The session provided an exciting opportunity for inexperienced teachers to develop classroom skills that they can take back to their schools to engage their students.



## RACI HARTUNG YOUTH LECTURES – MARCH & OCTOBER 2013

### Chemistry at the Nanoscale: The Next Ten Years

In the tradition of lectures given by Professor Hartung over 60 years ago, this year Professor Paul Mulvaney and Dr Tich-Lam Nguyen presented the Hartung Youth Lecture Series to more than 400 regional students. With the topic, Chemistry at the Nanoscale: The Next Ten Years, they aimed to inspire students in years 9-12 in an engaging and educational experience.

The lectures discussed the central role of chemistry in nanoscience and nanotechnology. In particular, they talked about some of the applications expected to appear over the next decade. Students were shown how certain materials, such as quantum dots, platinum and liquid magnet, are used. They also saw how gold colloids were synthesized, played with NiTiNol memory wires and magic sand. Students also took home with them book marks illustrating applications of nanomaterials, brochures on nanotechnology and a bucky ball origami with facts about nanoscience, sponsored by TechNYou.



With coordination by the RACI and universities, the lectures were presented at La Trobe University Albury-Wodonga, Bendigo and Melbourne campuses, Monash University Clayton campus and Deakin University Warrnambool campus. Students and teachers attending the lectures were from Penola Catholic College, Whittlesea Secondary College, Northcote High School, Trinity Grammar School, Swan Hill College, Victory Lutheran College, Marian College Myrtleford, Numurkah

Secondary College and Beechworth Secondary College.

Feed back from a teacher: "Many thanks for the exciting presentation yesterday at the Hartung Youth Science Lecture. I was fascinated to see and learn so much.... Thanks so much for the package of goodies - my students are loving them. I really enjoy telling them about coal, graphite, diamond, graphene.....and then BUCKY BALLS! I love the chemistry and I also love the structural implications."



# ALUMNI FUNCTION 2013

## 1980S REUNION



In mid-November, our Honours, Masters and PhD Alumni from the 1980s came together for a reunion dinner, which was a wonderful occasion and a delight that former Department Heads as well as many past staff from that era were able to participate.

The feeling of camaraderie was strong, even after all these years. The atmosphere during the night was convivial and the fond reminiscences of bygone days were entertaining. Thank you to those who attended the event at University House and shared their memories.



# SUBJECTS

## FIRST YEAR

**Director:** Stephen Best

**Lab Director:** Alice Lamb

CHEM10003	Chemistry 1 Stephen Best
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CHEM10004	Chemistry 2 Stephen Best
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CHEM10006	Chemistry for Biomedicine Stephen Best
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CHEM10007	Fundamentals of Chemistry Stephen Best
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## SECOND YEAR

**Director:** Mark Rizzacasa

CHEM20011	Environmental Chemistry Spas Kolev
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CHEM20018	Reactions and Synthesis Mark Rizzacasa
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CHEM20019	Practical Chemistry (Lab) Colette Boskovic
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CHEM20020	Structure and Properties Mark Rizzacasa
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## THIRD YEAR

**Director:** Trevor Smith

CHEM30012	Analytical and Environmental Chemistry (Lab) Spas Kolev
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CHEM30013	Chemical Research Project Richard O'Hair
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CHEM30014	Specialized Topics in Chemistry B Trevor Smith
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CHEM30015	Advanced Practical Chemistry Michelle Gee
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CHEM30016	Reactivity and Mechanism Trevor Smith
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CHEM30017	Specialized Topics in Chemistry A Trevor Smith
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## HIGHER YEAR LEVELS

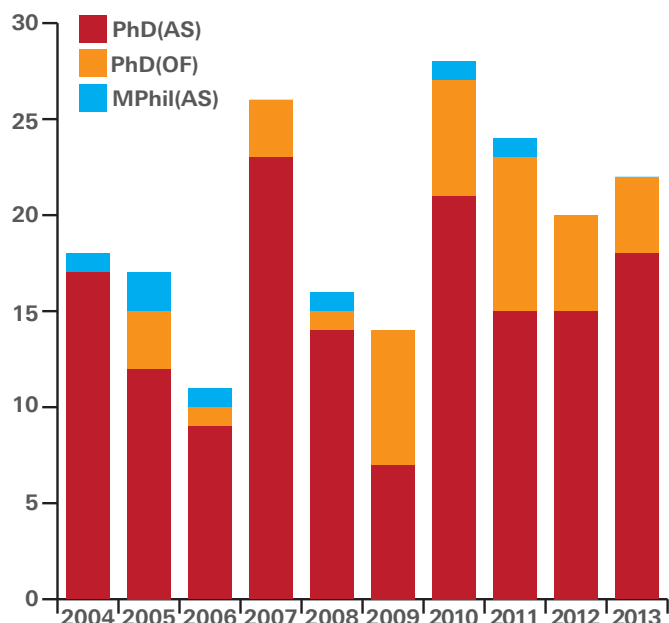
Honours, MSc and PG Diploma in Chemistry Craig Hutton
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PhD and MPhil Brendan Abrahams
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# KEY TEACHING AND LEARNING STATISTICS

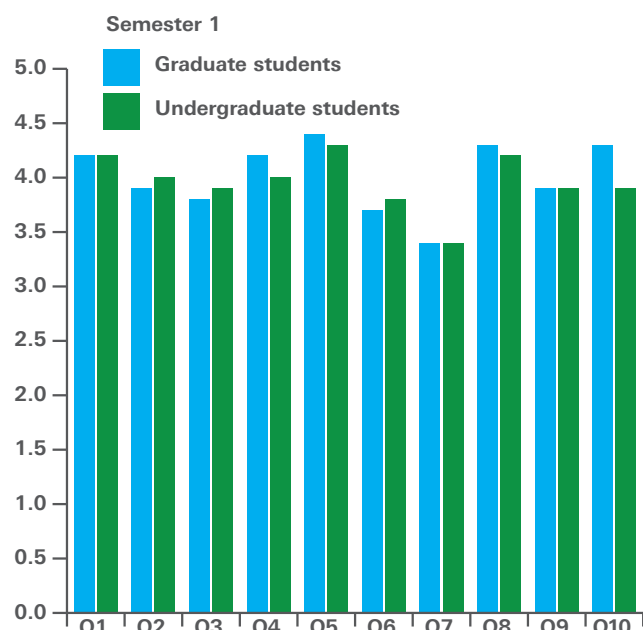
## RESEARCH COMPLETIONS BY YEAR



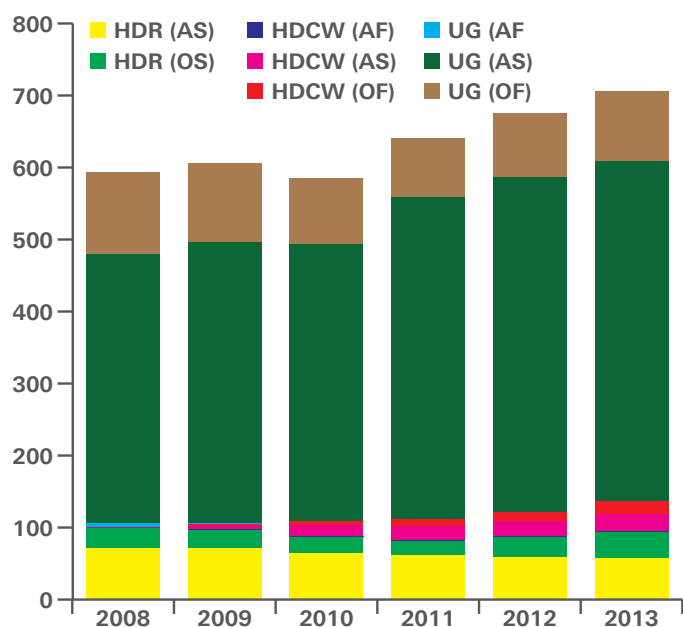
## 2013 SES

The SES survey provides feedback from undergraduate and postgraduate coursework students on their perceptions of the quality of teaching and learning experience for each subject in which they are enrolled.

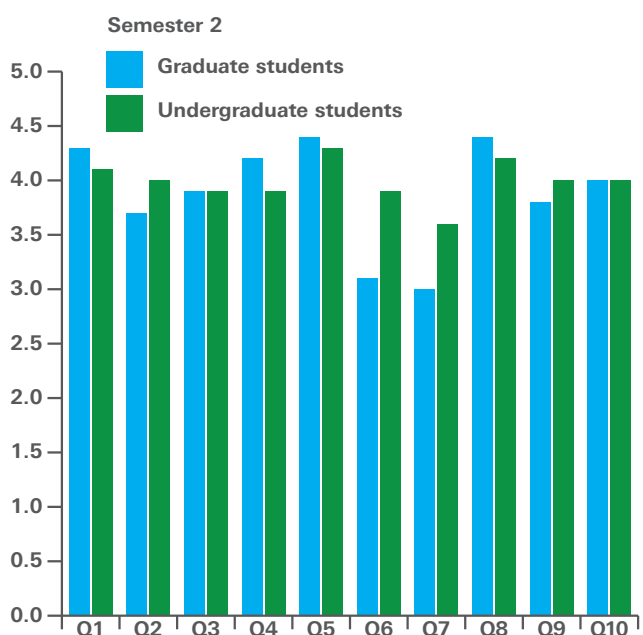
Students are asked whether they strongly agree (5); agree (4); agree nor disagree (3); disagree (2); or strongly disagree (1) with 10 questions regarding the subject.



## TEACHING LOAD



HDR (AS): Higher Degree Research/Australian Subsidised students  
 HDR (OF): Higher Degree Research/Overseas Full-Fee students  
 UG (AF): Undergraduate/Australian Full-Fee students  
 UG (OF): Undergraduate/Overseas Full-Fee students  
 UG (AS): Undergraduate/Australian Subsidised students  
 \*EFTSL refers to Effective Full-Time Student loan



Q1 - Intellectually Stimulating  
 Q2 - Well coordinated  
 Q3 - Learning resources  
 Q4 - Well taught  
 Q5 - High standard

Q6 - Useful assessment  
 Q7 - Valuable feedback  
 Q8 - New Ideas  
 Q9 - Apply to practice  
 Q10 - Learning community



# RESEARCH HIGHER DEGREE STUDENT COMPLETIONS

## Kerwyn Graham ALLEY

Towards valence tautomerism in polynuclear complexes

## Julia BALDAUF

The effects of external fields on the optical properties of nanocrystals

## Steven James BARROW

Single particle spectroscopy of self-assembled gold nanostructures

## Erika BICCIOCCHI

Donor-acceptor block copolymers for photovoltaic applications

## Stephen Lonsdale BIRKETT

Total synthesis of the deshydroxyjudazols A and B

## JiaYing Linda CHAN

Structure-function relationship studies on human relaxin-2 leading to the development of novel RXFP1 receptor-selective analogues

## Zhengfei CHEN

Protic ionic liquids as solvents for amphiphile self-assembly and the preparation of nano-structured inorganic materials

## Young Soo CHO

Removal of thiocyanate and cyanide from gold mine tailings water using a polymer inclusion membrane



Young Soo Cho

## Leena Chandhi DHARMARATHNE

Ultrasound initiated radical formation and electron transfer reactions in aqueous solutions

## Marilena Antonina GIARRUSSO

Ultrasound initiated radical formation and electron transfer reactions in aqueous solutions

## Ben Leigh HARRIS

Structural investigation of organic donor orbitals and their effects on reactivity in cubane, Beckmann fragmentation and seleniranium systems

## Emma Nicole HOOLEY

Ensemble and single molecule spectroscopy of conjugated polymers

## Lilian HOR

Structural and functional characterisation of diaminopimelate epimerase from Escherichia coli

## Brandon Ian MACDONALD

Solution-processed CdTe nanocrystal solar cells

## Benjamin ROBOTHAM

Ultrafast photochemistry of photosynthetic reaction centre mimics



Left to right: John Wade, Frances Separovic, JiaYin Linda Chan and Akhter Hossain

## Jesse ROTH-BARTON

Design, synthesis and characterisation of diketopyrrolopyrrole derivatives for organic photovoltaics

## Shan SUN

Synthesis of novel amino acid-appended cavitands

## Paul Douglas SYLVESTER

Assessment of perylene-based Prof. fluorescent nitroxides for monitoring polyester degradation upon weathering

## Tu Anh Xuan TRAN

A computational investigation into homolytic addition reactions of acyl radicals with alkynes, acetonitrile and ethenimine

## Nicholas Man Kei TSE

Nanostructured nanoparticulate contrast agent for medical imaging

## Jing-Yi Wyvette WEE

Synthesis and X-ray crystallographic studies of novel radioprotectors derived from Hoechst 33258

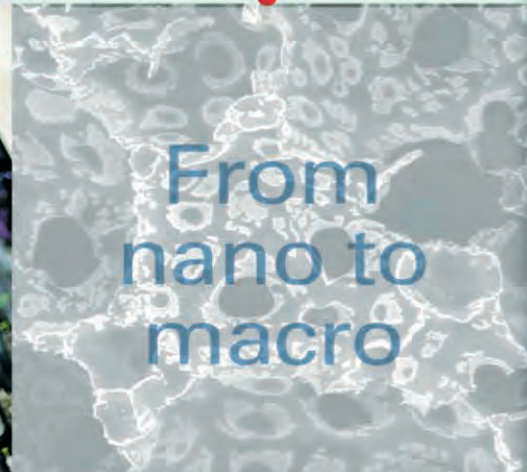
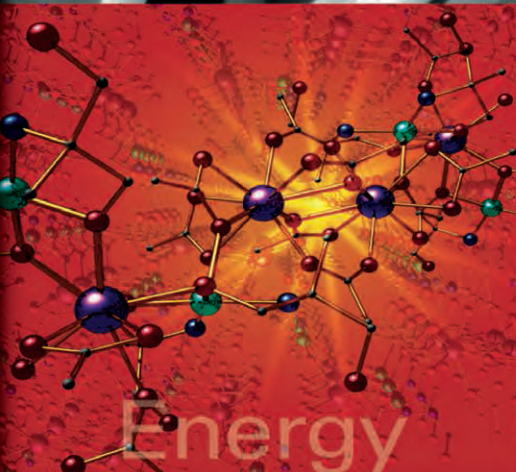
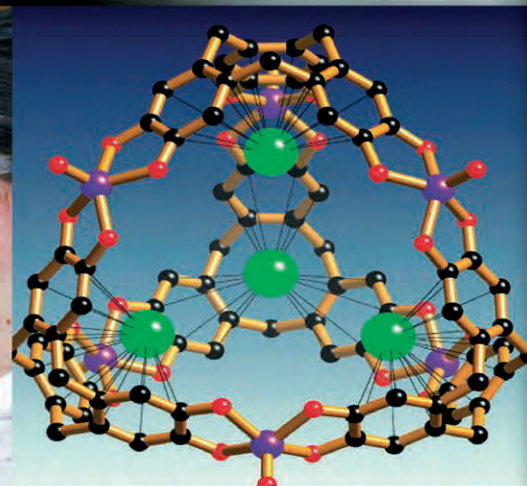
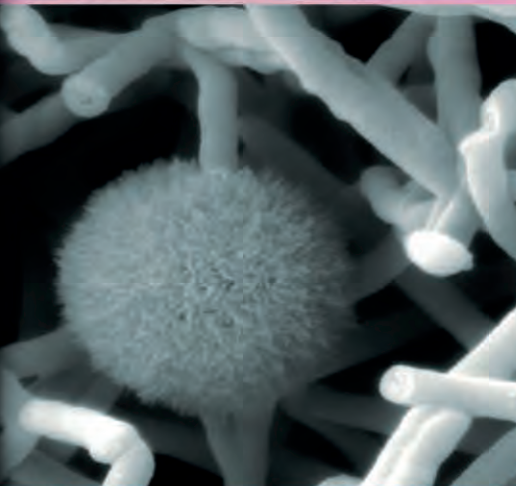
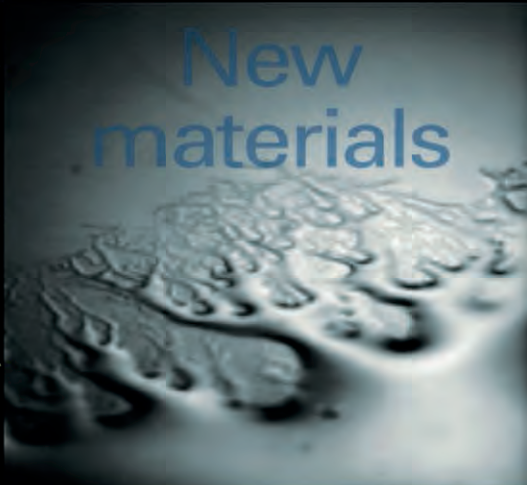
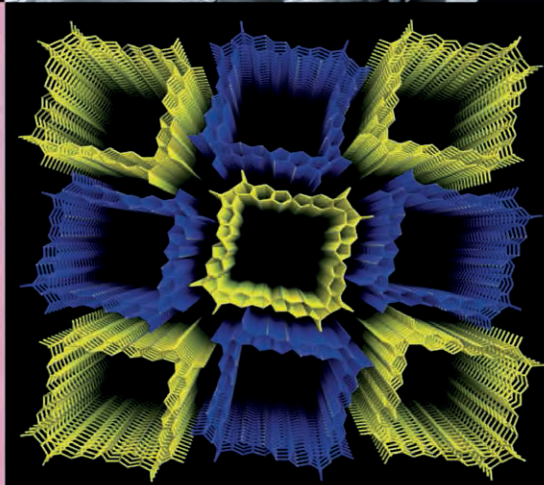
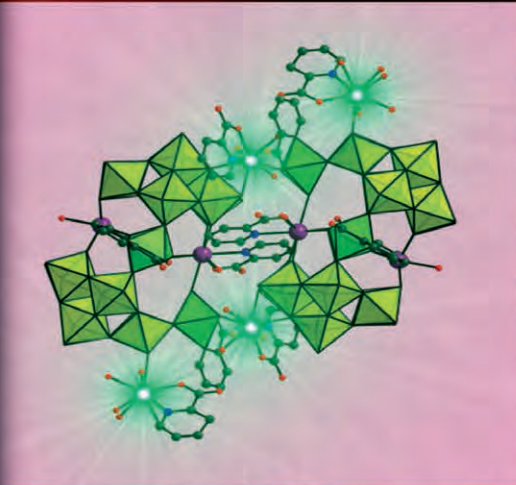
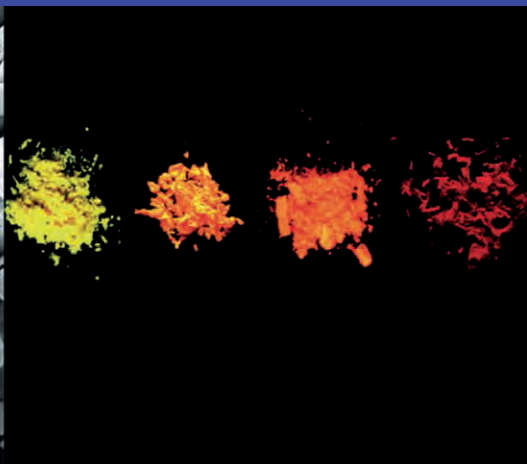
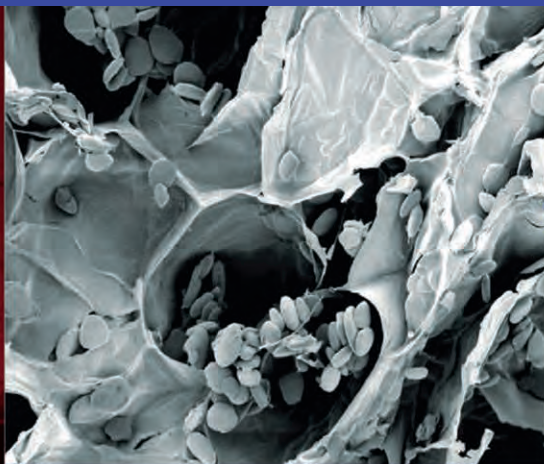
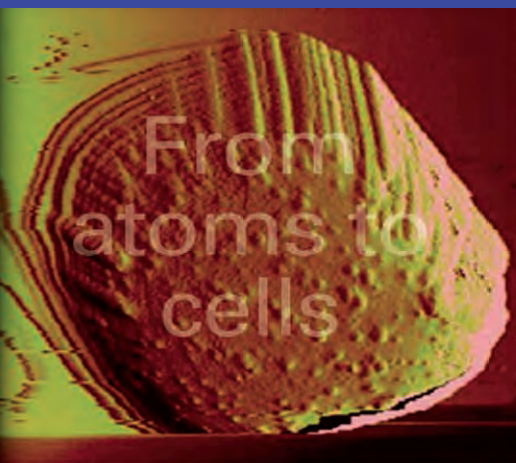
## Rohan James WILLIAMS

Investigating the mechanism of mannosidases: synthesis of novel inhibitors and substrates



Left to right: Jonathan White and Jesse Roth-Barton







# RESEARCH

## RESEARCH PERFORMANCE FOR 2013

The School of Chemistry at the University of Melbourne is one of Australia's leading research centres in the chemical sciences, with an excellent international research reputation and an outstanding record in attracting research funding. The School performed strongly in nationally competitive grant schemes with new successful ARC Discovery Projects, Linkage, Future Fellowships, Discovery Early Career Awards, LIEF equipment infrastructure grants, NHMRC Project, and Industry Transformation Research Hub Grants.

The School hosts the ARC Centre of Excellence for Free Radical Chemistry and Biotechnology and is a participant in the ARC Centre of Excellence in Coherent X-Ray Science. The School is a major part of the Bio21 Institute and has strong links with the Melbourne Materials Institute, Centre for Aquatic Pollution Identification & Management (CAPIM), and the Particulate Fluids and Processing Centre. The Surface and Chemical Analysis Network (SCAN) is a School of Chemistry facility for materials and environmental analysis connecting industry with University researchers. Several academic staff are also members of the Australian Synchrotron Sciences Network.

The quality of our researchers is recognized by awards for research excellence including:

- The Alan Sargeson Award from the RACI Inorganic Chemistry Division to Dr Colette Boskovic;
- The RACI Physical Chemistry Division Lectureship awarded to Dr Angus Gray-Weale;
- McAulay-Hope Prize for Original Biophysics awarded to Assoc. Prof. Michelle Gee;
- ARC Future Fellowships to Dr Paul Donnelly, Assoc. Prof. Spencer Williams and Dr Wallace Wong;
- ARC DECRA Fellowship to Dr Lars Goerigk;
- Victorian Postdoctoral Research Fellowship to Dr Brett Patterson;
- ASI Postdoctoral Fellowship awarded to Viktoras Dryza;
- Selby Research Award to Dr Chris Ritchie;
- The Kaye Merlin Brutton Bequest Grant awarded to Brett Paterson.
- Grimwade Prize in Industrial Chemistry awarded to Prof. Spas Kolev;
- William Evans Visiting Fellowship award to Prof. Mark Rizzacasa;
- Two Industry Transformation Research Hub Grants awarded to Prof. M. Ashokkumar (co-PI);

- Melbourne Neuroscience Institute Interdisciplinary Seed Funding awarded to Dr Akhter Hossain, Prof. Frances Separovic and Dr Joe Ciccotosto;
- MMI Grant awarded to Dr Tich-Lam Nguyen and Dr Wallace Wong;
- Melbourne Researcher Grant Support Scheme awards to Dr Colette Boskovic, Assoc. Prof. Rachel Caruso and Assoc. Prof. Uta Wille;
- CASS Foundation Travel Grant awarded to Dr Viktoras Dryza;
- Ian Potter Travel Award to Dr Ines Almeida;
- Vice-Chancellor's Staff Engagement Grant awarded to Dr Augustine Doronila;
- Carlton Connect Initiatives Fund (CCIF) – Facilitation stream awarded to Dr David Jones.

## RESEARCH FUNDING 2013

The School of Chemistry receives research funding and grants from a variety of sources, including the Australian Research Council (ARC), the National Health and Medical Research Council (NHMRC) and other Government and Industry bodies.

## RESEARCH AREAS

The School currently conducts research in the following areas:

### Advanced Materials and Nanoscience which includes:

complex fluids, nanoporous materials, nanotechnology, organic electronic materials, photovoltaics, polymers, quantum dots, solar cells, surface coating

### Analytical and Environmental Chemistry which

**includes:** environmental fate of pollutants, phytoremediation, flow analysis methods, paper-based microfluidic devices; passive sampling, green chemistry, membrane separation, trace element analysis

### Biological and Medicinal Chemistry which includes:

biological macromolecules, biophysics, biotechnology, metalloenzymes and model complexes, molecular nutrition, pharmaceutical chemistry

**Inorganic Chemistry which includes:** bioinorganic chemistry, catalysis, coordination chemistry, inorganic materials, metal ion dynamics, organometallic chemistry, transition metal chemistry

### Molecular Design and Synthesis which includes:

catalyst design, computational chemistry, free radical chemistry, ligands and metal complexes, macromolecules, supramolecular chemistry, templates

**Organic Chemistry which includes:** bioorganic chemistry, carbohydrate and peptide chemistry, free radical chemistry, natural product synthesis, physical organic chemistry, structural organic chemistry

**Physical Chemistry which includes:** photochemistry, sonochemistry, spectroscopy, surface science, theoretical and quantum chemistry

### Spectroscopy and Molecular Characterisation

**which includes:** atomic force microscopy, fluorescence, mass spectrometry, NMR and EPR, optical microscopy, photochemistry, single particle and ultrafast spectroscopy, structural chemistry, X-ray and synchrotron research



We also have a wide range of sponsors who offer prizes and scholarships and collaborate on research and infrastructure projects.

The School of Chemistry was awarded several new ARC and NHMRC projects commencing in 2013, including

**Prof. Spas Kolev**

The pollution potential of mercury in legacy biosolids and possibilities for its minimisation by phytoremediation and phytostabilisation approaches

**Dr Georgina Such**

Advanced bio-inspired polymer assembly: tools for diagnostics, imaging and therapies

**Prof. Frances Separovic**

Targeting the bacterial membrane

**Assoc. Prof. Uta Wille**

**Prof. Anthony Wedd**

Extending frontiers of structural chemistry and biology through high resolution pulsed electron paramagnetic resonance

**Assoc. Prof. Spencer Williams**

Defining the biosynthesis and immunological properties of mycobacterial glycolipids

**Prof. Evan Bieske**

**Assoc. Prof. Trevor Smith**

**Prof. Ken Ghiggino**

Supercontinuum fibre laser consortium for the chemical and materials sciences

**Prof. Ken Ghiggino**

**Assoc. Prof. Trevor Smith**

Time-resolved microspectroscopy of conjugated polymer films for organic photovoltaic applications

**Prof. Carl Schiesser**

**Prof. Peter Taylor**

Developing and Applying Free Radical Quantum Dots and Diamonds: Improving the performance of modern artists paint

**Prof. Paul Mulvaney**

Quantum Dot Energy Transfer-The chemistry of blinking

**Prof. Anthony Wedd**

How does Redox Cycling Drive the Metabolism of the Essential Metals Iron and Copper

**Dr Christopher Ritchie**

Rational Design and Fabrication of Polyoxometalate Based Nanodevices

**Dr James Hutchison**

Molecules and mirrors: new directions in chemistry and organic optoelectronics using hybrid light/matter states

**Dr Viktoras Dryza**

Guiding the Rational Design of Organic Dye Sensitisers for Solar Cell Technologies

**Assoc. Prof. Jonathan White**

Synthesis of new DNA Binding Radioprotectors

## RESEARCH GROUPS

**Assoc. Prof. Brendan Abrahams**

Coordination Networks

**Prof. Muthupandian Ashokkumar**

Sonochemistry and Sonoluminescence

**Dr Stephen Best**

Spectroelectrochemistry

**Prof. Evan Bieske**

Radical and Ion Spectroscopy

**Dr Colette Boskovic**

Inorganic Molecular Materials

**Assoc. Prof. Rachel Caruso**

Fabrication of Porous Inorganic Structures

**Dr Paul Donnelly**

Metals in Medicine and Radiopharmaceuticals

**Assoc. Prof. Michelle Gee**

Surface Forces and Surface Spectroscopy

**Prof. Ken Ghiggino**

Ultrafast Spectroscopy and Photochemistry

**Dr Angus Gray-Weale**

Mathematical Models in Chemistry, Biophysics and Soft Matter

**Prof. Franz Grieser**

Colloid and Surface Chemistry

**Prof. Andrew Holmes**

Applications of Synthesis to Problems in Materials & Biology

**Assoc. Prof. Craig Hutton**

Bio-organic Chemistry

**Dr George Khairallah**

Mass Spectrometry, Fundamental and Applied

**Prof. Spas Kolev**

Chemical Sensors and Membranes in Environmental Monitoring

**Prof. Robert Lamb**

Surface Science and Technology

**Prof. Paul Mulvaney**

Quantum Dots and Nanoparticles

**Prof. Richard O'Hair**

Fundamental and Applied Mass Spectrometry

**Prof. Mark Rizzacasa**

Asymmetric Synthesis of Biologically Active Natural Products

**Prof. Richard Robson**

Crystal Engineering of Infinite 2D and 3D Frameworks

**Prof. Carl Schiesser**

Free Radical and Antioxidant Chemistry

**Prof. Frances Separovic**

NMR and Biophysical Chemistry of Membranes

**Assoc. Prof. Trevor Smith**

Laser Spectroscopy, Microscopy and Photophysics

**Dr Alessandro Soncini**

Theoretical and Computational Chemistry

**Dr Georgina Such**

Smart polymeric materials: synthesis and application

**Prof. Tony Wedd**

Metal Chemistry in Catalysis and Biology

**Prof. Jonathan White**

Structural Organic Chemistry

**Assoc. Prof. Uta Wille**

Organic and Physical Organic Chemistry

**Assoc. Prof. Spencer Williams**

Biological Organic Chemistry and Carbohydrates

**Dr Wallace Wong**

Organic Electronic Materials

# ASIA-OCEANIA SONOCHEMICAL SOCIETY (AOSS 2013)

1st Meeting of the Asia-Oceania Sonochemical Society (AOSS 2013) was organised by Prof. Ashokkumar in Melbourne during 10-12 July 2013. Leading sonochemists around the world attended the meeting including Prof. Ken Suslick, Prof. Aharon Gedanken and Prof. Shinobu Koda who delivered the Plenary Lectures. The meeting was well attended by more than 100 participants with about 60 international participants from 20 countries. The meeting programme included contributions from almost all areas of ultrasonics and sonochemistry: General Sonochemistry, Sonoluminescence, Nano- and biomaterials, and Sonoprocessing including food and dairy processing. The meeting was sponsored by a number of ultrasonic reactor manufacturing companies. The School of Chemistry was one of the sponsors of this meeting.



*Photographs (top to bottom): Group photo of the participants. The conference dinner was held at Melbourne Aquarium*



# CONFERENCES 2013

Prof. Brendan Abrahams	July	International Conference on Materials for Advanced Technologies 2013	Singapore
	December	IC13 – RACI Inorganic Chemistry Divisional Conference	Brisbane
Dr Graeme Allinson	October	SETAC Australasia Conference 2013	Melbourne
	November	24th Conference of Residue Chemists	Melbourne
Prof. Muthupandian Ashokkumar	July	1st Meeting of the Asia-Oceania Sonochemical Society	UoM - Chair
Dr Stephen Best	July	VUVX Conference (Vacuum UV and X-ray Spectroscopy (VUVX))	Hefei, China
Prof. Evan Bieske	January	17th East Asian Workshop on Chemical Dynamics	Fukuoka, Japan
	June	68th Ohio Spectroscopy Conference	Ohio, USA
	July	31st International Symposium on Free Radicals	Potsdam, Germany
	December	RACI PhysChem 2013	Hobart
Dr Colette Boskovic	December	IC'13 - RACI Inorganic Chemistry Divisional Conference	Brisbane
Assoc. Prof. Rachel Caruso	February	International Symposium on Energy and Environmental Materials	Gold Coast
	April	Materials Research Society Spring Meeting	San Francisco USA
	August	8th Pacific Rim International Congress on Advanced Materials and Processing	Waikoloa USA
	November	CSIRO OCE Science Leader Symposium	Black Mountains, ACT
Dr Dehong Chen	July	7th International Conference on Materials for Advanced Technologies (ICMAT)	Singapore
Mrs Penny Commons	February	STAV Chemistry Teachers Conference	La Trobe University
	November	CEA November Lectures	Bio21
Dr Augustine Doronila	February	XIX International Conference of the Society for Human Ecology	ANU
	November	2nd Philippine National Conference and Workshop on Environmental Science	Los Banos, Laguna, Philippines
Dr Paul Donnelly	July	International Conference in Bioinorganic Chemistry	Grenoble, France
	December	IC'13, RACI Inorganic Chemistry Divisional Conference	Brisbane
Dr Viktoras Dryza	December	RACI PhysChem 2013	Hobart
Dr Ines Gameiro Sa Almeida	September	18th International Conference on Flow Injection Analysis	Oporto, Portugal
	October	SETAC Australasia Conference 2013	Melbourne
	December	21st Annual RACI Research and Development Topics Conference in Environmental and Analytical Chemistry	Canberra
Assoc. Prof. Michelle Gee	February	Australian Colloid and Interface Science Symposium	Noosa
	September	Chemeca	Brisbane
	September	14th International Conference on Pseudomonas	Lausanne, Switzerland
	September	13th Conference on Methods and Applications of Fluorescence	Genoa, Italy
	November	Australian Society for Biophysics Conference	Melbourne
	November	Statistical Mechanics of Soft Matter	Melbourne



Prof. Ken Ghiggino	May	The Future of Dynamic Structural Science, Erice Crystallography School	Erice, Sicily
	July	26th International Conference on Photochemistry	Leuven, Belgium
	September	12th European Conference on Molecular Electronics	London, UK
	September	13th Conference on Methods and Applications of Fluorescence	Genoa, Italy
	December	RACI PhysChem 2013	Hobart, Australia
	December	4th Asian Spectroscopy Conference	Singapore
Dr Angus Gray-Weale	December	RACI	Hobart
Prof. Franz Grieser	February	Australian Colloid and Interface Symposium	Noosa, QLD
	June	International Congress on Acoustics	Montreal, Canada
	July	ANZAAS	Melbourne
Prof. Andrew Holmes	January	ICMS-RMIT Nanomaterials Workshop	Bangalore, India
	March	The Chemical Record Lecture, Chemical Society of Japan	Kyoto, Japan
	April	Materials Research Society Spring Meeting	San Francisco, USA
	April	American Chemical Society 245th National Meeting, Division of Energy and Fuels	New Orleans, USA
	July	15th International Symposium on Aromatic Compounds,	Taipei, Taiwan
	August	"Solar Cells for Peace"	Istanbul, Turkey
	August	15th Asian Chemical Congress	Singapore
	December	12th International Conference on Frontiers of Polymers and Advanced Materials	Auckland, New Zealand
Dr James Hutchison	May	14th Conference on Physics of Light-Matter Coupling in Nanostructures	Hersonissos, Crete
	July	26th International Conference on Photochemistry	Leuven, Belgium
	December	4th Asian Spectroscopy Conference	Singapore
Assoc. Prof. Craig Hutton	April	SynthCon2	Yarra Glen, Victoria,
	July	6th Heron Conference on Reactive Intermediates and Unusual Molecules (HERON6)	Heron Island, Queensland,
	September	8th Australian Peptide Conference	Penang, Malaysia
	September	International Conference on Natural Products and Health	Singapore
Dr George Khairallah	June	61st American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics	Minneapolis, USA
	June	Gordon Research Conference on Physical Organic Chemistry	Holderness NH, USA
	July	Reactive Intermediates & Unusual Molecules (Heron6)	Heron Island, QLD
Prof. Spas Kolev	February	1st Annual Conference on Chemistry, Chemical Engineering and Chemical Process	Singapore
	March	Collaborative on Oceanographic Chemical Analysis	Honolulu, USA
	July	8th Aseanian Membrane Society Conference	Xian, China
	September	18th International Conference on Flow Injection Analysis	Porto, Portugal
	October	Society of Environmental Toxicology and Chemistry - Australasia Conference	Melbourne
	November	International Membrane Science & Technology Conference 2013	Melbourne
Prof. Robert Lamb	May	ANZPAC 2013	Melbourne
	October	AVS 60th International Symposium and Exhibition	California, USA

Prof. Paul Mulvaney	February	ACIS	Noosa, Queensland, AU
	February	Artificial Photosynthesis and ARENA Workshop	Wollongong, NSW
	May	Nanotechnology - The Next Ten Years, The Royal Society of Victoria	Melbourne
	June	Semiconductor Sensitized & Quantum Dot Solar Cells, NanoGe QuantumDot 2013	Granada Spain
	July	RSC 11th international Conference on Materials Chemistry	Warwick UK
	July	International Conference on Photochemistry	Leuven, Belgium
	August	Gordon Conference - Clusters Nanocrystals and Nanostructures	Holyoke College MA, USA
	September	ChinaNano 2013	Beijing
	October	Humboldt Foundation Colloquium	Sydney
	November	Bionics Symposium	Melbourne
Dr Tich-Lam Nguyen	March	RACI Hartung Lectures	Wodonga, VIC
	July	7th International Conference on Materials for Advanced Technologies	Singapore
	December	Universitas 21 Early Career Researchers Workshop	Mexico City
Prof. Richard O'Hair	June	61st American Society for Mass Spectrometry (ASMS)	Minneapolis, USA
	June	Gordon Research Conference on Physical Organic Chemistry	Holderness, USA
Ms Adabelle Ong	December	RACI PhysChem 2013	Hobart
	December	4th Asian Spectroscopy Conference	Singapore
Dr Brett Paterson	December	IC'13 - RACI Inorganic Chemistry Divisional Conference	Brisbane
Prof. Mark Rizzacasa	April	SynthCon2, Fergusson's Winery	Victoria
	September	24th International Congress on Heterocyclic Chemistry (ICHCC24)	Shanghai China
Dr Marc-Antoine Sani	February	US Biophysical Society meeting	Philadelphia
	September	APNMR - ANZMAG Conference	Brisbane
	September	Australian Peptide Society Conference	Penang
	November	Australian Society for Biophysics meeting	Melbourne
Prof. Carl Schiesser	June	Gordon Research Conference on Physical Organic Chemistry	Plymouth, USA
	June	6th Pacific Symposium on Radical Chemistry (PSRC-6)	Vancouver, Canada
	July	6th Heron Island Conference on Reactive Intermediates and Unusual Molecules: Synthesis and Mechanism	Heron Island, QLD
	July	12th International Conference on the Chemistry of Selenium and Tellurium (ICCST-12)	Cardiff, UK
Dr Geoffrey Scollary	July	8th In Vino Analytica Scientia symposium	Reims, France
Prof. Frances Separovic	February	57th Biophysical Society Meeting	Philadelphia, U.S.A
	April	245th American Chemical Society National Meeting & Exposition	New Orleans, U.S.A.
	May	18th ISMAR Meeting	Rio de Janeiro, Brazil
	July	9th European Biophysical Congress	Lisbon, Portugal
	September	10th Australian Peptide Conference	Penang, Malaysia
	October	9th Australian & New Zealand Society for Magnetic Resonance Conference	Brisbane
	November	Australia-Japan Neutron Science Workshop	Sydney
	November	37th Annual Meeting Australian Society for Biophysics.	Melbourne

Assoc. Prof. Trevor Smith	Feb	6th International Conference on Advanced Materials and Nanotechnology	Auckland, NZ
	July	26th International Conference on Photochemistry (ICP 2013)	Leuven, Belgium
	September	13th Conference on Methods and Applications of Fluorescence	Genoa, Italy
	November	CXS Applications in Microscopy workshop	Melbourne
	November	National Fluorescence Workshop (FCS2013)	Bangalore, India
	December	RACI PhysChem2013	Hobart
Dr Alesssandro Soncini	October	4th European Conference on Molecular Magnetism (ECMM2013)	Karlsruhe, Germany
	October	Kick-off meeting FP7-ICT-2013-10 network MoQuaS: Molecular Quantum Spintronics	KIT, Germany
Dr Georgina Such	July	Australasian Polymer Symposium	Darwin
Prof. Peter Taylor	March	Stampede Launch Event and Symposium	Austin, USA
	June	Very Accurate and Large Computational Approaches Conference	Fevik, Norway
	November	Supercomputing13	Denver, USA
Assoc. Prof. Peter Tregloan	December	Collaborative Universities Biomedical Education Network conference "Closing the loop"	Canberra
Willem Van den Heuvel	December	RACI PhysChem 2013	Hobart
Prof. John Webb	February	Fair Innovation Conference	Tehran, Iran
	August	12th International conference on Biomineraliation	Freiberg, Germany
	December	12th International Symposium on Applied Bioinorganic Chemistry (ISABC12)	Guangzhou, China
Prof. Anthony Wedd	July	4th International Symposium on Metallomics	Oviedo, Spain
	July	International Conference on Biological Inorganic Chemistry	Grenoble, France
	December	Conference of Inorganic Division of the Royal Australian Chemical Institute (RACI)	University of Queensland
Dr Xingzhan Wei	September	Metamaterials'2013, The 7th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics	Bordeaux, France
	November	ANFF Research Showcase 2013	Melbourne
Assoc. Prof. Jonathan White	July	6th Heron Island Conference on Reactive Intermediates and Unusual Molecules: Synthesis and Mechanism	Heron Island, QLD
Dr Uta Wille	April	SynthCon2	Yarra Glen
	June	6th Pacific Symposium on Radical Chemistry	Vancouver, Canada
	June	Gordon Research Conference on Physical Organic Chemistry, Holderness School	New Hampshire, USA
	December	38th Annual Synthesis Symposium	Bio21 Melbourne
Dr Spencer Williams	September	UWA Glycoscience Workshop	Perth
	December	38th Annual Synthesis Symposium	Bio21 Melbourne
Dr Wallace Wong	July	15th International Symposium on Novel Aromatic Compounds (ISNA15)	Taipei, Taiwan
	November	8th International Symposium on Integrated Synthesis (ISIS8)	Nara, Japan
Dr Xiao Zhiguang	November	RACI Inorganic Chemistry Group (VIC) Symposium, RMIT	Melbourne
	December	12th International Symposium on Applied Bioinorganic Chemistry (ISABC12)	Guangzhou, China
Dr Yanlin Zhang	October	Proceedings of SETAC Australia	Melbourne



# INORGANIC AND ANALYTICAL CHEMISTRY SEMINAR PROGRAM

Coordinator: Professor Tony Wedd E: [agw@unimelb.edu.au](mailto:agw@unimelb.edu.au)

## 8 FEBRUARY

**Prof. Rhett Kempe**  
**University of Bayreuth**  
"Bimetallic Catalysts for more Sustainability"

## 12 MARCH

**Dr Andreas Stasch**  
**Monash University**  
"The chemistry of molecular magnesium(II) compounds"

## 19 MARCH

**Dr Chris Richardson**  
**University of Wollongong**  
"Post-Synthetic Modification of Metal-Organic Frameworks: Changing for the Better"

## 26 MARCH

**Prof. Philip Blower**  
**King's College London**  
"Imaging Tissue Hypoxia with Redox Active Copper Complexes: from Inorganic Chemistry to the Clinic"

## 16 APRIL

**Dr Terry Turney**  
**Monash University**  
"Zinc Oxide Nano-Particles"

## 23 APRIL

**Dr Zhiguang Xiao**  
**University of Melbourne**  
"Is Oxidative Stress in Neurodegenerative Diseases Linked to Copper Binding to the Disease Proteins?"

## 30 APRIL

**Dr Mike Grace**  
**Monash University**  
"The Unexpected Effects of Medicating Our Waterways"

## 7 MAY

**Dr Brett Paterson**  
**University of Melbourne**  
"Macrobicyclic Cage Ligands for Non-invasive Targeted Cancer Imaging"

## 14 MAY

**Dr Colin Scholes**  
**University of Melbourne**  
"The Challenges of Selectively Separating Carbon Dioxide from Waste Gases"

## 21 MAY

**Dr Chrisitian Doonan**  
**University of Adelaide**  
"Gas Separations by Molecular Ratchets"

## 23 JULY

**Dr Ayman Nafady**  
**King Saud University**  
"TCNQ/TFAB: Magic anions for electrochemical and synthetic applications"

## 6 AUGUST

**Dr Jie Zhang**  
**Monash University**  
"Polyoxometalate Electrochemistry and Electrocatalysis"

## 13 AUGUST

**Dr Blaine Roberts**  
**Florey Institute**  
"Analytical Techniques to Probe the Role of Metalloproteins in Biological Systems"

## 20 AUGUST

**Prof. Frank Caruso**  
**University of Melbourne**  
"Interfacing inorganic and organic materials for biological outcomes"

## 27 AUGUST

**Dr John Moreau**  
**University of Melbourne**  
"Geo-Chemistry of Arsenic and Mercury"

## 10 SEPTEMBER

**Dr Vipul Bansal**  
**RMIT University**  
"Controllable surface functionalisation using polyoxometalates and amino acids: A critical parameter for sandwiched nanomaterial synthesis & applications"

## 17 SEPTEMBER

**Mr David Hayne**  
**University of Melbourne**  
"Development of a radio tracer specific for Abeta plaques to assist in diagnosis of Alzheimer's disease" – PhD Completion Seminar

## 24 SEPTEMBER

**Prof. Tadaharu Ueda,**  
**Prof. Kenji Matsumoto,**  
**Prof. Shingo Hadano**  
**Kochi University**  
Introductions to Research at Kochi University, Japan.  
**Prof. Tadaharu Ueda:**  
"Synthesis and characterization of novel polyoxometalates";  
**Prof. Kenji Matsumoto:**  
"Functional metal complexes utilized non-covalent interactions – siderophores, catalysts, luminescent complexes–";  
**Prof. Shingo Hadano:**  
"Synthesis, nanostructures, and thermal properties of ABA-type amphiphilic triblock copolymers"

## 8 OCTOBER

**Ms Jessica Holmes**  
**University of Melbourne**  
"The Chemistry of 3D Printing"

## 8 OCTOBER

**Ms Saumya Udagedera**  
**University of Melbourne**  
"The Toxicity of Lead"

## 22 OCTOBER

**Ms Ya Ya Bonggotgetsakul**  
**University of Melbourne**  
"Extraction of Gold(III) from HCl Solution and Preparation of Precious Metal Nanoparticles using Polymer Inclusion Membranes" – PhD Completion Seminar

## 23 OCTOBER

**Prof. Christine McKenzie**  
**University of Southern Denmark**  
"Masked non-heme Fe(V)oxo and other interesting reactive models for non-heme metalloenzymes"

## 12 NOVEMBER

**Dr Rahul Banerjee**  
**CSIR-National Chemical Laboratory, India**  
"Porous [Metal]- Organic [Nano]- Materials: Concept, Construction and Properties"

# ORGANIC CHEMISTRY SEMINAR PROGRAM

Coordinator: Dr Wallace Wong E: [wwhwong@unimelb.edu.au](mailto:wwhwong@unimelb.edu.au)

## 18 JANUARY

**Prof. Dr Gilles Gasser**  
**University of Zurich**

"In Vitro and In Vivo Evaluation of Metal-Based Anthelmintic and Anticancer Drug Candidates"

## 15 FEBRUARY

**Dr Elena Mena-Osteritz**  
**University of Ulm**

"3D-Nanoarchitectures with Thiophene Materials"

## 1 MARCH

**Prof. Peter Bäuerle**  
**University of Ulm**

"Small molecule organic solar cells: With tailored materials on the move to future technology"

## 15 MARCH

**Prof. Alan C. Spivey**  
**Imperial College London**

"Synthesis directed at the disruption of a protein-protein interaction in asthma"

## 22 MARCH

**Prof. Suzanne A. Blum**  
**University of California, Irvine**

"Microscopy for Synthetic Chemists and Dual-Metal Catalysis with Gold"

## 19 APRIL

**Dr Andrew Lawrence**  
**Australian National University**

"Biomimetic Total Synthesis of Natural Products"

## 3 MAY

**Prof. Neil R. Cameron**  
**Durham University**

"Glycopolymers and Glyconanoparticles"

## 17 MAY

**Erika Bicciochi**  
**University of Melbourne**

"Donor-acceptor block copolymers for organic photovoltaic applications" – PhD Completion Seminar

## 24 MAY

**Assoc. Prof. Richard J. Payne**  
**University of Sydney**

"Synthesis of Therapeutic Glycopeptides and Glycoproteins via Novel Chemical Ligation Strategies"

## 31 MAY

**Dayna Sturgess**  
**University of Melbourne**

"Total synthesis of alkyl citrate natural products" – PhD Completion Seminar

## 7 JUNE

**Dr Kriste L. Viske**  
**University of Melbourne**

"Investigating Palladium-Catalysed Cross-Coupling Reactions by Mass Spectrometry"

## 14 JUNE

**Dr Steven Bull**  
**University of Bath**

"Novel Synthetic, Catalysed Cross-Coupling Reactions by Mass Spectrometry"

## 18 JUNE

**Prof. Govindasamy Mugesh**  
**Indian Institute of Science**

"Glutathione Peroxidase Activity of Ebselen and Related Organoselenium Compounds"

## 21 JUNE

**Dr Jason Harper**  
**University of New South Wales**

"Getting the reaction outcomes you want in ionic liquids: Towards solvent-controlled reactivity"

## 2 JULY

**Prof. Stefan Braese**  
**Karlsruhe Institute of Technology**

"Small molecular entities for chemical biology"

## 5 JULY

**Prof. Norbert Jux**  
**University of Erlangen**

"Functionalised Porphyrins"

## 15 JULY

**Prof. Burkhard Koenig**  
**University of Regensburg**

"Let there be light – Luminescent Chemosensors and Chemical Photocatalysts"

## 26 JULY

**Prof. Stephen Hashmi**  
**University of Heidelberg**

"I Love Gold"

## 9 AUGUST

**Prof. Peter Scammells**  
**Monash University**

"Orthosteric, Allosteric and Bitopic Ligands Acting at G Protein-Coupled Receptors" – PhD swansong

## 15 AUGUST

**Prof. George Barany**  
**University of Minnesota**

"Reflections on a Half Century of Solid-Phase Peptide Synthesis"

## 16 AUGUST

**Prof. Fabian Mohr**  
**University of Wuppertal**

"Metals in Medicine: Quo vadis?"

## 22 AUGUST

**Dr Matthew Cook**  
**Queens University Belfast**

"New allylic rearrangements. Stereoselective sigmatropic and allylic reactions"

## 23 AUGUST

**Dr Ullrich Jahn**  
**Institute of Organic Chemistry and Biochemistry Academy of Sciences, Czech Republic**

"A journey from organic methodology development to the total synthesis of natural products, their biological investigation and back"

## 30 AUGUST

**Dr Derek Wilson**  
**York University, Canada**

"Structural Disorder in Protein Function and Pathogenic Aggregation"

## 6 SEPTEMBER

**Darran Loits**  
**University of Melbourne**

"Studies Towards the Synthesis of the Myxobacterium Metabolite Rhizopodin" – PhD Completion Seminar

## 13 SEPTEMBER

**Dr Joel Hooper**  
**University of Oxford**

"Rhodium catalysed hydroacylation and C-S bond activation"

## 18 SEPTEMBER

**Jenny Chambers**  
**University of Melbourne**

"Synthesis and biological evaluation of episilvestrol analogues" – PhD Completion Seminar

## 25 OCTOBER

**Prof. Stephen J. Blanksby**  
**University of Wollongong**

"Elucidating lipid structural diversity by mass spectrometry"

## 15 NOVEMBER

**Nicolas Fisk**  
**University of Melbourne**

"Towards the Total Synthesis of Aranotin and the Oxepin containing Dithiodiketopiperazines" – PhD Completion Seminar

## 12 DECEMBER

**Dr Sam Stranks**  
**University of Oxford**

"High Performance Solar Cells Incorporating Organo-lead Halide Perovskites"

## 16 DECEMBER

**Prof. Seth Marder**  
**Georgia Institute of Technology**

"Charge injection and collection at electrode interfaces"

# PHYSICAL CHEMISTRY SEMINAR PROGRAM

Coordinator: Dr Alessandro Soncini E: [asoncini@unimelb.edu.au](mailto:asoncini@unimelb.edu.au)

## 14 JANUARY

**Dr Gopalan Rajaraman**  
Department of Chemistry  
Indian Institute of Technology  
Bombay

"Computational Approach to Lanthanide Molecular NanoMagnets"

## 11 FEBRUARY

**Zhengfei Chen**  
School of Chemistry,  
University of Melbourne

"Synthesis and characterization of nanostructured inorganic materials from ionic liquids" – PhD Completion Seminar

## 4 MARCH

**Prof. Dagmar Gerthsen**  
Karlsruhe Institute of Technology

"Nanostructure of organic solar cells analysed by electron microscopy"

## 11 MARCH

**Prof. Amitabha Chattopadhyay**  
Centre for Cellular & Molecular Biology,  
Hyderabad India.

"Dipole Organization and Membrane Biophysics: A Tale of Two Studies"

## 25 MARCH

**Prof. Mark Gordon**  
Ames Laboratory, Iowa State University

"Strategies for Accurate Calculation on Large Molecular Systems"

## 22 APRIL

**Brian Adamson**  
University of Melbourne

"Laser Induced Mobility Modification"

## 24 APRIL

**Prof. Kevin Prince**  
Elettra-Sincrotrone Trieste, Italy

"Gas phase chemistry of bio molecules: synchrotron radiation studies, and prospects for Free Electron Lasers"

## 13 MAY

**Dr Viktoras Dryza**  
University of Melbourne

"Investigating the spectroscopy of organic dye-sensitized nano particles in the gas phase"

## 20 MAY

**Francesca Cavalieri**  
University of Melbourne

"Ultrasonic synthesis and characterization of multifunctional microspheres"

## 6 JUNE

**Assoc. Prof. Cynthia Whitchurch**  
University of Technology  
Sydney

"Stigmergy, explosions and traffic control during active expansion of bacterial biofilms"

## 4 JULY

**Prof. John P. Maier**  
University of Basel,  
Switzerland

"Electronic Spectroscopy of Carbon Chains and Rings of Astrophysical Interest"

## 8 JULY

**Dr Jesus M de la Fuente**  
Institute of Nanoscience of Aragon

"Engineering Multifunctional Nanoparticles"

## 15 JULY

**Prof. Kenneth S. Suslik,**  
Wilsmore Fellow  
University of Illinois at Urbana-Champaign

"The Optoelectronic Nose: An Adventure in Molecular Recognition"

## 22 JULY

**Prof. Kenneth S. Suslik,**  
Wilsmore Fellow  
University of Illinois at Urbana-Champaign

"Inside a Collapsing Bubble: Sonochemistry and Sonoluminescence"

## 26 AUGUST

**Dr Patrick Masset**  
Institut Sulzbach-Rosenberg,  
Germany

"Challenges in high temperature materials: development of coatings for power generation and aeronautics applications"

## 7 SEPTEMBER

**Prof. Terry Lybrand**  
Vanderbilt University

"The biotin-streptavidin complex as a model system for high-affinity ligand binding: Some unexpected results from biophysical and computational studies"

## 14 SEPTEMBER

**Prof. Regine v. Klitzing**  
Stranski-Laboratorium für Physikalische und Theoretische Chemie, TU Berlin

"Stimuli Sensitive Polymer Coatings with different film architectures"

## 28 OCTOBER

**Prof. Regine v. Klitzing**  
Stranski-Laboratorium für Physikalische und Theoretische Chemie, TU Berlin

"Forces across thin liquid films"

## 8 NOVEMBER

**Joe Varga**  
School of Chemistry,  
University of Melbourne

"Colloidal synthesis of nanocrystal particles for thin film solar cells", PhD Completion Seminar

## 11 NOVEMBER

**Prof. Michael Grunze,**  
Wilsmore Fellow  
University of Heidelberg

"Nanostructured surfaces in environmental and biomedical applications: beyond the Lotus effect"

## 12 NOVEMBER

**Prof. Gerhard Wagner**  
Harvard Medical School

"Advanced NMR pulse sequences for assignment and structure determination of proteins"

## 12 NOVEMBER

**Dr Pascal Hébraud,**  
Institut de physique et chimie des matériaux de Strasbourg

"Infiltration kinetics of a colloidal aggregate"

## 14 NOVEMBER

**Prof. Gerhard Wagner**  
Harvard Medical School

"The benefits of non-uniform sampling (NUS) and software for reconstruction"

## 19 NOVEMBER

**Prof. Gerhard Wagner**  
Harvard Medical School

"In-cell NMR and molecular crowding"

## 25 NOVEMBER

**Prof. Michael Grunze,**  
Wilsmore Fellow  
University of Heidelberg

"Challenges in the analysis of environmental samples with synchrotron radiation"

## 2 DECEMBER

**Ida Widner**  
University of Melbourne

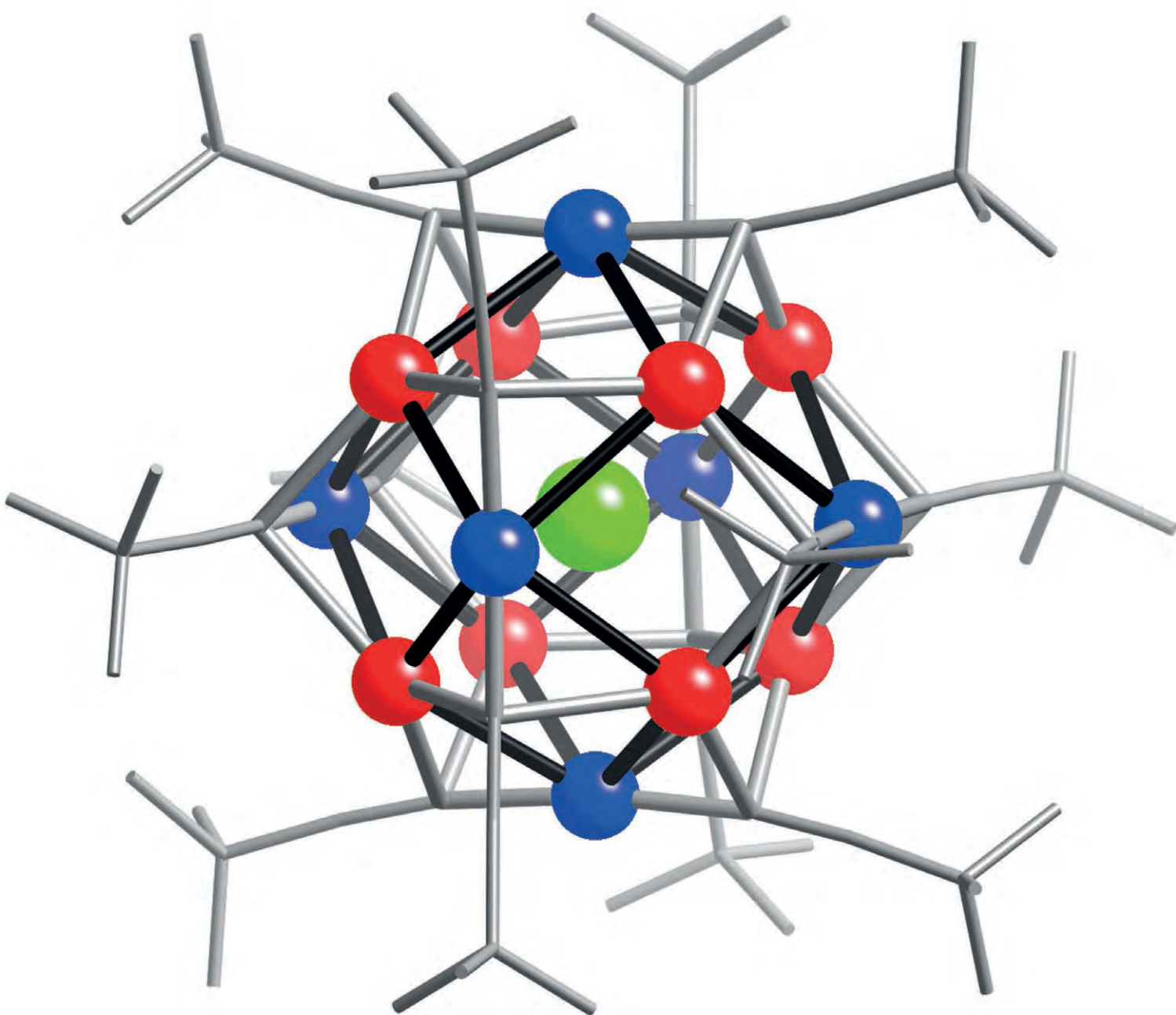
"Core-shell structures for dye-sensitised solar cells - increasing the light-scattering in the photoelectrode" – PhD Completion Seminar

## 9 DECEMBER

**Gary Beane**  
University of Melbourne

"Excitation Energy Transfer in semiconductor nanocrystal: organic dye hybrid structures" – PhD Completion Seminar





*Research Image by Spencer Williams.  
X-ray structure Ag<sub>8</sub>Cu<sub>6</sub> rhombic dodecahedron*

# PUBLICATIONS 2013

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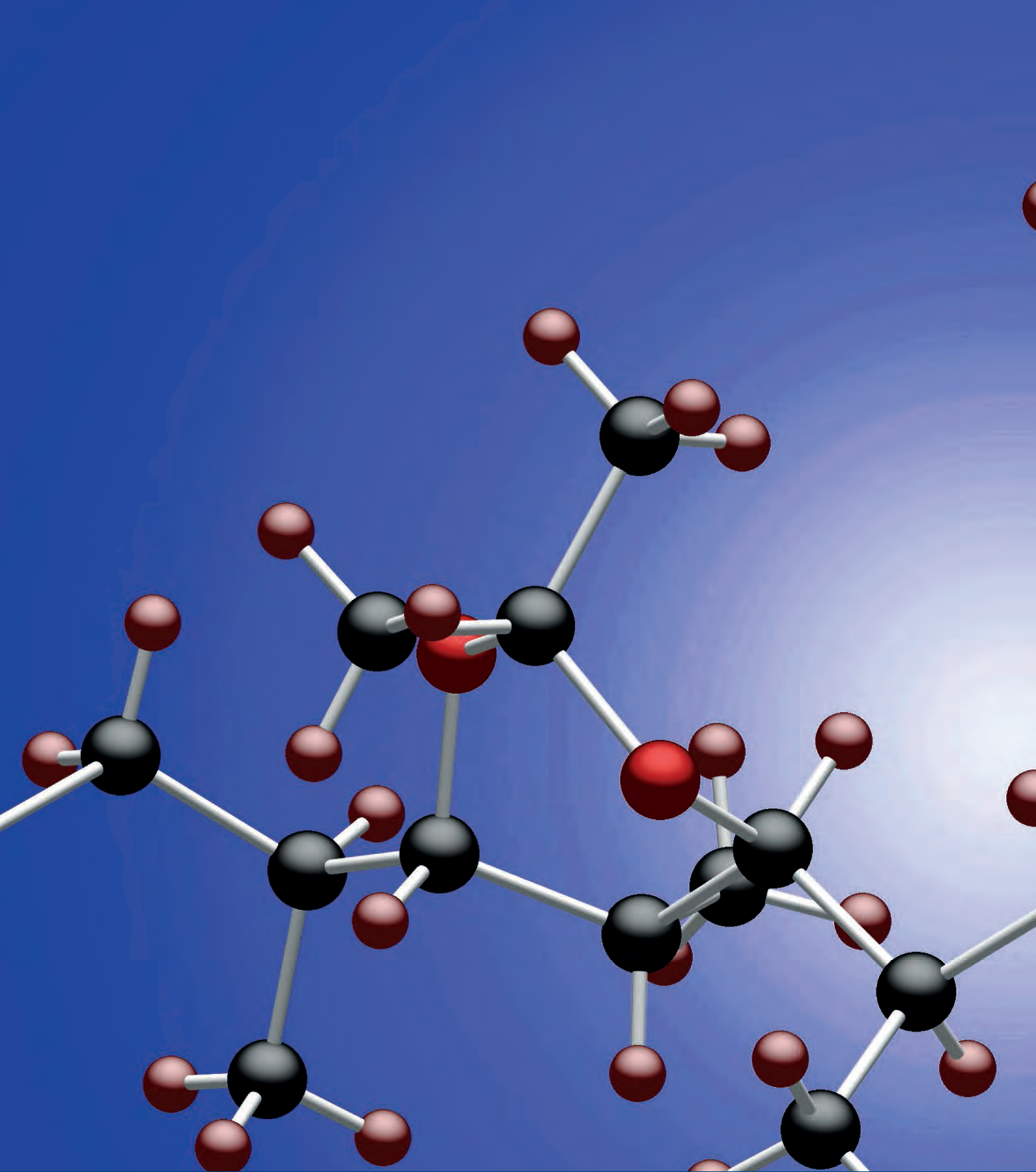
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Annual Report 2013**

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