



**UNSW**  
SYDNEY

Australia's  
Global  
University

# School of Chemistry Annual Report 2018



2018 Annual Report

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UNSW Sydney  
Sydney NSW 2052  
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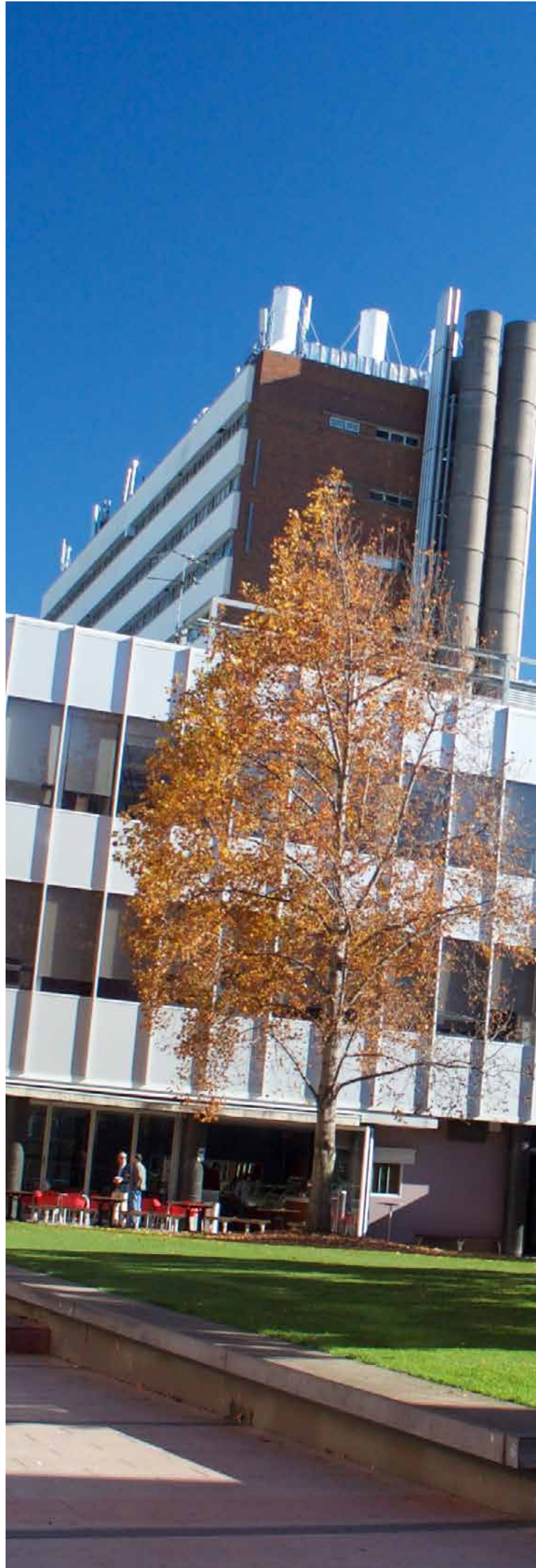
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# HEAD OF SCHOOL REPORT



## 2018 felt a little like the quiet before the storm to me!

**On the horizon in 2019 was UNSW-3+, the new 3-term academic calendar; the launch of six new Third Year courses and of the new Threshold-Mastery delivery and assessment in First Year Chemistry; the impending move of almost half the School into the new Science and Engineering Building and the rearrangement of space for those not moving. On top of this, the School was getting even younger and more inexperienced with the start of nine new academic staff in 2018/19. 2018 was very busy preparing, but the real test of this activity is yet to come in 2019.**

Researchers in the School had an outstanding year across all domains. Scientia Professor Martina Stenzel's Director of Research report lists a large number of prizes, awards and significant national and international service for chemistry and science more broadly. It is fantastic to see Chemistry staff being recognized. And even more importantly, members of the School are having impact beyond UNSW. This reflects very well on the individual, on the School and on UNSW and is aligned well with the UNSW Strategy that UNSW should have impact beyond its boundary, especially in broader society.

Traditional academic impact is found in journal articles and government funding. Our performance has continued the significant upwards trend of the past few years, e.g. 100% increase in government funding over the past 4 years and now the top chemistry department in Australia for quality of papers (Nature Index, 2015-18). However, the standout has been the increase in impact beyond the traditional academic norms. Income from industry doubled in a single year to \$2M and is now over 25% of the School's research income. The School has also launched a Masters of Industrial Research that is designed to give students an opportunity to experience research in an industry placement, as well as to lower the entry barriers for industry to engage with researchers at the School. The program was approved in 2018 and the first students and companies are lined up to start in 2019.

Members of the School had success in Future Fellowships and Early Career Awards (NHMRC and ARC DECRA). Kris Kilian and Vinh Nguyen were successful in their applications for ARC Future Fellowships, taking the number of FF's in the School to five. We also welcomed several new Research Fellows. Iman Roohani, Chris Medcraft, Xianjue Chen and Yiling Zhong started DECRA or NHMRC Fellowships in 2018 and Mohibul Kabir was successful in 2018 and will start in 2019.

Every Head of School annual report that I have written has reported on space pressures. This will be the last year! In 2018, the School took possession of ~700 square metres of research lab space, plus accommodation for 100 researchers on Level 7 of the new Hilmer Building. In 2018, we contributed to the design of Level 6 and 7 of the even newer Science and Engineering Building. This will add another 1200 sq. m. research lab space, plus space for the research groups. This is partly to offset the loss of the Chemical Sciences tower (F10), which is slated for a complete refurbishment in the coming years. However, the total research laboratory space for the School will have increased from about 2000 to 4000 sq. m. by the end of next year.

In 2017, the School decided to revamp our set of Third Year Chemistry offerings, changing from the very traditional "four pillars" of chemistry (organic, inorganic, analytical, physical) to six more cross-

disciplinary courses, reflecting the cross-disciplinary nature of modern chemistry better. Throughout 2018, teams of academics developed new theory and new laboratories to support this 2017 initiative. All were developed with the schedule of the new 3-term calendar being rolled out in 2019.



Throughout 2017-19, the School appointed four Education-focused academics, who have formed the core of the Chemistry Education group. This group was successful in receiving significant funds from UNSW to trial a new way of delivering and assessing First Year Chemistry, called Threshold-Mastery. Threshold material is delivered and assessed on-line and is a hurdle task for students (they must pass the hurdle task with a very high mark), whereas Mastery is taught and assessed traditionally. The development of on-line materials and assessment was a huge task in 2018, and next year the trial will be realized.

Student numbers in the School continue to grow steadily. The introduction of the 3-term calendar and the introduction of a new Diploma program by UNSW Global led to a successful business case to extend our First Year Chemistry laboratory space by 50%. Business case, planning, tendering and construction all

started within a 4 month period. Who said universities cannot be nimble?! But many thanks are owed to Nancy Talavera and her team for a lot of hard work over this period

Six new academic staff started in 2018, and we welcome Laura McKemish, Anna Wang, Nicole Rijs, Albert Fahrenbach, Dong Jun Kim and Fraser Stoddart to the Chemistry School family. A/Prof Steve Colbran announced his retirement in 2018, taking effect in 2019. General staff ranks were much more stable after a tumultuous 2017. Aftab Hossein replaced TJ Garo in the finance role and Sandra Sarkissian joined the admin team as the only changes in administrative or technical staff.

The recruitment of Nobel Laureate, Prof Sir Fraser Stoddart to the School on a 3-month per year basis drew significant national and international attention. Fraser won the 2016 Nobel Prize in Chemistry for his work on the design and synthesis

of molecular machines. Fraser started at UNSW in August, 2018, and will spend January-March each year at UNSW.

I'm a bit exhausted just from writing this report, reflecting on 2018. I want to finish up by extending my profound thanks to the School Manager, Toby Jackson, without whom we would not be on budget, on time and so well coordinated. I also want to thank explicitly Jodee Anning and all the admin team, and the School executive – Scientia Professor Justin Gooding, Professor Palli Thordarson, Scientia Professor Martina Stenzel, Associate Professor Jason Harper and Dr Toby Jackson (again) for being so responsive, suggestive and receptive to all the good ideas and being such a good sounding board, and for mentoring against the dumb ones.

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**Professor Scott Henderson Kable**



# THE SCHOOL OF CHEMISTRY WELCOMES SIR FRASER STODDART

Jim Prusching photography



After long but fruitful negotiations via the UNSW SHARP (Strategic Hire and Retention Pathways) program, the School is honoured to announce the part-time appointment of Knight of the Realm and Noble Laureate, Professor Sir Fraser Stoddart. This will certainly add momentum to UNSW's vision to make a global impact and its focus on education and research excellence.

**This will certainly add momentum to UNSW's vision to make a global impact and its focus on education and research excellence.**

Sir Fraser Stoddart was jointly awarded the Nobel Prize in Chemistry in 2016 for the design and synthesis of molecular machines. He is currently Professor of Chemistry and Head of the Stoddart Mechanostereochemistry Group at Northwestern University in Illinois. He also has a research laboratory supporting young researchers at Tianjin University in China. Before joining Northwestern in 2008, he spent 10 years at the University of California, Los Angeles.

Sir Fraser will be on campus at UNSW between January and March each year until 2022. Alongside his stellar research, he will teach higher year undergraduate students and help to inspire our next generation of scientists. He will also mentor early career researchers within the School, which is an exceptional opportunity for our academic staff.

The Stoddart Group at UNSW Sydney is a Centre for Contemporary Science, established by Sir Fraser Stoddart, and led by Dr Albert Fahrenbach and Dr Dong Jun Kim, both of whom joined UNSW Chemistry in 2018. This multidisciplinary research centre has three areas of focus: a) prebiotic chemistry and origin of life research; b) developing new transformative chemistry for battery storage technologies; and c) developing cyanide-free, environmentally friendly methods for gold extraction.

The Centre of Contemporary Science will eventually be housed on Level 6 of the new, state-of-the-art Science and Engineering Building, which is scheduled for completion in mid-2019. The laboratories have been built to Sir Fraser's unique specifications and are the equal to any in the world.

# STAFF

## School of Chemistry Committees – 2018

### School Executive Committee

- Professor Scott Kable (Chair)
- Scientia Professor Justin Gooding
- Scientia Professor Martina Stenzel
- Professor Pall Thordarson
- A/Prof Jason Harper
- Dr Toby Jackson

### Research Committee

- Scientia Prof. Martina Stenzel (Chair)
- Professor Scott Kable
- Scientia Prof. Justin Gooding
- Professor Les Field
- Professor Chuan Zhao
- Professor Jonathan Morris

- Professor Richard Tilley
- Dr Neeraj Sharma
- Dr Suzanne Neville
- Dr Josh Peterson

### Postgraduate Committee

- Professor Naresh Kumar (Chair)
- Professor Scott Kable
- Professor Tim Schmidt
- Professor Pall Thordarson
- A/Prof Shelli McAlpine
- Dr Junming Ho
- Dr Vinh Nguyen
- Dr Jon Beves
- Mr Ken McGuffin

### Teaching Committee

- A/Prof Jason Harper (Chair)

- Dr Gavin Edwards
- Professor Scott Kable
- A/Prof John Stride
- A/Prof Steve Colbran
- Dr Kris Kilian
- Dr Ron Haines
- Dr Luke Hunter
- Dr Shannan Maisey
- Dr Nancy Talavera
- Mr Michael Gandy

### Chemistry Education Committee

- Professor Scott Kable (Chair)
- A/Prof Steve Colbran
- Dr Ron Haines
- Dr Luke Hunter
- Dr Shannan Maisey
- Dr Kim Lapere

- Dr Scott Sulway
- Dr Reyne Pullen

### Building & Space Committee

- Professor Scott Kable (Chair)

### Search Committee

- Professor Scott Kable (Chair)

### School HS Consultation Committee

- A/Prof Graham Ball (Chair)

### Outreach Committee

- Dr Laura McKemmish (Chair)

#### School Executive Committee

Dr Toby Jackson,  
Professor Scott Kable,  
Scientia Professor Justin Gooding,  
Scientia Professor Martina Stenzel,  
Professor Pall Thordarson,  
A/Prof Jason Harper



#### Research Committee

Professor Scott Kable,  
Dr Josh Peterson,  
Dr Suzanne Neville,  
Professor Chuan Zhao,  
Scientia Professor Justin Gooding,  
Scientia Professor Martina Stenzel,  
Professor Les Field

(Absent:

Professor Jonathan Morris,  
Professor Richard Tilley,  
Dr Neeraj Sharma)



#### Teaching Committee:

Dr Shannan Maisey,  
Dr Luke Hunter,  
Professor Scott Kable,  
Dr Kris Killian,  
Dr Ron Haines,  
A/Prof Jason Harper,  
A/Prof Steve Colbran,  
Mr Michael Gandy

(Absent:

Dr Gavin Edwards,  
A/Prof John Stride,  
Dr Nancy Talavera)







**Postgraduate Committee:**

Professor Scott Kable,  
A/Prof Shelli McAlpine,  
Dr Junming Ho,  
Professor Naresh Kumar,  
Dr Jon Beves,  
Dr Vinh Nguyen,  
Professor Pall thordarson,  
Professor Tim Schmidt,  
Mr Ken McGuffin



**Chemical Education  
Committee**

Professor Scott Kable,  
Dr Shannan Maisey  
Dr Scott Sulway,  
Dr Ron Haines,  
Dr Reyne Pullen,  
Dr Kim Lapere,  
Dr Luke Hunter

*(Absent: A/Prof Steve Colbran)*

# Academic Staff



## Associate Professor Graham Edwin Ball

*BSc (Hons), PhD*  
*University of Sheffield, UK*

### Professional Activities:

- RACI Member

### Research:

- Chemical and biological applications of NMR spectroscopy.
- Characterisation of chemical reactive intermediates, especially organometallics.
- Applications of computational chemistry.
- Investigations of drug-DNA interactions.
- Structure elucidation

### Postdoctoral Fellows:

- Dr Kenneth K.C. Hong

### Honours Students:

- Leanne Pak

### PhD Students:

- Mushi He (MSc)
- Jane Jung
- Christopher Pracey



## Dr Jonathon Beves

*BSc (Hons I), MSc, The*  
*University of Sydney, PhD, The*  
*University of Basel*

### Professional Activities:

- RACI NSW Branch Secretary
- RACI Inorganic Division NSW Representative
- Polyhedron Editorial Board

### Research:

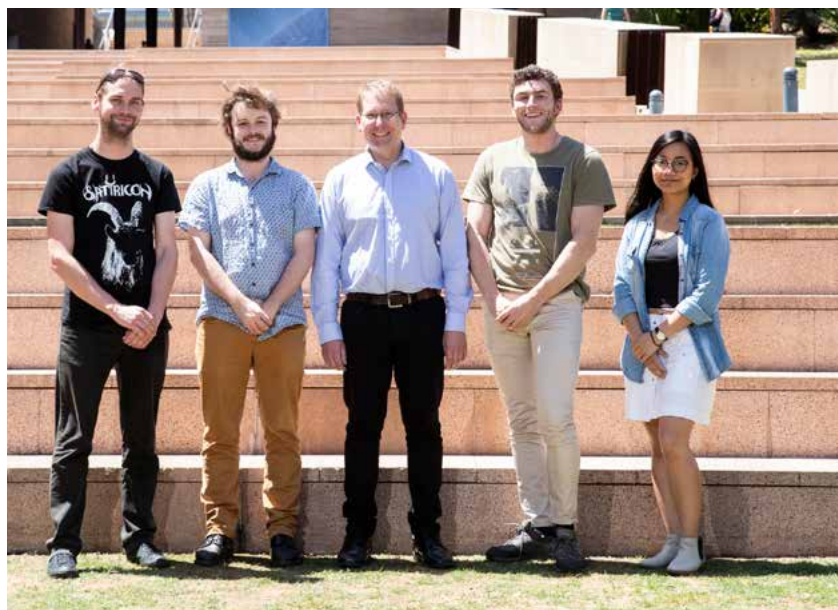
- Supramolecular chemistry
- Coordination chemistry

### PhD Students:

- Varsha Gopalakrishnan
- Hasti Iranmanesh
- Aaron Kennedy
- Ena Luis
- Tom MacDonald
- Neil Mallo

### Honours Students:

- Paul Reardon





**Dr Robert Chapman**  
**(VC Postdoctoral Fellow)**

*BEng (Ind. Chem Hons 1), UNSW,  
PhD, USYD*

**Professional Activities:**

- Associate Editor PLOSOne
- Community editorial board (Materials Horizons)
- Member RACI, Member RSC

**Research:**

- Oxygen tolerant controlled radical polymerisation systems for biomaterials design
- Protection of enzymes by nanoencapsulation

**PhD Students:**

- Zihao (Alvin) Li
- Daniele Melodia
- Ahmed Mustafa
- Yiping Wang   Honours Students:
- Shegufta Farazi
- Henry Foster



**Dr Sheng Chen**  
**(VC Postdoctoral Fellow)**

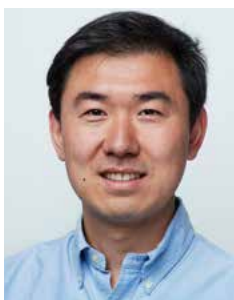
*PhD, Nanjing University of Science and  
Technology, China*

**Research:**

- Nanomaterial synthesis
- Electrocatalysis
- Renewable Energy
- Metal-organic framework
- Two-dimensional nanomaterials
- Carbon dioxide electroreduction
- Water splitting

**Honours Students:**

- Deeson Wu



**Dr Xianjue Chen**  
(DECRA Fellow)

*PhD, UWA*

**Professional Activities:**

- Chartered Member, Royal Australian Chemical Institute (MRACI CChem)
- Member, Australian Carbon Society

**Research:**

- Nanomaterials
- Carbon nanostructures
- Membrane separation
- Energy applications.



**Associate Professor**  
**Stephen Boyd Colbran**

*BSc (Hons), PhD, Otago*

**Professional Activities:**

- Level 2/3 Teaching Laboratory Coordinator, School of Chemistry, UNSW
- Member of the American Chemical Society (ACS) and the Royal Australian Chemistry Institute (RACI)
- Referee for the journals: Journal of the American Chemical Society; Angewandte Chemie International Edition, Chemistry—A European Journal; Journal of Physical Chemistry B, Inorganic Chemistry; Organometallics; Dalton Transactions; European Journal of Inorganic Chemistry; Inorganica Chimica Acta; Chemical Reviews.
- Editorial board member for the International Journal of Inorganic Chemistry (IJIC) and for the Journal of Chemical Sciences (JChem)

**Research**

- Transition metal chemistry and electrochemistry
- Transition metal-based catalysis and electrocatalysis

**PhD Students:**

- Timothy Elton
- James McPherson
- Matthew Mudge



## Associate Professor Marcus Lawford Cole

*BSc (Hons I), PhD, Cardiff University*

### Research:

- Low oxidation state and hydrido complexes of the p- and f-block elements.
- Catalytic applications of N-heterocyclic carbenes.
- Probes for the quantification of multidentate ligand stereoelectronics.
- Sterically hindered ligand design



## Dr William Alexander Donald

*BSc Seattle University, PhD  
University of California, Berkeley*



### Professional Activities:

- Treasurer, Australian and New Zealand Society for Mass Spectrometry
- Chair, RACI NSW Analytical & Environmental Chemistry Division
- Editorial Board, Expert Opinion on Therapeutic Patents
- Editorial Board, Journal of Enzyme Inhibition and Medicinal Chemistry
- Editorial Board, International Journal of Molecular Sciences (Biochemistry)

### Research:

- Fundamental and applied mass spectrometry, including ionization and ion fragmentation

- Single cell chemical analysis by mass spectrometry
- Portable ion detection devices
- Rapid, direct and portable ambient pressure methods for forming, focusing, separating and detecting ions

### Postdoctoral Fellows:

- Dr K M Mohibul Kabir

### Honours Students:

- Merryn Baker
- Vickie Chan

### PhD Students:

- Ezaz Ahmed
- Susannah Brown
- Peter Lee
- Giang Nguyen
- Huixin Wang
- Dr Muhammad Zenaidee

### MSc

- Liang Giang
- Ponthatai Kankaew

### MPhil

- Jordan Mastellone
- Panthipa Suwannakot



## Dr Gavin Leslie Edwards

*BSc (Hons), PhD Monash*

### Professional Activities:

- Associate Dean – Academic Programs
- Dr Albert Fahrenbach
- PhD Northwestern University

### Research:

- Prebiotic Chemistry with a Focus on RNA.



## Professor Leslie David Field

*Ph.D, D.Sc University of Sydney*

### Professional Activities:

- Director of the Victor Chang Cardiac Research Institute Pty Ltd (ACN 068 363 235)
- Fellow of the Australian Academy of Science
- Fellow of the Royal Australian Chemical Institute
- Fellow of the Royal Society for Chemistry
- Fellow of the Royal Society of NSW
- Member of the American Chemical Society
- Member of the International Society for Magnetic Resonance

### Research:

- Organometallic chemistry of coordinated dinitrogen - nitrogen fixation.
- C-H Bond activation and functionalisation
- Organometallic chemistry of carbon dioxide

- Applications of NMR spectroscopy in organic & organometallic chemistry
- Transition metal catalysis in organic synthesis
- Transition metal acetylides, organometallic polymers and new materials
- Metallocene chemistry

### Postdoctoral Fellows:

- Dr Hsiu LinLi
- Dr Synøve Scottwell

### Honours Students:

- Silviu Dobrota
- Dylan Oakes

### PhD Students:

- Vera Diachenko (co- supervision)
- Tim Elton (co-supervision)
- Peter Jurd



**Dr Vinicius  
Romero Goncales  
(ARC Laureate Fellow)**

*BSc, PhD, University of Sao Paulo, Brazil*

**Research:**

- Electrochemistry on semiconductors

**Honours Students:**

- Daniel Hagness



**Scientia Professor  
J. Justin Gooding**

*B.Sc. Hons (Melb), D. Phil (Oxon)*

- Modified surfaces for monitoring and controlling cells behaviour
- Immunosensors for monitoring the levels of glycosylated haemoglobin in the blood of diabetics
- Nanoparticle based biosensors labelling and detection in for medical diagnostics
- Single molecule detection using silicon nanopores.
- 3D Bioprinting of cells for the mass production of cancer models.
- Well-defined nanoparticle synthesis for advanced electrocatalysis
- Fida'A Alshawwreh
- Seyedyousef Armin
- Simone Bonaccorsi
- Ali Chamazketi
- Dongfei (Phoebe) Chen
- Uueqian Chen
- Sanjun Fan
- Shreedhar Gautum
- Nilou Jamshidi
- Mohaddesah Kahram
- Cameron Kelly
- Jianxin (Lily) Lian
- Sharmin Maitry
- Bijan Pouryousefi Markhali
- Milad Mehidpour
- Parisa Moazzem
- Munkhshur Myekhlai
- Duyen Nguyen
- Peter O'Mara
- Rahelleh Pardehkorram
- Agus Poerwoprajitno
- Abu Sadat Md. Sayem Rahman
- Hsaing-Sheng (Johnson)
- Manish Sriram
- Wenxian Tang
- Cong Vu
- Yanfang Wu
- Manchen Zhao
- Kelly Zong

**Postdoctoral Fellows:**

- Dr. Padmavathy Bakthavathsalam
- Dr Tania Benedetti
- Dr Lucy Gloag
- Dr Vinicius Gonçales
- Dr Fabio Lisi
- Dr Raheleh Pardehkorram
- Dr Iman Roohaniesfahani
- Dr. Alexander Soeriyadi
- Dr Iman Tehrani
- Dr Kristel Tjandra
- Dr Robert Utama
- Dr Wenqian Wang
- Dr James Webb
- Dr Yanfang Wu
- Dr Ying (Jessie) Yang
- Dr Long Zhang

**PhD Students:**

- Mehran Kashi Bolourian
- Lachlan Carter

**Professional Activities:**

- Fellow of the Australian Academy of Technology and Engineering, 2018-
- Fellow of the International Society of Electrochemistry 2016-
- Fellow of the Australian Academy of Science 2016-
- Fellow, Royal Society of New South Wales 2014-
- Fellow, The Royal Australian Chemical Institute 2012-
- Fellow, The Royal Society of Chemistry 2010-
- Inaugural Editor-in-Chief, of the American Chemical Society journal, ACS Sensors, 2015-Current

**Research:**

- Silicon electrodes for developing bioelectronic devices
- Porous silicon photonic crystals monitoring the release of enzymes from single cells

**Honours Students**

- Tom Armstrong
- Danielle Bennet
- Toby Funstan
- Kuan Li
- Johanna Wordsworth



## Dr Ronald Stanley Haines

*B.Sc. in Pure and Applied Chemistry,  
Ph.D. UNSW*

### Professional Activities:

- First Year Chemistry Laboratory Coordinator
- School of Chemistry IT Coordinator
- Member, School of Chemistry Teaching Committee

### Research:

- Assessment and instruction in undergraduate Chemistry laboratories.
- Chemical education and the impact of mobile devices and web development technologies on content delivery to students.

- Chemical kinetics, in particular the influence on reaction mechanisms of ionic liquids as solvents

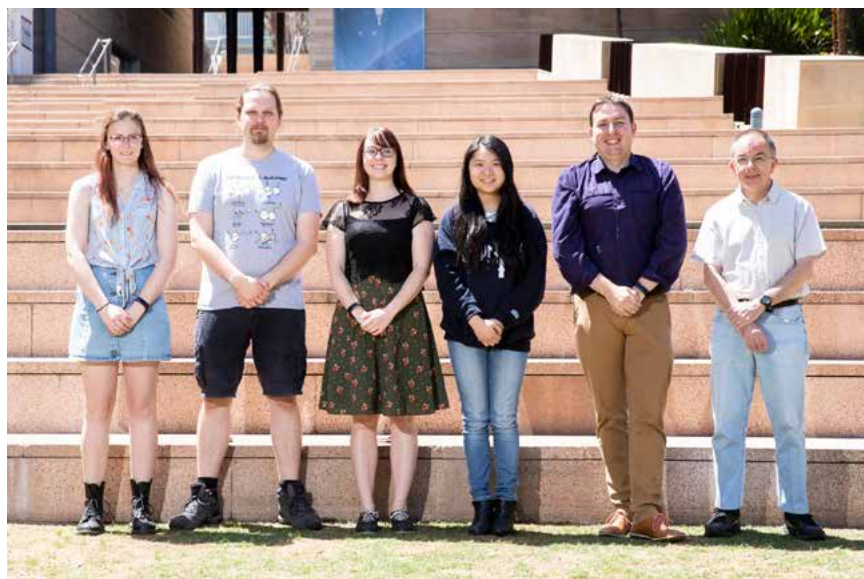
### PhD Students:

- Alyssa Gilbert
- Rebecca R. Hawker
- Karin S. Schaffarczyk McHale



## Associate Professor Jason Brian Harper

*B.Sc., University of Adelaide, B.Sc. (Hons), Ph.D. Australian National University*



### Professional Activities:

- Director of Teaching, School of Chemistry
- Reviewer for national funding bodies: Australia, USA, New Zealand
- Ph.D. Examiner: Australia, France, India
- Technical Committee, Chemeca 19
- Treasurer, Southern Highlands Conference on Heterocyclic Chemistry
- Member, IUPAC Subcommittee on Structural and Mechanistic Organic Chemistry
- Associate Member, Division III (Organic), International Union of Pure and Applied Chemistry

- Fellow, Royal Australian Chemical Institute
- Member, American Chemical Society (ACS)
- Director, Systems Chemistry Australia

### Research:

- Application of physical organic chemistry to understanding organic processes, including:
- The development of an understanding of ionic liquids as novel reaction media, and their application.
- The examination of the chemical and physical properties of N-heterocyclic carbenes
- The investigation of novel NMR spectroscopic methods for monitoring reaction kinetics

### PhD Students:

- Jeffrey Black
- Alyssa Gilbert
- Nicholas Konstasndaras
- Benjamin Lau
- Karin Schaffarczyk McHale

### Honours Students:

- Benjamin Smit-Colbran
- Michaela Wong

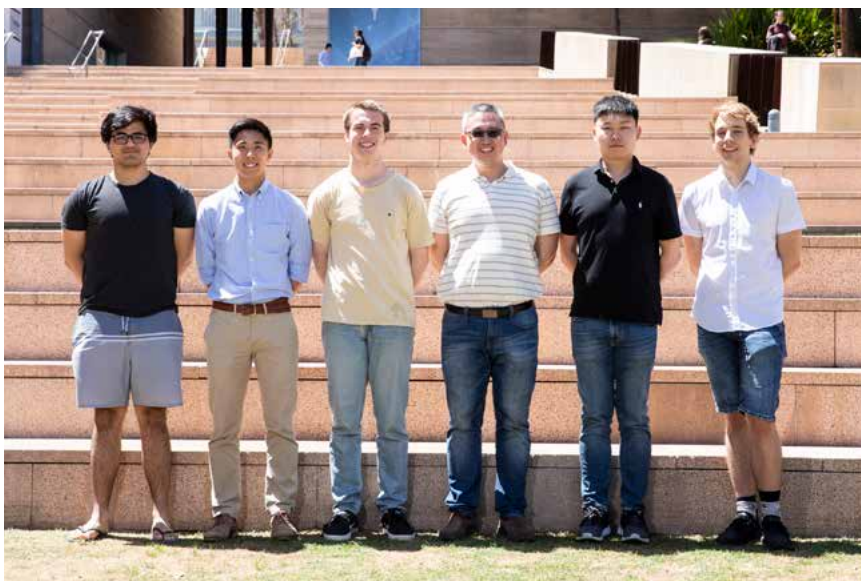




## Dr Junming Ho

*BSc, UWA, BSc (Hons), PhD ANU*

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### Professional Activities:

- Editorial Board Member (Chemical Data Collections and Elsevier Journal)
- Reviewer for American Chemical Society, Royal Society of Chemistry.
- Invited workshop for 22nd East Asian Workshop on Chemical Dynamics (Seoul)
- Invited workshop for the Quantum and Computational Chemistry Student Conference (2018, Kioloa NSW)

### Research:

- Computer-aided chemical design
- Organocatalysis
- Solvation modelling
- Multi-scale simulations

### PhD Students:

- Junbo Chen
- Gabriella Marcolin
- Isolde Sandler

### Honours Students:

- Alicia Evans
  - Jin Kato
  - Daniel Notaras
  - Ying Wu (Co-supervisor)
-



## Dr Luke Hunter

*BSc (Advanced) (Honours), PhD, The University of Sydney*

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### Professional Activities:

- Peer reviewer (multiple grants and papers)

### Research:

- Design and synthesis of bioactive molecules for applications in medicinal chemistry. A particular focus is on molecules that contain either stereoselective fluorination or aziridine.

### Postdoctoral Fellows:

- Dr Reyne Pullen
- Honours Students:
  - Daniel Weissberger
  - Patrick (Paddy) Ryan

### PhD Students:

- Ahmed Ahmed
- Alexandra Daryl Ariawan
- Catherine Au

- Rasha Jwad
  - Yun Cheuk (Jimmy) Leung
  - Yuvixza Lizarme
  - Flora Mansour
  - Nicole Richardson
  - Glen Surjadinata
-



## Professor Scott Henderson Kable

*B.Sc. (Hons) (Griffith), Grad. Dip. Business Admin. (QUT) PhD (Griffith)*

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### Professional Activities:

- RACI, Chair of the Membership Advisory Committee

### Research:

- Atmospheric Chemistry
- Molecular Reaction dynamics
- Molecular Spectroscopy

### Postdoctoral Fellows:

- Dr Christopher Hansen
- Dr Aaron Harrison
- Dr Klaas Nauta
- Dr Mitchell Quinn

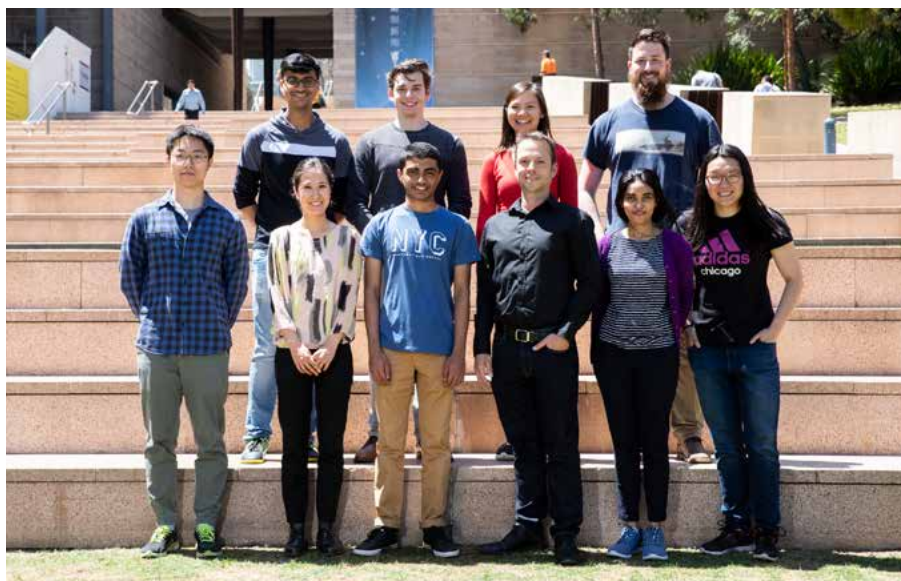
### PhD Students:

- Jyoti Campbell
  - Maggie Corrigan (co-supervisor)
  - Keiran Rowell
  - Blair Welsh
  - Callan Wilcox
-



## Dr Kris Killian

*BS, MS University of Washington,  
PhD UNSW*



### Professional Activities:

- Theme organiser, 10th International Nanomedicine Conference
- Symposium reviewer, Pacificchem 2020
- Chartered chemist, RACI
- Member, ASBTE

### Research:

- Biomaterials design
- Hydrogel chemistry
- Mechanochemistry and mechanobiology
- Cell, tissue and organoid engineering
- Model tumour microenvironments.

### Postdoctoral Fellows:

- Dr Sara Romanazzo

### Honours Students:

- Steven Chan
- Ashley Nguyen
- Lauren Niessen

### PhD Students:

- Jake Ireland
- Md Shariful Islam
- Honda Jayathilaka
- Thomas Molley
- Stephanie Nemec
- Yi Pei
- Pallavi Srivistava



## Dr Dong Jun Kim

*BSc, Yonsei University, Seoul, PhD  
Korea Advanced Institute of Science and  
Technology, Daejeon, Republic of Korea*

### Research:

- Energy storage
- Supramolecular chemistry
- Materials chemistry.



## Professor Naresh Kumar

*BSc (Hons 1) Punjab Agricultural University, India MSc Punjab Agricultural University, India PhD University of Wollongong, Australia*



### Professional Activities:

- Postgraduate Coordinator: Student review and completion
- Member, Royal Australian Chemical Institute (RACI)
- Member, American Chemical Society
- Member International Society of Heterocyclic Chemistry
- Chair, RACI (NSW) Natural Products Chemistry Group
- Member RACI Bioactive Discovery and Development Group
- Assessor for ARC Discovery, Linkage and LIEF projects
- Assessor for ARC Laureate Fellowship applications
- Reviewer for NHMRC Project Grant applications

- Research project evaluation for Auckland Medical Research Fund, and Cancer Society of New Zealand
- Reviewer for Academic Research Fund applications, Nanyang Technological University, Singapore
- Reviewer for US-Israel Binational Science Foundation (BSF) research proposals
- PhD thesis examiner for national and international universities
- Referee for Tetrahedron Letters, Tetrahedron, Organic and Biomolecular Chemistry, Bioorganic and Medicinal Chemistry Letters, European Journal of Medicinal Chemistry, Journal of Organic Chemistry, Journal of Medicinal Chemistry, Biofouling, and Acta Biomaterialia

### Research:

- Design and synthesis of novel antimicrobial agents including quorum-sensing inhibitors and antimicrobial peptide mimics

- Development of synthetic methodologies for the preparation of biologically important natural products and their analogues
- Heterocyclic chemistry
- Novel antimicrobial biomaterials

### Postdoctoral Fellows:

- Dr Renxun Chen
- Dr Shashidhar Nizalapur

### Honours Students:

- Albert Fung
- Robert Rourke

### PhD Students:

- Vina Aldilla
- Basmah Almohaywi
- Jeremy Debrowski
- Xiaoming Fu
- Satyanaryana Gadde
- Rajesh Kuppusamy
- Vidia Nuraini
- Damiel Wenholz
- Tsz Tin Yu



### Dr Kim Lapere

*BSc (Honours), PhD,  
The University of Western Australia*

#### Professional Activities:

- School of Chemistry Teaching Fellow Coordinator
- School of Chemistry Outreach Committee
- School of Chemistry Website Coordinator

#### Research:

- Chemical education - threshold / mastery project



### Dr Shannan Maisey

*BSc (Hons), BCom, PhD, UWA*

#### Professional Activities:

- Member of RACI national committee for chemical education.

#### Research:

- Chemical education threshold/mastery project
- Metacognition in novice science students
- Work integrated learning.



### Dr Adam Martin

*BSc (Hons), Curtin, PhD, UWA*

#### Professional Activities:

- Committee member, RACI NSW Branch
- Member, Society of Neuroscience
- Member, Australian Neuroscience Society
- Member, Materials Research Society
- Member, Australian Society for Biomaterials and Tissue Engineering

#### Research:

- Recreating the extracellular matrix of the brain for insights into the early stages of Alzheimer's Disease
- Novel transfection reagents
- Flexible metal-organic frameworks

#### Honours Students:

- Matthew Sims

#### PhD Students:

- Emily Barker (Co-supervisor)



## Associate Professor Shelli Renee McAlpine

*BSc University of Illinois, PhD UCLA*



### Professional Activities:

- American Chemical Society:  
International committee board member
- NHMRC adhoc grant reviewer
- ARC adhoc grant reviewer

### Research:

- Investigating the mechanism of action of Heat shock protein 90 inhibitors as chemotherapeutics
- Designing small molecules that target Heat shock protein 70 and Heat shock protein 27

### PhD Students:

- Laura Buckton
- Yuantao Huo
- Jessica Kho
- Chi Pham Phuong
- Adrian Pietkiewicz
- Marwa Rahimi
- Quantao Sun
- Samantha Zaiter
- Yuqi Zhang

### Honours Students:

- Renee (su-Hyeon Kwon)
- Fong Ying Tiew



## Dr Laura McKemmish

*BSc (Adv, Hons) USyd, PhD ANU*

### Professional Activities:

- Member of RACI EDI Committee

### Research:

- New methodology for ultracold atom-diatom scattering
- Molecular data for exoplanet spectroscopy

### PhD Students:

- Anne-Maree Syme



**Professor and Deputy  
Dean of Graduate  
Research Jonathan  
Charles Morris**

*BSc (Hons) UWA, PhD ANU*



**Professional Activities:**

- Deputy Dean of Graduate Research
- Member, Research Committee, School of Chemistry, UNSW
- Fellow, Royal Australian Chemical Institute and Member, American Chemical Society.
- Referee for ACS, RSC, Wiley and Elsevier Journals.
- Member, Scientific Advisory Board, Exonate Ltd.
- Treasurer of Organic Division, RACI
- Treasurer of Medicinal Chemistry and Chemical Biology Division, RACI

**Research:**

- Total synthesis of biologically active natural products
- Design of inhibitors of kinases that regulate alternative splicing [with Exonate]
- Applications of the Diels-Alder reaction to the synthesis of biologically active molecules

- Design of phosphatase activators (with Dr Matt Dun and Dr Nikki Verrills, University of Newcastle)
- Medicinal chemistry.

**Postdoctoral Fellows:**

- Dr Irene De Silvestro

**Honours Students:**

- Natalie Coulton

**PhD Students:**

- Stephen Butler
- Iliya Dragutinovic
- Jack Duncan
- Tom Hawtrey
- Tess Mutton
- David Neale
- Matthew Peterson
- Jonathon Ryan
- Stephen Wearmouth





## Dr Suzanne Neville

*BSc (Hons), PhD, USyd*



### Professional Activities:

- UNSW Faculty of Science A to B promotions committee
- UNSW Equity Diversity committee
- Treasurer NSW Inorganic Division RACI
- Council member NSW Division RACI
- Council member Society of Crystallography of Australia and New Zealand
- Conference organiser CRYSTALS (Society of Crystallography of Australia and New Zealand)
- Panel Assessment Committee (PAC) for the Powder Diffraction beamline the Australian Synchrotron.

### Research:

- Molecular switches
- Mining and mineral purification.

### Postdoctoral Fellows:

- Dr Lida Ezzedinloo
- Dr Synove Scotwell

### Honours Students:

- Maxwell Pearce

### PhD Students:

- Manan Ahmed
- Vera Diachenko
- Anthony Leverett



## Dr Vinh Nguyen

*B.E (1st class Hons) UNSW, Ph.D ANU*



### Professional Activities:

- MRACI (RACI)
- Treasurer, Natural Products Chemistry group, RACI.

### Research:

- Synthetic methodology
- Advanced functional materials

### Honours Students:

- Gabriella Chalmers
- Domenic Pace

### PhD Students:

- Reece Crockers
- Mohanad Hussein
- Demelza Lyons
- Giulia Oss
- Uyen Tran



## Dr Reyne Pullen

*BSc (Hons) UTas, Grad Dip Education QUT, PhD UTas*

### Professional Activities:

- RACI Chemical Education Committee member
- Chemistry Education Highlights Editor for RACI Chemistry in Australia publication.

### Research:

- Online learning using a threshold/mastery framework for first-year chemistry courses.
- Technology, Pedagogical Content Knowledge (TPACK) and how academics utilise this to develop learning experiences.
- The journeys and experiences of academics who identify as Discipline-Based Education Researchers (DBER).



## Dr Nicole Rijs

*BSc (Hons), PhD,  
University of Melbourne*

### Professional Activities:

- National Excellence in Education Leadership Initiative - Advanced Leadership Program
- Foundations of University Learning and Teaching Program - participant.

### Research:

- Building Ion-Mobility Mass spectrometer capability
- High throughput MS analysis of dynamic combinatorial solutions.



## Dr Iman Roohani (NHMRC Fellow)

*BSc, MSc (Materials Engineering)  
Isfahan University of Technology, PhD  
(Biomedical Engineering) USYD*

### Professional Activities:

- Editorial board member of Journal of Biomedical Glasses.
- Guest editor, Special Issue of "Additive manufacturing, and Biofabrication of Tissue Engineering Scaffolds", Journal of Materials.

### Research:

- Development of Bone-ink for bioprinting and in-situ printing of bone mimicked constructs.
- Effect of surface curvature on differentiation of bone marrow derived stem cells
- Identification of the role of microporosity on osteoinduction of synthetic bone grafts
- Fabrication and characterisation of biomimetic nanoparticles for treatment of bone metastasis
- Osteogenic and angiogenic behaviour of Lithium doped calcium phosphate nanoparticles
- A new technique for integration of bone forming growth factor with 3D printed synthetic grafts
- A modular design strategy to enable bone scaffolds to withstand complex in-vivo loadings and regulate mechanotransduction



### Postdoctoral Fellows:

- Dr Kang Lin
- Dr Xiaoting Lin
- Sara Romanazzo
- Rakib Sheikh
- Kathatina Spaniol

### PhD Students:

- Sudip Chakraborty (joint supervisor)



## Professor Timothy Schmidt

*BSc (Hons 1) USYD, PhD Cambridge*

### Professional Activities:

- Associate Editor, Journal of Photonics for Energy
- President, UNSW Chemical Society
- Science Director, ARC Centre of Excellence in Exciton Science

### Research:

- Molecular spectroscopy and photophysics
- Renewable Energy
- Astrochemistry
- Electronic Structure Theory

### Postdoctoral Fellows:

- Dr Nastaran Faraji
- Dr Thilini Ishwara
- Dr Shyamal K.K. Prasad
- Dr Alain Rives
- Dr Yu Liu

### PhD Students:

- Cameron Dover
- Elham Gholizaadeh
- Parisa Hosseinabadi
- Yu Liu
- Vineeth Yasarapudi
- Zachary Levey



## Dr Neeraj Sharma

*B Advanced Science, PhD USYD*

### Professional Activities:

- RACI Materials Division Chair
- Asian Crystallographic Association Regional Representative
- Member of National Committee for Crystallography (NCCr), Australian Academy of Sciences
- International Advisory Committee, International Meeting on Energy Storage Devices, IIT Roorkee, India December 10-12th
- Organising committee for the 12th International Conference on Ceramic Materials and Components for Energy and Environmental Applications (CMCEE), Singapore 22-27, July 2018 for the symposium "Advanced Batteries and Supercapacitors for Energy Storage Applications"
- Co-Editor Frontiers in Energy Research: In-situ and In-operando Techniques for Material Characterizations during Battery Operation – Research Topics Series

### Research:

#### Solid state and Materials Chemistry

Energy-related devices such as batteries and fuel cells are essential in our lives. In order to develop the next

generation of technologies we need more power, or better performance, at a lower environmental cost. Research into understanding the interplay between the crystal structure of new materials and their physical properties will allow us to revolutionise how we obtain and store energy.

My research approach encompasses exploratory synthesis, structural determination, physical property measurements and in situ structure and property characterisation of batteries and other devices.

### PhD Students:

- Emily Cheung
- James Christian
- Lisa Djuandhi
- Conrad Gillard
- Damian Goonetilleke
- Junnan Liu
- Divya Sehrawat
- Jennifer Stansby
- Jimmy Wu
- Honours Students:
- Michael Fenech



## Scientia Professor Martina Heide Stenzel

*MSc, University of Bayreuth, Germany  
PhD University of Stuttgart, Germany*



### Professional Activities:

- Co-Director Centre for Advanced Macromolecular Design (CAMD)
- Co-Director of the ARC Training Centre for Chemical Industries
- Fellow of the Australian Academy of Science
- Fellow of the Royal Australian Chemical Institute (RACI) and past chair of the RACI polymer division
- Scientific editor of the RSC journal Materials Horizon
- Associate editor: Beilstein Journal of Nanotechnology
- Member of the editorial board of the journals Macromolecular Bioscience, Macromolecular Rapid Communications, Biomacromolecules, Polymer Chemistry, Journal of Materials Chemistry B and Acta Biomaterialia, ACS Biomaterials Science and Engineering
- Chair of the National Chemistry Committee of the Australian Academy of Science

### Research:

- New polymer materials for drug delivery
- Self-assembly of polymers into nano-objects such as cylindrical micelles, vesicles, spherical micelles and other structures
- Hollow nanoparticles for the delivery of proteins
- Nanoparticles with proteins or sugars to generate bioactive nanoparticles with high affinity for cancer cells
- Macromolecular ligands for metal complexes and their use in cancer therapy
- Polyion complex micelles for protein delivery
- Investigation into the interaction of nanoparticles with cancer cells in 2D and in 3D multicellular spheroids

### Postdoctoral Fellows:

- Dr Radhika Raveendran
- Dr Chin Ken Wong

### Honours Students:

- Rebekka Lai
- Lok Kan Orion Lam

### PhD Students:

- Cheng Cao
- Fan Chen
- Sylvia Gandy
- Nidhi Joshi
- Yee Khine
- Haiwang Lai
- Yimeng Li
- Jordan Lovegrove
- Mingxia Lu
- Russul Mamdooh
- Daniele Melodia
- Ahmed Mustafa
- Janina Noy
- Alberto Piloni
- Guannan Wang
- Yiping Wang
- Sandy Wong
- You Dan Xu
- Jeaniffer Yip
- Lin Zhang



## Associate Professor John Arron Stride

*BSc (Hons.) Ph.D. (Chemistry),  
University of East Anglia, UK*

### Professional Activities:

- UNSW AINSE Delegate
- School of Chemistry Honours Coordinator

### Research:

- Molecular magnetism
- Nanostructured materials
- Molecular dynamics
- Photo-active devices
- Porous framework materials

### Postdoctoral Fellows:

- Dr Sreenu Jennepalli
- Dr Fatemeh Mirnajafizadeh

### PhD Students:

- Tim D'Adam
- Zichen (Jeffrey) Yan



## Dr Scott Andrew Sulway

*MChem (Hons), Ph.D. University of  
Manchester, P.G.C.E. Secondary Science  
(Chemistry), Manchester Metropolitan  
University*

### Professional Activities:

- Member of the School of Chemistry Outreach Committee

### Research:

- Lab Skills & The pedagogy of what we teach in a lab
- Lanthanide coordination chemistry
- Magnetic interactions of lanthanide complexes



## Professor Pall Thordarson

*BSc. Chemistry, University of Iceland,  
PhD Chemistry USYD*



### Professional Activities:

- Editorial board member –  
Commissioning Editor, the Australian Journal of Chemistry.
- Editorial board member –  
ChemSystemsChem (Wiley).
- Co-Chair, International Symposia on Macrocyclic and Supramolecular Chemistry (ISMSC) in Reykjavik, Iceland, June 2022.
- Membership of the Royal Australian Chemical Institute, The American Chemical Society, The Royal Society of New South Wales, The Icelandic Chemical Society, Society of Porphyrins and Phthalocyanines (SPP), The Australian Microscopy and Microanalysis Society and the Marie Curie Fellowship Association
- Australian Research Council (ARC) College of Expert member.

### Research:

- Systems Chemistry
- Origins of life (pre-biotic chemistry)
- Self-assembled gels for biomedical applications and electroactive displays.
- Biophysical chemistry and the supramolecular chemistry of proteins.
- Non-linear interactions in supramolecular chemistry

### Postdoctoral Fellows:

- Dr Abbas Darestani Farahani
- Dr Alistair Laos
- Dr Jonathan P. Wojcoechowski
- Dr (Chin) Ken Wong

### PhD Students:

- Fayaz Ali



## Professor Richard Tilley

*MChem Oxford, PhD Cambridge*

### Professional Activities:

- Editorial board ChemPlusChem and ChemNanoMat

### Research:

- Nanoparticle synthesis and applications and electron microscopy

### Postdoctoral Fellows:

- Dr Lucy Gloag

### Honours Students:

- Toby Funston
- Johanna Wordsworth

### PhD Students:

- Ali Alinezhad Chamazketi
- Hsiang-Sheng Chen
- Cameron Kelly
- Ujjaval Kerketta
- Jiaxin Lian
- Munkhshur Myekhlai
- Agus Poerwoprajitno

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## Dr Anna Wang

*BSc (Adv, Hons 1 & Medal) USyd, MSc & PhD in Applied Physics, Harvard University*

### Research:

- Membrane biophysics
  - Soft condensed matter
  - Origins of life
-





## Professor Chuan Zhao

*PhD Northwest University*



### Professional Activities:

- Chair of Electrochemistry Division  
Royal Australian Chemical Institute

### Research:

- Electrochemical energy conversion and storage
- Gas sensors

### Postdoctoral Fellows:

- Dr Sheng Chen
- Dr Xianjue Chen
- Dr Richard Gondosiswanto
- Dr Yibing Li
- Dr Quentin Meyer
- Dr Wenhao Ren
- Dr Yuan Wang
- Dr Yachao Zeng

### PhD Students:

- William Adamson
- Muhammad Ibrar Ahmed
- Xin Bo
- Karin Ching
- Kamran Dastafkan
- Tim Fang
- Mengchen Ge
- Haocheng Guo
- Chen Jia
- Zhen Su
- Wanfeng Yang

## Dr Yiling Zhong (DECRA Fellow)

*PhD, Soochow University, China*

### Research:

- Design and synthesis of multifunctional nanomaterials for bioapplications

# Academic Staff Awards

## Scientia Professor J. Justin Gooding

### Australian Academy of Technology and Engineering

- Elected Fellow

## Associate Professor Jason Harper

### ARC Postgraduate Council

- Postgraduate Research Supervisor Award

## Emeritus Professor Brynn Hibbert

### Member of the Order of Australia

- For significant service to science in the discipline of chemistry, to professional societies, and to sport through illicit drug profiling

## Dr Kim Lapere

### The University of New South Wales

- Science Excellent Early Career Teaching Award

## Dr Shannan Maisey

### The University of New South Wales

- Best Poster Award - Teaching and Learning Forum

## Associate Professor Shelli McAlpine

### The University of New South Wales

- Excellence in Research Supervision

## Dr Suzanne Neville

### Society of Crystallography of Australia and New Zealand

- Sandy Mathieson Award.

### Royal Australian Chemical Institute (RACI)

- Alan Sargeson Lectureship.

## Dr Neeraj Sharma

### Royal Australian Chemical Institute (RACI)

- Rennie Memorial Medal for Excellence in Chemical Science

### Australian Synchrotron

- Research Award

## Scientia Professor Martina Stenzel

### Australian Academy of Science

- Elected Fellow

### Royal Australian Chemical Institute (RACI)

- Century Fellowship

## Professor Chuan Zhao

### Royal Society of New South Wales

- Elected Fellow



# Staff

## Administration

### Head of School

Professor Scott Henderson Kable

### Deputy Head of School

Professor Pall Thordarson

### Strategy / SHARP / ERA

Scientia Professor John Justin Gooding

### Deputy Strategy / SHARP / ERA

Professor Timothy Schmidt

### Director of Research

Scientia Professor Martina Heide Stenzel

### Director of Teaching

Associate Professor Jason Brian Harper

### Deputy Director of Teaching

Dr. Gavin Leslie Edwards

### Post Graduate Coordinator – Student review and completion

Professor Naresh Kumar

### Post Graduate Coordinator – Admissions and scholarships

Dr. William Alexander Donald

### Honours Coordinator

Associate Professor John Arron Stride

### Higher Year Teaching Coordinator

Associate Professor Stephen Boyd Colbran

### First Year Coordinator

Dr. Luke Hunter

### First Year Laboratory Coordinator

Dr. Ronald Stanley Haines

### Undergraduate Research Coordinator

Dr. Suzanne Neville

### Medicinal Chemistry Program Coordinator

Associate Professor Shelli Renee McAlpine

### Nanotechnology Program Coordinator

Professor Chuan Zhao

### ITTC Coordinator

Associate Professor John Arron Stride

### Outreach Coordinator

Dr. Laura McKemmish

### IT Coordinator

Dr. Ronald Stanley Haines

### Website Coordinator

Dr. Kim Lapere

### Scholarship & Prizes Coordinator

Dr. Jonathon Beves

### Seminar Coordinator

Dr. Junming Ho

### Deputy Seminar Coordinator

Dr. Robert Chapman

### Teaching Fellows Coordinator

Dr. Kim Lapere

### Demonstrator Training Coordinator

Dr. Scott Andrew Sulway

### Tutorial Coordinator

Dr. Shannan Maisey

### Talented Students Program Coordinator

Dr. Neeraj Sharma

### School Manager

Dr. Toby Jackson

### Project Officer / Executive Assistant

Jodee Anning, BA UNSW

## Teaching Staff

### Scientia Professors

#### John Justin Gooding

*BSc Melb, DPhil Oxon*

#### Martina Heide Stenzel

*MSc Bayreuth, PhD Stuttgart*

### Professors

#### Leslie D. Field

*PhD D.Dc USyd*

#### Scott Henderson Kable

*BSc (Hons 1), PhD, Griffith*

#### Naresh Kumar

*MSc Punj., PhD W'gong., CChem, MRACI*

#### Jonathan Charles Morris

*BSc UWA, PhD ANU*

#### Timothy Schmidt

*BSc USyd, PhD Cambridge*

#### Pall Thordarson

*BSc Iceland, PhD Syd*

#### Chuan Zhao

*BSc Shaanxi, MSc PhD Northwest UT*

### Associate Professors

#### Graham Edwin Ball

*BSc PhD Sheffield, MRACI*

#### Stephen Boyd Colbran

*BSc PhD Otago*

#### Marcus Lawford Cole

*BSc (hons), PhD Cardiff*

#### Jason Brian Harper

*BSc Adelaide, BSc ANU PhD ANU*

#### Shelli Renee McAlpine

*BSc III, PhD UCLA*

#### John Arron Stride

*BSc (Hons.) PhD E.Anglia*

**Senior Lecturers****Jonathon Beves***BSc (Hons 1) MSc USyd, PhD Basel***William Alexander Donald***BSc Seattle, PhD UCA Berkley***Gavin Leslie Edwards***BSc PhD Monash, CChem, MRACI***Luke Hunter***BSc (Adv)(Hons), PhD USYD***Kris Kilian***BS, MS, University of Washington, PhD UNSW***Suzanne Neville***PhD USYD***Vinh Nguyen***B.Eng (Hons) UNSW, PhD, ANU***Neeraj Sharma***BSc (Hons) PhD USYD***Lecturers****Albert Fahrenbach***PhD Northwestern***Ronald Stanley Haines***BSc PhD UNSW***Junming Ho***BSc UWA, BSc (Hons) PhD ANU***Dong Jun Kim***BSc, Yonsei University, Seoul, PhD KAIST***Kim Lapere***PhD Berkley***Shannan Maisey***BScComm, BSc PhD, UWA***Adam Martin***BSc (Hons) Curtin, PhD UWA***Laura McKemmish***BSc Adv, (Hons) USYD, PhD ANU***Reynbe Pullen***BSc (Hons), PhD UTAS***Nicole Rijs***BSc (Hons), PhD UMEL***Scott Sulway***MChem (Hons), PhD Manchester***Anna Wang***BSc USYD, MSc, PhD Harvard***ARC Laureate Fellows****Dr. Vinicus Goncales***PhD, USP, Brazil***DECRA Fellows****Dr. Xianjue Chen***PhD UWA***Dr. Hongxu Lu***BSc MSc Ocean University of China, PhD Tsukuba University, Japan***Dr. Yiling Zhong***PhD Soochow University, China***NHMRC Fellows****Dr. Adam Martin***PhD UWA***Dr. Iman Roohani***BSc, MSc Isfahan University of Technology, PhD USYD***Dr Alex Soeriyadi***PhD UNSW***Vice Chancellor  
Postdoctoral Fellows****Dr. Robert Chapman***BEng (Ind. Chem Hons 1) UNSW, PhD USYD***Dr. Sheng Chen***PhD Nanjing University of Science and Technology, China***Dr. Yuhua Xue****Casual 1st Year Teaching Staff****Dr. Kakali Chowdhury***PhD, Uni New Dehli, India***Visiting Fellows****Emeritus Scientia Professor****Michael Nicholas Paddon Row***BSc Lond, PhD ANU, CChem, FRSC, FRACI***Emeritus Professors****Roger Bishop***BSc St And., PhD Camb., CChem, FRSC, FRACI***David St. Clair Black***M.Sc. Syd., Ph.D. Camb., AMusA, CChem, FRACI, AO***Ian Dance***M.Sc. Syd., Ph.D. Manc., CChem, FRACI, FAA***David Brynn Hibbert***BSc PhD Lond., CChem, MRSC, FRACI***Ronald Postle***PhD Leeds***Conjoint Professors****Grainne Mary Moran***BSc PhD NUI, CChem, MRACI***Professorial Visiting Fellows****Barbara Messerle***BSc PhD Syd***Margaret Harding***B.Sc, PhD, DSc, USyd; CChem, FRACI***Visiting Fellows****Dr. Joseph John Brophy***BSc, PhD DSc UNSW, DipEd Monash, CChem, FRACI***Honorary Associate Professors****A/Prof. Roger Read***BSc PhD Syd., DIC Lond., CChem, FRACI***Adjunct Senior Lectuer****Dr. Alex Falber***Algae Enterprises Ltd, Victoria, Australia*

**Technical staff:***Back Row:*

David Jacyna,  
Dr Clare Sullivan,  
Shan Balachandran,  
Dr. Warren Truong,  
Dr. Majid Asnavandi,  
Ken McGuffin

*Front Row:*

Anne Ayres,  
Svetislav Videnovic,  
Hitendra Gopal,  
Ian Aldred,  
Dr Ruth Thomas,  
Michael Gandy,  
Aftab Hossain,  
Dr. Joshua Peterson,  
Dr. Toby Jackson

## Professional and Technical Staff

### Administrative Support

#### Anne Ayres

Undergraduate administration

#### Kenneth Gerard McGuffin

BA USYD

Postgraduate administration

#### Hannah Ritchie-Young

#### Sandra Sarkissian

### Computer Officer

#### Ray Arnhold

### Finance Officer

#### Aftab Hossain

CA ANZ, MAcc UTS

### Laboratory Managers

#### Dr. Nancy Talavera

BSc (Hon), PhD Adel

Teaching Laboratories

#### Dr. Joshua Peterson

BSc Chem Eng Washington, PhD USYD

Research Laboratories

### School Store

#### Ian Aldred

#### Shan Balachandran

### Student Services Manager

#### Michael Gandy

BSc Chem, UWA

### Technical Officers

#### Dr. Majid Asnavandi

PhD UNSW

#### Hitendra Gopal

#### David Jacyna

#### Dr. Clare Sullivan

BSc, PhD UTS

#### Dr. Ruth Thomas

BSc, PhD UNSW

#### Dr. Warren Truong

PhD UNSW

#### Svetislav Videnovic

BChemEng, Sarajevo

# RESEARCH



## Director of Research Report

**The year 2018 was quite eventful for the School in terms of research. Of particular note was the growth in industry-related activities and the impact that UNSW's 2025 Strategy, specifically SHARP and Scientia are having on the School.**

### Grants:

The School had another very strong year in terms of grant success and income. The school has secured six ARC Discovery Projects grants directly led by members of the school (Professor Timothy Schmidt together with Professor Scott Kable; Professor Richard Tilley; Professor Martina Stenzel, Professor Scott Kable with collaborators from Sydney Uni, Professor Pall Thordarson and Dr William Donald). This is an excellent result as the school success rate of 33% is well above the national average (22%).

The School continues to secure ARC Future Fellowships. Three members of staff are currently on Future Fellowships and three more members are past Future Fellows. In 2018, Dr Thanh Vinh Nguyen secured an ARC Future Fellowship bringing the overall number up to seven.

The School continues to successfully mentor the applications of ARC DECRA fellowships. Dr K M Mohibul Kabir secured one of these highly competitive fellowships in 2018.

Further grant success includes the NHMRC project grant for Scientia Professor Justin Gooding and an ARC LIEF grant led by Professor Pall Thordarson.

### Industry initiatives:

The School continues to engage with industry. The ARC funded Industrial Transformational Training Centre (ITTC) for the Chemical Industries has now officially started at the school of chemistry. The

newly appointed Industry Centre Manager has initiated contacts with chemical industries. As part of the new centre, a new Master of Industrial Research was formulated that enables industry and academia to work together on industry-based projects.

### Accolades to our staff:

Externally, our staff also received a number of accolades. Scientia Professor Martina Stenzel was elected as Fellow of the Australian Academy of Science while Scientia Professor Justin Gooding was elected as Fellow of the Australian Academy of Technology and Engineering. Professor Chuan Zhao became Fellow of the Royal Society of New South Wales and Professor Stenzel received a Century Fellowship of the Royal Australian Chemical Institute (RACI). Dr Neeraj Sharma won the RACI Rennie Medal and the Australian Synchrotron Research Award while Dr Suzanne Neville received the Sandy Mathieson Medal. Members of the staff were awarded several UNSW awards: UNSW supervisor award (Arc UNSW Student Life) for Associate Professor Jason Harper and two faculty of Science awards (Excellent Early Career Teachers Award for Dr Kim Lapere and Excellence in Research Training (Supervision) for Associate Professor Shelli McAlpine).

### Publications:

After several years of exceptional growth in publications, our output has plateaued at around 270 papers published in 2018.

However, the quality of the publication has increased significantly. In 2018, the school of chemistry co-authored or led ten publications in the Nature family: Nature Communications (Stoddard, Morris, 2 Gooding, Kable, Schmidt) Nature Nanotechnology (Gooding+ 1 opinion piece), Nature Energy (Stride), Nature Chemistry (Schmidt).

### UNSW 2025 Strategy – Scientia and SHARP

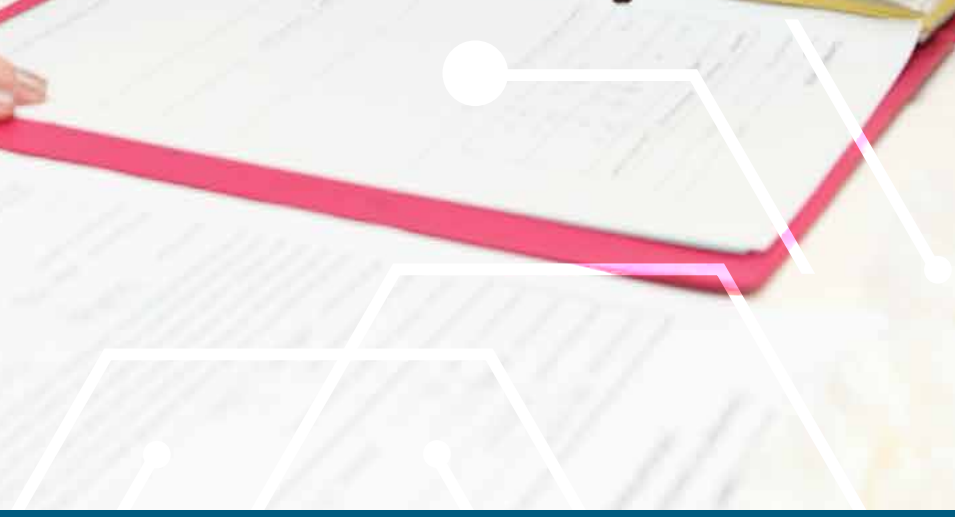
The School welcomed two Scientia Fellows in 2018, Drs Nicole Rijs and Anna Wang. Moreover, Dr Martin Peeks (Massachusetts Institute of Technology, MA) and Dr Martina Lessio (Columbia University/Uni Sydney) received a Scientia scholarship in 2017 and they will be joining the School in 2019. Our SHARP hire, 2016 Nobel Prize winner in Chemistry, Sir Fraser Stoddart, has now started working in the school.

### New Buildings

The expansion of the research activities was supported by move into state of the art research facilities in the Hilmer Building in 2018 while members of the school saw the SEB building grow during 2018, which will host more research groups of the school. These new facilities will support the continued growth of the school over the years to come.

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**Scientia Professor Martina Stenzel**  
Director of Research



# TEACHING



## Director of Teaching Report

**With the impending change to the UNSW3+ model at the beginning of 2019, unsurprisingly, the bulk of the goings on in terms of teaching within the School of Chemistry have focussed on preparations for this significant change.**

A key pillar on moving to the new model has been the development of new assessment models, particularly for exams, which might be considered to streamline the marks compilation and submission process in the new system where time constraints will be particularly problematic. Our ongoing collaboration with the School of Chemistry has demonstrated the effectiveness of this teaching model in a specialist first year course and significant effort has been made to expand this across our first year offerings. Along with changes to the delivery of these courses, it is anticipated that these modifications will significantly improve the experience for our very large first year cohort.

The trimester system has also involved challenges in the manner in which the School delivers the practical aspects of our courses; a term has fewer, but longer, practical sessions. The necessary change has allowed the practical components to be evaluated and modified to ensure that we are delivering the material most

appropriately to our students. Such content redistribution has also been applied to theory components of all courses taught within the School; this has been a non-trivial task and all involved should be congratulated.

On practical aspects, the rise of enrolments in the Diploma programme offered by New South Global put pressure on our laboratory space for first year. As such, in early 2019, significant changes will be made with Lab 162 being converted to a first year teaching space and space in the F10 tower on level 1 converted to instrumental teaching. This change will allow greater flexibility at both first and higher year levels in timetabling laboratory classes.

Of course, there is only so much that can be done in preparation. Looking forward to 2019, the implementation of the trimester model (and how such affects teaching in the School of Chemistry) will be the main focus.

Also into the future, the School continues to look at options for revising the currently suspended Bachelor of Science (Nanotechnology) programme. With support across the University, particularly from the School of Materials Science and Engineering, it is anticipated that a significantly enhanced version of this degree will be able to be put forward in 2019.

Finally, on a positive note, the changes implemented at our higher years already seem to have had significant effects. At the end of 2018, enrolments for 2019 in our second and third year courses were already >25% up on the previous years.

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**Associate Professor Jason B. Harper**  
Director of Teaching





## First Year Chemistry

### In many ways, 2018 was a year of preparation.

**The lead-up to the 3+ academic calendar required a large number of changes to be thought through, including deciding which term(s) each 1st year chemistry course would be offered in; refreshing the syllabi of the mainstream 1st year courses; and rearranging the content of each course from the old 12-week schedule into a new 9-week schedule.**

But the most significant preparations were for the new “Threshold / Mastery” style of teaching and assessment, which is being implemented across all mainstream 1st year courses in 2019. Excitingly, a team from the School of Chemistry (comprising myself; Professor Scott Kable; Drs. Kim Lapere; Shannan Maisey; Scott Sulway; and Mr Steve Yannoulatos) was successful in securing a large grant (\$170,000) from the UNSW Strategic Educational Innovation Fund to support this initiative. The funding allowed us to recruit a Chemical Education specialist, Dr Reyne Pullen, to work on the project full-time throughout 2018. This project will revolutionise the way that 1st year chemistry is taught and assessed. Our pilot studies have shown that the new model is more blended;

more personalised; offers students better feedback on their progress; gives a better consistency of learning outcomes across the course; gives a high pass rate; and garners exceptional ratings in student satisfaction surveys. It’s going to be a huge challenge to implement such a massive change across all of 1st year chemistry (~3,000 enrolments per year) but the benefits that our students will receive will hopefully make it all worthwhile!

As always, teaching 1st year chemistry is a team effort. As well as the people mentioned above, I want to thank Dr. Ron Haines for keeping the labs running so smoothly; and also our army of lecturers, tutors and demonstrators who do such sterling work at the coal-face.

One other change needs to be mentioned. I was proud and panicked in equal measure when I learned that our indefatigable Student Support Manager, Steve Yannoulatos, had been seconded to the Faculty of Science. We recruited Michael Gandy to fill Steve’s position in 2018, and I have to say that Michael has performed absolutely outstandingly in coming up to speed and keeping the whole show on the road. Thank you so much, Michael!

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**Dr. Luke Hunter**  
1st Year Coordinator



## Honours Program

**The Honours Programs that run within the School of Chemistry are the capstone research year primarily for students of several UNSW undergraduate Programs. Our Honours cohort typically includes students enrolled in the (i) Bachelor of Science majoring in Chemistry, (ii) the Bachelor of Advanced Science majoring in Chemistry, (iii) the Bachelor of Science in Medicinal Chemistry, and (iv) the Bachelor of Science in Nanoscience. Students from several other degree programs, such as the Bachelor of Environmental Science majoring in Chemistry, may also enroll in the Bachelor of Science program majoring in Chemistry for Honours.**

In the 'chemistry' focused degree programs, students undertake their entire fourth year in the School of Chemistry. This comprises a research project in collaboration with a member of the academic staff and contemporary chemistry courses delivered by formal lectures. In the 'medicinal chemistry' focused degree, students follow the above but also some interaction with academic staff in the Pharmacology section of the School of Medical Sciences, including collaborative projects.

The BSc Nanoscience students undertake a research project that represents just over 80% of their final year. This is carried out in the School of Chemistry, the School of Physics and/or the School of Materials Science and Engineering, and is supplemented by a number of undergraduate courses taught by these three Schools.

In 2018, 12 students completed Honours through the Bachelor of Science and Advanced Science BSc Programs, 9 completed Honours through the Bachelor of Medicinal Chemistry Program and 7 completed Honours through the Bachelor of Science in Nanoscience Program (5 of whom performed research projects in the School of Chemistry). A further nine

(8 Chemistry and 1 Medicinal Chemistry) began Honours in July 2018.

Stephen Roche (BSc Nanoscience) received a University Medal for outstanding performance across his degree program, including his final year research project in the School of Physics with Professor Michelle Simmons. He was also awarded the Nanoscience Prize for the best performance in a Nanoscience Honours thesis.

Merryn Baker was awarded the Angyal Prize for the best performance in a Chemistry Honours thesis and Albert Fung received the Cavill Prize for the best performance in a Medicinal Chemistry Honours thesis.

One innovation in 2018 was the completion of our first Honours exchange student with King's College London in the spirit of the PLuS Alliance; this student performed his research project at King's, graduating from UNSW. I would like to acknowledge the great support offered by the staff at King's who hosted our student at no cost and in the absence of a direct exchange.

2018 was my fifth year as Honours Coordinator and it is now time for me to hand over the reins to the very capable hands of Dr. Neeraj Sharma. It has been a

pleasure for me to get to know the Honours students to have passed through the School in my time overseeing the Honours programs - over 130 in total - and wish every one of them every success; every one of them an excellent ambassador for the School of Chemistry at UNSW. In my time we have introduced greater rigour to the examination process with increased enrolment numbers; these now seem to have stabilised around 25-35 per year and so there is still scope for some growth. A major innovation that has been widely appreciated by staff and students alike is the viva component of the examination - in fact this was extended from 15 to 20 minutes after the first year of introducing it, partly at the request of the students themselves! I am reassured that Honours will now be in the very capable hands of Neeraj, who I am sure will take it forward into the new regime of three terms at UNSW, necessitating a change to how the coursework component of Honours will be delivered. All the very best going forward Neeraj and once again, thank you to all of my colleagues & the students themselves for making my time so enjoyable.

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**Associate Professor John Stride**  
Honours Coordinator



## Postgraduate Research Report

We had another big year of postgraduate research activities with first and second year postgraduate confirmations and reviews in May 2018, and third year presentations and reviews in July 2018. The second round of major reviews was held from 22-26 October 2018. The GRS has made several changes to the higher degree research (HDR) thesis examination and progress review procedures. These procedures have now been implemented in the School.

### Current Situation

The School has experienced a significant growth in postgraduate numbers over the last few years. The number of enrolments has steadied to around 20 students enrolling in each semester. There were 29 completions recorded since the beginning of the year. The School has a strong track record of on-time completions, leading the Faculty in this regard. Chemistry has also done quite well in terms of on-time reviews with very few cases outstanding due to special circumstances.

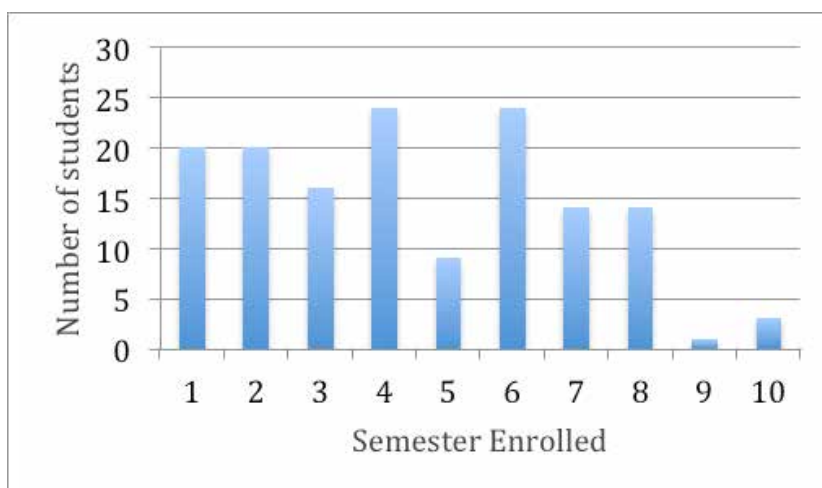


Figure 1: Number of postgrad enrolments (October 2018)

### Postgraduate Reviews

The First Year (S2 2017 start) and Second Year (S2 2016 start) PhD and MSc student reviews were held from 28-30 May 2018. The first year students each gave a 12 minutes presentation as part of their confirmation while the second year students gave a 3 minutes talk and prepared a poster as progress update. Awards were given for best oral and poster presentations.

#### Best Oral Presentation winners:

Hsiang Shang Chen and Tsz Tin Yu

#### Best Poster Presentation winners:

Jordan Mastellone and Junnan Liu

The third year PhD presentations and reviews for students who started in S2 2015 were held on Monday 16th July 2018. The students each gave a thirty-minute presentation.

The School had a strong presence at the Faculty of Science Postgraduate Competition 2018 with our students doing their best in a one-minute pitch showcasing their research.

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#### Professor Naresh Kumar

Postgraduate Research Coordinator:  
*Student Review and Completion*



## Outreach and Marketing Report

**The beginning of 2018 saw substantial change in Outreach and Marketing at UNSW Chemistry. The redistribution of workload from a school level to a university level resulted in the loss of administrative staff support, which was then exacerbated by the secondment of other staff to Faculty in March.**

I was promoted to the position of Chair of this committee effective January 2018. Faculty Outreach and Engagement leads Shane Hengst and Alyce Taylor were appointed to facilitate communication between the School and University, and to support Faculty outreach initiatives. The UNSW Department of External Relations (DEX) was also available to support outreach and marketing activities, with an online portal the main venue for requesting support with specific tasks. Fortunately, the roles and responsibilities of all parties in outreach and marketing is now becoming much clearer across the school, faculty and university levels, with communication channels flowing reasonably smoothly.

At the start of the year, this committee developed a Vision and Strategy document which will be reassessed yearly and amended as necessary along with a prepared Annual Plan for Outreach and Marketing in order to maximise our impact while maintaining or reducing staff contributions.

By combining effective utilisation of these new pathways for faculty and university, support has been provided for our in-school enthusiastic and knowledgeable staff and students, we are well positioned to deliver effective outreach and marketing initiatives efficiently into the future.

In terms of specific events, 2018 was very much a transitional year, especially in light of recent changes to the Year 11 and 12 high school syllabus. We delivered the last of the old-style on-campus visits with 35 St Aloysius students in June 2018 and piloted the new style of on-campus Depth Study visits with 145 James Ruse students in April 2018. Furthermore, as part of a UNSW Science collaboration, Chemistry has contributed to four online Depth Study modules, preparing some online professional development modules to support teachers in delivering new content. In 2019 we are looking to deliver a coherent online and on-campus Depth Study experience for Year 11 and Year 12 students in two one-week periods, enhancing our preparations by enabling many students to benefit from the on-campus experience while minimising the impact on undergraduate teaching and academic workload.

As with previous years, we provided support to many faculty and university events by delivering campus workshops; specifically this year, we have so far delivered workshops on campus for the Nura Gili summer school, National Youth Science Forum and a visit from Singapore Polytechnic. This will be extended into 2019 as an effective way of delivering outreach, utilising our strengths

as chemists and working scientists in combination with faculty and university experience and connections.

We have also provided substantial support at off-campus events at the Australian Museum (Sydney Science Festival) and at Science in the Swamp, with 6 days of exhibitions to an estimated 5000 people and 4 days of workshops to 382 students.

As with recent years, UNSW Chemistry also hosted the RACI Titration Heats and Finals in June and September respectively. Individual academics also participated in various school visits off-campus.

Open Day was once again the centrepiece of the 2018 Outreach calendar and was well supported by Chemistry Future Students, particularly Science representative Bonnie Xin. A somewhat reduced line-up of experiments did not limit the enjoyment of our many thousands of visitors on the day at our tent, while keen students made their way to the Advisory Centre to talk one-on-one with our academics and filled the lecture rooms at our Chemistry and Medicinal Chemistry talks.

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**Dr Laura McKemmish**

Outreach & Marketing Coordinator

# UNSW Chemical Society

The UNSW Chemical Society assists in the organisation of the School Seminar Series, a weekly program of talks from distinguished academics around Australia and the world. In addition the society organises a number of prestigious, endowed lectureships each year, and in 2018 it played host to the following Lecture series.

## The Howard Lectures, 2018:

- Professor Jonathan Sessler, University of Texas, Austin  
8th May, University of Sydney  
*Texaphyrins as drug candidates: Life, death, and attempts at resurrection*
- 10th May, UNSW  
*Adventures in Self-Assembly: Is There Logic Here?*

## The Cavill Lecture, 7th February 2018:

- Professor William Jorgensen, Yale University  
Order, Disorder, Flexibility, Function

## The Inaugural Kornis Lectureship, 3rd April 2018

- Professor Peter Schreiner, Institute of Organic Chemistry, Justus-Liebig University, Giessen Germany  
*London Dispersion Effects in Molecular Chemistry - Reconsidering Steric Effects*

The Kornis Lectureship is the School's newest named lectureship to support distinguished national and international visitors who are experts in the field of medicinal/organic chemistry to deliver lectures at UNSW. Professor Peter Schreiner is our inaugural Kornis Lecturer.



# STUDENTS

## SOCS 2018 Presidents Report

2018 was a busy year for SOCS, with a number of events hosted, both in conjunction with the School of Chemistry and independently. This included the running of TWO trivia nights which were both received very well. Personally, it was a big learning year, as I had never been a part of the SOCS executive before. Luckily the entire executive team was incredibly helpful and none of the events this year would have been nearly as successful without you! Thank you all very much.

**The executive for this year consisted of old dogs and new hands to the team:**

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**President**

Aaron Kennedy

**Treasurer**

Karin Schaffarczyk-McHale

**Secretary**

Jonathon Ryan

**Activities Coordinator**

Tim Elton

**Merchandising Officer**

Nicole Richardson

**ARC Delegate**

Stephen Bortolussi

**Undergraduate Reps**

Johanna Wordsworth (Nano)

Matthew Taylor (Higher Chem)

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The major event on the chemistry calendar is always Chem Ball and this year was no different! Hosted at the lovely L'aqua terrace room in Darling Harbour we had 140 guests in film noir theme for our largest event ever! A massive thanks to Iliya, Steve, Karin and Gemma for organising this excellent event.

In addition to several BBQs SOCS put on during the semester, we were involved with school events such as poster days, named lectures, PhD presentations and the end-



of-year Christmas party. Events such as these are vital in maintaining the social life of the school, and hopefully promote some cross-group collaboration!

In mid-April SOCS hosted our annual trivia night, however this time an external host was brought in which really helped the event run smoothly. In fact, it ran so well we hosted a second trivia night in late September (with a LOT of pizza!). From all accounts these events were a lot of fun, and hopefully we can continue with them in the future!

SOCS was also involved in an O-week event, welcoming first year undergraduates to the school and the university! This involved a lot of fun making liquid nitrogen

ice-cream and hopefully we'll be seeing more of those students in future.

SOCS has also started trialling Beem It as a payment method for our events. This app should make payment at events much simpler, hopefully we can see some widespread adoption in the following year!

Thank you again to all the exec for their help this year, and to the School of Chemistry as a whole for supporting SOCS and making our events what they are.

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**Aaron Kennedy**

SOCS President 2018

# Undergraduate Student Prizes

## Honours Prize Winners

### The Angyal Prize

*Best performance in Honours Chemistry*

MERRYN BAKER

### The Cavill Prize

*Best performance in Honours Medicinal Chemistry*

ALBERT FUNG

### The Nanoscience Honours Prize

*Best performance in Honours Nanoscience*

STEPHEN ROCHE

## Third Year Prize Winners

**The E&FJ Cowper Prize in Chemistry and School Medal for best performance in Level 3 Chemistry**

THOMAS ZHOU

### Medicinal Chemistry Prize

*Best performance in Level 3 Medicinal Chemistry*

WEISI HE

### The RACI Analytical Chemistry Group Prize

*Best performance in Level 3 Analytical Chemistry*

ROY FU

### The University of New South Wales Chemical Society Dwyer Prize

*Best performance in Level 3 Inorganic Chemistry*

THOMAS ZHOU

### The Inglis Hudson and Jeffery Bequests

*Best performance in Level 3 Organic Chemistry*

THOMAS ZHOU

### The Bosworth Prize and Medal for best performance in Level 3 Physical Chemistry

LORRIE JACOB

### The University of New South Wales Chemical Society Parke-Pope Prize

*Meritorious performance in Level 3 Chemistry Courses*

LORRIE JACOB

## Second Year Prize Winners

**The School of Chemistry Prize and School Medal for best performance in Level 2 Chemistry**

JACK BENNETT

### Alan Norman Buckley Prize for Analytical Chemistry

JACK BENNETT

### Howard Prize Level 2 Analytical Chemistry

THOMAS ZHOU

### Howard Prize Level 2 Inorganic Chemistry

ALAN SHENFIELD

### Howard Prize Level 2 Organic Chemistry

JACK BENNETT

### Howard Prize Level 2 Physical Chemistry

JACK BENNETT

### The University of New South Wales Chemical Society George Wright Prize

*Meritorious performance in Level 2 Chemistry Courses*

LUCY CHEN

## Year 10 Prize Winner

### The School of Chemistry Prize

*For Excellence and Enthusiasm in Chemistry for Year 10 students – Sydney Girls High School*

EVA VO

## First Year Prize Winners

**The June Griffith Memorial Prize and School Medal for best performance in Level 1 Chemistry**

LUKE CORBAN

### Howard Prize Chemistry 1A

TIMOTHY FERNANDO

### Howard Prize Chemistry 1B

XIAOYAN FAN

### Howard Prize Higher Chemistry 1A

YEAN QING CHUA

### Howard Prize Higher Chemistry 1B

JIETIAN MENG

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**Howard Prize Medicinal Chemistry 1A**JIETIAN MENG

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**Howard Prize Medicinal Chemistry 1B**JIETIAN MENG

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**The University of New South Wales  
Chemical Society Prize***Meritorious performance in Level 1  
Chemistry Courses*JIETIAN MENG

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**Postgraduate Prize Winner  
and Scholarships**

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**Don Craig Memorial Prize***For academic excellence in a research  
project in the area of Crystallography*

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**Paddon- Row Scholarship***For the highest ranked commencing local  
PhD student*SURABHI NAIK

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**Black Scholarship***For the highest ranked commencing  
international PhD student*SHREEDHAR GAUTAM

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**Fin Lawler Postgraduate Research  
Scholarship**JASON HOLLAND

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**Teaching Fellows**SUSANNAH BROWN,  
STEPHEN BUTLER,  
GRACE CONSTABLE,  
AARON KENNEDY,  
JESSICA KHO,  
GIULIA OSS,  
JENNIFER STANSBY AND  
BLAIR WELSH

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# SCHOOL

## Publications & Patents

### Associate Professor Graham Edwin Ball

TE Elton, GE Ball, M Bhadbhade, LD Field, SB Colbran, Evaluation of Organic Hydride Donors as Reagents for the Reduction of Carbon Dioxide and Metal-Bound Formates, *Organometallics* 2018, 37, 3972-3982.

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### Dr Robert Chapman, VC Fellow

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### Professor Chuan Zhao



# Grants and Research Fellowships

## AUSTRALIAN RESEARCH COUNCIL

Investigator(s)	\$	Project
<b>Discovery Projects</b>		
Prof. M. Stenzel; Dr A. Walther; Dr C. Garvey	140,000	Origami with triblock copolymers
A/Prof. SB Colbran, Prof. LD Field, Dr GE Ball, Prof. E. Norlander	167,000	Adding hydride punch to transition metal complexes for CO <sub>2</sub> electroreduction
Dr W. Alex Donald	100,000	Rapid ultra-sensitive protein structure information by mass spectrometry
Prof. C. Zhao	110,000	Three-dimensional, precious-metal-free electrolysis of water
Prof. SH. Kable, A/Prof. M. Jordan, Prof. Y.P. Lee	155,500	Atmospheric Photochemistry – it's a lot more complicated than we thought
Dr N. Sharma	64,000	Scaffolding layered structures to improve insertion electrodes
Prof. MH Stenzel, Dr R Chapman	111,000	Polymeric nanoparticles for enzyme stabilisation
A/Prof GE. Ball, Prof L.D. Field	99,000	Charging transition metals with activating alkanes
A/Prof. JB. Harper, Dr W.S. Price	140,000	Designer ionic liquids to control reaction outcome: Ionic liquids for solvent-controlled reactivity
Dr L. Hunter	29,750	Mixing the Jigsaw Pieces of Natural Products: New Molecules - New Properties (New)
Prof N. Kumar	295,000	New scaffolds for antimicrobial discovery
Dr S. Neville, et al.	10,000	Emergent properties in spin crossover materials (New)
Prof. R. Tilley	480,000	Nanoparticles with Structures that Mimic Enzymes for Electrocatalysis
Prof JC. Morris	108,000	Diene Regenerative Diels-Alder Reactions to Access Chemical Scaffolds
Prof. SH. Kable	145,000	Reactive Intermediates in Atmospheric and Combustion Chemistry
<b>ARC Laureate Fellowship</b>		
Prof. J.J. Gooding	1,166,257	The first generation of single entity measurement tools for analysis
<b>Future Fellowship</b>		
Prof. C. Zhao	60,000	Nanoconfined Ionic Liquids for Electrochemical Reduction of Carbon Dioxide
Dr J. Beves	200,000	Controlling chemistry with light powered molecular machines
Dr S. Neville	748,904	Molecular Switching Nanomaterials for Modern Technology (New)
Dr K. Kilian	74,666	Synthetic extracellular matrices for control of cellular reprogramming (New)
Dr Vinh Nguyen	185,000	Novel Organic Architectures and Functional Materials from Tropylium Ions (New)



Investigator(s)	\$	Project
<b>Centre of Excellence</b>		
Prof. J.J. Gooding, Prof. P. Thordarson, et al	3,714,286	ARC Centre of Excellence in Convergent Bio-Nano Science and Technology
Prof T.W. Schmidt, A/Prof D. McCamey et. al.	833,000	ARC Centre of Excellence in Exciton Science
<b>Linkage Program</b>		
M. Willcox, Prof. N. Kumar, N. Cole, N. James	75,004	Novel antimicrobial surface coatings for Cochlear implants
Prof. P. Thordarson, Dr J.M. Hodgkiss, Dr A. Falber	37,000	Precision luminescent solar concentrators from robust quantum dot arrays
Prof. JJ. Gooding, Prof. R. Tilley	136,667	A gold-coated magnetic nanoparticle biosensor for detecting microRNA
Prof. R. Nordon, Prof P. Thordarson, Prof. L. Bilston	38,000	Scaling manufacture of three-dimensional microstructures for the medical devices industry
<b>LIEF Program</b>		
Prof. SH. Kable	983,000	Shared Picosecond-Laser facility

Investigator(s)	\$	Project
<b>DECRA: Discovery Early Career Researcher Award</b>		
Dr H. Lu	115,000	Nanoparticle uptake of cell culture grown on micropatterned surfaces
Dr V. Nguyen	120,000	Organocatalysis: A new horizon for synthesis of organic structures
Dr N. Sharma	129,918	A new method to realise zero thermal expansion materials
Dr R. Chapman	142,000	Combinatorial design of multivalent polymers for cell receptor clustering
Dr X. Chen	122,815	Topochemical conversion of layers of graphene into diamond-like thin films
Dr C. Medcraft	117,900	A chirped pulse microwave spectrometer for studying atmospheric chemistry
Dr Y. Zhong	122,751	High Performing Multifunctional Silicon Nanomaterials for Bioapplications
Dr N. Rijs	121,850	Deconstructing molecular self-assembly by advanced mass spectrometry

## NATIONAL HEALTH & MEDICAL RESEARCH COUNCIL

Investigator(s)	\$	Project
Prof. JC. Morris	216,149	Understanding sphingolipid mediators of insulin resistance
Prof. JC. Morris	211,149	Targeting nicotinamide adenine dinucleotide biosynthesis to improve metabolism
Scientia Prof. JJ. Gooding, Prof. M. Kavallaris, Prof. B. Davis et al	1,417,704	Precision nanomedicine-based diagnostics and therapeutics for refractory malignancies
Dr I. Roohani, Dr Esfahani	243,607	A Targeted Drug Delivery System for Treatment of Bone Metastasis
Dr I. Roohani, Dr Esfahani	916,671	Optimising bone regeneration using advanced design and fabrication technologies

## UNIVERSITY OF NEW SOUTH WALES GRANTS

Investigator(s)	\$	Project
<b>Research Infrastructure Scheme</b>		
Prof. P. Thordarson, A/Prof. JB. Harper et al	148,000	Opendatafit: Transforming data analysis and storage for drug activity (IC50), kinetics and flow cytometry
Prof. C. Zhao	90,800	A plasma system to design nanostructured thin films for energy conversion and storage
<b>Faculty Research Grant</b>		
Dr J. Ho	15,000	Computer-Guided Development of Highly Active Catalysts for Organic Synthesis
Dr K. Kilian	18,000	Stimuli-responsive interfaces for real-time imaging of cell generated traction force
A/Prof S. McAlpine, Dr R. Chapman	25,000	Creating a molecular switch that controls cell stress via heat shock protein 27 (Hsp27)
<b>PLuS Alliance Seed Funding</b>		
Dr K. Kilian	21,000	Scaffolds Without Borders: An Intercontinental Biomaterials Design Team for Advancing Regenerative Medicine

Investigator(s)	\$	Project
<b>Strategic Educational Innovation Fund</b>		
Dr L. Hunter, Dr K. Lapere, Dr S.A. Sulway, Prof. SH. Kable	200,000	Threshold versus Expert Knowledge: A New Way to Teach and Assess First-Year Chemistry
Dr S. Maisey	100,000	Threshold Mastery Project
Dr SA. Sulway	50,000	STEM for Schools
<b>UNSW-SJTU Collaboration Fund</b>		
Dr X. Chen, Prof. C. Zhao et al.	10,000	Design and preparation of highly active catalytic materials for lithium-air batteries and water splitting

## AUSTRALIAN GRANTS

Investigator(s)	\$	Project	Source
Prof. P. Thordarson	100,000	Prototype study on dyes	Research Connections Grants
Dr N. Sharma	26,288	Electrodes for new battery systems - PhD scholarship	Australian Institute of Nuclear Science and Engineering
A/Prof. J. Stride	142,509	Environmentally friendly surfactants	Research Connections
Dr N. Sharma	3,000	Structural evolution of positive electrodes in sodium-ion batteries under extreme electrochemical conditions	International Synchrotron Access Program
A/Prof. J.A. Stride	50,097	Solving the Energy Roadblock	Science and Industry Endowment Fund
Prof. JJ. Gooding, Prof B. Eggleton (USyd)	1,066,667	New South Wales Smart Sensing Network (NSSN)	New South Wales State Government
Prod. JJ. Gooding	75,406	A gold-coated magnetic nanoparticle biosensor for detecting microRNA	Ferronova Pty. Ltd.
Prof JJ. Gooding	198,762	Biopinks for the 3D printing of cells made from off-the-shelf components	Inventia Life Science
Dr K. Kilian	40,000	Programming therapeutic activity of mesenchymal stem cells through engineered extracellular matrices	Industry Network Seed Fund, UNSW Faculty of Science/Cynata Therapeutics Ltd
Prof N. Kumar	30,000		Cochlear Ltd
Prof. N. Kumar	170,000	Novel isoflavone analogues	Australian Pharmaceutical Industry
Prof. C. Zhao	190,000	Fuel Cell	Kohodo Hydrogen Energy Ltd.
Dr A. Martin	43,860	Controlled network degradation of hydrogel scaffolds	ANSTO
Dr A. Martin	30,285	The effect of lysine on a series of self-assembled tetrapeptides	ANSTO
Dr X. Chen, Prof C. Zhao et al.	543,000	Renewable Hydrogen for Export, "Low-cost perovskite/silicon semiconductors integrated with earth abundant catalysts for efficient solar hydrogen generation	Australian renewable Energy Agency (ARENA)

## INTERNATIONAL GRANTS

Investigator(s)	\$	Project	Source
Prof. JC. Morris	25,544	Consulting services agreement	EXONATE LTD (UK)
Prof. JC. Morris	185,515	Design of SRPK1 Inhibitors	EXONATE LTD (UK)

# Industry and Community Interaction

Listed below are the companies, government authorities, societies and educational institutions that academic staff interacted with in 2018.

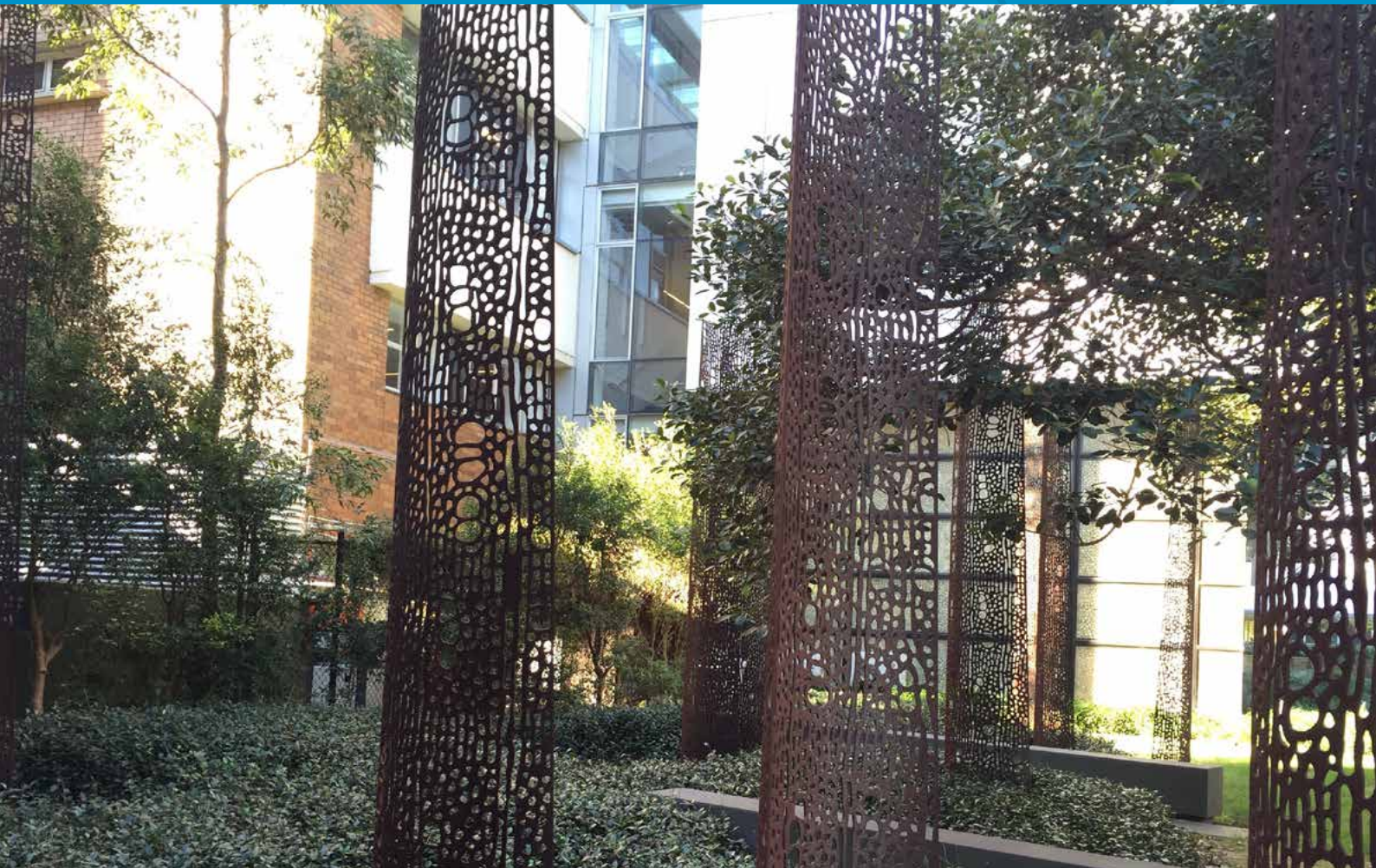
- Aachen University, Germany
- AAV Legal, Carlton VIC
- AHA Lawyers, Sydney NSW
- Allegra Orthopaedics
- Allnex
- ANSTO (Australia's Nuclear Science & Technology Organisation)
- Aqaba University of Technology, Jordan
- Archer Exploration Limited
- Armstrong Felton, NSW
- Australasian Society for Biomaterials and Tissue Engineering
- Australia and New Zealand Orthopaedic Research Society (ANZORS)
- Australian Academy of Science
- Australian Centre for Neutron Scattering
- Australian National University
- Australian Science Teachers Association
- Australian Synchrotron
- Australian Wool Testing Authority
- Brien Holden Vision Institute
- CEA, French National Research Agency
- Centre for Marine Bio-Innovation
- Chalmers University of Technology, Sweden
- Chess Legal, Sydney NSW
- Children's Cancer Institute Australia
- China East Normal University
- China University of Petroleum
- Clarivate Analytics
- CNRS Bordeaux
- Cobalt Blue Holdings
- Cochlear Ltd
- Columbia University
- Conaghan Lawyers, Sydney NSW
- Cornell University
- CSIRO Manufacturing
- Curtin University
- Cynata Therapeutics Ltd.
- Data 61
- Deakin University
- Department of Home Affairs
- Earth-Life Science Institute, Tokyo Institute of Technology
- Ege University
- ETH, Swiss Federal Institute of Technology, Zurich
- Exonate
- Faye Rose Legal, Parramatta NSW
- Faculty of Medicine, UNSW
- Ferranova Pty Ltd.
- Flinders University
- Freie University, Berlin, Germany
- George Washington University, USA
- Harvard Origins Initiative
- Harvard-Smithsonian Centre for Astrophysics
- Harvard University
- Helmholtz Zentrum Berlin for Energy & Materials
- Higher Education Research & Development Society Australasia
- Institute of Textiles & Clothing, Hong Kong
- International Federation of Musculoskeletal Research Societies
- Inventia Life Sciences
- Karlsruhe Institute of Technology
- La Trobe University
- Lowy Cancer Research Centre
- LX Group
- NASA Astrobiology
- North Carolina State University
- Macquarie University
- Manchester University
- Mark Wainwright Analytical Centre, UNSW
- Monash University
- Monash University, Institute of Pharmacy
- Monocure
- NASA Exobiology Program
- National Measurement Institute
- Noxopharm Ltd
- NSW Department of Education
- NSW Wine and Grape Research Industry Centre
- Office of the Chief Scientist & Engineer NSW
- Oxford University
- Paul La Pointe University, Alberta, Canada
- Prince of Wales Clinical School
- Princeton University
- Qingdao University, China
- Queensland Racing Integrity Commission





- ReNature Pty Ltd.
- Rhodes University, South Africa
- Royal Australian Chemical Institute (RACI)
- Royal Institute of Technology, Sweden
- Royal Melbourne Institute of Technology
- Royal Society of New South Wales
- Rutgers University, New Jersey, USA
- Sandia National Laboratories, California
- School of BABS, UNSW
- School of Chemical Engineering, UNSW
- School of Physics, UNSW
- Sensor Visions AB, Sweden
- Shanghai Zhizhen Medical Science and Technology Co. Ltd, China
- Seol National University
- SIEF STEM
- Smithsonian Astrophysical Observatory
- Solvay
- Soochow University
- Stacks Law Group, Sydney NSW
- Stanford University
- Strasbourg University
- Sydney Criminal Lawyers
- Technical University of Munich
- The Scripps Research Institute, San Diego, CA, USA
- Unisearch Expert Opinion
- University of Adelaide
- University of Bordeaux, France
- University of British Columbia
- University of California, Davis, USA
- University of Glasgow
- University of Groningen, Netherlands
- University of Iceland
- University of Illinois at Urbana-Champaign
- University of Kentucky
- University of Leeds
- University of Lille, France
- University of Maine, USA
- University of Massachusetts, Boston
- University of Melbourne
- University of Nevada, Las Vegas, USA
- University of Nottingham, UK
- University of Queensland
- University of Sydney
- University of Tasmania
- University of Technology, Sydney
- University of Texas at Austin, USA
- University of Western Australia
- University of Wollongong
- UNSW Canberra
- UNSW Foundation Studies
- UNSW Global
- Valence Technologies
- Watsons, Sydney NSW
- Western Sydney University
- Xnova
- Yale University

# SCHOOL EXTERNAL ADVISORY COMMITTEE



The Committee has representatives from our key stakeholder organisations – industry, government, schools and government research institutes. The terms of reference for the committee are as follows:

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1. To appraise the School programs in light of the needs of the School stakeholders (industry, government, schools and research institutions).
  2. To provide advice about the direction that the School should take to best enhance future interactions with our stakeholders.
  3. To provide advice about the changing needs of industry, research and government organisations to best prepare the School's graduates for future opportunities.
  4. To receive and discuss the School of Chemistry's Annual Report.
  5. To aid the development of the School in any other way possible.

## External Representatives



**Dr. Christopher Armstrong (Chair)**

Director, Office of the NSW Chief  
Scientist and Engineer



**Emeritus Prof. Bruce Sutton**

Honorary Professor (Agronomy),  
The University of Sydney



**Ms Natalie Chapman**

Managing Director, genmaker



**Mr Dave Sammut**

Principal, DCS Technical

## Ex Officio Members



**Professor Scott Henderson Kable**

Head, School of Chemistry



**Professor Pall Thordarson**

Deputy Head of School, School of Chemistry



**Scientia Professor Martina Stenzel**

Director of Research, School of Chemistry



**Associate Professor Jason Harper**

Director of Teaching, School of Chemistry