UNSW SYDNEY

Australia's Global University

SCHOOL OF MATERIALS SCIENCE & ENGINEERING

ANNUAL REPORT 2024

WELCOME

FROM HoS

IT IS A PLEASURE TO INTRODUCE THE SCHOOL'S 2024 ANNUAL REPORT

I would like to begin by highlighting the School's strong commitment to Work Health and Safety (WHS), which remains our top priority and aligns with the University-wide focus led by Vice-Chancellor Professor Attila Brungs. Over the past year, the School has continued to strengthen its safety protocols, achieving several key milestones. Highlights include the completion of psychosocial risk management and workplace noise monitoring programs, a full safety check of our Schedule 14 labs, and regular spot checks by the School's Senior Leadership Team. We also finalised the School's Risk Register, trained all technical staff in Mental Health First Aid, and introduced a new working-from-home checklist to support staff wellbeing.

I am pleased to note that the School is once again in a strong financial position, following an influx of new students into our undergraduate and postgraduate programs, as well as increased research income from various funding sources. With the support of our dedicated Marketing Committee and our students and staff, the School continuously strives to refine its recruitment strategies through a range of innovative outreach initiatives—including our flagship annual Open Day event—and by enhancing our educational offerings to attract high-quality students and ensure ongoing financial sustainability.

I would like to extend my warm congratulations to several colleagues on their recent career milestones. Drs Mengyao Li and Richard Webster were promoted to Lecturer, Dr Jack Yang was promoted to Senior Lecturer. We also celebrate A/Prof. Danyang Wang's promotion to Professor, and the conversions of Dr Caitlin Healy and A/Prof. Pramod Koshy to continuing academic positions. In addition, we are delighted to welcome Dr Vitor Rielli to the School as the ALCOA Lecturer in Extreme Materials. Congratulations to all on these well-deserved achievements!

The School's research excellence continues to gain international recognition, as demonstrated by the 2024 global discipline rankings. UNSW once again secured the top position in Australia in both the QS World Rankings for Materials Science and the ARWU World Rankings for Materials Science & Engineering. Impressively, UNSW was ranked 30th globally in Materials Science. Additionally, the University ranked first in Australia in the ARWU rankings for Metallurgical Engineering and Nanoscience & Nanotechnology, and third in Biomedical Engineering. These rankings reflect the exceptional work of our academic staff and their research teams across a broad range of disciplines.

Our research excellence is further supported by the success of our researchers in securing external funding. Staff were awarded grants through a range of competitive ARC schemes, including Discovery, Linkage, Infrastructure, and Industrial Transformation initiatives—as well as through other national and international funding agencies and industry collaborations. Notably, two of our staff received prestigious ARC Future and ARC Industry Fellowships. In addition, several staff were recognised with individual awards, fellowships, and honours from esteemed professional bodies. A summary of these research achievements is included in this report.

We're proud of our students' achievements, which reflect their commitment and hard work throughout the year. This report showcases their accomplishments, including undergraduate prize recipients, winners of the Industry Training poster presentations and postgraduate poster competitions, and recipients of the UNSW Dean of Graduate Research awards for outstanding PhD theses. Our students also excelled beyond the University, with our undergraduates earning top honours in the Materials Australia annual student thesis competition and research students receiving awards and commendations at national and international conferences.

I extend my sincere thanks to the 2024 Undergraduate (MATSOC) and Postgraduate (PGSOC) Society Presidents, Nelson Tear and Sanjith Udayakumar, and their Executive Committees for their outstanding efforts in fostering student engagement throughout the year. Their leadership was instrumental in delivering a wide range of social events and initiatives—most notably their close collaboration to deliver the School's second highly successful Forge Your Future – Materials Industry Networking Night, which brought together nearly 300 students, staff, and industry professionals. I also warmly welcome the incoming 2025 Executive Committees, with Nelson continuing as MATSOC President and Parkarsh Kumar stepping into the role for PGSOC. I look forward to the continued energy and enthusiasm they will bring to the student community. A selection of student society highlights is included herein.

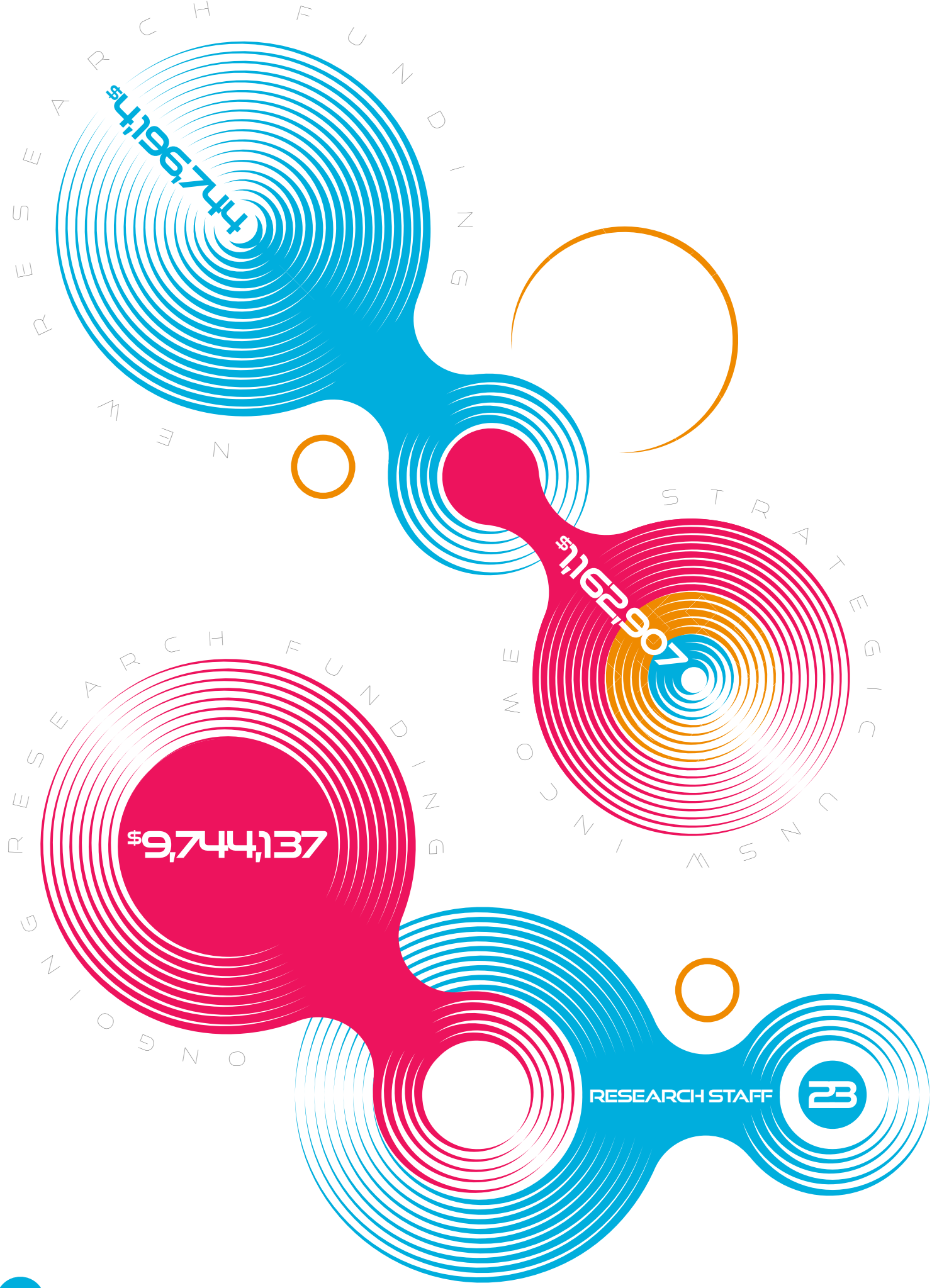
In closing, I would like to thank Chris Seymour, Lucy Zhang, and all other staff and students who contributed to this annual report. Special thanks, once again, to Greg Hosking for designing the final version of the report.

I hope you enjoy exploring the School's highlights and achievements from 2024.

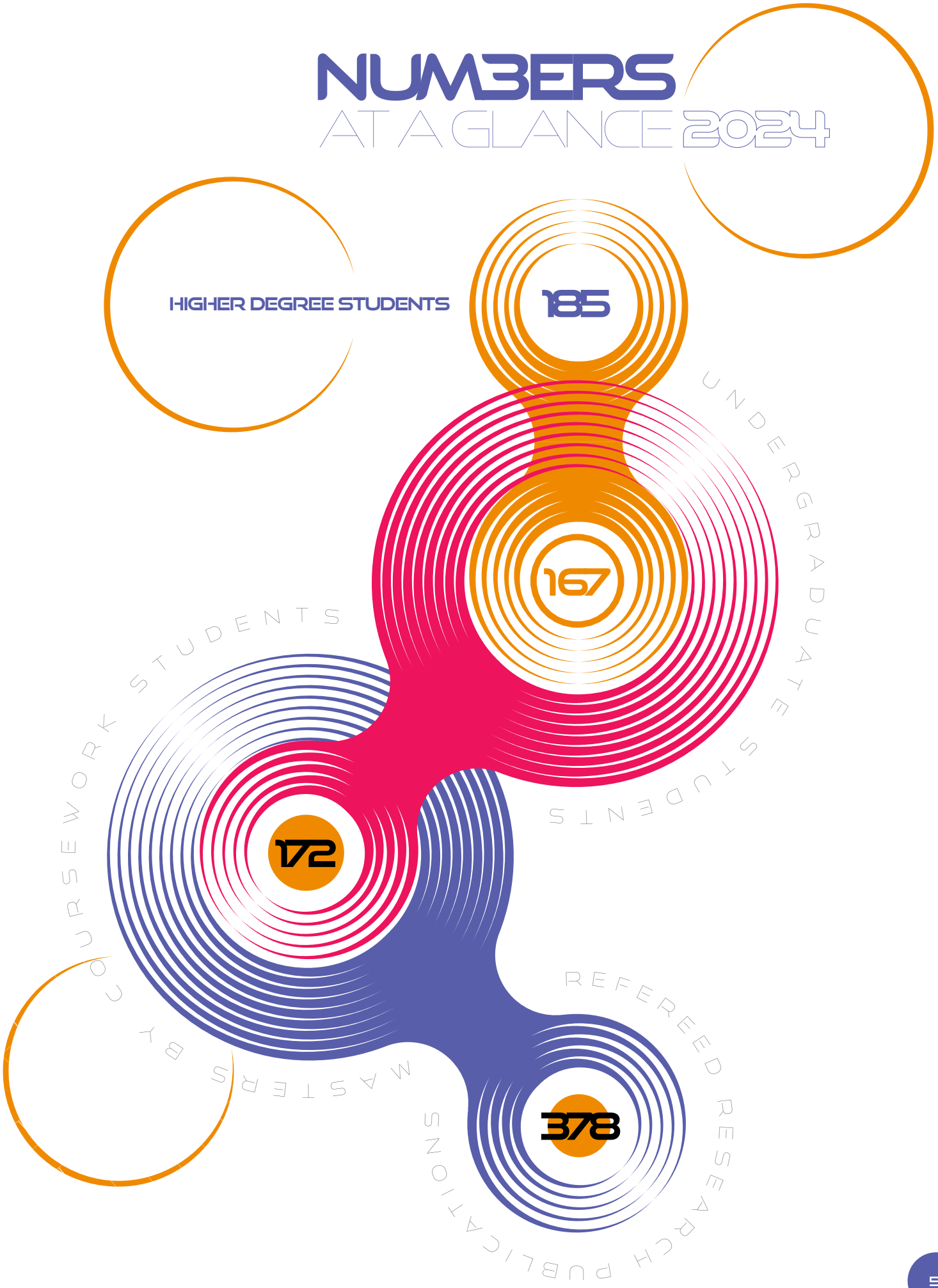
PROFESSOR MICHAEL FERRY

HEAD OF SCHOOL


UNSW
UNSW


NEW RESEARCH FUNDING
$4,196,744
STRATEGIC CONSULTING INCOME
$1,162,907
ONGOING RESEARCH FUNDING
$9,744,137
RESEARCH STAFF
23

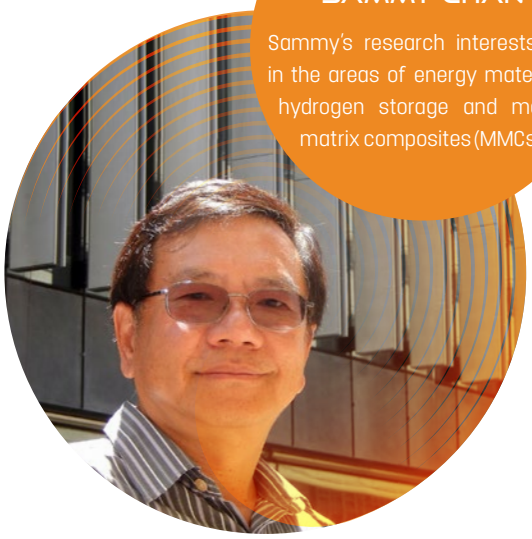
NUMBERS AT A GLANCE 2024



2024 ACADEMIC STAFF

HONORARY PROFESSOR SAMMY CHAN

Sammy's research interests are in the areas of energy materials, hydrogen storage and metal matrix composites (MMCs).



ASSOCIATE PROFESSOR SHERY CHANG
ASSOCIATE DIRECTOR OF EMU

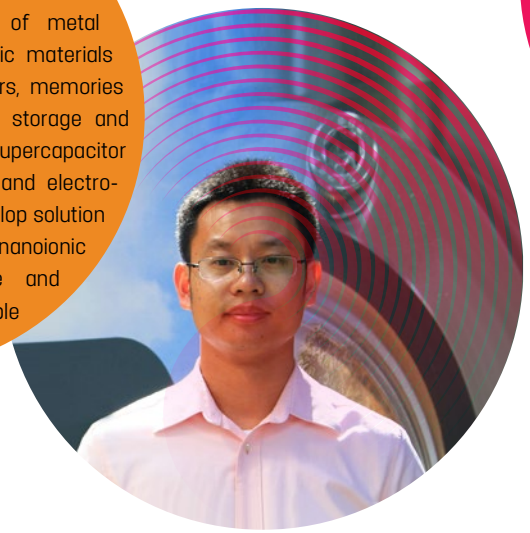
Shery's research uses state-of-the-art transmission electron microscopy and spectroscopy to study structure-property relationships in a range of advanced functional materials, including nano-photonics materials, wide bandgap materials and nano catalysts. In addition, she is developing new strategies to enable an understanding of material properties over multiple length and energy scales, including machine learning of big data sets, as well as correlative, multi-modal strategies.

EMERITUS PROFESSOR ALAN CROSKY

Alan's research focuses on the effect of structure (both micro and macro) on mechanical behaviour. Specific areas of research include directed fibre placement in fibre reinforced plastic composites, failure of composites, natural fibre composites, wood plastic composites and engineering failure analysis.

PROFESSOR DEWEI CHU

Dewei's research interests include design, fabrication and printing of metal oxides and suflides based nanoionic materials for nanoelectronics (including sensors, memories and transistors), as well as energy storage and conversion materials (including supercapacitor electrodes, solid-state electrolytes, and electro-catalysts). His group targets to develop solution processed, printable and flexible nanoionic materials for cost-effective and energy-efficient wearable electronics.



ASSOCIATE PROFESSOR JOHN DANIELS

John's research focuses on the understanding of the structural origin of physical properties of materials. This research has, to date, been primarily directed in the field of electro-mechanical materials where a wide range of underlying structural processes at different length scales leads to the coupling of mechanical load and electrical charge.

PROFESSOR MICHAEL FERRY HEAD OF SCHOOL

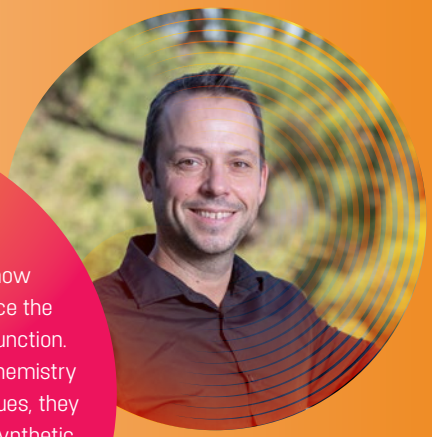
Michael's research interests are concerned mainly with the mechanisms of microstructure and texture evolution during solidification, solid-state phase transformation and deformation & annealing with recent emphasis on the mechanical and physical properties of crystalline and amorphous light metals.

ASSOCIATE PROFESSOR JUDY HART

Judy's research interests are in developing new semiconducting materials, particularly solid solutions and doped materials, for use in renewable energy applications such as photocatalysis and solar cells. The focus of this work is understanding relationships between composition and properties and finding effective ways of using computational and experimental techniques in parallel.

EDUCATION FOCUSSED LECTURER DR CAITLIN HEALY

Caitlin's research interests are the design, development and characterisation of new metallic alloys. With a focus on single phase high entropy alloys and using the compositionally complex designs to enhance binary intermetallics.



PROFESSOR KRIS KILIAN

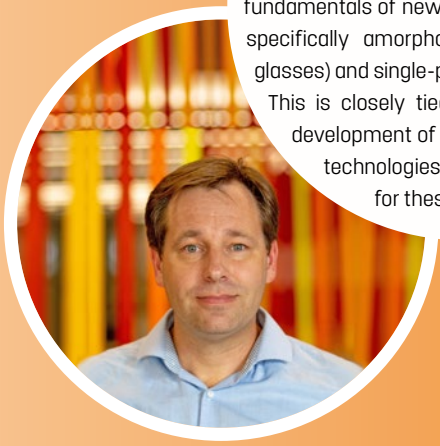
Kris's research group explores how natural and synthetic materials influence the signalling that controls cell fate and function. Combining both 'soft' and 'hard' materials chemistry with nano- and micro-fabrication techniques, they specialise in designing and developing synthetic tissue models to more accurately explore cell signalling and tissue assembly across numerous physiological and pathological conditions including development and cancer.

ASSOCIATE PROFESSOR RAKESH JOSHI

Rakesh leads the Graphene Research Group. He is the Fellow of the Royal Society of Chemistry (FRSC), A/Fellow of the Institution of Chemical Engineers (AFIChemE) and among a select group of researchers who have been awarded each of the world's most prestigious relevant International Research Fellowships; the JSPS Invitation Fellowship; the Humboldt Fellowship and the Marie Curie International Fellowship. He is currently leading various industry funded research projects on application. His research interest includes experiment design for application of graphene and 2D materials, membranes, separation and purification, diffusion mechanism.

ASSOCIATE PROFESSOR KEVIN LAWS

Kevin's research interests are concerned with the design, development and fundamentals of new or advanced metal alloys; specifically amorphous alloys (bulk metallic glasses) and single-phase high entropy alloys. This is closely tied with the design and development of new alloy production technologies and applications for these materials.



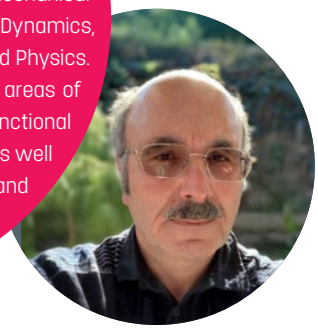
2024 ACADEMIC STAFF

ASSOCIATE PROFESSOR PRAMOD KOSHY

Koshy's research foci is on the development of advanced materials for environmental and energy applications, particularly the transformation of waste materials /industrial by-products into value-added materials for economical and industrially-viable high-performance applications. He is the co-leader of the NEMCAT (Novel Engineered Materials for Conventional and Applied Technologies) group in the School of Materials Science and Engineering UNSW Sydney which focusses on understanding the correlations between structure-properties for different conventional and advanced materials.

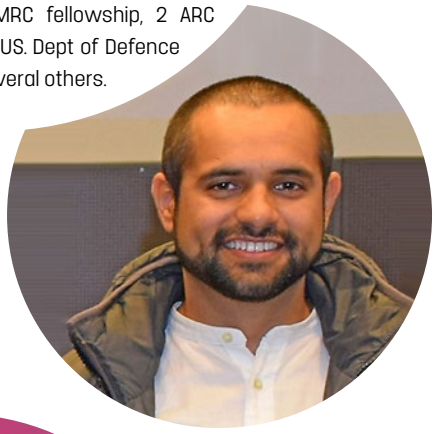
EDUCATION FOCUSED SENIOR LECTURER DR AKIF KAYNAK

Akif is an accomplished lecturer with nearly 30 years of teaching and convening experience in a broad range of courses, including Engineering Materials, Mechanical Properties, Engineering Mechanics, Statics & Dynamics, Stress & Failure Analysis, Structural Design, and Physics. Akif also has broad research interests in the areas of electroactive polymers, polymer coatings, functional materials, fibres, sensors, and actuators, as well as applied physics and the mechanical and electrical properties of materials.



SCIENTIA SENIOR LECTURER DR TUSHAR KUMERIA

Tushar's group focuses on: 1. Porous materials-based drug delivery systems for efficient and targeted delivery. 2. Porous materials/Polymer composite scaffolds and implants for tissue engineering. 3. Porous photonic crystals-based point-of-care sensors for diagnostics and environmental applications. Tushar is a Scientia Senior Lecturer and an Australian National Health and Medical Research Council (NHMRC) Early Career Fellow with the School. He has co-authored over 84 journal publications in top-tier journals in the field of nanomaterials, biomaterials, drug delivery, and sensing. Tushar has been successful in securing over $3.6 million in competitive research grants including an NHMRC fellowship, 2 ARC Discovery projects, a US. Dept of Defence grant, and several others.



PROFESSOR SEAN LI DIRECTOR OF MATERIALS AND MANUFACTURING FUTURES INSTITUTE

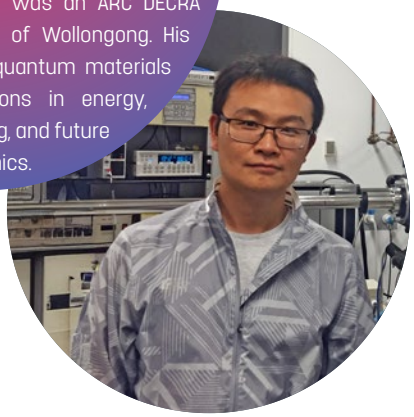
Sean's research interests mainly focus on advanced multifunctional materials including 2D electron gases of complex hetero-structured oxides, energy materials and other electrical and optical oxide based materials.

ASSOCIATE PROFESSOR DAMIA MAWAD

Damia's research interests are in conductive polymers as active materials in flexible organic bioelectronic devices. She leads a multidisciplinary research team that brings expertise in chemistry, physics and material science aimed at developing chemical strategies and electronic circuitry towards the realisation of flexible bioelectronics with advanced functionalities.

ARC FUTURE FELLOW & SCIENTIA SENIOR LECTURER DR ZHI LI

Dr. Zhi Li is a Scientia Senior Lecturer and ARC Future Fellow at the School of Materials Science and Engineering, University of New South Wales. Prior to joining UNSW, he was an ARC DECRA Fellow at the University of Wollongong. His research focuses on quantum materials and their applications in energy, quantum sensing, and future electronics.



EDUCATION FOCUSSED SENIOR LECTURER DR SAMANE MAROUFI

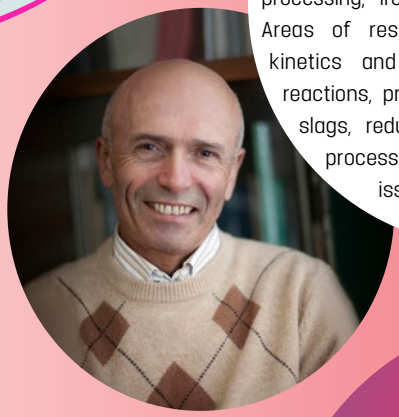
Samane conducts research across the fields of high temperature pyrometallurgical processing, sustainability of materials process (waste recycling and materials transformation) and synthesizing nano-structure materials from waste for energy storage devices. As an expert on innovative green solutions for waste challenges, she has considerable experience of working closely with industries, leading industrial projects in SMaRT Centre, and incorporating research into the manufacturing industry. Since 2018, Samane has made a significant contribution to education through teaching, fully designing, developing, and delivering courses related to waste recycling and sustainability. Samane was the recipient of 2022 UNSW Vice-Chancellor award for outstanding contributions to student learning (early career).

PROFESSOR PAUL MUNROE

Paul's research is focused on the characterization of materials using electron microscopy and related methods. This includes publication of a significant body of work focused on ion beam technology. He is also active in a range of areas in characterization of materials such as functional thin films, intermetallic alloys and biochars.

EMERITUS PROFESSOR OLEG OSTROVSKI

Oleg's major contributions are in the field of pyrometallurgical technologies for minerals processing, iron-, steel- and ferroalloy-making. Areas of research include thermodynamics, kinetics and mechanisms of metallurgical reactions, properties of molten metals and slags, reduction, smelting and refining processes, and environmental issues in pyrometallurgy.



EDUCATION FOCUSSED LECTURER DR BENJAMIN PACE

Ben is an Education Focused Lecturer, with a teaching focus primarily in foundational materials science and sustainable materials. He also maintains a number of research interests spanning the range of thin film deposition technologies, particularly for highly tailored mechanical, biomedical and electrical/energy applications such as photovoltaics. More broadly, Ben maintains a strong interest and publishes in the: 1. Characterisation of coating morphology and behaviours, and; 2. Exploration of micro and nanoscale interactions that occur at interfaces between organic and metallic or mineral phases in composite products, biochars, soils and plant matter.

PROFESSOR SOPHIE PRIMIG

Sophie's current research contributions are in processing-structure-property relationships of structural metallic materials for high-performance applications such as aerospace. Currently, these materials include Ni-based superalloys and advanced steels processed by industrial forging or metal 3D printing. She combines state-of-the-art microscopy techniques with mechanical testing and contemporary modelling approaches. Her research philosophy is to achieve a balance between fundamental discovery and industrial application.

2024 ACADEMIC STAFF

SCIENTIA & ALCOA LECTURER DR VITOR VIEIRA RIELLI

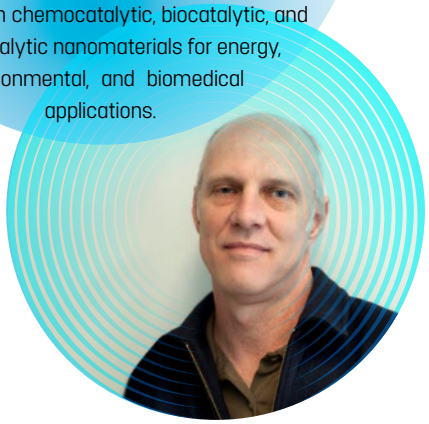
Scientia & Alcoa Lecturer in the School of Materials Science and Engineering. Dedicated student-focused lecturer with teaching training (Beginning to Teach and Foundations of University Learning and Teaching programs). Skilled in multiple advanced microscopy and micromechanical testing techniques. Strong background in physical metallurgy, phase transformation, and manufacturing processes. Academic leadership training at Harvard, Oxford, and MIT.

SCIENTIA PROFESSOR VEENA SAHAJWALLA, SMART CENTRE DIRECTOR ARC LAUREATE FELLOW

As a leading expert in the field of recycling science, and founding Director of the Centre for Sustainable Materials Research & Technology at UNSW, Professor Veena Sahajwalla is producing a new generation of green materials, products and resources made entirely, or primarily, from waste. Veena also heads the ARC Industrial Transformation Research Hub for 'green manufacturing' – a leading national research centre that works in collaboration with industry to ensure new science is translated into real world environmental and economic benefits. Veena has been extensively recognised for the innovation and significance of her work, including via election to be a Fellow of the esteemed Australian Academy of Science.

PROFESSOR CHRIS SORRELL

The main focus of Chris's research has been the processing of ceramics, including fabrication, forming, and densification of bulk materials, thick films, and thin films. While his overarching approach is the use of phase equilibria to inform his strategies, his emphasis on publications is the elucidation of phenomenological mechanisms underpinning the data. His current research is focussed on chemocatalytic, biocatalytic, and photocatalytic nanomaterials for energy, environmental, and biomedical applications.



PROFESSOR JAN SEIDEL

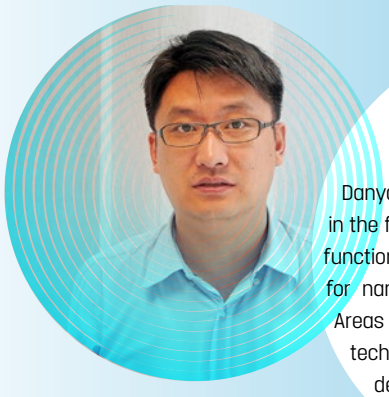
Jan's research interests are in the area of advanced electronic, photonic and spintronic materials, including scanning probe microscopy, nanotechnology enhanced photovoltaics, electrochromism, nanoscale phase separation, nano-optics, spectroscopy, plasmonics, x-ray based synchrotron techniques and high-resolution transmission electron microscopy.

SENIOR LECTURER DR OWEN STANDARD, DEPUTY HEAD OF SCHOOL

Owen's research is in the processing/microstructure/property relationship ofadvanced ceramics for functional applications including colloidal processing of electroceramics, compositional and microstructural modification of bioactive and bionert ceramics, sol-gel deposition of functional ceramic coatings, development of sol-gel coatings on textile fibres and ceramic coatings on biomedical alloys.

PROFESSOR NAGARAJAN VALANOOR

Nagy's most significant contribution is in the field of thin film epitaxy functional property relationships for ferroelectrics, dielectrics and multiferroic nano-materials. Research includes thin-film oxide epitaxy, scanned probe microscopy of functional materials and Landau-Ginzberg modelling of phase transitions. Nagy is also our postgraduate coordinator.



ASSOCIATE PROFESSOR DANYANG WANG

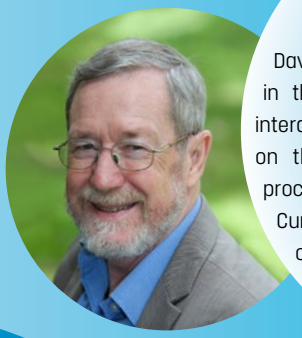
Danyang's most significant contribution is in the field of growth and characterization of functional oxide thin films and heterostructures for nanoelectronic and energy applications. Areas of research include thin film technology, functional materials and devices, micro/nanofabrication techniques, heterointerface effects.

ASSOCIATE PROFESSOR RUNYU YANG

Runyu is focussed in the field of particle/powder science and technology. His primary research interests lie in particle technology, aiming to understand the behaviour of particles through rigorous modelling and simulation at microscopic and macroscopic levels. This knowledge is then applied to solving problems in various industrial applications.

PROFESSOR TOM WU

Tom's research focuses on the vapour- and solution-based synthesis of transition-metal oxides and hybrid halide perovskites, in the forms of thin films, nanomaterials and mixed-dimensional nanocomposites. His team is interested in exploring composition-structure-property correlations in emerging materials, targeting at diverse disruptive electronic, data storage and energy conversion technologies.

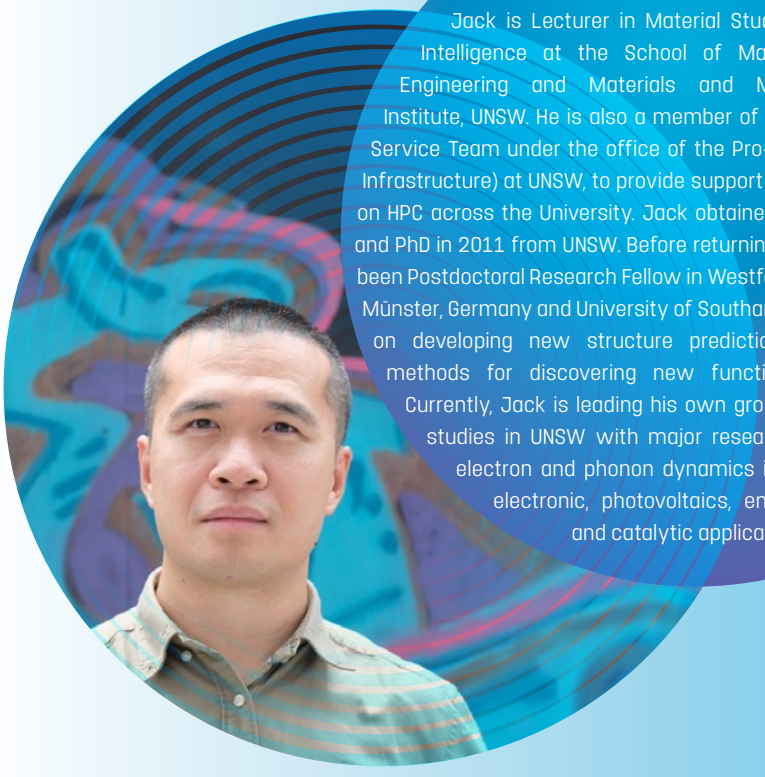


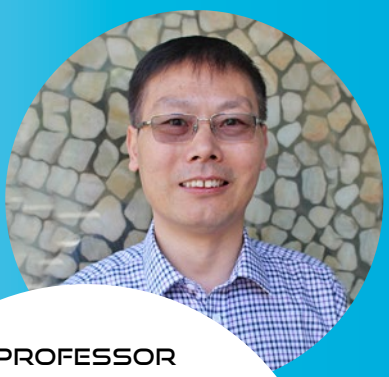
EMERITUS PROFESSOR DAVID YOUNG

David's most significant contributions are in the field of high temperature alloy-gas interactions. Particular emphasis is placed on the diffusion and phase transformation processes which support these reactions. Current work includes fundamental studies of corrosion by CO2, metal dusting reactions and water vapour effects on oxidation.

LECTURER DR JIANLIANG (JACK) YANG

Jack is Lecturer in Material Studies with Artificial Intelligence at the School of Materials Science and Engineering and Materials and Manufacturing Futures Institute, UNSW. He is also a member of the Research technology Service Team under the office of the Pro-Vice-Chancellor (Research Infrastructure) at UNSW, to provide support for computational research on HPC across the University. Jack obtained his BSc(Nanotech) in 2008 and PhD in 2011 from UNSW. Before returning to UNSW in 2017, Jack had been Postdoctoral Research Fellow in Westfälische Wilhelms-Universität Münster, Germany and University of Southampton, UK where he worked on developing new structure prediction and machine-learning methods for discovering new functional organic materials. Currently, Jack is leading his own group in AI-driven material studies in UNSW with major research interests on the electron and phonon dynamics in perovskites for electronic, photovoltaics, energy storage and catalytic applications.





PROFESSOR JIANQIANG ZHANG

Jianqiang's research is focused in the field of gas-solid reactions at high temperature, including high temperature corrosion and processing metallurgy. Research emphasis is on reaction thermodynamics and kinetics, phase transformation and characterisation, reaction mechanism understanding, sustainable materials processing and new materials development.

School STAFF

RESEARCH STAFF

Salim Al Khadhoori	Microfactorie Engineer
Ghazaleh Bahman Rokh	Postdoctoral Fellow
Andrew Breen	Senior Postdoctoral Fellow
Ehsan Farabi	Postdoctoral Fellow
Tobias Foller	Research Associate
Peiyuan Guan	Postdoctoral Fellow
Heriyanto	Microfactorie Engineer
Rumana Hossain	Research Associate
Long Hu	ARC DECRA Fellow
Yue Jiang	Research Associate
Rasoul Kh.Nekouei	Senior Research Associate/Lecturer
Mengyao Li	Research Associate
Chun-Ho Lin	Postdoctoral Fellow
Farshid Pahlevani	Associate Professor
Bo Qu	Industry Engagement Executive
Yasuhiro Sakamoto	Research Assistant
Sajjad Seifi Mofarah	Senior Research Associate
Sara Taherymoosavi	Research Fellow
Matthew Teusner	Research Associate
Tao Wan	Postdoctoral Fellow
Lucas Way	Microfactorie Engineer
Dr. Richard Webster	Research Associate
Xuteng Warren Xi	Postdoctoral Fellow
Ji Zhang	Postdoctoral Fellow

ADMINISTRATIVE STAFF

Alan Chow	Administrative Officer
Kim Foster	Executive Assistant to Prof Sean Li
Michael Lai	Student Advisor
Peggy Leung	Executive Assistant, SMaRT
Chris Seymour	Student Engagement and Outreach Officer
Qing Xia	Administrative Officer
Lucy Zhang	School Manager

TECHNICAL STAFF

Majid Asnavandi	Senior Technical Officer
Soo Woon Chong	Technical Officer
Jane Gao	Specialist Lab Support
Anirban Ghose	Head of Microfactories
William (Bill) Joe	Senior Technical Officer
Xi Lin	Technical Officer
Irshad Mansuri	Laboratory Manager
Sajjad Seifi Mofarah	Acting Technical Officer
David Miskovic	Technical Officer
Moein Seyfouri	Technical Officer
Thiam Teck (TT) Tan	Technical Laboratory Manager
George Yang	Senior Technical Officer
Anthony Zhang	Safety Officer

INDUSTRY ADVISORY BOARD

Cathy Inglis AM	Group CEO, Think Brick Australia
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Adam Berkovich	General Manager Transformation and Technical Support (Acting) Aluminium, Rio Tinto
Lyndon Edwards	Chair, Generation IV Advanced Manufacturing and Materials Engineering Working Group, & Honorary Fellow, ANSTO
George Melhem	Managing Director, Perfect Engineering
Jason Hodges	Open Innovation & Intellectual Property Manager, BlueScope Steel Ltd
Andrew Petersen	Chief Executive Officer, Business Council for Sustainable Development Australia
Michael Gow	NPD Project Manager CSR Limited
Edward Humphries	Director, Applied Materials Technology Group, Weir Minerals
Holstein Wong	Key Account Manager, Industrial Automation in Mining, Minerals and Metals, Schneider Electric
Sean Windred	Associate - Materials, BG&E

SCHOOL COMMITTEES

SCHOOL BOARD
Michael Ferry (Chair)
Academic Staff
Professional Staff (Technical)
Professional Staff (Administrative)

SCHOOL ADVISORY COMMITTEE
Michael Ferry (Chair)
Owen Standard
John Daniels
Peggy Zhang
David Miskovic
Lucy Zhang

LEARNING & TEACHING COMMITTEE
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Michael Ferry
Judy Hart
Caitlin Healy
Damia Mawad
Nagarajan Valanoor
Runyu Yang

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Michael Ferry
Dewei Chu
Rakesh Joshi
Kris Kilian
Sean Li
Sophie Primig
Veena Sahajwalla

HIGHER DEGREE RESEARCH COMMITTEE
Nagarajan Valanoor (Chair)
Danyang Wang
Tushar Kumeria
Michael Lai
Qing Xia

WORK HEALTH & SAFETY COMMITTEE
Jianqiang Zhang (Chair)
Michael Ferry
Owen Standard
Anthony Zhang
Rakesh Joshi
David Miskovic
Linghui Meng

MARKETING & RECRUITMENT COMMITTEE
Christopher Seymour (Chair)
Michael Ferry
Lucy Zhang
Owen Standard
Benjamin Pace
Cailin Healy
Rumana Hossain

EQUITY, DIVERSITY & INCLUSION COMMITTEE
Samane Maroufi (Chair)
Damia Mawad
Michael Ferry
Lucy Zhang
Owen Standard
Chris Seymour
Sanjith Udayakumar

WOMEN IN MATERIALS COMMITTEE
Judy Hart (Chair)
Caitlin Healy
Kris Kilian
Samane Maroufi

SCHOOL SCHOLARSHIP COMMITTEE
Michael Ferry (Chair)
Owen Standard
Lucy Zhang

SCHOOL INFORMATION TECHNOLOGY COMMITTEE
Michael Ferry (Chair)
Paul Eccleston (UNSW IT)
Jane Gao (UNSW IT)
Kathleen Gray
w(FSci. IT Business Partner)
Owen Standard
Lucy Zhang

SPACE COMMITTEE
Michael Ferry (Chair)
Lucy Zhang
Anthony Zhang

HONOURS PROJECTS COORDINATOR
Tushar Kumeria

POSTGRADUATE COORDINATORS
Nagarajan Valanoor
Danyang Wang

UNDERGRADUATE PROGRAM COORDINATOR
Owen Standard

HONOURS PROJECTS COORDINATOR
Tushar Kumeria

MASTER BY COURSEWORK COORDINATOR
Runyu Yang

MISCONDUCT AND GRIEVANCE OFFICER
Owen Standard

FACULTY UNDERGRADUATE ASSESSMENT
Owen Standard

OVERSEAS DEGREE PROGRAMS/ ASIA ENGAGEMENT
Danyang Wang

FACULTY ENTERPRISE COMMITTEE
Kevin Laws

FINANCIAL REPORT 2024

In previous years, schools were provided with an operating expenditure budget and expected to operate within that allocation. From 2024, a new financial framework has been implemented, where schools are assigned a target contribution margin instead. Schools must ensure their operating financial results meet or exceed this target.

FINANCIAL STRATEGY & BUDGETING

This margin-based approach allows greater financial flexibility. Schools exceeding their forecasted revenue can negotiate an increase in expenditure, provided they maintain their target margin. Conversely, if revenue falls short, schools are expected to reduce costs where feasible. However, given that a significant portion of school expenses are linked to continuing salaries, adjusting costs can be challenging.

The key components of our 2024 budget were determined as follows:

- Revenue – Forecasted based on student load planning in collaboration with UNSW Planning and Performance.
- Target Contribution Margin – Determined based on the school's 2023 full-year forecast, revenue trajectory, and cost structure.
- Operating Expenditure – Calculated by applying the target margin to projected revenue to derive the school's net contribution. The remaining portion represents the allowable operating expenditure.
- Financial Oversight – The Dean, Faculty Executive Director, and Finance Business Partner have assessed our expenditure trends against prior years and peer institutions to ensure alignment with strategic objectives.

This framework allows schools to allocate funds based on their priorities, whether for staffing or operational needs. However, approval processes for new roles remain unchanged to ensure long-term financial sustainability.

TEACHING REVENUE & EXPENDITURE

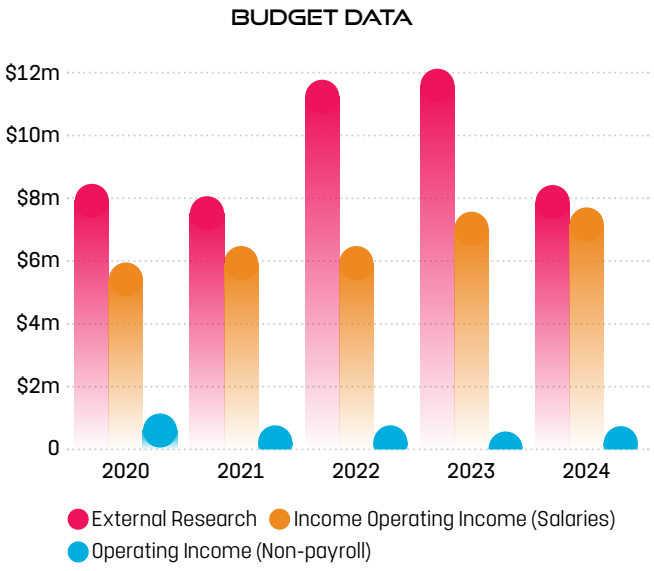
Our school's 2024 teaching revenue exceeded its target, granting us additional expenditure capacity. The following chart illustrates our teaching load distribution over the past five years.

OPERATING INCOME & EXPENDITURE

Operating income is derived from multiple revenue streams, including teaching income, Commonwealth-funded research, contract research overheads, and other institutional funding sources.

The table below shows the breakdown of School operating income. Following a strong financial performance in teaching, the school prioritised capital investments in teaching labs and learning-enhancement resources. Post-COVID, capex allocations were initially restricted, but additional expenditure allowances were granted as revenue targets were exceeded.

INCOME		
University:		
Teaching	$12,029,132	
Other	$78,108	**$12,107,240**
Allocation to School:		
Committed people related budget	$7,708,129	
Non fixed workforce budget	$741,345	
		$8,449,474
EXPENDITURE		
Salaries	$7,705,038	
Non-salary	$829,765	
Capital expenses	$264,403	**$8,799,206**
Variance		-$349,732



STRATEGIC FUNDING INITIATIVES

UNSW's strategic funding supports research excellence and institutional priorities. In 2024, our school received $1,162,907 in strategic funding across multiple initiatives, including:

PROJECT	Manager	Amount ($)
Scientia Fellow Support	Zhi Li	50,000
Scientia Fellow Support Salary	Tushar Kumeria	232,454
Scientia Fellow Support	Tushar Kumeria	35,153
Scientia Fellow II Support Salary	Vitor Rielli	15,003
Scientia Fellow II Support	Vitor Rielli	8,333
Strategic Research Support	Sean Li	317,394
Strategic Post Laureate	Veena Sahajwalla	94,470
Stephen Joseph Publication Support	Paul Munroe	60,000
SPF02 Materials	Various	80,100
SPF04 Materials	Various	270,000
Total:		1,162,907

RESEARCH INFRASTRUCTURE SCHEME

The University's Research Infrastructure Block Grant supports the development of world-class research environments. Our school secured funding for the following major project in 2024:

Lead Chief Investigator	Project Title	Grant ($)
Damia Mawad	A Modular Rheo-Optics System	146,586

EXPENDITURE OVERVIEW

Staff salaries represent over 80% of non-capital operating expenditure, consistent with trends across UNSW faculties. Other key expenditure categories in 2024 included:

Item	Amount ($)
Student research allocations	100,000
Publications allocation	100,000
Teaching laboratories	58,517
Safety	14,500
Staff start up	15,000
Education focused staff support	12,000
Early career research grant	20,000
School office	30,000
Marketing	15,000
Repair, maintenance & building utilities	25,000
Undergraduate's association support	5,000
Postgraduate's association support	5,000

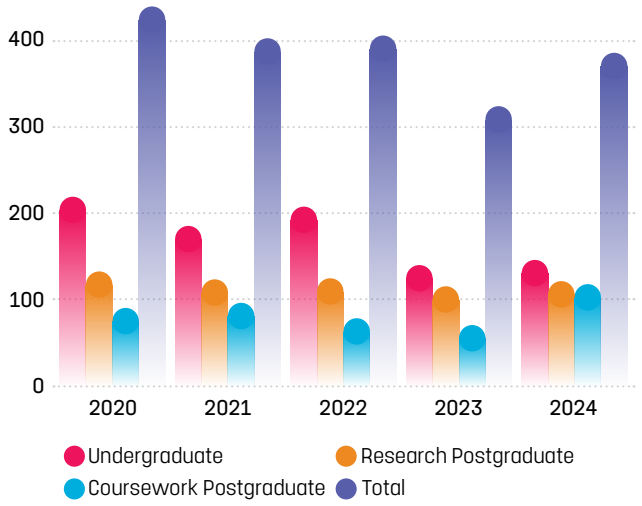
RESEARCH INCOME & PERFORMANCE

The school's research income constitutes the largest portion of its total revenue. External research funding has rebounded strongly in 2024, with successful outcomes including:

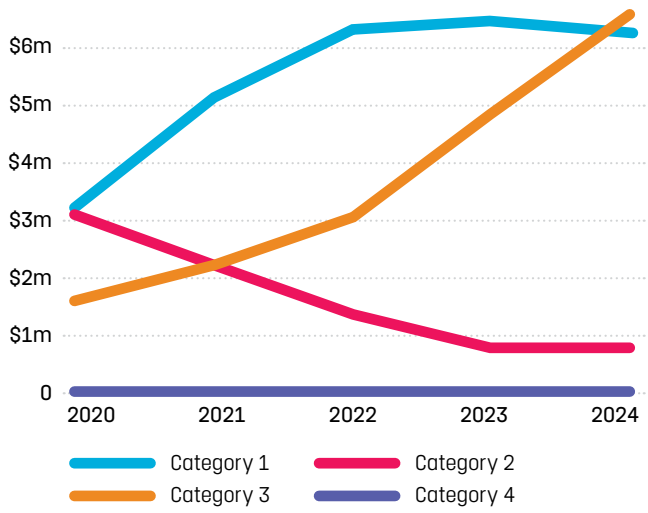
- Four new ARC Discovery Grants
- Four Chief Investigators from our school awarded ARC LIFE grants

These achievements underscore the school's strong research standing and its ability to attract competitive external funding.

EQUIVALENT FULLTIME TEACHING STUDENT LOAD



RESEARCH INCOME



EDi REPORT 2024

Equity, diversity and inclusion are important parts of the Materials Science and Engineering community and principles we stand by. We pride ourselves on having such an incredibly rich and diverse range of students and staff, and the amazing opportunities and experiences these offer.

PGSOC, our postgraduate student society are a great example of EDI excellence within our school, celebrating various events throughout the year that celebrate people from all walks of life and backgrounds. In the year 2023 they hosted many of these events including Lunar New Year, EID and Persian New Year to name a few.

We also value the great relationship this fosters between the staff and students, creating an environment we are all comfortable in and proud to be a part of.

The School also organised some key events to celebrate **Equity, Diversity & Inclusion**.

We held a seminar titled **Mental Health and Stress Management Strategies for MSE Students and Staff** on Wednesday, 28th August. Dr. Narjes Gorjizadeh, author of the #1 Amazon best-selling book Grow Your Mind, Grow Your Life, was invited as the guest speaker. The talk was followed by a guided meditation session, where attendees had the opportunity to practice a short meditation to help manage stress and enhance their mental well-being.

To celebrate **International Women's Day** on 8th March, the school organized an event to acknowledge the critical role women play in society and promote equal access and participation for women in science. The event featured four distinguished speakers from various sectors, including academia, industry, and business. They shared insights into their life-work balance, career development pathways, and the challenges they have faced throughout their journeys as women.

Additionally, we created a video where our women staff had the opportunity to share their perspectives as women, highlighting their unique experiences and contributions which was a great community effort from within the school! You can find the amazing video on our social media channels.

We can't wait to continue our dedication to equity, diversity and inclusion going into 2025 and to celebrate the many faces of the Materials Science and Engineering community!

WORK HEALTH & SAFETY WHS

WHS COMMITTEE MEMBERS:

The members of the School WHS Committee in 2024 were **Jianqiang Zhang** (Chairperson), **Michael Ferry** (HOS, management representative), **Owen Standard** (Deputy HOS), **Anthony Zhang** (School Safety Officer), **David Miskovic** (technical and administrative staff representative), **Rakesh Joshi** (Academic representative), and **Linghui Meng** (postgraduate student representative).

School WHS committee would like to thank all staff and students in the School for all their understanding, cooperation and compliance with WHS requirements and procedures.

"THINK SAFE BE SAFE HOME SAFE"

WHS ACTIVITIES 2024:

BUILDING

- Annual Servicing of our Life Safety System (Gas sensors, toxic and asphyxiant).
- New WIFI Upgrade for the whole building/ laboratories.
- Updated Hilmer building ECO and First aid officers.
- Updated Key watcher for Hilmer Building.
- Completed annual checks for RCD, and fume cupboards.
- Continuation of good neighbors meeting with staff in Hilmer, SEB and F10.
- New lab/ Company Setups.

COMPLIANCE

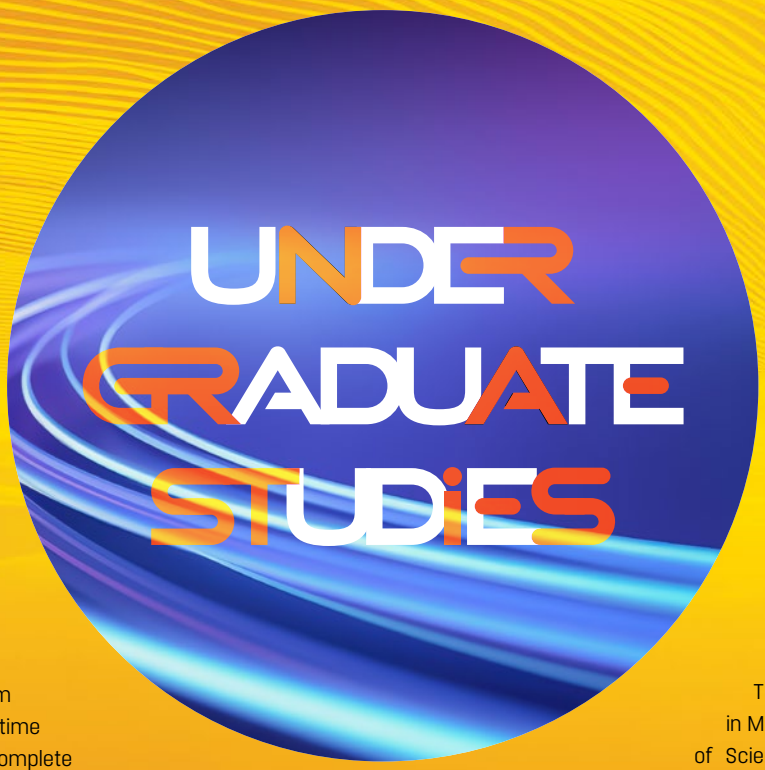
- Safe Zone App of all staff and students.
- Implemented speak up cards (Physical yellow cards)
- Continuation of Safety program SALUS, SAI360.
- Inspection reporting, Hazards and incident reporting via Salus 360
- Completed School Risk Register into Salus.
- Updated MSE Chemicals in JAGGAER chemical inventory.
- Schedule 14 Health Monitoring program for lead and chromium work.
- UNSW RECS, for ethics and Lasers/ laser training.
- Completed psychosocial Risk Assessment for the School.
- Completed annual Evac/ Lockdown drill within the building.
- Completed quarterly level 3 Safety committee meetings.

INSPECTIONS (LABS & OFFICES)

- Completed monthly Senior leadership tours done by our Head of School/ Faculty.
- Faculty Deans Safety visit.
- Faculty WHS Safety business partner audits.
- Schedule 14 lab audits and WHS Safety BP audited our Lead Labs.
- Inspected staff and student office areas.
- Building visits by the UNSW safety central team.
- Completion of annual electrical test and tagging for the year.
- Quarterly workplace/laboratory safety inspections and completion of corrective actions.

TRAINING

- MSE Technical Team Trained in plug replacement (NSW Test and Tag Course)
- Held multiple Salus Sessions for the whole School.
- Ccompleted Safety and Health Awareness Course and Ergonomics & Manual Tasks (refresher) Course.
- Staff attended Mental health first aid training (MHFA).
- Updated warden and first aid training.
- Completed Laser Training and Laser Safety Supervisor courses.
- Mandatory School WHS info sessions (~11 per year) for all new staff, postgrad and Honors students.
- External company SUPAGAS training for gas and cryogenics for both staff and students.
- HF training/ practical for specific research students.



UNDER GRADUATE PROGRAMS OFFERED

The main undergraduate degree program offered by the School is a Bachelor of Engineering Honours (BEHons) in Materials Science and Engineering. The program consists of four years of full-time study and requires students to complete at least 60 days of approved industrial training (in materials engineering or a related field) and is fully accredited with Engineers Australia. In addition, the BEHons program is offered as formal structured combination with the following programs: Bachelor of Engineering Science in Chemical Engineering (BEHons/BSc); Bachelor of Commerce (BEHons/BCom); and a Master of Biomedical Engineering (BEHons/MBiomedE).

In the BE program students complete a common engineering first year, a common second year of fundamental materials engineering courses and mathematics courses, followed by more discipline-specific materials courses in Years 3 and 4, as well as an Honours research project in Year 4. Students who commenced in the program prior to 2024 major in either Materials Engineering, Ceramic Engineering, Functional Materials, Physical Metallurgy, or Process Metallurgy by selection of appropriate professional electives in Years 3 and 4 and an appropriate Honours research project in Year 4. Students who commence from 2024 major in only Materials Engineering, this having been substantially revised and updated (see BE Program Revision below) and now aligns with strategic societal themes of Transport & Infrastructure, Health & Wellbeing, Electronics & Communications, and Energy & Environment.

The School also offers a major in Materials Science in the Bachelor of Science (BSc) coordinated by the Faculty of Science. The BSc (Materials) consists of three years of full time study and Honours can be obtained by a further year of full-time study. The BSc can also be combined with degree programs in other Faculties, including Bachelor of Engineering, Bachelor of Arts, Bachelor of Law, etc. The major in Materials Science is also offered in the 4-year Bachelor of Advanced Science Honours (BAdvScHons) coordinated by the Faculty of Science.

The primary aim of the School's undergraduate programs is to deliver graduates possessing the fundamental knowledge, skills, and capabilities needed to succeed in the discipline of Materials Science and Engineering, as well as having the generic graduate attributes expected in a university graduat e and, in the case of the BEHons program, having the Stage 1 graduate engineering competencies prescribed by Engineers Australia.

The School's undergraduate programs are designed to have strong relevancy to today's material's industry and research whilst being adaptable to future trends and growth in the discipline.

TABLE 1: First Year Student Intake (2020–2024) into BE Programs

Program	2020	2021	2022	2023	2024
3131 BE(Materials Sci. & Eng.)	52	33	22	19	46
3132 BE(Materials Sci. & Eng.)/BEngSci.	6	11	3	2	8
3133 BE(Materials Sci. & Eng.)/MBiomedE	11	29	6	16	21
3134 BE(Materials Sci. & Eng.)/BCom	0	1	1	1	1
Total:	69	73	32	38	76

TABLE 2: 2024 Graduating Class

Program	H1 + Medal	H1	H2/1	H2/2	Pass	Total
3131 BE(Materials Sci & Eng)	0	4	5	4	5	18
3132 BE(Materials Sci & Eng)/BEngSci	0	4	1	0	1	6
3133 BE(Materials Sci & Eng)/MBiomedE	0	3	5	5	0	13
3134 BE(Materials Sci & Eng)/BCom	0	0	0	0	0	0
3970 BSc (Materials Sci)	0	0	0	0	3	3
3972 BAdvSci(Materials Sci)	0	0	0	0	0	0
Total:		11	11	9	9	40

NEW ENROLMENTS

Admission to the School's BE programs is through the Universities Admissions Centre (UAC) for local students. International students with appropriate qualifications apply through UAC International or directly through UNSW Apply Online. Enrolments into the School's BE programs (Table 1) showed a decline in 2022 and 2023.

This decline was addressed by various measures including updating the School's BE program to align it with societal themes (see BE Program Revision below) and increasing marketing activity at School and Faculty level. Pleasingly, these measures correlated with the first year intake number doubling in 2024, returning to pre-2023 levels. Similar to previous years, the quality of the new local students was high as indicated by ATAR entry scores of >85 for the School's undergraduate programs with approximately 30% being female. Despite the decline in the number of first year enrolments, the School continues to have the largest undergraduate program in the discipline nationwide by a considerable margin and the total number of undergraduate students enrolled in the School's BE and double-degree programs in 2024 was approximately 200. Also, there is a significant number of first year students who will undertake the Materials Science major in the Faculty of Science's Bachelor of Science program (many in double degrees with other engineering disciplines) but meaningful data for first year intake is not available because many students do not declare their major until later years.

GRADUATING CLASS

The BE degree is awarded at Honours First Class (H1); Second Class Division 1 (H2/1), Second Class Division 2 (H2/2), or Pass classifications as determined by a weighted average mark calculated based on the year of study and the relative weighting of each course in the curriculum for that year. In addition, an exceptionally high level of attainment for H1 may be recognised by the awarding of the University medal.

A summary of the graduating class is given in Table 2.

BE PROGRAM REVISION

In 2022, the School substantially revised its BE Hons (Materials Science and Engineering) program to update and renew the structure and content and to implement the School's strategic societal themes of Transport & Infrastructure, Health & Wellbeing, Electronics & Communications, and Energy & Environment.

The existing academic streams of Materials Engineering, Ceramic Engineering, Physical Metallurgy, Process Metallurgy, and Functional Materials were removed (the need for these was questioned in the last EA accreditation evaluation of the program) and replaced by a single, larger academic stream of Materials Engineering. This program was introduced in 2024 for incoming Year 1 students.

In 2024, the content and arrangement of core courses in Years 2 of the program were reviewed and revised, especially to improve coherency and sequencing, and to address any overlap or deficiencies.

The School's Industry Advisory Board was consulted and it provided input into the proposed changes. Detailed revision and design of course curricula and assessments, and curriculum mapping of the Stage 1 Engineering competencies prescribed by Engineers Australia, were completed and submitted for University approval. The detailed analysis of the program will continue in 2025 for Year 3 of the program.

DR OWEN STANDARD

Undergraduate Program Coordinator

CO-OP SCHOLARSHIP PROGRAM

Rory at one of the reduction lines at Boyne Smelters Limited (BSL)

The Co-op Scholarship Program has a long-standing history of providing industry-funded scholarships and associated training and developmental activities to UNSW undergraduate students across 18 program streams. In 2024, these scholarships provided students with a stipend of $21,600 per annum for 4 years and substantial opportunity for industrial training with sponsoring companies. For the School of Materials Science and Engineering, Co-op scholarships are an effective means to attract high-quality students into our discipline and to provide them with beneficial and relevant industrial training in key industries operating in the engineering sector. Moreover, Co-op graduates are highly sought by industry and many who have entered the materials industry have risen to senior leadership and management positions.

Co-op scholars are selected largely based on their personal skill, leadership potential and motivation, their academic achievements (eligible students require a 96+ ATAR) as well as their passion and understanding for the materials science and engineering discipline. Students who apply for the Program and are successful for an interview, are interviewed by a panel comprised of UNSW Co-op staff, the Academic Co-ordinator, UNSW Academics and/or sponsor representatives and then selected into the Program. The Co-op scholars in the School of Materials Science and Engineering are at university for 5 years, and as part of the Program, benefit from gaining immensely valuable graduate skills and networking, communication, and workplace experience through both the industrial training placements as well as professional development workshops and events run by the UNSW Co-op Program.

Co-op Program in Materials Science & Engineering – (2021 to 2024)

COHORT	2021	2022	2023	2024
Number of Scholarships	3	–	1	1
Names of Scholar	Olivia Lloyd Rory Vallejo		Jo Kawahashi	Caitlin Blackburn
Scholarship Sponsors	Rio Tinto Aluminium BlueScope Steel Weir Minerals		Viridian Glass	Weir Minerals
Current Year of Degree (during 2024)	Y4 (IT21 & IT3)	Y3	Y2 (Intro & IT1)	Y1

In 2024, there were a total of 5 current scholarships provided by 4 industrial sponsors – Rio Tinto Aluminium, Weir Minerals, BlueScope Steel, and Viridian Glass (see Table 1).

As part of the program, Co-op scholars complete up to 18-months of structured and highly relevant industrial training with the sponsor companies which, from 2019, consists of up to 4 weeks at the beginning of Year 2 during Summer Term (optional and at the sponsor's discretion), 20 weeks during Term 3 of Year 2, and two 24-week placements in Year 4. The industrial training experiences for two of the current scholars are described below:

RORY VALLEJO

"The past year and half during Co-op scholarship placement has been the most enjoyable and pivotal period in my professional and personal life. My first placement was with BlueScope Steel, based in their innovation labs. The pure scale of the environment in Port Kembla is both confronting and exciting. One of the most memorable days was the tour of the steelworks. Most of the work I was involved in revolved around developing corrosion protection technologies, of which previously I had zero experience. I found that this was of little significance as I was surrounded by technical experts who were willing to share their time and experience. I learnt the importance of being confident to reach out to various teams and utilise their skills.

Relocating to Brisbane to work with Rio Tinto (2nd placement) was my first time living outside of home. I was most grateful for this opportunity, as I saw immense personal growth. I worked within the aluminium smelting technical support team and was exposed to a diverse range of projects. From adapting technical literature to present to site, to assisting in data analysis for heat balance adjustment, which was directly implemented to site, I found a passion for process engineering. I had the opportunity to visit the largest smelters in Australia, Tomago Aluminium, and Boyne Smelters Limited, getting to visually experience the technical knowledge developed in the office. My involvement with

Olivia with her Rio Tinto aluminium smelter control system decision tree

Rio Tinto has continued today, completing my honours thesis through an industry partnered project. For my final placement, I found a home at the largest ferrous foundry in Australia with WEIR Minerals in Artarmon. I was involved in the metals team, focusing on R&D of wear resistant white cast irons, and supporting failure analysis for manufacturing. This experience was more hands-on, where I had the opportunity to develop a list of metallurgy related skills, from preparing samples to analysing them under an SEM, particularly useful for my upcoming thesis.

The Co-op program has showed me what I value from a workplace, allowed me to make invaluable connections, and ultimately developed me into a more confident and complex professional student that should enable a smooth transition into the industry after graduation."

OLIVIA LLOYD

"2024 was a year of incredible growth and hands-on experience through my Co-op Scholarship, allowing me to undertake two distinct yet equally rewarding placements as part of my Materials Science & Engineering degree. The first half of the year saw me working in BlueScope Steel's Innovation Labs, where I was immersed in hands-on research, testing the durability of polymer coatings on metals. I had the opportunity to work in their product development team, which was both challenging and rewarding, deepening my technical expertise and problem-solving skills. Living in Wollongong for this placement was also a great experience, providing a new perspective both professionally and personally.

The second half of the year took me to Rio Tinto Aluminium, where I worked with the Carbon & Reduction team in Brisbane. This role was incredibly diverse, allowing me to collaborate with multiple teams across carbon emissions, information & technology, operational efficiency, and even marketing. One of the most fascinating aspects was my research into the carbon footprint of aluminium and exploring potential ways to reduce emissions through power modulation. Additionally, I was able to automate a manual auditing process using Python, which was a fantastic learning opportunity, made possible through the support and mentorship of my team.

Being part of the Co-op Scholarship program has provided me with invaluable industry experience, access to incredible mentors, and the opportunity to work on meaningful projects that have strengthened both my technical and professional skills. These placements have given me an in-depth understanding of how Materials Science & Engineering is applied in industry, from coatings research to sustainable production. This year reinforced my passion for tackling real-world challenges, collaborating with industry experts, and continuously learning. I'm incredibly grateful for the experiences, the skills I developed, and the amazing people I worked with along the way."

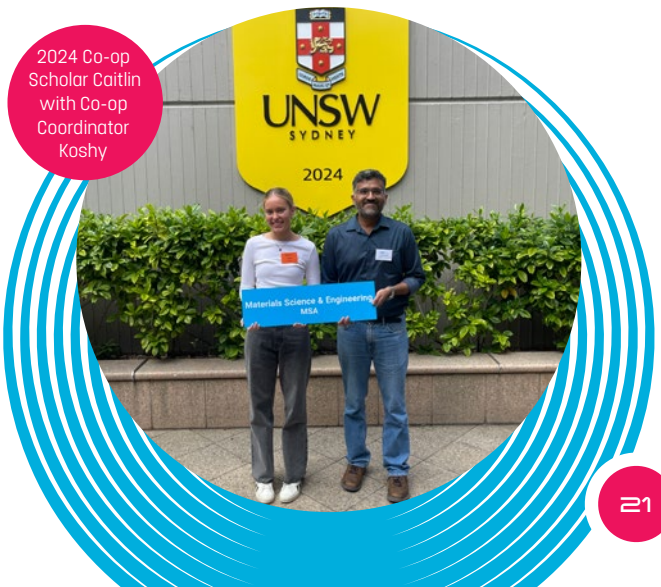
The School is extremely thankful to its Co-op sponsors for the extensive efforts they put into hosting students on placement, including their training, guidance, and support during the placements, and for their continued generous support to the Co-op Program.

The School is also very grateful to the Co-op office team, particularly Ms. Karen Le, Co-op Industry Partnerships Manager for their enormous efforts in securing scholarships from the sponsors, organising interviews, and managing the progress and activities of the scholars during their tenure.

A/PROF. PRAMOD KOSHY

Academic Co-ordinator, Co-op Program in Materials Science and Engineering

www.unsw.edu.au/co-op-program



2024 Co-op Scholar Caitlin with Co-op Coordinator Koshy

RESEARCH THEMES

STRUCTURE & GROUPS OVERVIEW

TRANSPORT & INFRASTRUCTURE:

THEME LEADER SOPHIE PRIMIG

Primarily structural materials used expressly for creating the means of transportation, to large-scale structures and infrastructure that dominate our daily lives, including land, sea and aerospace vehicles to buildings, superstructures, machines and any other fixed or moving infrastructure.

BIOMEDICAL & HEALTH:

THEME LEADER KRISTOPHER KILIAN

Structural materials exhibiting specific functionality to largely functional materials that are designed to interact with biological systems for therapeutic and diagnostic medical purposes. These materials are used in dental devices, orthopaedic implants, artificial organs, implantable devices, artificial skin, drug delivery.

ENERGY & ENVIRONMENT:

THEME LEADER RAKESH JOSHI

Materials that play a critical role in the production, storage and conversion of energy, through to eco-materials, created by sustainable processes using either raw constituents or recycled waste, that impart an overall positive impact on the environment. These are integral materials in next generation fuel cells, solar devices, gas-powered generators, electric vehicles, water purification systems, recycled products.

ELECTRONICS & COMMUNICATIONS:

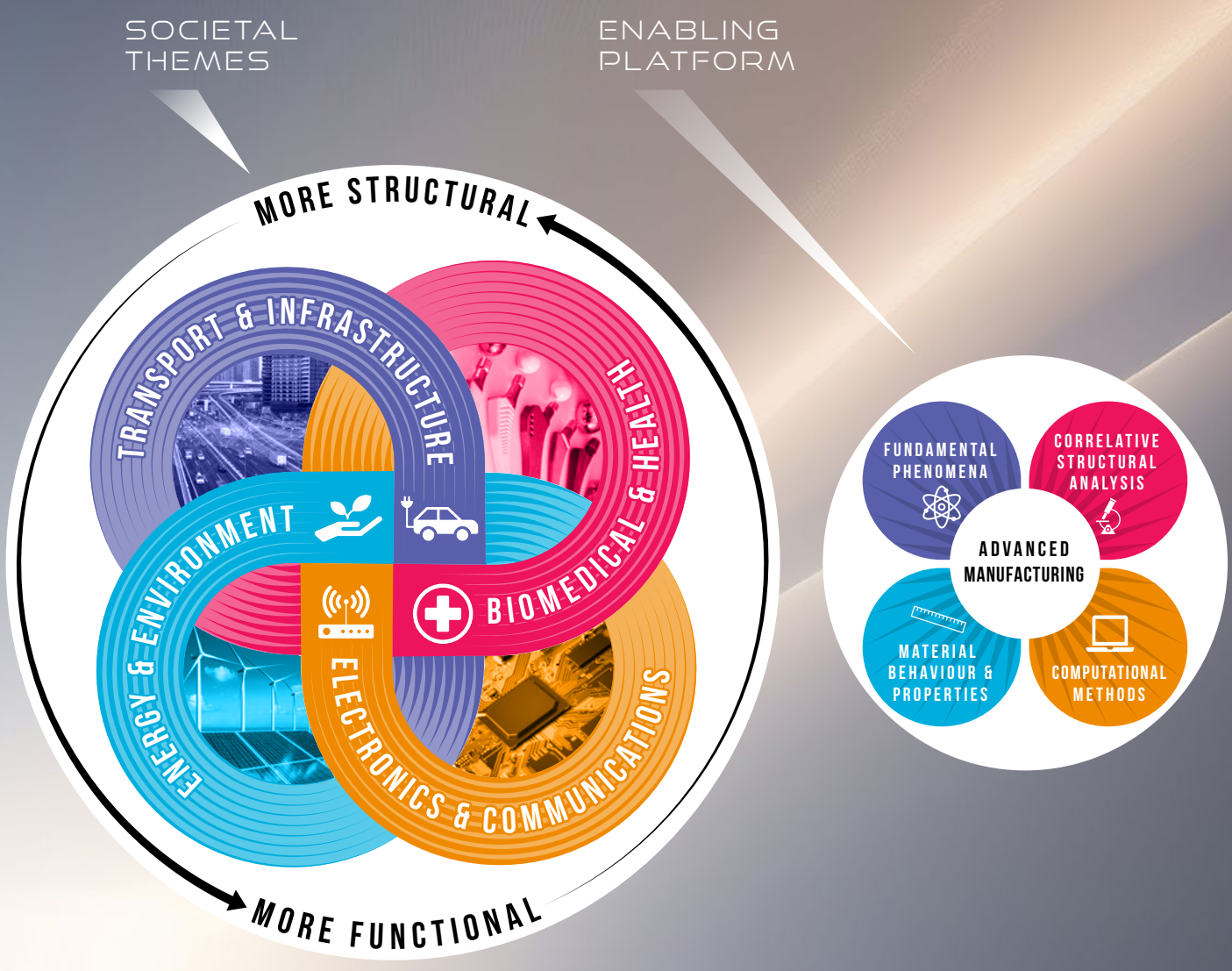
THEME LEADER DEWEI CHU

Primarily functional materials with structural requirements used in electrical, electronics and microelectronics applications, including components and devices that comprise integrated circuits, circuit boards and visual displays, to cables, wires and optical fibres for transferring power and information.

The field of materials science and engineering offers unlimited possibilities for innovation and development. Australia is a country rich in minerals and materials science is a priority area for research and development. Advanced materials and improvements in sustainability can give manufacturing companies, in virtually any industry, the edge over their competitors.

Beyond our basic scientific curiosity and the thrill of discovery, we consciously design materials and sustainable processes that impart a substantial benefit to society through the way they positively impact the environment, improve human health, increase our standard of living, increase productivity of our vital resources, enhance national security, or by simply promoting economic prosperity. Taking this fact into account, we have restructured our research to create four new interconnected society centred research themes (right).

Underpinning this new thematic structure is our enabling platform, which is the necessary suite of skills and expertise that materials scientists and engineers need to possess to be able to create the materials of use to society. It consists of a deep understanding of fundamental phenomena,



multi-scale computational methods, correlative structural analysis techniques, and the behaviour and properties of materials. The cornerstone of the platform is advanced manufacturing, which is the critical path for creating all those wonderful materials of significant benefit to a contemporary society.

Our four Theme Leaders are responsible for coordinating the various research groups within their theme and encouraging communication and collaboration between groups through to cross disciplinary collaboration between Themes and other Schools, and Research Centres, Hubs and Institutes both within UNSW and externally.

The close relationship between our four interconnected research themes and our enabling platform is illustrated in the diagram above.

TRANSPORT & INFRASTRUCTURE:

Prof Sophie Primig – Engineering Microstructures (Theme Group Leader)

Prof Michael Ferry – Frontier Alloys & Processes

AProf Kevin Laws – Metal Physics & Advanced Alloy Research Team

Prof Paul Munroe – Structure-Property Optimisation Group

Dr Vitor Rielli – Alcoa and Scientia Lecturer

Emeritus Prof David Young – High Temperature Materials Group

Prof Jianqiang Zhang – Advanced Corrosion Resistant Materials

Innovations in structural materials are at the heart and centre of any advanced engineering design in transport and infrastructure. Advanced structural materials developed in our theme group can maintain their performance profiles even under the severest conditions such as high mechanical loads, wear, extreme temperatures, and in corrosive environments.

Next generation materials for transport and infrastructure combine several advanced properties including superior strength, ductility, and corrosion resistance, while also being lighter, safer, more cost efficient, and more recyclable than currently available materials. Various combinations of properties that are traditionally often in conflict with each other are unlocked via advancements in materials synthesis and processing. These routes include processing routes such as casting followed by thermo-mechanical processing, and, increasingly, additive manufacturing such as metal 3D printing. Our research efforts are enabled by the application of state-of-the-art techniques in characterisation, modelling and testing available in our School and at UNSW, across multiple length scales.

The academics, researchers and students in this theme are leaders in advanced structural materials, with interests in fundamental and applied research, often carried out in close collaboration with manufacturers, defence and government agencies.

The highlight of 2024 was our second MSE Transport & Infrastructure mini-symposium in October. This successful day was jointly organised and facilitated by Drs. Vitor Rielli, Andrew Breen and several student helpers. Despite the stormy weather and related challenges coming to campus, we brought together ~30 students, Post-Docs and academics from UNSW Science and Engineering Faculties, Manufacturing Engineering, The University of Sydney, and even The University of Wollongong with skills or interests in our research area. This event was an opportunity to create more awareness of the research projects and skills in other groups at and around UNSW Materials, promote collaborations and more efficient sharing of facilities, and develop ideas for future joint research projects.

After a talk by our Head of School Prof Michael Ferry and a welcome by the organisers, we enjoyed a series of presentations by academics or their talented deputies from our theme group, from the UNSW School of Mechanical & Manufacturing Engineering and as well as two invited presentations by Prof Elena Pereloma (University of Wollongong) and Prof Xiaozhou Liao (The University of Sydney).

Chatting to peers over great food and nice drinks was much appreciated by all, as was the fun trivia session organised by PhD student David Pham that concluded the day.

Another highlight of 2024 was that our School and Theme group welcomed a new junior academic, Alcoa and Scientia Lecturer Dr Vitor Rielli. Vitor is not an unknown to the School as he started at UNSW as a Scientia PhD student in early 2019 in Sophie's group in collaboration with an industry partner, a European aerospace parts manufacturer. After a PostDoc in the same group, he has now been appointed to the prestigious Scientia Program as part of its new industry co-funded initiative. Other members of the related industry co-funded project are Profs Jianqiang Zhang, Michael Ferry and Emeritus Prof David Young.

They are all excited to mentor Vitor in navigating academia and making a real impact on the world through the research program with our industry partner. As the second Scientia PhD graduate to transition into the UNSW Scientia Program, Vitor is proud to embody the program's vision of nurturing talent that bridges academia and industry. What he values the most about the position is the opportunity to demonstrate the real benefits of working closely with industry. He is also already built up a reputation as popular lecturer with our undergrad students.

Last, Sophie was awarded an Australian Research Council Fellowship titled 'Encoding 3D microstructural gradients via metal additive manufacturing'. This is just one example amongst various other funding from diverse sources attracted by the various members of our theme group.

BIOMEDICAL & HEALTH:

Polymer Research in Therapeutics (PRinT) group **– led by A/Prof. Damia Mawad**

Laboratory for Advanced Biomaterials & Matrix Engineering (LAB&ME) – **led by Prof. Kris Kilian**

Novel Engineered Materials for Conventional and Advanced Technologies (NEMCAT) group – **led by Prof. Charles Sorrell and A/Prof. Pramod Koshy**

Laboratory for Advanced Porous Nano-Biomaterials **– led by A/Prof. Tushar Kumeria**

Electron Imaging for Advanced materials (EIAM) group **– led by A/Prof. Shery Chang**

Comupational Granular materials (CGM) group **– led by A/Prof. Runyu Yang**

The Biomedical & Health theme was established to bring together the diverse biomedical and health-based research conducted in the school, in order to establish a centralised structure that would provide regular interactions among members, disseminate opportunities to the theme, and connect materials science students and staff to biomedical colleagues across campus and the burgeoning biomedical and biotechnology industries in Australia and beyond. The research groups within the theme include:

In 2024, materials made a big impact in human health. A/Prof Tushar Kumeria, head of the Laboratory for Advanced Porous Nano-Biomaterials, expanded his enterprise with receipt of several new grants to support his research in nanomaterials for drug delivery, including TRaCE funding for agricultural delivery systems with Pacific Blue and from the Osteology Foundation for soft tissue regeneration. Dr. Kumeria also received the Young Investigator Award from the Oral Delivery Focus Group of Controlled Release Society in recognition of his contributions to the society. A/Prof Damia Mawad, head of the Polymer Research in Therapeutics (PRinT), continued her exciting research in bioelectronics through the ARC Research Hub for Connected Sensors for Health and received new funding through an ARC Linkage Project in collaboration with researchers at Western Sydney University. A/Prof Runyu Yang continued his research with industry partners in high-load powder dispersion delivery. Prof Charles Sorrell and A/Prof Pramod Koshy, co-leads of the Novel Engineered Materials for Conventional and Advanced Technologies (NEMCAT) laboratory, continued their work to develop new ceramic materials, including a new ARC Linkage Project awarded in 2024 for new battery materials. A/Prof. Koshy was also awarded a prestigious mid-career industry fellowship from the Australian Research Council in 2024, in recognition of his laboratory's strong ties to industrial translation. Prof. Kris Kilian, director of the Laboratory for Advanced Biomaterials and Matrix Engineering (LAB&ME), continued his work with Inventia Life Science, initiating several new projects in collaboration with Prof. Justin Gooding in the School of Chemistry and through the recently funded ARC Training Centre in Next-Gen Biomedical Analysis. Prof. Kilian also began a new project in designing materials to treat myocardial infarction, awarded in 2024 from NSW Health Cardiovascular Research Capacity Program. Prof. Shery Chang organised the 17th International Conference on New Diamond and Nano Carbons in Sydney, together with two co-Chairs: Igor Aharonovich (UTS) and Brant Gibson (RMIT). Chief Scientist Dr. Cathy Foley opened our conference (see accompanying image).

Together, in 2024 the B&H theme raised >$7M in support of their research programs and published 62 journal articles.

ENERGY & ENVIRONMENT

The Energy and Environment (EE) research groups continue to foster a strong collaborative culture, working closely through shared supervision of research students, joint project development, and co-authored publications. The leaders of these research groups maintain an active exchange of ideas, participating in formal and informal meetings to maximise research collaboration and leverage collective expertise.

As part of this effort, the EE theme launched a seminar series to encourage collaboration and knowledge sharing. Distinguished guest speakers outside UNSW are invited to present insightful lectures and discuss pioneering research ideas for potential collaborative research initiatives.

A significant highlight of the year was the successful International Conference on Sustainable Nanomaterials Integration & Organization for Energy and Environment in India by the School's Energy & Environment (E&E) Theme Team. This international conference featured over 200 speakers and was a natural progression following the successful E&E Research Theme Mini Symposium held at UNSW in 2023.

Over the past year, researchers within the EE theme have accomplished significant milestones in high-impact and globally competitive research. Their success is reflected in publications in top-tier journals, successful acquisition of ARC grants, and strategic collaborations with national and international partners. These joint efforts have also contributed to organising prominent national and international events, strengthening industry ties, and facilitating knowledge transfer.

The EE theme's proactive approach has driven impactful research outcomes and cultivated an inspiring environment for both emerging and established researchers. The research groups have demonstrated exceptional productivity, collectively publishing over 90 journal papers, with a majority featured in leading scientific journals. Furthermore, their patent filings underscore their commitment to translational research, bridging the gap between scientific discovery and real-world applications.

ELECTRONICS & COMMUNICATIONS

Ms. Jiyun Kim holds up the miniature gas sensor made with sustainable 2D-printing techniques

In 2024, the EC team achieved significant milestones, securing competitive grants, publishing impactful research, and expanding international collaborations. They were awarded a new ARC Discovery grant and multiple industry grants, alongside setting up the UNSW-JA Soar Joint Laboratory. The team also grew its research capacity with over 20 new HDR students and ECRs.

The EC team developed a highly sensitive miniature sensor capable of detecting low levels of nitrogen dioxide (NO_2), a toxic gas with significant environmental and health implications.

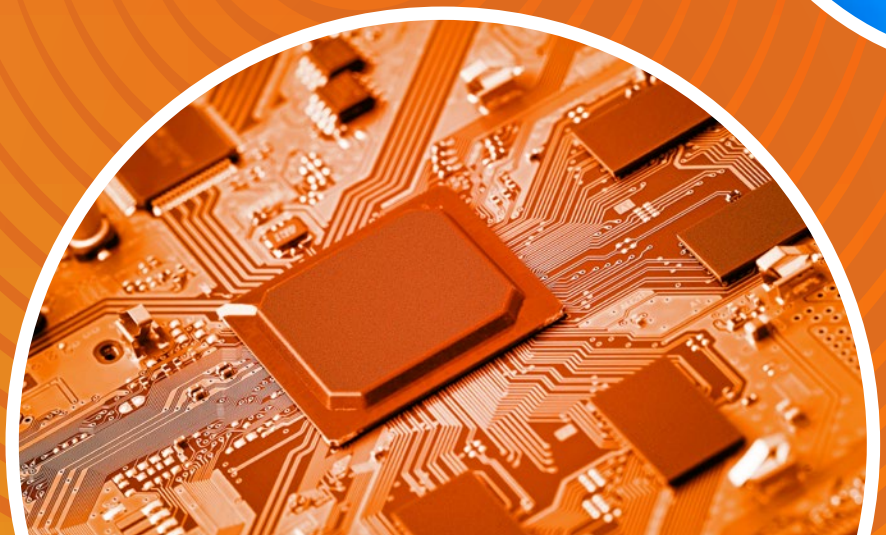
Gas sensors have widespread applications, particularly in health and safety regulations, where they monitor combustible, flammable, and toxic gases.

This new sensor, measuring approximately 2 cm × 2 cm and only 0.4 mm thick, addresses key limitations of existing gas sensors, including bulky size, high cost, and excessive energy consumption.

Developed by Ms. Jiyun Kim, Dr. Tao Wan, Dr. Long Hu, Prof Tom Wu, Professor Dewei Chu, and a team from UNSW's School of Materials Science and Engineering, the prototype demonstrates high sensitivity to NO_2 and operates efficiently at room temperature.

Gas sensors are essential for portable and miniaturized sensing technologies, ranging from air quality monitoring to explosive detection and medical diagnostics. However, current chemiresistive NO_2 sensors face challenges such as low sensitivity, high operating temperatures, and slow recovery.

A/Prof. John Daniels co-authored a paper published in Nature, in piezoelectric materials. The study found that when polycrystalline piezoceramics become extremely thin, a large portion of their grains enter a unique stress state, significantly increasing domain switching. The team also discovered that oxygen vacancies create uneven switching at the material's surfaces, causing thin piezoceramics to bend. These insights could lead to new ways to engineer piezoelectric materials for advanced electromechanical actuation applications.



2024 SMaRT CENTRE REPORT

EXECUTIVE SUMMARY

In 2024, the SMaRT Centre made significant progress on two multi-year agreements within the TRaCE (Trailblazer) program. The first is with existing partner Kandui Technologies (trading as Noveco Surfaces) on commercialising Green Ceramics. The second is with partner Jamestrong Packaging commercialising Green Aluminium in a new facility at the company's Taree complex. Both projects are for the life of TRaCE and the Centre has successfully met the ambitious milestones of year 2 in 2024.

SMaRT also made progress in 2024 to bring on line the newly awarded ARC Industry Laureate for Green Metals, a new research program to work with industry partners to develop novel approaches to use electronic and solar PV waste as a remanufacturing feedstock resource – enabling the recovery of materials which have high market values.

SMaRT also successfully hosted for the fourth year the UNSW consortia-based NESP Sustainable Communities and Waste Hub, comprising five leading research institutions and many industry and government agency (local, state and national) partners.

In 2024, the Hub's annual research plan was approved and the Hub's annual progress report was also submitted to the Department of Climate Change, Energy, the Environment and Water, demonstrating significant outputs and outcomes.

In 2024, SMaRT secured numerous publications and gave dozens of presentations across a wide range of stakeholders. This was supported by an active media and communications program that delivered hundreds of published stories, videos, speeches, as well as advocacy by way of numerous government consultation submissions and committee advisory meetings.

IMPACT

(commercialisation, communications, engagement, awards)

COMMERCIALISATION

SMaRT advanced its research commercialisation efforts across its various technologies and research programs, with a key development being the launch in July 2024 of a UNSW-invented Plastics Filament MICROfactorie™ Technology module installed and operating at partner Renew IT's Sydney warehouse in Lane Cove, Sydney (see case study below). The new MICROfactorie™ reforms hard plastics from mixed electronic waste into valuable filament for 3D manufacturing.

Commercialisation advances made in relation to a range of MICROfactorie™ Technologies:

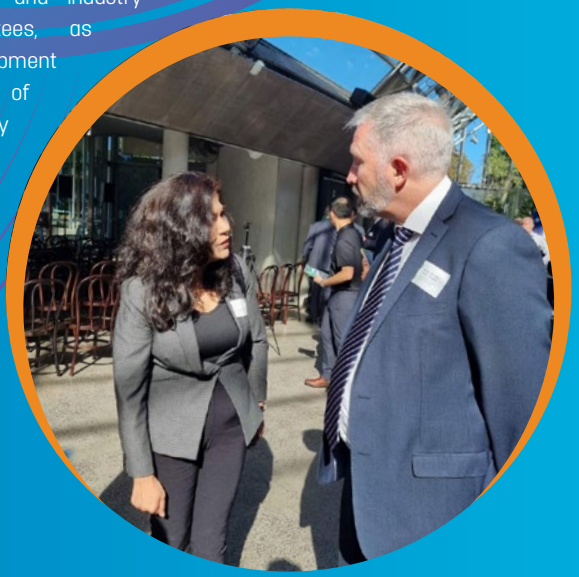
- Green Ceramics – with head licensee Kandui Technologies, operator of a MICROfactorie™ in Nowra and selling products under its Noveco Surfaces trading brand, ongoing development work has resulted in significant process and product improvements, and recognised with a number of awards
- This technology and partnership was also featured by UNSW Science Faculty as a translation success story as part of the Pact for Impact initiative
- Plastic filaments – advanced collaboration with an industry partner to streamline and optimise its new MICROfactorie™, with other commercialisation efforts underway.

COMMUNICATIONS & ENGAGEMENT

SMaRT continued to implement a comprehensive communications program covering website and digital channels, media engagement, other stakeholder engagements including public speaking and advocacy.

This has involved undertaking many reputation building activities, achieving extensive media coverage, public speaking opportunities, and government and industry engagements including attending many government and industry advisory committees, as well as the development and submission of various public policy submissions.

Around 200 media stories, interviews, podcasts etc were published in the calendar year involving SMaRT.



2024 SMaRT CENTRE REPORT

MEDIA HIGHLIGHTS:

- Network 10's The Project features new plastics MICROfactorie™ www.smart.unsw.edu.au/news-events/news/project-features-new-plastics-microfactorie
- SMaRT work features in new science economic report www.smart.unsw.edu.au/news-events/news/smart-work-features-new-science-economic-report
- Turning waste into wealth: op ed www.smart.unsw.edu.au/news-events/news/turning-waste-wealth-op-ed
- SMaRT inspires kids at museum display www.smart.unsw.edu.au/news-events/news/smart-inspires-kids-museum-display
- SMaRT Centre creates sustainable art work for charity auction www.smart.unsw.edu.au/news-events/news/smart-centre-creates-sustainable-art-work-charity-auction
- SBS features SMaRT insights and tech www.smart.unsw.edu.au/news-events/news/sbs-features-smart-insights-and-tech
- ABC interviews Veena on plastic waste innovation www.smart.unsw.edu.au/news-events/news/abc-interviews-veena-plastic-waste-innovation

ENGAGEMENT HIGHLIGHTS:

In 2024 SMaRT members participated as keynote speaker, invited speaker and panellists in over 100 conferences, workshops and webinars. SMaRT also engaged with many governments and made several public policy submissions. Below contains some highlights only:

- SMaRT Centre continued to build engagement and collaborative networks with different industrial and community partners including many local councils and not for profit groups to help translate research to commercial application, thus helping to deliver economic, social and environmental benefits.
- SMaRT and Veena were also part of other networks such as MECLA and other collaborative forums.
- SMaRT made various government consultation submissions including:
  - Submission to Productivity Commission inquiry on circular economy: www.smart.unsw.edu.au/news-events/news/submission-productivity-commission-inquiry-circular-economy
  - Helping shape Australia's new National Science and Research Priorities: www.smart.unsw.edu.au/news-events/news/helping-shape-australias-new-national-science-and-research-priorities
  - Submission to the Federal Government consultation on green metals: www.smart.unsw.edu.au/news-events/news/submission-federal-government-consultation-green-metals
- SMaRT formally partnered with and supported dozens of government and community awareness initiatives.
- SMaRT member, Professor Sahajwalla has contributed to advisory committees and bodies, including:
  - Engineers Australia Chemical College Advisory Board
  - EPA Victoria Science, Engineering and Health Committee and Governing Board
  - Associate Editor Resources, Conservation & Recycling (International)

SMaRT also engaged with many community groups and school-level students via numerous events and interactions. Below is just one highlight.

ENGAGEMENT HIGHLIGHTS:

UNSW SMaRT Centre Director, Professor Veena, has inspired the next generation of science and engineering students in officially opening the Discovery Centre at St Philip's College in Alice Springs and its new Sustainability Learning Centre.

Designed to be a multipurpose learning environment, the Discovery Centre is strategically located adjacent to the Swag Chapel and the Sustainability Centre to support teaching and learning opportunities with a focus on our commitment to challenge (To Strive), inspiration (To Seek), and environmental sustainability (To Care).

Veena shared the UNSW SMaRT Centre vision for a sustainable future, highlight the importance of creating a circular economy and how using waste as a resource - including various UNSW SMaRT Centre recycling technologies - must be at the centre of our manufacturing future and innovative decarbonisation efforts.

She explained that making sure that our actions today do not have an adverse effect on the potential of present and upcoming generations to exist comfortably on this planet is the essence of sustainability.

Veena said the challenge is very much one of incorporating emerging recycling technologies, like the various ones developed by the SMaRT Centre, into future manufacturing challenges to help make sure we can fulfill our requirements in ways that are financially viable, environmentally responsible and benefits communities.

The Discovery Centre represents the largest construction project undertaken by St Philip's College in recent years. Key features include:

- Interactive Technologies: The latest in educational technology, including 3D printers and laser cutters, ensures that students have access to cutting-edge tools.
- Inclusive Design: The facility is accessible and supports students with diverse learning and physical needs.
- Sustainability Initiatives: The building has a 75kW solar power system that meets approximately 15% of the school's electricity requirements. This brings the amount of renewable energy produced by the College to 40%.

2024 SMaRT CENTRE REPORT

MAJOR RESEARCH PROGRAM SUMMARIES

AUSTRALIAN TRAILBLAZER FOR RECYCLING & CLEAN ENERGY

The UNSW SMaRT Centre is involved in the Trailblazer for Recycling and Clean Energy (TRaCE) Program. Hosted by UNSW and in partnership with the University of Newcastle and many industry partners, the TRaCE Program runs for four years from 2023 to help Australia and the world transition to sustainable recycling and clean energy solutions and systems. In 2024, SMaRT undertook the second year of two projects with its partners to accelerate commercialisation of several of its recycling MICROfactorie™ and other technologies. One involved the ramping up of the Commercial Green Ceramics Microfactorie™ at Shoalhaven City Council's waste and recycling facility, adjacent to a landfill site. The other involved new partner Jamestrong to launch efforts to plan, build and commercialise SMaRT's Green Aluminium MICROfactorie™ Technology. 2024 highlights: www.smart.unsw.edu.au/tags/trailblazer.

NESP SCAW HUB

The National Environmental Science Program's Sustainable Communities and Waste (SCaW) Hub involves five research nodes working on developing policy, planning and design for more sustainable communities. The SCaW Hub predominantly focusses on applied science and capability for recommendations to government and end users, to help create more sustainable communities, and is engaging with local communities, businesses and councils in many rural, regional and metro locations to help achieve its goals. 2024 highlights: www.nespsustainable.edu.au/2024-review-looking-back-hubs-achievements-and-impact.

MICROFACTORIES™ UPDATE

Australia faces a growing waste crisis with vast amounts of waste materials, such as glass and plastics stockpiled or landfilled across the country. Australia generated an estimated 74.1 million tonnes (Mt) of waste in 2019, equating to 2.94 Mt of waste per capita, one of the highest globally. This has helped enable SMaRT to further build the case to develop commercialisation opportunities for this technology. Apart from launching the first commercially operating Plastics Microfactorie™ in 2024, the technologies were lauded by Assistant Minister for Education, Senator Anthony Chisholm (picture with Veena).

CASE STUDY - PLASTICS FILAMENT MICROFACTORIE™

A collaboration between the UNSW SMaRT Centre and IT asset management company Renew IT has begun turning discarded hard plastics into 3D printer feedstock via SMaRT's first commercially-run Plastics Filament MICROfactorie™. A UNSW-invented Plastics Filament MICROfactorie™ Technology module has been installed at a partner's Sydney warehouse in Lane Cove, Sydney, and is fully operational by turning plastics destined for landfill into valuable filament, as reported in media including The Sydney Morning Herald and The Age.

UNSW SMaRT Centre Founder and Director, Professor Veena Sahajwalla said "commercialising our Plastics Filament MICROfactorie™ Technology has taken a lot of time and effort, but it is a sustainable waste, recycling and manufacturing solution. We're turning the hard plastics found in all modern electronic hardware but not subject to conventional recycling methods, into feedstock for a booming sector. Filament is almost entirely imported to Australia and made from petrochemicals, so being able to locally make it from used plastics also reduces the environmental impacts from global freight. 3D printing is a wonderful technology enjoying rapid uptake but the tragedy is until now 3D printing has been reliant on virgin plastics.

"These Plastics Filament MICROfactories™ have the potential to revolutionise 3D printer filament creation. I look forward to a time when 3D printing feedstock is sourced exclusively from recycled plastics," she said.

UNSW Vice-President Societal Impact, Equity and Engagement, Professor Verity Firth said UNSW's partnership with Renew IT has the potential to create genuine, large-scale change.

"The combination of Prof. Sahajwalla's pioneering science and Renew IT's commercial expertise and financial commitment can accelerate genuine change. This industry partnership is an exquisite example of UNSW's commitment to societal impact."

Partner CEO and founder James Lancaster said, "this venture addresses two wicked issues." "Not only does it reduce virgin plastic production by creating 3D printing filament from waste items but it also stops hard plastic ending up in landfill. Electronic goods like televisions, computers and printers are being produced in ever-increasing numbers and often with increasingly short life-cycles, when they do reach end of life, the waste industry's solution has been to deliver them to landfill.

"Dispatching hard plastics to landfill is not a solution that sits easily with me. To re-purpose that plastic into a new product that's increasingly in demand and which we can sell at a competitive price is a beautiful solution. If 3D printing feedstock can be competitively produced by recycling plastic, we shouldn't be producing it with virgin materials. By recovering high quality plastics from e-waste for re-manufacturing we can help organisations lower their Scope 3 emissions and boost local manufacturing."

www.youtube.com/embed/fd0LDoG6yg0?feature=oembed

GROUND BREAKING PHOTOVOLTAIC COLLABORATION

The UNSW Materials and Manufacturing Futures Institute ('MMFI') has proudly fostered a collaboration between UNSW and JA Solar, a global leader in the photovoltaic (PV) industry. The UNSW-JA Solar Collaboration Laboratory (Collaboration Lab) leverages UNSW's academic and research expertise, alongside JA Solar's industrial capabilities, to advance JA Solar's position as a leader in PV innovation, energy storage, and management. This will revolutionise solar energy manufacturing and innovation worldwide and contribute to UNSW's reputation as a dynamic hub for groundbreaking international partnerships and collaboration.

THE MATERIALS & MANUFACTURING FUTURES INSTITUTE

Opening Ceremony of the UNSW-JA Solar Collaboration Laboratory, with delegates from UNSW & JA Solar

The opening ceremony for the Collaboration Laboratory was held on the 23rd of September 2024 and was organised and hosted by MMFI. The event was attended by senior representatives from JA Solar and UNSW, including JA Solar's Chairman Jin Baofang, Dr Yangfeng Cao (Director of Strategy), Dr Zi Ouyang (Vice President and CTO), UNSW's Executive Vice President Vlado Perkovic, Professor Grainne Moran (PVC Research Infrastructure), Professor Stephen Rodda (PVC Industry & Innovation), Professor Martin Green, and Professor Sean Li (Director of UNSW MMFI). 'Green to Global' research grants have been awarded which will see advancements in PV innovation across research, industry and sustainability. MMFI will continue to engage with scientific and industry leaders to deliver real-world benefits. Thank you to the School of Materials Science & Engineering for their support.

STAFF AWARDS & ACHIEVEMENTS

AWARDS

Dr Sarasadat Taherymoosavi (Sara) was awarded the prestigious **Australia and New Zealand Biochar Industry Group (ANZBIG) Researcher of the Year Award** for her outstanding work on biochars. Sara is supervised by Prof Paul Munroe.

Dr Tushar Kumeria was selected for the prestigious **Young Investigator Award** by the Controlled Release Society's (CRS) Oral Delivery Focus Group. This recognition is a testament to Tushar's exceptional contributions to the field and his dedication to advancing oral drug delivery research.

Professor Kristopher Kilian received the **Research Collaboration Award** as part of the UNSW Science 2024 Staff Impact Awards. This Award celebrates staff who displayed outstanding research collaboration, with researchers at UNSW and/or outside of UNSW, and may include collaborations with non-academic researchers.

PROMOTIONS

Dr Wenxian Li was promoted to **Senior Lecturer**

Dr Vitor Vieira Rielli commenced in the School as the new **Alcoa Lecturer in Materials for Extreme Environments**

Dr Jack Yang was promoted to **Senior Lecturer**

Tushar Kumeria was promoted to **Associate Professor**

Danyang Wang was promoted to **Professor**

Dr Mengyao Li was promoted to **Lecturer**

Dr Richard Webster was promoted to **Lecturer**

FELLOWSHIPS

Associate Professor Rakesh Joshi was awarded a **DST India VAIBHAW Fellowship**. This is a very prestigious fellowship scheme with only 22 successful applicants from 300 high calibre applicants worldwide. This fellowship aims to enhance India's research ecosystem by fostering collaborations between Indian and global institutions. Over the next three years, Rakesh will spend two months annually at IIT Roorkee, focusing on graphene-based membrane technology for NetZero.

A/Professor Pramod Koshy was awarded a prestigious **Australian Research Council Mid-Career Industry Fellowship**. Koshy's 4-year fellowship is entitled '**Optically Tunable Functional Nano-Coatings on Fly Ash-Based Ceramics**'. The ARC will provide $1,078,000 and Koshy's industry partner, Vecor Technologies Pty Ltd, will contribute an equivalent amount in cash to the project.

Professor Sophie Primig was awarded a highly prestigious **Australian Research Council Future Fellowship**. Sophie's 4-year fellowship is entitled '**Encoding 3D microstructural gradients via metal additive manufacturing**'. The ARC has awarded Sophie $1,206,632 to carry out her fellowship.

Dr Vitor Rielli was awarded a **UNSW Scientia Fellowship**. The UNSW Scientia Program was established as a cornerstone of the UNSW 2025 Strategy with the aim to place our highest-level Early-Career and Mid-Career research performers on a trajectory to being exceptional research leaders.

The Australian Research Council (ARC) 2025 Discovery (DP25) grants and 2025 Linkage Infrastructure (LIEF25) grants

ARC GRANT	MSE CHIEF INVESTIGATORS	GRANT TITLE	ARC AMOUNT
Discovery (DP250104633)	Sean Li	Unlock the Potential of Gallium Oxides for Power Electronic Applications	$616,215
Discovery (DP250100778)	Danyang Wang, Jack Yang	Nanostructured dielectric thin films for miniaturized energy storage	$581,236
Discovery (DP250101514)	Xiaopeng Li (SMME), M Ferry	Uncovering Mesostructures in Additively Manufactured Aluminum Alloys	$560,043
Discovery (DP250100714)	Shuhua Peng (SMME), Tao Wan	Self-Powered and Interference-Free Wearable Sensors	$518,288

GRANTS

Professor Kris Kilian was awarded a **Cardiovascular Senior Researcher Grant** from **New South Wales Health** entitled "Dynamic extracellular matrices for in vitro maturation of cardiac tissue". Kris will receive ~$750,000 over 3 years to carry out research on clinically viable cells and materials to treat patients that have had a heart attack via new approaches to creating functional heart tissue through stem cell engineering.

Dr Tushar Kumeria was awarded a **Young/Advanced Researcher Grant** from the **Osteology Foundation** of Switzerland entitled "Engineering an Extracellular Vesicle-Embedded Sprayable Nanofiber Scaffolds for Enhanced Soft Tissue Integration". Tushar will initially receive ~$40,000 Swiss Francs to develop multifunctional composite nanofibre scaffolds to improve soft-tissue integration, which is crucial for long-term success of dental implants and surgeries. As research funded by the Foundation is carried out in stages, further funds will be received once Tushar's team delivers their first in-vitro results.

A/Prof Pramod Koshy and **Dr Sajjad Mofarah** are chief investigators on a recently announced ARC Industrial transformation Hub for Intelligent Energy Efficiency in Future Protected Cropping! The UNSW node of the Hub, supported by our industry partner investigator, **Mark Ramsey** (CEO of Vecor Australia Pty Ltd), will carry out research in the Hub on the development of Na-ion stationary energy storage batteries.

Dr Giulia Silvani, who is a postdoctoral fellow with Kris Kilian, successfully won a grant for her personal research. The grant is entitled *'Deciphering Glioblastoma Phenotypic Plasticity: A Novel Platform for Precision Targeting'* from the Charlie Teo Foundation. The grant is valued at $200k in research funds across 2 years.

Scientia Professor Veena Sahajwalla and **Dr Rasoul Nekouei** of UNSW's SMaRT Centre received a 3-year **CRC Project Grant** (CRC-P) entitled 'Upscaling a Novel Technology for Recycling Lithium-Ion Batteries'! Other collaborators on the grant include Prof. Guan Yeoh and Dr Cheng Wang from the School of Mechanical & Manufacturing Engineering as well as in-kind contributions from SMaRT Centre staff, Samane Maroufi, Rumana Hossein, Anirban Ghose and Irshad Mansuri.

The project is in partnership with Oxleigh Pty Ltd, with other industry partners, Scimita Operations, Envirostream Australia & Worley Services, supporting the research. The team received $2.75M from the Australian Government in conjunction with $8.1M from the industry partners.

The overall aim of the project is to fully develop and upscale a safe and environmentally sustainable micro-isolation process specifically designed to treat the black mass or shredded material from waste lithium-ion batteries.

A/Prof Kevin Laws is a chief investigator on a successful **ARC Linkage grant** entitled *'Advanced shield materials for compact fusion energy'*.

The research team received ~$665,000 from the Australian Research Council, in addition to a generous cash contribution of ~$360,000 from their Industry partner, Tokamak Energy Ltd.

LIEF GRANT	MS&E CHIEF INVESTIGATORS	GRANT TITLE	ARC AMOUNT	HOUSED
LE250100086	Veena Sahajwalla	Dynamic Nuclear Polarization NMR for Accelerating Materials Science	$1,490,304	UNSW / CHEM
LE250100161	Dewei Chu	A multifunctional platform for advanced materials characterization	$570,000	NEWCASTLE
LE250100137	John Daniels	In-situ high-energy X-ray synchrotron platform for engineering materials	$1,474,839	RMIT
LE250100032	Zhi Li	Victorian Facility for Atom-Scale Quantum Microscopy and Manufacturing	$904,800	MONASH

STAFF STORY

A PERSPECTIVE ON UNDERGRADUATE EDUCATION

DR. JUDY HART

A university education should be about so much more than learning the properties and behaviour of materials.

As a research and teaching academic in the School of Materials Science & Engineering, I am involved in teaching and curriculum development across all our programs and years of study, and have particularly been involved in developing our first year teaching over more than 10 years.

In the first year of our Materials Science & Engineering programs, we have relatively little contact with our students, as they are mostly doing foundational courses in physics, maths and chemistry. Our main opportunity to connect with our first year students is in the one materials science course they take, Introduction to Materials Science and Engineering, where our goal is to set the foundation for our students' success in their studies and their careers. A key part of this is to help students build the social networks that will support them throughout their time at university and will become their professional networks when they graduate. To do this, we include a few rather unconventional activities in the course.

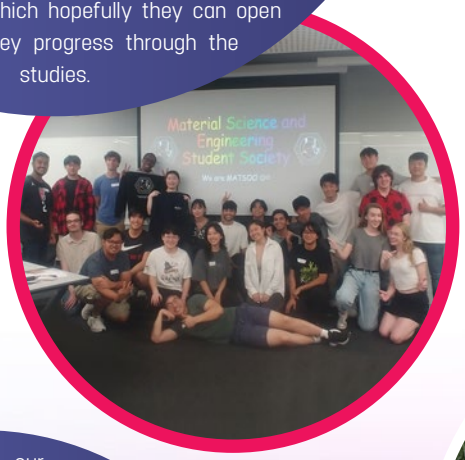
Firstly, early in the course, we get the students together for an afternoon of pub-style trivia, games and pizza. The idea is to help the students get to know each other and make friends – and the effect is noticeable – in the classes following this event, I notice more chatter when I arrive at the lecture theatre for classes and students sitting together in the friendship groups they have started to nucleate. The event is run by MATSOC (our undergraduate student society) and our peer mentors, giving our first year students a chance to make friends with some senior students, who will also become an important part of their academic and social support networks, while giving our senior students a chance to develop their leadership skills.

Part of the unconventionality of our approach is that this seemingly non-academic event is embedded very much as an academic component of the course – attendance is recorded and the event appears in the students' class timetable – we don't see this as an optional extra, but something as important at the start of our students' journeys as learning the definition of elastic modulus.

Secondly, we encourage students to attend the MATSOC camp, which is held over a weekend around the middle of the students' first term – we even relate attendance at camp to one of the course assessments. Again, the effect is noticeable – and we hear from many students that attending camp in first year establishes friendships that last throughout their time at UNSW and beyond.

We want our students entering university to understand that there is a whole other side to UNSW beyond what they see in class, and the people they see teaching their classes do more than just teach – they are also all researchers.

Since the research side of the university is quite hidden from first year students, we want to give them the opportunity to learn about the cutting-edge research that is going on around them. As well as talking to them in class about my own and other research being done in our School, and more broadly in the field, for one of the assessments in the course, we get the students to interview a member of the School's academic staff – giving them a small window into the research world, which hopefully they can open further as they progress through the studies.



Finally, our first year course includes site visits to companies where our graduates are now working. I love hearing the feedback from the students about these site visits, with students often saying that the visits help them to understand the applications of what they are learning in class and to see the possibilities that studying materials science and engineering will open up for them, and how useful it is to talk to people who once were in the same position that they are in today. We are grateful to the members of our Industry Advisory Board who make these visits possible!

DR. JUDY HART

DEPUTY DIRECTOR OF TEACHING

STUDENT AWARDS & ACHIEVEMENTS

AWARDS

PhD student, **Montajar Sarkar**, was awarded the inaugural **2023 Anton Paar Battery Innovation Award** for his outstanding research in sustainable development of Li-ion and Na-ion batteries. Montager is currently in year 3 of his PhD, working under the supervision of Scientia Professor Veena Sahajwalla and Dr Rumana Hossain of the SMaRT Centre.

This award is provided by the Australian battery Society to outstanding researchers in Australia and elsewhere. Valued at $3000, it aims to assist researchers specialising in new battery or energy storage materials in attending either a domestic or international conference.

Frederick Zhang (PhD candidate, supervised by Pramod Koshy & Chris Sorrell) won the **Best 1-Minute Thesis Presentation** from the School at the UNSW Science Postgraduate Research Showcase.

Serap Ubic (MSc candidate, supervised by Veena Sahajwalla & Rasoul Nekouei) won **Best Poster Prize** at the UNSW Science Postgraduate Research Showcase

Alexandra (Ally) Bradley won the 3rd poster prize at the CAMS 2024 Conference in Adelaide for her excellent poster summarising her PhD literature review.

2024 AMAS/AXAA Combined Student Seminar, featuring undergraduate and postgraduate student presentations from across NSW showcasing their outstanding research. We had two PhD students who won prizes.

Marcus Miljak (First prize) - supervised by A/Prof. Pramod Koshy & Dr Joel O'Dwyer (CSIRO).

Kayla Lord (Third prize) - supervised by Prof. Nagy Valanoor & Dr Kirrily Rule (ANSTO).

The UNSW Dean's Award for Outstanding PhD Theses, presented by the Dean of the UNSW Graduate Research School were awarded to **Dr Xinyue Wen** (supervised by Rakesh Joshi & Veena Sahajwalla) and **Dr Michael Haines** (supervised by Sophie Primig & Nima Haghdadi).

ANNUAL MSE POSTER COMPETITION

First Place: Feng Zhiheng –*A novel source of energy-Moisture*

Second Place: Liang Yang-*SPM study of phase separation and effect of temperature change in $LiCOO_2$ thin films.*

Third Place: Asiyeh Kheradmand- *Green adsorbent- Upcycling cotton waste for waste decolorisation*

People's Choice Awards: Tingting Mei, Haowei Jia, Ming Luo, Jeffrey Zhang

INDUSTRIAL TRAINING AWARDS

Victoria-Lee Inthavong & Sherie Xue – Joint 1st Prize

Jonathan Ren – 2nd Prize

Jason Feng – 3rd Prize

Alex Ajaka – People's Choice Award

ACHIEVEMENTS

Jun Liang, **Kayla Lord** and **Michelle Xu** were selected for the 2024 **UNSW STEMM Champions Program**!

Jun and Kayla were selected as our **PhD Champions** and are currently carrying out their PhD projects under the supervision of Danyang Wang and Nagy Valanoor, respectively. Michelle was selected as our **Early Career Scientist Champion** and is currently working as a research fellow under the supervision of Damia Mawad.

STUDENT COMMITTEE EXECUTIVES

MATSOC

- President - Nelson Tear (also 2024 President)
- Vice President of Internal Affairs - Katerina Kleintova
- Vice President of External Affairs - Reece Chan
- Secretary - Oscar Pohlman
- Treasurer - Jacob Beer
- Social Director - Lucy Liu
- Marketing Director - Alyaa Pranoto
- Assistant Social Director - Inaya Khandaker
- Assistant Marketing Director - Eason Wang
- 4th Year Representative - Louise Denton
- 3rd Year Representatives - Niamh Maybloom & Sushrut Mogarkar
- 2nd Year Representatives - Jet Chong & Terry Dang
- International Representative - Eason Lin

PGSOC

- President - Parkarsh Kumar
- Vice-President (Internal) - Saman Mostafapoor
- Vice-President (External) - Duoduo Zhao
- Treasurer - Akbar Davoodi Jamaloei
- Secretary - Sudheer Guntaka
- Welfare Officer - Manisha Joshi
- Social Media Officer - Asiyeh Kheradmand
- Coursework Student Representative - Bhumika Badhan
- Arc Delegate - Ruth Soshanna John
- Peer Mentoring Coordinator - Tingting Mei

MATERIALS AUSTRALIA NSW BRANCH STUDENT PRESENTATION COMPETITION

ORAL PRESENTATION AWARDS

1st Prize ($600, sponsored by Gravitas Technologies):

Fenglin (Wendy) Zhuo

UNSW Materials Science and Engineering, supervised by A/Prof. Pramod Koshy, Ms. Molly Kirkpatrick (CSIRO), and Dr Briana Ganly (CSIRO).

2nd Prize ($500, sponsored by United Steel):

Jessie Lum

UNSW Mechanical and Manufacturing Engineering.

4th Prize ($300, sponsored by SOTO Consulting Engineers):

Jess Degeling

UNSW Materials Science and Engineering, supervised by A/Prof. Pramod Koshy, Dr Daniel Gregg (ANSTO), and Dr Ghazaleh Bahmanrokh (ANSTO).

POSTER PRESENTATION AWARDS

UNSW also dominated the poster presentation competition, securing the top three positions:

1st Prize ($300, sponsored by SOTO Consulting Engineers):

Louise McGuiggan

UNSW Materials Science and Engineering, supervised by A/Prof. Pramod Koshy and Dr Ben James (CSIRO).

2nd Prize ($200, sponsored by Gravitas Technologies):

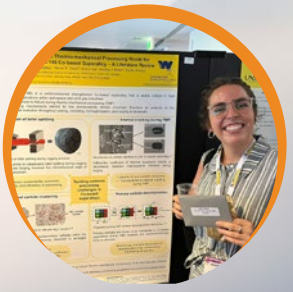
Stella Lin

UNSW Materials Science and Engineering, supervised by Prof. Sophie Primig, Dr Andrew Breen, and Hubert Lee.

3rd Prize ($100, sponsored by ANSTO):

Terrance Nguyen

UNSW Mechanical and Manufacturing Engineering.



MARCUS MILJAK STUDENT STORY

My time at UNSW started in 2019 when I enrolled into a flexible first-year engineering degree. I had a passion for chemistry and engineering, so I remember having my heart set on pursuing a career in chemical engineering. However, I chose a flexible first-year program, just in case I didn't like chemical engineering, or I discovered there was something that I liked more.

I met so many people at the beginning of my degree. One of my best friends in first-year, Ratan, was studying materials science and engineering. It was not until I looked over his shoulder and saw his homework for the first-year course, MATS1192, that I discovered what materials science was, and from then I made the decision to transfer to it. Like many of my friends, I attended the first-year camp and made many memories, having drinks with friends around a bonfire and playing Mario Kart on a projector in our cabins. Being at university gave me a new perspective on myself and the confidence to travel overseas to Japan with Ratan in the summer after first-year, it was an amazing trip!

During second-year, I got to study more materials focused courses which I loved, but also the COVID era! Many of my lectures were online so I didn't get to see my friends very often. We still made time to study together and would call online. Although I preferred face-to-face lectures, I still put in a lot of effort to learn. For my efforts, I received the Max Hatherly Prize for having the highest WAM at the end of second-year. Since I transferred to a materials science degree "the system" thought that I was a first-year. I was put into a peer mentoring program and made friends with my mentors. Thank you for taking me into your group, Sarra, Andrew, and Moey!

At the end of second-year, I got in touch with Associate Professor Pramod Koshy, who everyone calls Koshy. He offered me a position as a research assistant. Before I could start, I was accepted to an industrial trainee position at the CSIRO! Instead of working under Koshy as a researcher, I spent the summer at CSIRO at Lucas Heights working with Dr Joel O'Dwyer, right next to ANSTO and the nuclear reactor.

This project involved working on novel X-ray diffraction technologies, it was exciting and physics-y and fun. I would continue this project into my third year, working at the CSIRO during breaks between terms. My time at CSIRO was extremely rewarding and taught me the most out of my degree. I was able to learn MATLAB and python languages, as well as X-ray radiation safety. I got hands on experience in the lab arranging X-ray sources and detectors. It is an experience that I will be forever grateful for. In third-year, I studied hard and was recognised by attaining the Sir Rupert Myers Prize for the best performance in the course MATS3001

The team at CSIRO must have liked me, since they offered to take me as an honour's student in my fourth year of studies. Again, supervised by Koshy and Joel, I undertook an extension of the same project. It was through Koshy, that I was able to be a part of a few presentation events, I had a blast being able to share my work with people from across the materials science field. During fourth-year I kept my studies up and was able to graduate with Honours class 1 and the University Medal.

Following on from my honours thesis, Joel and Koshy thought that the project had been successful and there remained enough scope to continue the project into a PhD. I had grown to enjoy the style of research-for-industry work done at the CSIRO. I thought it would be perfect to continue my project into a PhD and continue through the school of materials science as a postgraduate researcher.

After starting my PhD, my experience in the school of materials science got much busier. I have been able to enjoy some of the most amazing experiences, from weekly badminton games with Koshy at UNSW, to exploring Melbourne, Adelaide, Brisbane, Hobart and Perth for internal CSIRO conferences and events. Since starting my postgraduate degree, I have made even more friends and have been able to experience a very "stereotypical" university life. Life as a postgrad has been cool, I've been able to go out from dinner and bouldering with friends and play volleyball to break from endless writing!

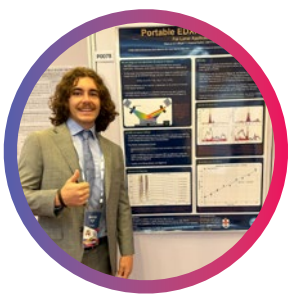
I have been privileged to take a part in so many incredible professional activities. I attended the International Union of Crystallography conference in Melbourne in 2023 and presented a poster. I presented my PhD work at events run by the Australian X-ray Analysis Association and won a first-place award! I was also lucky enough to travel to Italy with my partner Sarra for the European Powder Diffraction Conference in 2024 where I was able to present my PhD work so far. Additionally in 2024, I was able to attend Combined Australian Materials Societies conference in Adelaide and present even more of my work. I am grateful for the support of my supervisors and friends and family for supporting me through all my studies, without them, my time at UNSW in the school of materials science would have been much less fantastic.

Cheers, Marcus


Fat Thaiger
SYDNEY CITY


Mineral Detection by Rover Analyser


CeraVe
Moisturising
Lotion




Sponsor
ZEISS

MATSOC

I am honoured and gratified to have been elected as President of MATSOC not only in 2024 but once more in 2025. I would like to give my thanks and appreciation to both previous and current members of the executive team, the School of Materials Science and Engineering and its various staff both professional and academic for their support, mentorship and dedication throughout the year.

My goals for MATSOC over 2024 were to continue the fervour trailblazed by our former president Louise and to reintroduce and sustain professional development throughout the year. While dedicated professional workshops were notably lacking, MATSOC was successful nonetheless in maintaining and growing our lovely, small community. We ran a grand total of 29 different events including:

3 SITE VISITS

16 INDEPENDENT EVENTS

10 COLLABORATIONS

Standouts of the year varied from our smaller, cozier events such as our termly Welcome back to Term, Coffee Catchups and Study Sessions to our larger, more expansive collaborative socials and networking events such as the return of our Forge Your Future: Materials Industrial Networking Night held in collaboration with the Materials Postgraduate Society, PGSOC. MATSOC continued and strengthened its ties to the Chemical Engineering Undergraduate Society (CEUS), the Food Science Association (FSA) and the Renewable Energy Society (RESOC) with our annual 1st Year Camp, Cruise and Ball.

The Forge Your Future: Materials Industrial Networking Night returned this year to tremendous success: hosting 239 attendees, welcoming 10 different companies and attracting the attention of the Faculty of Science's Dean's Unit. Students, staff and industry members and alumni alike socialised and networked over a night of delicious food and drink, fascinating research posters from our postgraduates and provocative information from our presenters and QnA panellists.

Although 2023's Annual General Meeting left our team solely lacking in both numbers and diversity, the combination of an immensely successful first year camp and subsequent Extraordinary General Meeting (EGM) welcomed new, needed members to team; at camp we elected an unprecedented four 1st year representatives and at our EGM welcomed three new executive members.

As always, our gratitude and appreciation go towards all those who have supported MATSOC in any way, shape or form and a sincere thank you goes out to our major sponsors Cochlear and Corrosion Control Engineering and our 0-week sponsor Engineers Australia. Finally, a special note of thanks and appreciation goes to the School of Materials Science and Engineering, without their support MATSOC would not have the capability for the success it enjoys today.

As both myself and most of the team are returning for the upcoming year, please look forward to MATSOC's continued success in 2025.

NELSON TEAR

2024 President

MATSOC 2024 TEAM

Nelson Tear President

Siranjeev Suresh Balan Vice President Internal Affairs

Reece Anthony Chan Vice President External Relations

Jo Kawahashi Socials Director (form.), 2nd Year Representative

Katerina Kleintova Social Director

Michael Stephen Lape Marketing Director, Secretary (form.)

Eason Lin Arc Delegate, Assistant Social Director (form.)

Lucy Liu Assistant Social Director

Jesse Muya Assistant Marketing Director

Jacob Beer Treasurer

Oscar Pohlman – Secretary, 3rd Year Representative

Anthony Lu – 4th Year Representative

Louis Denton – 3rd Year Representative

Alyaa Pranoto - International Representative

Angelin Prabaharan - First Year Representative

Bianca Zlotkowski - First Year Representative

Eason Wang - First Year Representative

Cassie Wood - First Year Representative


Q&A Panel
BlueScope
Brett Tarrant
BlueScope Manufacturing Manager Cokemaking & Ironmaking
Cochlear
Ciara Gallagher
Cochlear
Senior Process Engineer
CCE
CORROSION CONTROL ENGINEERING
Jim Galanos
CCE
Principal Engineer
ZEISS
Bernd Schulz
ZEISS
Business Developme
Specialist – Materials
Science

PGSOC

YET ANOTHER YEAR OF VIBRANT COMMUNITY ENGAGEMENT WITH PGSOC

Building upon the sound foundation laid erstwhile, PGSOC continued to thrive in 2024 with the unwavering support of the passionate executives and vibrant, spirited postgraduate community, further solidifying its position as a lively hub for postgraduate students within the School of Materials Science and Engineering at UNSW. Our commitment to fostering inclusivity, cultural exchange, and professional development remained resolute, resulting in another year of impactful events and meaningful connections.

Recognizing the diverse backgrounds of our postgraduate community, PGSOC organized and supported celebrations for various cultures and their grand festivals. Throughout the year, PGSOC celebrated the rich cultural diversity of our community by hosting an assortment of multifaceted events. We kicked off with a vibrant Diwali celebration, featuring traditional food, music, and activities that brought the festive spirit to life. Our support for the school's End-of-Year Christmas party added to the joyous atmosphere, while our Lunar New Year festivities welcomed the new lunar cycle with colourful decorations and delicious cuisines. The Nowruz (Persian New Year) celebration provided a unique opportunity to showcase Iranian customs, and our Eid events united students from various religious backgrounds in a spirit of harmony and mutual respect. Additionally, PGSOC's active participation in the school's International Women's Day celebrations highlighted our commitment to inclusivity and gender equality. We also played a crucial role in the faculty's welcome events for new coursework and HDR students each term, ensuring that newcomers felt warmly embraced by our vibrant community. These initiatives not only encouraged cultural exchange and understanding but also strengthened the bonds within our postgraduate family.

A cornerstone of PGSOC's 2024 activities was the phenomenally successful "Forge Your Future 2024" event, a collaborative endeavour with MATSOC that unified academic excellence with industry engagement. The Materials Industry Networking Night provided a vital platform for postgraduate students to connect with representatives from over ten diverse industries, encouraging valuable professional relationships and exploring potential career pathways. Concurrently, the Annual MSE Poster Competition showcased the cutting-edge research of over 25 postgraduate students, with a distinguished panel of experts judging the presentations. The industry attendees were deeply impressed by the breadth and depth of the research, highlighting the exceptional talent within our school. This twofold event effectively bridged the gap between academia and industry, offering students invaluable networking opportunities and a chance to present their work to a wider audience, testifying PGSOC's commitment to professional development. The school-supported event drew a remarkable crowd of over 150 participants, marking it a premier gathering, and demonstrating the strong interest in the intersection of academia and industry.

Fun and social events provided a much-needed respite from academic pressures, allowing students to unwind and connect with their peers. PGSOC hosted a lively Bowling Night for postgraduate students, creating a relaxed atmosphere where they could de-stress, interact with colleagues outside the lab, and build camaraderie. Moreover, PGSOC organized memorable trips to the Blue Mountains and the South Coast of NSW, offering students the chance to explore the natural beauty of these regions, recognizing the importance of well-being and connection with nature. These excursions offered valuable opportunities for relaxation, building newer relationships across cultures, notably enhancing the overall postgraduate experience. PGSOC demonstrated its commitment to the well-being of the School of Materials Science and Engineering community by supporting Mental Health Day, an initiative led by the school's Equity, Diversity, and Inclusion (EDI) team. Recognizing the unique pressures faced by students and staff, PGSOC helped organize and promote a session on stress management techniques. This session provided practical strategies and resources tailored to the MSE fraternity, empowering individuals to handle personal and professional challenges with resilience. PGSOC's involvement highlighted its dedication to fostering a supportive and healthy environment, prioritizing mental well-being alongside academic and professional success.

The PGSOC executives, with unwavering dedication, carved moments from their rigorous schedules to celebrate their shared accomplishments. The seamless coordination stands as a testament to the transformative power of collaborative spirit. PGSOC is more than a society; it is a legacy of enrichment, a transformative journey, where the postgraduate community finds solace in shared experience, converges, cultivating lasting kinship and crafting cherished moments.

PGSOC remains dedicated to continuing these successful initiatives and is constantly exploring new opportunities to enrich the postgraduate experience within the School of Materials Science and Engineering. We have an exciting lineup of events, both indoor and outdoor, planned for the next year. With the energetic team of executives leading every year, we are eager to carry the legacy of our successful events forward.

SANJITH UDAYAKUMAR

2024 President


MATERIALS
POSTGRADUATE
SOCIETY


MATERIALS
POSTGRADUATE
SOCIETY


MATERIALS
POSTGRADUATE
SOCIETY

MARKETING & OUTREACH

2024 marked another successful year for the school of Materials Science and Engineering in Marketing and Outreach. Our school hosted more schools for outreach, were more involved in more events on campus and managed to collaborate more with other internal UNSW parties.

This marked a very successful year for on campus engagement amongst students and staff alike. We also had great online engagement through our social media channels and making various updates and improvements through our website.

SOCIAL MEDIA

We used our social media platforms this year to promote all the great happenings in our school! Facebook and Instagram are the two platforms we utilise for our school and this year was a great year for celebrating school, staff and student achievements!

Social Media is becoming more prevalent each day so this year we used it to promote a lot of our upcoming events, as most staff and students within the school would be on social media. This was a great opportunity to increase our exposure both internally and externally as we went with a bigger push for students and staff alike to engage with us through social media.

Don't forget to follow us over on Instagram @unswmaterials and on our Facebook page to stay up to date on the latest happenings in the School of Materials Science and Engineering!

OPEN DAY

Open Day like always for the School of Materials Science and Engineering was a huge success! It is one of the schools biggest engagement events so there is a huge amount of preparation and behind the scenes work involved, so first and foremost we want to extend a huge thankyou to everyone from the school who was involved on the day. We were again one of the most popular tents on campus with lots of continuous foot traffic throughout which is a testament to all the amazing interactive and informative demonstrations and stalls we had from all the schools!

We also got to show off our freshly renovated Maglev train which was a huge hit along with our liquid nitrogen ice-cream (as always!) with a never ending line which kept our students and staff busy all day.

We got to give away lots of goodies and interact with lots of prospective students and the general community which was extremely rewarding for everyone involved. We can't wait to see what next years open day has in stall (and hopefully we will see you there)!

OUTREACH

The School of Materials Science and Engineering was lucky enough to be able to engage in lots of outreach engagement this year which was an amazing opportunity for the school to interact with prospective future students!

We were getting lots of request from schools wanting to come onto campus which was an amazing sign for the school, so in order to keep up with demand we decided to revamp and expand our outreach program which was a really exciting project for the school!

We on boarded more academics to run the outreach sessions to meet the demand we were receiving from the schools and together we were able to develop and refine a new outreach program and brochure, which you can now check out if you visit our website!

We can't wait to implement this new program in 2025 and look forward to all the future school visits and outreach programs we will be engaging in!

MARKETING COMMITTEE

Our Marketing Committee continued our fortnightly meetings throughout the year. This helped us maintain a clear and consistent vision for the school, keep key figures of the school up to date with various activities happening both internally and externally and make sure we were representing the school in the best way.

This highly dedicated committee helped to keep the school engagement on track along with collaborating on lots of great ideas for the school! We are always keeping our staff, students and community in mind with each decision we make which are important for the values the school upholds as well as those of UNSW.

EVENTS

We were able to host and be apart of a number of events this year which was another great opportunity for the school to engage both internally and externally.

We were apart of a heap of events but here are some highlights! We got to be apart of SciFest which was like a mini open day held in the roundhouse where we had out Charpy and Maglev demonstrations. We also had an amazing opportunity collaborating with the on campus Women in STEMM team to host a fun interactive event with a group of girls from Coogee Public school which was very rewarding for everyone involved.

As always we got the chance to team up and work with PGSOC and MATSOC our student societies on various events they were running and ones we chose to run as well with events like the Industry Networking Night, Alumni Networking Night and various calendar celebrations happening throughout the year. We are very proud of the strong connections we have with our student societies and can't wait to collaborate with them on even more events in the future!

2024 RESEARCH GRANTS

Amounts provided below are apportioned amounts for 2024

HERDC CATEGORY 1:
AUSTRALIAN COMPETITIVE GRANT RESEARCH INCOME

ARENA - Australian Renewable Energy Agency / Transformative Research Accelerating Commercialisation (TRAC) Program - Iron and Steel Research and Development (R&D) Funding Round, Blast Furnace Innovations: Integrating New Injections and Burdens for Sustainable, Low-Carbon Ironmaking Project (2023/TRAC732 (PRO-442), Shen, Y; Mathieson, J; Koshy, P; Zhuo, Y; Yu, X; Liu, Y; Elliot, L; Ma, X; Florin, NH; Evans, T; Austin, PR; Ferreira, RS; Mao, X; Wang, C; Xu, X; Shen, F, $228,000

Australian Coal Research (ACR) Limited / Australian Coal Association Research Program (ACARP), Biochar-Coke Integration for Improved Coke Strength and Performance, Koshy, P; Tahmasebi, A; Williamson, L; Lomas, H; Lee, S; Seifi Mofarah, SS; Drew, M; Herbertson, J, $73,320

Australian Nuclear Science & Technology Organisation (ANSTO) / FutureNow Plus Scholarships, Development of Ultra-High Temperature Ceramics (UHTCs) for Extreme Environments (Energy, Aerospace, and Defence Applications) - Scholarship for Vienna Wong, Koshy, P; Sorrell, CC; Muransky, O; Holmes, RL; Wong, V, $15,000

Australian Research Council / Discovery Early Career Researcher Award (DECRA), Printed Infrared Quantum Dot Photodetectors and Large-scale Image Sensors, Hu, L, $150,718

Australian Research Council / Discovery Early Career Researcher Award (DECRA), Lead-free Perovskite Nanowires for Artificial Photo-synapse Arrays, Lin, C, $155,000

Australian Research Council / Discovery Project, Designing a photo-electro-catalysis system for selective organic oxidation, Scott, JA; Toe, C; Amal, R; Hart, J; Valanoor, N, $6,635

Australian Research Council / Discovery Project, Corrosion of heat resisting alloys in steam/hydrogen-rich environment, Zhang, J; Young, DJ, $150,000

Australian Research Council / Discovery Project, Beyond the Ferroelectric Field Effect Transistors, Li, S; Zhang, S; Wang, D, $170,000

Australian Research Council / Discovery Project, Ferroelectric bilayer composites with giant electromechanical properties. , Valanoor, N; Chang, L; Daniels, JE, $103,333

Australian Research Council / Discovery Project, In-situ grain boundary engineering via metal additive manufacturing, Primig, S; Haghdadi, N, $143,170

Australian Research Council / Discovery Project, Bioinspired Nanoionic Materials for Watt-scale Nano-Hydroelectric Generator, Chu, D; Wang, C; Han, Z; Su, D, $172,000

Australian Research Council / Discovery Project, Mixed-Dimensional 2D/0D Heterostructures for Infrared Detection, Wu, T; Chang, L , $97,216

Australian Research Council / Discovery Project, Nitride materials: In the "bond ionicity Goldilocks zone" for solar energy, Green, M; Hart, J; Patterson, RJ; Suryawanshi, MP, $27,062

Australian Research Council / Discovery Project, Engineered topological nanostructures – a new frontier in materials design, Seidel, J; Sharma, PK, $132,232

Australian Research Council / Future Fellowship, Iron-based high-temperature topological superconductors, Li, Z, $206,436

Australian Research Council / Industrial Transformation Research Hubs, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH; Wang, H; O'Mullane, A; Pahlevani, F; Joshi, RK; Boehme, T; Pozo-Gonzalo, C; Prashant, S; Giurco, D; Bhattacharya, S; Tricoli, A; Sharma, N; Maroufi, S; Kerr, R; Perez, P; Malik, A; Florin, NH; Tricoli, A, $498,000

Australian Research Council / Industrial Transformation Research Hubs, ARC Research Hub for Connected Sensors for Health, Wang, C; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Neff, R; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Foroughi, J; Li, B; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Wu, S; Sriram, S; Kou, L; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Sonar, P; Wright, R; Drummond, J; Liao, T; Phan, H; Wu, S, $125,000

Australian Research Council / Industrial Transformation Research Hubs, ARC Research Hub for Fire Resilience Infrastructure, Assets and Safety Advancements (FRIASA) in Urban, Resources, Energy and Renewables Sectors, Yeoh, GH; Canbulat, I; Si, G; Tabelin, C; Chan, QN; Jing, Y; Boyer, CA; Zhang, C; Dai, L; YUAN, J; Sammut, C; Li, S; Kay, MJ; Zhang, W; Kabir, II; Samali, B; Wang, H; Tao, Z; Perera, S; Song, P; Yeo, G; Nguyen, T; Carpini, J; Fruhen, L; Maas, A; Lange, D; Ghodrat, M; Sharafi, P; Jiang, C; Parameswaran, S; Voice, D; Hsu, A; Mouritz, A; Wu, W, $42,214

Australian Research Council / Industry Fellowship - Industry Laureates, Recycling Innovations to Transform Electronic Waste into Green Metals, Sahajwalla, VH, $363,598

Australian Research Council / Industry Fellowship - Mid Career, Bio-inspired Sustainable Materials for Self-powered Environmental Sensing, Chu, D; Howard, M; Nicholls, E, $239,409

Australian Research Council / Industry Fellowship - Mid Career, Optically Tunable Functional Nano-Coatings on Fly Ash-Based Ceramics, Koshy, P; Koshy, P, $91,470

Australian Research Council / Linkage Projects, Structure-property relationships of next generation aero-engine materials, Primig, S; Ringer, SP, $47,500

Australian Research Council / Linkage Projects, New Lead-Free Brass Solutions for Drinking Water Applications, Laws, KJ; Gludovatz, B; Bertelli, M; Spinner, N; Pradzynski, K; Hinds, J; Birbilis, N; Birbilis, N, $41,417

Australian Research Council / Linkage Projects, Powering Next Generation Wearable Electronics: Moisture Electric Generator, Chu, D; Wu, T; Joshi, RK; Hart, J, $166,705

Australian Research Council / Linkage Projects, Electrodeposited Cathodes with Tunable Stoichiometry for Alkaline Batteries, Koshy, P; Sorrell, CC; Wang, H; Sharma, N; Arandiyan, H, $8,691

Australian Research Council / Linkage Projects, Sustainable and robust Australian Ni-based superalloy manufacturing, Primig, S, $75,934

Department of Agriculture, Fisheries and Forestry (DAFF) / Soil Science Challenge, Engineering novel amendments for regenerating soil C without the greenhouse gas implications of using more N fertilizer 4-H4T201A, Munroe, PR; Vinu, A; Van Zwieten, L; Tavakkoli, E; Fang, Y; Taherymoosavi, S, $283,454

Department of Climate Change Energy the Environment and Water / National Environment Science Program (NESP 2), Sustainable Communities and Waste Hub, Sahajwalla, VH; Kickett, M; Aryani, A; Kendal, D; Green, D; Wiedmann, T; Downing, M; Ghose, A, $992,333

Department of Education / Trailblazer Universities Program (TRaCE), Mid,Poc and High impact fund – Kandui, Sahajwalla, VH; Mastio, E, $250,000

Department of Education / Trailblazer Universities Program (TRaCE), Mid, Poc and High impact fund – Vecor, Koshy, P; Sorrell, CC; Seifi Mofarah, SS, $380,639

Department of Education / Trailblazer Universities Program (TRaCE), Mid, Poc and High Impact Fund – Jamestrong, Sahajwalla, VH; Ghose, A, $81,203

Department of Education / Trailblazer Universities Program (TRaCE), Testing new alloy materials for economical hydrogen production , Zhao, C; Laws, KJ; Healy, C, $6,667

Department of Education / Trailblazer Universities Program (TRaCE), Transforming Fiberglass Waste into Biodegradable Silicon, Kumeria, T, $50,000

Department of Education / Trailblazer Universities Program (TRaCE), Rechargeable Cost-effective Seawater Batteries for Residential Energy Storage Applications, Chu, D, $80,000

Royal Melbourne Institute of Technology / ARC Discovery Project Shared Grant, Two-dimensional nanomaterials for wearable zinc ion battery, Chu, D; Liu, D; Wang, Z, $28,870

Royal Melbourne Institute of Technology / ARC Industrial Transformation Research Hub Shared Grant, ARC Research Hub for Transformation of Reclaimed Waste Resources to Engineered Materials and Solutions for a Circular Economy , Gao, W; Setunge, S; Mendis, P; Wang, H; Horne, R; Fernando, N; Choudhury, NR; Shah, K; Giustozzi, F; Law, D; Pathirana, PN; Pahlevani, F; Li, W; Tam, V; Polonsky, M; Halgamuge, S; Zhang, G; Smith, S; Lokuge, W; Gravina, R; Iyer-Raniga, U; Madapusi, S; Daver, F; Nguyen, T; Sofi, M; Sabri, Y; Wijayasundara, M; Costa, S, $30,000

University of Sydney / ARC Linkage Project Shared Grant, Advanced hard metals: microstructure-property-processing relationships, Primig, S; Ringer, SP; Czettl, C, $35,333

University of Wollongong / ARC Industrial Transformation Training Centres Shared Grant, ARC Training Centre for Innovative Composites for the Future of Sustainable Mining Equipment, Zhang, J; Ren, T; Si, G; Jiang, Z; Zhang, C; Zhang, G; Remennikov, A; Huang, H; Kizil, M; Yang, R; Pareek, VK; Karakus, M; Yoon, J; Knights, P; Su, L; Zhang, Y; Karekal, S; Hastie, D; Lu, M; Roberts, J, $34,627

Western Sydney University / NHMRC Ideas Grant Shared Grant, Wireless stimulator with no impinging electrodes, circuitry and connections for improving nerve regeneration in a crush injury model, Mawad, D; Vissel, B; Lauto, A; Mahns, D; Gargiulo, G; Morley, J, $30,168

HERDC CATEGORY 2: **OTHER PUBLIC SECTOR RESEARCH FUNDING**

Australian Nuclear Science & Technology Organisation (ANSTO) / ARC Centre of Excellence in Future Low-Energy Electronics Technologies (FLEET) Student Project Agreement, FLEET scholarship awarded to PhD student Michael Lord, Valanoor, N, $32,000

Australian Nuclear Science & Technology Organisation (ANSTO) / Student Project Agreement, Glass-Ceramic Wasteform design for the immobilization of Fluoride Salts - Honours student Alexander McRae-Black, Koshy, P; Gregg, D; Rokh, GB; McRae-Black, A, $2,000

CSIRO - Commonwealth Scientific and Industrial Research Organisation / Commonwealth Government Contract, Characterisation of surfaces and advanced thin film materials for devices - Part 2, Koshy, P, $20,790

CSIRO - Commonwealth Scientific and Industrial Research Organisation / Commonwealth Government Contract, Surface and structural characterisation of crystal substrates, bulk materials and thin films (Contract ID C043843) (Agreement no. 2023123079), Koshy, P, $6,000

CSIRO - Commonwealth Scientific and Industrial Research Organisation / Postgraduate Studentship, Dialysis-MEG Fundamental - PhD Scholarship for Jinbo Wang, Chu, D; Han, Z, $20,000

Department of Climate Change Energy the Environment and Water / Commonwealth Government Contract, Sustainable Communities and Waste Hub - Research Support Services NESP, Sahajwalla, VH, $195,545

Department of Industry, Science and Resources / Innovation Connections Contract, Effective heat treatment conditions for steel alloys, Pahlevani, F, $25,000

Grains Research & Development Corporation (GRDC) / Department of Agriculture, Water & the Environment Soil Science Challenge Partner Contribution, Engineering novel amendments for regenerating soil C without the greenhouse gas implications of using more N fertilizer , Munroe, PR; Taherymoosavi, S; Tavakkoli, E; Van Zwieten, L; Vinu, A; Fang, Y, $75,000

Investment NSW / NSW RAAP - Co-Investment in Industrial Transformation Research Program (Hubs and Centres), ARC Research Hub for Connected Sensors for Health , Wang, C; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Foroughi, J; Li, B; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Sonar, P; Neff, R; Drummond, J; Liao, T; Wu, S, $2,727

NSW Department of Planning and Environment / RAAP - ARC Industrial Transformation Research Program (ITRC & ITRH), ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH; Joshi, RK; Boehme, T; Sharma, N; Maroufi, S; Wang, H; Forsyth, M; Perez, P; Pahlevani, F; Giurco, D; Bhattacharya, S; O'Mullane, A; Kerr, R; Tricoli, A; Malik, A; Florin, NH; Tricoli, A, $8,000

Oxleigh Pty Ltd / DIIS - Cooperative Research Centre Projects (CRC-P's) Shared Grant, Upscaling a Novel Technology for Recycling Lithium-Ion Batteries, Yeoh, GH; Maroufi, S; Hossain, R; Mansuri, I; Ghose, A; Wang, C; Nomvar, M; Griffiths, M; Stevens, M; Tilley, M; Sahajwalla, VH, $320,181

Sydney Water Corporation / State Government Contract, Graphene Oxide-Coated LPG Fibre for Ammonia Sensing in Water, Joshi, RK; Stenzel, M; Grattan, KT; Tong, S, $42,574

2024 RESEARCH GRANTS

HERDC CATEGORY 3: INDUSTRY AND OTHER FUNDING

AAM Pty Ltd / ARC Industry Fellowship - Mid Career Industry Partner Contribution, Bio-inspired Sustainable Materials for Self-powered Environmental Sensing, Chu, D, $132,302

Advanced Alloy Holdings Pty Ltd / ARC Linkage Project Industry Partner Contribution, New Lead-Free Brass Solutions for Drinking Water Applications, Laws, KJ; Gludovatz, B; Smith, R; Bertelli, M; Pradzynski, K; Hinds, J; Birbilis, N; Birbilis, N, $29,167

Advanced Alloy Holdings Pty Ltd / Contract Research, Bridging Project – Plumbing Brasses, Laws, KJ, $9,089

Advanced Alloy Holdings Pty Ltd / TRaCE Trailblazer Partner Contribution, Testing new alloy materials for economical hydrogen production , Zhao, C; Laws, KJ; Healy, C, $6,667

AINSE - Australian Institute of Nuclear Science and Engineering / Pathway Scholarship, IONSIV Waste Immobilisation in Hot Isostatically Pressed Glass-Ceramic Waste Forms – Student Jessica Degeling, Koshy, P; Degeling, J, $5,000

AINSE - Australian Institute of Nuclear Science and Engineering / Postgraduate Research Award, Investigating Magnetoelectric Effects of a BiFeO3 Resonant Tunnelling Diode - PGR student King-Fa (Gordon) Luo, Valanoor, N; Cortie, D, $9,000

AINSE - Australian Institute of Nuclear Science and Engineering / Residential Student Scholarship, Pyrochlore Glass-Ceramic Wasteforms for Immobilising Nuclear Waste – Student Joel Abraham, Koshy, P, $8,250

AINSE - Australian Institute of Nuclear Science and Engineering / Residential Student Scholarship, Designing Glass-Ceramic Wasteforms for Actinide Immobilisation through Understanding of Actinide Crystal Chemistry Structure. Student: Aurpa Bhuiyan., Koshy, P; Bhuiyan, A; Zhang, Y, $9,000

ALCOA of Australia / Contract Research, Refinery of the Future, Primig, S; Ferry, M; Zhang, J, $903,019

ALMAG S.p.A / ARC Linkage Project Industry Partner Contribution, New Lead-Free Brass Solutions for Drinking Water Applications, Laws, KJ; Gludovatz, B; Smith, R; Bertelli, M; Pradzynski, K; Hinds, J; Birbilis, N; Birbilis, N, $29,167

AST Mining Service Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC Research Hub for Fire Resilience Infrastructure, Assets and Safety Advancements (FRIASA) in Urban, Resources, Energy and Renewables Sectors, Yeoh, GH; Si, G; Yuen, A; Canbulat, I; Tabelin, C; Chan, QN; Jing, Y; Boyer, CA; Zhang, C; Dai, L; YUAN, J; Sammut, C; Li, S; Kay, MJ; Zhang, W; Kabir, II; Ghodrat, M, $2,000

Australian Advanced Materials Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Chu, D; Lovell, N; Gooding, J; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Wang, C; Sonar, P; Foroughi, J; Drummond, J; Liao, T; Wu, S, $3,913

Australian Advanced Materials Pty Ltd / ARC Linkage Partner Contribution, Powering Next Generation Wearable Electronics: Moisture Electric Generator, Chu, D; Wu, T; Joshi, RK; Hart, J, $80,000

Baosteel Australia Joint Research and Development Centre (BAJC) / Research and Development Fund, High-entropy alloy based catalysts for green hydrogen evolution, Li, W; Li, S; Yang, J; Qu, B; Lin, X, $60,000

Bisalloy Steels Pty Ltd / Innovation Connections Contract, Effective heat treatment conditions for steel alloys, Pahlevani, F, $5,034

BlueScope Steel (AIS) / ARENA TRAC Program - Iron and Steel R&D Funding Partner Contribution, Blast Furnace Innovations: Integrating New Injections & Burdens for Sustainable, Low-Carbon Ironmaking Transitions, Shen, Y; Mathieson, J; Koshy, P; Zhuo, Y; Yu, X; Liu, Y; Elliot, L; Ma, X; Florin, NH; Evans, T; Austin, PR; Ferreira, RS; Mao, X; Wang, C; Xu, X; Shen, F, $12,500

Bureau Veritas Asset Integrity and Reliability Services Pty Ltd / Contract Research, Bureau Veritas Materials Testing, Daniels, JE, $15,080

Charlie Teo Foundation / Better Tools Grant, Deciphering Glioblastoma Phenotypic Plasticity: A Novel Platform for Precision Targeting, Silvani, G, $79,252

Cleantech Energy Australia PTY LTD / ARENA TRAC Program - Iron and Steel R&D Funding Partner Contribution, Blast Furnace Innovations: Integrating New Injections & Burdens for Sustainable, Low-Carbon Ironmaking Transitions, Shen, Y; Mathieson, J; Koshy, P; Zhuo, Y; Yu, X; Liu, Y; Elliot, L; Ma, X; Florin, NH; Evans, T; Austin, PR; Ferreira, RS; Mao, X; Wang, C; Xu, X; Shen, F, $30,000

Commonwealth Steel Company / ARC ITRH Industry Partner Contribution, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH, $275,000

DMTC Limited / Contract Research, Characterisation of Relaxor Ferroelectric Single Crystals in Support of Crystal Growth, Utilisation and Compositional Development, Daniels, JE; Cairney, J, $54,478

Flame Security International Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Wang, C; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Foroughi, J; Sonar, P; Drummond, J; Liao, T; Wu, S; Mao, G, $14,053

Genesys Electronics Design Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Wang, C; Foroughi, J; Sonar, P; Drummond, J; Liao, T; Wu, S, $6,522

Jamestrong Packaging Pty Ltd / TRaCE Trailblazer Partner Contribution, T4.2 Green Aluminium, Sahajwalla, VH; Ghose, A, $200,000

JCED Australia Pty Ltd / ARENA TRAC Program - Iron and Steel R&D Funding Partner Contribution, Blast Furnace Innovations: Integrating New Injections & Burdens for Sustainable, Low-Carbon Ironmaking Transitions, Shen, Y; Mathieson, J; Koshy, P; Zhuo, Y; Yu, X; Liu, Y; Elliot, L; Ma, X; Florin, NH; Evans, T; Austin, PR; Ferreira, RS; Mao, X; Wang, C; Xu, X; Shen, F, $30,000

Kandui Technologies Pty Ltd / TRaCE Trailblazer Partner Contribution, T4.1 Green Ceramics, Sahajwalla, VH; Ghose, A; Mastio, E, $75,000

Kumul Petroleum Holdings Limited / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC Industry Transformation Research Hub for Resilient and Intelligent Infrastructure Systems (RIIS) in Urban, Resources and Energy Sectors, Khalili-Naghadeh, N; Rajabifard, A; Chan, T; Zlatanova, S; Samali, B; Wang, C; Canbulat, I; Perera, S; Gao, W; Parameswaran, S; Prasad, D; Sammut, C; Zhang, W; Li, B; Shen, X; Barton, J; Cholette, M; Clark, SR; Aryal, J; Raval, SA; Ma, L; Shahbodaghkhan, B; Vahab, M; Mao, G; Le, K; Felson, A; Chu, D; Ronagh, HR; Makki Alamdari, M; Rashidi, M; Mo, H, $9,524

Mattress Recycle Australia / ARC ITRH Industry Partner Contribution, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH, $75,000

MicroTau / Innovation Connections Contract, Roll to Roll process development, Li, S; Li, W; Lin, X, $79,211

Mines Rescue Pty Limited / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC Research Hub for Fire Resilience Infrastructure, Assets and Safety Advancements (FRIASA) in Urban, Resources, Energy and Renewables Sectors, Yeoh, GH; Si, G; Yuen, A; Canbulat, I; Tabelin, C; Chan, QN; Jing, Y; Boyer, CA; Zhang, C; Dai, L; YUAN, J; Sammut, C; Li, S; Kay, MJ; Zhang, W; Kabir, II; Ghodrat, M, $1,000

Neuroscience Research Australia (NeuRA) / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Wang, C; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Foroughi, J; Prashant, S; Drummond, J; Liao, T; Wu, S, $2,609

Nutromics Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Gooding, J; Lovell, N; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Wang, C; Sonar, P; Foroughi, J; Drummond, J; Liao, T; Wu, S, $11,478

OneSteel Manufacturing Pty Ltd / Contract Research, Advancing Australian steelmaking for next generation construction applications, Primig, S, $10,000

Perfect Engineering / Contract Research, Analysis of corroded steels, Munroe, PR, $10,000

Planet Ark Environmental Foundation / ARC ITRH Industry Partner Contribution, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH, $50,000

POSCO / International Contract, Combustion characteristics of high volatile coal for the blast furnace ironmaking, Koshy, P; Ostrovski, O, $8,845

Pure Power Tech Pty Ltd / TRaCE Trailblazer Partner Contribution, Rechargeable Cost-effective Seawater Batteries for Residential Energy Storage Applications, Chu, D, $150,000

PVC Separation Pty Ltd / TRaCE Trailblazer Partner Contribution, Transforming Fiberglass Waste into Biodegradable Silicon, Kumeria, T, $50,000

Renew IT (AUS) Pty Ltd / ARC - Industry Fellowship - Industry Laureates Partner Contribution, Recycling Innovations to Transform Electronic Waste into Green Metals, Sahajwalla, VH, $110,542

Roobuck Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Li, B; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Wang, C; Foroughi, J; Drummond, J; Liao, T; Wu, S, $5,217

SANTEVATION PTY LTD / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Wang, C; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Foroughi, J; Prashant, S; Drummond, J; Liao, T; Wu, S, $22,826

SOL.AR SRL / ARC ITRH Industry Partner Contribution, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH, $18,000

Sydney Pain Research Centre / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Wang, C; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Sonar, P; Foroughi, J; Drummond, J; Liao, T; Wu, S, $3,913

Sydney Water Corporation / ARC ITRH Industry Partner Contribution, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH, $20,000

Tankel Pty Ltd / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC Research Hub for Fire Resilience Infrastructure, Assets and Safety Advancements (FRIASA) in Urban, Resources, Energy and Renewables Sectors, Yeoh, GH; Si, G; Yuen, A; Canbulat, I; Tabelin, C; Chan, QN; Jing, Y; Boyer, CA; Zhang, C; Dai, L; YUAN, J; Sammut, C; Li, S; Kay, MJ; Zhang, W; Kabir, II; Ghodrat, M, $100

Textile Recyclers Australia Pty Ltd / ARC ITRH Industry Partner Contribution, ARC Research Hub for Microrecycling of battery and consumer wastes, Sahajwalla, VH; Pahlevani, F; Joshi, RK; Sharma, N; Maroufi, S, $40,000

TIGER PHARM PTY LTD / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Chu, D; Lovell, N; Gooding, J; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Brodie, AM; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Wang, C; Foroughi, J; Sonar, P; Drummond, J; Liao, T; Wu, S, $5,217

Tiger Techno Iwindow Pty Ltd / INSF Industry Partner Contribution, Development of cost-effective Ag nanowire electrodes through spray-coating, Chu, D; Wan, T; Li, M, $20,000

University of Sydney / ARC Linkage Project - Ceratizit Shared Partner Contribution, Advanced hard metals: microstructure-property-processing relationships, Primig, S; Ringer, SP; Czettl, C, $17,333

Vecor Australia / ARC Linkage Project Industry Partner Contribution, Electrodeposited Cathodes with Tunable Stoichiometry for Alkaline Batteries, Koshy, P; Sorrell, CC; Sharma, N; Arandiyan, H; Wang, H, $8,236

Vecor Australia / Contract Research, Vecor Co-Location Agreement, Koshy, P; Mofarah, S; Sorrell, CC, $1,238,791

Vecor Australia / TRaCE Trailblazer Partner Contribution, Joint UNSW-Vecor Trailblazer Project into Nanostructured Materials (Universal Precursor Materials and Seawater Splitting) and Transformation of Fly Ash (Ceramic Filler), Koshy, P; Seifi Mofarah, SS; Sorrell, CC, $1,250,000

Vecor Technologies Pty Ltd / ARC Mid-Career Industry Fellowship Partner Contribution, Optically Tunable Functional Nano-Coatings on Fly Ash-Based Ceramics, Koshy, P, $57,076

2024 RESEARCH GRANTS

voestalpine BOHLER Edelstahl GmbH & Co KG / ARC Linkage Project Industry Partner Contribution, Structure-property relationships of next generation aero-engine materials, Primig, S; Ringer, SP, $2,000

WALKING TALL HEALTH PTY LTD / ARC Industrial Transformation Research Hubs Industry Partner Contribution, ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH, Brodie, AM; Lovell, N; Gooding, J; Chu, D; Celler, BG; Wu, T; PENG, S; Zhang, J; Do, T; Bilston, LE; Stevens, M; Liu, G; Mao, G; Argha, A; Han, Z; Mawad, D; Lord, SR; Yeoh, GH; Parameswaran, S; Hill, DJ; Li, B; Neff, R; Bhaskaran, M; Cheng, W; Gu, Y; Xi, J; Minichiello, MA; Wu, S; Sriram, S; Kou, L; Wright, RF; Egglestone, P; Raad, R; Carroll, N; Ooi, SM; Wang, C; Prashant, S; Foroughi, J; Drummond, J; Liao, T; Wu, S, $3,913

Wellcome Leap / In Utero Program, Detecting the 'at risk' fetus by non-invasive rapid assessment of fetoplacental blood flow, Welsh, AW; Barber, TJ; Li, S; Thomas, S; Wang, D, $1,050,426

Western Australian Specialty Alloys Pty Ltd / ARC Linkage Project Industry Partner Contribution, Sustainable and robust Australian Ni-based superalloy manufacturing, Primig, S, $32,500

Western Australian Specialty Alloys Pty Ltd / Contract Research, Advanced thermo-mechanical processing of low Nb grade alloy 718 - student Hubert Lee, Primig, S; Lison-Pick, M; Street, S; Tse, WW, $16,250

OTHER RESEARCH FUNDING

Australian National University / ARC LIEF Subcontract (UNSW Admin), Quantum microscopy facility for ultrasensitive nanoscale magnetic imaging, Seidel, J; Tretiakov, O; Hamilton, A; Laucht, A; Bedford, N; Kennedy, BJ; Lu, Y; Hollenberg, L; Lise-Pronovost, A; Karel, J; Tetienne, J; Daeneke, T; Meneses, F; Broadway, D, $2,500

Australian Research Council / LIEF, Integrated Tip-Enabled Nanofabrication and Characterisation at Atomic Scale, Xia, Z; Chu, D; Zheng, Y; Dai, L; Qiao, S; Wang, C; Zhao, C; MacLeod, J, $104,780

Australian Research Council / LIEF, Ultra-fast structure-property characterisation of materials, Gludovatz, B; Kruzic, JJ; Munroe, PR; Primig, S; Chang, L; Cairney, J; Lu, M; Dargusch, M; Juodkazis, S; Ang, A; Liao, X, $301,880

Australian Research Council / LIEF, Quantum microscopy facility for ultrasensitive nanoscale magnetic imaging, Seidel, J; Tretiakov, O; Hamilton, A; Laucht, A; Bedford, N; Kennedy, BJ; Lu, Y; Hollenberg, L; Lise-Pronovost, A; Karel, J; Tetienne, J; Daeneke, T; Meneses, F; Broadway, D, $275,000

Australian Research Data Commons / Contract Research, 2.23 - Domain Data Portals program application to the Sustainable Communities and Waste Hub, Ghose, A; Way, L; Barnett, G; Zaman, A; Flies, E; Raven, R; Klymenko, P; Martin, J; Gallant, S; Anderson, N, $91,000

Monash University / ARC LIEF Subcontract (UNSW Admin), Quantum microscopy facility for ultrasensitive nanoscale magnetic imaging, Seidel, J; Tretiakov, O; Hamilton, A; Laucht, A; Bedford, N; Kennedy, BJ; Lu, Y; Hollenberg, L; Lise-Pronovost, A; Karel, J; Tetienne, J; Daeneke, T; Meneses, F; Broadway, D, $2,500

Queensland University of Technology / ARC LIEF Subcontract (UNSW Admin), Integrated Tip-Enabled Nanofabrication and Characterisation at Atomic Scale, Xia, Z; Chu, D; Zheng, Y; Dai, L; Qiao, S; Wang, C; Zhao, C; MacLeod, J, $4,000

Royal Melbourne Institute of Technology / ARC Industrial Transformation Research Hubs Collaborating Organisation Contribution, ARC Research Hub for Transformation of Reclaimed Waste Resources to Engineered Materials and Solutions for a Circular Economy , Gao, W; Setunge, S; Mendis, P; Wang, H; Horne, R; Fernando, N; Choudhury, NR; Shah, K; Giustozzi, F; Law, D; Pathirana, PN; Pahlevani, F; Li, W; Tam, V; Polonsky, M; Halgamuge, S; Zhang, G; Smith, S; Lokuge, W; Gravina, R; Iyer-Raniga, U; Madapusi, S; Daver, F; Nguyen, T; Sofi, M; Sabri, Y; Wijayasundara, M; Costa, S, $30,000

Swinburne University of Technology / ARC LIEF Subcontract (UNSW Admin), Ultra-fast structure-property characterisation of materials, Gludovatz, B; Kruzic, JJ; Munroe, PR; Primig, S; Chang, L; Cairney, J; Lu, M; Dargusch, M; Juodkazis, S; Ang, A; Liao, X, $9,600

University of Adelaide / ARC LIEF Subcontract (UNSW Admin), Integrated Tip-Enabled Nanofabrication and Characterisation at Atomic Scale, Xia, Z; Chu, D; Zheng, Y; Dai, L; Qiao, S; Wang, C; Zhao, C; MacLeod, J, $4,000

University of Melbourne / ARC LIEF Subcontract (UNSW Admin), Quantum microscopy facility for ultrasensitive nanoscale magnetic imaging, Seidel, J; Tretiakov, O; Hamilton, A; Laucht, A; Bedford, N; Kennedy, BJ; Lu, Y; Hollenberg, L; Lise-Pronovost, A; Karel, J; Tetienne, J; Daeneke, T; Meneses, F; Broadway, D, $3,750

University of Newcastle / Contract Research, Characterization and quality testing of metallurgical coals and cokes, Koshy, P; Tahmasebi, A, $58,500

University of Queensland / ARC LIEF Subcontract (UNSW Admin), Ultra-fast structure-property characterisation of materials, Gludovatz, B; Kruzic, JJ; Munroe, PR; Primig, S; Chang, L; Cairney, J; Lu, M; Dargusch, M; Juodkazis, S; Ang, A; Liao, X, $9,600

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