Summer Scholarships 2017/18
Taste of Research
Have you ever wondered what research is about?

Or whether you would be interested in a research career?

To give you an opportunity to find out, UNSW Engineering offers Taste of Research Summer Scholarships.

More than 60 scholarships funded by the Faculty and its nine schools.

Visit engineering.unsw.edu.au for:
1. A complete list of projects
2. Detailed description of each project
3. Project supervisor contact details
4. Apply online

Eligibility
- You must be a high achieving third-year* undergraduate student enrolled in a full-time program (second-year students may be considered in special circumstances)
- Students with WAM ≥75 are encouraged to apply.
- You must be enrolled in a relevant program at UNSW or another Australian or New Zealand University
- You must submit an application form by 18 August, 2017
- You may be a local or an international student

*Students undertaking a combined undergraduate degree (e.g. BE/BE, BE/BCom) may apply if entering their final year of study in 2018. This exemption does not apply to students enrolled in a BE/BEng or BE/ME.

Benefits
- $500 per week stipend (tax exempt)
- UNSW Bachelor of Engineering students may use their Taste of Research Summer Scholarship project towards their Industrial Training requirements (up to 6 weeks)

Availability
- The scholarships are available in a variety of research areas for a period of 12 weeks from 20 November 2017 to 23 February 2018.

For Further Information
Faculty of Engineering, Administrative Unit
Alman Yeung
02 9385 6429
a. yeung@unsw.edu.au

www.engineering.unsw.edu.au
CRICOS Provider Number 00098G

Biomedical Engineering
Lauren Kark
lauren.kark@unsw.edu.au

Physiological Measurement
A thermal imaging sensor for unobtrusive monitoring of falls in elderly people
Nigel Lovett, Michael Stevens
Development of a device for rapid detection of falls in elderly people
Michael Stevens, Nigel Lovett

Biomaterials and Tissue Engineering
Manufacturing blood in a dish
Robert Nordton, Kang Liang
Production of bioactivecs for vascular tissue engineering
Fenyng Tang, Megan Lord
Production of new drugs for immunotherapy
Fenyng Tang, Megan Lord
Development of novel silk-based biomaterials for soft tissue regeneration
Jelena Rijak-Kovacina, Sally Tang
Promoting tissue vascularisation
Jelena Rijak-Kovacina, Sally Tang
Self-powered micromotors
Kang Liang, Song Gao

Rehabilitation Engineering
Friction-sensing-based force-controlled gripping
Stephen Redmond, Heba Khamsi
Smartphone apps for clinical settings (cardiac rehab, gait analysis and mental health)
Nigel Lovett, Michael del Rosario

Implantable Bionics
Pushing heart pumps to the limit: increase heart pump output during exercise
Michael Stevens, Nigel Lovett
Measuring from hearts, eyes and brains: Next generation optodes
Nigel Lovett, Francois Ladouceur

Chemical Engineering
May Lim
m.lim@unsw.edu.au

Energy
Harnessing the intramolecular electrons of enzymes: a pathway to novel enzymatic fuel cells
Vicky Chen, Chao Ji
Oxygen electrocatalysis: What is the role of surface-active charges at metal and non-metal interface
Dawei Wang, Kuang-Hao (Tim) Wu
Finding chlorine – an atomic-scale investigation underneath the shiny skin of steel.
Patrick A Burt, Hassan Tahini

Water and Environment
On-Demand Water Disinfection with Antimicrobial Polymetric Gels
Wang, W., Cylente Boyer
Assessing relative role of bacteria and algae in membrane photobioreactors
Pierre Le-Clech, Rita Henderson

Civil and Environmental Engineering
Wei Gao
w.gao@unsw.edu.au

Biocatalytic membranes for CO2 Conversion Using Enzymatic Cascades
Vicki Chen, Song Gao

Food and Health
A smart theranostic nanoplatform for disease diagnosis and simultaneous therapy
Sophia Gu, Andre Borgers
2-Photon Upconversion: Using Light for Highly Precise Drug Release
May Lim, Cylente Boyer
2-Photon Upconversion: Using Light for Highly Precise Drug Release
May Lim, Cylente Boyer

Molecular Engineering
Novel Synthetic Antimicrobial Polymers
Edgar Wong, Cylente Boyer
Vicki Chen, Jinqwei Hou

Process and Products
Simulation Studies on Distributed Control of Renewable Energy Storage
Jie Bao, Ruiping Wang
Using light to produce advanced materials
Cylente Boyer, Jason Xu
Enhanced Bioseparations with Novel Vibrating Membranes
Vicki Chen, Milton Chai
Supercritical fluid extraction of lycopene from tomato products
Frank Lucien, Per Zetterlund

Biocatalytic membranes for CO2 Conversion Using Enzymatic Cascades
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Vicki Chen, Milton Chai
Supercritical fluid extraction of lycopene from tomato products
Frank Lucien, Per Zetterlund

Watching the Bacterial Spider
Patrick Spencer, Stuart Prescott
Model and design of a rapid thermal processing reactor
Yansong Shen, Yuang Zhou

Water and Environment
On-Demand Water Disinfection with Antimicrobial Polymetric Gels
Wang, W., Cylente Boyer
Assessing relative role of bacteria and algae in membrane photobioreactors
Pierre Le-Clech, Rita Henderson

Civil and Environmental Engineering
Wei Gao
w.gao@unsw.edu.au

Optimal design of structures under uncertainty
Wei Gao, Di Wu
Development and application of nanoparticle-based technologies for water and wastewater treatment
David Wai, Chris Miller, Shikha Gang
Factors contributing to the Growth & Toxicity of Freshwater Algae in Sydney Water Supply Catchments
David Wai, Manabu Fujii
Development of innovative cement binders with low carbon footprint
David Wai, Mark Bligh, Adate Jones

Light and Free-Radical Mediated Transformations of Iron and Copper in Oxic Natural Waters
David Wai, Ninh Pham, Chris Miller, Shikha Gang

Development of robust, low maintenance approaches to treatment of brackish contaminated groundwaters
David Wai, Peter Kovalsky, Jingxin Ma
Development of Reactive Barriers for Managing Radioactive Groundwater Contaminants
David Wai, Richard Collins, Andrew Kinsela

An experimental study of hydraulic curler blockage
Stefan Felder, Grantley Smith
Arsenic contamination in ground waters of the Mekong
Denis O’Carroll, Gregory Leslie

LiDAR measurements of scale effects in free-surface characteristics of hydraulic jumps
Stefan Felder, Laura Montanone
Logistics in humanitarian emergency operations
Hanna Grzybowska, Lauren Gardner
### Mining Engineering

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<th>Seher Ata</th>
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**Mining Systems and Mineral Processing**

- Study of foam stability in flotation process
  - Seher Ata, Ghislain Bournival
- Effect of non-frothing reagents on bubble size
  - Seher Ata, Ghislain Bournival

**Sustainable Mining Practices**

- Laser induced breakdown spectroscopy for evaluating heavy metal contamination
  - Simit Raval, Bikram Banerjee

### Petroleum Engineering

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**Co-optimization of CO2 Storage and Oil recovery**

- Furqan Hussain, Emmanuel Ajoma

**Analysis of Fines Induced Injectivity Loss During Water Disposal**

- Furqan Hussain, Faisal Othman

**Application of AFM to study the role of ions in altering wettability of carbonate reservoirs**

- Sheik Rahman, Hongna Ding

**Thermo-mechanical constitutive modelling: from micro- to macro scale**

- Hamid Roshan, Hossein Massoumi

**VR Driller: Virtual-Reality Deep Drilling Simulator with head mounted displays and a hand controller**

- Stuart Walsh, James Tibbett

**Geothermal Refrigeration: Providing access to geothermal power in developing nations to fight hunger**

- Stuart Walsh, Klaus Regenauer-Lieb

**Injectivity loss during Low Salinity Waterflooding**

- Furqan Hussain, Muhan Yu

### Photovoltaic and Renewable Energy Engineering

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<th>Shujuan Huang</th>
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**Characterisation**

- Improving the accuracy of luminescence imaging for solar cell research and manufacturing
  - David Payne, Matthias Juhl

**Temperature-Dependent Photoluminescence Measurements of Silicon Wafers and Silicon Solar Cells**

- Ziv Hameiri, Mattias Juhl

**2nd Generation Solar Cells (Thin Film)**

- Cd free CZTS solar cells
  - HONGTAO CUI, Jialiang Huang

### Combustion and Biofuels

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<th>Evatt Hawkes, Bruno Savard</th>
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**Lean premixed combustion of hydrogen**

- Ivan Perez Wurfl, Tracey Yeung

**Automation of data acquisition and control of an anaerobic, marine photobioreactor producing CH4**

- Ivan Perez Wurfl, Tracey Yeung