UNSW SYDNEY

SCHOOL OF CIVIL & ENVIRONMENTAL ENGINEERING

ANNUAL REPORT 2023

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UNSW SYDNEY 2052

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SECTION 1

THE BIG PICTURE

ABOUT US

> We don't seek to uphold the status quo

UNSW CIVIL AND ENVIRONMENTAL ENGINEERING is internationally ranked as the top School of our kind in Australia and within of the world's top twenty.

We have been pursuing excellence and innovation in education and research since our foundation in 1949. We were the first School in the country to offer a postgraduate coursework program for engineers with our Master of Technology (1958), the first to design an Environmental Engineering degree (1991) and the first to provide a Civil Engineering with Architecture degree (2007).

We continue this tradition of innovation along with our equally strong commitment to advancing a sustainable, safe and just society. Our academic staff are recognised world leaders in their fields of expertise, while our alumni are to be found as innovators and decision makers in industry, government and the community.

With a large and talented student cohort, we offer more than ten undergraduate single and double degrees, while our postgraduate coursework degree, the MEngSc offers nine areas of technical specialisation. The number and diversity of our academic staff and the breadth of our engagement with industry allows us to bring tremendous expertise to our teaching.

Our research centres and discipline groups are at the forefront of fundamental and applied research across civil and environmental engineering with strengths in construction innovation, decarbonisation, infrastructure (CIES), water (WRC & WRL), transport (rCITI), surveying and geospatial engineering (SAGE), sustainability (SAP) and smart infrastructure (RIIS.

We are always embedded in the real world. Each year, our researchers work with over 120 industry and government organisations on specific industry and community-related projects. But we don't seek to uphold the status quo, in these challenging times, we are looking for change and transformation.

ABOUT

WELCOME

Welcome to the 2023 Annual Report of UNSW's School of Civil & Environmental Engineering, internationally ranked as the number one School of its kind in Australia, (AWRU & QS Rankings 2023) and in the world's top twenty (QS 2023).

IT CONTINUES TO BE MY PRIVILEGE and honour to lead this School, with its amazing, hard working and brilliant staff and students.

Our School maintains a strong breadth and depth of knowledge in all core areas of civil and environmental engineering as well as surveying and geospatial engineering. We offer a wide variety of undergraduate and postgraduate degree programs to our over 2,200 students. The quality and diversity of our academic staff, and our intensive engagement with industry, allow us to bring an unmatched level of expertise to our research and teaching.

Our researchers continue to be awarded millions of dollars each year in industry and government funding, and are at the forefront of innovative 'blue sky' and applied research across the many facets of civil and environmental engineering. In 2023 ARC funding alone totalled $6.7M - with seven Discovery Projects (DP), four Linkage Projects (LP), and two major Fellowships being awarded to our staff.

We are very mindful of our responsibilities as teachers and guides of the next generation of innovative, creative and ethical professionals. Our students are ambitious and talented, and keen to have a positive impact on their world. We want them to be well-equipped to do so.

We have never been an ivory tower School, and we are not now. At the heart of our research and teaching, and indeed of our profession, is the desire to be of service to our wider communities. In 2023 our Centres and hubs were engaged in over 150 research projects with 120 industry and government partners.

Meanwhile 24 industry partners closely support our work with our undergraduates in career advice, prizes and mentoring as well as our outreach to high school and primary school students throughout the state.

I believe that the sky is truly the limit in what we can achieve in teaching, research, and community engagement as we seek to make a significant and positive contribution to Australia and the world.

Scientia and PSM Professor Nasser Khalili
Head of School

> "We are very mindful of our responsibilities as teachers and guides of the next generation of innovative, creative and ethical professionals."

WELCOME

2023 OVERVIEW

No. 1 Global ranking in Australia!
(AWRU & QS Rankings 2023)

TEACHING

PROGRAMS

10 Undergraduate

9 Postgraduate

2 Master of Engineering

STUDENTS ENROLMENT

1444 Undergraduate (773 EFTSL*)

796 Postgraduate (442 EFTSL*)

189 Higher Degree Research (101 EFTSL*)

**Equivalent Full Time Student Load*

FEMALES

25% Postgraduate students

16% Academic staff

26% Undergraduate students

38% HDR students

MOST POPULAR UNDERGRADUATE DEGREES

765 BE (Hons) Civil Engineering students

189 BE (Hons) Civil/ BCom students

175 BE Civil with Architecture students

LOCAL/INTERNATIONAL ENROLMENTS

Undergraduate	Postgraduate Coursework	Higher degree research
74%/26%	29%/71%	29%/71%

RESEARCH

6

Research centres and hubs

GRANT INCOME

$14.8M

TOTAL

FEDERAL (ARC) AND STATE GRANTS AWARDED IN 2023

- **7** ARC Discovery
- **4** ARC Linkage
- **2** ARC Fellowships
- **1** CRC-P
- **2** NSW State grants
- **2** AEA grants

$10.9M

TOTAL

STAFF

61 Academic staff

52 Research staff

28 Professional & technical staff

12 WRL Engineers

SOCIAL MEDIA

4,060

No.s of LinkedIn followers by Nov 2023

FINANCES

$50.3M

Generated teaching & research income

$19.3M

Operating Budget

SCHOOL EXECUTIVE GROUP

THE SCHOOL EXECUTIVE GROUP (SEG) is a senior leadership group which acts as an advisory group to the Head of School. It meets monthly with the Head of School to discuss key and current issues on matters of strategy, planning and policy directions for the School.

School Executive Group 2023
L-R: Steve Davis, Richard Stuetz, Nasser Khalili, Kristen Splinter, Denis O'Carroll, Anthony Dever.
Absent: Kurt Douglas, Ian Turner.

GROUP MEMBERS

NASSER KHALILI
Chair

KURT DOUGLAS
Associate Head (Engagement)

DENIS O'CARROLL
Deputy Head (Research)

KRISTEN SPLINTER
Managing Director, (WRL)

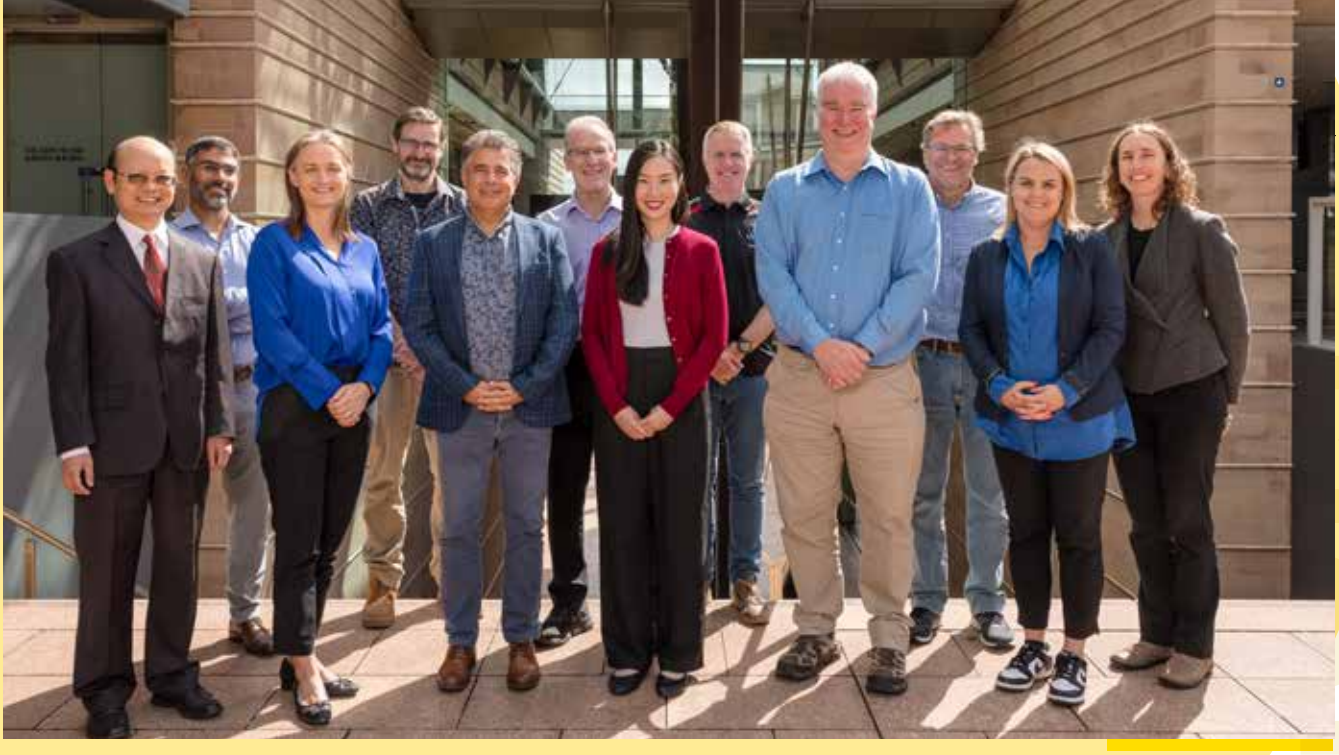
RICHARD STUETZ
Deputy Head (Education)

ANTHONY DEVER
School Manager

IAN TURNER
Deputy Head (Industry & Innovation)

STEVE DAVIS
Associate Head (Academic)

Head of School is an *ex officio* member of all the CVEN committees



SCHOOL MANAGEMENT COMMITTEE (SMC)

THE SCHOOL MANAGEMENT COMMITTEE (SMC)) represents the peak decision-making body in the School with all key decisions relating to academic matters and overall direction debated and ratified by this Committee. The SMC is chaired by the Head of School and is made up of Deputy and Associate Heads, Directors of the School's Research Centres, the Chair of the H&S Committee, School Manager, the Equity, Diversity & Inclusivity representative, senior Teaching Support Officer and the Executive Assistant to the Head of School.

MEMBERS OF SMC

NASSER KHALILI
Chair

DENIS O'CARROLL
Deputy Head (Research)

RICHARD STUETZ
Deputy Head (Education)

IAN TURNER
Deputy Head (Industry & Innovation)

STEVEN DAVIS
Associate Head (Academic)

KURT DOUGLAS
Associate Head (Engagement)

CHONGMIN SONG
Director CIES

FIONA JOHNSON
Director WRC

VINAYAK DIXIT/ TAHA RASHIDI
Director rCITI

KRISTEN SPLINTER
Managing Director, WRL

LINLIN GE/ CRAIG ROBERTS
SAGE rep

ASAL BIDARMAGHZ
Equity, Diversity & Inclusion rep

PAUL GWYNNE
Chair, HSC

ANTHONY DEVER
School Manager

LUCIA WONG
EA to HoS/Admin

ELLIE WILLIAMS /EMMA COTTER
Teaching Support Officers

SMC Members 2023
L-R: Linlin Ge, Taha Rashidi, Kristen Splinter, Paul Gwynne, Nasser Khalili, Anthony Dever, Lucia Wong, Denis O'Carroll, Steven Davis, Richard Stuetz, Emma Cotter, Fiona Johnson
Absent: Asal Bidarmaghz, Vinayak Dixit, Kurt Douglas, Chongmin Song, Ian Turner, Ellie Williams

ARC RESEARCH GRANTS 2023

2023 was a very successful year for many of the School's exciting, innovative and socially beneficial research projects with significant Australian Research Council (ARC) funding totalling $6.7M - with seven Discovery Projects, four Linkage Projects, and two Fellowships being awarded. As well as ARC funding, other government and industry grants for new research projects totalled $4.77M.

Australian Government
Australian Research Council

THE BREADTH AND DEPTH of research across the School is reflected in the variety of project aims funded by the Australian Government through the ARC:

- improving resilience of water supply in remote communities, with further development of robust, PV-powered water treatment units.
- the development of advanced computational multiphysics analysis and modelling techniques to quantitatively assess the impacts of climate change on structures.
- providing a much improved ability to predict and control the ultimate fate of emerging contaminants in our water sources.
- establishing an advanced nondeterministic design methodology that will largely reduce the need for repetitive large-scale experimental tests on structures.

- developing a comprehensive travel demand modelling platform that provides realistic, robust metrics for transport infrastructure planning addressing contemporary changes in the transport system.
- developing a smartphone rip-detection tool and online education game to help reduce the number of Australians drowning in rips each year.
- designing composite clad steel-geopolymer concrete systems - towards Net-zero structural design.
- quantifying the future risk of very rare to extreme floods, in order to protect vital infrastructure from flood extremes, and reduce future infrastructure damage costs and liability.
- developing a data validation framework to transform current 2D land tenure drawings and reconstructing them into 3D models.
- developing a novel hydrophobic concrete with integrated water-proofing and self-healing capacities.
- assessing the viability in Australia of exploration of naturally produced hydrogen and its engineered retrieval.
- improving Australian policy on stormwater reuse to future-proof our water supplies.
- reducing the uncertainties in characterising and predicting drought impacts on Australian ecosystems.

> “2023 was a very successful year for many of the School’s exciting, innovative and socially beneficial research projects”

GRANTS

ARC FELLOWSHIPS

In 2023 two of our brilliant mid-career School academics Dr Bojan Tamburic and Associate Professor Yi Liu were awarded highly sought after ARC Fellowships

Dr Bojan Tamburic

Building capacity in urban stormwater reuse

Dr Bojan Tamburic, a Senior Lecturer in Environmental Engineering, and lead CI of the Nuisance and Harmful Algae Science-Practice Partnership (NHASP), received an ARC mid-career Industry Fellowship. (IM230100222)

Bojan has a multidisciplinary scientific / engineering background with a PhD in Chemical Engineering, an MSc in Sustainable Energy Futures and an MSci in Physics, all from Imperial College London.

The ARC Industry Fellowship, valued at $865,628.00, will support Dr Tamburic's project on 'Large scale urban stormwater reuse: safe, clear and odourless water supply.' With industry partners Melbourne Water Corporation, the project aims to build capacity in urban stormwater reuse and address an industry-identified need to determine the suitability of urban lakes and wetlands for stormwater harvesting.

Project activities will include using satellites to image urban lakes and wetlands and to identify the best sites to supply stormwater; and the development of new monitoring techniques to ensure that reused stormwater is safe and fit for purpose. The project will inform adaptive planning and infrastructure readiness at water utilities, guiding Australian policy on stormwater reuse.

Bojan says he is looking forward to sharing the project outputs with Melbourne Water as well as more broadly across the sector. "Through this project, we will have the ability to inform adaptive planning, to future-proof water supplies and to improve Australian policy on stormwater reuse. This will help us to become more resilient to extreme events and provide increased water security."

Below: Centennial Park Sydney stormwater lake

Reducing the uncertainties in characterising and predicting drought impacts

In July Associate Professor Yi Liu , a hydrologist with research interests in using satellite-based observations and model simulations to investigate the hydrological cycle,was awarded an ARC Future Fellowship, to a value of $919,906.00.

A/Prof Yi Liu's research interests are remote sensing in hydrology, looking at global vegetation dynamics, and climate change and extreme events. His Future Fellowship research aims to reduce the uncertainties in characterising and predicting drought impacts on Australian ecosystems.

The work will focus on understanding how vegetation responded to hydro-meteorological conditions from the onset to termination stages during Australian droughts in the past 40 years, by investigating the newly developed first global long-term vegetation water content record from satellites. This will provide significant benefits in developing drought mitigation strategies for national agricultural production and water resource allocation.

Yi's previous research highlights have included the development of a new technique to map changes in the amount of carbon stored in living plant mass (or "biomass") above the ground over the last four decades, by merging vegetation information from several passive microwave satellites. This has allowed Liu and his colleagues to track global changes in biomass from month to month in response to natural, climate related and human activities, something that was not possible before.

Associate Professor Yi Liu

Stephen Foster joins ATSE

CVEN Professor and Dean of UNSW Engineering (2020 -2023) Stephen Foster was among 33 new Fellows appointed to the Australian Academy of Technological Sciences and Engineering (ATSE) in 2023. The Fellows are among Australia's most distinguished engineers and scientists, elected by their peers for ground-breaking research in their fields.

Stephen is an internationally renowned authority in structural engineering whose research focuses on new materials. His contributions include advancements in high-strength reinforcing steels, low-carbon construction materials and ultra-high-performance concretes.

His research directly informs Australian Standards for concrete structures, including a world-first design standard for bridges incorporating steel fibre reinforced concrete. He also spearheaded globally important technical specifications for geopolymer concrete, which is less carbon-intensive than traditional concrete.

Stephen received his PhD from UNSW in 1993, and taught at the School from 1992. He has been Director of the School's Centre for Infrastructure, Engineering & Safety (CIES), Head of the School, and Acting Head of the School of Minerals & Energy Resources Engineering, before becoming UNSW Engineering Dean in 2020. He 'retired' at the end of 2023 to become Emeritus Professor. He remains President of the International Federation for Structural Concrete (fib).

Professor Stephen Foster

NEW CENTRE LEADERSHIP

In September Scientia Associate Professor Fiona Johnson became Director of the UNSW Water Research Centre (WRC), while Associate Professor and ARC Future Fellow Kristen Splinter became the Managing Director of the School's Water Research Laboratory (WRL).

> A/Prof Johnson has over twenty years' experience in hydrology working as a consultant, for government and in academia.

JOHNSON AND SPLINTER are now at the helm of two legendary Australian water research organisations – powerhouses of creative problem-solving teams, with international reputations for their expertise in an immense variety of disciplines.

Both WRC and WRL continuously seek and build connections across a wide range of industry and government organisations.

A/Prof Fiona Johnson is a water resources engineer whose research focuses on flooding and extreme events and the use of global climate models for climate change assessments of water resources systems.

She has over twenty years' experience in hydrology working as a consultant, for government and in academia. She is passionate about water quality, and water equality, and is currently undertaking research projects in the Pacific and Australia.

A/Prof Johnson's vision for the WRC is focused on improving and strengthening connections, including ensuring there are solid support structures for PhD candidates and Early Career Researchers.

Johnson has plans also for increased strategic industry engagement, with a whole-of-centre industry engagement strategy able to showcase WRC's collective strengths.

A/Prof Kristen Splinter is a coastal engineer with over twenty years of applied and fundamental research experience in the fields of coastal processes and hazards. Her research uses physical and numerical modelling as well as field data collection to better understand coastal processes.

With a strong desire to support and encourage more women into the discipline, Kristen has long been an advocate for better gender equity within academia and engineering.

She sees her appointment as "a very humbling opportunity to help foster this great team of both academics and professional engineers and lead us to even bigger and better things."

"As we continue to face the challenges associated with climate change", she says, "I want to see WRL as an Australian leader in innovative water related design."

In November the School's Research Centre for Integrated Transport Innovation (rCITI) was delighted to welcome the appointment of **Dr Divya Nair** as **Deputy Director.**

Divya Nair brings a wealth of expertise to her role, particularly in the realm of transport engineering, operations research, and optimization. Her specialized focus encompasses areas such as freight and humanitarian logistics, transport network design, resilience, sustainability, and disaster management.

Notably, she has collaborated on impactful projects with entities such as SCATS, TfNSW, RMS, SES, NSW Department of Premier and Cabinet, Government of India, Government of Indonesia, and non-profit organizations like OzHarvest and Foodbank.

"I want to see WRL as an Australian leader in innovative water related design."

LEADERSHIP

CONGRATULATIONS

> The 3D-printed building was printed onsite in Macedon Ranges in Victoria using a modular gantry system and an extrusion-based printer

Dr Ali Kashani - National Award in Technology and Innovation

Congratulations to Dr Ali Kashani who, with a team from CONTOUR 3D and Group Architects, won the prestigious National Award of "Excellence in Concrete" in Technology and Innovation awarded by the Concrete Institute of Australia (CIA) at the Concrete 2023 biennial conference in Perth.

The team had developed a new type of concrete which was used for the first 3D-printed building in the southern hemisphere.

The 3D-printed building was printed onsite in Macedon Ranges in Victoria using a modular gantry system and an extrusion-based printer (in which printing mortar is pumped through a hose and extruded from a nozzle). A printable concrete with excellent shape stability after extrusion and high early strength for buildability to support the weight of successive layers was designed and delivered.

Based in the School's Centre for Infrastructure Engineering & Safety (CIES), Dr Kashani is a Senior Lecturer in Sustainable Concrete and 3D printing and a Churchill Fellow in Construction 3D Printing, with extensive experience in research, development, and commercialisation of advanced and sustainable construction materials. He is a founding member of the Researcher Network for Decarbonising the Building Industry (RNDBI).

Em Prof Chris Rizos - Global Impact

Congratulations to UNSW Emeritus Professor Chris Rizos who is the new President of the International Union of Geodesy and Geophysics (IUGG).

IUGG is the global organisation dedicated to advancing, promoting, and communicating knowledge of the Earth system, its space environment, and the dynamic processes causing change. Founded in 1919, the Union is comprised of eight semi-autonomous International Associations, each responsible for a specific range of topics or themes. Amongst many other activities, IUGG scientists have contributed to the United Nations Intergovernmental Panel on Climate Change (IPCC) report.

It is a huge honour for UNSW Engineering and indeed Australia for Em Prof Rizos to be selected to lead the Union over the next four years. The most recent IUGG General Assembly, held in Berlin in July 2023 had over 5000 registrants, thousands of oral or poster presentations, and up to 26 parallel technical sessions.

Em Prof Rizos, a past Head of the UNSW School of Surveying and Geospatial Engineering, is a Fellow and the Past President of the International Association of Geodesy (IAG), a Fellow of the Australian Institute of Navigation, and a Fellow of the U.S. Institute of Navigation.

Emertus Professor Chris Rizos

Australian Honours for John Trinder (AM)

Congratulations to Emeritus Professor John Trinder who was awarded Member of the Order of Australia (AM) in 2023 for his significant service to tertiary education, and to professional associations.

Em Professor Trinder has had a long and distinguished career in research, teaching and senior management at UNSW, and in the leadership of professional societies in Australia and globally.

One of our School's first surveying graduates, John graduated in 1963 with a BSurv (Hons). This was followed by a MSc at ITC in The Netherlands, and PhD from UNSW. He taught at the School of Surveying and Geospatial Engineering (SAGE) at UNSW from 1965 to 1999, progressing to the position of Professor in 1991 and SAGE Head of School from 1990-1999. He served as President of the national Surveying and Spatial Sciences Institute (now the Geospatial Council of Australia) from 2013-2015.

John's teaching and research activities at UNSW spanned more than 50 years, specializing in a range of topics in photogrammetry, remote sensing and spatial sciences. A dedicated teacher and supervisor, he taught his last class in 2019. He published more than 200 scientific papers in journals and conference proceedings and received several awards for his papers.

He made significant contributions to research into the determination of digital elevation models and linear feature extraction from remotely sensed images, and has materially advanced the state of photogrammetric research and development in Australia and abroad.

Professor Trinder has provided leadership and inspiration to hundreds of undergraduate, postgraduate and PhD students who, in turn, contribute to the surveying and geospatial engineering profession in Australia, in Asia, and around the world.

Emertus Professor John Trinder

> "Em Professor Trinder has had a long and distinguished career in research, teaching and senior management at UNSW"

Top 2% in the World

Forty-five School of Civil & Environmental Engineering current and past researchers were represented on the 2023 Stanford-Elsevier lists of the world's most-cited scholars. For so many of our staff to be included on this prestigious list is a powerful testament to the global reach and impact of the research taking place at the School.

The final selection is based on the world's top-cited 100,000 scientists by a composite score or a percentile rank of 2% or above in the researcher's primary sub-field.

Separate lists are created for career-long (up to end of 2022) and for single recent year (2022) impact.

The School is well represented in each list, with both long serving professorial staff and emerging researchers featured.

Congratulations to L-R, Top - Bottom: Em Prof Ian Acworth, Adj Prof Ali Akbar Nezhad, Prof Ryan T Armstrong, Hon A/Prof Mario Attard, Scientia Prof Mark Bradford, Dr Richard Collins, Prof Vinayak Dixit, Em Prof Robin Fell, Prof Stephen Foster, Prof Wei Gao, Em Prof Ian Gilbert, Dr Milad Haghani, A/Prof Ailar Hajimohammadi, A/Prof Ehab Hamed, Dr Ahmed Hammad, Dr Mitch Harley, Dr Ali Kashani, Scientia Prof Nasser Khalili, Prof Stuart Khan, A/Prof Wengui Li, A/Prof Yi Liu, Prof Michael Manefield, Dr Rajeshwar Mehrota, Prof Peyman Mostaghimi, Prof Bing-Jie Ni, Prof Denis O'Carroll, the late Prof Yong Lin Pi, Prof Taha Rashidi, Em Prof Chris Rizos, Prof Adrian Russell, Prof Ashish Sharma, Dr Ayesha Siddika, Prof Chongmin Song, A/Prof Kristen Splinter, Prof Richard Stuetz, Em Prof Francis Tin-Loi, Prof Ian Turner, Prof Brian Uy, Prof Hamid Valipour, Scientia Prof T David Waite, Prof Travis Waller, A/Prof Jinling Wang, Prof Tommy Wiedmann, Dr Maziar Yazdani and Dr Yang Yu.

"Outstanding dedication, exceptional performance, and unwavering commitment to excellence"

Employee of the Year – Denise Lee

Denise Lee, Facilities Officer for Civil & Environmental Engineering was awarded the inaugural Head of School's Employee of the Year Award at the School's End of Year gathering.

Denise had facilitated and project managed the repainting and refurbishment of the School's community spaces, walls and floors and furnishings of corridors, foyers, kitchens and staff meeting areas – a massive job, requiring tenacity, patience, focus and multitasking to the nth degree.

Head of School Prof Nasser Khalili said he was awarding it to Denise for her 'outstanding dedication, exceptional performance, and unwavering commitment to excellence.'

School staff invited into ARC College of Experts

In 2023 Head of School PSM Professor Nasser Khalili and Water Research Centre Professor Bing-Jie Ni were invited to join the Australian Research Council's 2024 College of Experts.

The ARC College of Experts supports the advancement of knowledge, contributes to national innovation, and plays a key role in identifying research excellence for the ARC. Members of the College are experts of international standing drawn from the Australian research community: from higher education, industry and public sector research organisations.

Prof Nasser Khalili is a globally recognised expert in unsaturated soil mechanics and computational geomechanics, and is the Director and Lead Chief Investigator for the ARC Hub - Resilient and Intelligent Infrastructure Systems (RIIS).

Prof Bing-Jie Ni is an ARC Future Fellow working in the field of environmental technology and wastewater treatment, and is a worldwide pioneer in modelling and control of potent greenhouse gases emissions from wastewater management systems.

13 of the 269 members of the 2023 College of Experts are from UNSW - including the School's Director of the Centre for Infrastructure Engineering & Safety (CIES), Professor Chongmin Song who has served on the College since 2022.

Appointments are for a three-year duration, which means that Professors Khalili and Ni will be making it an amazing hat-trick for the School in 2024!

Professor Nasser Khalili

Professor Bing-Jie Ni

Dr Andrew Dansie recognised for Humanitarian Engineering impact.

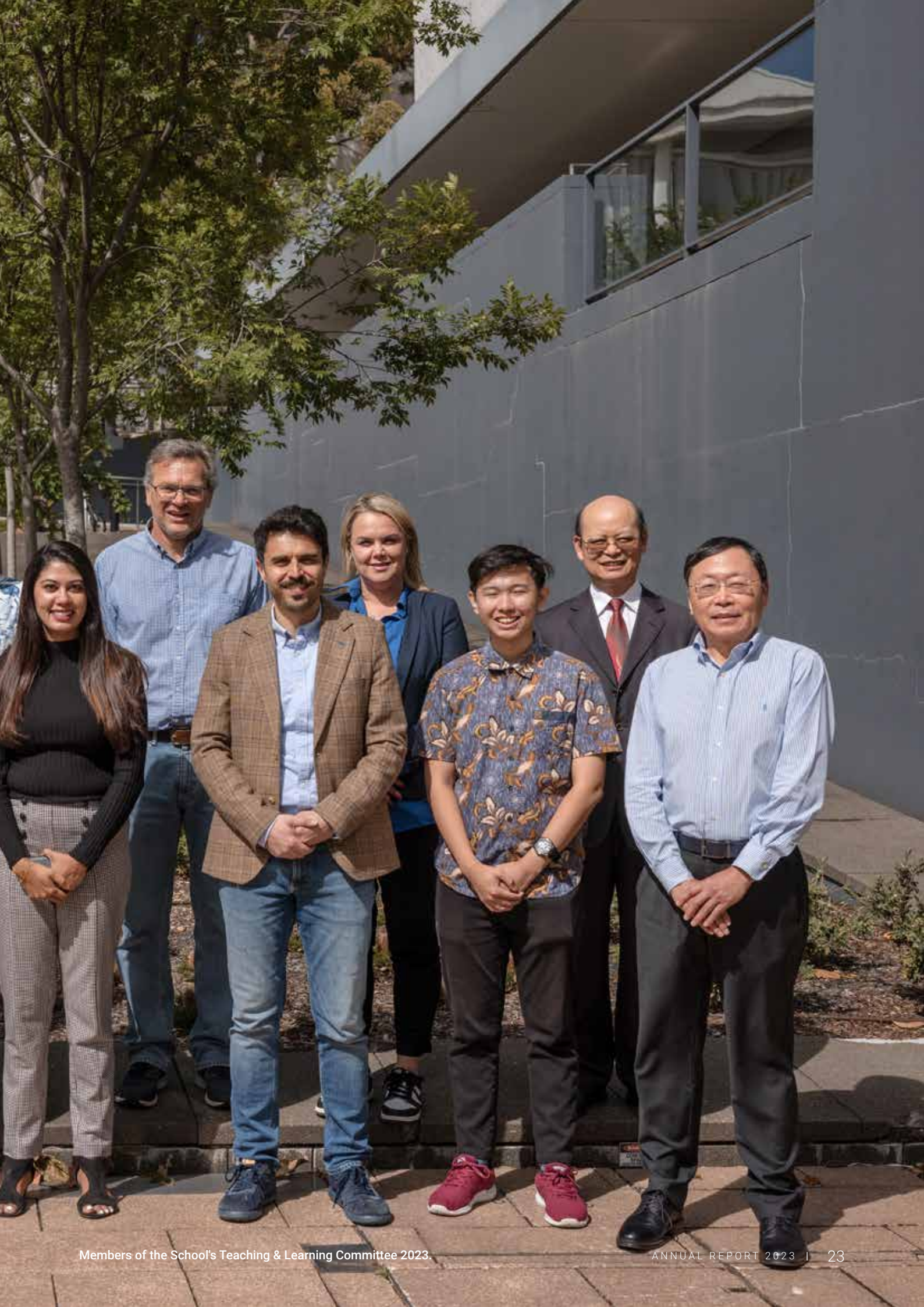
In 2023 Academic Lead of UNSW Humanitarian Engineering Dr Andrew Dansie won a UNSW Engineering Excellence Award for Social Impact. Supported by students from the Faculty of Engineering, Dr Dansie has achieved ongoing impact through Humanitarian Engineering partnerships. In collaboration with Uganda's Gulu University, an ongoing HE student project begun in 2019 seeks to enhance the safety of drinking water in underserved regions of Northern and Western Uganda, where access to clean water remains a critical issue. By implementing sustainable solutions for schools, healthcare centres, and remote communities, the project not only improves public health outcomes but also fosters cross-cultural understanding and promotes global citizenship among participating students.

For more information on the Uganda project – see Our Teaching.

Dr Andrew Dansie

SECTION 2

OUR PEOPLE



Members of the School's Teaching & Learning Committee 2023.

ACADEMIC STAFF

MARTIN ANDERSEN
Associate Professor
MSc in Engineering, PhD DTU, Denmark

Research Interests: Reactive flow and transport modeling, Investigation of geochemical processes and groundwater dynamics in the coastal zone, Surface water groundwater interactions.

ELENA ATROSHCHENKO
Senior Lecturer
MSc in Mechanics and Applied Mathematics, Saint-Petersburg State University PhD in Civil Engineering, University of Waterloo, Ontario

Research Interests: Computational Mechanics and Numerical Methods, with application to fracture mechanics, acoustics, bending and vibration of composite plates.

KHALEGH BARATI
Lecturer
MSc Sharif, PhD UNSW

Research Interests: Automation, Data Sensing, Fuel and Emissions Modeling, Optimization, Sustainability Issues, and their applications in the construction and operation of infrastructure projects.

ASAL BIDARMAGHZ
Senior Lecturer
PhD Civil Engineering (Geothermal Technologies) University of Melbourne

Research Interests: Energy geo-structures and geothermal systems, Investigating the impacts of urbanization on subsurface temperature increase at the city-scale, Uncertainty analysis of large scale subsurface hydro-thermal models.

MARK BRADFORD
UNSW Scientia Professor
BSc BE PhD USyd DSc UNSW FTSE CPEng CEng PE Dist.MASCE FIStructE FIEAust.

Research Interests: High-strength steel structures, steel-concrete composite structures, steel-timber hybrid structures, concrete structures, arches, geometric non-linearity, pavement thermo-upheaval buckling, railway thermo-lateral buckling, design for deconstructability, low-emissions structural paradigms, forensic engineering.

DA (DANIEL) CHEN
ARC DECRA & Lecturer
PhD (Structural Engineering) UQ

Research Interests: Lightweight multifunctional structural forms; Architectured materials; Machine learning aided analysis; Additive manufacturing; Offshore structures. Daniel is best known for his expertise in the development of functionally graded porous structural components. His DECRA project is 'Smart Optimisation of Functionally Graded Porous Structures'.

ULRIKE DACKERMANN
Lecturer
Dipl.-Ing. Univ., Technical University of Munich (TUM), PhD UTS

Research Interests: Structural Health Monitoring, Non-Destructive Testing, Damage Detection, Structural Dynamics, Artificial Intelligence, Timber Engineering.

ACADEMICS

ANDREW DANSIE

Senior Lecturer & Academic Lead, Humanitarian Engineering UNSW

BSc, MSc Flinders, PhD Oxford

Research Interests: Specialising in water resources, water access, air pollution, and the biogeochemistry of dust. Concerned with large-scale environmental systems and international development to meet environmental and social SDGs. Dansie has 18 years of experience in the water and development sector spanning the private sector, the United Nations, universities and an NGO

STEVE DAVIS

Senior Lecturer

Chair, Teaching & Learning Committee

BE PhD UNSW

Research Interests: Online Assessment, Virtual Reality, Project Scheduling, Safety, Construction Defects and Rework.

VINAYAK DIXIT

Professor, Director of rCITI, IAG Chair of Risk in Smart Cities

MT Institute of Technology, Delhi, PhD University of Central Florida

Research Interests: Key research interest lies in studying risk in the transportation infrastructure system as it relates to highway safety, travel time uncertainty, as well as natural and man-made disasters

KURT DOUGLAS

Pells Sullivan Meynink Senior Lecturer of Rock Mechanics, Chair External Relations Committee.

BE (Hons1) USyd, PhD UNSW

Research Interests: Lie in the field of rock mechanics and dam engineering. Predicting field properties of rock masses continues to be a major challenge for us to address. My dams research focusses on spillway erosion and backward erosion of dams.

STEFAN FELDER

Associate Professor

Dipl.-Ing. RWTH Aachen, PhD UQ

Research Interests: Expert in hydraulic engineering and applied fluid mechanics with internationally recognised research in air-water flows, hydraulic structures engineering and fish passage. Pioneered the use of remote sensing technology for flow observations in hydraulic structures.

RUTH FISHER

Senior Lecturer

BASc/BEng USyd, MEngSc PhD UNSW

Research Interests: Education focused academic, Environmental Engineering and Sustainability - research expertise in the sustainability and performance of waste management systems, such as wastewater treatment.

STEPHEN FOSTER

Professor and Dean of UNSW Engineering,

BE NSWIT, MEngSc PhD UNSW, MIEAust, FIEAust

Research Interests: Behaviour of structural systems (buildings and bridges) constructed of reinforced and prestressed concrete. I'm particularly interested in bringing new and advanced materials technologies to the engineering of structures. My interests are in the use of high and ultra-high performance concretes, fibre-reinforced concretes and geopolymer concretes and in use of carbon fibre technologies for strengthening and repair of structures and structural systems. I develop physical-mechanical models for use in advanced computational and numerical tools such as FEM and for their use in the study of behaviour of concrete structures that are subjected to extreme events.

WEI GAO
Professor
BE HDU, ME PhD Xidian, MIIAV, MAAS

Research Interests: Uncertain modelling & uncertain methods: Vehicle-bridge interaction dynamics: Wind and/or seismic induced random vibration: Train-rail-sleeper-foundation-tunnel/ bridge system: Stochastic nonlinear system: Vehicle dynamics & vehicle rollover: Structural optimization & control: Smart structures: Stability & reliability analysis.

LINLIN GE
Professor
BE, MSc Wuhan, PhD UNSW

Research Interests: Professor of remote sensing and earth observation. Integrating radar and optical remote sensing with GPS and GIS, we measure the subtle change on the surface of the Earth with minimum latency using data collected from satellite, airborne and UAV platforms

WILLIAM GLAMORE
Professor
BE UI Boulder Colorado USA, PhD UoW

Research Interests: Primary fields of interest are related to estuarine hydrodynamics and water quality including restoration of estuarine environments, acid sulphate soils, coastal wetlands, boat wake waves, outfall hydraulics and field testing, and related physical and numerical models. William is particularly interested in restoring large wetland and riverine systems.

MILAD HAGHANI
Senior Lecturer & ARC DECRA Fellow
BSc US&T, Tehran, MSc Sharif, PhD U Melbourne

Research Interests: Milad's research and teaching is at the intersect of transport and safety research with a particular focus on human factors. He has undertaken an extensive amount of experimental and theoretical research in the areas of crowd safety, mass emergencies, public safety, public security perception, evacuation planning, pedestrian modelling and simulation, road safety and transport psychology.

AILAR HAJIMOHAMMADI
Associate Professor
Ph.D. University of Melbourne

Research Interests: Examines the chemistry of materials to develop innovative construction elements with attractive properties. She is also investigating waste management and resource recovering strategies towards the circular economy in civil and construction projects.

EHAB HAMED
Associate Professor
BSc MSc PhD Technion

Research Interests: Viscoelastic behaviour of materials and structures, strengthening of structures with FRP composite materials, sandwich panels.

MITCHELL HARLEY
Scientia Fellow and Senior Lecturer
BE/BSc, PhD UNSW

Research Interests: Leading researcher in the field of coastal hazards, wave climates, coastal monitoring and real-time early warning systems.

BRUCE HARVEY
Senior Lecturer
BSurv (Hons1), GradDip HE, PhD UNSW

Research Interests: Dr Harvey's expertise and research interests include: Least Square analysis of surveying measurements; Alternative surveying measurement analysis methods (L1 norm and grid searching); Surveying education; 3D laser scanning; High accuracy surveying; Surveying calculations and computing.

ROBERT HOLDOM
Senior Lecturer

Research Interests: Construction management.

ACADEMICS

ELNAZ IRANNEZHAD
Senior Lecturer
MSc Iran Uni of Science & Technology, PhD UQ

Research Interests: Elli's research contributes to the advancement of science in cross-disciplinary fields, including logistics, supply chain and freight transportation, agent-based modelling, mobility and logistics as a service, automated vehicles, and blockchain technology. Elli endeavours to align her research closely with industry to ensure a good alignment with real-world needs.

FIONA JOHNSON
Director - WRC. Associate Professor & Scientia Fellow
BE, PhD UNSW

Research Interests: Associate Professor Johnson's areas of research and teaching focus on statistical hydrology, particularly with respect to flooding and extreme events and the use of global climate models for climate change assessments of water resources systems. She has a particular interest in solutions to climate and hydrological challenges faced by communities in the Global South and is currently undertaking research projects in Tanzania, Nepal, the Pacific and Australia.

MOHSEN KALANTARI
Associate Professor
BE (Surveying), MEng GIS - UT, Tehran, PhD Geomatics, GradCert Uni Teaching - U Melbourne

Research Interests: Digital Engineering, Space situational Awareness, Geospatial Data, LiDAR, Geographic Information Systems (GIS), Cadastral Surveying, Building Information Modelling (BIM), Land Administration. Mohsen is a co-founder of Faramoon, a geospatial technology company which, amongst other things, converts point cloud data to 3D models.

ALIREZA KASHANI
Senior Lecturer
BSc, MSc Amirkabir University of Technology, Tehran PhD University of Melbourne

Research Interests: Lecturer and Churchill Fellow in Sustainable Construction Automation and 3D Printing with extensive experience in research, development, and commercialisation of advanced and sustainable construction materials. Research areas include development of novel high-performance materials and techniques for construction 3D printing, and sustainable construction materials for the 'Circular Economy' including wastes valorisation, low-carbon construction materials and sustainable concrete.

NASSER KHALILI
UNSW Scientia & PSM Professor
BSc Teh, MSc Birm, PhD UNSW

Research Interests: Mechanics of unsaturated soils: Flow & deformation in double porosity media: Numerical methods applied to geotechnical engineering: Pavement engineering.

STUART KHAN
Professor
BSc (Hons 1) Usyd, PhD UNSW, MIEAust

Research Interests: My research encompasses the fate of trace organic contaminants during conventional and advanced water treatment processes, with a particular emphasis on water recycling applications.

ARMAN KHOSHGHALB
Senior Lecturer
BEng, MEng, Sharif University of Technology, Tehran, PhD UNSW

Research Interests: Mechanics of unsaturated soils, coupled analysis of porous media, advanced numerical methods in geomechanics, modelling discontinuities in porous media, large deformation analysis in geomechanics, stabilisation techniques in computational geomechanics, constitutive modelling of geomaterials, dynamic properties of geomaterials.

TAEHWAN KIM
Senior Lecturer
BSc, MSc KAIST, PhD Purdue USA

Research Interests: Advanced and sustainable infrastructure materials: Thermodynamics in cementitious materials and the modelling of their chemical process: Advanced materials characterization techniques: fundamental understanding of chemo-physical reactions in cementitious materials: Microstructure evolution of cementitious materials: Utilizing natural and waste materials to develop low carbon foot-print materials.

SAMSUNG LIM
Associate Professor
BA, MA (Maths) Seoul, PhD U Texas at Austin

Research Interests: I develop advanced GIS technologies that allow us to improve the way we view, understand, design, plan, manage, analyse, interpret, and extract information such as patterns and trends of big data. I apply GIS to real-world problems and help decision-making in humanitarian engineering problems, including red-flagging of epidemics and natural disaster management

WENGUI LI
ARC Future Fellow & Scientia Associate Professor
PhD Structural Engineering, joint Tongji University / Northwestern University (USA),

Research Interests: Multifunctional concrete and low-carbon construction materials, with a particular focus on smart concrete (e.g., self-sensing, self-healing, hydrophobicity, photocatalysis, energy-saving), recycled aggregate concrete materials and structures, solid waste recovery for construction materials, low-carbon concrete, and CO2 mineralized concrete, concrete nanotechnology, concrete durability, seawater-sea sand concrete materials and structures, fire resistance of concrete, and pavement materials and technology.

YI LIU
Scientia Fellow & Senior Lecturer
MSc Environmental Mgmt, MSc Hydrology - Vrije Universiteit Amsterdam, PhD UNSW

Research Interests: Earth Observation, Ecohydrology, Climate Change & Extreme Events

MEHRISADAT MAKKI ALAMDARI
Senior Lecturer
BSc Sharif, MSc Iran University of Science and Technology, Mech Eng Manitoba, PhD UTS

Research Interests: Structural Health Monitoring, vibration analysis and testing, structural dynamics, inverse dynamic problems, signal processing and data mining. Mehri is on the Executive of the Australian Network of Structural Health Monitoring (ANSHM), and a member of The International Society for Structural Health Monitoring of Intelligent Infra-structure (ISHMII).

MICHAEL MANEFIELD
Professor
BSc, PhD UNSW

Research Interests: Prof Manefield has broad interests in environmental microbiology. Research highlights include the discovery of the first bacterial quorum sensing inhibitors, the development of RNA based stable isotope probing, development of experimental models of activated sludge floc formation, discovery of the world's first chloroform degrading bacterial culture and the discovery of isoprene respiring bacteria.

JAMES MCDONALD
Lecturer
PhD UNSW

Research Interests: Research Fellow in the School of Civil and Environmental Engineering's Water Research Centre (WRC)

DIVYA JAYAKUMAR NAIR
Senior Lecturer
PhD UNSW

Research Interests: My research interests extend but are not limited to, the following topics; Transportation Engineering, Transport Infrastructure Resilience, Traffic Assignment, Network Design, Highway Engineering, Operations Research, Statistical Modelling, Data Mining, Traffic Flow Theory, Autonomous Vehicle, Humanitarian logistics.

PROFESSOR BING-JIE (BRUCE) NI,
Professor and ARC Future Fellow
Ph.D. in Environmental Engineering, University of Science & Technology of China (USTC).

Research Interests: Environmental technology and wastewater treatment, particularly the interface among process engineering, microbial biotechnology, materials science and mathematical modelling to develop innovative and sustainable technological solutions to achieve high-levels of pollutant removal from wastewater with a minimised carbon footprint and maximised energy recovery, in order to transform wastes or wastewater from a troublesome pollutant to a valuable resource and save large quantities of greenhouse gas emissions.

DENIS O'CARROLL

Professor, Deputy Head of School (Research)

BASc Ottawa, MESc Clarkson, PhD U Michigan

Research Interests: Research projects include developing nanometals for contaminated site remediation, investigating the environmental fate and ecotoxicity of nanoparticles released from commercial products, improving the understanding of the fate of nonaqueous phase liquids in the subsurface and developing climate change mitigation measures in urban areas.

DANIEL O'SHEA

Lecturer

BE (Civil), PhD UNSW

Research Interests: Computational Mechanics, Biomechanics, Continuum Mechanics, Hyperelasticity, Advanced Finite Element Methods, Shell Analysis, Fibre-Reinforced Composites. Expert in applied mathematics, computational mechanics, devising models for nonlinear material behaviour, with application to biological tissues and advanced manufactured composites.

AN NINH PHAM

Lecturer and Research Fellow

BE Hons 1, PhD UNSW

Research Interests: Dr An Ninh Pham is a Lecturer and Research Fellow with the UNSW Water Research Centre in the School of Civil and Environmental Engineering. His research interests include: Geochemistry of iron in natural systems; Kinetic modelling of chemical reactions; Acid sulfate soils; Ground water modelling; Water treatment processes.

TAHA HOSSEIN RASHIDI

Professor, Director rCITI'

BSc MSc Sharif UT: PhD UI Chicago

Research Interests: A/Prof Rashidi leads rCITI's Travel Behaviour Modelling Team. Current research areas include: Travel behaviour analysis; Transport planning; Activity-based travel demand modelling; Housing search and land use modelling; Integrated land use and transportation models; Goods movement modelling; Microsimulation Modelling methods for urban activities; potential and capacity of new mobility technologies and social media data; autonomous driving.

CRAIG ROBERTS

Senior Lecturer

BSurv U South Australia, PhD UNSW

Research Interests: As an education-focussed academic, I am interested in the implications of datum modernisation on the geospatial community, leveraging multi-GNSS CORS infrastructure and combining UAV or laser scan data for practical application to surveying and geospatial engineering, understanding the policy implications of new measurement technologies on authoritative geospatial data management, and investigating AR/VR applications.

ADRIAN RUSSELL

Professor

BE, PhD UNSW, PGCert Bristol

Research Interests: Applied unsaturated soil mechanics; Liquefaction of variably saturated soils and tailings; Fundamental modelling of soils linking microstructure to large scale behaviour; Fundamental rock mechanics: Fibre reinforced soils.

MEEAD SABERI KALAEE

Associate Professor

BSc Mashhad, MSc Portland, PhD Northwestern University, Illinois

Research Interests: A/Prof Saberi leads rCITI's CityX research lab which focuses on scientific understanding of cities through modelling, simulation, data analytics, and visualisation. His research interests and experience include traffic flow theory & characteristics, large-scale transportation network modelling, complex networks, pedestrian crowd dynamics and simulation, and urban data analytics & visualisation.

BABAK SHAHBODAGHKHAN

Senior Lecturer

MSc Uni of Tehran, PhD Kyoto University

Research Interests: Computational Geomechanics, Dynamics of Unsaturated Soils, Constitutive Modelling of Geomaterials, Seismic Analysis of Geostructures, Dynamic Soil-Structure Interaction.

ASHISH SHARMA

Professor

BE Roorkee, MTech IIT Delhi, PhD Utah State

Research Interests: Prof Sharma is an engineering hydrologist interested in problems involving hydrological uncertainty. Much of his research has focussed on the impact of climate change and variability on hydrological practice, along with applications related to remote sensing, formulating stochastic approaches, developing hydrological models, and the two big hydrology bread-and-butter problems - design flood estimation + water resources management

JOHNSON XUESONG SHEN

Associate Professor

BEng, MSc Nanjing,
PhD Hong Kong Polytechnic University

Research Interests: Digital Twins, Artificial Intelligence, Smart Sensing, Autonomous Systems, Internet of Things, Mixed Reality, and their applications in the construction, operation, and maintenance of civil infrastructure and built environment.

CHONGMIN SONG

Professor and Director CIES

BE ME Tsinghua, DEng Tokyo

Research Interests: Scaled Boundary Finite-Element Method, Mesh Generation, Dynamic Soil-Structure Interaction, Structural Dynamics & Earthquake Engineering, Fracture Mechanics, Elasto-Plastic-Damage Constitutive Modelling.

KRISTEN SPLINTER

Associate Professor & ARC Future Fellow, Managing Director-WRL

BSc Queens University, Kingston, Canada, MSc Florida, PhD Oregon State

Research Interests: Applied and fundamental research experience in the fields of coastal processes and hazards, engineered wetland design, and coastal structures. Kristen's research uses physical and numerical modelling as well as field data collection to better u It will help remove barriers people with disability face when accessing and succeeding in tertiary education. It also aims to encourage the employment of people with disability at all levels of the University, both in the academic and non-academic spheres. nderstand coastal processes. Her team pioneers the use of remote sensing in the coastal zone, including lidar, UAVs (drones), and video cameras.

RICHARD STUETZ

Professor and Deputy Head of School (Education)

BSc, PhD UNSW

Research Interests: Research is in the fate of contaminants in atmospheric and aquatic systems with specific interests in: Assessment of volatile emissions: Management of emissions from water, wastewater, waste management and intensive animal operations: On-line monitoring water and wastewater quality and process control: Characterisation of complex emissions using chemical and sensorial methods: Reducing environmental impact and annoyance through improved community engagement practices.

DR ADNAN SUFIAN

Senior Lecturer

BE (Civil) & PhD (Civil Engineering), UNSW

Research Interests: Multi-scale and multi-phase mechanics of granular materials. My research aims to develop tools and guidelines so that geotechnical engineers can better handle, manipulate and construct with granular materials, leading to innovative solutions in the development of urban infrastructure.

BOJAN TAMBURIC

Melbourne Water Lecturer and ARC Industry Fellow

BSc, MSc, PhD Imperial College, London

Research Interests: Research to predict and control harmful algal blooms in the environment so as to preserve water quality and aquatic habitats, and how to cultivate algal biomass in order to produce useful products such as biofuels, animal feed and sustainable chemicals. ARC Fellowship to improve the resilience of Australian water supplies by advancing urban stormwater reuse.

ROHIT TIWARI

Lecturer

MEng Indian Institute of Technology,
PhD Uni of Melbourne

Research Interests: Geotechnical Earthquake Engineering, Performance Based Seismic Design of Geo-structures.
Rohit has a strong background in experimental investigations of seismic actions in Earth Retaining Structures and calibration of numerical non-linear material models.

IAN TURNER
Professor and Deputy Head of School (Industry & Innovation)
BSc (Hons) USyd, MEnvEngSc UNSW, PhD USyd

Research Interests: Ian's current research interests include beach groundwater dynamics and sediment transport at the beach face, monitoring of coastal change and impacts of climate variability, coastal erosion control and coastal management, and coastal aquifer hydrogeology. Named by The Australian in 2020 as Australian Leader in the field of Ocean & Marine Engineering, recognising his extensive contribution to coastal engineering.

BRIAN UY
Scientia Professor
BE (Hons 1), PhD, UNSW FTSE, FRSN, FIEAust, FASCE, FICE, FIStructE, FIABSE, FSEI, MAICD, CPEng, CEng, PE, IntPE (Aus)

Research Interests: Brian research has been highly cited in the area of steel-concrete composite structures, steel structures, structural engineering and civil engineering where he is in the top 5% cited of all researchers in all these fields. His current research team's expertise is very multidisciplinary. In the area of welded steel structures, he is using neutron diffraction techniques with senior colleagues at ANSTO and collaborating with physicists and material scientists.

HAMID VALI POUR GOUDARZI
Professor
BE, MEngSc, PhD UNSW

Research Interests: Structural mechanics; Development of innovative hybrid steel-timber-concrete structures with emphasis on sustainability and improved structural performance; Behaviour of structures subjected to extreme loads such as earthquake, impact, blast and explosion: Computational mechanics and non-linear finite element modelling of structures: Constitutive modelling of materials.

DAVID WAITE
Scientia Professor & Executive Director and CEO, UNSW CTET
BSc Tas, GradDip RMIT, MAppSc Monash, PhD MIT

Research Interests: Researcher of international standing who has made a significant contribution to the field of environmental chemistry. Particular expertise in the behaviour of elements such as iron, manganese, copper, silver and uranium in natural and engineered systems. Aims to improve our understanding of natural aquatic systems to enable prevention of environmental degradation as well as development of solutions to challenges in provision of water supply and improving human health.

JINLING WANG
Associate Professor
BSc, MSc Wuhan, PhD Curtin

Research Interests: Global Navigation Satellite Systems - GNSS (GPS, Glonass, Galileo, BeiDou System: Multi-Sensor Integration for Positioning, Mapping and Navigation: Statistical Theory and Its Applications in Positioning, Mapping and Navigation. Research Goals: The development of reliable mathematical modelling and quality control procedures for geospatial mapping and navigation applications.

THOMAS (TOMMY) WIEDMANN
Professor of Sustainability Research
MSc, PhD Ulm

Research Interests: Long-standing experience in integrated sustainability assessment and environmental footprint analysis. My main research question is how to achieve concurrent human and planetary well-being. I develop and apply environmental input-output analysis as part of a holistic concept to life cycle assessment, industrial ecology and sustainable consumption and production research. Recent research interests are related to systems change towards post-growth economies.

PROFESSORS OF PRACTICE

ROBERT CARE
BE, PhD UNSW

Independent consultant and mentor, Dr Robert Care has built and led high performance teams in diverse countries, cultures and economies. He was a leader within ARUP for three decades, both locally and globally. He is currently the Chair of RedR Australia, a leading international humanitarian response agency that selects, trains, and deploys technical specialists.

SHANE GEHA
BE (Civil), PhD, (Town Planning) UNSW

Founding Managing Director of EG Advisory's urban planning business, Dr Shane Geha is one of the leading rezoning experts in New South Wales. He believes that we need to ensure that our urban centres are accessible, liveable and, importantly, affordable.

EMERITUS PROFESSORS

IAN ACWORTH

JOHN BLACK

DAVID CARMICHAEL

ROBIN FELL

IAN GILBERT

MAX IRVINE

MIKE REGAN

CHRIS RIZOS

FRANCIS TIN-LOI

JOHN TRINDER

HONORARY, ADJUNCT, AND VISITING ACADEMICS

HONORARY PROFESSORS

Marshall, Lucy

Waller, Steven Travis

HONORARY ASSOCIATE PROFESSORS

Attard, Mario

Cox, Ron

ADJUNCT PROFESSORS

Deletic, Ana (CVEN)

Nezhad, Ali Akbar (CIES)

Park, Eun-Kee (WRC)

Peirson, William (WRL)

Sullivan, Caroline (WRC)

Zhao, Xiao Lin (CIES)

ADJUNCT ASSOCIATE PROFESSORS

Aldred, James (CIES)

Guan, Jing (WRC)

Lambert, Daniel (WRC)

Lundie, Sven (WRC)

CONJOINT ASSOCIATE PROFESSOR

Wang, Yuan (WRC)

ADJUNCT SENIOR LECTURERS

Blacka, Matthew (WRL)

Crosbie, Nicholas (WRC)

Liu, Wei (rCITI)

Rey, David (rCITI)

Roser, David (WRC)

ADJUNCT LECTURERS

Allen, Cameron (WRC)

Mahmood, Aziz Hasan (CIES)

Zhang, Xiang (CIES)

ADJUNCT ASSOCIATE LECTURER

Duell, Melissa (rCITI)

ADJUNCT RESEARCH FELLOW

Ashmore, David Patrick (rCITI)

VISITING PROFESSORS

McNeil, Sue (rCITI)

King, Ian (WRL)

VISITING PROFESSORIAL FELLOWS

Kearsley, William (SAGE)

Massicotte, Bruno (CVEN)

VISITING FELLOWS

Bai, Hongjuan (WRC)

Barczak, Radoslaw (WRC)

Bibi, Saima (WRC)

Hanson, James (WRC)

Hou, Yanan (WRC)

Huang, Lei (SAGE)

Jian, Sisi (rCITI)

Jiang, Ze (WRC)

Kim, Seokhyeon (WRC)

Liao, Wenjuan (WRC)

Lui, Gough Yumu (WRC)

Prata JNR, Ademir Abdala (WRC)

Shadkam, Elham (rCITI)

Shiran, Gholam (CIES)

Song, Haemin (CIES)

Swarbrick, Gareth Edward (CIES)

Vahab, Mohammad (CIES)

Xu, Bin (CIES)

Yesiller, Nazli (WRC)

Yoon, Hae Na (WRC)

Zhang, Chunhui (WRC)

VISITING JNR RESEARCH FELLOW

Schmid, Johannes (CIES)

RESEARCH STAFF

Centre for Infrastructure Engineering & Safety (CIES)

SENIOR RESEARCH ASSOCIATES

Chhor, Allen

Liu, Xinpei

Mousavi, Mohsen

RESEARCH ASSOCIATES

Al-Damad, Iman Munadhil Abbas

Alnahhal, Mohammed F E

Feng, Yuan

Golnary Ardekany, Farshad

Jayathilaka, Roshan

Kumar, Ankit S

Lakshminarayanan Mohana Kumar

Lin, Gaochao

Salehi Dezfooli, Mojtaba

Siddika, Ayesha

Ya, Shukai

Yazdani, Maziar

Yu, Yang

Zhang, Sen

RESEARCH FELLOW

Chen, Xiaojun

POSTDOCTORAL FELLOW

Henderson, Ian Edward James

Research Centre for Integrated Transport Innovation (rCITI)

RESEARCH ASSOCIATES

Hu, Bohan

Lilasathapornkit, Tanapon

Najmi, Ali

Niu, Chence

Shahriari, Siroos

Water Research Centre (WRC)

ARC DECRA FELLOW & SENIOR LECTURER

Zhang, Kefeng

SENIOR RESEARCH FELLOW

Mehrotra, Rajeshwar

RESEARCH FELLOW

Vogel, Elisabeth

SENIOR RESEARCH ASSOCIATES

Garg, Shikha

Lee, Matthew

Prodanovic, Veljko

RESEARCH ASSOCIATES

Aryampa, Shamim

Chen, Zhijie

Farzanehsa, Seyedeh Zahra

Goodwin, Kylie

Hassan, Md Mahamudul

Hayes, James

He, Calvin

Jiang, Ze

Kinsela, Andrew

Miller, Christopher

Sun, Yingying

Zheng, Zhaozhi

POSTDOCTORAL FELLOWS

Higgins, Philippa Ann

Jian, Jie

Kusumastuti, Cilcia

Sinha, Jhilam

Water Research Laboratory (WRL)

SENIOR RESEARCH FELLOW

Carley, James (Principal Coastal Engineer)

RESEARCH ASSOCIATES

David, Daniel Raj

Khojasteh, Danial

Leaman, Christopher

Liu, Shuang

Ruprecht, Jamie

Vos, Killian

TOPCON

PROFESSIONAL STAFF

SCHOOL OFFICE

ANTHONY DEVER,
School Manager

WARASSAMON KATE BROWN,
Web/IT Coordinator

LAARNI CALUDUCAN,
Health, Safety & Environment Adviser (OH&S embedded)

DENISE LEE,
Facilities Officer (Faculty embedded)

PAULA PLOYSARAK,
Finance & Purchasing Administrator (Faculty embedded) (till October 2023)

DENNIS FERRER,
Finance Officer (Faculty Embedded)

PATRICK VUONG,
Computer Systems Officer (IT embedded)

LUCIA WONG,
Executive Assistant to HoS

MICHELLE GREGOR,
Michelle Gregor, Administrative Officer (Start Oct 2023))

HDR & TEACHING SUPPORT

SUNHEE LIM,
Higher Degree Research (HDR) Support Officer (Faculty Embedded)

KARENNA KENT,
Teaching Support Officer

EMMA COTTER,
Teaching Support Officer

ELLIE WILLIAMS,
Teaching Support Officer

EXTERNAL RELATIONS & COMMUNICATIONS

MARY O'CONNELL,
Digital Content Coordinator (p/t)

TAMARA ROUSE,
Industry Relations Special Projects (p/t)

PATRICIA TESORIERO,
Project Manager, Community Outreach (p/t)

RESEARCH CENTRES

RESEARCH CENTRE MANAGEMENT

UTTRA BENTON,
Manager, Water Research Centre
(till Oct 2023)

MARIA LEE,
Manager, rCITI

BRETT MILLER,
Director - Industry Research, WRL

PAULA PLOYSARAK,
Manager, Water Research Centre
(WRC) (Oct 2023-)

THERESA WISNIEWSKI,
Research Hub Business Manager, RIIS

GRACE ZHU,
Manager, CIES.

RESEARCH CENTRE PROFESSIONAL

ANNA BLACKA,
Scientific Illustration, Graphics &
Communication, WRL & Social Media CVEN

CHRISTINA CHIUL,
Business Development,
rCITI

GRACE CARLINO,
Administrator, WRL

KATIE JACKA,
Publications Officer, WRL

ROSS MATHEWS,
Purchasing Officer, WRL

TECHNICAL STAFF

TECHNICAL SERVICES

LABORATORY MANAGERS

DR ZHEN-TIAN CHANG,
Manager, Randwick Heavy Structures Laboratory

PAUL GWYNNE,
Manager, Infrastructure & Geotechnical Laboratories, Kensington

DR MINH NHAT LE,
Manager, Water Quality Laboratory, Kensington

JULIUS SECADININGRAT,
TRACSlab Manager, rCITI

INFRASTRUCTURE & GEOTECHNICAL LABORATORIES – KENSINGTON

FARJ ELHADAYRI,
Technical Officer

LUIZ PETTERSEN,
Technical Officer

RUDINO SALLEH,
Senior Technical Officer

WILLIAM TERRY,
Senior Technical Officer

CALVIN YUNG,
Technical Officer

WATER LABORATORIES – KENSINGTON

THI SONG THAO LE,
Technical Officer

KELVIN ONG,
Technical Officer

ARTUR ZIOLKOWSKI,
Technical Officer

TECHNICAL SERVICES

HEAVY STRUCTURES LABORATORY – RANDWICK CAMPUS

SANJEEWA HERATH,
Senior Technical Officer

RONALD MONCAY,
Senior Technical Officer

ROYCE QIU,
Technical Officer

GREG WORTHING,
Technical Officer

WRL TECHNICAL STAFF

LARRY PAICE,
Workshop Supervisor

EVAN JENSEN,
Technical Officer

AARON COLUSSO,
Technical Officer

DAVID CLOUSTON,
WorkshopTechnical Officer

ROBERT THOMPSON,
Technical Officer - IT

rCITI

ALIREZA RAEI,
Full Stack Web Developer

SAGE

PETER MUMFORD
Technical Officer (SAGE & rCITI)

DR YINCAI ZHOU,
Professional Officer, SAGE

TECHNICAL

WATER RESEARCH LABORATORY (WRL) PROJECT ENGINEERS

PRINCIPAL COASTAL ENGINEERS

JAMES CARLEY

IAN COGHLAN

PRINCIPAL ENGINEERS

FRANCOIS FLOCARD

ALICE HARRISON

BEN MODRA

PROJECT ENGINEERS

FARID CHAAYA

DANIEL GILBERT

TOBY TUCKER

JONATHAN CHAN

MARGOT MASON

YARRAN DOHERTY

LAURA MONTANO LUNA

WATER

VALE

The School of Civil & Environmental Engineering notes with sadness the passing in 2023 of two of our founding academics – Professor Desmond O'Connor (1926 – 2023) and Dr Ian James Somervaille (1929 – 2023).

EMERITUS PROFESSOR DESMOND O'CONNOR.

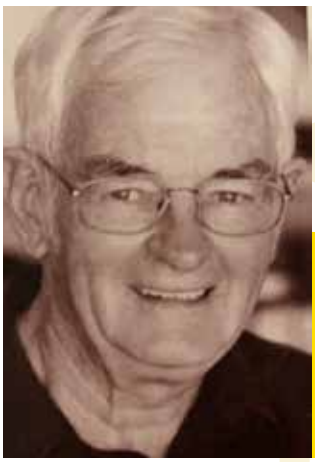
Desmond O'Connor, a licensed surveyor, came to the School in 1954 as our second surveying lecturer. With the launching of UNSW's first surveying degree in 1957, he specialised in photogrammetry. He was considered by the students as one of their best teachers – being 'very meticulous and dedicated.' Indeed, decades later he was still being recalled by alumni for his excellent and practical teaching, lively personality and dapper dress sense. The bow tie particularly remembered!

Desmond completed an ME (then the highest qualification offered) at the School in 1960, supervised by Alan J Carmichael. His topic was 'Improved methods of ground control for photogrammetric work in Australia, with particular reference to barometric altimetry.'

Desmond left UNSW in 1963, and went on to have a brilliant career, first in the United States as Chief of the Environmental Sciences Office for the US Army Corps of Engineers (USACE) before returning home to Australia in 1973. He became a founding professor at WA's Murdoch University. As a key part of the new academy, Professor O'Connor was to establish the School of Environmental Science, which was an entirely new discipline in Australia.

Desmond retired in 1988 but continued to serve his community in a variety of active roles. He was president of the Royal Flying Doctor Service and the Ryder-Cheshire Foundation for the Relief of Suffering, Deputy Chairman of the Environmental Protection Authority, a member of Amnesty International, and served on various government boards connected with the environment.

DR IAN SOMERVAILLE,



Dr Ian Somervaille, who taught and researched in numerical and computational methods in structural engineering, was one of UNSW's longest serving academic staff, working in the School from 1955 to 1997.

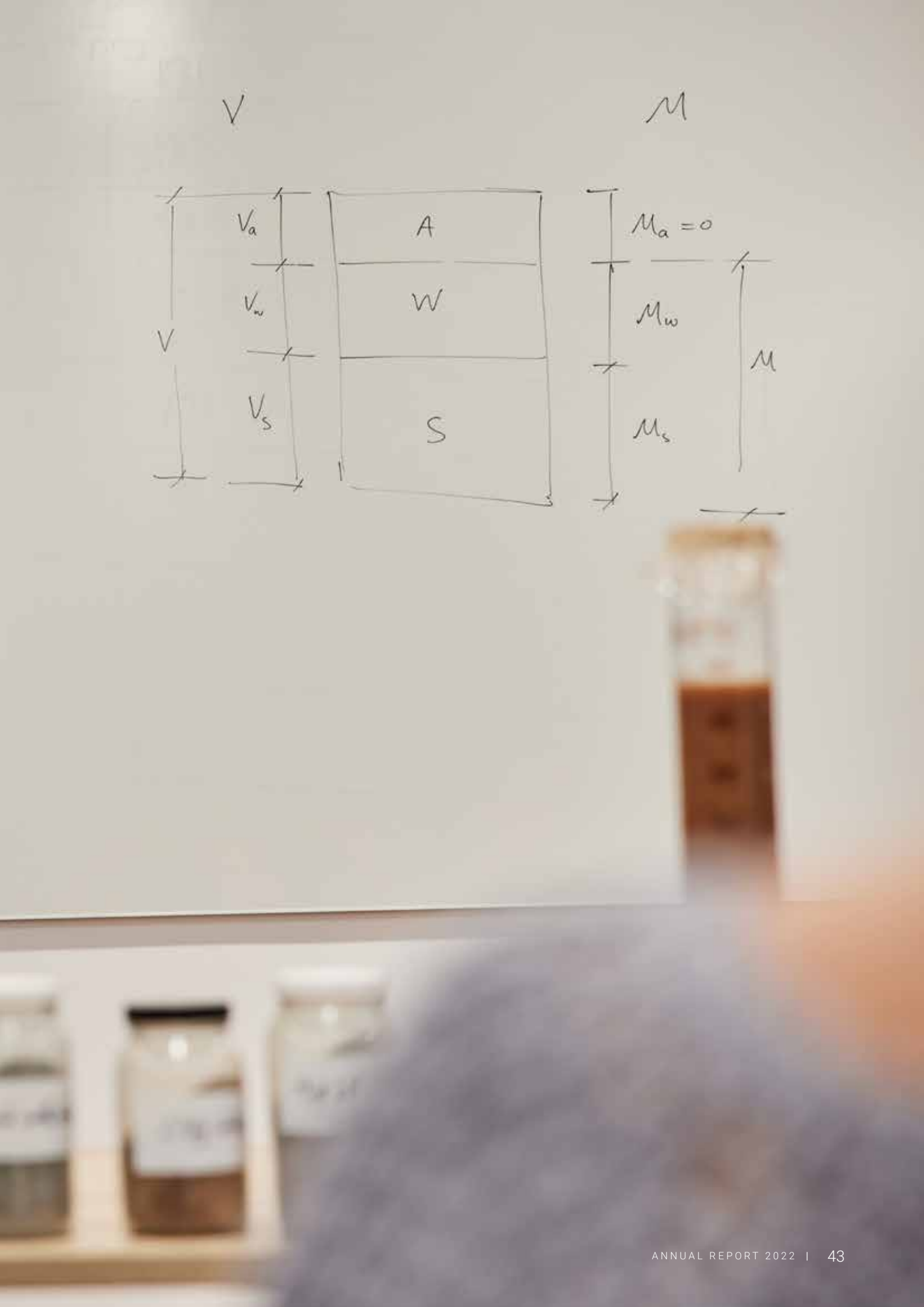
Ian was part of UNSW from its very beginning, graduating with a BE in Mechanical Engineering at UNSW's very first graduation ceremony in 1952. He began as lecturer in the School of Civil in 1955. Later he undertook his PhD in civil engineering, supervised by Al Kabaila, graduating in 1974. His thesis topic was 'Dual analysis of flat plates using the finite element method.'

Ian was actively involved in the Staff Association (which acted as a union) from 1960, and was the Association's President for ten years. He was passionate about staff rights and working conditions. Professor Stephen Foster, Dean of Engineering recalls, 'Ian was a great academic and a leader in computational modelling … and a very active unionist. If my memory is correct, he once got into a bit of strife for jumping on a senior university manager's car at the gate during a protest for improved wages and conditions – this was before Enterprise Bargaining Agreements!'

Ian retired in 1997, and in 1999 when UNSW celebrated its fiftieth year, he received a medal for being the longest serving academic of the university.

SECTION 3

OUR TEACHING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TEACHING & LEARNING COMMITTEE (TLC)

> "The major drive behind the Committee's agenda is to improve the learning experience of students."

THE TEACHING AND LEARNING COMMITTEE (TLC) of the School is responsible for all academic matters relating to all undergraduate and postgraduate coursework programs. These involve encouraging teaching quality, providing teaching aids to staff, monitoring courses through student focus group surveys, interaction with student representatives, and setting policy regarding academic aspects of undergraduate and postgraduate examinations and enrolments. The major drive behind the Committee's agenda is to improve the learning experience of students.

COMMITTEE MEMBERS

STEVEN DAVIS
Chair

RUTH FISHER
Deputy Chair

RICHARD STUETZ
Deputy Head (Education)

ANDREW DANSIE
Co-Year 1 Coord

TAEHWAN KIM
Co-Year 1 Coord

ELENA ATROSHCHENKO
Co-Year 2 Coord

LINLIN GE
Co-Year 2 Coord

ASAL BIDARMAGHZ
Co-Year 3 Coord

DIVYA JAYAKUMAR NAIR
Co-Year 3 Coord

ROBERT HOLDOM
Co-Year 4 Coord

MOHSEN KALANTARI
Co-Year 4 Coord (Surveying)

STEVE DAVIS
Civil Eng Program Coord

BOJAN TAMBURIC
Enviro Eng Program Coord

ROBERT HOLDOM
Civil with Arch Program Coord

BRUCE HARVEY
Surveying Program Coord

ANDREW DANSIE
HE Program Coord

MICHAEL MANEFIELD
Postgrad Coursework

FIONA JOHNSON
Elite Students Coordinator

STEVE DAVIS
Grievance officer

LINLIN GE/JINLING WANG
Industrial Training Coord

ELLIE WILLIAMS/EMMA COTTER
Teaching Support Officers

VICTORIA BUENO
Student Support Officer

TO MACK LI (JAN -SEPT), JENNIFER WANG (SEPT - DEC)
Undergraduate Student (CEVSOC) Rep

ARVIN SUKIWAN
Postgrad Rep

SURVEYING STUDENT MATTHEW BATES won a NSW University Student Project of the year award at the 2023 Excellence in Surveying and Spatial Information (ESSI) Awards for his Honours thesis "Managing Moving Monuments – Using modern technologies to safeguard the cadastre."

Matthew is pictured here with the President of ISNSW Mitch Hanlon and proud fourth year Honours supervisor. Dr Craig Roberts (on right).

Matthew reported that as the thesis explored a vast array of topics, it developed from a nebulous idea into a comprehensive product. "I worked closely with my experienced supervisor to pursue a unique area of study, so as to achieve the most fulfilling result possible."

"I worked closely with my experienced supervisor to pursue a unique area of study, so as to achieve the most fulfilling result possible."

ABOUT OUR DEGREES

The School offers a range of engineering program specialisations in our Engineers Australia accredited degrees.

OUR FLAGSHIP DEGREE, the four-year **Bachelor of Engineering (Honours) (Civil Engineering)** provides students with strong skills and knowledge to enter the civil engineering industry. We also offer

- Bachelor of Engineering (Honours) (Civil Engineering with Architecture)
- Bachelor of Engineering (Honours) (Environmental Engineering)
- Bachelor of Engineering (Honours) (Surveying)
- Bachelor of Engineering (Honours) (Civil)/ Bachelor of Surveying

In 2023 almost a third of our undergraduate students were enrolled in double degrees, which are five-six years in duration. The majority of those students are enrolled in the **Bachelor of Engineering (Honours)/ Bachelor of Commerce.** Also available for our students are

- Bachelor of Engineering (Honours)/ Bachelor of Science
- Bachelor of Engineering (Honours)/ Bachelor of Arts
- Bachelor of Engineering (Honours)/ Master of Biomedical Engineering
- Bachelor of Engineering (Honours)/ Bachelor of Computer Science
- Bachelor of Engineering (Hons)/ Bachelor of Engineering Science (this is a combined degree of Civil & Environmental Engineering)

Humanitarian Engineering

Also available within our Civil and Environmental Engineering degrees is the Humanitarian Engineering Minor (ENGGA2) which covers a breadth of humanitarian activities from disaster response and preparedness to long-term sustainable community development within Australia and overseas. It is a complementary skill to existing engineering disciplines and prepares students to work in challenging and diverse situations to help disadvantaged and disempowered communities and individuals.

POSTGRADUATE COURSEWORK DEGREES

UNSW Master of Engineering

- Master of Engineering (Civil Engineering)
- Master of Engineering (Environmental Engineering)

The UNSW Master of Engineering in Civil Engineering or EnvironmentalEngineering is a two-year full-time postgraduate degree professionally accredited by Engineers Australia. This degree includes an integrated 60 days industrial training component and courses to develop technical knowledge and skills in engineering management, analysis and design.

Students undertake an extensive research project in a specific area of interest, learning valuable skills in project planning and management and the critical analysis, interpretation and communication of results. The structure of the degree also provides the opportunity for students to specialise in an area of interest such as project and construction management, transport, structural or geotechnical engineering, and water resources and wastewater treatment.

UNSW Master of Engineering Science

The MEngSc is a one-two year postgraduate degree designed for students who have a four-year accredited engineering degree, who wish to enhance their careers through cross-training, re-training or increased specialisation. To enable study by industry professionals, many of our courses are offered in the evening, as short course or partially online (blended learning). The MEngSc offers a diverse range of specialisations and subject areas, including:

- Civil Engineering
- Environmental engineering
- Geotechnical Engineering & Engineering Geology
- Project management
- Structural engineering
- Sustainable Systems
- Transport engineering
- Water engineering - Catchment to Coasts
- Water engineering - Water, Wastewater & Waste Engineering

Graduate Diplomas are also available in Civil Engineering, Environmental Engineering, Geotechnical Engineering and Engineering Geology, Project Management, Structural engineering, Transport Engineering, Water, Wastewater and Waste Engineering, and Water Engineering: Catchments to Coasts.

Some **Graduate Certificates** are also offered.

TEACHING STATISTICS

IN 2023 WE ENROLLED 1444 undergraduate and 796 postgraduate coursework in our degree programs. The School also graduated 269 undergraduates and 269 postgraduate coursework students in 2023. Over half of undergrads were enrolled in our flagship degree – the four-year BE (Hons)in Civil Engineering. Another third of our undergrad students were busy with the five-six years double degree programs, the most popular, as usual, being the 5.7 year BE (Hons) Civil/ B Commerce degree.

Ten percent of our undergrad students were enrolled in environmental engineering single or double degrees, while the double degree BE Civil/Surveying which allows students to gain accreditation as both Engineers and Surveyors, has been successful in attracting more students and will hopefully be of benefit to the growing needs of the surveying industry.

UNDERGRADUATE STUDENTS ENROLLED IN 2023	1444		
CIVIL	765	ENVIRO/SCIENCE	8
CIVIL/COMMERCE	189	ADVANCED SCIENCE/CIVIL	7
CIVIL W/ ARCH	175	ADVANCED SCIENCE/ENVIRO	7
CIVIL/SURVEYING	96	ENVIRO/COMPUTER SCIENCE	7
ENVIRO	66	ADVANCED MATHS/CIVIL	7
CIVIL/COMPUTER SCIENCE	46	CIVIL/LAW	3
CIVIL/ENVIRO	23	CIVIL/MUSIC	1
CIVIL/SCIENCE	22	ENVIRO/ARTS	1
CIVIL/ARTS	11	MUSIC/ENVIRO	1
SURVEYING	8	CIVIL/MINING	1

Our MEngSc and ME postgraduate coursework programs continue to provide useful industry focussed training to support career progress and increase in-depth knowledge.

POSTGRADUATE COURSEWORK STUDENTS ENROLLED IN 2023	796		
ME (2 YEAR FULL TIME)	**218**	WATER, WASTEWATER & WASTE ENGINEERING	24
CIVIL ENGINEERING	156	WATER ENGINEERING - CATCHMENT TO COASTS	16
ENVIRONMENTAL ENGINEERING	62	SUSTAINABILITY SYSTEMS	14
MENGSC (1 YEAR FULL TIME)	**557**	**GRADDIPS & GRAD CERTS**	**21**
CIVIL ENGINEERING	129	CIVIL ENGINEERING	6
PROJECT MANAGEMENT	128	GEOTECHNICAL ENGINEERING	10
GEOTECHNICAL ENGINEERING	125	PROJECT MANAGEMENT	1
STRUCTURAL ENGINEERING	56	WATER ENGINEERING - CATCHMENT TO COASTS	3
TRANSPORT ENGINEERING	37	TRANSPORT ENGINEERING	1
ENVIRONMENTAL ENGINEERING	28		

STUDENT INTERVIEW

Student Interview: Jennifer Wong, surveying student

Spatial Source - an independent news service for the Australasian surveying and spatial sectors interviewed one of our students, Jennifer Wong, a first-year surveying student.

Spatial Source: Please tell us a bit about yourself — where you grew up, what your interests are etc?

Jennifer Wong: I've been born and raised in southwest Sydney. In my spare time I enjoy building models and reading… from a journal article to the back of a packet of chips.

SS: How did you become interested in surveying?

JW: During high school, my class was used to pilot a STEM program. And in the process of building Rube Goldberg machines and solar cars, I realised I wanted to do something in the engineering field. At first, I thought civil would be my best bet because structures and construction sites have always fascinated me. But I wasn't quite satisfied with that choice as I was also quite the enthusiast for geography. Luckily, in year 11, a conversation with my grandfather brought me to surveying, and after a bit of research I was immediately hooked. What could be better at marrying the two — engineering and geography — than surveying?

SS: What do you enjoy about learning surveying?

JW: Field work! I don't think there are many degrees, where your classes take you out onto the grass to work with some awesome equipment. The smaller classes are also great for getting to know your classmates and professors.

SS: Tell us something you've learned so far that surprised you.

JW: I think I've been surprised at how fast surveying technology has progressed. During my first year, I had a shock discovering my dad had worked as a survey assistant (I'm surprised I hadn't found this out earlier). And one the of first things he asked about was steel tapes. The emergence and rise in prevalence of robotic jiggers, GPS and laser scanning has happened so quickly. So, it's exciting to think about what will change by the time I graduate.

SS: Do you intend to specialise in a particular kind of surveying once you reach the workforce?

JW: Honestly, I'm not quite sure yet. As a highschooler my understanding of surveying was limited to cadastral work. But my first year of study has opened my eyes to how broad the profession can be. Who knew hydrographic surveying was a thing? I also think GIS is an interesting field. I guess I'll just have to continue working and studying and see what I like.

SS: What would you say to someone who's thinking about studying surveying? Would you recommend it?

JW: Absolutely! I've had a blast so far. Everyone I've met, from surveyors at my work, to industry reps, professors and my fellow classmates have all been wonderful and I've learnt so much from them.

> "I think I've been surprised at how fast surveying technology has progressed."

STUDENT AWARDS

University Medal in Civil Engineering winner Jordan Gois

University Medal in Civil Engineering

The University Medal is one of the most distinguished awards to be bestowed on a UNSW undergraduate. We congratulate our 2023 University Medallist in Civil Engineering, **Jordan Gois**, on his tremendous achievement.

In 2023 Jordan was also awarded the D.N Foster Award issued by Engineers Australia's National Committee on Coastal & Ocean Engineering.
Jordan now works for leading geotechnical engineering company PSM as a surface water engineer.

Deans Awards 2023

The UNSW Engineering Dean's Awards are designed to recognise the Faculty's high-achieving students – for undergraduates those who have a minimum High Distinction average (an overall cumulative myUNSW WAM of 85). In 2023 Deans Awards were received by three Civil & Environmental Engineering students:

Clarissa Lan Lu

Xuantao Lin

Rachael Hoi Kiu Ng

Shibo Jian and family with academics Craig Robert, Jinling Wang, Ashish Sharma

Undergraduate 2023 Prizes

The Alexander Wargon Prize:
For the best performance in the Structures Discipline in the Bachelor of Engineering in Civil Engineering degree program. **2023 Winner: Ho Kyeong Lee**

The Australian Steel Institute Undergraduate Steel Design Prize:
For the best performance in CVEN3301 Structural Analysis and Modelling and CVEN3302 Structural Behaviour and Design. **2023 Winner: Tsz Ling Tang**

The BOSSI Medal:
For the most outstanding performance in the final year of the Bachelor of Surveying and Spatial Information Systems. **2023 Winner: Thomas James Maile**

The Crawford Munro Memorial Prize:
For the best performance in CVEN3501 Water Resources Engineering.
2023 Winner: Shibo Jian

The Engineers Australia Civil and Structural Engineering Prize:
For the best performance in structural design in the final year of the degree.
2023 Winner: Yiyang Liu

The Full Time Class of 1962 Civil Engineering and Surveying Alumni Prize:
For the highest WAM at the end of 3rd Year to a local female in the School of Civil and Environmental Engineering **2023 Winner: Olivia Adams Bourke**

The Geospatial Council of Australia Prize:
For the best performance in remote sensing and Photogrammetry courses in the Bachelor of Engineering in Surveying and Spatial Information Systems program.
2023 Winner: Claire Warren

The Geospatial Council of Australia Prize winner Claire Warren

The Institution of Surveyors New South Wales Prize:
The best performance by a graduating student in the Bachelor of Engineering in Surveying and Spatial Information Systems program
2023 Winner: Thomas James Maile

The Jacob N Frenkel Prize:
For the best achievement in Civil Engineering for a first year student.
2023 Winner: Hoi Kiu Rachael Ng

The Maurice Maughan Prize:
For the best student with the best total marks in GMAT2500 and GMAT2550.
2023 Winner: Xiaowei Zhang

The Maurice Maughan Prize winner Xiaowei Zhang

The R S Mather Memorial Prize:
For outstanding performance in Geodesy courses in the Bachelor of Engineering in Surveying and Spatial Information Systems program.
2023 Winner: Zachary Aubourg

The Weld Australia Prize:
For the best performance in CVEN3303 Steel Structures.
2023 Winner Chenxiao Xu

Industry-Sponsored CVEN Final Year Prize Winners - 2023

At the annual Fourth Year dinner, the following Prizes were awarded to outstanding fourth or final year students.

The Civil and Environmental Engineering Civil with Architecture Discipline Prize:
Alexander Vorstermans - Sponsored by ARUP

The Civil and Environmental Engineering Construction Management Discipline Prize:
Kirusan Subakaran – Sponsored by Qubist

The Civil and Environmental Engineering Environmental Discipline Prize:
Mitchell Gertos - Sponsored by Turnbull Engineering

The Civil and Environmental Engineering Geotechnical Discipline Prize:
Pradyun Hazarika - Sponsored by PSM

The Civil and Environmental Engineering Practice Prize:
Kieran Sorensen - Sponsored by Keller

The Civil and Environmental Engineering Structures Discipline Prize:
Ho Kyeong Lee - Sponsored by Aurecon

The Civil and Environmental Engineering Surveying Discipline Prize:
Benjamin Hutchinson - Sponsored by RPS

The Civil and Environmental Engineering Water Discipline Prize:
Dominique F Djaidiguna - Sponsored by Jacobs

The Institution of Surveyors New South Wales PrizePrize winner Thomas James Maile

The R S Mather Memorial Prize winner Zachary Aubourg

Professor Steven Davis

> Steve is an Education-Focussed academic, a category introduced at UNSW in 2017 for passionate and innovative educators

Teaching Staff Profile – Dr Steven Davis

Dr Steven (Steve) Davis has been Chair of the School's Teaching and Learning Committee (TLC) since 2013. He has been a leader in managing, supporting and improving one of the School's core functions - the education of thousands of budding civil and environmental engineers. The TLC team constantly investigates teaching practices, seeking innovation and stimulating discussion between colleagues. It is also a meaningful interface between students and academics.

Winner of the Vice Chancellor's Award for Teaching Excellence in 2014, Steve is an Education-Focussed academic, a category introduced at UNSW in 2017 for passionate and innovative educators, and is a keen builder of the EF community in the School and across campus.

The greatest benefit of a stronger educational focus is the enrichment of the student experience at UNSW. "We care about excellence in education," Steve says. "We want to do a really exciting job for our students." As Chair of the TLC, he says he feels "privileged to see the amazing things that different members of staff in the School are doing in their teaching."

Steve himself teaches construction and project management at both undergraduate and post graduate levels. Expert in areas such as cost, time and risk, his courses attract a wide range of local, international and distance students. For over ten years he has coordinated the immensely popular Project Management stream of the Faculty's Master of Engineering Science.

Developing his own online software since 2011, Dr Davis has been able to enhance student learning, exposing the classroom to real world problems in today's construction industry and challenging commonplace practice, assumptions and beliefs in order to identify and address deficiencies in industry modelling standards.

He has translated his expertise in construction computing directly to the classroom, guiding students in the art of graphic modelling to solve some of engineering's most complex problems and providing them with an invaluable foundation in comprehensive model building skills.

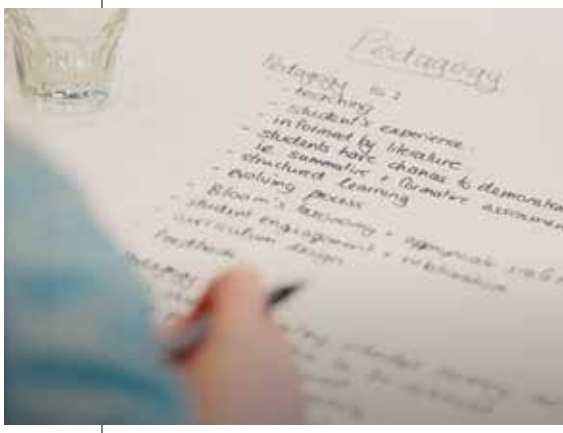
Steve is acutely aware that different cohorts of students have different needs. His experience in distance and online learning came in handy when due to the COVID-19 outbreak, universities around the world had to make a sudden shift towards online teaching on a mass scale, using digital technologies such as light boards, online polling and other interactive tools. Yet, for Steve, teaching and learning is still all about communication and engagement.

"I'm a great believer in the importance of the social dimension in the business of teaching and learning." Steve says. "It is a well-established fact that students learn better just by being together in a classroom. It is being with one another that reinforces the importance of what they are doing."

As studies also keep showing, students need to regularly attend lectures and tutorials to get better marks. But, as pointed out in a recent paper published by Steve and construction management teaching colleagues, successful learning is not just about attendance, it is about engagement.

He and other TLC colleagues at the School have just submitted a paper to the 8th International Academic Conference on Education in Oxford about the dimensions, indicators and measurement of student engagement. Their findings emphasize the complexity of student engagement and the necessity for a multi-dimensional approach in both measurement and advanced technology-oriented pedagogical strategies to enhance student learning outcomes.

At the 2023 Education Focussed Academics Retreat, Steve was one of two academics videoed throughout the retreat to show their experiences. Check it out at https://www.youtube.com/watch?v=yaGyhrhnx0g



> "I'm a great believer in the importance of the social dimension in the business of teaching and learning."

2023 CEVSOC REPORT

Over the course of 2023, the Civil and Environmental Engineering Society of UNSW (CEVSOC) grew significantly, undergoing structural changes into four new workstreams:

- **Development** – responsible for industry and academic events;
- **Socials** – responsible for all student social events;
- **Community** – responsible for building up the internal CEVSOC community; and
- **Marketing** – the creative backbone responsible for the online marketing materials, published student guides, and merchandise run by the society.

Under the development portfolio, CEVSOC is well-renowned for events with long-standing industry partnerships, such as the:

- **Careers Fair** – an opportunity for all partner companies to unpack internship and graduate pathways with our students, where we had close to 500 registrations;
- **Women in Civil** – an event held in June which centred around the female perspective within industry, raising awareness, and promoting female mentorship within industry; thanks to participating industry partners, Arup, Beca, Downer, Laing O'Rourke, and PSM. (Image above)
- **Industry Mentoring Program** – where students are partnered up with an industry mentor over a longer-term over the year, allowing them to connect and learn invaluable career skills.

The community team has been built with a dedicated focus on uplifting the internal CEVSOC community, with highlights such as:

- **First year camp** – held in March 2023 at AGH Camp at Douglas Park- a wonderful opportunity for first year students to connect directly with older civil and environmental engineering students; and
- **Pride in engineering** – an event hosted to uplift LGBTQI+ individuals within the community as well as provide opportunities for networking, raising awareness and advocacy.

The social portfolio ran several well-received events including:

- **Halloween party** – a fun social event for students; and
- **Final Year Dinner** – a graduation dinner for any graduating civil or environmental or surveying engineering students, and a chance to reward thesis students for outstanding work with thesis prizes worth $1000.

Last but certainly not least, the marketing portfolio has helped:

- **Launch the new website** – a crucial one-stop-shop for students to view the Job Board with upcoming placement opportunities, and publications, such as the First Year Guide, Academic Guide; and
- **Organise the big merchandise drop** that brings in much-needed revenue to help the society operate.

In October the 2023 CEVSOC Executive Team proudly handed over to the new executives, who have grown the society to a record 68 total members this year, all working behind the scenes to build up a rich internal culture, and trickle-down positive effects for the students of the Civil and Environmental School of Engineering.

Wishing the new team all the very best,

2023 CEVSOC Co-President Annikka Burge

2023 CEVSOC Co-President Annikka Burge

2023 CEVSOC Co-President Maddy Clacy

EXECUTIVE COMMITTEE MEMBERS

2023

ANNIKKA BURGE/ MADDIE CLACY
Co-president

JESSICA ZHU
Treasurer

SADIA KHAJA
Arc Delegate

LACHLAN HO
Vice President (Community)

DOMINIC UNG
Vice President (Development)

MICHAELA BEARDSELL
Vice President (Marketing)

MICHAELA BEARDSELL
Vice President (Socials)

2024

DOMINIC UNG/ SUE KIM
Co-president

SISSI ZHU
Treasurer

JUSTIN NONIS
Arc Delegate

AKSHARA YOGESVARAN
Vice President (Community)

ARJUNA EDIRISINGHE
Vice President (Development)

JANICE LI
Vice President (Marketing)

JORDAN YIN
Vice President (Socials)

DROUGHT RESISTANCE UGANDA STUDENT-LED PROJECT

The UNSW Drought Resistance Uganda Student-led Project began in 2019, building on existing partnerships within UNSW's Humanitarian Engineering (HE) Project course, coordinated by HE Lead Dr Andrew Dansie.

> "More than 20 million Ugandans do not have access to a safe drinking water source."

Sadia Khaja

Sarina Ulrich

MORE THAN 20 MILLION UGANDANS do not have access to a safe drinking water source. There is a real and pressing need for reliable low-cost long-lasting water treatment systems that can ensure accessible and safe purified water to local communities.

DRU collaborates with local Ugandan organisations including the Africa STEM Education Initiative (ASEI), Gulu University and the Love Mercy Foundation (LMF) on various projects including agricultural irrigation systems and water filtration solutions.

The multidisciplinary team of undergraduate students met weekly, working closely with their in-country partners via Zoom, to develop a water purification system that uses UV-C LED light and a two-stage pre-filtration system using a cartridge of micron yarn and charcoal.The team also assessed the broader challenges that restrict effective water treatment processes for remote point of use systems.

Following over two years of remote collaboration with our partners, in May 2023 an excited team of eight Engineering students headed off on a two-week trip to Uganda with a very packed schedule.

On the trip were two Environmental Engineering students Sadia Khaja and Sarina Ulrich – both completing Humanitarian Engineering Minors within their BE.

Sadia has a passion for sustainable development through improving water, sanitation, and hygiene (WASH) services for all, while Sarina is passionate about , climate resilience, food security and international development.

In a video made with UNSW, (https://www.youtube.com/watch?v=Gck3Bu5Jioc) the students reported back on their trip:

"With water scarcity issues on the rise, the focus for the trip was to conduct relevant field research, as well as engage with as many different stakeholders as possible. The months leading up to the trip were spent researching various agricultural practices, prototyping our UV-C water filtration device, preparing for troubleshooting weather stations in-country, organising taking equipment over, and of course planning our trip activities.

We started our trip in Fort Portal. We finally got to meet the ASEI team in person, and piece together the micro factory system with our UV-C prototype. The system is designed to use UV-C light and a charcoal and cotton filter to treat water with E. coli and theoretically produce clean water. Our next goal was to put it to the test! We tested samples from three different water sources for turbidity and E. coli and the results were very promising. Our UV-C filtration device had a 96% efficiency rate in reducing E. coli CFUs/100mls.We also set up 3-D printers, to increase the

> ASEI runs a variety of different programs and workshops at Kyebambe Secondary School, a boarding school in Fort Portal for girls aged 16 to 19 years old.

ASEI team's accessibility to piping components that aren't readily available in-country by allowing them to print out the components themselves."

ASEI runs a variety of different programs and workshops at Kyebambe Secondary School, a boarding school in Fort Portal for girls aged 16 to 19 years old. They facilitated a DRU visit to the school to speak about their experiences studying engineering and to encourage the local girls to pursue careers in science, technology, engineering and mathematics (STEM). In the school outreach everything from gender roles to traditional beliefs and the differences and similarities to life in Uganda and Australia were discussed. "It was an amazing exchange, and the time spent with the girls definitely remains a highlight of the trip".

DRU also visited the Kyaka II Refugee Settlement to engage in knowledge exchange activities on water supply and treatment with support from The Office of the Prime Minister and Oxfam.

It wasn't all work – "After each day's work we spent the afternoons together with the ASEI team doing local sightseeing, beautiful hikes and even a Safari!"

After farewelling Fort Portal, the students travelled 400 kms to Lira to work with the Love Mercy Foundation, an Australian – Ugandan organisation whose projects increase access to food security, healthcare, clean water and income generation for thousands of families in northern Uganda. While there the DRU team conducted field studies in health centres, visited community plots, and had lots of insightful discussions.

Being involved with DRU, says Sadia, 'has shown me the impact engineers can have on a society. And that what we learn in the classroom can help solve real world problems. It teaches you to be agile, the value of interacting with people with different perspectives, the importance of working in a team and that you never know when the fluid mechanics will come in handy."

"These two weeks were valuable experiences and so on behalf of DRU we thank everyone that made this unforgettable trip happen."

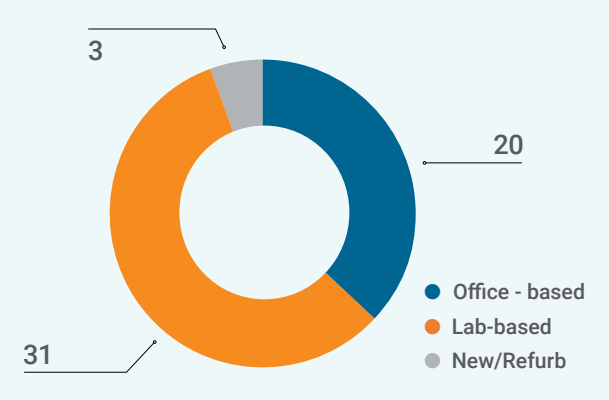
"A special thank you to our partners Alicwamu Moses, Assoc. Prof. Davy David Okello Owiny, Collins Okello, Rebecca Lloyd, Jimmy Okullo, Florence Ademun, and our wonderful companions Pius and Ceaser!"

Top left to bottom right: Sanmugi Sivakumar, Dr Andrew Dansie, Rebecca Lloyd (CEO of LMF), Sarina Ulrich, Thomas Larcombe, Advaita Nitturkar, Syed Zafar, Franco Prego, and Sadia Khaja.

TRAILBLAZING IN PROACTIVE SAFETY

The School of Civil and Environmental Engineering puts the safety of its students, staff and visitors as its top priority. 2023 proved to be another great year for safety achievements and milestones particularly focusing on strengthening the School's proactive safety culture.

WORKPLACE INSPECTIONS CARRIED OUT IN 2013

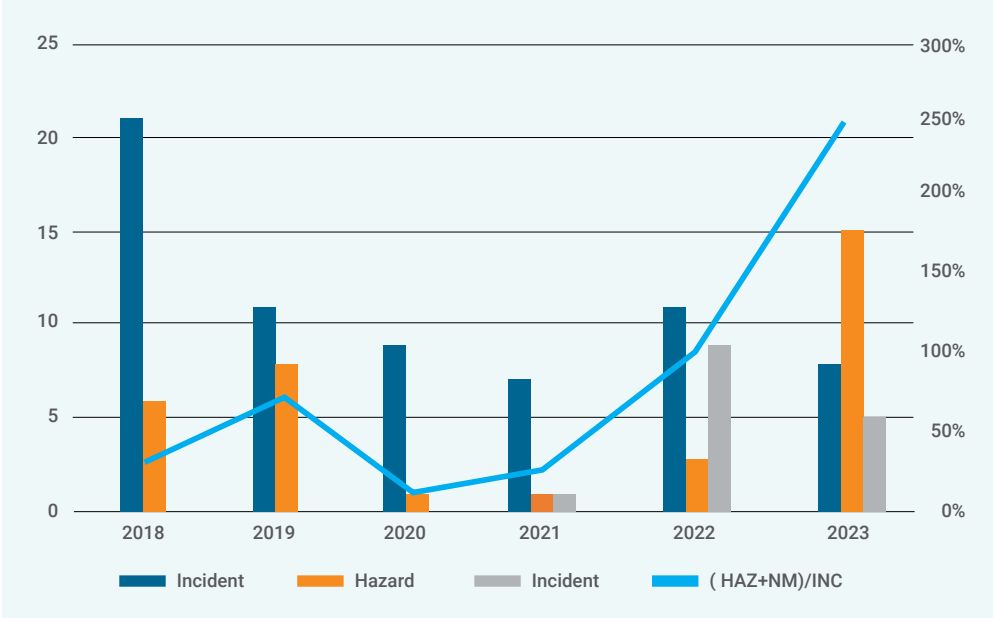


All scheduled laboratory and office-based workplace inspections were carried out by the School in 2023. Laboratories were inspected six-monthly while offices were inspected annually. Three new or refurbished laboratories were also inspected before they were put into operation. Here's a breakdown of the number of inspections carried out for the year:

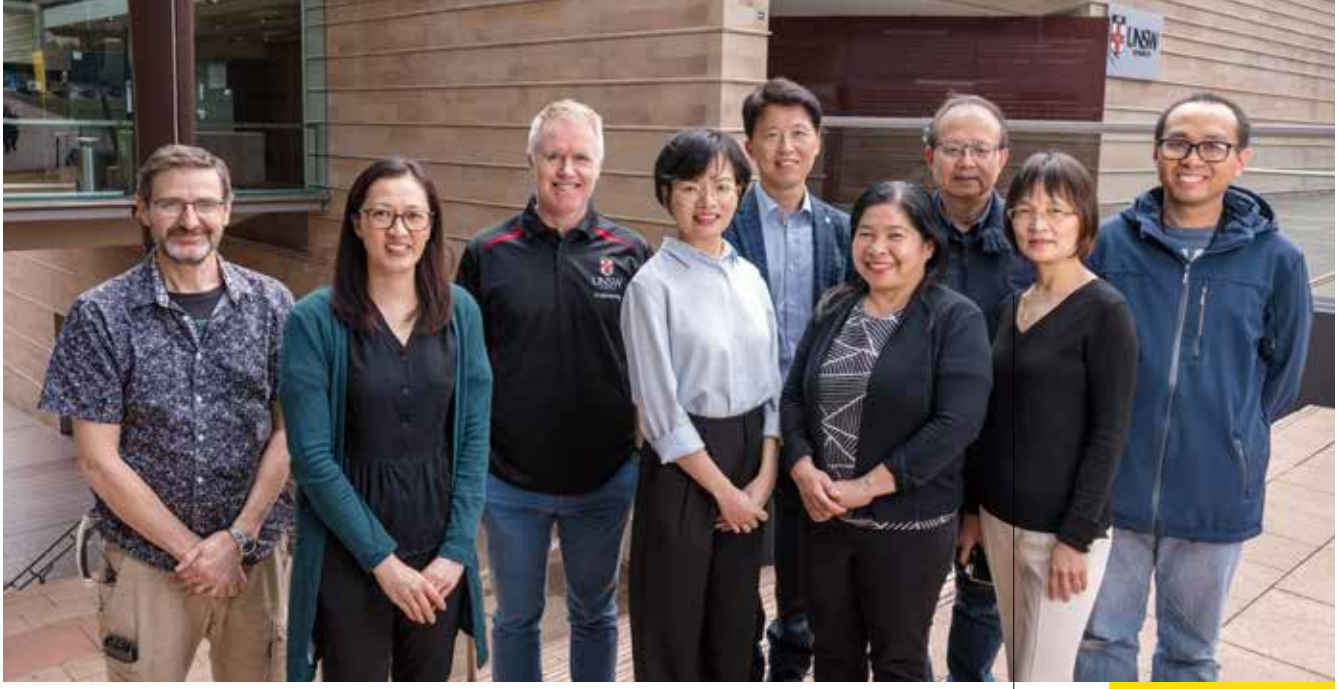
A total of 192 action plans were raised during these inspections. This means that the School was able to recognize and correct 192 safety hazards through planned inspections before these contribute or result in accidents.

The trend of hazard and near-miss reporting is also progressively improving within the School. This graph shows the number of incidents reported versus the hazards and near-miss reporting.

REPORTING RATE - INCIDENTS VS NEAR-MISS & HAZARD



Notwithstanding the COVID pandemic data, where far less people were actually on campus, the number of incidents is declining. Conversely, the number of reports of hazards and near-misses are increasing. This shows the improved awareness and empowerment of staff and students in reporting hazards and near-misses.



School staff and students forged ahead in understanding and adapting Salus, the new cloud-based safety management software package installed to meet UNSW's safety needs and ensure the University met its compliance obligations.

A series of awareness training sessions were organised for different key stakeholders including staff and students. The School's intranet was also updated to include Salus use. By the end of the year, 599 Risk Management Forms and 378 Safe Work Procedures were published by the School. A total of 977 safety documents were successfully transitioned and published from Safesys, (the previous safety management system) to Salus, which is one of highest in the whole of UNSW.

All of these were made possible thanks to the support of the School management and the active involvement of our Level 3 Health and Safety Committee.

Report by Laarni Caluducan

> "All scheduled laboratory and office-based workplace inspections were carried out by the School in 2023."

L3 HEALTH AND SAFETY COMMITTEE MEMBERSHIP

PAUL GWYNNE INF REP
Chairperson

LAARNI CALUDUCAN WHS ADVISOR
Secretary

FRANCOIS FLOCARD WRL REP
Deputy Chair

DENIS O'CARROLL HOS RESEARCH
School Management

REPRESENTATIVES

ZHEN-TIAN CHANG
Heavy Structures (R9)

YINCAI ZHOU
SAGE

JULIUS SECADININGRAT
rCITI

MINH NHAT LE
WQL

PAULA PLOYSARAK
WRC

GRACE ZHU
CIES

ALEX ONG
iCinema

SAMSUNG LIM
Academic Rep

DENISE LEE
Admin Rep.

SARA FAZELI
Postgrad Rep

ARJUNA EDIRISINGHE
Undergrad Rep

ANNIKKA BURGE
Undergrad Rep

THI SONG, THAO LE

SAFETY

SECTION 4

OUR RESEARCH

RESEARCH MANAGEMENT COMMITTEE (RMC)

THE SCHOOL'S RESEARCH MANAGEMENT COMMITTEE (RMC) is responsible for setting research policy, enhancing research activity and output, administering the School's research budget, managing all aspects of postgraduate research student activity (including processing applications, monitoring progress, assessment and examination), monitoring and improving School publications and grant income, maintaining an active seminar program, promoting School research and generally raising the research profile of the School.

RMC continues to renew and invigorate our laboratory infrastructure to ensure CVEN labs are leading edge. In 2023 RMC provided equipment funding support for a group of researchers led by Andrew Dansie to monitor air quality throughout the Pacific Islands, as well as a team led by Stefan Felder to quantify energy dissipation in dam spillways.

> "RMC continues to renew and invigorate our laboratory infrastructure to ensure CVEN labs are leading edge."

COMMITTEE MEMBERS

DENIS O'CARROLL
Chair

EHAD HAMED
Deputy Chair/ Postgrad Research Student Coord.

ADRIAN RUSSELL
Geotech Rep.

AILAR HAJIMOHAMMADI
ECA

BOJAN TAMBURIC
ECA

MEHRI MAKKI ALAMDARI
ECA

CHONGMIN SONG
CIES Director

JINLING WANG
SAGE Rep.

JOHNSON SHEN
Construction Rep.

MICHAEL MANEFIELD
WRC Rep.

MITCHELL HARLEY
HDR Admissions/WRLRep.

TAHA RASHIDI
rCITI Rep

WEI GAO
Structure Rep

GRACE ZHU
Admin

RMC

ARC DISCOVERY PROJECTS

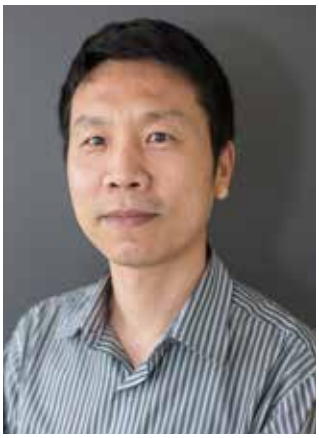
Congratulations to Associate Professor Martin Andersen, Professor Wei Gao, Dr Matthew Lee, Dr James McDonald, Dr Ali Najmi, Professor Denis O'Carroll, Associate Professor Taha Hossein Rashidi, Professor Ashish Sharma, Professor Chongmin Song, Professor Brian Uy and Scientia Professor David Waite for their Discovery Projects awards in 2023.

Fuller details:

Professor Wei Gao; Professor Dong Ruan; Associate Professor Zhen (Jeff) Luo
DP240102559
Award: $519,537.00

Title: Experiment-numerical-virtual Generative Design for Nondeterministic Impacts.

Summary: This project will establish an advanced nondeterministic design methodology to uncover the optimised material properties and 3D printed metastructural capacity in real-time against impact loading. It will develop a rigorous framework that integrates numerical simulation, experiment, and machine learning-based virtual modelling to tackle practical challenges in design and manufacture of impact-proof materials and structures with intrinsic uncertainties. The generative design-calibration system unifying experimental-numerical-virtual processes will largely reduce the need for repetitive large-scale experimental tests. This project benefits civil, aerospace, automotive, and defence with competitive advantage through technological innovation.



Professor Wei Gao

Professor Denis O'Carroll; Professor Stuart Khan; Professor Clare Robinson; **Associate Professor Martin Andersen; Dr Matthew Lee; Dr James McDonald**
DP240101865
Award: $400,573.00

Title: Impact of redox condition on emerging contaminants fate.

Summary: This project aims to improve our ability to predict the environmental drivers that control the fate of contaminants of emerging concern in the subsurface. Emerging contaminants are a concern due to their potential negative ecosystem and health outcomes. Prediction of their environmental fate will be of benefit as it will help ensure the safety of our drinking water sources and ensure that water sources are fit for purpose. With increasing pressure on our precious water resources prediction of the risks to this resource is essential. Expected outcomes are of significance as they will include a much improved ability to predict and control the ultimate fate of emerging contaminants in our water sources.

Professor Denis O'Carroll

Professor Taha Hossein Rashidi

Professor Taha Hossein Rashidi; Professor John Rose;
Dr Ali Najmi; Professor Dr Eric Miller; Dr Joshua Auld
DP240102648
Award: $491,742.00

Title: Integrating land use, market equilibrium, and transport for city planning.

Summary: This project is significant because it offers a comprehensive travel demand modelling platform that provides realistic, robust, and self-consistent metrics for transport infrastructure planning addressing contemporary changes in the transport system. The expected outcomes of the platform are incorporating recent advances in activity-based methods for travel demand modelling, developing a dynamic and integrated system for modelling short- and long-term household decisions, and creating a systematic calibration mechanism to handle the large-scale model. The benefits of this platform to the Australian transport industry and authorities will be demonstrated in use cases to design and optimise pricing for a multiplayer transport network.

Professor Ashish Sharma

Professor Ashish Sharma; Professor Rory Nathan; Dr Conrad Wasko;
Dr Kenneth Kunkel
DP240101365
Award: $399,260.00

Title: Rare Event Simulation: Protecting vital infrastructure from flood extremes.

Summary: This research aims to develop Rare Event Simulation to quantify the future risk of very rare to extreme floods. Expected outcomes include a framework for the design and maintenance of critical Civil Engineering infrastructure such as dams, extrapolation of extreme storm events beyond the observed record, and an assessment of change in rare flood risk across Australia. The significance of this world-first research lies in adapting rare event simulation techniques that have only been applied to computer system failure before, to water engineering design. With Australian riverine flooding projected to cause $170 billion in losses by 2050, the benefit of this proposal in reducing future infrastructure damage costs and liability is overwhelming.

Professor Chongmin Song

Professor Chongmin Song; Associate Professor Ean Tat Ooi
DP240101471
Award: $528,283.00

Title: Computational MultiPhysics Analysis of 3D Structural Damage and Failure.

Summary: This project aims to develop advanced modelling techniques to assess quantitatively the impacts of environmental changes caused by climate on structures. New and existing structures need to be climate-resilient to sustain more frequent and hazardous climatic actions. Attention will focus on modelling structural damage caused by extreme loads and MultiPhysics mechanisms caused by climate change. The expected outcome is a new computational tool that will benefit Australian society by facilitating more reliable assessments of risks associated with structural damage and failure. This is significant in the design of structures where effective measures to improve functionality can be implemented to add value to an asset's life-cycle management.

Professor Brian Uy; Professor Zhong Tao
DP240100489
Award: $569,705.00

Title: Composite clad steel-geopolymer concrete systems for resilient structures.

Summary: This project aims to develop innovative clad steel-geopolymer concrete composite members that will significantly improve the safe and economical design and construction of civil engineering systems. The expected outcomes will result in improved durability which has become a key issue in the economic justification of civil engineering infrastructure systems. Fire resistance in multi-storey buildings will also be improved through this project, and the coupled use of clad steel and geopolymer concrete in composite systems will reduce consumption and contribute toward Net-zero structural design. This will provide considerable benefits to Australian structural engineers and constructors in advancing their capability in composite construction.

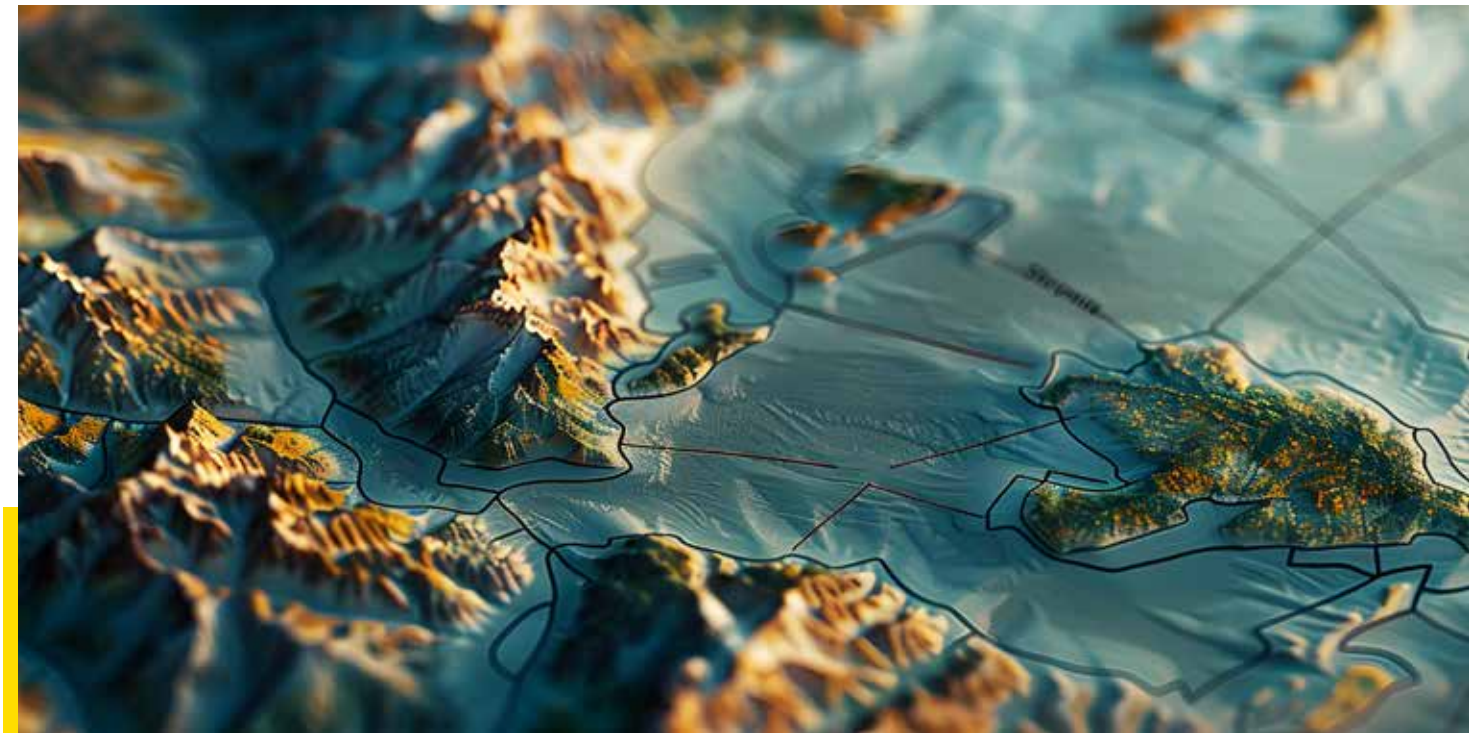
Professor Brian Uy

Professor David Waite; Professor John Fletcher; **Dr Yuan Wang**; Professor Lina Yao
DP240101469
Award: $395,082.00

Title: Improving Resilience of MCDI for Water Supply in Remote Communities .

Summary: The aim of this project is the development of robust, PV-powered water treatment units based on the emerging technology of Membrane Capacitive Deionisation (MCDI). The development of a more resilient approach to provision of potable water is particularly significant to remote indigenous communities in central Australia where brackish groundwaters are unsuitable for use without prior treatment. Expected outcomes include development of resilient MCDI units incorporating innovative control of the charging and discharging cycles using "smart" (machine learning enabled) Digital Twins of these units. These MCDI units will benefit any community requiring removal of contaminants from brackish waters without the need for external mains power supply.

Professor David Waite



ARC LINKAGE PROJECTS

Congratulations to Dr Mitchell Harley, Associate Professor Mohsen Kalantari, Associate Professor Wengui Li, and Scientia Professor David Waite for their Linkage Projects funding awarded in 2023.

Dr Mitchell Harley

Congratulations also to their industry partners: Australian Spatial Analytics Ltd; Chem Concrete Pty Ltd , Geoscience Australia; Geological Survey of Western Australia; Geological Survey of NSW; Department for Energy and Mining; Department of State Growth TAS; Surf Life Saving Australia Limited; YAT Engineering And Construction;

Detail of the successful grants are:

LP220200780 A smartphone rip-detection tool to improve rip current awareness.

Dr Mitchell Harley; Associate Professor Yang Song; Dr Imran Razzak; Dr Jasmin Lawes; Professor Robert Brander; Professor Toby Walsh; Dr Amy Peden; Mr Shane Daw

Industry Partner: Surf Life Saving Australia Ltd

Grant Awarded: $342,924.00

About: This project aims to develop a smartphone rip-detection tool and online education game to help reduce the number of Australians drowning in rips each year. The project expects to develop an optimised deep learning algorithm to detect rips from smartphone video taken at Australian beaches, which can then be used by Surf Life Saving Australia for training and education. Expected outcomes of this project are enhanced identification and literacy of rip currents, particularly among priority high-risk demographics like young males, culturally and linguistic diverse communities and rural visitors. This should provide significant benefits in reducing rip-current drowning and rescue incidents in Australia, particularly at unpatrolled beaches.

LP220200901: Reconstructing land tenure maps of Australia in 3D.

Associate Professor Mohsen Kalantari; Professor Dr Sisi Zlatanova; Ms Prudence Lawrence; Ms Samantha Garbutt

Industry Partner: Australian Spatial Analytics Ltd

Grant Awarded: $173,220.00

About: Existing land tenure maps of above and below ground, such as apartment ownership, tunnels, and mining, are maintained using 2D drawings. However, the drawings are not structured and valuable for detailed and advanced visualisation, analytics, and simulation, which are essential for testing potential interventions and policy development. This project aims to develop a data validation framework for transforming current drawings and reconstructing them into 3D models. The outcomes include validation principles, formal mathematical terms, and computational algorithms. Benefits include a cost-effective onshore alternative to offshore 3D reconstruction practices, efficient land development and infrastructure planning, and fewer property disputes.

Associate Professor Mohsen Kalantari

LP 230100288: Novel Hydrophobic Concrete for Durable and Resilient Mining Infrastructure.

Associate Professor Wengui Li; Professor Zhong Tao; Mr Luke Liu; Mr Soheil Jahandari

Industry Partners: YAT ENGINEERING AND CONSTRUCTION; CHEM CONCRETE PTY LTD

Amount Awarded: $458,910

Project Summary: The mining field is harsh with various corrosive media that cause rapid deterioration and ageing of concrete. This project aims to develop a novel hydrophobic concrete with integrated water-proofing and self-healing capacities and optimise its efficacy and cost-effectiveness for durable and resilient mining infrastructure using hybrid water-repellent nanoparticles and raw crystalline admixtures.

The new hydrophobic concrete is expected to significantly improve structural safety, durability, and service life of mining infrastructure while simultaneously reducing protection costs, repair needs, and reconstruction. The outcomes will offer desirable benefits for Australia's mining industry, with significant reductions in maintenance costs.

Associate Professor Wengui Li

LP220200912: Hydrogen generation by subsurface iron mineral transformations.

Scientia Professor David Waite; Professor Ryan Armstrong; Dr Andrew Feitz; Dr Peter Haines; Ms Elinor Alexander; Dr Kevin Ruming; Mr Ralph Bottrill

Industry Partners: Geoscience Australia; Geological Survey of Western Australia; Geological Survey of NSW; Department for Energy and Mining; Department of State Growth TAS

Grant Awarded: $612,689.00

About: The aim of this project is to elucidate key factors responsible for natural hydrogen generation in Australian subsurface environments. Large amounts of this valuable resource are produced naturally with estimates of production rates of this "gold" hydrogen at least 100 times the annual demand for this critical resource. Based on improved understanding of the source of natural hydrogen, predictive tools will be developed that will assist in assessing the viability in Australia of hydrogen exploration and engineered retrieval. Ready access to naturally produced hydrogen could enable Australia to replace hydrogen that is currently generated via the use of unabated hydrocarbons.

Scientia Associate Professor Davidi Waite

Professor David Waite

MORE GRANTS

One of our leading multidisciplinary researchers, Professor David Waite was awarded a NSW Government iCare Grant in June 2023 - **Dust Diseases Board Discovery Grant.**

Project: Identifying causal factors in particle-induced lung disease using novel cell models

Chief Investigator: Scientia Professor David Waite, with Yingying Sun, and Andrew Kinsela.

Awarded Funding: $334,957.10

Work-related dust-induced lung dysfunction remains a pressing issue both in Australia and globally. Major etiological agents include asbestos, coal mine dust (CMD), and crystalline silica, which have been widely used in various industries—ranging from building materials and coal mining to construction, tunnelling, and engineered stone manufacture.

Scientia Professor Waite and his research team aim to deepen the understanding of factors that contribute to the considerable variations in latency periods and rates of disease progression. Utilising a novel co-culture technique along with advanced 3D organoid models, the successful completion of this project is expected to offer substantial insights which will hold significant value for future clinical investigations, and crucial for policymakers.

https://www.icare.nsw.gov.au/injured-or-ill-people/work-related-dust-disease/dust-diseases-board-research-grants/research-funding/ideas-to-action#gref

Australian Economic Accelerator Grants

In 2023 Dr Asal Bidarmaghz and Dr Ali Kashani were successful in receiving funding in the very first round of the federal government's new Australian Economic Accelerator (AEA) program.*

Dr Bidarmaghz's project aims to address the urgent challenges of energy affordability and climate crisis in densely populated areas in Australia, by unlocking the full potential of geothermal energy cost-effectively. This will be achieved by

1. introducing novel and efficient geothermal systems that reduce the installation and operational costs while increasing the thermal gain and
2. developing a user-friendly web-based tool for simplified, cost-effective yet reliable design of these systems.

Collaborating/Partner Entrepreneurs: University of Melbourne, AJ Lucas Services and Fourth Element Energy

Grant amount: $199,953 (Dept. of Education) and $30,000 (Industry contribution).

Dr Asal Bidarmaghz

Dr Kashani's project is focused on creating a new low-emission concrete masonry. The technology uses recycled CO2 and steel slag (a by-product of steel making) to make a concrete binder with Portland cement replacement.

Collaborating/Partners: Adbri and Australian Steel Mill Services

Grant amount: $200,000

*The aim of the AEA is to support translation and commercialisation activities aligned with national research priorities, supported by expert governance arrangements. The program will develop a pipeline from discovery through to commercialisation, ensuring Australia reaps the benefits of investment in research within the university sector.

Dr Ali Kashani

ARC LIEF Grant LE240100118

rCITI's Associate Prof Meead Saberi is a Chief Investigator in The National Cycling Data and Analysis Platform (NCDAP) led by Prof Chris Pettit of UNSW Arts, Design & Architecture which received an ARC LIEF Grant ($500,000) announced in October 2023, start 2024.

This strategic grant will address the significant issue of data fragmentation, pilot a national cycling survey, and develop a cycling toolkit to allow exploring and testing various cycling infrastructure scenarios. The project will aid in promoting more active and healthier lifestyles, alleviating traffic congestion and public transport crowding, and promoting decarbonisation and energy efficiency in Australian cities.

Congratulations to all involved in this cross-faculty collaborative initiative between ADA, Science and Engineering at UNSW.

Associate Professor Meead Saberi

GRANTS

RESEARCHER PROFILE:

ASSOCIATE PROFESSOR AILAR HAJIMOHAMMADI – ENERGY FROM WASTE TRAILBLAZER

In June 2023 researchers led by Associate Professor Ailar Hajimohammadi in the School's Centre for Infrastructure,Engineering & Safety (CIES) were awarded $2.7 million in the federal government's Cooperative Research Centres Projects (CRC-P) funding for their innovative project to create construction materials from thermal treatment facility wastes.

> "Australia is facing a shortage of landfill space, prompting a shift towards Energy from Waste technologies"

In collaboration with Enviropacific and Flexiroc Australia, the team will commercialise technologies to convert wastes from thermal treatment facilities and soil washing residues into value-added products for construction.

A/Prof Ailar Hajimohammadi will lead the UNSW research, contributing to a move towards a circular economy in Australia. Her CIES research colleagues are Dr Ali Kashani, Dr Taehwan Kim, and Scientia & PSM Professor Nasser Khalili.

'Australia is facing a shortage of landfill space, prompting a shift towards Energy from Waste technologies', A/Prof Hajimohammadi said. 'This project aims to explore the potential of these wastes as supplementary cementitious materials. Success of this collaboration will lead to new industries, increased productivity, and alignment with the circular economy.'

The CRC-P Program supports collaborations between industry, researchers, and the community. The focus is on linking researchers with industry to develop products with commercial uses.

A.Prof Hajimohammadi also leads two projects awarded Tyre Stewardship Australia (TSA) grants in 2023.

- Next Generation Concrete Pipes: Rubberized Solutions, with colleagues Mohsen Kalantari and Ehab Hamed. **Grant:** $753,135
- Recycling tyre textile fibres into value-added asphalt additive, with colleagues Mohsen Kalantari and Nasser Khalili. **Grant:** $582,287

In July Ailar's team were also part of a successful NSW EPA grant of $750,000 awarded to State Asphalts NSW and their collaborators in their continuing work addressing Australia's recycling capability and capacity.

Approximately 7,000 tonnes of combustible cladding in NSW will be destined for landfill after the material was banned in 2018. As this cladding is decommissioned and the aluminium is recovered, the end-markets for the remaining mineral-filled and chemical compounded plastic are very limited.

State Asphalts NSW, in partnership with the UNSW, PanelCycle and Primaplas will develop state-of-the-art technologies to characterise the remaining materials, process the recyclate and create end markets for 800 tonnes of ACP-derived polyethylene per year.

"Collaboration between cutting-edge university research and industry expertise sets the foundation for the asphalt industry's future," A/Prof Ailar Hajimohammadi said. "Together, we develop cost-effective recyclate-derived additives, meeting stringent quality standards, and driving sustainable, high-performance infrastructure solutions."

About A/Prof Hajimohammadi:

A/Prof Hajimohammadi received her PhD on sustainable construction materials from the University of Melbourne in 2011. She worked in an international company for four years as a consultant and did three years of postdoctoral research before joining the faculty at UNSW Civil & Environmental Engineering in 2019.

Ailar's research examines the chemistry of materials to develop innovative construction elements with attractive properties. She investigates waste management and resource recovering strategies towards circular economy.

She is particularly interested in and research active in sustainable and resilient construction materials, waste minimization and resource recovery in civil and construction, and advanced materials for sustainable infrastructure.

In 2023 A/Prof Hajimohammadi was selected for an International Association of Advanced Materials (IAAM) Scientist Medal. The Medal is awarded to researchers who have made distinctive contributions towards interfacing the materials for multi-inter-trans disciplinary fields of science, engineering, and technology.

> "Collaboration between cutting-edge university research and industry expertise sets the foundation for the asphalt industry's future,"

PROFILE

CERSA

The Civil and Environmental Engineering Research Students Association (CERSA) represents the interests of postgraduate research students.

> Our aims are to create a unified body to develop friendship among ourselves, collectively represent our interests and build mutually beneficial relations with the school.

The Civil & Environmental Research Students Association (CERSA) was very active in 2023.

> "CERSA also learnt more about Australia's First Nations with a cultural awareness workshop hosted by UNSW Indigenous office Nura Gili"

CERSA OFFICE HOLDERS 2022-2023

ELEANOR EARL
President

LINJIE TANG
Secretary

SARA FAZELI
Grievance Rep

CHANG LIU
Vice President

ADITYA DESHMUKH
Secretary

ZIHENG SHENG
Arc Rep

HUI ZOU
Treasurer

JOHNSON WONG
EDI Rep

LISHA LIU
HEPI Liaison Rep

2023 was, as President Eleanor Earl noted, a good year in which CERSA's hard work and dedication helped 'to regain CERSA's pre-covid momentum and organise such an amazing array of events.'

These events included hiking trips along the coast, bush walks, and an Earth Hour night walk in the city; sporting events such as squash and table tennis, visits to galleries including the Museum of Contemporary Art, a thrilling whale watching boat trip, participation in a Bake your PhD fun food show, the annual Board games night (along with pizza and popcorn!) celebration of cultural festivals such as Chinese New Year and an International Food Festival, where students shared their iconic cultural dishes.

CERSA also learnt more about Australia's First Nations with a cultural awareness workshop hosted by UNSW Indigenous office Nura Gili, and a pre-Naidoc week afternoon tea.

After the AGM in September, outgoing President Eleanor Earl thanked her dedicated CERSA team as well as everyone who had participated in the events, and the CVEN staff who had supported the club throughout the year. Special thanks went to Sunhee Lim, the School's Higher Degree Research Support officer, 'who has helped us with so many of our events throughout the year.'

Eleanor wished the new team well, and said she had "every confidence that they will continue to drive CERSA forward and help continue to make our HDR community friendly and vibrant."

CERSA V-P Chang Liu with School's HDR Manager Sunhee Lim on Grad Day.

THE 2023-2024 CERSA EXECUTIVE TEAM

SURAJ SHAH
President

TAHEREH SARA YAZDANPARAST
Vice President

SARA FAZELI
Treasurer

JACK YAFEI SUN
Secretary

ROSS (JINGWEN) LUO
EDI Rep

JIMMY HILLY
Grievance Officer

MEHRDAD MEMARPOUR
Arc Delegate

MORTEZA MESGARI HAGH (MORTY)
Engineering HDR Student Liaison Rep

PhD GRADUATES

DOCTOR OF PHILOSOPHY (PhD) CIVIL & ENVIRONMENTAL ENGINEERING

AFROZ, SUMAIYA
Supervisor: T Kim, A Castel
Shrinkage, cracking and self-healing in low carbon cement concrete
Discipline: Structural

AKBARIAN, SHARAREH
Supervisor: S Lim, X Shen, CY Xu
Machine learning-based sugarcane yield prediction using multispectral time-series imagery
Discipline: SAGE

ALHARIQI, ABDULRAHMAN
Supervisor: Meead Saberi Kalaee & Vinayak Dixit
The Environmental Impact of Connected and Automated Vehicles' Car-following Behaviour
Discipline: Transport

BALES, CLARE
Supervisor: TD Waite, J Fletcher & Y Wang
Membrane capacitive deionization (MCDI) desalination for water treatment
Discipline: Water

BO, LUO
Supervisor: W Gao, G Li, D Wu
Nonlinear Dynamic Behaviour of Solar Cells with Advanced Materials
Discipline: Structural

CHEN, YISU (GEORGE)
Supervisor: Wei Gao, Di Wu & Francis Tin Loi
Fatigue Analysis on Wind Turbine Towers in Cyclone-Prone Areas
Discipline: Structural

FARZADKHOO, MARYAM
Supervisor: Stefan Felder,Richard Kingsford, & Iain Suthers
Attracting fish into tube fishways: linking fish behaviour with flow hydrodynamics
Discipline: Water

GONG, SHUANGQING
Supervisor: H Rashidi & F Luo
Electric Vehicles and its mobility as a service
Discipline: Transport

HAMDEN, ABDELRAHMAN
Supervisor: T Kim & A Hajimohammadi
The role of chemical composition and structure of calcium magnesium aluminosilicate glassy phase on the reaction kinetics and microstructure development of alkali-activated materials
Discipline: Structural

HAN, XUDONG
Supervisor: A Sharma, R Mehrotra, S Bellie
Application of complex network theory for flood estimation under current and future climate
Discipline: Water

KIM, YOUNGIL
Supervisor: A Sharma, F Johnson & J Evans
Comprehensive bias correction of regional climate model boundary conditions for simulation of hydrologic extremes
Discipline: Water

KUMAR, LAKSHMINARAYANAN MOHANA
Supervisor: S Foster, E Aboutanios
Fibre orientation and distribution in steel fibre reinforced concrete
Discipline: Structural

GRADUATES

KUSUMASTUTI, CILCIA
Supervisor: Ashish Sharma & Rajeshwar Mehrotra
Correcting Systematic Bias in Climate Model Simulations in the Time-Frequency
Discipline: Water

LI, QINGYA
Supervisor: W Gao, F T Loi, D Wu
A Framework for Size-dependent Structural Analysis of Smart Micro/nanoplates
Discipline: Structural

LI, XINMING
Supervisor: TH Rashidi & TR Koo
Innovative Disaggregate Modelling Frameworks for Predicting Tourists' behaviours
Discipline: Transport

LIN, GAOCHAO
Supervisor: N Khalili & B Shahbodaghkhan
Influence of Osmotic and Matric Suction on Reactive Soils Based on Experimental Investigation and Constitutive Modelling
Discipline: Geotech

MA, MINGYOU
Supervisor: V Dixit, W Liu & F Zhang
Modelling and Managing Integrated Public Transport System for Passengers and Freight
Discipline: Transport

MANSOURIANFAR, MOHAMMADHADI
Supervisor: M Saberi, ST Waller & TH Rashidi
Modelling mixed autonomy traffic networks with pricing and routing control
Discipline: Transport

MAYAR, KHALILULLAH
Supervisor: X Shen, DC Carmichael
Resilience - A System Interpretation
Discipline: ECM

NIU, CHENCE
Supervisor: V Dixit, D Jayakumar Nair
Resilience in Transportation Networks
Discipline: Transport

POKHAREL ,BADAL
Supervisor: S Lim
Assessment of earthquake-triggered landslides in Central Nepal
Discipline: SAGE

SHAFEE, ASHKAN
Supervisor: A Khoshghalb & N Khalili
Application of Node Based Smoothed Point Interpolation Methods in Small and Large Deformation Problems of Geomechanics
Discipline: Geotech

SIDDIKA, AYESHA
Supervisor: A Hajimohammadi & V Sahajwalla
Recycling Waste Glass to Develop Low-CO2 Foamed Composites: Advancing Sustainability
Discipline: Materials

SIVAGURUNATHAN, VARSHA
Supervisor: SJ Khan, S El Sawah
Scenario development for urban water management Planning for uncertainty
Discipline: Water

SKAVENBORG, MATHIAS
Supervisor: TD Waite & C McKenzie
Application of Biomimetic Metal Complexes to Environmental Technologies
Discipline: Water

TAHIR, MUHAMMAD NAEEM
Supervisor: E Hamed, R Gilbert
Thermo-mechanical structural response of profiled metal-faced insulating sandwich panels
Discipline: Structural

VIDELA, JAVIER
Supervisor: E Atroshchenko & C Song
Locally refined splines for optimisation and inverse problems in acoustics
Discipline: Structural

VISSER, JOHAN
Supervisor: A Sharma, L Marshall
The Intensification of Extreme Precipitation in a Warmer Climate
Discipline: Water

WANG, YANZHI
AR Russell
Strength, liquefaction and cone penetration test results in unsaturated silty tailings
Discipline: Geotech

WEI, BANGYANG
Supervisor: M Saberi Kalaee, W Liu, S Waller
Modeling and Managing a Transportation System With Shared Mobility Services
Discipline: Transport

XU, KAI
Supervisor: M Saberi, W Liu, V Dixit
Modeling and Management of Ridesourcing Services with Order Cancellation and Platform Collaboration
Discipline: Transport

YOON, HAE NA
Supervisor: A Sharma & LA Marshall
Hydrologic predictions for ungauged catchments using surrogate river discharge
Discipline: Water

ZHANG, SEN
Supervisor: E Hamed & C Song
A meso-mechanical framework for the prediction of the time-dependent behaviour of concrete
Discipline: Structural

DOCTOR OF PHILOSOPHY (PhD) GEOSPATIAL ENGINEERING

PIMENOVA, OLGA
Supervisor: CA Roberts, JC Valerio Leon & C Rizos
Design of a New Geoid-Based Vertical Datum for Costa Rica
Discipline: SAGE

WIIG, FRANCES
Supervisor: CA Roberts, M Harrower, S Hensley & C Rizos
Evaluation of Multi-frequency Synthetic Aperture Radar for Subsurface Archaeological Prospection in Arid Environments
Discipline: SAGE

ZHANG, WENHAO
Supervisor: J Wang, V Dixit, A Khodabandeh
Trustworthy precise point positioning with global navigation satellite systems
Discipline: SAGE

MASTER OF PHILOSOPHY (MPHIL) (ENGINEERING)

LI, JIACHENG
Supervisor: N Khalili & B Shahbodaghkhan
An experimental study on consolidation of saturated and unsaturated soils under cyclic loading
Discipline: Geotech

TIAN, WEIZHE
Supervisor: W Gao & F Tin-Loi
Nonlinear dynamic analysis and quantification of additive manufacturing error on the stability of lattice-core composite sandwich plate
Discipline: SAGE

GRADUATES

ESTATE & TECHNICAL SERVICES COMMITTEE (ETSC)

THE SCHOOL HAS SEVERAL WELL-EQUIPPED laboratories used for research and teaching purposes. None of our research achievements and awards would be possible without these high-use laboratories and technical facilities, which are staffed by a highly skilled team of technical officers and managers. The ETSC provides oversight, support and management of the School's physical estate.

COMMITTEE MEMBERS

DENIS O'CARROLL
Co-Chair – Estate

VINAYAK DIXIT
Co-Chair – Technical

STEFAN FELDER
Deputy Chair; WRL Rep

MINH NHAT LE
Water Quality Labs

PAUL GWYNNE
Geotechnical and Materials Research Labs

ZHEN-TIAN CHANG
Heavy Structures Laboratory

YINCAI ZHOU
SAGE Rep.

JULIUS SECADININGRAT
TRACSLab/SNAPLab Rep.

HAMID VALIPOUR
Academic-in-charge Heavy Structures and Materials Lab.

STUART KHAN
Academic-in-charge Water Quality Labs

ARMAN KHOSHGHALB
Academic-in-charge Cost Recovery

ADRIAN RUSSELL
Academic-in-charge Geotechnical Labs

LAARNI CALUDUCAN
H&S Rep

MARIA LEE
Admin

> "The ETSC provides oversight, support and management of the School's physical estate."

ETSC

GRANT INCOME 2023: RESEARCH CENTRES

Our Research Centres grant income for 2023 totalled $14.8M, with more than 150 research projects on the go, involving over 120 industry, government and academic partners.

Centre for Infrastructure, Engineering & Safety (CIES)

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Atroshchenko, E	The International Symposium on Communications and Information Technologies (ISCIT), Web Information Systems Engineering WISE 2023	$14,871	Australian Academy of Science / The Ukraine-Australia Research Fund
Bidarmaghz, A	Geothermal Cities: Transforming Urban Energy Supply with Innovative and Cost-Effective Shallow Geothermal Systems	$159,962	Department of Education / Australia's Economic Accelerator Seed Grants
Bradford, MA	Vulnerability of Steel Lattice Towers to Fire	$109,653	Australian Research Council / Discovery Project
Chen, D	Smart Optimisation of Functionally Graded Porous Structures	$131,701	Australian Research Council / Discovery Early Career Researcher Award (DECRA)
Foster, S | Hajimohammadi, A	A study into Long-Term Performance of Geopolymer Concrete and Assessment of Field Performance	$35,000	Transport for NSW / State Government Contract
Foster, S | Hajimohammadi, A | Rey, D	Concrete Mixes for Durability: A Hybrid Mathematical Optimisation Approach	$184,342	ARC Linkage Project / Boral Shared Business Service P/I Industry Partner
Gao, W	Topological Design of Mechanical Meta-Structures	$50,000	University of Technology Sydney (UTS) / ARC Discovery Project Shared Grant
Gao, W | Pahlevani, F	ARC Research Hub for Transformation of Reclaimed Waste Resources to Engineered Materials and Solutions for a Circular Economy	$60,000	Royal Melbourne Institute of Technology / ARC Industrial Transformation Research Hub Shared Grant
Hajimohammadi, A	Victorian Recycled PV glass in construction applications	$35,345	PV Industries Pty Ltd / Sustainability Victoria - Circular Economy Markets Fund Subcontract
Hajimohammadi, A | Foster, S | Vali Pour Goudarzi, HR | Moreau, DJ	Development of Novel Concrete Noise Walls Incorporating Recycled Materials	$106,875	ARC Linkage Project; Tyre Stewardship Australia & Flexiroc Australia - Industry Partners
Hajimohammadi, A | Hameiri, Z	The uptake of Solar PV glass in construction applications	$216,776	PV Industries Pty Ltd / NSW EPA Circular Solar Trials Grants Program Shared Grant

Centre for Infrastructure, Engineering & Safety (CIES) CONTINUED

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Hajimohammadi, A | Kashani, A | Kim, T | Khalili-Naghadeh, N	Creating construction materials from thermal treatment facility wastes	$92,308	Enviropacific Services Pty Ltd (EPS) / DIIS - Cooperative Research Centre Projects (CRC-P's) Shared Grant
Hajimohammadi, A | Khalili-Naghadeh, N	Beneficiating hard-to-recycle plastic waste into recycled resins and construction additives	$39,750	State Asphalts NSW Pty Ltd / NSW Environment Protection Authority - Circular Plastics Program Shared Grant
Hajimohammadi, A | Kim, T	Investigating the reuse of glass from waste photovoltaic modules for construction applications	$44,910	PV Industries Pty Ltd / NSW EPA Circular Solar Trials Grants Program Shared Grant
Hajimohammadi, A | Kim, T | Foster, S	Next generation sustainable concrete: trialling recycled glass in geopolymer concretes	$76,594	John Holland Pty Ltd / NSW EPA Civil Construction Market Program Shared Grant
Hajimohammadi, A | Moreau, DJ | Vali Pour Goudarzi, HR	Implementation of recycled rubber for acoustic applications	$18,000	Tyre Stewardship Australia - R&D Fund & Flexiroc - Industry Partner
Kashani, A	3D printing construction	$43,000	Contour 3d Pty Ltd / Contract Research
Kashani, A	The International Clean Innovation Researcher Network for Net Zero Buildings (ICIRN-NZB)	$5,556	University of Melbourne / DISR - International Clean Innovation Researcher Networks Shared Grant
Kashani, A | Canbulat, I | Arns, C | O'Carroll, DM | Hajimohammadi, A | Kim, T | Shikhov, I | Miller, BM | Flocard, FD | Foster, S	Geopolymer Project - Phase 1: Development of a novel injecting cementitious grout as an underground hydraulic barrier	$42,263	Rio Tinto / Contract Research
Kashani, A | O'Carroll, DM | Arns, C | Gilbert, DM | Hajimohammadi, A | Kim, T | Shikhov, I | Miller, BM	Development of a novel cementitious grout for use as sub-surface hydraulic barriers and its application in mining operations and mine closure	$116,660	Technological Resources Pty Ltd / Contract Research
Khalili-Naghadeh, N | Bidarmaghz, A | Vahab, M	Non-differentiable Energy Minimisation For Modelling Fractured Porous Media	$126,000	ARC Discovery Project
Khalili-Naghadeh, N | Hajimohammadi, A | Shahbodaghkhan, B	Recycling plastic and paperboard waste to develop value-added asphalt	$371,417	State Asphalts NSW Pty Ltd / DIIS - Cooperative Research Centre Projects (CRC-P's) Shared Grant
Khalili-Naghadeh, N | Khoshghalb, A | Shahbodaghkhan, B	Pile foundations in unsaturated soils: a mechanistic framework	$84,500	ARC Discovery Project
Khoshghalb, A	Cyclic simple shear tests on tailings samples	$86,706	ATC Williams Pty Ltd / Contract Research
Kim, T	Self-Healing Concrete for Mitigation of Chloride induced Steel Corrosion	$3,500	University of Technology Sydney (UTS) / ARC Discovery Project Shared Grant
Kim, T | Hajimohammadi, A | Moreau, DJ	Decarbonising built environments with hempcrete and green wall technology	$2,000	University of Technology Sydney (UTS) / ARC Linkage Project Shared Grant
Makki Alamdari, M	Developing an Advanced Drive-by Bridge Inspection Technology	$145,325	Australian Research Council / Discovery Early Career Researcher Award (DECRA)
Russell, A	Preventing mining disasters: reducing the risk of tailings dam failure	$260,000	Australian Research Council / Future Fellowship

Centre for Infrastructure, Engineering & Safety (CIES) CONTINUED

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Shen, X | Barati, K | Wang, CC	Advanced Manufacturing of Sustainable Buildings Using Prefabricated Modular Panels	$13,333	KMK Property Solutions / Innovation Connections Business Researcher Placement Project Contract
Song, C	Ship response under corrosion, fatigue and complex sea-state environments	$34,263	University of Newcastle / ARC Linkage Project - DSTG & Pacific ESI Shared Partner Organisations
Song, C	An Intelligent Condition- Monitoring System for Mineral Screening Machines	$22,580	University of Technology Sydney (UTS) / ARC Linkage Project Shared Grant
Vali Pour Goudarzi, HR	Buckling of longitudinal steel bars in columns	$10,411	InfraBuild Pty Ltd / Contract Research
Vali Pour Goudarzi, HR	Development of timber-steel encased structural system	$96,300	Viridi Group Pty Ltd / Contract Research
Vali Pour Goudarzi, HR	Buckling of longitudinal steel bars in reinforced concrete columns	$68,293	InfraBuild Pty Ltd / Contract Research
Vali Pour Goudarzi, HR	Compressive and bending strength of a new sustainable concrete	$7,158	Alluminate Designs Pty Ltd / Contract Research
Vali Pour Goudarzi, HR	Loading capacity of timber composite I-joists	$7,662	Alpha Timber / Contract Research
Vali Pour Goudarzi, HR | Atroshchenko, E	Development of a framework for optimization of reinforced concrete frames	$35,438	Van der Meer Consulting / Contract Research
Vali Pour Goudarzi, HR | Bradford, MA	Torsion in innovative timber composite floors	$130,000	ARC Discovery Project
Vali Pour Goudarzi, HR | Foster, S	Connections for hybrid steel-timber-concrete structures	$112,000	ARC Discovery Project

CIES - RIIS Projects - ARC Industry Transformation Research Hub for Resilient and Intelligent Infrastructure Systems (RIIS)

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2022	PARTNERS & SPONSORS
Khalili-Naghadeh, N | Zlatanova, S | Wang, C | Canbulat, I | Gao, W | Parameswaran, S | Prasad, D | Sammut, C | Zhang, W | Li, B | Shen, X | Barton, J | Clark, SR | Raval, SA | Shahbodaghkhan, B | Vahab, M | Mao, G | Makki Alamdari, M	ARC Industry Transformation Research Hub - ARC Funding	$387,333	Australian Research Council / Industrial Transformation Research Hubs
Khalili-Naghadeh, N | Zlatanova, S | Wang, C | Canbulat, I | Gao, W | Parameswaran, S | Prasad, D | Sammut, C | Zhang, W | Li, B | Shen, X | Barton, J | Clark, SR | Raval, SA | Shahbodaghkhan, B | Vahab, M | Mao, G | Chu, D | Ronagh, HR | Makki Alamdari, M	RIIS Project	$79,980	Kumul Petroleum Holdings Limited/ RIIS Industry Partner Contribution
Khalili-Naghadeh, N | Zlatanova, S | Wang, C | Canbulat, I | Gao, W | Parameswaran, S | Prasad, D | Sammut, C | Zhang, W | Li, B | Shen, X | Barton, J | Clark, SR | Raval, SA | Shahbodaghkhan, B | Vahab, M | Mao, G | Ronagh, HR | Makki Alamdari, M	RIIS Project	$21,053	Lindenbaum Pty Ltd / RIIS Industry Partner Contribution

CIES - RIIS Projects - ARC Industry Transformation Research Hub for Resilient and Intelligent Infrastructure Systems (RIIS) CONTINUED

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
as above	RIIS Project	$84,211	Linke & Linke Surveys / RIIS Industry Partner Contribution
as above	RIIS Project	$63,158	Azure Mining Technology Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$12,632	Roobuck Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$4,211	Crypses Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$21,053	Asset Institute Limited / RIIS Industry Partner Contribution
as above	RIIS Project	$21,053	Woolpert Australia Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$10,526	South East Water / RIIS Industry Partner Contribution
as above	RIIS Project	$6,316	Spatial Vision Innovations Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$42,105	Emerson Process Management Australia Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$21,053	Hawk Measurement Systems Pty Ltd /RIIS Industry Partner Contribution
as above	RIIS Project	$12,632	Rockfield Technologies Australia Pty Ltd /RIIS Industry Partner Contribution
Khalili-Naghadeh, N | Zlatanova, S | Wang, C | Gao, W | Parameswaran, S | Prasad, D | Sammut, C | Zhang, W | Li, B | Shen, X | Clark, SR | Raval, SA | Shahbodaghkhan, B | Vahab, M | Mao, G | Barton, J | Canbulat, I | Ronagh, HR | Makki Alamdari, M	RIIS Project	$8,421	Sycamore Civil Group Pty Ltd / RIIS Industry Partner Contribution
as above	RIIS Project	$10,526	Ports Australia / RIIS Industry Partner Contribution
TOTAL CIES (INCLUDES RIIS)		**$4,006,715**	

CVEN - ENG001

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Armstrong, RT	An advanced multiphase model for geometrical evolution and anomalous flows	$270,000	ARC Future Fellowship
Armstrong, RT | McIlquham, JD	Physically-informed machine learning techniques applied to spectroscopy for mineral and elemental identification - Student Scholarship	$3,542	CSIRO Top Up Scholarship
Armstrong, RT | Mostaghimi, P	Beyond Darcys Law: Influence of wettability on multiphase flow in rocks	$142,890	ARC Discovery Project
Armstrong, RT | Mostaghimi, P | Tang, K	Deep Convolutional Neural Networks for Mineral Identification and Liberation Analysis Linked to In-Situ Recovery Methods - Postgraduate Top-Up Scholarship	$74,118	ARC Linkage Project
Mostaghimi, P	Postgraduate Top-Up Scholarship for Scott Higgs	$24,832	CSIRO Top Up Scholarship
Mostaghimi, P	OreAI: Bringing next generation AI to Iron Ore Production and Processin	$250,000	Australian National University / Contract Researc
Mostaghimi, P | Armstrong, RT | Jing, Y | Wang, YD	Wettability change in underground hydrogen storae	$4,500	CSIRO / Commonwealth Government Contract
Mostaghimi, P | Armstrong, RT | Regenauer-Lieb, K	In-situ characterisation of coal for coal seam gas developments	$100,821	ARC Linkage Project & QGC Pty Ltd - Industry Partner
Mostaghimi, P | Wang, YD | Armstrong, RT	Generative technologies for 3D high-resolution images of porous media	116,000	TotalEnergies / International Contract
Mostaghimi, P | Zheng, Q	Leaching and Mineral Recovery - Scholarship for Quan Zheng	$10,000	CSIRO - / Postgraduate Studentship
Si, G | Mostaghimi, P	Maximise goaf gas drainage for safe coal extraction and emissions reduction	$82,806	ARC Linkage Project & Australian Coal Research (ACR) Ltd / Industry Partner
CVEN - ENG001 TOTAL 2023		**$1,090,842**	

Surveying & Geospatial Engineering Hub (SAGE)

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Ge, L | Liu, C	Building damage estimation after natural disaster using multi satellite source data based on machine learning - PhD scholarship	$50,000	CRC for SmartSat / PhD Scholarship
Ge, L	All-weather, near real-time monitoring of bushfire with satellite SAR	$16,167	CRC for SmartSat / Project Agreement
Ge, L	Quantifying the Past and Current Major Australian Floods with SAR and other Satellites	$99,000	CRC for SmartSat / Project Agreement
Lim, S	Assessing post-fire forested ecosystem by using Spaceborne LiDAR over south-eastern Australia	$20000	Natural Hazards Research Australia / Postgraduate Research Scholarship
SAGE TOTAL 2023		**$185,167**	

Water Research Centre (WRC)

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Johnson, FM | Kohn, R | Chandra, R | Marshall, L	MATH: Development of Bayesian ensemble deep learning for Spatio-temporal modelling – Post Doc	$44,664	University of Sydney / ARC Industrial Transformation Training Centres Shared Grant
Johnson, FM | Liu, Y | Tamburic, B | Marshall, L | Glamore, W	Satellite remote sensing for the calibration of the WaterNSW Integrated Water Quality Model	$59,741	Water Research Australia Limited / Contract Research
Johnson, FM | Marshall, L	Data Analytics for Resources and Environments (DARE) Industrial Transformation Centre - PhD Scholarship for Maryam Zeinolabedini Rezaabad	$10,508	University of Sydney / NSW Department of Planning, Industry and Environment (DPIE) ARC ITTC Shared Partner Contribution
Johnson, FM | Marshall, L | Kohn, R | Chandra, R	MATH: Development of Bayesian ensemble deep learning for Spatio-temporal modelling – Post Doc	$5,226	University of Sydney / NSW Department of Planning, Industry and Environment (DPIE) ARC ITTC Shared Partner Contribution
Keith, DA | Sharples, JJ | Ooi, M | Evans, JP | Johnson, FM	AWRC: The establishment and delivery of the NSW Bushfire and Natural Hazards Research Centre - Bushfire and Natural Hazards Research Services	$46,000	Western Sydney University / NSW DPE - NSW Bushfire and Natural Hazards Research Centre Shared Tender
Meissner, K | Evans, JP | Johnson, FM	CCRC: The establishment and delivery of the NSW Bushfire and Natural Hazards Research Centre - Climate and Weather Research Services	$200,000	Western Sydney University / NSW DPE - NSW Bushfire and Natural Hazards Research Centre Shared Tender
Khan, SJ | O'Carroll, DM | Stuetz, R	ARC Training Centre for Transformation of Australia's Biosolids Resource - ITTC Project 1C: Advanced microbial technologies for enhancing biosolid transformations	$36,852	Royal Melbourne Institute of Technology / ARC Industrial Transformation Training Centre Shared Grant & Shared Partner Contributions
Manefield, M | Lee, M | Harding, E	Assessment of biodegradation potential and activity	$108,426	Orica Australia / Contract Research
Marshall, L	New data science methods for addressing problems related to the natural environment - PhD Scholarships	$34,627	University of Sydney / ARC Industrial Transformation Training Centres Shared Grant
Marshall, L	New data science methods for addressing problems related to time series analysis across multiple applications in the natural environment, including water resources – PhD Scholarships	$16,519	University of Sydney / NSW Chief Scientists Office ARC ITTC Shared Partner Contribution
Marshall, L | Chandra, R	Data Analytics for Resources and Environments (DARE) Industrial Transformation Centre - PhD Scholarship for Arpit Kapoor	$5,700	University of Sydney / Geoscience Australia ARC ITTC Shared Partner Contribution
O'Carroll, DM | Stuetz, R | Khan, SJ | Browne, MA	ARC Training Centre for Transformation of Australia's Biosolids Resource - ITTC Project 3C: Development of a risk-based framework for biosolids quality management	$112,040	Water NSW / State Government Contract
Sharma, A | Mehrotra, R | Jiang, Z	Hydrological Risk ssessment of Rural NSW Dams (2022-24)	$340000	Water NSW / State Government Contract

Water Research Centre (WRC) CONTINUED

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Stuetz, R	Translating Research Practice and Understanding the Impacts of Cultural Backgrounds	$ 13,636	Australian Water Association / DFAT National Foundation for Australia-China Relations Competitive Grants Program Shared Grant
Stuetz, R | Fisher, RM	ARC Training Centre for Transformation of Australia's Biosolids Resource - ITTC Project 3A: Linking Stability, Odour and Production route	$109,714	Royal Melbourne Institute of Technology / ARC Industrial Transformation Training Centre Shared Grant & Shared Partner Contributions
Stuetz, R | Kearnes, MB	AARC Training Centre for Transformation of Australia's Biosolids Resource - ITTC Project 3D: Stakeholder engagement and acceptance	$8,698	Royal Melbourne Institute of Technology / ARC Industrial Transformation Training Centre Shared Grant & Shared Partner Contributions
Stuetz, R | Tamburic, B | Henderson, RK	Assessing granular activated carbon capacity for algal taste and odour removal: Development of a predictive tool	$20,000	Water Research Australia Limited / Contract Research
Stuetz, R | Tamburic, B | Henderson, RK	Nuisance & Harmful Algae Science-Practice Partnership 2.0 (NHASP 2.0)	$17,287	Hunter Water Corporation / State Government Contract
Le Clech, P | Stuetz, R	CMST: Improving the chemical and biological water quality of a fully integrated Kraft Pulp and Paper Mill	$6,961	Visy Pulp & Paper Pty Ltd / Student Project and Placement
Henderson, RK | Tamburic, B | Stuetz, R	CEIC: Strategies to mitigate the risk of algal growth and accumulation within water treatment plants	$46,666	Goulburn Valley Water ,Melbourne Water Corporation , SEQWater / NHASP Research Project
Tamburic, B	Large scale urban stormwater reuse: safe, clear and odourless water supply	$140,506	Australian Research Council / Industry Fellowship - Mid Career
Tamburic, B	Large scale urban stormwater reuse: safe, clear and odourless water supply	$180,000	Melbourne Water Corporation / ARC Industry Fellowship - Mid Career Partner Contribution
Tamburic, B	Identification and characterisation of unpleasant taste/odour chemicals in raw water for informed risk management - Student	$60,000	Water Research Australia Limited / Contract Research
Tamburic, B | Leslie, GL | Stafford, TM	Analysing the economic impact of HNABs to the Australian water industry	$15,000	Water Research Australia Limited / Contract Research
Tamburic, B | Stuetz, R	Ecophysiology of microbes that produce taste/odour chemicals and their impact on drinking water treatability - Student	$60,000	Water Research Australia Limited / Contract Research
Waite, TD	Mineral transformation and oxidant production in subsurface environments	$120,000	ARC Discovery Project
Waite, TD	Physico-chemical characteristics and toxicity of coal mine and artificial stone particulates: Identifying factors critical to the pathogenesis and severity of coal workers' pneumoconiosis and silicosis	$184,462	University of Queensland / Office of Industrial Relations (QLD) Shared Contract

Water Research Centre (WRC) CONTINUED

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Waite, TD | Armstrong, RT	Hydrogen generation by subsurface iron mineral transformations	$49,300	ARC Linkage Project - ARC Funding
Waite, TD | Armstrong, RT	Hydrogen generation by subsurface iron mineral transformations	$140,000	Department for Energy and Mining, Department of Mines Industry Regulation & Safety (WA), Department of Regional NSW, Department of State Growth (Tasmania), Geoscience Australia / ARC Linkage Project Industry Partners
Waite, TD | Fletcher, J | Wang, Y | Bednarz, TP	High Water Recovery, Low Cost Desalination using PV-Powered Membrane Capacitive Deionisation (mCDI)	$29,670	Australian Coal Research (ACR) Limited /Research Program (ACARP)
Waite, TD | Kinsela, AS	Engineered Approaches to Management of Legacy Waste Sites	$50,000	Australian Nuclear Science & Technology Organisation (ANSTO) / Commonwealth Government Contract
Waite, TD | Wang, Y | Fletcher, J	Development of carbon materials, ion exchange membranes and module assembly for membrane capacitive deionisation	$31,505	UNSW Centre for Transformational Environmental Technologies (Yixing) / International Contract
Balatbat, MC | Wiedmann, T | Jackson, AB	FBS101: Specialist, Short Time-frame Project requiring Climate Expert to support AASB Climate/ Sustainability project	$3,733	Australian Accounting Standards Board / Commonwealth Government Contract
Sahajwalla, VH | Green, D | Wiedmann, T | Ghose, A	SMART: Sustainable Communities and Waste Hub	$70,8625	Department of Climate Change Energy the Environment and Water / National Environment Science Program (NESP 2)
Wiedmann, T | Benton, U | Prasad, D	NSW Circular Research Taskforce	$4,359	Office of the NSW Chief Scientist & Engineer / Challenge Funding Continuation (formerly NSW Circular)
Wiedmann, T | Fisher, RM | Stuetz, R	ARC Training Centre for Transformation of Australia's Biosolids Resource - ITTC Project 3B: The role of Biosolids Management in preserving Earth's resilience	$71,120	Royal Melbourne Institute of Technology / ARC Industrial Transformation Training Centre Shared Grant & Shared Partner Contributions
Wiedmann, T | Prasad, D	Achieving Circularity: Development of a sustainable and scalable model to recycle and reduce the cost of polypropylene waste in hospitals	$50,000	Office of the NSW Chief Scientist & Engineer / Challenge Funding Continuation (formerly NSW Circular)
Wiedmann, T | Prasad, D	Repurposing recovered organic materials as alternative raw materials for brick production	$40,000	Office of the NSW Chief Scientist & Engineer / Challenge Funding Continuation (formerly NSW Circular)
Zhang, K	From stormwater to potable water via Water Sensitive Urban Design?	$143,430	ARC Discovery Early Career Researcher Award (DECRA)
Zhang, K | Khan, SJ | Le Clech, P	Review of stormwater quality to support the development of stormwater recycling guidelines	$65,690	Water Research Australia Limited / Contract Research
Zhang, K | Prodanovic, V	Passive biofiltration processes for nitrogen removal from polluted waters	$35,882	Queensland University of Technology / ARC Discovery Project Shared Grant
Deletic, A | Prodanovic, V | Zhang, K	Greywater treatment and reuse using vegetated walls for sustainable urban greening in Qatar	$79,370	Hamad Bin Khalifa University / QNRF – National Priority Research Program Shared Grant
WRC TOTAL 2023		**$3,505,917**	

Water Research Laboratory (WRL)

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Andersen, MS	Predicting the impacts of groundwater drawdown on groundwater ecosystems	$40,000	Macquarie University / ARC Linkage Project Shared Grant
Chaaya, FC | Harley, MD | Splinter, KD	Shellharbour coastal research project	$28,700	Shellharbour City Council / State Government Contract
Coghlan, IR | Carley, JT | Paice, L | Blacka, MJ	Wave Overtopping Surveillance and Early Warning System, Fairy Bower (WRL2018092)	$32,700	Northern Beaches Council / Local Government Contract
Felder, SM | Kingsford, R | Leslie, GL	AWRC: Next Generation Water Engineering and River Management Hub	$73,311	Charles Sturt University / Department of Education, Skills and Employment (DESE) Regional Research Collaboration (RRC) Program Shared Grant
Felder, SM | Suthers, IM | Kingsford, R	AWRC: Phase 3: Installing Experimental Tube Fishways at NSW Weirs to develop fish passage design guidelines for new or rehabilitated barriers	$16,667	NSW Department of Primary Industries / Recreational Fishing Trust Grants
Leslie, GL | Felder, SM	ENG009: SFIRP Drought resilience for turf production	$216,513	Department of Regional NSW / Storm and Flood Industry Recovery Grants
Flocard, FD | Carley, JT | Blacka, MJ | Harrison, AJ	Coastal Hazards Adaptation Plan for Roches Beach, TAS	$68,000	Clarence City Council / Local Government Contract
Flocard, FD | Coghlan, IR | Carley, JT	CU Bund 2D Physical Modelling	$58,000	SMEC Australia Pty Limited / Port of Townsville Subcontract
Flocard, FD | Coghlan, IR | Carley, JT | Harrison, AJ | Tucker, TA	Coastal Hazards and Adaptation Plan for Pipe Clay Lagoon, TAS	$69,000	Clarence City Council / Local Government Contract
Glamore, W	Regional Land Partnerships Program - Shorebird Habitat Research Modelling (PhD Scholarship) - Water Research Laboratory	$8,000	NSW Local Land Services / Department of Agriculture, Water and the Environment Regional Land Partnerships Program Subcontract
Glamore, W	Hydrological monitoring of THPSS	$125,000	South32 Limited / Contract Research
Glamore, W	Blue Heart Sunshine Coast: Blue Carbon and Blue Co-Benefits Pilot Project	$53,000	University of the Sunshine Coast / Sunshine Coast Council Shared Contract
Keith, DA | Mason, TJ | Glamore, W	AWRC: Implementing an action toolbox to conserve Coastal Upland Swamps in the Sydney Basin.	$30,093	NSW Office of Environment and Heritage (OEH) / Saving our Species Research Grant
Harley, MD | Song, Y | Razzak, MI | Brander, R | Walsh, T | Peden, AE	A smartphone rip-detection tool to improve rip current awareness	$1,587	ARC Linkage Project & Surf Life Saving Australia Industry Partner
Harrison, AJ | Chan, JW | Miller, BM	Supporting Increased Aquaculture Production Through Reduced Harvest Closures	$434,070	Department of Regional NSW / Storm and Flood Industry Recovery Grants
Harrison, AJ | Chan, JW | Miller, BM	Supporting Increased Aquaculture Production Through Reduced Harvest Closures	$97,500	Bega Valley Shire Council / Eurobodalla Shire Council / MidCoast Council / Nambucca Valley Council / Port Macquarie-Hastings Council /Shoalhaven City Council : Dept of Regional NSW Storm and Flood Industry Recovery Grants Partner Contributions

Water Research Laboratory (WRL) CONTINUED

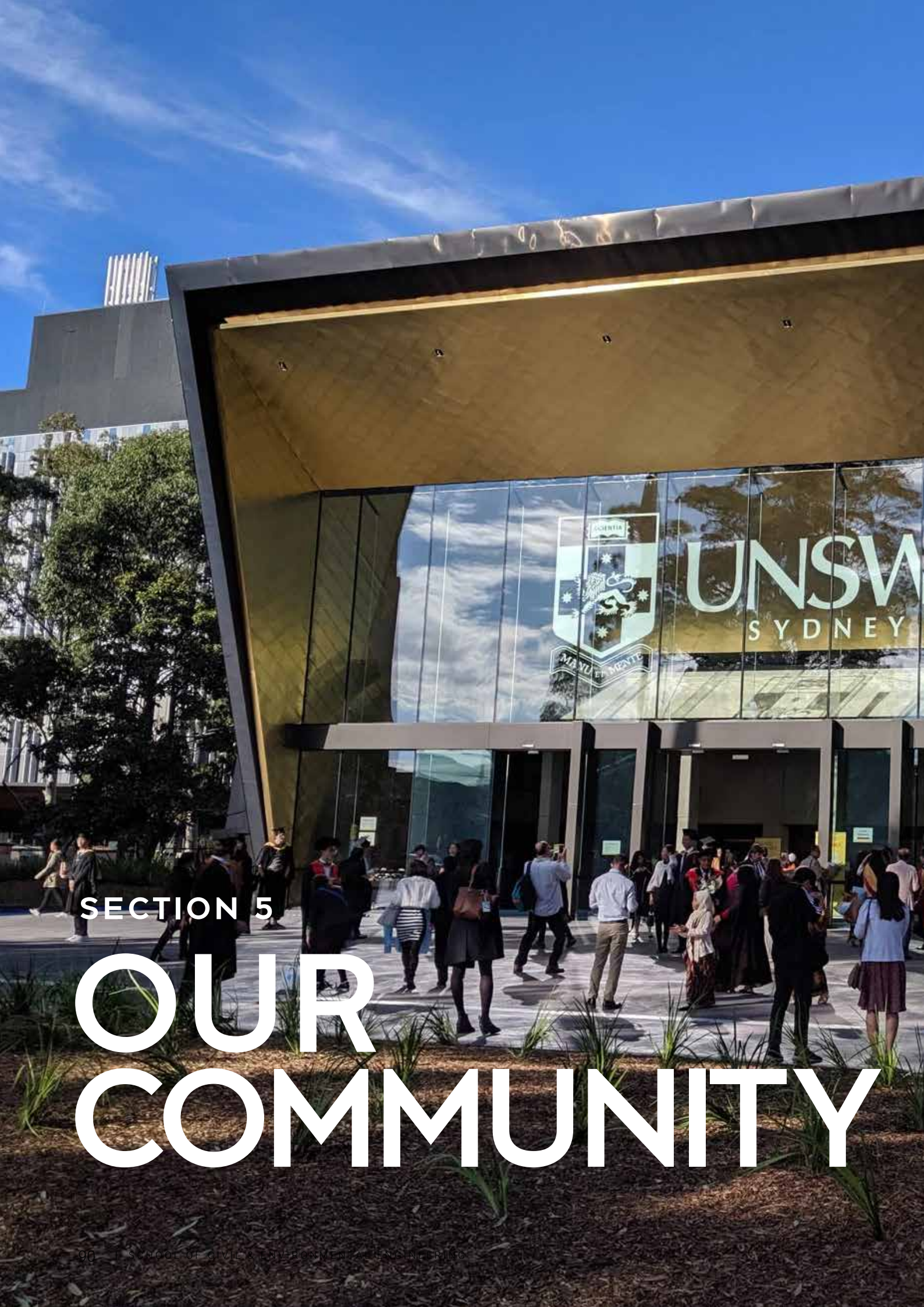
UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Harrison, AJ | Glamore, W	Project-level environmental economic accounting for coastal blue carbon ecosystems	$54,898	Deakin University / Department of Agriculture, Water and the Environment Subcontract
Miller, BM | Harley, MD | Thompson, RG | Paice, L | Blacka, MJ	TRESBP coastal monitoring and surveillance services (TPO-ENG-1819-26) (WRL2019003)	$49,500	NSW Department of Planning and Environment / State Government Contract
Miller, BM | Thompson, RG | Paice, L | Blacka, MJ	Coastal imaging and reporting for the monitoring of littoral areas - LG314/621/19/127	$351,600	Gold Coast City Council / Local Government Contract
Modra, BD | Flocard, FD | Coghlan, IR | Carley, JT	Townsville Eastern Breakwater Q3D	$92,500	SMEC Australia Pty Limited / Port of Townsville Subcontract
Modra, BD | Miller, BM | Felder, SM | Montano Luna, LE | Gilbert, DM | Chaaya, FC | Chan, JW | Jacka, KE | Paice, L	SDIP EW Physical Hydraulic Model (PHM)	$24,210	SEQWater / State Government Contract
Modra, BD | Miller, BM | Felder, SM | Paice, L | Jenkins, RB	Somerset Dam Physical Hydraulic Modelling	$182,000	SEQWater / State Government Contract
O'Carroll, DM | Jones, AM | McDonald, J | Le, TST | Colusso, A	Enhancement of Calix Nano-Active Bio-Active Materials	$25,000	Calix Limited / Investment NSW COVID-19 TechVoucher Shared Grant
Ruprecht, J | Glamore, W | Harrison, AJ	Big Swamp Monitoring Program (WRL2014086)	$18,951	Mid-Coast Council / Local Government Contract
Sadat Noori, M | Andersen, MS | Glamore, W	Is groundwater discharge an overlooked source of methane in restored coastal wetlands?	$39,704	Hermon Slade Foundation & Australia and Pacific Science Foundation / Australia Pacific Science Hermon Slade Research Fund
Splinter, KD	Developing Methodologies for Coastal Remote Sensing and Hazards Topic 5: Coastal hazards driven by climate variability and climate change	$56,593	Department of the Interior (USA) / US Geological Survey Research and Data Collection Grant
Splinter, KD	Multi-scale ensemble modelling of coastal systems in a changing climate	$233,042	Australian Research Council / Future Fellowship
Splinter, KD | Turner, IL	Quantifying the impact of infiltration on dune erosion under waves & surge	$75,000	Australian Research Council / Discovery Project
Tucker, TA | Chan, JW | Harrison, AJ	Muddy Lake - Flushing and water quality assessment	$6,000	NSW Department of Planning and Environment / State Government Contract
Tucker, TA | Glamore, W	Clybucca Wetlands Monitoring Program 2020-2023	$15,000	North Coast Local Land Services / State Government Contract
Tucker, TA | Harrison, AJ | Chan, JW | Glamore, W	Shortland WWTP overflows – Stage 2 data gaps and scoping study	$26,400	Hunter Water Corporation / State Government Contract
Tucker, TA | Harrison, AJ | Gilbert, DM | Miller, BM	Woodberry Swamp access track hydrological assessment	$24,000	Ausgrid / Contract Research
Tucker, TA | Harrison, AJ | Miller, BM	Arndilly and Micalo Island blue carbon feasibility assessment	$21,700	North Coast Local Land Services / State Government Contract
Tucker, TA | Miller, BM | Glamore, W | Ruprecht, J	Hydrological Assessment for Everlasting Swamp National Park and State Conservation Area	$50,250	NSW Department of Planning and Environment / State Government Contract
Turner, IL | Flocard, FD	Controlling coastlines while generating power	$55,259	Swinburne University of Technology / ARC Linkage Project Shared Grant & Collaborating Institution
WRL TOTAL 2023		**$2,753,748**	

Research Centre for Integrated Transport Innovation (rCITI)

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Dixit, V	E-network for rail-based cane transport systems	$9,420	Advisian Pty Ltd / Sugar Research Australia Shared Contract
Dixit, V	Project Echo	$15,000	Idetika Pty Ltd / Contract Research
Dixit, V | Hossein Rashidi, T	Travel time and Parking Study of AVs	$183,982	UChicago Argonne LLC (Argonne National Laboratory) / International Contract
Dixit, V | Regan, MA	BEV and Hybrid Motion Sickness in China	$30,000	Ford Motor Company / Ford-UNSW Alliance Contracts
Dixit, V | Regan, MA	A Road Out of Motion Sickness in Autonomous Vehicles	$64,976	Ford Motor Company / ARC Linkage Industry Partner
Dixit, V | Regan, MA | Khorgade, P	A Road Out of Motion Sickness in Autonomous Vehicles	$88,591	ARC Linkage Project
Dixit, V | Waller, ST	Project for capacity building, technology transfer and creation of enabling environment for establishment of Centre of Excellence namely Centre for Advanced Transportation Technology and Systems (CATTS)	$1,313,816	Indian Academy of Highway Engineers (IAHE) / International Contract
Dixit, V | Waller, ST	Predicting traffic flow in a city with roadways and railroad tracks	$277,000	Mitsubishi Heavy Industries, Ltd. / International Contract
Harris, MS | Lee, J | Pettit, CJ | Dixit, V	CITYFTRS Project: Interactively visualising street design scenarios for communicating bike infrastructure options to communities and policy-makers	$12,000	CRC for iMOVE / Research Project
Haghani, M	A novel approach in crowd evacuation planning: Behavioural intervention	$143,476	ARC Discovery Early Career Researcher Award (DECRA)
Hossein Rashidi, T	The Australian Transport Research Cloud	$102,000	University of Melbourne / Australian Research Data Commons Subcontract
Hossein Rashidi, T	Evaluating 5G productivity uses in transport	$170,000	CRC for iMOVE / Research Project
Hossein Rashidi, T	Discrete Choice Modelling for sustainable food and beverage packaging	$197,927	CRC for Future Food Systems / Research Project
Hossein Rashidi, T	SKEMA Business School funding	$5,008	SKEMA Business School / International Contract
Hossein Rashidi, T	Development of Carbon Credit Standard for Papyrus Methodology	$3,000	EnviroLabs Pty Ltd / Contract Research
Hossein Rashidi, T | Jayakumar Nair, D | Rey, D | Waller, ST	Quantifying Ethics-related Metrics for Transport Network Systems	$167,198	ARC Discovery Project
Irannezhad, E | Haghani, M | Hossein Rashidi, T | Yazdani, M	Desire Lines User Behaviour Research: Initial Scoping and Feasibility	$25,000	CRC for iMOVE / Research Projec
Irannezhad, E | Hossein Rashidi, T | Agyemang, KO	Commodity Based Freight Transport Modelling for Food and Agriculture Supply Chain - Scholarship for Kesewa Opoku Agyemang	$4,300	CRC for Future Food Systems / Top-up PhD Scholarship
Lee, J | Harris, MS | Irannezhad, E | Roberts, L	CITYFTRS Project: Longitudinal Study - Castlereagh and Oxford St Cycleway	$20,895	City of Sydney / Consultancy Professional Services - RFQ

Research Centre for Integrated Transport Innovation (rCITI) CONTINUED

UNSW INVESTIGATORS	PROJECT TITLE	APPORTIONED INCOME 2023	SPONSOR NAME
Regan, MA | Dixit, V | Prabhakharan, P | Secadiningrat, J	Use of a driving simulator as a safety-assured method of assessing and approving alternative in-tunnel aesthetic solutions	$20,514	AUSTROADS LTD / Contract Research
Anstey, KJ | Kiely, K | Velonaki, M | Regan, MA	PSYC Project: Ageing drivers: Cognitive ageing and technology	$67,804	ARC Linkage Project
Saberi Kalaee, M	Rethinking walking infrastructure: AI-assisted footpath network modelling	$133,125	ARC Discovery Project
Saberi Kalaee, M | Irannezhad, E | Haghani, M | Dixit, V | Hossein Rashidi, T	Transport for NSW Modelling Guidelines Review	$54,402	WSP Australia Pty Ltd / Transport for NSW Shared Tender
Saberi Kalaee, M | Rey, D	Signal control optimisation with connected and autonomous vehicles considering vulnerable road users	$27,690	CRC for iMOVE / PHD Project
Saberi Kalaee, M | Rey, D	Stable on-demand optimization for workforce and fleet logistics management	$19,250	Staybil Pty Ltd / ARC Linkage Industry Partner
Saberi Kalaee, M | Waller, ST | Rey, D	Stable on-demand optimization for workforce and fleet logistics management	$50,616	ARC Linkage Project
Salim, FD | Deldari, S | Xue, H | Saberi Kalaee, M	COMPSCI Project: Rail Passenger Ride Comfort Modelling using In-vehicle IoT Sensor Data: A Feasibility Assessment	$14,575	Sydney Trains / State Government Contract
Waller, ST | Rey, D	Incentivised Strategic Traffic Assignment: Bi-level Transport Optimization	$10,833	ARC Discovery Project
rCITI TOTAL 2023		**$3,232,398**	



SECTION 5

OUR COMMUNITY

Wanderer

CHANGES AT THE IAC

> He has been a fantastic friend, supporter and advisor to several Heads of School as well as staff and students

Farewell and thank you Ian McIntyre.

At our final School of Civil & Environmental Engineering (CVEN) Industry Advisory Committee (IAC) meeting for 2023, it was sad to farewell IAC Chair Ian McIntyre.

Ian, an alumnus of the School, has been part of the IAC since its inception in 2006, becoming Chair in 2010. He has been a fantastic friend, supporter and advisor to several Heads of School as well as staff and students. We have been grateful for his wise counsel, industry savvy, occasional tough questions, and complete dedication to the progression of the School, its staff, and students.

During his time on the IAC, Ian led several outreach initiatives such as the School's Primary School Maths Prize - part of a broader campaign to raise awareness of the importance of mathematics; the Year 10 work experience week offered annually by the School to students around the state; and addressing the gender disparity in School enrolments.

For decades, Ian was Principal and Global Service Leader, Contracting Strategy, Expert Witness and Dispute Resolution for global consultancy Advisian (previously Evans & Peck). He is graded as an Arbitrator and is an experienced expert witness, presenter and facilitator, and has been active in several Dispute Boards on major projects. He is President of Region 3 (Australasia) of the international Dispute Resolution Board Foundation and a member of the International Board of that organisation.

Ian so generously brought all these skills and industry knowledge to his role with the School. He has been a crucial partner in our curriculum reviews, our EA accreditation processes, and has acted as facilitator in several industry and teaching forums. Through all his work with School staff and its leadership, Ian never lost sight of the students and the important mission of the School - to prepare them well for the many challenges and delights of their chosen career.

Welcome to Athena Venios

We warmly welcome Athena Venios as our new IAC Chair. Athena, another proud alumnus of the School, has been on the IAC since 2014.

A Fellow of the Institution of Engineers, Athena is the Managing Director of Keller Australia, a leading ground engineering contractor. She is a civil engineer with over 25 years of experience in developing, designing and delivering numerous complex infrastructure projects, including motorways, railways and multi-modal infrastructure.

Driven by her vision for a better world, and immensely proud of her profession, Athena's career has spanned both government and the private sector. She has been the Technical Director of Transport for AECOM, the Director of the Greater Sydney Project Office for Transport for NSW, and Executive Director of Infrastructure NSW. The breadth of Athena's experience is impressive, spanning projects in road, bridge construction and maintenance, rail, water, aviation and transport planning and community support facilities, and include major projects such as the Athens and Sydney Olympics.

Athena has led teams of up to 350 over several states, is a strong communicator both written and verbally and brings financial, commercial and people management skills to any team. Colleagues affirm that Athena nurtures, inspires and challenges her teams to do their best work and to keep learning and growing. We look forward to Athena's leadership of the IAC, including her occasional tough questions!

"Driven by her vision for a better world, and immensely proud of her profession, Athena's career has spanned both government and the private sector."

INDUSTRY ADVISORY COMMITTEE

IAN MCINTYRE
Chair, CVEN Industry Advisory Committee and Director at Ian McIntyre & Associates Pty Ltd

A consultant for more than three decades (for Evans & Peck and Advisian), Ian has advised on a wide range of infrastructure, building and systems integration projects throughout Australia and Asia. He is frequently retained in "trouble shooting", independent review and due diligence roles and has considerable experience in analysis of the reasons for project delivery problems. He is graded as an Arbitrator and is an experienced expert witness, presenter and facilitator. He is a member of four Dispute Boards on major projects and is a member of the Board in Region 3 (Australasia) of the Dispute Resolution Board Foundation.

GREG BOWYER
Manager, GHD Western Sydney, Principal, GHD Senior Technical Director / Infrastructure Project Director

With a background in the Australian Army, Greg specialises in managing consulting projects in the transport, energy and resources, water and property markets. He is passionate about creating leadership opportunities for junior engineers. Greg is currently driving GHD's Western Sydney community and growth, looking to integrate innovative architectural and engineering thinking, property owners, investment options, thought leadership and alternate client futures to build new and lasting communities in Western Sydney.

ANDREW JOHNSON
Principal at Arup, Structures Leader NSW/ACT

Andrew is a structural engineer with a passion for design philosophies combining innovation with efficiency in holistic building or structural solutions. Creating elegant and functional spaces with appropriate material selection and effective direct load paths minimising material use and embodied carbon are a constant goal. His expertise includes tall buildings, hybrid structures, long-term serviceability of structures, seismic analysis and design, and long-span lightweight roof structures. He leads an integrated multi-disciplinary buildings design team in Arup's Sydney office.

LUCAS JORDAN
Senior Advisor at E3 Advisory

Lucas has 15 years' experience in the development, procurement and delivery of major infrastructure and building projects, covering both the private and public sectors. Having held key delivery roles during his time at the Sydney Ports Corporation and Evans & Peck, Lucas now specialises in commercial advisory services for major project delivery and in contractual disputes.

SCOTT POWELL
Managing Director, Operations, Aurecon

Scott is Aurecon's Managing Director, Operations and is responsible for the performance and operational efficiency of the business. With 25 years consulting experience, including ten years in business leadership roles, he has been involved in delivering many major infrastructure projects across several industries.

JESSICA QIU
Major Project Executive,
WSP in Australia

Jessica Qiu is a project executive with international charterships. She is a highly experienced project management professional with extensive experience in the conceptualisation, planning, design, management and construction of large infrastructure projects, focusing on transport, development and social infrastructure sectors. She was the president of Engineers Australia Sydney during 2020-2021 and has led various industry initiatives such as the Innovation Network, the Western Sydney Initiative, Education Support – Cradle to Graduation, Migrant Engineer Support etc.

DES SINOVICH
Head of Careers and Pathways,
St Andrew's Cathedral School.

Des Sinovich, a Careers Counsellor, has worked in several education sectors in Australia and abroad in various roles including teaching, development and leadership. He has a particular interest in curriculum relevance.

GARETH SWARBRICK
Principal Geotechnical Engineer, PSM

Moving from academia to industry, Gareth's expertise centres on tailings dam design and operation, assessment and management of mine subsidence impacts and numerical analysis. Signature projects include protection of the Upper Canal and Hume Highway during undermining, prediction of steam pressures at Lihir Gold Mine, numerical analysis of hydromechanical coupling at Olympic Dam, Brisbane Airport Link tunnel design and investigation of the Lane Cove Tunnel collapse. He is currently a Visiting Fellow with the UNSW Water Research Laboratory.

CRAIG TURNER
Managing Director, SDG

Craig is the Managing Director of SDG, a Land Title and Survey Consultancy based in Sydney. He is a Registered Land Surveyor with over 30 years' experience in Industry and is the current President of Consulting Surveyors National

ATHENA VENIOS
Managing Director, Keller Australia

Athena is the Managing Director of Keller Australia, a leading ground engineering contractor. She is a civil engineer with over 25 years of experience in developing, designing and delivering numerous complex infrastructure projects, working both for government and in the private sector. In 2016 Athena was awarded the Judy Raper Award for Leadership in Engineering, in recognition of her sustained and significant contribution through demonstrated leadership within the profession in Australia.

NICOLE WATERMAN
Technical Leader at Laing O'Rourke

Nicole brings more than 20 years of experience in delivering complex multidisciplinary infrastructure engineering projects across Australia, Europe, the Middle East and Asia in a range of sectors including rail, commercial, cultural and civic, sports, and the water and wastewater industries. She was the Project Technical Lead for Central Station Metro working with Sydney Metro, and is a Committee Member of EA's Sydney Division.

EXTERNAL RELATIONS COMMITTEE (ERC)

> "The Committee works closely with Faculty of Engineering at UNSW on all their external engagement endeavours."

ERC MEMBERS ORGANISE the promotion and rep¬resentation of the School at many presentations and functions on and off campus. These include Engineering Information Days, UNSW's annual Open Day, High School visits on and off campus, Women in Engineering events, and the NSW Careers Advisors Annual Conference. The Committee works closely with Faculty of Engineering at UNSW on all their external engagement endeavours.

COMMITTEE MEMBERS

KURT DOUGLAS
Chair

CRAIG ROBERTS
Deputy Chair

KRISTEN SPLINTER
WRL

ALI KASHANI
CIES

ADEMIR PRATA
WRC

MEEAD SABERI KALAEE
rCITI

JOHNSON SHEN
CIES

ROBERT HOLDOM
Scholarships

TAMARA ROUSE
External Relations Manager

TRICIA TESORIERO
Outreach Projects

Kurt Douglas at the annual Year 4 Dinner

The Committee is responsible for the management of the CVEN Primary School Maths prize, administered by Tricia Tesoriero and the Industry Partner Program which is coordinated by the Chair Kurt Douglas and ER Manager Tamara Rouse.

The ERC liaises with the CVEN Industry Advisory Committee (IAC) and our Industry Partners on many projects, including the annual Year 10 work experience week, Elite Student/Industry Partner Breakfast, discipline prizes awarded at the CVEN 4th year dinner, and the Industry Part¬ners Careers Market.

Communications

Anna Blacka, our Digital Communications Officer, regularly shares our staff and student successes, achievements and calls to action through a growing LinkedIn page. By the end of 2023 we had 4,060 followers.

Mary O'Connell, Digital Content Coordinator, works on creating and curating content for our Centre and School websites.

PRIMARY SCHOOL PRIZE IN MATHEMATICS OUR OUTREACH CONTINUES

2023 Primary Maths Prize Winners

Alexandria Park Community School
Ayden Celander
Elizabeth Lee
Alexander Lockwood
Jonah Yabsley

Annandale North Public School
Hal Fletcher
Damon Koo
Hannah Koskie
William Tindall

Armidale City Public School
Oliver Akerman
Henry Bartlett-Taylor
Edden Kanety
Isaac Stubbs

Arncliffe Public School
Deon Goninan
Arncliffe Public School
Jermeyne Henson

Australian International Academy of Education
Aadam Abdellatef
Sajed Hussein
Muhammed Usman
Ibrahim Zameer

Balgowlah Heights Public School
Buzz Giffney
Lucie Coventry
Alexander Tasevski
Liam Wylie

Bankstown West Public School
Brandon Ly
Anh Tuan Nguyen
Marilyn Nguyen
Alice Truong

Barramurra Public School
Maximus Holt
Tenzin Tendhar Tenkhang

Beaumont Hills Public School
Kaci Chen
Felix Ng

Beauty Point Public School
Hadi Adeel
Jack Davenport
Jet Louie
Flynn McColl
Haydan Qian

Beecroft Public School
Patrick Huang
Clara Zhou

Bellevue Hill Public School
Aaron Blumenow
Harley Blumenow
Aaron Guttman
Oscar Hadassin
Aiken Leng-Inthapanya

Belrose Public School
Emily Adcock
Daniel Clegg
Claudia Scicluna
Charlotte Vandenbergh

Beverly Hills Public School
Phylicia Kong

Blackheath Public School
Eden Jones
Annie Zhou

Blacktown West Public School
Subhaan Farzam
Nawid Karimi
Holly Wang
Sandra Wang

Bondi Beach Public School
Eric Fletcher
Marlon Hair
Emmeline Henrici
Elena de Jong

Bondi Public School
Max Johnson
Gene Taranto

Bronte Public School
Evan Crawford

Cammeray Public School
Adele Cale
Leo Son

Canterbury South Public School
Liana Chen
Henry Shimada

Carlingford Public School
Dhanvi Sarker
Damien Zhang

Carlton Public School
Claire Hu
Lisa Nguyen
Michael Ye
Toby Zhuo

Casula Public School
Arvin Hasan

Chifley Public School
Alexander Pratt

Claremont College
Evan Hidayat

Clovelly Public School
Iggy Hylands-Hill

Condobolin Public School
Lucy McFadyen
Anastasia Phillips

Cowra Public School
Ethan Buik
Douglas Chase

Crescent Head Public School
Mali Adam
Patrick Browning
Ben Hiscock
Coby Mulato

Daceyville Public School
Edward Atkin
Donglin Li

MATHS PRIZES

Double Bay Public School
Jack Boykin
Beatrix Escott
Tri Nguyen
Portia Salter

Eastlakes Public School
Afnan Ahmed
Muhammad Shahwaiz Hanif
Sayed Sami
Ahmad Ibne Mohammad

Engadine Public School
Thomas Collibee
Tobias Evers
Abbey Ferraro
Jordan Milgram

Epping North Public School
Alex Au-Yeung
Daniel Sims

Ermington Public School
Koby Leung
Alexander Peng
Elvin Wang
Oscar Zhu

Ermington West Public School
Tristan Adams
Francis Chai
Xingyu Chen
James Lee

Ferncourt Public School
Murray Davison
Charlie Lau
Ellie Tran
Xavier Zhang

Glenhaven Public Schoo
Caleb Chen

Harbord Public School
Remy Clements
Jasmine Milne
Georgie Williams
Oscar Wilson

Illawong Public School
Jason Panagiotidis
Joshua Peel
Oscar De Santis
Mitchell Van Ryn

Jasper Road Public School
Ethan Gulliford
Aanya Mehndiratta
Felix Wang
Grace Wang

Kambora Public School
Owen Evans
Jack Maris

Kensington Public School
Anna Chen
Lara Li
Charlotte Liu
Noah Manoj

Lawson Public School
Nash Cardillo
Johan Welbergen

Lugarno Public School
Flynn Clifford-O'Sullivan
Peyton Low
Isaac Megeed
Ryan Srinivas

Manly West Public School
Isaac Kriletic

Maroubra Junction Public School
Teo Carnjanakavyn
Darren Foo
Felix Haines
Noah McCollum

Masada College
Hongbo Zhao

Matraville Public School
Codi Roach

Middle Harbour Public School
Zosha Kordjazy
William Scoufis

Mosman Public School
Scarlett Dai
Christopher Papadakis

Mount Colah Public School
Hugh Cameron
Namya Jain
Pranita Poudel
Adelaide Wood

Narrabeen North Public School
Luca Mottin

Niagara Park Public School
Lan Ciren
Isaac Gobbe

North Haven Public School
Jacob Everden
Luke Middleton
Darci Ray

North Sydney Demonstration School
Cosmo Bresard
Christina Mitchell
Harley Pearce
Giselle Thorburn

Northmead Public School
Nicholas Gnezdiloff
Erin Huang
Jayden Mau
Harrison Phan

Oatley Public School
Toby Chan
Oatley Public School
Joy Qiu

Our Lady of the Rosary Primary School Kensington
Jorence Jo
Lukas Krehein
Edelyn Lim
Joshua Vagenas

MATHS PRIZES

Pagewood Public School
Elena Chouseas
Hei Yin Ko
Alana Santoso
Jeslyn Wong

Parramatta North Public School
Nitya Singh

Picnic Point Public School
Cameron Guyer

Picnic Point Public School
Ganeev Kainth

Picnic Point Public School
Cameron Guyer
Ganeev Kainth
Pradanya Logabalakrishnan
Marcus Tanner

Pitt Town Public School
Bryson Gauci
Layla McCarthy
Benjamin Morris
Nixon Doughan Precians

Rainbow Street Public School
Tanmay Ganesh Kummar

Randwick Public School
Kaylee Tse

Roselea Public School
Connor Graves
Zhongbo Hong

South Coogee Public School
Sophie Connell
Daniel Hanna
Zac McLellan
Veronica Williams

St Aloysius Catholic Primary School, Cronulla
Hutch Boyd
Patrick Hughes
Jaxon Lewis
Thomas Ridley

St Declan's Catholic Primary School Penshurst
Abigail Blackman
Mitchell Grubits
Natalie Ng
Tyler Quinn

St John Bosco Catholic Primary School, Engadine
Aiden Dudarenok

St Joseph Primary School Como-Oyster Bay
Matilda Duff
Ryan Ellis
Layne Fanning
Christian Gill

St Philip's Christian College
Alexander Debenham
Moyefoluwa OlaOluwa

Sylvania Heights Public School
Johnny Ding
Lindsay Ling
Jayden McKiernan
Roham Ravanbakhsh

Tacking Point Public School
Scarlett Brook
Daisy Powell

Toongabbie Public School
Rohan Torsvik Kane
Chamaya Senevirathna

Toongabbie West Public School
Johanna Mathew
Jaden Melhem

Ulladulla Public School
Alex Lee

Ultimo Public School
Isabella Yeung

Warrawee Public School
Christopher Lee
Haein Moon
Nathan Zhao
Ryan Andalib Zoghi

West Pennant Hills Public School
Fynn Brophy
Aiden Callaghan
Dev Kadaba
Jack Khoo

West Ryde Public School
Kushagra Agrawal
Siddhant Deshkulkarni
Marcus Orton
Louie Verdy

Wheeler Heights Public School
Harrison Bates
Indigo James
Taj Timosevski
Michael Wan

Wollondilly Anglican College
Katelyn Davies
Jayden Field

Woollahra Public School
Rafael Clarke
Ethan Cui
Aidan Kamal
Audrey Li

WORK EXPERIENCE WEEK

In May 2023 Tricia Tesoriero and her team coordinated another successful work experience week for Year 10 high school students from across the state. The demand was high – the program accepted 91 students from 91 High Schools, with 58 students on the reserve list.

Year 10 Work Experience - Group winners of the structural stability test!

> Daily field trips were led by UNSW staff, and supported by engineering professionals from our Industry Partner program.

THE WEEK'S SCHEDULE aims to provide students with some first-hand experience with engineering projects and the six areas of our civil and environmental engineering fields:

- coastal and port infrastructure
- structures and design
- construction and project management
- water, wastewater and environment
- road, transport and underground
- surveying and geospatial engineering.

Daily field trips were led by UNSW staff, and supported by engineering professionals from our Industry Partner program. Students visited a range of engineering sites across Sydney, followed by an afternoon debrief and short report writing session at the UNSW Kensington campus

During the 2023 week, Civil & Environmental staff were assisted by staff from other schools – Chemical Engineering, Electrical Engineering and Telecommunications, and Minerals and Energy Resources.

The week was the usual success with students and parents:

A student's email:

> *"Thank you for the opportunity to enjoy a lovely week of work experience at UNSW I found it to be a very informative and enjoyable time, making new friends and exploring new avenues in the work environment*
>
> *I know this event would have taken a lot of work and time to plan and account for everything and everyone. So thank you for using the time to create a memorable experience."* Denzil

A parent's email:

> *"[Our son] thoroughly enjoyed his week with the civil engineering work experience, and it has now cemented the direction he would like to take once he finishes school.*
>
> *He commented on how wonderful all teachers etc were, and loved the insights into the industry. It was a well run excursion, and has given valuable encouragement to our son to continue to strive at school, so he can become part of the industry one day."* Kelly and Seth

INDUSTRY PARTNERS CAREERS DAY

NEARLY 500 UNSW CIVIL ENGINEERING, environmental engineering and surveying students registered for the 2023 annual School's Industry Partners Careers Market held at UNSW's New College in March.

It was a wonderful opportunity for representatives from nineteen of our industry partners to meet with students, identifying likely candidates for industrial training placements or graduate employment.

Participating industry partners and supporters:

AURECON	KELLER	WARD CIVIL
BECA	LAING O'ROURKE	WITT CONSULTING
CMS SURVEYORS	NORTHROP	WSP
DOUGLAS PARTNERS	PSM	
DOWNER	ROYAL HASKONING DHV	
DREYFUS ADVISORY	RPS	
E3 ADVISORY	SMEC	
JACOBS	TTW	

INDUSTRY PARTNERS

It's important to us that high school and undergraduate students can see a direct path from university to the exciting and challenging world of engineering. That's where our Industry Partner Program comes in!

> "The IPP helps fund our outreach programs with potential future students, raising the profile of the profession and its work to students in primary and high schools."

THE IPP HELPS FUND OUR OUTREACH PROGRAMS with potential future students, raising the profile of the profession and its work to students in primary and high schools. This includes our very successful Primary School Maths Prize and Year 10 Engineering Work Experience Week. Funds are also used to run events that link our undergraduates with our Industry Partners, such as the Industry Partners Careers day and our Elite Student Breakfast.

Industry Partners in 2023

- ARUP
- Aurecon
- Beca
- CMS Surveyors
- Douglas Partners
- Downer
- Dreyfus Advisory
- E3 Advisory
- Laing O'Rourke
- LandPartners
- LTS – Registered Surveyors
- Northrop Consulting
- Pells Sullivan Meynink Pty Ltd
- PMO Pro
- SMEC Australia
- Taylor Thomson Whitting (TTW)
- Ward Civil
- Witt Consulting
- WSP

ALUMNI PROFILE: PROFESSOR OLIVIA MIRZA

In 2023 School alumnus (BE (Civil) 2002) Professor Olivia Mirza (FIEAust, CPEng, NER, MIEAust) won the Judy Raper award for Leadership.

PROF. MIRZA IS ASSOCIATE DEAN - Engagement at Western Sydney University with expertise in forensic engineering to aid the rehabilitation and strengthening of ageing infrastructures. Her PhD completed in 2009 at WSU, 'Behaviour and Design of Stud Shear Connectors in Composite Steel-Concrete Beams' was supervised by Prof Brian Uy.

"One of my passions is looking at diversity in STEM programs, especially engineering. Diversity for me is not only about gender diversity, but also diversity in terms of background and culture," Prof Mirza said at the 2023 UNSW Women in Engineering Awards ceremony held in June.

"I come from Malaysia and I have experienced discrimination personally because of my race and my religion. Even though I studied very hard and got into the top 3 per cent in our equivalent of HSC, I was not given the opportunity to study at university in the engineering course I wanted to take.

"Fortunately, my parents helped me to be able to study at a private college where I worked hard and was awarded a Golden Jubilee Scholarship to come to Australia in 2000.

"We now have an ASPIRE Indigenous Engineering program at UWS to help Indigenous students academically, but also give them an opportunity to work while studying. And I am very proud of that."

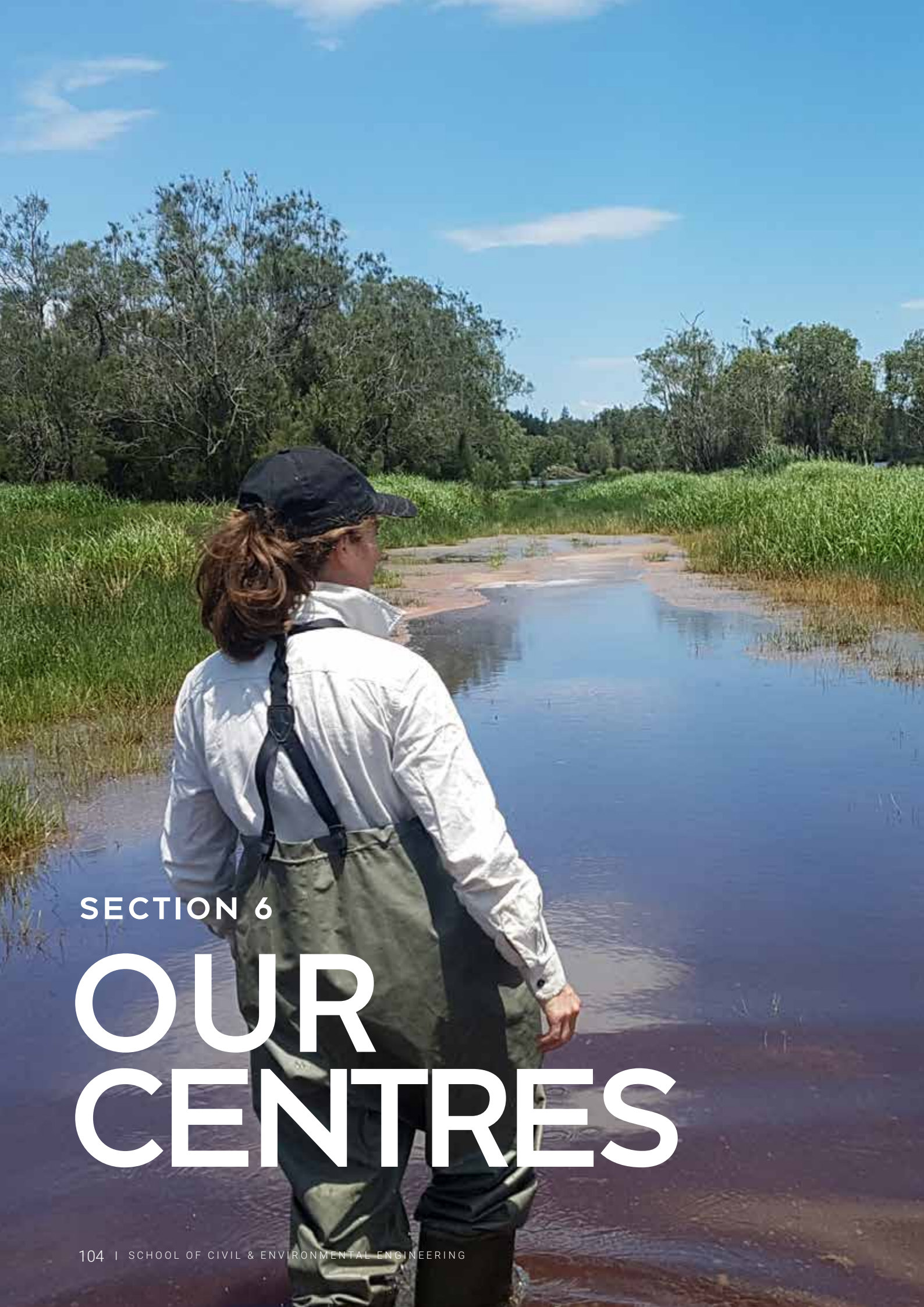
The WiE awards are designed to recognise the amazing achievement of women engineers who are inspiring, mentoring and proving to be role models for the next generation. Olivia is an active and successful mentor for Western Sydney University's Women in STEM Education (WiSE) Program, its Science in Australia Gender Equity (SAGE) initiative group and Engineers Australia's Women in Engineering mentoring program. .

Prof Mirza has been actively volunteering for Engineers Australia since her undergraduate days at UNSW. Over the years, she has held various positions, including Student Engineer Representative, Chair of Young Engineers, and Representative and Committee Member for Women Engineers in the Western Sydney Region. Additionally, she has served as Chair for Engineers Australia Western Sydney Regional Group.

In 2022, she was elected as President of Engineers Australia Sydney Division, and in 2024 she was elected to the Engineers Australia National Congress.

"Diversity is not only about gender, but also about background and culture."

ALUMNI



SECTION 6

OUR CENTRES

WRL Principal Engineer Alice Harrison (l);
(r) Dean Egan, National Parks- Everlasting Swamp, NSW.

OUR RESEARCH CENTRES AND HUBS

The School is a research powerhouse – over fifty professional researchers in 2023 and 189 PhD candidates led by our world-renowned academic staff. Our success is based upon the detailed, rigorous and visionary work of our research centres and discipline groups, working together with external academic, government and industry colleagues to address current local and global challenges.

In 2023 our Centres worked with over 120 industry, government, and community partners on a wide range of research projects. See Grant Income tables in this Section for more details.

CIES Centre for Infrastructure Engineering & Safety

CIES Director: Professor Chongmin Song

Centre Manager: Ms Grace Zhu

W: www.cies.unsw.edu.au

E: cies@unsw.edu.au

CIES was established as a UNSW Research Centre in January 2007 to facilitate advanced research in all aspects of civil engineering infrastructure, including building structures, bridges, tunnels, roads, railways, pavements, dams and the like. Our work has expanded to include construction management, advanced systems and low-carbon technologies.

We aim to be the nexus of the various scientific disciplines including structural engineering, geotechnical engineering, engineering materials and computational mechanics, in the broad fields of engineering infrastructure; its design, evaluation, construction, performance, retrofit and reuse. We achieve this as an integral part of a circular economy, dedicated to high societal productivity and minimised waste.

rCITI Research Centre for Integrated Transport Innovation

rCITI Director: Professor Vinayak Dixit

Professor Taha Rashidi

Centre Manager: Maria Lee

W: www.rciti.unsw.edu.au

E: maria.lee@unsw.edu.au

rCITI's vision is to be a world-leading organisation in integrated interdisciplinary transport research, development and education. They are well on their way to achieving the Centre's goals by providing critical expertise and experience in Mobility planning, Analytics, Operations and Technology. With a core objective to drive Efficiency, Equality and Emerging technologies (3Es) in mobility systems.

rCITI aims to pursues globally-leading interdisciplinary solutions for transport planning and management that integrate three critical aspects for societal impact:-

(i) Emerging mobility technology

(ii) Human behaviour & choice

(iii) Institutional / market landscape

RIIS: Resilient and intelligent infrastructure systems

RIIS Hub Director and
Lead Chief Investigator: Professor Nasser Khalili

HUB Business Manager: Theresa Wisniewski

W: https://riis.org.au

P: +61 2 9348 0771

RIIS is an industry and ARC funded research and innovation hub for smart infrastructure established in 2022. It engages with industry, government, and the community to develop and implement science-based policy and integrated practical solutions to the current and future challenges facing Australia's urban, resource and energy infrastructure.

RIIS will deliver transformational technologies to address Australia's critical infrastructure needs. It will integrate advances in sensor technology, connectivity, data analytics, machine learning, robotics, smart materials, and reliable models to deliver resilient and adaptive infrastructure systems in urban, energy and resource sectors – sectors critical to Australia's prosperity and well-being.

WRC Water Research Centre

WRC Director: Professor Denis O'Carroll

A/Prof Fiona Johnson

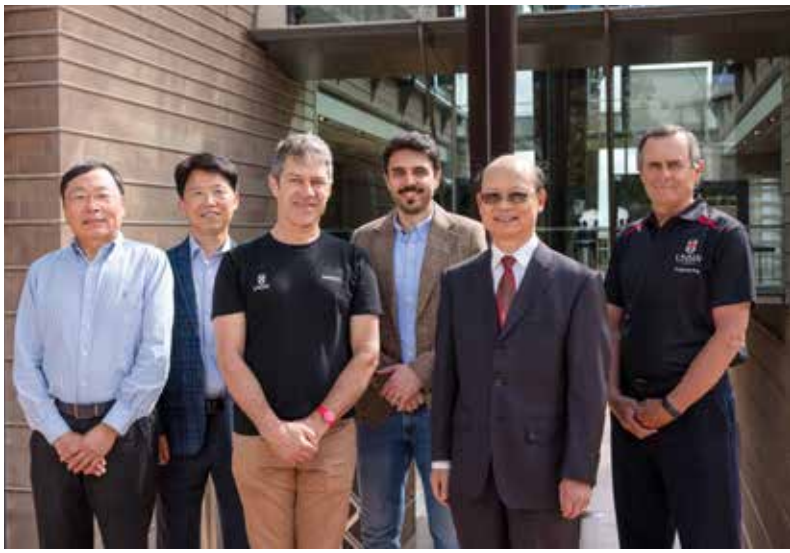
Centre Manager: Uttra Benton

W: www.wrc.unsw.edu.au

E: water@unsw.edu.au

The Water Research Centre (WRC) is an international leading university centre that provides multidisciplinary pure and applied research in water resources, engineering, management and the development of tools for environmental management and sustainability for improving aquatic and atmospheric environments. As a leading Australian water research organisation we apply our experience and critical thinking across more than just water, into diverse (yet related) fields.

- Water quality and treatment processes
- Lifecycle assessment and sustainability
- Waste management
- Hydroclimatology
- Carbon and water footprinting
- Issues concerning atmospheric emissions and odour
- Risk assessment



SAGE academic staff L-R: A/Prof Jinling Wang, A/Prof Samsung Lim, Dr Craig Roberts, A/Prof Mohsen Kalantari, Prof Linlin Ge, Dr Bruce Harvey.'

SAGE Surveying and Geospatial Engineering Research

SAGE Academic Leader: Professor Linlin Ge

W: www.sage.unsw.edu.au

Research enquiries: l.ge@unsw.edu.au

The SAGE Research group conducts world-class research in the sub disciplines of geodesy, photo-grammetry, positioning measurement and remote sensing. Broad research topics include Satellite Navigation Technology and Applications, Geodetic Infrastructure and Analysis, Light detection and ranging (Lidar), Geospatial Information Systems, Multi-GNSS, Multi-sensor integration for positioning & mapping, Statistical theory applied to positioning, mapping, and Remote Sensing.

WRL Water Research Laboratory

WRL Managing Director: Professor Denis O'Carroll

A/Prof Fiona Johnson

WRL Industry Research Director: Brett Miller

W: www.wrl.unsw.edu.au

E: info@wrl.unsw.edu.au

The Water Research Laboratory (WRL) is a world-leading research and consulting laboratory on a four-hectare site at Manly Vale that tackles the most challenging and pressing water engineering problems faced by the world today. We are the largest coastal/hydraulics research laboratory in Australia, home to state-of-the-art facilities, equipment and personnel comprised of the most experienced and creative problem solvers in their respective areas of research and industry.

Our areas of expertise include coastal, ocean, ecosystems engineering, estuarine and wetland management; riverflow and floodplain management; civil engineering hydraulics; and climate change adaptation.

RIIS-ARC RESEARCH HUB

FOR RESILIENT AND INTELLIGENT INFRASTRUCTURE SYSTEMS (RIIS)

Even though the RIIS Hub was officially launched only in April 2023, by the end of the year we had achieved remarkable progress with our projects.

Above: RIIS Investigators at UNSW

Over 60% of the Hub projects had already commenced, and several other new and exciting projects with our industry collaborators are ready to commence in 2024.

We have actively recruited many high-quality PhD students, under the excellent guidance of their supervisors to ensure their research is aligned and progressing with our Hub deliverables.

Three of our PhD students have already received awards for their work:

- **Sana Shahoveisi:** Best Paper Award during the Sixth Australasian Conference on Computational Mechanics (ACCM-2023).
- **Ensiyeh Javaherian Pour:** Runner up - Three Minute Thesis at the Information Resilience PhD School – a two-day event held at the University of Melbourne in October.
- **Masoud Kamali:** Runner up - Data Literacy Competition, Information Resilience PhD School

Many congratulations to Sana, Ensiyeh, and Masoud

Some RIIS project highlights:

- **Automated Scan-vs-BIM for Real-Time Construction Progress Management of Infrastructure Projects.** A streamlined workflow and an automated spatial data processing routine is being developed in collaboration with Industry Partner Linke&Linke to support intelligent infrastructure construction.
- **Computational Tool for Data-Driven Structural Safety Assessment and Service Life Prediction.** Efficient physics-informed machine learning methods are being developed for forward and inverse structural analyses in collaboration with Industry partner Lindenbaum.
- **Nanosensor Integration and Manufacturing Technology for Safe Mining.** A highly innovative sensitive nanosensor is developed for detection of methane, carbon dioxide, and carbon monoxide based on electro crystalised nanowires. The sensor developed has a detection sensitivity of one part per billion.
- **Underground Navigation and Obstacle Avoidance for Unmanned Equipment.** Both Vector Field based Strategy as well as Camera Based Vehicle Tracking are used to identify the location of a vehicle in underground setting for the purpose of navigation and obstacle avoidance. This work is conducted in collaboration with Industry Partner Azure Mining Technology.
- **Infrastructure Protection Utilising Real-Time Monitoring of Affected Catchments.** A shared database between CSDILA and Lixia is being developed to store and access Lixia's sensor data. Collaborating with Townsville local council, access is gained to the site's historical weather and flow data to developing predictive models for flash flooding events.
- **Integrating Spatial Digital Twin with Automation System in Smart Infrastructure Asset Management.** In this work, data capturing methods for 3D industrial plants is explored. SOTA 2D and 3D object recognition and segmentation algorithms are developed and semi-supervised learning-based methods are developed in order to enable real-time infrastructure asset management.
- **Data Integration with Spatial Digital Twin for No Spill Network and Fibre Optic System for Pipeline Monitoring.** Initial investigation of underground utility data received from South East Water; Investigation of 3D spatial and graph data models (e.g. CityGML, IFC, LandInfra, etc) for underground utility management; and Identification of general and specific requirements for underground utility data and comparing 3D data models against these requirements.

In 2024 we anticipate highly developed research results in a number of exciting areas, continued collaborations, and advancements in our projects. We will invest further in our PhD researchers with training workshops as well as actively supporting their participation in local and international conferences.

We are enthusiastic about sharing this journey with our RIIS Chief and Partner Investigators and look forward to continuing our joint efforts towards meeting the challenges of infrastructure engineering & asset management.

Professor Nasser Khalili
Director - RIIS
https://riis.org.au

"In 2024 we anticipate highly developed research results in a number of exciting areas, continued collaborations, and advancements in our projects."

RIIS-ARC

WATER RESEARCH CENTRE (WRC) 2023 REPORT

UNSW Water Research Centre

In 2023, WRC continued to focus on its research excellence and stakeholder engagement. This was achieved through stellar research outputs, grants, and research/industry partnerships. In particular, the Centre was the UNSW node of two cross-institutional research hub/training centres, (ARC IITC - Data Analytics for Resources and Environments (DARE)and the Transforming Biosolids Centre) maintained its high numbers of higher degree researchers (HDR), and shared its activities through multiple scientific meetings, and industry and community engagements.

New leadership in 2023

WRC welcomed a new leadership team this year with Associate Professor Fiona Johnson becoming the Managing Director and Associate Professor Bojan Tamburic the Deputy Director. The new leadership team acknowledged the strong position of the Centre and thanked Prof Denis O'Carroll for his leadership of the Centre in 2022/2023 as well as his earlier leadership from 2018 to 2020. Uttra Benton was farewelled as Centre Manager in September. Uttra moved within UNSW to help set up a new research centre in the Faculty of Medicine. We were very pleased to appoint Paula Ploysarak as the new WRC Centre Manager in October who joined us from the School of Civil and Environmental Engineering administration team.

Academic and Research Staff

WRC has 15 academics, with Prof Bing-Jie Ni joining us in 2023. Prof Ni is a highly cited researcher working in the field of environmental technology and wastewater treatment, focusing particularly on the interface of process engineering, microbial biotechnology, materials science, and mathematical modelling. His research develops innovative and sustainable technological solutions to remove pollutants from wastewater whilst minimising the carbon footprint and maximising energy recovery. We also bade farewell to Prof Stuart Khan and Dr Matt Lee.

WRC hosted a number of international visiting researchers in 2023, including Dr Peter Bach (Swiss Federal institute of Aquatic Science and Technology), Prof Hongiuan Bai (North University of China), Prof Andras Bardossy (University of Stuttgart), Prof Paolo Burlando (ETH Zurich), and Prof James Smith (McMaster University).

WRC is home to 61 Higher Degree Researchers (PhD and MPhil) and we were proud to have 13 researchers submit their dissertations in 2023, while 10 new HDR researchers joined the WRC. Our HDR researchers continue to achieve excellent research and leadership, with a number of best presentation awards at local and international conferences.

Centre Strategies

A focus for WRC in 2023 was to implement the Centre's strategy after holding a strategy planning day in 2022. As a result, three working groups, focusing on research, thought leadership and culture, have been set up to support the Centre's strategy with representatives from academics, research staff and HDR candidates. The leadership team meets fortnightly to discuss current activities and potential WRC research and engagement strategy.

New initiatives in 2023 included Professional Development and Training awards that were granted to five PhD and Early Career Researchers to enable them to attend training courses to broaden their skills. The training courses supported included project management, time management and a women in leadership course. WRC also hosted a course on Data visualisation and communication workshop delivered by James Goldie for our early carer and higher degree researchers.

ARC Successes

It was a very successful year with Australian Research Council funding for WRC researchers, with the following projects awarded in 2023:

- ARC Discovery Project for Professor Denis O'Carroll, together with Professor Stuart Khan; Clare Robinson; Dr Martin Andersen, Dr Matthew Lee and Dr James McDonald for Impact of redox condition on emerging contaminants fate.
- ARC Discovery Project for Professor David Waite together with Prof John Fletcher; Dr Yuan Wang and Prof Lina Yao for Improving Resilience of MCDI for Water Supply in Remote Communities.
- ARC Discovery Project for Professor Ashish Sharma, together with Professor Rory Nathan; Dr Conrad Wasko; Dr Kenneth Kunkel, for Rare Event Simulation: Protecting vital infrastructure from flood extremes.
- ARC Linkage Project for Scientia Professor David Waite, together with Professor Ryan Armstrong; Dr Andrew Feitz; Dr Peter Haines; Ms Elinor Alexander; Dr Kevin Ruming; Mr Ralph Bottrill for Hydrogen generation by subsurface iron mineral transformations.

"WRC is home to 61 Higher Degree Researchers (PhD and MPhil) and we were proud to have 13 researchers submit their dissertations in 2023, while 10 new HDR researchers joined the WRC."

WRC

Dr Bojan Tamburic

Associate Professor Fiona Johnson

Professor Bing-Jie Ni

On the publication front, WRC researchers published a total of 180 journal papers in 2023 with 160 of these in highly ranked Q1 journals. In addition, 10 book chapters and 1 report were also prepared by WRC researchers and one patent was approved.

Outreach, Expert Advice and Impact

WRC researchers continued their work with industry, government partners and international research collaborators to deliver new technologies, research methods and improve the understanding of water and atmospheric systems.

WRC's active seminar series continued in 2023 with visitors and WRC staff presenting on a wide range of research topics. Highlights included a seminar on Climate Anxiety by Dr Chloe Watfern for RUOK day, a presentation on the Water Energy Food Nexus by Prof Paolo Burlando visiting from ETH Zurich and presentations by Tata Steel when a delegation visited WRC from India.

WRC researchers were invited to a range of Federal, State and Local government policy discussions and gave expert advice such as:

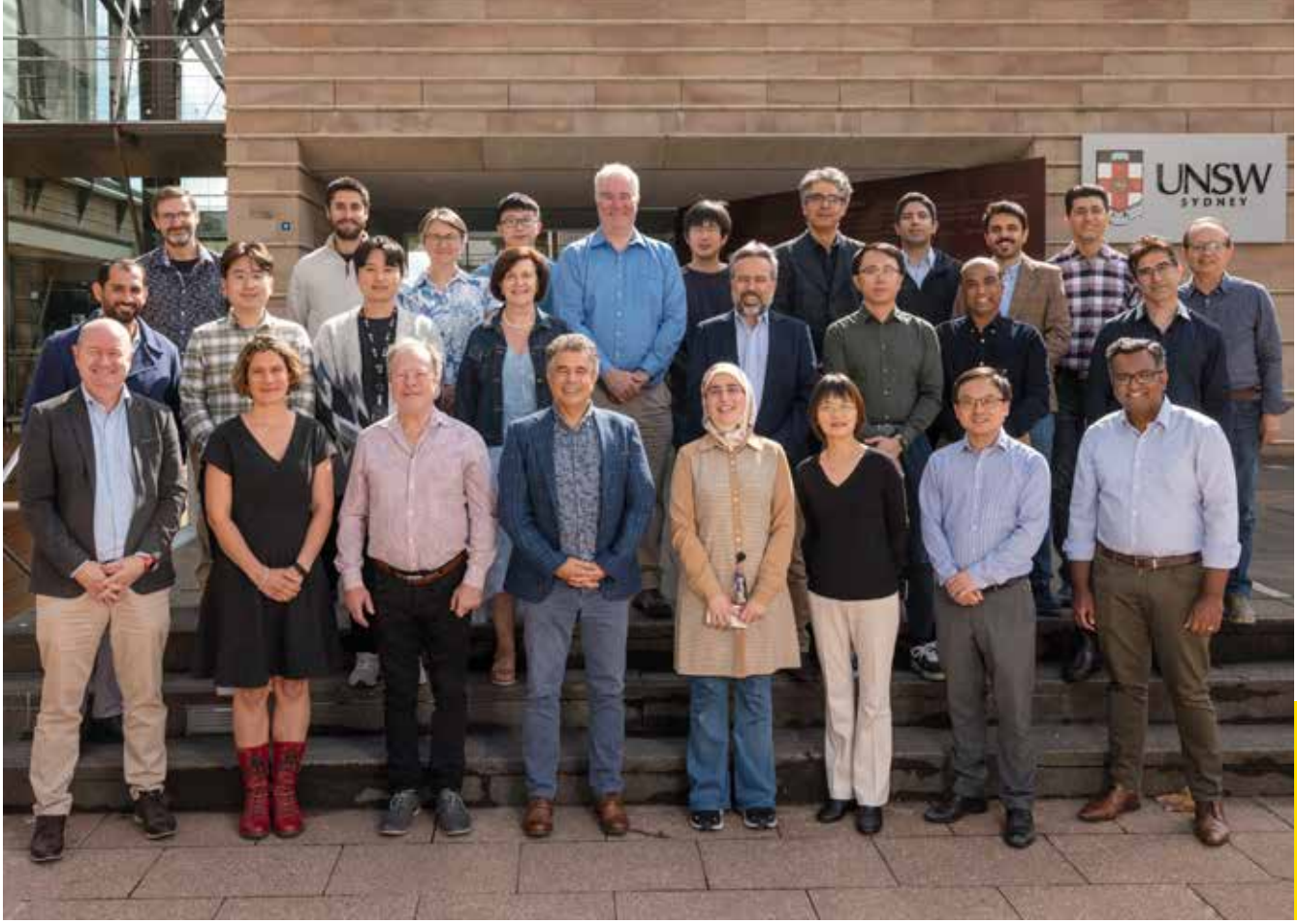
- Prof David Waite to the NSW Department of Planning and Environment and the Independent Planning Commission of NSW on mining projects including assessment and policy related matters.
- Prof Tommy Wiedmann to ACE Hub Metrics Working Group at the Australian Circular Economy Hub
- Dr Bojan Tamburic gave expert advice for long-term management plan of harmful algal blooms at Western Treatment Plant for Melbourne Water.
- A/Prof Fiona Johnson continued in her role as expert advisor for the Victorian Climate and Water Initiative

Awards & Recognition

Prof Tommy Wiedmann was listed as Highly Cited Researcher 2023 by Clarivate

Prof Bruce Ni's wastewater research was featured as one of the Nature Index 2023 Rising stars.

Dr Andrew Dansie, Humanitarian Engineering Lead for the Faculty of Engineering, won an award for Social Impact at UNSW Engineering Excellence Awards in 2023.



ACHIEVEMENTS AT CIES IN 2023

CENTRE FOR INFRASTRUCTURE ENGINEERING AND SAFETY

CIES WAS ESTABLISHED as a UNSW Research Centre in January 2007 to facilitate advanced research in all aspects of civil engineering infrastructure: building structures, bridges, tunnels, roads, railways, pavements, dams and the like. It has expanded to include construction management, advanced systems and low-carbon technologies.

We aim to be the nexus of the various scientific disciplines in the broad fields of engineering infrastructure; its design, evaluation, construction, performance, retrofit and reuse - as an integral part of a circular economy, dedicated to high societal productivity, low emissions and minimised waste.

Our team's accomplishments during 2023 were undeniably impressive. Collectively our members were active on over fifty industry and government funded research projects to an annual value of $5.6M, secured five Australian Research Council (ARC) Discovery and Linkage grants totalling $2.25M, as well as $2.7 million in Cooperative Research Centre Projects (CRC-P) funding, and $400K in Australian Economic Accelerator Grants.

Warm congratulations to staff involved in these and other grants: Dr Asal Bidarmarghz, Prof Wei Gao, A/Prof Ailar Hajimohammadi, A/Prof Ehab Hamed, A/Prof Mohsen Kalantari, Dr Ali Kashani, Dr Taehwan Kim, Scientia PSM Professor Nasser Khalili, A/Prof Wengui Li, Prof Chongmin Song, and Scientia Prof Brian Uy. See the Our Research Section in this report for fuller details.

The Centre maintains a steady stream of contract research projects, expert advice and consulting activities, attracted increasing amounts of industry funds, with 14 new projects begun in 2023. During the year we also graduated sixteen brilliant PhD students, and published 150 refereed Q1 journal papers, three book chapters, and one book.

CIES

Centre For Infrastructure Engineering and Safety

> "We aim to be the nexus of the various scientific disciplines in the broad fields of engineering infrastructure"

CIES

Dr Da (Daniel) Chen

Scientia Associate Professor Wengui Li

Dr Adnan Sufian

Welcomes

In 2023 we welcomed **Dr Da (Daniel) Chen**, **Scientia Associate Professor Wengui Li** and **Dr Adnan Sufian** to the CIES team.

Dr Da (Daniel) Chen, an ARC DECRA fellow has a diverse research background across structural, mechanical, and material engineering. With a focus on the development of novel composite and structural forms, he is best known for his contributions to the advance of Functionally Graded Porous Structures.

Scientia Associate Professor Wengui Li is an ARC Future Fellow who has earned international recognition for his pioneering research in the fields of intelligent/smart concrete and sustainable construction materials for resilient and durable infrastructure.

Dr Adnan Sufian is an ARC DECRA Fellow and an ARC Early-Career Industry Fellow. His research interest is broadly in the area of multi-scale and multi-phase mechanics of granular materials, with a focus on innovative solutions to geotechnical issues surrounding the development of urban infrastructure.

We also welcomed back Scientia Professor Brian Uy, a previous Director of CIES and a research luminary in structural engineering. Brian's research has been highly cited in the area of steel-concrete composite structures, steel structures, structural engineering and civil engineering where he is in the top 5% cited of all researchers in all these fields. Brian has delivered over 350 conference papers in 35 countries on 6 continents, and has co-authored over 750 publications.

Other CIES 2023 highlights

Congratulations to **Dr Ali Kashani** who, with a team from CONTOUR 3D, and Group Architects, won the prestigious National Award of "Excellence in Concrete" in Technology and Innovation awarded by the Concrete Institute of Australia (CIA) at the Concrete 2023 biennial conference in Perth in September. Dr Ali Kashani is one of the Chief Investigators and founding member of the Researcher Network for Decarbonising the Building Industry (RNDBI), which received federal government funding of $2M in July 2023.

Recognition as leading national experts

Congratulations to **CIES Professor Stephen Foster** who was appointed Fellow of the Australian Academy of Technology Sciences and Engineering (ATSE) for his role in advancing the quality and sustainability of concrete structures in Australia and around the world.

Associate Professor Ehab Hamed joined the Standards Australia committee CE-026 (AS 1597) - Precast Reinforced Concrete Box Culverts, representing UNSW; and committee BD-032 (AS2327 Composite Construction), representing the National Precast Concrete Association of Australia (NPCAA). **Scientia PSM Professor Nasser Khalili** was appointed to the 2024 ARC College of Experts.

Global Impact in 2023

Associate Professor Ailar Hajimohammadi was awarded an International Association of Advanced Materials (IAAM) Scientist Medal. For more about Ailar and her work, see pp68-69 of this report. **Associate Professor Johnson Shen** was elected as the Vice-President of the premier International Association for Automation and Robotics in Construction (IAARC). **Professor Brian Uy** was elected as Vice President of the International Association of Bridge and Structural Engineering (IABSE) for a 4-year term (2023-2027). He is the first Australian to serve in this capacity.

Impact through Journals

In 2023 **Dr Asal Bidarmaghz** was a guest editor of the journal Tunnelling and Underground Space Technology - a top 5% journal in her field.

Associate Professor Wengui Li was appointed Special Issues Editor by Construction and Building Materials, and Associate Editor of ASCE's Journal of Materials in Civil Engineering.

Professor Adrian Russell joined the editorial board of the International Journal of Rock Mechanics and Mining Sciences. He is now on the boards of his discipline's top three journals.

On behalf of the Executive Committee, I would like to thank all our staff and students who contributed so generously to the success of the Centre. I would also like to express my sincere appreciation and thanks to our industry partners and advisory committee members for your strong support and important contributions.

Professor Chongmin Song
CIES Director

Professor Chongmin Song

> "On behalf of the Executive Committee, I would like to thank all our staff and students who contributed so generously to the success of the Centre."

CIES EXECUTIVE COMMITTEE

PROFESSOR CHONGMIN SONG
Director

PROFESSOR HAMID VALIPOUR
Deputy Director

PROFESSOR ADRIAN RUSSELL,
Deputy Director

PROFESSOR GANGADHARA PRUSTY
Deputy Director

GRACE ZHU
Centre Management

CIES 2023 - Awarded Research Grant Topics & Chief Investigators:

ARC Discovery Projects

Prof Wei Gao, DP240102559 Experiment-numerical-virtual Generative Design for Nondeterministic

Impacts

Prof Chongmin Song, DP240101471 Computational MultiPhysics Analysis of 3D Structural Damage and Failure.

Scientia Prof Brian Uy, DP240100489 Composite Clad Steel-geopolymer Concrete Systems for Resilient Structures

ARC Linkage Projects

A/Prof Mohsen Kalantari, LP220200901 Reconstructing Land Tenure Maps of Australia in 3D.

A/Prof Wengui Li, LP 230100288 Novel Hydrophobic Concrete for Durable and Resilient Mining Infrastructure.

CRC-P

A/Prof Ailar Hajimohammadi - Creating Construction Materials from Thermal Treatment Facility Wastes.

AEC Grants

Dr Asal Bidarmarghz - Unlocking the Full Potential of Geothermal Energy Cost-Effectively

Dr Ali Kashani - Creating a New Low-Emission Concrete Masonry

Professor Brian Uy

WATER RESEARCH LABORATORY (WRL): SOME HIGHLIGHTS IN 2023

UNSW
Water Research
Laboratory

Associate Professor
Kristen Splinter

Associate Professor
Stefan Felder

IN 2023, THE WATER RESEARCH LABORATORY welcomed a new leadership team this year with Associate Professor Kristen Splinter becoming the Managing Director and Associate Professor Stefan Felder becoming the Deputy Director. Professor Denis O'Carroll continues his research at WRL while continuing his role as the Deputy Head of School (Research). Brett Miller continued his role as Director Industry Research.

In 2023 WRL won and undertook $3.45M of industry applied research. 29 papers were published, and 45 technical reports were prepared for industry. One PhD student graduated - congratulations to Dr Maryam Farzadkhoo.

Summary of Key Publications and Research Grants

- **Dr Kilian Vos** led a landmark publication, along with colleagues Dr Mitchell Harley, A/Prof. Kristen Splinter and Prof. Ian Turner in the prestigious journal Nature Geoscience using satellite technology developed at WRL to analyse over 8000 km of beaches across the Pacific to understand how Pacific Ocean beaches respond to El Nino and La Nina cycles. An accompanying explainer article about this work was published in The Conversation as well ABC News, The Guardian and the Sydney Morning Herald. Dr Mitchell Harley was interviewed on live TV about coastal erosion issues in relation to this publication on ABC News 24.
- **Dr. Danial Khojasteh** led a global assesment of estuarine tidal response to sea level rise with colleagues, A/Prof Stefan Felder, Dr. Valentin Heimhuber, and Prof. William Glamore.
- **Dr.Phillipa Higgins** led the development on a new South Pacific Drought Atlas (SPaDA) to examine the effects of extreme events on island hydroclimate around the Pacific.
- Congratulations to **Dr Mitchell Harley** for securing a new ARC Linkage Grant ($342,924) partnering with Surf Life Saving Australia to develop a smartphone rip-detection tool and online education game to help reduce the number of Australians drowning in rips each year.
- Congratulations to **Prof. Denis O'Carroll** and **A/Prof. Martin Anderson** on their new ARC Discovery Grant ($400, 574) to look at the impact of redox condition on emerging contaminants fate.

Awards and achievements

- **A/Prof. Martin Andersen** won the Faculty of Engineering Excellence Award for HDR Supervision.
- Congratulations to PhD student **Katie Wilson** for being chosen for GradConnection 2024 as one of the Top 100 Future Leaders in Australia.

PhD candidate Hiruni Kammanankada and Research Associate Dr Jasmin Martino during Tube fishway field trial in Gayini

Just Some of the Year's Highlights

Testing of the Somerset Dam model wrapped, with the project spanning 5 years, over 80 design configurations and nearly 1000 individual tests.. It was the world's first application of Lidar remote sensing to a dam model, providing high frequency water surface profiles, and pioneered the use of conductivity probes for velocity measurements in this application.

WRL welcomed 821 visitors on Open Day who enjoyed viewing and interacting with the various displays.

Hydraulics - The UNSW Tube Fishway project, an interdisciplinary collaboration of WRL hydraulic engineers with fish biologists from BEES, has made important progress during 2023, conducting several Tube Fishway field trials. Initial trials proved the continuous mechanical operation, while later trials lifted fish effectively. The field research is complemented by several PhD projects at WRL investigating attraction and injury-free fish transport under controlled laboratory conditions.

Coastal - WRL coastal engineers and physical modelers' investigations ranged from assessing changes to an existing breakwater under extreme cyclonic waves conditions for the Port of Townsville to testing different engineered solutions to protect wharves from seabed scour risk due to larger and more powerful ferry vessels operating in Tasmania and New Zealand.

In the last two years, WRL conducted extensive wave flume testing of coastal protection structures to be built along several kilometers of foreshore in Wellington Harbour, New Zealand.

Groundwater -The NSW Critical Zone Observatory (CZO) - one of five national observatories - was installed at the UNSW Wellington Research Station in 2023. The network of CZOs, an ARC LEIF funded facility, are designed to observe and answer questions about hydrology, energy, nutrients and carbon cycles, as well as probe the interactions between the hydro-, bio- and geospheres. The CZO is a facility that observes processes in the skin of the Earth (the critical zone) from bedrock via aquifers to the tree canopy.

The Everlasting Swamp National Park

Indigenous Partners - Through the UNSW Yuwaya Ngarra-li partnership, A/Prof Martin Andersen and Dr Laura Montano Luna worked with the Walgett Dharriwaa Elders Group's River Ranger Team on various aspects of groundwater and river water processes and quality. With assistance from UNSW the River Ranger Team now measure and publish weekly river water quality data from the Ngamaay (Namoi) and Baawan (Barwon) rivers. See http://dharriwaaeldersgroup.org.au/index.php/waterquality

Environmental - Everlasting Swamp numerical modelling & blue carbon assessment. The Everlasting Swamp National Park near Grafton has been earmarked by the NSW Government as a priority site for the restoration of blue carbon (tidal wetland) habitat. WRL has conducted multiple field investigations to collect environmental data and the development of a detailed hydrodynamic model of the site. Recently, WRL has completed numerical modelling to identify inundation risks across the site, identify suitable habitat areas for restoration, and to analyse how the site will be affected by sea level rise.

Muddy Lake. Engineer Daniel Gilbert

NSW Coastal floodplain prioritisation study - Originally developed by Glamore and Rayner (2014), WRL recently updated and applied the coastal floodplain prioritisation methodology to seven NSW coastal floodplains including the Tweed, Richmond, Clarence, Macleay, Hastings, Manning and Shoalhaven floodplains. In addition to prioritising subcatchments for the seven estuaries, WRL also developed best practise land management guidelines, and identified a strategic pathway for the remediation floodplains to mitigate the impacts of acid sulfate soil and blackwater drainage.

Muddy Lake tidal flushing processes - Muddy Lake is located on the western side of Lake Macquarie on the NSW Central Coast. The lake was suffering proliferation of the weed Salvinia Molesta across the lake, poor mangrove health, reduced abundance of wetland birdlife, and poor water quality (high levels of nutrients and reduced dissolved oxygen levels). Reinstating the mangrove-blocked tide to Muddy Lake through the construction of a channel at its downstream extent was identified by WRL as the preferred option for managing Salvinia Molesta. This option was also found to provide added benefit by improving water quality and the health of the lake as a whole.

Sheila
UNSW
SYDNEY

UNSW
SYDNEY