



THE UNIVERSITY OF  
MELBOURNE

# School of Chemistry

## Annual Report 2009

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24 Cr Cr=51.996 51.996	25 Mn Mn=54.938 54.938	26 Fe Fe=55.935 55.935	27 Co Co=58.933 58.933	28 Ni Ni=58.693 58.693	29 Cu Cu=63.546 63.546	30 Zn Zn=65.38 65.38	31 Ga Ga=69.723 69.723	32 Ge Ge=72.630 72.630	33 As As=74.922 74.922	34 Se Se=78.96 78.96	35 Br Br=79.904 79.904	36 Kr Kr=83.80 83.80									
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106 Sg Sg=263 263	107 Bh Bh=264 264	108 Hs Hs=265 265	109 Mt Mt=266 266	110 Ds Ds=271 271	111 Rg Rg=272 272	112 Uub Uub=285 285															
59 Pr Pr=140.91 140.91	60 Nd Nd=144.24 144.24	61 Pm Pm=144.91 144.91	62 Sm Sm=150.36 150.36	63 Eu Eu=151.96 151.96	64 Gd Gd=157.25 157.25	65 Tb Tb=158.93 158.93	66 Dy Dy=162.50 162.50	67 Ho Ho=164.93 164.93	68 Er Er=167.26 167.26	69 Tm Tm=168.93 168.93	70 Yb Yb=173.05 173.05	71 Lu Lu=174.97 174.97									
91 Pa Pa=231.04 231.04	92 U U=238.03 238.03	93 Np Np=237 237	94 Pu Pu=239 239	95 Am Am=243 243	96 Cm Cm=247 247	97 Bk Bk=247 247	98 Cf Cf=251 251	99 Es Es=252 252	100 Fm Fm=257 257	101 Md Md=258 258	102 No No=259 259	103 Lr Lr=262 262									

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## **Sponsors**

back cover



# Introduction from the Head of School



and large flat panel displays which allow demonstrator resources to be run to support practical instruction for our first year students. The ground floor refurbishment also includes a new library and resource area, the Student Learning Centre, tutor offices and reception area, and an informal student lounge, The Labyrinth, equipped with computers and wireless networking.

Display cases built into the refurbishment have provided a space for exhibiting items of the Chemistry Cultural Collection. An exhibition "Chemistry@Melbourne: the first hundred years" assembled by Petronella Nel, Michelle Gee, Mick Moyland and Belinda Nemec (University Collections) was a highlight of the alumni function and continuing displays will join those of other University collections that are available as a resource to the wider public.

During the year the new Advanced Materials Laser Laboratories in the East Wing were also completed and IT, electronics and glass blowing personnel moved into purpose built workshops. The

second level teaching laboratories, that will also house substantial instrumentation spaces for new NMR, EPR and mass spectrometry instrumentation, were also nearing completion in time for the commencement of the 2010 teaching year.

Funding was also made available to undertake the third level teaching laboratory refurbishment in 2010. Since 2007 over \$26 million has been provided by the University for the Chemistry

refurbishment and associated works, however substantial additional funding will be needed to complete the remaining research laboratories, lecture theatre and office refurbishments over the next few years.

Once again a number of staff and students received accolades for their research performance. Paul Mulvaney was elected a Fellow of the Australian Academy of Science, Alison Funston received a Victorian "Tall Poppy" award, Frances Separovic the Robertson Award of the Australian Society of Biophysics, Spas Kolev the Lloyd Smythe

Medal of the RACI Analytical Division, and Jack Jacienak the Chancellor's prize for the best PhD thesis in the University for the previous year. Andrew Holmes was appointed as a prestigious Laureate Professor of the University while two School members, Rachel Caruso and John Gehman, were also successful in the initial round of ARC Future Fellowships. The School was again highly successful in research grant performance and it was particularly pleasing to see the ARC Centre of Excellence for Free Radical Chemistry and Biotechnology, which has its administrative Centre in the School, receive renewed funding for a further 5 years.

Among other notable achievements for 2009, Penny Commons received a Dean's Award for Excellence in Teaching and Mick Moylan was also the recipient of a University Knowledge Transfer grant to further develop his outreach activities to regional secondary schools. These awards again reflect the high performance of School members across all areas of activity of the University.

Second year chemistry subjects under the Melbourne Model science degree were successfully implemented under the guidance of the academic programs committee of the School chaired by Richard O'Hair. These subjects include core lecture and laboratory subjects that must be undertaken by all chemistry major students. 2009 also saw the first enrolments of MSc coursework students into Chemistry under the new Graduate School of Science programs. The introduction of the new third year subjects in 2010 will see the completion of this very major revision to our chemistry major and I believe will continue to maintain our course as the benchmark for Australian chemistry degrees.

My term as Head of School will be completed at the end of 2009. The past 12 years have seen many significant changes in the School of Chemistry and the University. The Bio21 Institute and Masson precinct Chemistry building refurbishments have transformed our research and teaching infrastructure while our teaching courses have undergone perhaps the most major revision in the School's long history. These changes would not have been possible without the dedicated input of staff and students and I wish to thank them for their support in this process. I am certain this support will continue for our new Head of School, Frances Separovic, and I wish her well in her new role in 2010.

*Ken Ghiggino  
Masson Professor of Chemistry  
Head, School of Chemistry*



L-R: Professor Ken Ghiggino (Head, School of Chemistry), Dr J. Patrick Greene (CEO, Museum of Victoria), Professor Glyn Davis (Vice Chancellor), Professor Emeritus Ray Martin (former Professor of Inorganic Chemistry and Dean, Faculty of Science), Professor Liz Sonenberg (Dean, Faculty of Science).

During 2009 the School celebrated a major milestone with the current building redevelopments, implemented major changes to its teaching programs in line with the Melbourne Model initiatives, and staff and students continued to achieve outstanding successes in research and teaching performance.

The completion of Stage 1 of the building program was marked by a celebration in February attended by the Vice-Chancellor and over 150 of our alumni. Stage 1 comprises the new ground floor teaching laboratories that feature modern fume-hood extraction



# our people

## Staff

### Academic

#### *Head of School and Masson Professor*

Kenneth Philip Ghiggino

#### *Professors*

Franz Grieser

Robert Lamb

Richard Alfred O'Hair

Mark Antony Rizzacasa

Carl Herbert Schiesser

Frances Separovic

Anthony Gordon Wedd

#### *Associate Professors and Readers*

Brendan Francis Abrahams

Muthupandian Ashokkumar

Michelle Louise Gee

Spas Dimitrov Kolev

Trevor Alexander Smith

Jonathan Michael White

Charles Graham Young

#### *Senior Lecturers*

Stephen Peter Best

Evan Bieske

Rachel Caruso

Craig Hutton

Uta Wille

Spencer John Williams

#### *Lecturers*

Colette Boskovic

Paul Donnelly

#### *ARC Federation Fellows and Professors*

Andrew Bruce Holmes

Paul Mulvaney

#### *ARC Australian Postdoctoral Fellows*

Elizabeth Krenske

Evan Moore

Jingli Xie

#### *ARC International Linkage Fellow*

Linda Feketeova

#### *Chemistry Outreach Fellow*

Michael Moylan

#### *Tutors*

Penelope Commons

Vicky-June Ellis

Sonia Horvat

#### *Research Fellows*

Neppolian Bernaudshaw

Dehong Chen

Daniel Dias

Christopher Dean Donner

John D. Gehman

Catrin Goeschen

Martin Grannas

Xiaotao Hao

Tim Hudson

David John Jones

Matthias Karg

Yvonne Kavanagh

George Khairallah

Sangwan Lee

Jagannathan Madhavan

Anthony Morfa

Christopher Ritchie

Colin Skene

Michelle Taylor

Hemayet Uddin

Hung Si Vo

Huabin Wang

Xiaoming Wen

Zhiguang Xiao

Meifang Zhou

#### *Research Assistants*

Viktoras Dryza

James Hickey

Liisa Hirvonen

Andreas Ide

Irving Liaw

Phoebe MacDougall

Michelle Meiries

Dana Morgan

Lachlan McKimmie

Tich Lam Nguyen

Joerg Taubitz

Shannon Zanatta



## Honorary appointments

### *Professors Emeritus*

Alan Buchanan  
Donald William Cameron  
Francis Patrick Larkins

### *Professorial Fellows*

Robert Cattrall  
Roger Francis Martin  
Richard Robson  
Peter Allan Tregloan  
Robert Oliver Watts

### *Principal Fellows*

Yoshinari Baba  
Ronald Cooper  
William David McFadyen  
Peter McTigue  
Peter James Thistlethwaite  
John Wade

### *Senior Fellows*

Bruce Cowie  
Robert Craig  
Donald Neil Furlong  
Valda May McRae

### *Fellows*

Ming Chen  
Noel Dunlop  
Peter Harbour  
Richard David Harcourt  
Akhter Hossain  
Craig Hill  
John Lambert  
Christine Schieber  
Suzanne Reichman  
Tania Obranovich  
Gerard Wilson  
Jan Ramuald Zdysiewicz

### *Visitors*

Dr Francesca Cavalieri, University of Rome, Italy  
Prof Juliet Gerrard, University of Canterbury,



New Zealand

Prof Alessandro Martucci, University Padova, Italy

Dr Sonia Melino, University of Rome, Italy

Dr Shirish Sonawane, Vishwakarma Institute of Technology, India

Prof Peter Steel, University of Canterbury, New Zealand

Assoc Prof Richard Ming Wah Wong, National University of Singapore, Singapore

### *Wilsmore Fellows*

Dr Frank Bernhard, Goethe–University of Frankfurt, Germany

Prof David W Knight, Cardiff University, Wales

Prof Zoran D Popovic, Xerox Research Centre of Canada, Canada

Prof Ayyalusamy Ramamoorthy, University of Michigan, USA

Prof Petr Solich, Charles University, Czech Republic

## Professional

Jennifer York (Executive Manager)

Marino Artuso

Renee Beale

Vicki Burley

Christine Callahan

Monalisa D'souza

Fran Dynan (Acting Executive Manager)

Jim Dynan

Gregory Ellis

Emanuele Failla

Jed Fraser

Robert Gable

Les Gamel

Sue Hickey

Ross Lineham

Brendan Mangan

Richard Mathys

Esther McConnell

Alf Meilak

Peter Mills

John Nuske

Des Odgers

Charlie Penman

Lachlan Pollock

Craig Sanders

Jennifer Scott

Doug Taylor

Joe Tyler

Joanne Tymms

Sioe See Volaric





# highlights of 2009

## News

### Kangaroos give a lesson in skin cancer protection

Dr Linda Feketeová and Dr Uta Wille from the ARC Centre of Excellence for Free Radical Chemistry and Biotechnology in the School of Chemistry were interviewed by the press on their work toward reducing the number of skin cancer-related cases by investigating the chemistry behind potential skin cancer therapies. See Edtbauer et al., Formation of pyrimidine dimer radical anions in the gas phase. *Chemical Communications* 2009, 47: 7291. The article was selected as a 'Hot Article' by Chem. Comm.



### Frances Separovic wins 2009 Robertson Award

Congratulations to Prof Frances Separovic, who received the Robertson Award at the Dec. 2009 Meeting of the Australian Society for Biophysics in Ballarat. The award is an externally refereed prize and recognizes individuals for distinguished scholarship and service in the field of Biophysics.

### Cambridge celebration for Andrew Holmes

In 2008 University of Cambridge held a special celebration in honour of Prof Andrew Holmes. A special themed issue on Andrew's work was produced by the Royal Society of Chemistry in 2009.

### Spas Kolev awarded Lloyd Smythe Medal

Congratulations to Assoc. Prof. Spas Kolev who was awarded the RACI, Analytical Chemistry Division, Lloyd Smythe Medal for 2009. The Lloyd Smythe Medal is awarded for excellence in pure or applied scientific work in analytical science in Australia, or for service to Analytical Chemistry during the previous fifteen years.

### Article on Chemistry Cultural Collection

An article entitled "Our Chemical cultural heritage – The University of Melbourne Chemistry Collection" by Petronella Nel was published in the November edition of *Chemistry in Australia*.

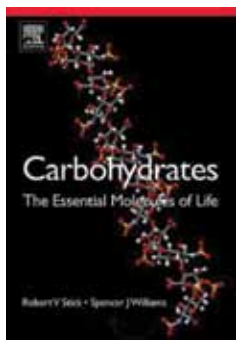
An article about the Chemistry museum by Katherine Smith, 'Chemistry Past, Present and Future' was published in *The Voice* in March 2009.

### Young Tall Poppy Award for Alison Funston

Congratulations to Dr Alison Funston who was announced as one of the recipients of a 2009 Young Tall Poppy Science Award. The prestigious Young Tall Poppy Science Awards aim to recognise the achievements of Australia's outstanding young scientific researchers and communicators.

### ARC Future Fellows for School of Chemistry

The School of Chemistry congratulates Dr Rachel Caruso and Dr John Gehman who were announced as recipients of ARC Future Fellowships. Dr Caruso will undertake a project entitled 'Engineered materials for future energy technologies' and Dr Gehman's project is 'Maximizing solid state NMR with maximum entropy'.



### Carbohydrates textbook co-authored by Spencer Williams

A book entitled 'Carbohydrates: The essential molecules of life' has been recently published by Elsevier. This book

was co-authored by Spencer Williams with his former PhD supervisor Bob Stick. Essentials gives the reader the basics of carbohydrate chemistry, a sense of its history, methods for their synthesis, and an understanding of the importance of carbohydrates and their conjugates in the world of glycobiology. The book has received strongly positive reviews in the *Australian Journal of Chemistry* (Aust. J. Chem. 2009, 62, 600–601) and *Chemistry in Australia* (Chem. Aust., 2009, 76(7), 32–33).

### Knowledge transfer project grant for Mick Moylan

Congratulations to Chemistry Outreach Fellow, Mick Moylan, who was awarded a Knowledge Transfer Project Grant to work with Distance Education Centre Victoria to develop multimedia tools to help year 12 students learn about spectroscopy and chromatography. This project will follow on from the 'Lab in a Box' kits of chemistry equipment developed for use in remote-area classrooms through a 2008 Knowledge Transfer grant.

### Chancellor's Prize for Jack Jasienak

The School of Chemistry was delighted to announce the award of the 2008 Chancellor's Prize to Dr Jacek (Jack) Jasieniak. Jack commenced his PhD in 2004 under the supervision of Prof Paul Mulvaney. During that time he was the recipient of the School of Chemistry Excellence Award and was also chosen to attend a meeting of the Nobel Laureates in Lindau, Germany. Jack is currently working on quantum dot based solar cells and printed electronics at CSIRO where he is employed as a research scientist.

### Andrew Holmes appointed Laureate Professor

Prof Andrew Holmes was appointed as a prestigious Laureate Professor to the University of Melbourne. The appointment recognises Andrew's distinguished career in science and outstanding contributions to research and leadership.

### Chem Comm. cover for Mulvaney Group

Dr Tich-Lam Nguyen of the School's Nanoscience Laboratory described a new use for semiconductor quantum dots in a paper published in the RSC journal 'Chemical Communications' and featured on the cover. IR 'upconverters' can convert invisible infrared radiation into visible light but the range of colours is quite small. Using quantum dots as 'downconverters', Tich-Lam showed that any visible colour can be created by overcoating an upconverter material with a few monolayers of highly luminescent quantum dots. Such materials have potential uses in night-time warning signs, emergency signs, infra red night vision technology as well as in document security.

## Peter McTigue awarded AOM

Congratulations to our Honorary Staff member, Assoc Prof Peter McTigue upon receiving an Order of Australia award (AOM) that was announced on the Queen's Birthday. The award was given in recognition of Peter's extraordinary and unparalleled contributions to secondary and tertiary Chemistry education for a period of over 40 years. Peter has worked tirelessly to promote the subject and to ensure that its teaching is of the highest standard. His dedication acts as a role model to those who follow.

## Women as successful scientists and mentors

Dr Uta Wille, School of Chemistry group leader, was in the spotlight for 'Science Matters'. In a feature profile by Dr Renee Smart, Uta talks about her triumphs and difficulties pursuing a science career in Germany, her career goals, women in science and her role as a mentor. An article profiling Prof Frances Separovic as a biophysicist was also published in the newsletter of the Biophysical Society (USA).

<http://sciencematters.unimelb.edu.au>

## Congratulations to Richard Robson

A perspective article written by Prof Richard Robson entitled 'Design and its limitations in the construction of bi- and poly-nuclear coordination complexes and coordination polymers (aka MOFs): a personal view' was listed as one of the most influential recent articles published in Dalton Transactions and listed as one of the most highly accessed articles from the journal during 2008.

## Funding continued for ARC Centre of Excellence

Congratulations to members of the ARC Centre of Excellence for Free Radical Chemistry and Biotechnology who were notified that the ARC approved an extension of funding until the end of 2013 with a further \$9.8 million provided. Members of the School are also participants in the ARC Centre of Excellence for Coherent X-Ray Science, which also received an extension of funding until 2013.



Australian delegation with Professor Rudy Marcus.

## Chemistry PhD students at Nobel Laureates Meeting

The School of Chemistry congratulates PhD students, Adam Brothie and Asimo Karnezis, who were selected as young researchers to attend the 59th Meeting of Nobel Laureates in Lindau.

Approximately 20 Nobel Laureates and 500 young researchers from around the world met at Lindau over the period 28th June to 3rd July. The 2009 Lindau Meeting was dedicated to Chemistry.

Now for a report on the LINDAU proceedings from Asimo Karnezis...

*"The Nobel Meeting provided a forum that allowed us to network with people from other countries, that we would never have gotten the opportunity to meet. It provided us with the basis to learn new thing and share our experiences with others.*

*Interacting with eminent scientists gave a broader understanding of the discipline of Chemistry and a wonderful opportunity to discuss my research and learn about theirs, while also helping me to further my research success. This has helped me to make more informed choices regarding my career plans after I complete my PhD studies.*

*It was wonderful to speak to the different Laureates about my work, to gain a more in-depth understanding of their work and how they went about determining what area of research they would concentrate on in their careers. It also provided the perfect basis to discuss with them how they managed time in the lab with their hobbies and families, and I received some good tips on how to organize myself to be able to juggle both my academic career and my other interests."*

## Paul Mulvaney elected to AAS

Congratulations to Prof Paul Mulvaney who was elected a Fellow of the Australian Academy of Science (AAS) for his work on nanoscience and plasmonics: surface plasmon spectroscopy enabling the optical detection of electrons in metal nanostructures. Election to the AAS represents one of the highest honours for individual contributions to science in Australia.

## Frances Separovic appointed to editorial board of Accounts of Chemical Research

Congratulations to Prof Frances Separovic who was appointed to the Editorial Advisory Board of the prestigious ACS journal, Accounts of Chemical Research. Frances went to Salt Lake City in March to participate in her first meeting as a board member.

## Donnelly article in Proc. Natl Acad. Sci. USA

Research into new ways to treat Alzheimer's disease using metal complexes was published in Proceedings of the National Academy of Sciences (USA). Paul Donnelly and researchers from the Department of Pathology (Kevin Barnham and Tony White) are investigating the use of metal complexes to treat Alzheimer's disease. Their studies have shown that metal complexes prepared in the Donnelly group decrease the build up of harmful proteins in the brains of animal models of Alzheimer's disease.



# Societies



## Chemistry Postgraduate Society

President:	Lisa Smith
Secretary:	Ben Harris
Treasurer:	Brandon McDonald
Staff Representative:	Vicki Burley
General Committee:	Christian Potzner, Jess Barton, Julia Baldauf, Keith White.

### *President's report*

In financial terms, this year was a reasonably successful one for the CPS. Many of our events funded themselves and almost all were run under budget.

Attendance at CPS events is an ever-present issue. For most events this year, the CPS managed to host at least 60 people. The annual trivia night in August was well received, the annual dinner in October attracted 35 attendees. We turned a small profit for both events which allowed us to host the honours welcome lunch and the Cup Day BBQ, as well as a welcome back BBQ in January this year, all rather enthusiastically attended. In addition, our first social drinks night had an unexpectedly good turn-out even though we ran it concurrently with the Bio21 RAPD symposium.

## Melbourne University Chemical Society (MUCS)

**President:** Prof Mark Rizzacasa

**Secretary:** Assoc Prof Brendan Abrahams

**Treasurer:** Dr Evan Moore

**Student Representatives:** Keith White, Nicole Rijs, Nick Fisk, John Lynch, Brian Adamson, Steve Burkett

The 2009 lecture series featured 12 presentations, given by high profile Australian and overseas guest speakers. These presentations covered many different aspects of Chemistry and science in general. We thank FB Rice and Co Patent and Trade Mark Attorneys, the Australian Journal of Chemistry, the Royal Australian Chemical Institute and LasTek for their generous support. A full list of lectures is available at:

[www.chemistry.unimelb.edu.au/news/mucs/mucs2009.php](http://www.chemistry.unimelb.edu.au/news/mucs/mucs2009.php)

### MUCS seminar series

**Coordinator:** Assoc Prof Brendan Abrahams

#### *March 11*

Professor Alan Cowley, University of Texas, Austin USA – Recent Adventures in Low Coordinate, Low Valent Group 13 and Group 15 Chemistry

#### *March 18*

Professor Keitaro Yoshihara, Toyota Physical and Chemical Research Institute, Japan – Water droplet formation from ambient air by UV irradiation

#### *April 29*

Dr Mike Grace, Director, Water Studies Centre, School of Chemistry, Monash University – Toxic soup and too good to drink: Short tales of two iconic Melbourne Waterways

#### *May 27*

Professor Peter Steel, Department of Chemistry, University of Canterbury, Christchurch, New Zealand – Metallosupramolecular Chemistry: Aspects of Ligand Design

#### *June 3*

Professor Curt Wentrup, University of Queensland – The Australian Journal of Chemistry-Past, Present and Future

#### *September 2*

Prof. Jean-François Létard, Université Bordeaux – Device Development from Iron Spin-Crossover Materials

#### *September 9*

Dr Tim Schmidt, University of Sydney – Molecular spectroscopy for fun and profit - from astronomy to solar energy

#### *September 30*

22nd G. I. Feutrill Memorial Lecture – Dr Stephen H. Bell, General Manager, Commercial Qenos Pty Ltd – The Future of Manufacturing in Australia

#### *October 21*

22nd D. R. Stranks Memorial Lecture – Professor Stephen Lincoln, University of Adelaide – Aspects of Climate Change and Energy

#### *November 11*

Dr Paul Donnelly, RACI Alan Sargeson Lecturer, University of Melbourne – Coordination Chemistry in Biology: Metal Complexes in Diagnosis and Therapy

#### *November 18*

Prof. Petr Solich, Charles University, Czech Republic – Recent trends in liquid chromatographic separations



# Chemistry building redevelopment

The School of Chemistry is undergoing extensive refurbishment, which involves staged development of modern teaching and research laboratories and flexible learning spaces for the chemical sciences. Stage 1 is now complete, providing a new integrated first year teaching laboratory, chemistry library and learning and resource centre, which were officially opened in February 2009. In addition, new research laboratories for the laser-based research groups were completed in the East Wing basement as well as new glassblowing and electronics workshops in the West Wing basement and IT on level 3 West.

These photos are of Stage 1: new laser laboratories and workshops in basement. Stage 2: new integrated teaching laboratories on Level 2 will open in 2010.



# Prizes & awards

## First year

Dwight Prize In 1st Year Chemistry	Shannon Regan
Exhibition Prize In 1st Year Chemistry	Kezia Kezia

## Second year

The Huntsman Australia Prize	Kimberley Mclean
C.A. Taylor Scholarship – Chemistry	Michael Leeming

## Third year

J.S. Anderson Prize	Joey Yeo
Dulux Australia Prize In Chemistry	Robert Elliott
James Cuming Memorial Scholarship (Major)	Joey Yeo
James Cuming Memorial Scholarship (Minor)	Rohul Adnan
Bryan Scholarship in Natural Science	Joey Yeo

## Honours

Dixon Research Scholarship	Gary Beane
Dean's Honours List (Honours)	Han Yu Melvin Tan
Kernot Research Scholarship	David John Hayne
Ronald Riseborough Prize	Han Yu Melvin Tan
The Stanley Harvey Prize	David John Hayne

## Postgraduate

The Monica Elizabeth Reum Memorial Prize	Berin Boughton
Thomas Healy Award	William McMaster Ben Mashford Tu Ahn Tran Sun Chun Lim

## Staff

Dean's Award For Excellence In Teaching (Tutor and/or Demonstrator)	Ms Penny Commons
Grimwade Prize in Industrial Chemistry	Bernard L Flynn

*Note: Prizes and Awards for 2009 were given at the Dean's Awards Ceremony held in May 2010.*



Joey Yeo pictured with Prof Frances Separovic at the Faculty of Science Dean's Awards Ceremony.



Penny Commons pictured with the Dean of Science, Prof Robert Saint, at the Faculty of Science Dean's Awards Ceremony.

# Victorian Institute for Chemical Sciences (VICS)



The Victorian Institute for Chemical Sciences (VICS) was established by Melbourne, Monash and RMIT Universities in 2003 with the primary aim of advancing the chemical sciences in Victoria. VICS collaborates in four areas to benefit the three member universities:

- ♦ to bring distinguished visitors to Melbourne
- ♦ to liaise with industry
- ♦ to organise major initiatives that benefit the three universities
- ♦ to educate and reach out to the next generation of chemists

The Outreach Program took real-life chemistry activities to the schools of more than 20,000 students in 2009, engaging these students in chemistry and supporting their teachers with interesting, curriculum relevant activities and professional development sessions.

The biggest events on the outreach calendar continue to be our VCE programs. In the Analysis Workshops, almost one in seven Victorian Year 12 Chemistry students come in to the labs over a two week period to measure the saltiness of soy sauce, the caffeine in cola drinks, the alcohol content of white wine or the iron content of dietary tablets using chemical instrumentation that is very important for professional chemists but unavailable to most schools. The Periodic Table activity went into 41 classrooms of Year 10 and 11 students and gave the students a chance to safely handle some of the rarer and more unusual elements including indium, xenon and tungsten.

The Outreach Program also developed and tested two Labs in a Box – portable, self-contained kit of instruments and materials for senior secondary chemistry which allow teachers in rural and remote locations to run hi-tech, curriculum relevant activities in their classrooms. The kits were funded under the Knowledge Transfer grant scheme and developed in partnership with small rural government schools and Distance Education Centre Victoria.





# Alumni function

The official opening to celebrate the completion of the ground floor refurbishment of the School of Chemistry provided a perfect opportunity for 150 PhD alumni to revisit the school and reconnect. Much has changed in the school since many of the alumni studied there. The \$12 million refurbishment has seen the transformation of the 'heritage' first year teaching laboratories into modern laboratories, the relocation of the library and the establishment of a computer lounge and student resource area. The refurbishment is the first phase of a major building renovation. Items from the recently established Chemistry Cultural Collection were on display and, when contrasted with the new state-of-the-art facilities, gave rise to the animated sharing of memories.

Dating back to 1882, the Chemistry Cultural Collection is of major historical, cultural and scientific significance. It was recently returned to the University of Melbourne from the Science Museum and its value as cultural record of activities over more than a century was confirmed. The collection is unique in Australia with chemistry collections elsewhere in Australia reduced to a few remnants or dating back only fifty years.

More information can be obtained from the site:

<http://sciencematters.unimelb.edu.au/2009/02/chemistry-phd-alumni-celebrate-the-schools-refurbishment/>



1

1. Valda McRae;

2. Donald Stewart, Tom O'Donnell, Peter Tregloan

3. Tony Wedd, Ian Roos

4. Peter McKay, John Lawlor, Tony Kriegler

5. Liz Sonenberg, David McFadyen

6. Jennifer York, Vicki Burley, Robyn Trethowan

7. Petronella Nel



2



3



4



5



6



7

# teaching and learning

## Subjects taught by the School

### First year

Director: Spencer Williams

Deputy Director: Muthupandian Ashokkumar

511-124 – Chemistry Component: Oral Health Sciences 1	Colette Boskovic
610-101 – Chemistry 1	Spencer Williams
610-102 – Chemistry 2	Spencer Williams
610-150 – Chemistry for Biomedicine	Spencer Williams
610-171 – Fundamentals of Chemistry	Spencer Williams

### Second year

Director for New Generation courses: Stephen Best

610-280 – Environmental Chemistry	Trevor Smith
610-282 – Spectroscopic Methods of Analysis	Stephen Best
610-283 – Reactions and Synthesis	Stephen Best
610-284 – Practical Chemistry	Muthupandian Ashokkumar
610-285 – Structure and Properties	Stephen Best

### Third year

Director for New Generation courses: Uta Wille

Coordinator of the new Third Year lab program: Trevor Smith

610-310 – Physical Chemistry IIIA (Lab)	Franz Grieser
610-311 – Physical Chemistry IIIB	Franz Grieser
610-315 – Physical Chemistry Practical III (Lab)	Franz Grieser
610-320 – Organic Chemistry IIIA (Lab)	Mark Rizzacasa
610-321 – Organic Chemistry IIIB	Mark Rizzacasa
610-325 – Organic Chemistry Practical III (Lab)	Mark Rizzacasa
610-332 – Bio-organic Chemistry	Spencer Williams
610-333 – Molecular Technology and Processes	Uta Wille
610-340 – Inorganic Chemistry IIIA (Lab)	Stephen Best
610-341 – Inorganic Chemistry IIIB	Stephen Best
610-345 – Inorganic Chemistry Practical III (Lab)	Stephen Best
610-360 – Analytical and Environmental Chemistry (Lab)	Spas Kolev
610-399 – Chemical Research Project	Kenneth Ghiggino

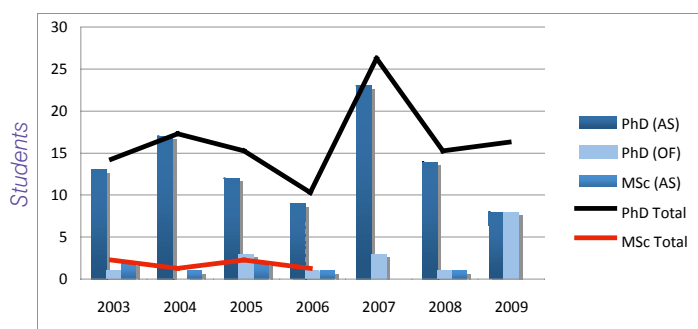
### Higher years

610-400 – Honours	Richard O'Hair
610-500 – Masters	Craig Hutton



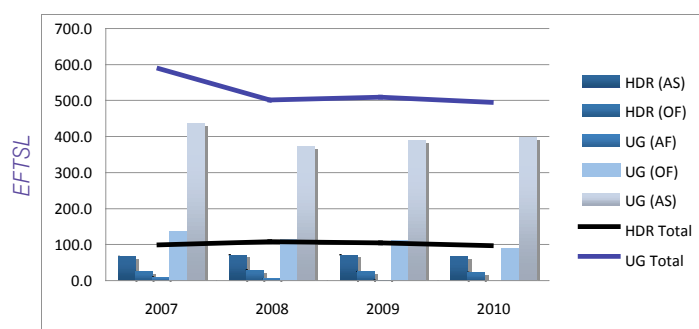
# Key teaching and learning statistics

## Research completions by year



AS: Australian Subsidised students  
OF: Overseas Full-Fee students

## 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 Load.

## Quality of Teaching scores

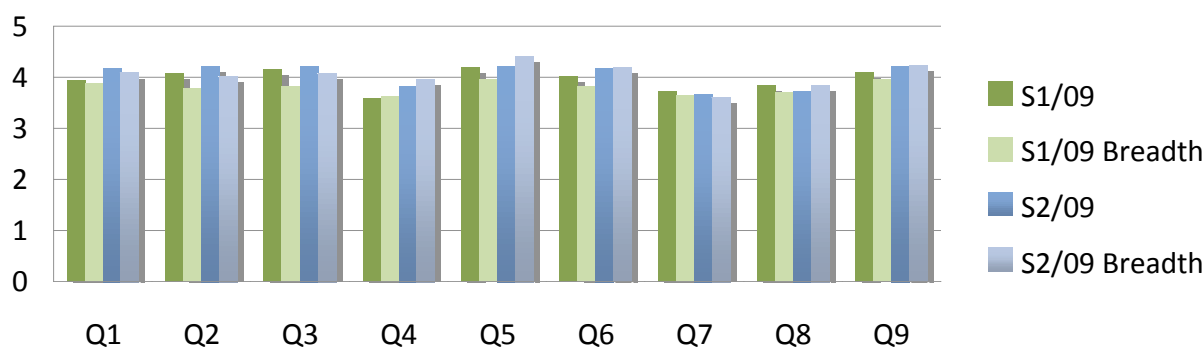
The Quality of Teaching survey provides feedback from undergraduate and postgraduate coursework students on their perceptions of the quality of teaching and learning experience for each subject in which they are enrolled.

This graph also shows results for undergraduate breadth subjects.

The Student Feedback Questionnaire has been used throughout the University since 1994 with little variation in the questions over the period.

Surveys are mandatory in all 'taught' subjects in all semesters. Students are asked whether they strongly agree (5); agree (4); agree nor disagree (3); disagree (2); or strongly disagree (1) with the following statements.

1. I had a clear idea of what was expected of me in this subject.
2. This subject was well taught.
3. This subject was intellectually stimulating.
4. I received helpful feedback on how I was going in my subject.
5. In this subject, teaching staff showed an interest in the academic needs of the students.
6. I felt part of a group of students and staff committed to learning in this subject.
7. There was effective use of computer-based teaching materials in this subject.
8. Web-based materials for this subject were helpful.
9. Overall satisfaction with the quality of the learning experience in this subject.





# Research higher degree student completions

## *Berin Alain Boughton*

Thesis: Rationally designed inhibitors of Escherichia coli dihydroadipic acid synthase

## *Karrera Yani Djoko*

Thesis: Copper resistance in Escherichia coli: the cuprous oxidase PcoA catalyses oxidation of Cu(I) in the copper chaperone Cu11-PcoC

## *Cara Maxwell Doherty*

Thesis: Porous LiFePO<sub>4</sub>: advanced templated structures for high powered lithium ion batteries

## *Ann Kathleen Gooding*

Thesis: Charge transfer processes in CdSe semiconductor nanocrystals

## *Yuanhua He*

Thesis: Sonochemistry and advanced oxidation processes: synthesis of nanoparticles and degradation of organic pollutants

## *Fuzhi Huang*

Thesis: Synthesis, modification and characterization of novel electrodes for dye-sensitized solar cells

## *Peter Franz Kaiser*

Thesis: Amino acid synthesis using organoboron reagents

## *Sofia Lobachevsky*

Thesis: A kinetic study of intramolecular homolytic substitution at selenium

## *Karen Jean Loft*

Thesis: Synthesis of sulfated carbohydrates for the development of a coupled assay to monitor carbohydrate sulfatases

## *Georgia Elizabeth McCluskey*

Thesis: Synthesis and properties of organic electronic materials and processing using supercritical carbon dioxide

## *Lachlan James McKimmie*

Thesis: 3-dimensional non-linear optical spectroscopy of semiconductor quantum dots

## *Yanyan Mulyana*

Thesis: Towards multi-step valence tautomerism: a study of mono- and polynuclear cobalt and iron complexes of ortho-dioxolene ligands

## *Wee Lin Victor Ng*

Thesis: Molybdenum complexes containing hydrogen-bond acceptors or donors as models for mononuclear molybdoenzymes

## *Carolina Soares Novo*

Thesis: Single particle spectroscopy of gold nanocrystals

## *Berwyck Lloyd James Poad*

Thesis: Infrared spectroscopy of size selected cation-neutral complexes

## *Christine Schieber*

Thesis: Identifying signalling proteins with phosphoinositide probes



## Research funding

The School of Chemistry performed strongly in 2009, receiving more than \$2.2 in new funding through the ARC Discovery program. A further \$1.1m was received in new Infrastructure and Large Equipment support. There was further success with two staff winning ARC Future Fellowships (Drs Rachel Caruso and John Gehman), and staff were also participants on NHMRC Grants. In particular, we congratulate Drs. Linda Feketeova and George Khairallah, who are now ARC Fellows.

The funding includes grants for:

- ✦ Formation, structure and chemistry of non covalent complexes of biomolecules via mass spectrometry (Dr L Feketeova)
- ✦ Synthesis of phosphatidylinositol and inositol polyphosphate derivatives to probe key signalling proteins associated with cell growth and cancer (Prof AB Holmes; Prof AW Burgess; Dr BL Catimel)
- ✦ Catalytic currency: the role of size reactivity relationships of simple and mixed 'coinage' metal clusters in C C bond forming reactions (Dr G Khairallah)
- ✦ Repulsive van der Waals forces and Brownian ratchet motors: manipulating thermal and quantum Fluctuations (Prof P Mulvaney; Prof JE Sader)
- ✦ Chemistry of the transport of nutrient copper in biological cells (Prof AG Wedd; Dr F. Arnesano)
- ✦ Mannosyl transfer processes in leishmania and mycobacteria (Dr SJ Williams; Prof MJ McConville).

There was substantial new funding for key equipment in 2009. This included:

- ✦ A laser facility for ultrasensitive molecular characterization
- ✦ A soft matter and responsive materials characterisation facility
- ✦ An advanced ultrasonic spray deposition system for large area solar cells fabrication
- ✦ A small molecule X-ray molecular structure elucidation facility.

Chemistry staff were involved in 3 successful NHMRC grants:

- ✦ Preclinical evaluation of F-18 fluoroethyltriazolyl PEGstilbenes as potential PET imaging agents for Alzheimer's disease (White et al.)

- ✦ Multi-Targeted Inhibition of an essential tetrameric enzyme from drug-resistant *Streptococcus pneumoniae* (Hutton et al.)
- ✦ Role of LPS in encapsulation (Gee et al. \$415K).

Staff won 2 Linkage grants to develop chemistry with industry partners:

- ✦ Phytoextraction approaches for mitigating heavy metal release from unlined and loosely capped rural landfills (Kolev)
- ✦ Ultrasonics as a new platform technology in dairy processing (Ashokkumar, Kentish and Zisu).

Staff were co-investigators on successful ARC Grants led by other universities including: Paper fluidics – A novel approach to low cost printable microsensors (Kolev et al.)

Finally, we note that Dr Spencer Williams is a co-investigator on 2 NHMRC Development grants, which fund initial work into the possible commercialisation of medical research. These two grants were for studies of metabolites of synthetic flavonols for the treatment of cardiovascular disease and the development of new anti-fibrotic drugs for prevention of diabetic nephropathy.

### Continued funding for ARC Centre of Excellence

Congratulations to members of the ARC Centre of Excellence for Free Radical Chemistry and Biotechnology who were notified that the ARC has approved an extension of funding until the end of 2013 with a further \$9.8 million provided. Members of the School are also participants in the ARC Centre of Excellence for Coherent X-Ray Science which also received an extension of funding until 2013.

Details of the press release can be accessed from [www.freeradical.org.au/article.php?id=28](http://www.freeradical.org.au/article.php?id=28)

Full details of the Centre and the work they are undertaking can be accessed from their websites.

### Grants

Assoc Prof Evan J Bieske, Dr Adam I Mechler, Dr Evan G Robertson, Dr Toby D Bell  
*Lighting up the charged brigade: laser spectroscopy of protonated and metal containing complexes*

Dr Raymond R Dagastine, Prof Graeme J Jameson, Dr Ian C Larson, Prof Franz Grieser, Prof Geoff W Stevens, Prof Derek Y Chan, Assoc Prof Muthupandian Ashokkumar, Dr Grant B Webber, Assoc Prof Erica J Wanless, Dr Rob Atkin, Dr Benjamin J Boyd, Prof Elena Ivanova, Prof Russell J Crawford  
*Soft matter and responsive materials characterisation facility*

Prof Andrew B Holmes, Dr David J Jones, Dr Doojin Vak, Prof YiBing Cheng, Dr Udo Bach  
*Advanced ultrasonic spray deposition system for large area solar cells fabrication*

Assoc Prof Jonathan M White, Dr Anne F Richards, Assoc Prof Stuart R Batten, Assoc Prof Brendan F Abrahams, Dr Peter J Barnard, Assoc Prof Andrew B Hughes, Dr Paul S Donnelly, Dr Colette Boskovic, Dr Craig A Hutton, Assoc Prof Charles G Young, Dr Spencer J Williams, Prof Peter C Junk, Prof Cameron Jones, Prof Leone Spiccia, Dr David J Wilson, Dr Conor F Hogan, Assoc Prof Philip C Andrews, Prof Glen B Deacon, Prof Andrew B Holmes, Prof Keith S Murray  
*Small molecule Xray molecular structure elucidation facility*

Assoc Prof Anthony Purcell, Prof Richard O'Hair et al.  
*A protein molecular interaction and localisation facility*

Dr L Feketeova  
*Formation, structure and chemistry of non covalent complexes of biomolecules via mass spectrometry*

Prof AB Holmes, Prof AW Burgess, Dr BL Catimel

*Synthesis of phosphatidylinositol and inositol polyphosphate derivatives to probe key signalling proteins associated with cell growth and cancer*

Dr G Khairallah

*Catalytic currency: the role of size reactivity relationships of simple and mixed 'coinage' metal clusters in C C bond forming reactions*

Prof P Mulvaney, Prof JE Sader

*Repulsive van der Waals forces and Brownian ratchet motors: manipulating thermal and quantum fluctuations*

Prof AG Wedd, Dr F Arnesano

*Chemistry of the transport of nutrient copper in biological cells*

Dr SJ Williams, Prof MJ McConville

*Mannosyl transfer processes in leishmania and mycobacteria*

Dr JD Gehman

*Approved maximizing solid state nuclear magnetic resonance (NMR) with maximum entropy*

Dr RA Caruso

*Engineered materials for future energy technologies*





# Conferences

Abrahams, Assoc Prof B	Dec	SICC 6 – Singapore International Chemical Conference, Singapore.
Boskovic, Dr C	Dec	RACI Victorian Branch Inorganic Division Postgraduate Symposium, Melbourne, VIC.
Caruso, Dr R	May	International Workshop: Advanced Materials for Australia's Future, The University of Melbourne, VIC.
	Aug	Science Leaders Workshop. CSIRO Clayton, VIC.
	Oct	NanoSMat, Rome, Italy.
Chen, Dr D	Jul	The International Conference and Exhibition on Materials and AustCeram 2009 (MA2009), Queensland.
	Sep	European Congress on Advanced Materials and Processes, Glasgow, Scotland
Donner, Dr C	Feb	VCE Chemistry Conference, LaTrobe University, Melbourne, VIC.
	Mar	Melbourne-Vanderbilt Chemistry Symposium, Bio21 Institute, University of Melbourne, VIC.
	Nov	Pacific Symposium on Radical Chemistry (PSRC-4), Shanghai Institute for Organic Chemistry, Shanghai, China
	Dec	34th Annual Synthesis Symposium, Bio21 Institute, University of Melbourne, VIC.
Feketeova, Dr L	Jan	The Australian and New Zealand Society for Mass Spectrometry (ANZSMS 22), University of Sydney, Sydney, NSW.
	Mar	Joint Melbourne-Vanderbilt Chemistry Symposium, Bio21 Institute, Melbourne, VIC.
	Jul	6th International Conference on Radiation Damage in Biomolecular systems (RADAM 2009), Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany.
Ghigginio, Prof, K	Feb	Symposium on Recent Advances in Fluorescence and Spectroscopic Methods, Hokkaido University, Japan
	Feb	Frontiers in the Photocatalysis and Photochemistry of Advanced Materials, Kanagawa Science Park, Japan
	July	XXIV International Conference on Photochemistry, Toledo, Spain
	Aug	42nd IUPAC Congress, Glasgow, UK
	Nov	Australasian Conference on Optics, Lasers and Spectroscopy (ACOLS/ACOF 2009), Adelaide
	Dec	11th Pacific Polymer Conference, Cairns, QLD
Gee, Assoc Prof M	Jun	13th IACIS International Conference on Colloid Science and the 83rd ACS Colloid and Interface Science Symposium, Columbia University, New York, USA
	Aug	World Congress of Chemical Engineering, Montreal, Canada.
Hutton, Dr C	Mar	Melbourne-Vanderbilt Chemistry Symposium, Melbourne, VIC.
	Jun	Gordon Research Conference on Heterocyclic Compounds, Newport, USA
	Oct	8th Australian Peptide Conference, Couran Cove, Queensland, QLD.
Kolev, Assoc Prof S	Jul	5th Conference of the Aseanian Membrane Society, Kobe, Japan
	Sep	Flow Analysis XI, Mallorca, Spain
	Dec	17th RACI Research & Development Topics Conference, Gold Coast, QLD.
McKimmie, Dr L	Nov	Australian Conference of Optics, Lasers and Spectroscopy (ACOLS09), University of Adelaide, SA.
Moylan, Mr M	Feb	The Periodic Table, VCE Chemistry Conference, LaTrobe University, VIC.
	Jul	ANZAAS Youth Conference, Melbourne, VIC.
	Nov	STAVCON, LaTrobe University, Melbourne, VIC.
	Nov	CEA November Lectures. Melbourne, VIC.

Mulvaney, Prof P	Feb	Australian Colloid and Interface Science Conference (ACIS2009). Glenelg, SA.
	Feb	AMN4 Dunedin, New Zealand
	May	Australian Science Festival, Canberra, ACT.
	Jun	ICMAT 2009, Singapore
	Jul	Leuven Conference on Photochemistry in Nanoscale Systems, Leuven, Belgium
	Jul	Gold 2009 Heidelberg, Germany
	Aug	NanoToday 2009, Singapore
	Nov	FABLS Life Sciences Conference, Melbourne, VIC.
	Dec	MRS, Boston, USA
Ashokkumar, Assoc Prof & Reader A	Jan	1st Symposium on Interaction between Ultrasound and Microbubbles, Nagoya, Japan
	Mar	COST Action D32 Final Meeting, Crocow, Poland
	Apr	4th International Symposium on Spray Dried Products, Melbourne, VIC.
	May	International Workshop on Advanced Materials for Australia's Future, Melbourne, VIC.
	Jun	International Conference on Materials for Advanced Technologies (ICMAT 2009), Singapore
	Jul	Murray Goulburn Ultrasonics Workshop, Melbourne, VIC.
	Dec	International Workshop on Recent Advances in Waste Water Treatment, Mumbai, India.
O'Hair, Prof R	Jan	22nd Australian and New Zealand Society for Mass Spectrometry Conference, University of Sydney, Sydney, NSW.
	Feb	Science Teachers' Association of Victoria STAV 2009 Chemistry Conference, La Trobe University, VIC.
	Mar	Inaugural Melbourne-Vanderbilt Chemistry Symposium, Melbourne, VIC.
	Jun	57th American Society for Mass Spectrometry (ASMS) Conference, Pennsylvania Convention Center, Philadelphia, USA
	Jun	Third International Workshop on Electrostatic Storage Devices, Department of Physics and Astronomy, Aarhus University, Denmark
	Aug	18th International Mass Spectrometry Conference, Bremen Conference Center, Bremen, Germany
	Feb	The biennial Australian Colloid and Interface Symposium and the 10th Australia-Japan Colloid and Interface Science Symposium, Glenelg, SA.
	Jun	International Conference on Materials for Advanced Technologies, Singapore
Schiesser, Prof C	Feb	Exploiting Free Radical Reactions at Selenium. Zing Main Group Chemistry Conference, Playa del Carmen, Mexico
	May	RACI 1st Symposium on Trace Elements in Food and Health (STEFH-1), Queensland Health Forensic and Scientific Services, QLD.
	Jun	Gordon Research Conference on Physical Organic Chemistry, Molecular Design and Synthesis, New Hampshire, USA
	Nov	4th Pacific Symposium on Radical Chemistry, Shanghai Institute of Organic Chemistry, Shanghai, China.
Separovic, Prof F	Jan	6th Asian Biophysics Association Symposium, Hong Kong, China
	Feb	53rd Annual Mtg Biophys. Soc., Boston, USA
	Jul	7th EBSA European Biophys. Congr. Genoa, Italy
	Nov	3rd Asia-Pacific International Peptide Symposium, Jeju Island, Korea
	Dec	33rd Australian Society for Biophysics, Ballarat, VIC.



Smith, Assoc Prof T	Jun	Nanophotonics Down Under 2009 Devices and Applications [SMONP2009], Melbourne, VIC.
	Aug	Femtochemistry, Femtobiology, and Femtophysics (Femto IX), Peking University, Beijing, China
	Sep	11th Conference on Methods and Applications of Fluorescence (MAF11), Budapest, Hungary.
	Nov	Light in Life Sciences (LILS) conference, Melbourne, VIC.
	Dec	Australasian Conference on Optics, Lasers and Spectroscopy (ACOLS), Adelaide, SA.
Wedd, Prof T	Jul	Frontiers in Chemistry and Biochemistry, Nanyang Technological University, Singapore
	Jul	14th International Conference on Biological Inorganic Chemistry, Nagoya, Japan
	Nov	Symposium on Advanced Biological Inorganic Chemistry, Tata Institute of Fundamental Research, Mumbai, India
	Nov	Symposium on Metals in Biology, Indian Institute of Technology, Kanpur, India
	Dec	RACI Postgraduate Symposium on Inorganic Chemistry, University of Melbourne, VIC.
Williams, Dr S	Jun	Gordon Research Conference, 'Carbohydrates', New Hampshire, USA.
Xiao, Dr Z	Nov	Symposium on Advanced Biological Inorganic Chemistry (SABIC-2009), Mumbai, India
Young, Assoc Prof C	Feb	Zinc Main Group Chemistry Conference, Cancun, Mexico
	Jul	Gordon Research Conference on Molybdenum and Tungsten Enzymes, Lucca, Italy
	Dec	RACI Victorian Inorganic Chemistry Symposium, University of Melbourne, VIC.



Australia presents a gift to Countess Bettina Bernadotte after the 'Lindau Polonaise'



# Organic Chemistry Seminars

**Coordinator: Dr Craig Hutton**

## 23 January

Prof Louis Fensterbank  
*Universite Paris 6*  
New Radical and Organometallic  
Methodologies for Organic Synthesis

## 6 March

Prof David Knight  
*Cardiff University*  
Frisky protons with a silver lining: new methods  
in heterocyclic synthesis

## 30 March

Prof Richard F W Jackson  
*University of Sheffield*  
Amino Acid-Derived Organometallics:  
Applications and Solution Structure

## 7 April

Prof Dieter Seebach  
*ETH Zurich*  
Peptides; a synthetic organic chemist gone  
astray?

## 24 April

Kristine Tan  
*PhD swansong*  
Thiyl Radical Reactions with Alkynes in the  
Absence and Presence of Oxygen

## 1 May

Prof Colin Barrow  
*Deakin University*  
Omega-3 Biotechnology: Functional Foods  
and Pharmaceuticals

## 8 May

Nathan McGill  
*PhD swansong*  
Synthesis of Carbohydrate Antigens for the  
Production of Arabinogalactan Protein-Specific  
Monoclonal Antibodies

## 15 May

Assoc Prof Andrea Robinson  
*Monash University*  
Applying homogenous catalysis to the  
synthesis of peptidomimetics

## 22 May

Georgia McCluskey  
*PhD swansong*  
Organic electroactive materials for processing  
in alternative solvents

## 29 May

Woan Mei Kok  
*PhD swansong*  
Dityrosine-linked A beta peptide dimers and  
their role in Alzheimer's disease

## 31 July

Joel Hooper  
*PhD swansong*  
An exo Selective Diels-Alder Approach to the  
Eunicellins

## 7 August

Dr Sebastian Meiries  
*The University of Melbourne*  
Journey to the Centre of the ADDA World

## 14 August

Prof Richard Wong  
*National University of Singapore*  
Understanding Stereoselectivity in Asymmetric  
Organocatalysis – A Computational Approach

## 21 August

Suwan Yap  
*PhD swansong*  
Synthesis and Bioassay of Targeted Flavonols

## 28 August

Quentin Churches  
*PhD swansong*  
Synthesis of highly Functionalized Amino Acids

## 4 September

Dr Kathryn Fairfull-Smith  
*Queensland University of Technology*  
The Synthesis and Application of Isoindoline  
Nitroxides in Biological Systems and in  
Materials Science

## 11 September

Yen Lim  
*PhD swansong*

## 18 September

Dr Fei Liu  
*Macquarie University*  
Multidentate Organocatalysis in Asymmetric  
Synthesis

## 25 September

Sara Kyne  
*PhD swansong*  
Understanding Acyl Radical Cyclisations

## 9 October

Dr Danielle Skropeta  
*University of Wollongong*  
Discovery, Design and Development of New  
Therapeutic Agents: from the Alps to the Deep-  
sea

## 16 October

Dr Allan Gamble  
*Australian National University*  
Hormone Regulation- Inhibition of  
Peptidylglycine alpha-amidating  
Monooxygenase (PAM)

## 23 October

John Lynch  
*PhD swansong*  
Synthetic Studies towards the Spirofungins

## 30 October

Adrian Lam  
*PhD swansong*  
Mobile Protons and Mobile Radicals: Examining  
the gas-phase dissociation of cysteinyl radicals  
and  $\beta$ -alanine.

## 6 November

Phillip Van der Peet  
*PhD Swansong*  
Chemical Tools for the Study of Leishmania  
Mexina  $\beta$ -1,2-mannosyltransferases

## Nov 13

Ina Ritsner  
*PhD swansong*  
Radicals Masquerading as Electrophiles:  
Exploring Frontier Orbital Interaction in free  
Radical Reactions. The Theoretical Studies



# Inorganic and Analytical Seminars

**Coordinator: Prof Tony Wedd**

## 3 March

Dr Guillem Aroni  
*University of Barcelona*  
Synthesis of Molecular Cluster Pairs:  
Addressing the Challenges of Quantum  
Computing through Coordination Chemistry

## 10 March

Prof Alan Cowley  
*University of Texas at Austin*  
Novel Lanthanide and Main Group Complexes  
Supported by Redox-Active Diazabutadiene,  
Bis(imino)acenaphthene and Related Ligands

## 19 March

Prof Venceslas Kaucic  
*University of Ljubljana, Slovenia*  
Modified Microporous and Mesoporous  
Materials and their Composites

## 24 March

Dr David Jones  
*The University of Melbourne*  
Organic Solar Cells: Materials, Characterization  
and Device Assembly

## 31 March

Dr Rosalie Hocking  
*Monash University*  
Backbonding – Quantifying, Measuring  
and Applying it: from Crystallography to  
Spectroscopy; from Electronic Structure to  
Geometric Structure; from Innocent to non-  
Innocent

## 7 April

Victor Ng  
Molybdenum Complexes Containing  
Hydrogen-Bond Acceptors or Donors as  
Models for Mononuclear Molybdoenzymes

## 21 April

Dr James Hickey  
*The University of Melbourne*  
Synthetic approaches towards anticancer  
agents. Gold and silver complexes with  
bidentate N-heterocyclic carbene ligands

## April 28

Kerwyn Alley  
*The University of Melbourne*  
Jens Brose  
*University of Bielefeld*  
Ferrofluids: The Art and Application of Liquid  
Magnets  
Glutathione Reductase: an Enzyme or a  
Copper Chaperone or Both?

## 5 May

Prof Keith Murray  
*Monash University*  
Metallo-Supramolecular Clusters and  
Frameworks; Spinexchange, Single Molecule  
Magnets and Spin-switching

## 12 May

Michelle Ma  
*The University of Melbourne*  
Cagey Turns and Complex Twists: Synthesis  
and Applications of Metallopeptides

## 19 May

Matthias Zimmermann  
*The University of Melbourne*  
Copper and Zinc: How Nature Sorts Them Out

## 26 May

Assoc Prof Ian McKelvie  
*Monash University*  
Diffusive Gradients and Equilibria in Thin  
Films: A Different Approach to Measuring  
Phosphorus Fluxes and Concentrations in  
Aquatic Sediments

## 28 July

Dr Hugh Harris  
*University of Adelaide*  
Towards in vivo Imaging and Spectroscopy  
with X-rays

## 4 August

Nick Fitzgerald  
*The University of Melbourne*  
Clams, Swiss Cheese and Other  
Supramolecular Delicacies

## 11 August

Dr Gerry Sweigers  
*University of Woollongong*  
Homogeneous Catalysts with a Mechanical  
("Machinelike") Action. Catalytic Solar Water  
Splitting Inspired by Photosynthesis

## 18 August

Cristina Lomonte  
*The University of Melbourne*  
Environmental Fate and Phytoremediation of  
Mercury in Biosolids

## 25 August

Gojko Buncic  
Sin Chun Lim  
*The University of Melbourne*  
How Plants Communicate with Us  
Metals in Dental Science

## 1 September

Prof Jean-Francois Letard  
*The University of Toulouse, France*  
Nanoparticles of Iron(II) Spin Cross-over  
Compounds

## 8 September

Assoc Prof Shi Yao Yang  
*Xiamen University, China*  
Exploring Factors Which Influence the  
Assembly of Coordination Polymers for Yang

## 15 September

Prof Leone Spiccia  
*Monash University*  
Solar Driven Water Oxidation by a Bio-inspired  
Manganese Molecular Catalyst

## 6 October

Keith White  
Andrea North  
*The University of Melbourne*  
Gas hydrates  
Honeycombe Sandwiches and Stealthy Foams

## 13 October

Prof Petr Solich  
*Charles University, Czech Republic*  
Monolithic separation columns – how  
successful are they?

## 20 October

Glenna Anderson  
*The University of Melbourne*  
Template Synthesis and Surface Modification  
of Metal Oxides as Storage Materials for  
Nuclear and Toxic Wastes.

# Physical Chemistry Seminars

**Coordinator: Assoc Prof Trevor Smith**

## 2 February

Prof Jürgen Grotemeyer  
*Universität Kiel, Germany*  
Processes in Isolated Molecules Revealed by Mass Spectrometry

## 3 February

Dr Ryuzi Katoh  
*National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan*  
Time-Resolved Microwave Conductivity Measurements & Transient Absorption Spectroscopy Studies on TiO<sub>2</sub> Nanoparticles

## 19 February

Berwyck Poad  
*PhD swansong*  
Infrared investigations of size selected cation-neutral complexes

## 5 March

Prof Ron Steer  
*University of Saskatchewan, Canada*  
Fast upper singlet state relaxation in metalloporphyrins: implications for NIR solar energy harvesting

## 12 March

Dr Brendon Conlan  
*Australian National University*  
Engineering of Light Activated Metallo-Proteins

## 19 March

Dr Venceslav Kaucic  
*University of Ljubljana, Slovenia*  
Modified microporous and mesoporous materials and their composites

## 24 March

Dr David Jones  
*The University of Melbourne*  
Organic Solar Cells: Materials, Characterisation and Device Assembly

## 2 April

Assoc Prof Greg Scholes  
*University of Toronto, Canada*  
Light harvesting in photosynthetic antenna proteins: Quantum energy funnels at room temperature

## 9 April

Prof David Millar  
*The Scripps Research Institute, La Jolla, USA*  
Application of Single-Molecule Fluorescence Spectroscopy to Biochemical Systems

## 23 April

Yuanhua He  
*PhD swansong*  
Sonochemistry and Advanced Oxidation

Process: Synthesis of Nanoparticles and Degradation of Organic Pollutants

## 7 May

Dr Xingdong Wang  
*PhD swansong*  
The synthesis of noble metal/TiO<sub>2</sub> composites via templating techniques and application of the composites in photocatalysis reactions

## 21 May

Dr Seth Olsen  
*University of Queensland*  
The Electronic Structure of the Methine Unit – Implications for Photoisomerization and Charge Separation in Organic Dyes – abstract

## 27 May

Prof James Wishart  
*Brookhaven National Laboratory*  
Spectroscopic Studies of Structure, Dynamics and Reactivity in Ionic Liquids

## 28 May

Assoc Prof Paul Meredith  
*University of Queensland*  
Melanins – Bio-electronic Materials – abstract

## 3 June

Lachlan McKimmie  
*PhD swansong*  
Ultrafast Dynamics of CdSe Core/Shell Semiconductor Quantum Dots: A 3-Pulse Photon Echo Peakshift Study

## 11 June

Phil Wearne  
*PhD swansong*  
On the optical properties of carbon nanoparticles stored in a quadrupole ion trap

## 16 July

William Donald  
*University of California, Berkeley, USA*  
Connecting Reduction Energies of Gaseous Hydrated Metal Ion Clusters to Aqueous Solution: Obtaining Absolute Reduction Potentials, and Investigating Ion and Electron Solvation

## 20 August

Assoc Prof Alex Martucci  
*Università di Padova, Italy*  
Sol-Gel Films containing Metal and Semiconductor Nanoparticles For Gas Sensing – abstract

## 27 August

Dr Vik Dryza  
*The University of Melbourne*  
Elucidating the structures of gas-phase metal-

carbide clusters and nanocrystals via photo-ionisation

## 3 September

Geoff Burrell  
*PhD swansong*  
Tuning the properties of room temperature Protic Ionic Liquids

## 10 September

Emma Lees  
*PhD swansong*  
Preparation and Characterisation of Biocompatible Semiconductor Nanocrystals

## 17 September

Ann Gooding  
*PhD swansong*  
Charge Transfer Processes in CdSe Semiconductor Nanocrystals

## 8 October

Assoc Prof Francesca Cavalieri  
*University of Rome Tor Vergata, Italy*  
Thin multilayer films and microcapsules bearing DNA quadruplex moieties – abstract

## 15 October

Dr Dehong Chen  
*The University of Melbourne*  
Sol-gel synthesis of monodisperse mesoporous Titania microspheres and their photovoltaic application

## 22 October

Assoc Prof Tiffany Walsh  
*University of Warwick, UK*  
Learning to Control the Interface between Biomolecules and Inorganic Surfaces: a Molecular Simulation Perspective

## 29 October

Ms. Boon Teo  
*PhD swansong*  
Ultrasonic Polymer Synthesis

## 13 November

Prof Tom M. Klapötke  
*LMU Munich, Germany*  
Some Recent Aspects of Burning Rate Modifiers, RDX Replacements and new High-Energy Dense Oxidizers.

## 17 December

Prof Garry Rumbles  
*National Renewable Energy Laboratory and University of Colorado, USA*  
Transient Microwave Conductivity Studies of Organic Photovoltaics





# Publications

## A1 - Authored Research Books

Stick V & Williams S. 2009. Carbohydrates. The Essential Molecules of Life. United Kingdom: Elsevier Science.

## B - Book Chapters

Kail W, Young C, Johnson E & Basu . 2009. Understanding Oxotransferase Reactivity in a Model System Using Singular Value Decomposition Analysis. In Long C & Baldwin M (eds), Bioinorganic Chemistry: Cellular Systems and Synthetic Models. pp. 199-217.

## B1 - Research Book Chapters

Bowie H, Jackway J, Separovic F, Carver A & Tyler J. 2009. Host-Defense Peptides from the Secretion of the Skin Glands of Frogs and Toads: Membrane-Active Peptides from the Genera Litoria, Uperoleia, and Crinia. Bioactive Peptides. Abingdon, United Kingdom: Taylor & Francis Ltd, pp. 333-355.

Kail W, Young C, Johnson E & Basu . 2009. Understanding Oxotransferase Reactivity in a Model System Using Singular Value Decomposition Analysis. In Long C & Baldwin M (eds), Bioinorganic Chemistry: Cellular Systems and Synthetic Models. Washington DC, United States: American Chemical Society, pp. 199-217.

Learmonth P, Kable H & Ghiggino K. 2009. Basics of Fluorescence. In Goldys M (ed), Fluorescence Applications in Biotechnology and Life Sciences. United States: Wiley-Blackwell Publishing, pp. 1-26.

Shabanpoor F, Hughes R, Bathgate R, Separovic F & Wade J. 2009. Development of lanthanide-labelled human INSL3 for use in bioassays. Relaxin and Related Peptides: Fifth International Conference, Ann NY Acad Sci Vol 1160. United States: Wiley-Blackwell Publishing, pp. 87-90.

Shabanpoor F, Hughes R, Separovic F & Wade J. 2009. The chemistry and biology of insulin-like peptide 3, a novel member of the insulin superfamily. Bioactive Peptides. Abingdon, United Kingdom: Taylor & Francis Ltd, pp. 159-168.

Shabanpoor F, Separovic F & Wade J. 2009. The Human Insulin Superfamily of Polypeptide Hormones. Vitamins and Hormones, Vol 80. Massachusetts, United States: Elsevier Science, pp. 1-31.

Smith T, Lincoln C & Bird D. 2009. Time-resolved fluorescence in microscopy. Fluorescence Applications in Biotechnology and the Life Sciences. United States: Wiley-Blackwell Publishing, pp. 195-221.

Williams S. 2009. Glycoconjugate Structure and Biosynthesis. Wiley Encyclopedia of Chemical Biology. United States: John Wiley & Sons, pp. 1-14.

## C - Journal Articles

Cho M, Seo M, Lee -K, Zhang H & Lamb R. 2009. Electronic Properties of Oxygen Vacancies in Titania Nanotubes. Physica B. 404 (1), pp. 27-130.

Karg M. 2009. New "smart" poly(NIPAM) microgels and nanoparticle microgel hybrids: Properties and advances in characterisation. Current Opinion in Colloid & Interface Science. 14 (9) : 438-450.

Karg M. 2009. Smart inorganic/organic hybrid microgels: Synthesis and characterisation. Journal of Materials Chemistry. 19 (46) : 8714-8727.

Mitchell G, Gabb , Ritchie C, Hazel , Long & Cronin . 2009. Controlling nucleation of the cyclic heteropolyanion {P8W48}: a cobalt-substituted phosphotungstate chain and network. Crystal Engineering Communications. 36 - 39.

Ritchie C, Boyd , Long , Ditzel & Cronin . 2009. Grafting ligands to direct the self-assembly of Co/Ni<sup>2+</sup> substituted polyoxometalate clusters. Dalton Transactions. 1587 - 1592.

Scardino J, Zhang , Cookson D, De Nys & Lamb R. 2009. The role of nano-roughness in antifouling. Biofouling. 25 (7-8) : 757-767.

## C1 - Journal Articles Refereed

Abrahams B, Fitzgerald NJ, Hudson T, Robson R & Waters T. 2009. Closed and Open Clamlike Structures Formed by Hydrogen-Bonded Pairs of Cyclotricatechylene Anions that Contain Cationic "Meat". Angewandte Chemie - International Edition. 48 (17) : 3129-3132.

Abrahams B, McCormick LJ & Robson R. 2009. Crystallographic studies on a series of salts of 2,3,7-trihydroxy-9-phenyl-fluorone. Journal of Molecular Structure. 920 : 466-471.

Adamson BD, Sader J & Bieske E. 2009. Photoacoustic detection of gases using microcantilevers. Journal of Applied Physics. 106 (11) : 114510-4.

Adlard P, James S, Bush A & Masters C. 2009.  $\beta$ -amyloid as a molecular therapeutic target in Alzheimer's disease. Drugs of Today. 45 (4) : 293-304.

Amos RIJ, Smith JA, Yates BF & Schiesser C. 2009. Acyl Radical Addition to Pyridine: Multiorbital Interactions. Tetrahedron. 65 : 7653-7657.

Amos R, Schiesser C, Smith JA & Yates BF. 2009. Nucleophilic Acyl Substitution of Acyl Diimides. Journal of Organic Chemistry. 74 : 5707-5710.

Anandan & Ashokkumar M. 2009. Sonochemical synthesis of Au-TiO<sub>2</sub> nanoparticles for the sonophotocatalytic degradation of organic pollutants in aqueous environment. Ultrasonics Sonochemistry. 16 : 316-320.

Ang JC, Mulyana Y, Ritchie C, Clerac & Boskovic C. 2009. Mixed-Valent Polynuclear Cobalt Complexes Incorporating Tetradentate Phenoxyamine Ligands. Australian Journal of Chemistry. 62 : 1124-1129.

Ashokkumar M, Lee , Iida , Yasui , Kozuka , Tuziuti & Towata . 2009. The detection and control of stable and transient acoustic cavitation bubbles. Physical Chemistry Chemical Physics. 11 : 10118-10121.

Ashokkumar M, Lee J, Zisu , Bhaskaracharya R, Palmer & Kentish S. 2009. Hot topic: Sonication increases the heat stability of whey proteins. Journal of Dairy Science. 92 (11) : 5353-5356.

Barnard A. 2009. Modelling the Relative Stability of Carbon Nanotubes Exposed to Environmental Adsorbates and Air. Journal of Physics - Condensed Matter . 21 (14) : 144205.

Barnard A & Hales J. 2009. Thermodynamic stability and electronic structure of small carbon nitride nanotubes. Journal of Physics - Condensed Matter . 2009 (14) : 144205.

Barnard A, Vlasov I & Ralchenko V. 2009. Predicting the Distribution and Stability of Photoactive Defect Centers in Nanodiamond Biomarkers. Journal of Materials Chemistry. 2009 (19) : 360-365.

- Barton JR, Goh YW, Karnezis A & White J. 2009. Structural Studies on alpha Pyrone Cycloadducts. Manifestation of the Early Stages of CO<sub>2</sub> Extrusion by retro Hetero Diels-Alder Reaction. *Australian Journal of Chemistry*. 62 : 407-412.
- Barton JR & White J. 2009. X-ray structural analysis for the prediction on the nature of the retro Diels-Alder pathway: concerted or stepwise. Structural studies on nitrosobenzene cycloadducts. *Australian Journal of Chemistry*. 62 : 1695-1698.
- Bell T, Bhosale V, Ghiggino K, Langford J & Woodward P. 2009. Synthesis and Photophysical Properties of a Conformationally Flexible Mixed Porphyrin Star-Pentamer. *Australian Journal of Chemistry*. 62 : 692-699.
- Bell T, Yap S, Jani H, Bhosale V, Hofkens , De Schryver C, Langford J & Ghiggino K. 2009. Synthesis and photophysics of core-substituted naphthalene diimides: fluorophores for single molecule applications. *Chemistry - An Asian Journal*. 4 : 1542-1550.
- Bernaudo Shaw N, Doronila A, Grieser F & Ashokkumar M. 2009. Simple and efficient sonochemical method for the oxidation of arsenic(III) to arsenic. *Environmental Science & Technology*. 43 : 6793-6798.
- Bhaskaracharya R, Kentish S & Ashokkumar M. 2009. Selected applications of ultrasonics in food processing. *Food Engineering Reviews*. 1 : 31-49.
- Bieske E & Dryza V. 2009. Structure and properties of the Zn<sup>++</sup>-D<sub>2</sub> complex. *Journal of Chemical Physics*. 131 : 224304-7.
- Bieske E, Dryza V & Poad BLJ. 2009. Spectroscopic Study of the Benchmark Mn<sup>++</sup>-H<sub>2</sub> Complex. *Journal of Physical Chemistry A*. 113 (21) : 6044-6048.
- Bieske E, Trevitt AJ & Wearne PJ. 2009. Coalescence of levitated polystyrene microspheres. *Journal of Aerosol Science*. 40 (5) : 431-438.
- Bojarova P & Williams S. 2009. Aryl sulfamates are broad spectrum inactivators of sulfatases: Effect on sulfatases from various sources. *Bioorganic and Medicinal Chemistry Letters*. 19 : 477-480.
- Boskovic S, Hill , Turney , Stevens G, Gee M & O'Connor A. 2009. Micropore Characterization of Mesocellular Foam and Hybrid Organic Functional Mesocellular Foam Materials. *Journal of Physical Chemistry C*. 113 (51) : 21283-21292.
- Brothie AR, Grieser F & Ashokkumar M. 2009. The effect of power and frequency on acoustic cavitation bubble size distributions. *Physical Review Letters*. 102 : 0843021-4.
- Brothie AR, Mettin , Grieser F & Ashokkumar M. 2009. Cavitation activation by dual-frequency ultrasound and shock waves. *Physical Chemistry Chemical Physics*. 11 : 10029-10034.
- Buso , Palmer LA, Bello , Mattei , Post , Mulvaney P & Martucci . 2009. Self-assembled gold nanoparticle monolayers in sol-gel matrices: synthesis and gas sensing applications. *Journal of Materials Chemistry*. 19 : 2051-2057.
- Catimel B, Yin MX, Schieber C, Condron M, Patsiouras H, Catimel J, Robinson D, Wong L, Nice E, Holmes A & Burgess A. 2009. PI(3,4,5)P<sub>3</sub> Interactome. *Journal of Proteome Research*. 8 : 3712-3726.
- Chan D, Uddin M, Cho K, Dagastine R, Lamb R, Stevens G, Grieser F & Liaw I. 2009. Silica nano-particle super-hydrophobic surfaces: the effects of surface morphology and trapped air pockets on hydrodynamic drainage forces. *Faraday Discussions*. 143 : 151-168.
- Changsan , Chan , Separovic F & Srichana . 2009. Physico-chemical characterization of structure and stability of rifampicin liposome dry powders for inhalation. *Journal of Pharmaceutical Sciences*. 98 (2) : 628-639.
- Chan KL, Sims M, Pascu SI, Ariu M, Holmes A & Bradley DDC. 2009. Understanding the Nature of the States Responsible for the Green Emission in Oxidized Poly(9,9-dialkylfluorene)s: Photophysics and Structural Studies of Linear Dialkylfluorene/Fluorenone Model Compounds. *Advanced Functional Materials*. 19 : 2147-2154.
- Chan NYO, Hao X, Smith T & Dunstan D. 2009. Aggregation of Water Soluble Conjugated Polymers in Couette Shear Flow. *Journal of Physical Chemistry B*. 113 : 13138-13141.
- Chen D, Huang , Cheng & Caruso R. 2009. Mesoporous anatase TiO<sub>2</sub> beads with high surface areas and controllable pore sizes: A superior candidate for high performance dye-sensitized solar cells. *Advanced Materials*. 21 : 2206-2210.
- Chen D, Huang F, Cheng & Caruso R. 2009. Mesoporous Anatase TiO<sub>2</sub> Beads with High Surface Areas and Controllable Pore Sizes: A Superior Candidate for High-Performance Dye-Sensitized Solar Cells. *Advanced Materials*. 21 (21) : 2206-2210.
- Chen , Regan K, Craig L, Krenske H, Houk N, Jorgensen L & Brauman I. 2009. Steric and Solvation Effects in Ionic S<sub>N</sub>2 Reactions. *Journal of the American Chemical Society*. 131 : 16162-16170.
- Chesnut B, Bartolotti J & Harcourt R. 2009. Characterization of the Weak SS Bonds in the OSSSO and O<sub>2</sub>SSSO<sub>2</sub> Molecules. *Journal of Physical Chemistry A*. 113 : 8677-8682.
- Chong LX, Hinds M, Xiao Z & Wedd A. 2009. Unprecedented Binding Cooperativity between CuI and CuII in the Copper Resistance Protein CopK from *Cupriavidus metallidurans* CH34. Implications from Structural Studies by NMR Spectroscopy and X-ray Crystallography. *Journal of the American Chemical Society*. 131 : 3549-64.
- Clark J, Crispini , Donnelly S, Engelhardt M, Harrowfield M, Jeong , Kim , Koutsantonis A, Lee Hoon, White H, Pierre , Sobolev N, Skelton W, Sargeson M, Rukmini , Polzan , Pettinari , Park C, Ogden I, Nealon I, Mocerino & Lengkeek A. 2009. Variations on a Cage Theme: Some Complexes of Bicyclic Polyamines as Supramolecular Synthons. *Australian Journal of Chemistry*. 62 : 1246-1260.
- Crouch P, Hung LW, Adlard P, Cortes , Lal , Filiz G, Perez K, Nurjono, Caragounis A, Du T, Laughton K, Volitakis I, Bush , Li Q, Masters , Cappai R, Cherny , Donnelly P, White A & Barnham K. 2009. Increasing Cu bioavailability inhibits Aβ oligomers and tau phosphorylation. *Proceedings of the National Academy of Sciences of the United States of America*. 106 (2) : 381-386.
- Dias A, Goble J, Silva A & Urban . 2009. Phenylphenalenones from the Australian Plant *Haemodorum simplex*. *Journal of Natural Products*. 72 (6) : 1075-1080.
- Dias A & Urban . 2009. Chemical constituents of the lichen, *Candelaria concolor*: A complete NMR and chemical degradative investigation. *Natural Product Research*. 23 (10) : 925-939.
- Dias DA, White J & Urban S. 2009. *Laurencia filiformis*: Phytochemical profiling by conventional and HPLC-NMR approaches. *Natural Product Communications*. 4 (2) : 157-172.
- Dias & Urban . 2009. Application of HPLC-NMR for the rapid chemical profiling of a Southern Australian Sponge, *Dactylospongia* sp. *Journal of Separation Science*. 32 (4) : 542-548.





- Dias & Urban . 2009. HPLC and NMR Studies of Phenoxazone Alkaloids from *Pycnoporus cinnabarinus*. *Natural Product Communications*. 4 (4): 489-498.
- Dias & Urban . 2009. Naphthalene Aglycones and Glycosides from the Australian Medicinal Plant, *Dianella callicarpa*. *Planta Medica*. 75 (13) : 1442-1447.
- Dias & Urban . 2009. Phytochemical Investigation of the Australian Lichens *Ramalina glaucescens* and *Xanthoria parietina*. *Natural Product Communications*. 4 (7) : 959-964.
- Doherty CM, Caruso R, Smarsly , Adelhelm & Drummond . 2009. Hierarchically porous monolithic LiFePO<sub>4</sub>/carbon composite electrode materials for high power lithium ion batteries. *Chemistry of Materials*. 21 : 5300-5306.
- Doherty CM, Caruso R, Smarsly & Drummond . 2009. Colloidal crystal templating to produce hierarchically porous LiFePO<sub>4</sub> electrode materials for high power lithium ion batteries. *Chemistry of Materials*. 21 : 2895-2903.
- Domigan IJ, Scally SW, Fogg MJ, Hutton C, Perugini M, Dobson R, Muscroft-Taylor AC, Gerrard JA & Devenish SRA. 2009. Characterisation of dihydronicotinamide synthase (DHSDPS) from *Bacillus anthracis*. *Biochimica et Biophysica Acta-Proteins and Proteomics*. 1794 (10) : 1510-1516.
- Drechsler AP, Miles J, Norton S, Wallace A & Separovic F. 2009. Effect of lipid on the conformation of the N-terminal region of equinatoxin II: a synchrotron radiation circular dichroism spectroscopic study. *European Biophysics Journal with Biophysics Letters*. 39 : 121-127.
- Drisko GL, Cao L, Chee Kimling MCLY, Harrison , Luca & Caruso R. 2009. Pore size and volume effects on the incorporation of polymer into macro- and mesoporous zirconium titanium oxide membranes. *ACS Applied Materials and Interfaces*. 1 : 2893-2901.
- Drisko GL, Luca , Sizgek , Scales & Caruso R. 2009. Template synthesis and adsorption properties of hierarchically porous zirconium titanium oxides. *Langmuir*. 25 : 5286-5293.
- Dryza V & Bieske E. 2009. The Cr<sup>++</sup>-D<sub>2</sub> cation complex: Accurate experimental dissociation energy, intermolecular bond length, and vibrational parameters. *Journal of Chemical Physics*. 131 (16) : 164303-6.
- Dryza V, Gascooke JR, Buntine MA & Metha GF. 2009. Onset of carbon-carbon bonding in the Nb<sub>5</sub>Cy (y = 0-6) clusters: a threshold photo-ionisation and density functional theory study. *Physical Chemistry Chemical Physics*. 11 : 1060-1068.
- Dryza V & Metha F. 2009. Threshold photoionization and density functional theory studies of bimetallic-carbide nanocrystals and fragments: Ta<sub>3</sub>ZrCy (y = 0-4). *Journal of Chemical Physics*. 130 (24) : 244301.
- Dryza V, Poad BLJ & Bieske E. 2009. Infrared Spectra of Mass-Selected Mg<sup>++</sup>-H<sub>2</sub> and Mg<sup>++</sup>-D<sub>2</sub> Complexes. *Journal of Physical Chemistry A*. 113 (1) : 199-204.
- Edtbauer , Russell KA, Feketeova L, Taubitz J, Mitterdorfer , Denifl , O'Hair R, Maerk , Scheier & Wille U. 2009. Formation of pyrimidine dimer radical anions in the gas phase. *Chemical Communications*. 7291-7293.
- Feketeova L & O'Hair R. 2009. Comparison of collision versus electron induced dissociation of sodium chloride cluster cations. *Rapid Communications in Mass Spectrometry*. 23 : 60-64.
- Feketeova L & O'Hair R. 2009. Electron-induced dissociation of doubly protonated betaine clusters: controlling fragmentation chemistry through electron energy. *Rapid Communications in Mass Spectrometry*. 23 : 3259-3263.
- Feketeova L, Ryzhov & O'Hair R. 2009. Comparison of collision- versus electron-induced dissociation of Pt (II) Ternary Complexes of His- and Met-containing Peptides. *Rapid Communications in Mass Spectrometry*. 23 : 3133-3143.
- Feketeova , Zabka , Zappa , Grill , Scheier , Mark D & Herman . 2009. Surface-induced dissociation and chemical reactions of C<sub>2</sub>D<sub>4</sub><sup>+</sup> on stainless steel, carbon (HOPG), and two different diamond surfaces. *Journal of the American Society for Mass Spectrometry*. 20 : 927-938.
- Fernandez DI, Gehman J & Separovic F. 2009. Membrane Interactions of Antimicrobial Peptides from Australian Frogs. *Biochimica et Biophysica Acta-Biomembranes*. 1788 : 1630-1638.
- Fraser SJ, Separovic F & Polyzos . 2009. Cubic phases of ternary amphiphile-water systems. *European Biophysics Journal with Biophysics Letters*. 39 : 83-90.
- Funston A, Novo CS, Davis J & Mulvaney P. 2009. Plasmon Coupling of Gold Nanorods at Short Distances and in Different Geometries. *Nano Letters*. 9 (4) : 1651-1658.
- Gehman J & Provis J. 2009. Generalized biaxial shearing of MQMAS NMR spectra. *Journal of Magnetic Resonance*. 200 : 167-172.
- George J, Drury B, Fu , Friedrich , Doonan J, George N, White J, Young C & Cramer P. 2009. Molybdenum X-Ray Absorption Edges from 200 - 20,000 eV: The Benefits of Soft X-Ray Spectroscopy for Chemical Speciation. *Journal of Inorganic Biochemistry*. 103 : 157-167.
- Giannakis E, Samuel C, Hewitson T, Boon WM, Macris M, Reeve S, Lawrence J, Smith AI, Tregear G & Wade J. 2009. Aberrant protein expression in plasma and kidney tissue during experimental obstructive nephropathy. *Proteomics - Clinical Applications*. 3 : 1211-1224.
- Goeschen , Herges , Richter , Tokarczyk & Wirz . 2009. 2-(2,4-Dinitrobenzyl)pyridine (DNBP): A Potential Light-Activated Proton Shuttle Proton Shuttle. *Helvetica Chimica Acta*. 92 (10) : 1909-1922.
- Goh YW & White J. 2009. Structure Correlation Study of Some Diels-Alder Cycloadducts of Anthracene. *Australian Journal of Chemistry*. 62 : 419-424.
- Gomez Alvarez DE, Tan TAT, White J, Bell T & Ghiggino K. 2009. Synthesis and single chain fluorescence of a sulfonated conjugated polymer. *Australian Journal of Chemistry*. 62 : 1577-1582.
- Gomez Alvarez DE, Van Embden JL, Mulvaney P, Fernee J & Rubinsztein-Dunlop . 2009. Exciton-Trion Transitions in Single CdSe-CdS Core-Shell Nanocrystals. *ACS Nano*. 3 (8) : 2281-2287.
- Goodger J, Cao B, Jayadi I, Williams S & Woodrow I. 2009. Non-volatile components of the essential oil secretory cavities of Eucalyptus leaves: Discovery of two glucose monoterpene esters, cuniloid B and froggattiside A. *Phytochemistry*. 70 : 1187-1194.
- Grimsdale A, Chan KL, Martin RE, Jokisz P & Holmes A. 2009. Synthesis of Light-Emitting Conjugated Polymers for Applications in Electroluminescent Devices. *Chemical Reviews*. 109 (3) : 897-1091.
- Han , Bach , Cheng , Caruso R & Macrae . 2009. A design for monolithic all-solid-state dye-sensitized solar cells with a platinumized carbon counter-electrode. *Applied Physics Letters*. 94 : 103102-103103.
- Hao X, Chan SWL, Dunstan D & Smith T. 2009. Conformational Changes



and Photophysical Behavior in Poly[2-methoxy-5-(2'-ethyl-hexyloxy)-1,4-phenylene vinylene] Thin Films Cast under an Electric Field. *Journal of Physical Chemistry C*. 113 (27) : 11657-11661.

Hao X, Ryan TM, Bailey M & Smith T. 2009. Molar Mass Determination of Water-Soluble Light-Emitting Conjugated Polymers by Fluorescence-Based Analytical Ultracentrifugation. *Macromolecules*. 42 (7) : 2737-2740.

Harcourt R. 2009. Erratum to "Wiberg-type atomic valence formulae for diatomic electron-pair bonds and antibonds" [*J. Mol. Struct. (Theochem)* 897 (2009) 83]. *Journal of Molecular Structure - Theochem*. 908 (908) : 125.

Harcourt R. 2009. On the Magnetic Exchange Parameter for an O-Cu-Cu-O Component of CuII Carboxylate Dimers\*. *Croatia Chemica Acta*. 82 (1) : 245-251.

Harcourt R. 2009. Wiberg-type atomic valence formulae for diatomic electron-pair bonds and antibonds. *Journal of Molecular Structure - Theochem*. 897 : 83-85.

Harding , Bodkin A, Issa , Hutton C, Willis C & Mcleod D. 2009. The asymmetric aminohydroxylation route to GABOB and homoserine derivatives. *Tetrahedron*. 65 : 831-843.

Hirvonen , Wicker , Mandula & Heintzmann . 2009. Structured illumination microscopy of a living cell. *European Biophysics Journal with Biophysics Letters*. 38 (6) : 807-812.

Holmes A, Greenham N, Huck W & Midgley P. 2009. From the Philosopher's Stone to Nanotechnology: Celebrating 800 Years of University of Cambridge (1209 - 2009). *Advanced Materials*. 21 : 3825-3826.

Horvat S & Schiesser C. 2009. An Ab Initio and DFT Study of Some Homolytic Substitution Reactions of Acyl Radicals at Silicon, Germanium and Tin. *Organometallics*. 28 : 3311-3318.

Hossain A, Rosengren K, Zhang , Bathgate R, Tregear G, Lierop Jvan, Robinson J & Wade D. 2009. Solid phase synthesis and structural analysis of novel A-chain dicarba analogs of human relaxin-3 (INSL7) that exhibit full biological activity. *Organic & Biomolecular Chemistry*. 7 (8) : 1485-1736.

Hossain MA, Belgi A, Lin F, Zhang S, Shabanpoor F, Chan L, Belyea C, Truong H-T, Blair A, Andrikopoulos S, Tregear G & Wade J. 2009. Use of a temporary "solubilizing" peptide tag for the Fmoc solid-phase synthesis of human insulin glargine via use of regioselective disulfide bond formation. *Bioconjugate Chemistry*. 20 : 1390-1396.

Hussain , Bernaudshaw N, Kim , Choi , Lee , Park , Heeger . 2009. Improved performance of polymer light-emitting diodes with nanocomposites. *Applied Physics Letters*. 94 : 073306.

Hussain F, Gable R, Speldrich , Koegerler & Boskovic C. 2009. Polyoxotungstate-encapsulated Gd6 and Yb10 complexes. *Chemical Communications*. 328-330.

Hussain F, Ritchie C, Gable R, Moubaraki , Murray & Boskovic C. 2009. Tungstoarsenate(III) polyoxoanions as inorganic ligands for polynuclear copper complexes. *Polyhedron*. 28 : 2070-2074.

Hussain F, Spingler , Conrad , Speldrich , Koegerler , Boskovic C & Patzke . 2009. Cesium-templated lanthanoid-containing polyoxotungstates. *Dalton Transactions*. 4423-4425.

Hutchison JA, Sintic J, Brotherhood R, Scholes C, Blake M, Ghiggino K & Crossley J. 2009. Control of Photoinduced Charge Transfer Lifetimes

in Porphyrin Arrays by Ligand Addition. *Journal of Physical Chemistry C*. 113 : 11796-11804.

Hutchison JA, Sintic J, Crossley J, Nagamura & Ghiggino K. 2009. The photophysics of selectively metallated arrays of quinoxaline-fused tetraarylporphyrins. *Physical Chemistry Chemical Physics*. 11 : 3478-3489.

Jagannathan M, Grieser F & Ashokkumar M. 2009. Degradation of Orange G by sonophoto Fenton process. *Water Science and Technology*. 60 (8) : 2195-2202.

Jagannathan M, Grieser F & Ashokkumar M. 2009. Kinetics of the Sonophotocatalytic degradation of orange G in the presence of Fe3+. *Water Science and Technology*. 60 : 2195-2202.

Jagannathan M, Maruthamuthu , Murugesan & Ashokkumar M. 2009. Kinetics of degradation of acid red 88 in the presence of Co2+ ion/ peroxomonosulfate reagent. *Applied Catalysis A: General*. 368 : 35-39.

Jagannathan M, P , S & Ashokkumar M. 2009. Kinetics of degradation of acid red 88 in presence of Co2+-ion/peroxomonosulfate reagent. *Applied Catalysis A: General*. 368 : 35-39.

James PF, Dogovski C, Dobson R, Bailey M, Goldie K, Karas J, Scanlon D, O'Hair R & Perugini M. 2009. Aromatic residues in the C-terminal helix of human apoC-I mediate phospholipid interactions and promote discoidal particle morphology. *Journal of Lipid Research*. 50 (7) : 1384-94.

Jasieniak JJ, Smith LN, Van Embden JL, Mulvaney P & Califano . 2009. Re-examination of the Size-Dependent Absorption Properties of CdSe Quantum Dots. *Journal of Physical Chemistry C*. 113 : 19468-19474.

Johns MK, Yin M, Conway SJ, Robinson D, Wong L, Bamert RS, Wettenhall R & Holmes A. 2009. Synthesis and Biological Evaluation of a novel cardiolipin affinity matrix†. *Organic & Biomolecular Chemistry*. 7 : 3691-3697.

Karnezis A, O'Hair R & White J. 2009. Carbon-Germanium Hyperconjugation: Solid-State and Gas-Phase Investigations of (Trialkylgermyl)methyl-Substituted Pyridinium Ions. *Organometallics*. 28 : 6480-6488.

Karnezis A, O'Hair R & White J. 2009. Desilylation of  $\beta$ -silyl Pyridinium Ions: Gas-Phase&Solution-Phase Studies in Conjunction with DFT Calculations. *Organometallics*. 28 : 4276-4282.

Kavanagh , O'Brien & Evans . 2009. Stereocontrolled Preparation of Bicyclic Alkaloid Analogues: An Approach Towards the Synthesis of Kinabalu F. *Tetrahedron*. 65 (39) : 8259-8268.

Khairallah G, Stewart , Yuriev , Xu , Orbell & O'Hair R. 2009. Gas Phase Supramolecular Cluster Ions of Deoxyguanosine Induced by Binding to (2,2':6'2"-terpyridine)-Platinum(II) and (diethylenetriamine)-Platinum(II). *Dalton Transactions*. 2009 (9) : 1542-1548.

Khairallah G, Thum CCL & O'Hair R. 2009. A Second Metal Center Enhances the Reactivity of an Organomagnesate: Comparison of the Gas-Phase Reactions of Water with [RCCMgCl2]- and [RCCMg2Cl4]- (R = H, Ph). *Organometallics*. 28 : 5002-5011.

Khairallah G, Waters T & O'Hair R. 2009. C-C Bond Coupling Mediated by the Organometallic Cations CH3Ag2+, CH3Cu2+ and CH3AgCu+ and Allyliodide. *Dalton Transactions*. 15 : 2832-2836.

Kok WM, Scanlon D, Karas J, Miles L, Tew D, Parker M, Barnham K & Hutton C. 2009. Solid-phase synthesis of homodimeric peptides: preparation of covalently-linked dimers of amyloid  $\beta$  peptide. *Chemical Communications*. 6228-6230



- Kolev S, Baba , Catrall R, Tasaki , Pereira N, Perera J & Stevens G. 2009. Solid phase extraction of zinc(II) using a PVC-based polymer inclusion membrane with di(2-ethylhexyl)phosphoric acid (D2EHPA) as the carrier. *Talanta*. 78 : 795-799.
- Kolev S, Fernandes RLV, Satinsky & Solich . 2009. Highly sensitive gas-diffusion sequential injection analysis based on flow manipulation. *Talanta*. 79 : 1021-1025.
- Krenske H, Pryor A & Houk N. 2009. Mechanism of SH<sub>2</sub> Reactions of Disulfides: Frontside vs Backside, Stepwise vs Concerted. *Journal of Organic Chemistry*. 74 : 5356-5360.
- Kumar , Raj , Anandan , Zhou M & Ashokkumar M. 2009. Visible light assisted photocatalytic degradation of acid red 88 using Au-ZnO nanophotocatalysts. *Water Science and Technology*. 60 : 1589-1596.
- Kyne SH & Schiesser C. 2009. Ab Initio Studies of Carbonyl Radical Additions to Hydrazone Systems. *Australian Journal of Chemistry*. 62 : 728-733.
- Latham K, Mensforth EJ, Rix CJ & White J. 2009. Synthesis of supramolecular metallo-oxy acid systems via crystal disassembly/reassemble. *CrystEngComm*. 11 : 1343-1351.
- Latham K, White K, Szpakolski KB, Rix CJ & White J. 2009. Synthesis, crystal structure and luminescent behaviour of coordination complexes of copper with bi- and tridentate amines and phosphonic acids. *Inorganica Chimica Acta*. 362 : 1872-1886.
- Lees EE, Nguyen T, Clayton & Mulvaney P. 2009. The Preparation of Colloidally Stable, Water-Soluble, Biocompatible, Semiconductor Nanocrystals with a Small Hydrodynamic Diameter. *ACS Nano*. 3 (5) : 1121-1128.
- Leong TSH, Wooster , Kentish S & Ashokkumar M. 2009. Minimising oil droplet size using ultrasonic emulsification. *Ultrasonics Sonochemistry*. 16 : 721-727.
- Lim J, Sader J & Mulvaney P. 2009. Electrodynamic ratchet motor. *Physical Review E*. 79 : 03105-4.
- Lioe H, Barlow C & O'Hair R. 2009. How Does Acetylcholine Lose Trimethylamine? A Density Functional Theory Study of Four Competing Mechanisms. *Journal of the American Society for Mass Spectrometry*. 20 : 238-246.
- Littlejohn N, Fernee j, Gomez Alvarez DE, Mulvaney P & Rubinsztein-Dunlop . 2009. High-Resolution Line Width Measurement of Single CdSe Nanocrystals at Long Time Scales. *Journal of Physical Chemistry C*. 113 : 5345 - 5348.
- Loft KJ, Bojarova P, Slamova , Kren & Williams S. 2009. Synthesis of Sulfated Glucosaminides for Profiling Substrate Specificities of Sulfatases and Fungal  $\alpha$ -N-Acetylhexosaminidases. *ChemBioChem*. 10 : 565-576.
- Luo x, Bathgate R, Liu YL, Shao XX, Wade J & Guo ZY. 2009. Recombinant expression of an insulin-like peptide 3 (INSL3) precursor and its enzymatic conversion to mature human INSL3. *FEBS Journal*. 276 (18) : 5203-11.
- Mak SYF, Chiang GCH, Davidson JEP, Davies E, Ayscough A, Pain G, Burton JW & Holmes A. 2009. Synthesis of Simplified Analogues of Eleutherobin via a Claisen Rearrangement/RCM Strategy. *Tetrahedron-Asymmetry*. 20 : 921-924.
- Ma M, Hoang HN, Scully CCG, Appleton TG & Fairlie DP. 2009. Metal clips that induce unstructured pentapeptides to be  $\alpha$ -helical in water. *Journal of the American Chemical Society*. 131 : 4505-4512.
- Ma MT, Karas J, White J, Scanlon D & Donnelly P. 2009. A new bifunctional chelator for copper radiopharmaceuticals: a cage amine ligand with a carboxylate functional group for conjugation. *Chemical Communications*. 3237-3239.
- Ma MT, Waters T, Beyer K, Palamarczuk RA, Richardt P, O'Hair R & Wedd A. 2009. Gas Phase Fragmentation of Polyoxotungstate Anions. *Inorganic Chemistry*. 48 : 598-606.
- Mao , Guo , Bai , Nguyen T, Xia , Huang , Mulvaney P & Wang . 2009. Hydrogen Bonding Selective Phase Transfer of Nanoparticles across Liquid/Gel Interfaces. *Angewandte Chemie - International Edition*. 121 (27) : 5053-5056.
- Mccluskey GE, Lee J-K, Sha J, Ober CK, Watkins S & Holmes A. 2009. Synthesis and Processing of Organic Materials in Supercritical Carbon Dioxide. *MRS Bulletin*. 34 : 108-115.
- Mcgill NW & Williams S. 2009. 2,6-Disubstituted Benzoates As Neighboring Groups for Enhanced Diastereoselectivity in beta-Galactosylation Reactions: Synthesis of beta-1,3-Linked Oligogalactosides Related to Arabinogalactan Proteins. *Journal of Organic Chemistry*. 74 : 9388 - 9398.
- Meyer , Khairallah G, O'Hair R & Kass . 2009. Gas Phase Synthesis and Reactivity of the Lithium Acetate Enolate Anion, [CH<sub>2</sub>CO<sub>2</sub>Li]<sup>-</sup>. *Angewandte Chemie - International Edition*. 48 : 2934-2936.
- Mosse W, Koppens M, Gengenbach , Scanlon D, Gras S & Ducker W. 2009. Peptides Grafted from Solids for the Control of Interfacial Properties. *Langmuir*. 25 (1) : 1488-1494.
- Mulyana Y, Nafady , Mukherjee A, Bircher , Moubaraki , Murray , Bond , Abrahams B & Boskovic C. 2009. New family of ferric spin clusters incorporating redox-active ortho-dioxolene ligands. *Inorganic Chemistry*. 48 : 7765-7781.
- Nguyen T, Spizzirri P, Wilson G & Mulvaney P. 2009. Tunable light emission using quantum dot-coated upconverters. *Chemical Communications*. 2009 (2) : 174-176.
- Novo CS, Funston A, Gooding AK & Mulvaney P. 2009. Electrochemical Charging of Single Gold Nanorods. *Journal of the American Chemical Society*. 131 : 14664-14666.
- O'Rourke , Catrall R, Kolev S & Potter D. 2009. The extraction and transport of organic molecules using polymer inclusion membranes. *Solvent Extraction Research and Development, Japan*. 16 : 1-12.
- Pereira N, St John AM, Catrall R, Perera J & Kolev S. 2009. Influence of the composition of polymer inclusion membranes on their homogeneity and flexibility. *Desalination*. 236 : 327-333.
- Price KA, Caragounis A, Paterson B, Filiz , White A, Masters C, Barnham K, Donnelly P, Crouch P & Volitakis I. 2009. Sustained Activation of Glial Cell Epidermal Growth Factor Receptor by Bis(thiosemicarbazono) Metal Complexes Is Associated with Inhibition of Protein Tyrosine Phosphatase Activity. *Journal of Medicinal Chemistry*. 52 : 6606-6620.
- Price KA, Crouch P, Donnelly P, Masters L, White A & Curtain C. 2009. Membrane-targeted strategies for modulating APP and AB-mediated toxicity. *Journal of Cellular and Molecular Medicine*. 13 (2) : 249-261.
- Pugazhenthiran N, Anandan S, Kathiravan G, Udaya Prakash NK, Crawford S & Ashokkumar M. 2009. Microbial synthesis of silver nanoparticles by *Bacillus* sp. *Journal of Nanoparticle Research*. 11 (7) : 1811-1815.



- Qin C, Yap SW & Woodman O. 2009. Antioxidants in the prevention of myocardial ischemia/reperfusion injury. *Expert Review of Clinical Pharmacology*. 2 (6) : 673-695.
- Rajapakshe , Snyder A, Astashkin A, Bernardson , Evans D, Young C, Evans H & Enemark H. 2009. Insights into the Nature of Mo(V) Species in Solution: Modeling Catalytic Cycles for Molybdenum Enzymes. *Inorganica Chimica Acta*. 362 : 4603-4608.
- Reichman S & Vesk P. 2009. Hyperaccumulators and herbivores - a Bayesian meta-analysis of feeding choice trials. *Journal of Chemical Ecology*. 35 : 289-296.
- Rijs NJ & O'Hair R. 2009. Gas-Phase Synthesis of Organoargentate Anions and Comparisons with their Organocuprate Analogs. *Organometallics*. 28 : 2684-2692.
- Ritchie C, Cooper JT, Song , Streb , Yin , Parenty DC, Maclaren A & Cronin . 2009. Spontaneous assembly and real-time growth of micrometre-scale tubular structures from polyoxometalate-based inorganic solids. *Nature Chemistry*. 1 (1) : 47-52.
- Ritchie C, Li , Pradeep p, Long , Xu & Cronin . 2009. A functional hybrid polyoxometalate framework based on a 'trilacunary' heteropolyanion [(P4W6O34)2Co2Na2(H2O)2]18-. *Dalton Transactions*. 7 (33) : 6483-6486.
- Rodriguez-Fernandez , Funston A, Perez-Juste , Alvarez-Puebla A, Liz-Marzan M & Mulvaney P. 2009. The effect of surface roughness on the plasmonic response of individual sub-micron gold spheres. *Physical Chemistry Chemical Physics*. 11 : 5909-5914.
- Rodriguez-Fernandez , Novo CS, Myroshnychenko , Funston A, Sanchez-Iglesias , Pastoriza-Santos , Perez-Juste , Garcia De Abajo F, Marzan M & Mulvaney P. 2009. Spectroscopy, Imaging, and Modeling of Individual Gold Decahedra. *Journal of Chemical Physics*. 113 : 18623-18631.
- Romero MJ, Morfa A, Al-Jassim M, Van De Lagemaat J & Reilly TH. 2009. Nanoscale Imaging of Exciton Transport in Organic Photovoltaic Semiconductors by Tip-Enhanced Tunneling Luminescence. *Nano Letters*. 9 (11) : 3904-3908.
- Rudnitskaya A, Schmidtke LM, Delgadillo I, Legin A & Scollary G. 2009. Study of the influence of micro-oxygenation and oak chip maceration on wine composition using an electronic tongue and chemical analysis. *Analytica Chimica Acta*. 642 (2009) : 235-245.
- Rupasinghe T, Cardwell J, Catrall R & Kolev S. 2009. Determination of arsenic in industrial samples by pervaporation flow injection with amperometric detection. *Analytica Chimica Acta*. 652 : 266-271.
- Ryzhov V, Lam AKY & O'Hair R. 2009. Gas-Phase Fragmentation of Long-Lived Cysteine Radical Cations Formed via NO Loss from Protonated S-Nitrosocysteine. *Journal of the American Society for Mass Spectrometry*. 20 : 985-995.
- Sani A, Keech , Gardestrom , Dufourc J & Grobner . 2009. Magic-angle phosphorus NMR of functional mitochondria: in situ monitoring of lipid response under apoptotic-like stress. *FASEB Journal*. 23 (9) : 2872-8.
- Sani , Dufourc J & Grobner . 2009. How does the Bax- $\alpha$ 1 targeting sequence interact with mitochondrial membranes? The role of cardiolipin. *BBA-Biomembranes*. 1788 (3) : 623-631.
- Sardar , Funston A, Mulvaney P & Murray W. 2009. Gold Nanoparticles: Past, Present, and Future. *Langmuir*. 25 (24) : 13840-13851.
- Sherman, Jackway, Gehman J, Praporski, Mccubbin, Mechler, Martin, Separovic F & Bowie. 2009. The solution structure and membrane interactions of the antimicrobial peptide fallaxidin 4.2: an NMR and QCM study. *Biochemistry*. 48 : 11892-11901.
- Singla R, Grieser F & Ashokkumar M. 2009. Sonochemical degradation of martius yellow dye in aqueous solution. *Ultrasonics Sonochemistry*. 16 : 28-34.
- Singla R, Grieser F & Ashokkumar M. 2009. The kinetics and mechanism for the sonochemical degradation of a non-ionic surfactant. *Journal of Physical Chemistry A*. 113 : 2865-2872.
- Smith G, Wermuth UD & White J. 2009. 1,10-Phenanthroline-1-ium 2-carboxy-4,5-dichlorobenzoate. *Acta Crystallographica Section E - Structure Reports Online*. 65 : O2333.
- Smith G, Wermuth UD & White J. 2009. 4-Chloroanilinium 2-carboxy-4,5-dichlorobenzoate. *Acta Crystallographica Section E - Structure Reports Online*. 65 : O2111.
- Smith G, Wermuth UD & White J. 2009. Zero-, one-, and two-dimensional hydrogen-bonded structures in the 1:1 proton-transfer compounds of 4,5-dichlorophthalic acid with the monocyclic heteroaromatic Lewis bases 2-aminopyridine, nicotinamide and isonicotinamide. *Acta Crystallographica Section C - Crystal Structure Communications*. 65 : O103-O107.
- Smith G, Wermuth UD, Young DJ & White J. 2009. Proton transfer versus nontransfer in compounds of the diazo-dye precursor 4-(phenyldiazenyl)aniline (aniline yellow) with strong organic acids: the 5-sulfosalicylate and the dichroic benzenesulfonate salts, and the 1:2 adduct with 3,5-dinitrobenzoic acid. *Acta Crystallographica Section C - Crystal Structure Communications*. 65 : O543-O548.
- Sunartio DM, Grieser F & Ashokkumar M. 2009. Sonoluminescence quenching in aqueous solutions of aliphatic diols and glycerol. *Ultrasonics Sonochemistry*. 16 : 23-27.
- Sze CM, Khairallah G, Xiao Z, Donnelly P, O'Hair R & Wedd A. 2009. Interaction of Cisplatin and Analogues with a Met-Rich Protein Site. *Journal of Biological Inorganic Chemistry*. 14 (2) : 163-165.
- Tan PH & Donner C. 2009. Total Synthesis and Confirmation of the Absolute Stereochemistry of Semiviriditoxin, a Naphthopyranone Metabolite from the Fungus *Paecilomyces variotii*. *Tetrahedron*. 65 : 4007-4012.
- Teo BM, Chen , Hatton , Grieser F & Ashokkumar M. 2009. A novel one-pot synthesis of magnetite latex nanoparticles by ultrasound irradiation. *Langmuir*. 25 : 2593-2595.
- Teo BM, Grieser F & Ashokkumar M. 2009. High Intensity Ultrasound Initiated Polymerisation of Butyl Methacrylate in Mini- and Microemulsions. *Macromolecules*. 42 : 4479-4483.
- Thiel Mr, Ritchie C, Streb Dr, Long Dr & Cronin Prof. 2009. Heteroatom-Controlled Kinetics of Switchable Polyoxometalate Frameworks. *Journal of the American Chemical Society*. 131 (12) : 4180-4181.
- Thornton W, Nairn M, Hill M, Jill J. 2009. Metal-Organic Frameworks Impregnated with Magnesium-Decorated Fullerenes for Methane and Hydrogen Storage. *Journal of the American Chemical Society*. 131 (30) : 10662-10669.
- Tian HY, Buckley CE, Wang SB & Zhou M. 2009. Enhanced hydrogen storage capacity in carbon aerogels treated with KOH. *Carbon*. 47 : 2128-2130.





- Tomov A, Gibson V, Britovsek G, Long R, Van Meurs M, Jones D, Tellmann K & Chirinos J. 2009. Distinguishing Chain Growth Mechanisms in Metal-catalyzed Olefin Oligomerization and Polymerization Systems: C<sub>2</sub>H<sub>4</sub>/C<sub>2</sub>D<sub>4</sub> Co-oligomerization/Polymerization Experiments Using Chromium, Iron, and Cobalt Catalysts. *Organometallics*. 28 (24) : 7033-7040.
- Tregear G, Bathgate R, Hossain A, Lin , Zhang , Shabanpoor F, Scott DJ, Ma S, Gundlach A, Wade D & Samuel C. 2009. Structure and activity in the relaxin family of peptides. *Annals of The New York Academy of Sciences*. 1160 : 5-10.
- Van Embden JL, Jasieniak JJ & Mulvaney P. 2009. Mapping the Optical Properties of CdSe/CdS Heterostructure Nanocrystals: The Effects of Core Size and Shell Thickness. *ACS Nano*. 131 : 14299-14309.
- Van Embden JL, Sader JE, Davidson M & Mulvaney P. 2009. Evolution of colloidal nanocrystals: theory and modeling of their nucleation and growth. *Journal of Physical Chemistry C*. 113 (37) : 16342-16355.
- Vlasov I, Barnard A, Ralchenko V, Lebedev O, Kanzyuba M, Saveliev A, Konov V & Goovaerts E. 2009. Nanodiamond photo emitters based on strong luminescence from silicon-vacancy defects. *Advanced Materials*. 2009 (21) : 808-812.
- Voss J, Scally SW, Taylor N, Dogovski C, Alderton MR, Hutton C, Gerrard JA, Parker M, Dobson R & Perugini M. 2009. Expression, purification, crystallization and preliminary X-ray diffraction analysis of dihydrodipicolinate synthase from *Bacillus anthracis* in the presence of pyruvate. *Acta Crystallographica Section F - Structural Biology and Crystallization Communications*. 65 (Pt2) : 188-91.
- Wang Q, Khairallah G, Koutsantonis , Williams , Callahan D & O'Hair R. 2009. Competition Between Cluster Fragmentation, C-C Bond Coupling and C-X Bond Activation in Silver Hexynyl Cluster Cations, [(C<sub>4</sub>H<sub>9</sub>CCAg)<sub>n</sub>Ag]<sup>+</sup>. Size Does Matter! *Physical Chemistry Chemical Physics*. 11 : 4132-4135.
- Wang Q, Khairallah G & O'Hair R. 2009. Role of Cluster Size and Substrate in the Gas Phase C-C Bond Coupling Reactions of Allyl Halides Mediated by Ag<sup>n+</sup> and Ag<sup>n</sup>-1H<sup>+</sup> Cluster Cations. *International Journal of Mass Spectrometry*. 2009 (283) : 17-25.
- Waters T, Khairallah G & O'Hair R. 2009. Gas phase fragmentation of  $\eta^2$  coordinated aldehydes in [VO<sub>2</sub>( $\eta^2$ -OCHR)]<sup>-</sup>: aldehyde structure dictates the nature of the products. *Dalton Transactions*. 7374-7380.
- Waters T & O'Hair R. 2009. Endocyclic versus Exocyclic Mechanisms for Methyl Migration in Protonated N, N'-dimethylpropane-1,3-diamine. *European Journal of Mass Spectrometry*. 15 : 105-112.
- Wen X, Davis J, Dao LapVan, Hannaford P, Coleman V, Tan H, Jagadish c, Koike K, Sasa S, Inoue M & Yano M. 2009. Thermal quenching of photoluminescence in ZnO/ZnMgO multiple quantum wells following oxygen implantation and rapid thermal annealing. *Journal of Luminescence*. 129 : 153.
- Wen X, Lincoln C, Smith T, Dao LV & Hannaford P. 2009. Characterization of the back surface reflection in InP using femtosecond luminescence up-conversion. *Journal of Physics D - Applied Physics*. 42 (4) : 045115.
- White J, Ng WLV, Clarke DC, Smith P, Taylor M & Young C. 2009. 1,2-Borotropic Shifts and B-N Bond Cleavage Reactions in Molybdenum Hydrotris(3-isopropylpyrazolyl)borate Chemistry: Mixed-valence MoVIMoV<sub>2</sub> and Pyrazole-rich Oxo-MoIV Complexes. *Inorganica Chimica Acta*. 362 : 4570-4577.
- Williams S. 2009. Robert Vyent Stick: A Colourful Character. *Australian Journal of Chemistry*. 62 : 503-509.
- Wong W, Hooper JF & Holmes A. 2009. Silicon analogues of polyfluorene as materials for organic electronics. *Australian Journal of Chemistry*. 62 : 393-401.
- Wong W, Jones D, Yan C, Watkins E, King , Haque A, Wen X, Ghiggino K & Holmes A. 2009. Synthesis, photophysical and device properties of novel dendrimers based on a fluorene-hexabenzocoronene (FHBC) core. *Organic Letters*. 11 : 975-978.
- Wu SH, Leong TSH, Kentish S & Ashokkumar M. 2009. Frequency effects during acoustic cavitation in surfactant solutions. *Journal of Physical Chemistry B*. 113 : 16568-16573.
- Wyer A, Feketeova L, Nielsen B & O'Hair R. 2009. Gas phase fragmentation of protonated betaine and its clusters. *Physical Chemistry Chemical Physics*. 11 : 8752-8758.
- Young C, Malarek MS, Evans D, Doonan CJ, Ng WLV & White J. 2009. Synthesis and Characterization of TpiPrMoO(S<sub>2</sub>PR<sub>2</sub>) (R = Pri, Ph, OEt, OPri, (-)-mentholate) and {HB(OMe)(Pripz)<sub>2</sub>}MoO(S<sub>2</sub>PPri<sub>2</sub>), Including Isomers of Known 1,2-Borotropically-Shifted Complexes. *Inorganic Chemistry*. 48 : 1960-1966.
- Zahirovic S, Lubansky A, Yeow Y & Boger D. 2009. Obtaining the steady shear rheological properties and apparent wall slip velocity data of a water-in-oil emulsion from gap-dependent parallel plate viscometry data. *Rheologica Acta*. 48 (2) : 221-229.
- Zammit S, Cox A, Gow R, Zhang Y, Gilbert E, Krum H, Kelly D & Williams S. 2009. Evaluation and optimization of antifibrotic activity of cinnamoyl anthranilates. *Bioorganic and Medicinal Chemistry Letters*. 19 (24) : 7003-7006.
- Zanatta S, Manallack T, Jarrott B & Williams S. 2009. Synthesis and evaluation of dithiolethiones as novel cyclooxygenase inhibitors. *Bioorganic and Medicinal Chemistry Letters*. 19 (2) : 459-461.
- Zimmermann M, Clarke O, Gulbis M, Keizer D, Jarvis R, Cobbett C, Hinds M, Xiao Z & Wedd A. 2009. Metal binding affinities of Arabidopsis zinc and copper transporters: selectivities match the relative, but not the absolute, affinities of their amino-terminal domains. *Biochemistry*. 48 (49) : 11640-54.
- Zimmermann M, Xiao Z, Cobbett C & Wedd A. 2009. Metal Specificities of Arabidopsis Zinc and Copper Transporters Match the Relative, But not the Absolute, Affinities of Their Amino-Terminal Domains. *Chemical Communications*. 6364-6.
- Zuo , Knoerzer , Ashokkumar M, Kentish S & Mawson. 2009. The pasting properties of sonicated waxy rice starch suspensions. *Ultrasonics Sonochemistry*. 16 (4) : 462-468.

## C2 - Journal Articles Unrefereed

Lamb R & Mills . 2009. The Light's On and Everybody's Home. Chemistry in Australia. 76 (6) : 0314-4240.

## C3 - Journal Articles Unrefereed Letters or Notes

Mulvaney P & Hartland V. 2009. Nanophotonics: plasmonics and metal nanoparticles. Physical Chemistry Chemical Physics. 11 (28) : 5866.

## F - Conference Proceedings

Duan X, Tran , Roberts & Lamb R. 2009. Gas and Liquid Media Approaches to Low Temperature Fabrication of Aluminum Oxide Thin Films, 56 (40).

## F1 - Full Written Papers Refereed

Ashokkumar M & Kentish S. 2009. Ultrasound In Food Processing Applications - An Overview. Proceedings of 2nd GPE-EPIC. 1-9. Toulouse, France: Institute of National Polytechnique de Toulouse.

Ghiggino K & Bell T. 2009. Single molecule laser spectroscopy - from probes to polymers. Proceedings of the Australasian Conference on Optics, Lasers and Spectroscopy and Australian Conference on Optical Fibre Technology i associayion with the International Workshop on Dissipative Solitons. 2-3. Melbourne, Australia: Australian Optical Society.

Kolev S, Baba , Tasaki , Pereira N, Cattrall R, Stevens G & Perera J. 2009. Selective extraction of Zn(II) using a polymer inclusion membrane. Proceedings of AMS 5 in Kobe, Japan, (2009) CD-ROM. 526-527. Japan: Aseanian Membrane Society.

Robotham B, Ghiggino K, Langford J & Lee . 2009. Time-resolved spectroscopy of photosynthetic mimics. Proceedings of the Australasian Conference on Optics, Lasers and Spectroscopy and Australian Conference on Optical Fibre Technology i associayion with the International Workshop on Dissipative Solitons. 452-453. Melbourne, Australia: Australian Optical Society.

Sakai , Kadota , Hayashita , Cattrall R & Kolev S. 2009. Transport of thiourea across PVC/Capriquat polymer inclusion membranes with different Capriquat counter anions. Proceedings of AMS 5 in Kobe, Japan (2009) CD-ROM. 314-315. Japan: Aseanian Membrane Society.

Wang H, Wilksch JJ, Strugnell R & Gee M. 2009. Nanoscale study of the mechanical properties of individual and aggregated bacteria using atomic force microscopy. 8th World Congress of Chemical Engineering. 4. Montreal, Canada: McGill University Press.

Wu HF, Cho KL, Liaw I, Zhang H & Lamb R. 2009. Synthesis of Poly(Methylmethacrylate) Latex with Enhanced Rigidity through Surfactant Control. Synthesis of Poly(Methylmethacrylate) Latex with Enhanced Rigidity through Surfactant Control. 1134 BB05-10. Pennsylvania, United States: Materials Research Society.





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