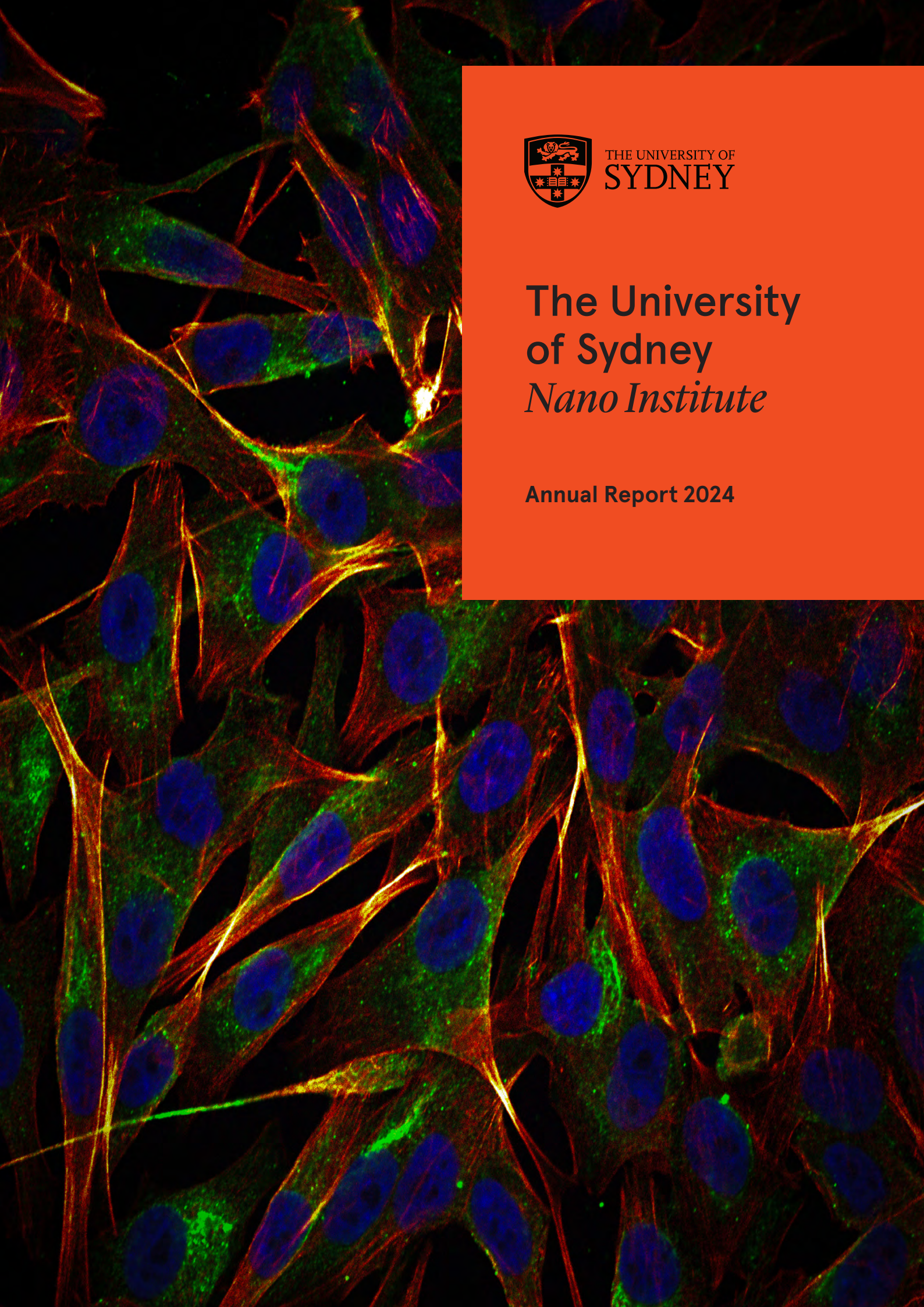


THE UNIVERSITY OF SYDNEY

The University of Sydney *Nano Institute*

Annual Report 2024

Acknowledgement of Country

We recognise and pay respect to the Elders and communities- past, present, and emerging- of the lands that the University of Sydney's campuses stand on. For thousands of years they have shared and exchanged knowledges across innumerable generations for the benefit of all.

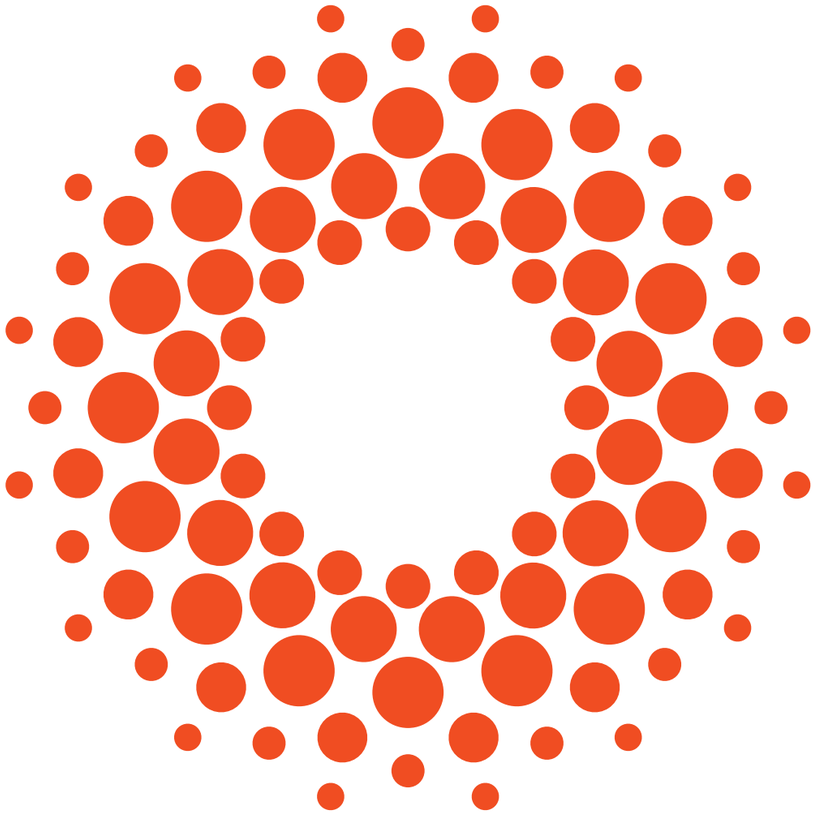
Front cover image: *Actin' Crazy* by William Ryder

A dramatic reorganisation of the cellular actin cytoskeleton, visualized through immunostaining in lung epithelial adenocarcinoma cells.

Thinking small
for a bigger tomorrow.

Sydney Nano takes a start-up approach to supercharging research and innovation.

We strategically invest in agile, multidisciplinary teams, providing them with the freedom and resources to ambitiously tackle major challenges at the forefront of critical and emerging technologies, driving transformative breakthroughs for a better future.



2024 *at a glance*

$42.46M

External grants

18

Academic promotions

$125k

Philanthropic funds awarded to research translation

5

Sydney Nano Student Ambassadors

8

Records of invention associated with Sydney Nano

9

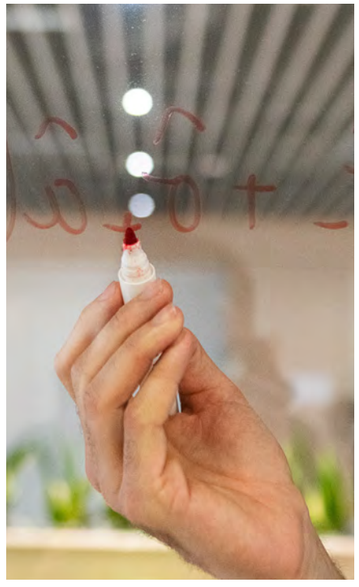
Kickstarters Awarded

646

Sydney Nano-affiliated publications

100+

New members in 2024



Contents

Director's note

This past year has seen Sydney Nano achieve significant success both in terms of research funding and the impact of our research. This success is entirely due to our outstanding Sydney Nano community, and congratulations to them all.

We kicked off the year launching the Sydney Nano 2024-2028 Strategy, which is the synthesis of my many conversations with Sydney Nano members, Faculty and University Leadership along with alignment to government priorities and of course the University's 'Sydney in 2032' strategy.

The focus of our new strategy is to establish an environment that blends flexible, outcome-focused initiatives with an entrepreneurial culture, backed by world-class infrastructure and strong partnerships. Underpinning all we do are our values of Culture, External engagement, 10X not 10% change, and Experimentation.

A highlight for me was our success in securing $18.4m from the Australian Government to establish and lead a national quantum growth centre - Quantum Australia. This was strong recognition of our commitment to research excellence, collaboration and translation and a clear signal that industry, government and academia can work together to progress Australia's quantum advantage.

While this report looks back on past achievements and initiatives, my focus is firmly on the future.

We are in a complex external environment, but one that brings significant opportunities for researchers and teams who are focused on critical and emerging technologies with a mindset geared towards research translation.

I look forward to sharing in the journey with you as we continue to expand our research impact.

Professor Stephen Bartlett

About us

Our vision

To drive transformative outcomes in critical and emerging technologies at the nanoscale.

Our mission

To bring together the people, knowledge, infrastructure and partnerships needed for world-class innovation in critical and emerging technologies at the nanoscale.

Our purpose

To enable, facilitate and promote transformational activities and translational outcomes in critical and emerging technologies at the nanoscale that would otherwise not be possible through existing faculty and university structures.

Sydney Nano takes a start-up approach to supercharging research and innovation.

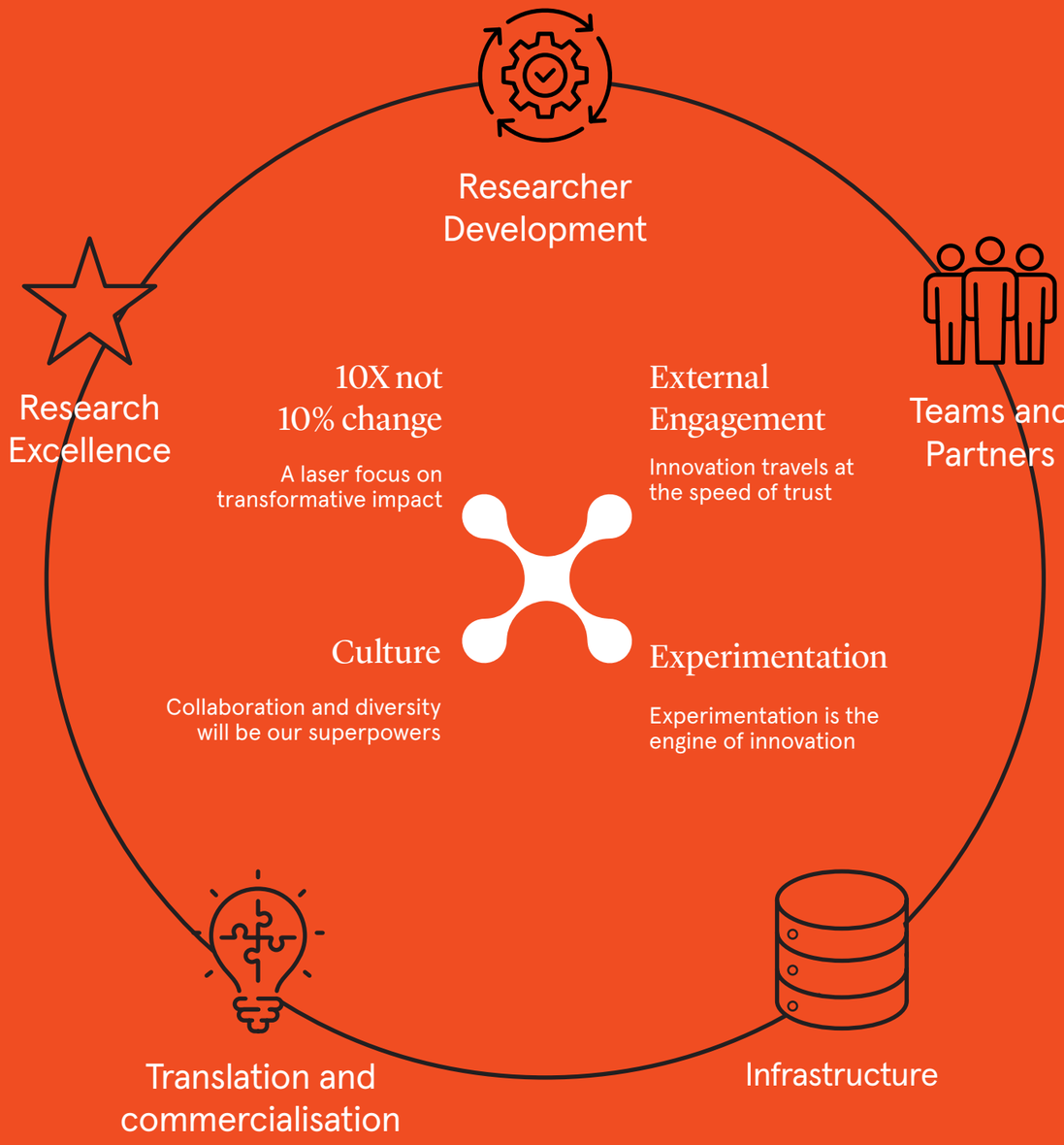
We support agile, multidisciplinary teams to ambitiously solve big challenges in critical and emerging technologies.

Tackling society's massive, systemic challenges requires solutions that are seriously small.

At Sydney Nano, we are committed to driving transformative outcomes- uniting unparalleled expertise, innovative technologies and strategic partnerships, to advance world-class innovation and outcomes in critical and emerging technologies at the nanoscale.

In 2024, we launched our Sydney Nano 2024-2028 Strategy. Building on past successes, we crafted an ambitious vision to amplify our researchers' contributions and address society's most pressing challenges in an experimentation-driven environment.

Five strategic pillars underpin our strategy, while our values are at the core of everything we do.



Infrastructure and enabling capabilities

One of our strategic objectives is to optimise use of, and access to, our infrastructure and facilities in order to maximise delivery of research excellence.

We are achieving this through strong relationships with Faculties and Schools and also with the University's Core Research Facilities and other internal service units.

The Sydney Nanoscience Hub (SNH) comprises multiple stakeholders, including external users of our Core Research Facilities (CRF).

Sydney Nano occupies a crucial impartial role in ensuring SNH operations are delivered in a coordinated, transparent and accountable manner and to the benefit of all.

We welcomed three new laboratory-based research groups into the SNH in 2024:

- Dr Xanthe Croot and her team, Superconducting Quantum Circuits Laboratory in Lab 2026
- Associate Professor Niels Quack and his team, Laboratory for Micro-and Nanosystems in Lab 4028
- Dr Alex Song and his team, Song Lab in Lab 4030

We address society's most pressing challenges in an experimentation-driven environment.

Sydney Nanoscience Hub in 2024:

10
Research groups

3
Core research facilities

10
Industry engagement activities

173
Occupants

Sydney Nanoscience Hub comprises:

10,000m²
state-of-the-art teaching and learning facilities

32
leading-edge research laboratories

900m²
ISO Class 5 cleanroom

In 2024 we reviewed our membership model to ensure more researchers, regardless of their career stage, could access and benefit from our programs and opportunities.

Our people

In 2024, more than 100 new members signed up, the largest ever increase in a single year.

Our members

In 2024 we reviewed our membership model to ensure more researchers, regardless of their career stage, could access and benefit from Sydney Nano's programs and opportunities.

Two membership categories now exist: Member and Research Student Member. This inclusive approach has resulted in strong growth in membership from Level B academics while maintaining ground across Level C, D and E.

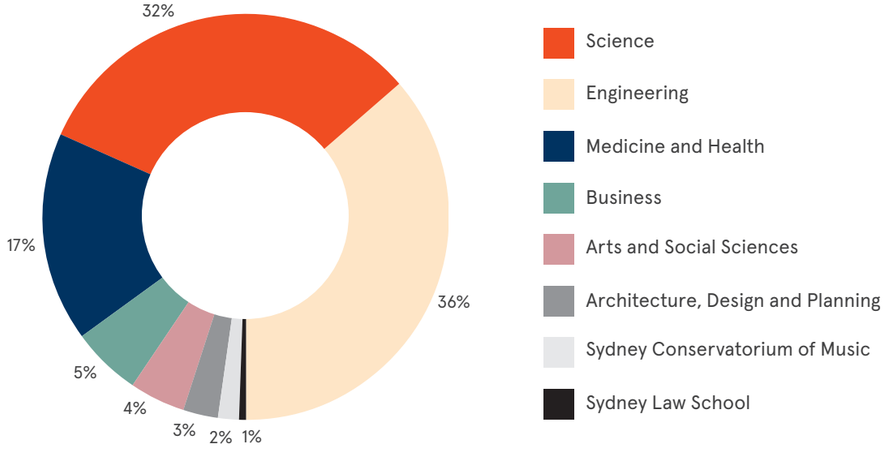
Our membership consists of 312 research members and 50 research student members, with representation from all faculties across the university.

Both the Faculty of Engineering and the Faculty of Science each have over 100 members involved with Sydney Nano. Additionally, there is representation from non-STEM faculties, including the Law and Business Schools and the Sydney Conservatorium of Music, highlighting the diverse and interdisciplinary nature of our community.

High engagement in our funding schemes is evident, with 25% of members applying for a Sydney Nano Program. Of these applicants, 83.5% (66 out of 79) were successful. The School of Biomedical Engineering showed the highest interest, contributing 25.3% of the total number of applications.

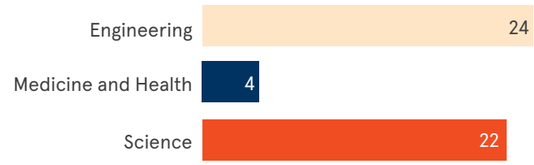
In 2024, more than 100 new members signed up, the largest ever increase in a single year.

Faculty representation

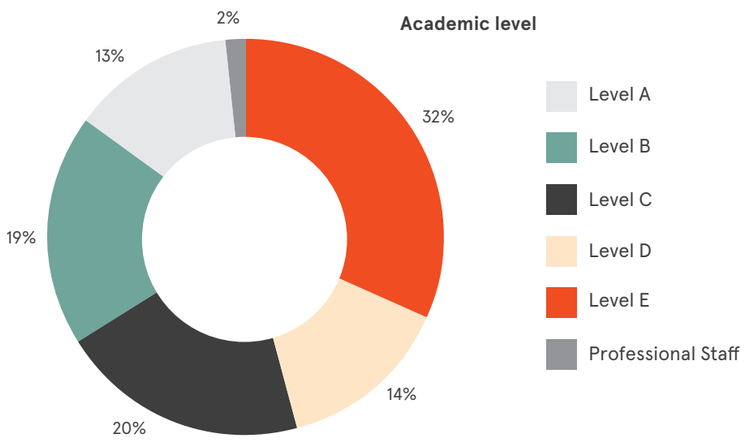


One third are women

Research students by faculty



Academic level



Our Sydney Nano Student Ambassadors

Providing research students with opportunities to develop leadership experience and confidence.

The Sydney Nano Student Ambassador program was created to provide PhD candidates of Sydney Nano members with the opportunity to develop their skills in science communication, leadership and project management.

The program provides opportunities for the Student Ambassadors to apply their knowledge through leadership and involvement in key programs, events and initiatives.

The following five Student Ambassadors were appointed in 2023 and will conclude in their roles in 2025:

"Participating in this program has been an incredible journey for me. I've gained a wealth of experience in areas like leadership, science communication, and networking."
-Zhenxu (Joseph) Yang

George Li
School of Electrical and Information Engineering

Jiayi Sun
School of Aerospace, Mechanical and Mechatronic Engineering

Lara Westwood
School of Medical Sciences

Pratiksha Dad
School of Chemistry

Zhenxu (Joseph) Yang
School of Biomedical Engineering

Our Sydney Nano Team

Our team brings together diverse talents and a shared passion for what we do.

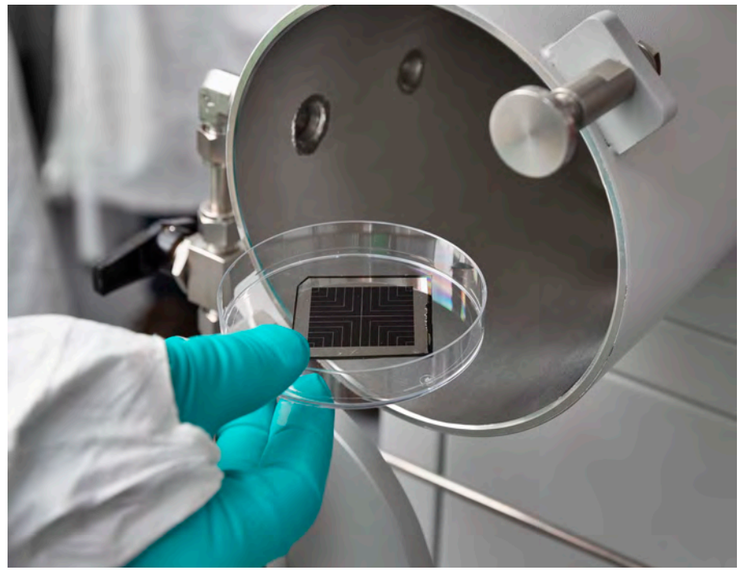
- Professor Stephen Bartlett, Director
- Kristl Mauropoulos, General Manager
- Trudy Fernan, Operations Manager
- Haobin Liang, Senior Research Officer
- Gaurav Singhai, Senior Research Officer
- Gerard Minogue, Senior Project Officer- SNH Operations
- Terance Pereira, Project Officer- Digitisation and Data Management
- Leesa L'Episcopo, Project Administrator
- Brooke Mills, Project Officer and Executive Assistant
- Ankita Som, Communications and Engagement Officer

"As a global leader in multidisciplinary research aligned with critical and emerging technologies, Sydney Nano is a sought-after partner for industry and government stakeholders who are seeking to innovate for tomorrow's industries."

-Professor Kathy Belov,
Pro-Vice-Chancellor,
Global & Research Engagement

Supporting excellence

We're redefining how fundamental research, emerging technologies and novel innovation come together to deliver transformative impact.



Our comprehensive program offering is structured to provide opportunities for researchers from diverse disciplines, across all career stages, and aligns with the University's 'Sydney in 2032' strategy, specifically 'Our research is excellent, tackles the greatest challenges and contributes to the common good'.

Sydney Nano Kickstarters

The re-imagined Kickstarter scheme seeds projects towards external opportunities that are aligned with the Sydney Nano 2024-2028 Strategy. Projects selected aim to grow multi-disciplinary research, from idea through to collaboration, ultimately supported by external funding.

2024 Kickstarter recipients

Nanoscale Genome-editing Technology
Associate Professor Markus Müllner and Associate Professor Brian Jones

This group have developed a proof-of-concept nanotechnology platform that greatly improves the efficiency of precision genome editing in plants. With the Kickstarter they aim to expand the range of applications for the technology and develop a streamlined nanocomplex delivery mechanism.

Brain plasticity on-a-chip
Dr Ann Na Cho

This project aims to create a 'brain circuit' on-chip system using human stem cells and 3D biofabrication technology. By modelling the real human neuronal communication between different brain regions, this project will enable discovery of biomedical research and ultimately achieve commercialisation by itself and facilitating precision medicine.

Er:SiC integrated photonics
Dr Elizabeth Marcellina

This Kickstarter aims to combine the quantum properties of single erbium atoms with recent fabrication advances in on-chip photonic circuits in silicon carbide. This team of engineers and physicists aim to build prototype devices for novel optical technologies including lasers, modulators and components for quantum computers.

Engineering Cellular Longevity
Dr Giselle Yeo

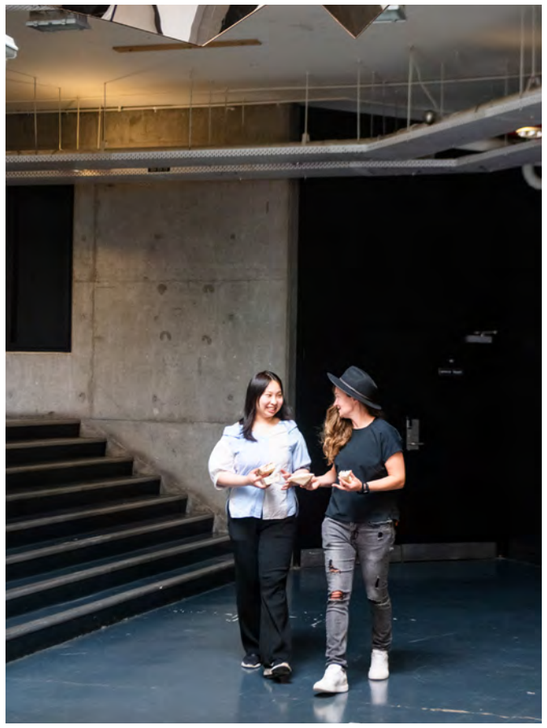
Stem cells hold great promise for many diseases, but their effectiveness is hampered by cell ageing. This team are developing nanotechnologies to deliver a protective protein into cells and biomaterials, to maintain cell longevity and improve therapeutic outcomes

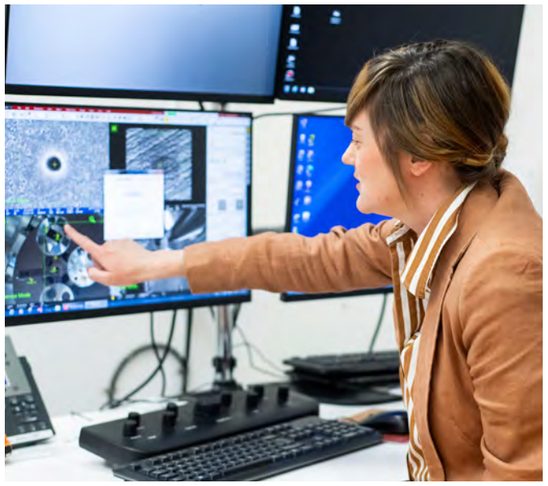
Emerging Nanotechnologies' Customers
Dr Jarryd Daymond

The rapid pace of development in the field of nanotechnology presents a unique challenge: identifying and understanding the customers who are most likely to adopt these new technologies. This research project will investigate the relationship between emerging nanotechnologies and their early adopting customers.

Forecasting Nano-3D Biointegration
Dr Natalie Holmes

This project aims to enable more accurate predictions of medical implant biointegration timelines for bone tissue repair, by building a world-first protocol based on quantitative nanoscale 3D tomography.





Nano-patterned blood vessels
Dr Michael Morris

The aim of this Kickstarter is to build blood vessels in a dish that can be used to transplant into patients who need artery bypass surgery. To do this, the team are using a plasma-treated, biodegradable plastic to which they ‘trap’ the various cell types in the correct places.

Nano-heterogeneity for thermoelectricity
Dr Sima Aminorroaya Yamini

This project aims to correlate the chemistry of microstructural components with the electronic properties of high-entropy alloys, a new generation of thermoelectric materials. The findings will set the foundation for the design of new materials with high conversion efficiency of waste heat to electricity.

Epidermal hydrogel electrodes
Dr Shuying Wu

Skin electrodes are essential for continuously recording biopotentials like electroencephalography (EEG), electromyography (EMG), electrocardiography (ECG), which are important for diagnosing and treating diseases related to the heart, brain, and muscles, such as dementia, sleep disorders, and heart conditions. Currently, rigid electrodes with electrolyte gel are predominantly used, but they have problems with unstable and weak connections to the skin and signal degradation. Soft polymeric electrodes have shown great promise because they fit better on the skin. This project aims to develop soft, self-adhesive, conductive polymeric materials-based electrodes to overcome these challenges and improve continuous biopotential monitoring systems.

Living Lab

In partnership with University Infrastructure, Sydney Nano Living Lab provides real-world on-campus environments to apply nano research. In addition to fostering multidisciplinary collaboration and initiating new initiatives, Living Lab also supports the University’s desire to advance the sustainability goals across our university campuses.

2024 Living Lab recipients

Dr. Shaikh Nayeem Faisal - Biowaste and Plastic waste derived 3D Nanocarbon aerogels as alternative filler and CO2 sequestering agent for concrete.

The selection committee was also highly impressed by Dr Eugenia Gasparri’s ALGA Facade: Autonomous Living Green Architectural Façade project and it was awarded in-kind support to enable the project to progress to the next stage to collaborate with University Infrastructure.

Taste of Research

In 2024, we worked with our Sydney Nano Student Ambassadors to promote the Taste of Research (ToR) program.

The Student Ambassadors took an active role in determining the best mode of promotion and in the delivery of the initiative.

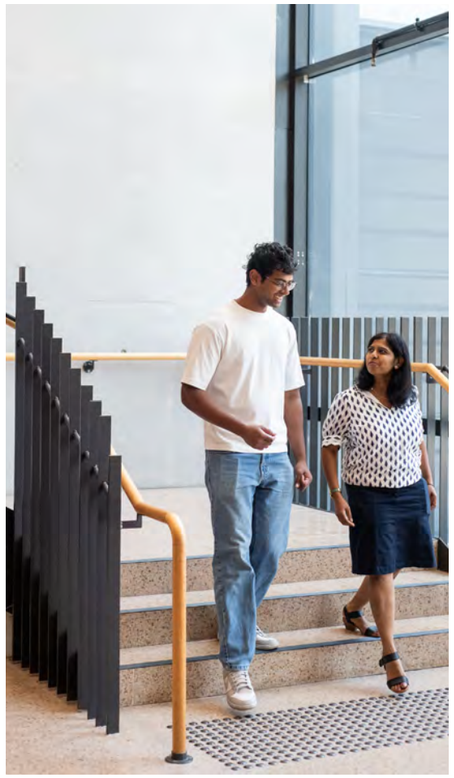
They developed an information session in the form of a Taste of Research Showcase, which was held in August at Sydney Nanoscience Hub with more than 35 undergraduate students attending. This excellent student-led awareness raising exercise resulted in an unprecedented number of ToR applications (>40 applications).

From the forty plus applications received, eighteen high-performing undergraduate students were offered the opportunity to develop their research skills through our Taste of Research program.

Throughout a six-week research program, the students gained experience into working with Sydney Nano Members in an academic lab environment, finding solutions to real-world challenges related to critical and emerging technologies.

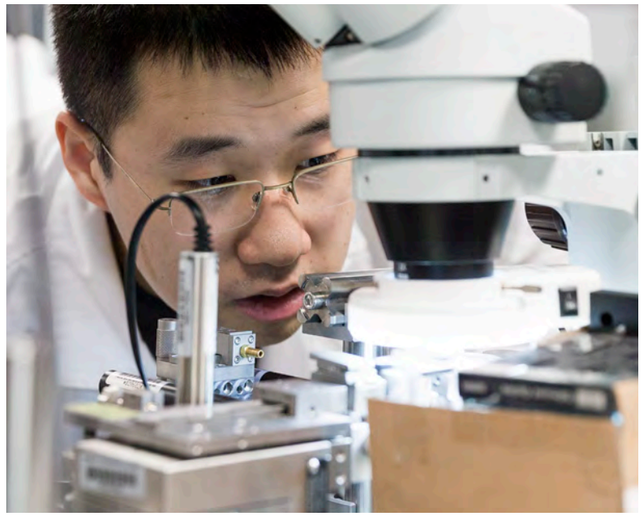
"This program has provided me with invaluable exposure to the world of scientific research and has helped me become a better scientist."

-Seran Suganthan



"This experience allowed me to engage in all components of research including literature review, experiment design, data management and analysis, and collaboration."

-Christina Yazbeck



Congratulations to:

- Chen-Chin Chang, hosted by Dr Ling Zhu (Faculty of Medicine and Health)
- Chloe Tse, hosted by Dr Chun Xu (Sydney Dental School)
- Clara Valeria, hosted by Dr Arnold Lining Ju (School of Biomedical Engineering)
- Cristina Yazbeck, hosted by Dr Cassandra Fleming (School of Chemistry)
- Elizabeth Lai, hosted by Dr Markus Müllner (School of Chemistry)
- Ho Minh Anh Le, hosted by Dr Rachel North (School of Medical Sciences)
- Hongchao Chen, hosted by Professor Xiaoke Yi (School of Electrical and Information Engineering)
- Jasmine Ho, hosted by Dr Ann Kwan (School of Life and Environmental Sciences)
- Jessie Kristo, hosted by Dr Hien Duong (Sydney School of Pharmacy)
- Luke Brutto, hosted by Dr Kaye Minkyung Kang (School of Chemistry)
- Michelle Kazarinov, hosted by Dr Xanthe Croot (School of Physics)
- Minghao Zhang, hosted by Professor Yuan Chen (School of Chemical and Biomolecular Engineering)
- Neel Pradhan, hosted by Dr Kaye Minkyung Kang (School of Chemistry)
- Seran Suganthan, hosted by Dr Yogambha Ramaswamy (School of Biomedical Engineering)
- Somerset Wu, hosted by Associate Professor Asaph Widmer-Cooper (School of Chemistry)
- Suvan Shrestha, hosted by Professor Fariba Dehghani (School of Chemical and Biomolecular Engineering)
- Yifan Xing, hosted by Dr Anastasia Globa (Sydney School of Architecture, Design and Planning)
- Zihan Gao, hosted by Dr Markus Müllner (School of Chemistry)

Translation and commercialisation highlight

NanoPitch

Our NanoPitch program is designed to provide a supportive pathway for Sydney Nano members to cultivate skills in research translation & commercialisation.

It incorporates several training and development modules over a five month period including; 'how to pitch' workshops, individual mentoring, pitch refinement sessions, and external engagement and networking support.

A group of participants are selected to put their training to practice by pitching their ideas to a panel of expert judges and a broader audience, including industry partners, venture capitalists, government representatives, and philanthropists at our NanoPitch event.

Mentoring

By closely collaborating with the university innovation ecosystem, including Sydney Knowledge Hub, Commercialisation Office and INCUBATE, the mentoring sessions aim to guide participants in refining their research to ensure impactful outcomes for end-users.
The mentoring sessions cover understanding intellectual property components, achieving product-market fit, articulating value propositions and developing robust business models.

Pitch development and refinement support

Pitch workshops prepare participants to communicate their research to non-academic audiences by breaking down key mechanisms for making their presentation relatable and convincing.

One-on-one coaching sessions offer participants personalised guidance to prepare their pitches, market analysis and tailored feedback on presentation style and delivery.

NanoPitch event

At this event, participants have the opportunity to connect with potential partners to amplify the impact of their work and secure prize money to advance their research translation efforts.

Ongoing support

All participants receive ongoing support beyond the pitch event. This is customised to each of their circumstances but can take the form of in-kind support, connections to external networks/mentors, invitations to commercialisation events and communication training.

In 2024, Sydney Nano held two NanoPitch Events: NanoPitch STEM and NanoPitch Health.

NanoPitch STEM - Driving innovation for sustainability

Winner: Dr Yi Shen who won the NanoPitch STEM award ($25,000)

People's Choice Award: Dr Grant Lynch ($5,000 and a spot in the Sydney Knowledge Hub's 2024-2025 Inventor Mentoring Program)

The pitch line up:

- A/Prof. Shumi Akhtar
  A robust sustainable circular economy

- Dr Hansheng Chen
  Rare-earth magnets via additive manufacturing: addressing supply challenges

- Dr Inseong Cho
  Low-cost faraday rotators for next generation optical devices

- Dr Shaikh Faisal
  Waste-derived 3D nanocarbon aerogels for clean energy and green construction

- Dr Eugenia Gasparri
  ALGA Facade: Autonomous living green architectural facade

- Dr Kaye Minkyung Kang
  Nanoscope: Powering energy

- Dr Grant Lynch
  EMU Systems

- Dr Yi Shen
  Protein derived bioplastics

- Dr Gurvinder Singh
  Rare-earth free based permanent magnets for sustainable clean energy

NanoPitch Health: Driving health innovation

In 2024, the NanoPitch Health prize money was supported by Goldman Sachs partner Zac Fletcher.

Best pitch: Dr Nicholas Hunt ($100,000)

Runner up: Dr Syamak Farajikhah ($20,000)

People's Choice Pitch Award: Dr Allan Sun ($5,000)

People's Choice Poster Award: Summer Cao ($1,000)

The pitch line up:

- Dr Belal Chami
  Rapid detection of intestinal inflammation – a game changer for patients and clinicians

- Dr Ann-Na Cho
  Miniaturised human brain-on-chip

- Dr Syamak Farajikhah
  VitaGuard: A rapid cardiac health monitoring device

- Dr Nicholas Hunt
  Inverse nano-vaccination for prevention of autoimmune Type 1 diabetes

- Dr Aeryne Lee
  Next-generation polymeric heart valve replacement

- Mr Allan Sun
  SmartClot: AI paper-based blood coagulation diagnostics using a mobile phone

- Dr Pegah Varamini
  Bionic membrane-coated nanotechnology for precision therapy of triple-negative breast cancer

- Dr Edward Yang
  LesioLogic treatment mapping system to improve heart rhythm disorder procedure outcomes

"It was fantastic to see so many people excited to learn about the new innovations emerging from the University of Sydney."

-Allan Sun, Nanopitch People Choice Pitch Award winner

Member engagement and achievements

Providing the Sydney Nano community with access to world-class expertise is a key priority.

Distinguished Lectures

Our Distinguished Lectures connect the Sydney Nano community with leading researchers on multidisciplinary topics across critical and emerging technologies.

In 2024 we hosted:

- Professor Song Jin, University of Wisconsin-Madison
  Non-centrosymmetric and Chiral Quantum Materials through Screw Dislocations and Structural Tuning.

  This Distinguished Lecture was held in partnership with the School of Chemical and Biomolecular Engineering

- Professor Pulickel M. Ajayan, Rice University and Professor Mauricio Terrones, Penn State
  Advanced Nanomaterials

- Professor Wei Gao, Caltech
  Skin-Interfaced Wearable Biosensors

Symposiums, Workshops and Seminars

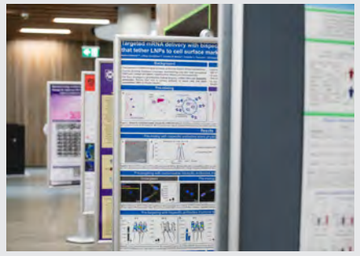
Sydney Nano supports member activities that align to our Sydney Nano 2024-2028 Strategy. The form of support varies on a case-by-case basis and could include varying degrees of funding, in-kind support, sponsorship and/or promotion via our communication channels and social platforms.

In 2024 we supported several member-initiated activities including the Electro-Chemistry Symposium, International Day of Light activities, ICONN, Biotech Futures Symposium and the Nano Health Symposium.

Impact highlight

Nano Health Symposium, October 2024

Leads: Dr Ann-Na Cho and Dr Chun Xu



The Nano Health Symposium was made possible by joint funding support from Sydney Nano and three other sponsors, including two from industry.

This one-day event featured renowned speakers discussing the discovery and advancements of nanotechnology and its applications in health as well as a poster session and networking. It was open to internal and external audiences and received more than 300 registrations.

Plenary speakers:

Professor Robert Langer, Professor at MIT and Co-Founder of Moderna.

Dr. Langer has written more than 1,600 articles and holds over 1,495 issued and pending patents worldwide. His patents have been licensed or sublicensed to over 400 pharmaceutical, chemical, biotechnology, and medical device companies. He is the most cited engineer in history (h-index 324 with more than 427,700 citations according to Google Scholar).

Professor Frank Caruso, NHMRC Leadership Fellow at the University of Melbourne.

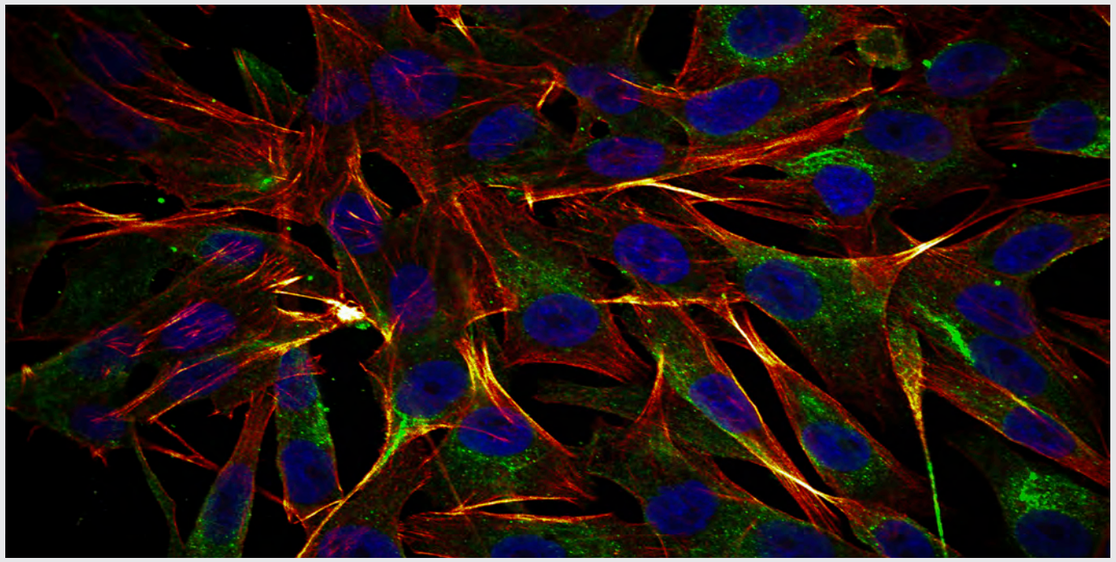
Professor Wei Tao, Brigham and Women's Hospital and Harvard Medical School.

Key impacts as noted by the leads:

- Facilitated competitive grant applications in the field of nanotechnology and health (NHMRC e-Asia Grant)
- Provided Early and Mid-Career Researchers (EMCRs) with valuable opportunities to expand their professional networks leading to future research partnerships and career development
- Enhanced cross-disciplinary collaboration, promoting the cross-pollination of ideas
- Promoted visibility of emerging Researchers via poster session and workshops

Awards and achievements

Many of our members were awarded with significant grants and prizes in 2024, highlighting the breadth, depth and quality of our research.
Here are some highlights.



ARC Future Fellowships
Professor Girish Lakhwani and Dr Fengwang Li

Officer of the Order of Australia
Professor Thomas Maschmeyer AO

International Award, Biochemical Society
Professor Renae Ryan

Scientist of the Year, Australian Space Awards and Australian Academy of Science Nancy Millis Medal for Women in Science
Professor Anita Ho-Baillie

Australian Academy of Science Ian Wark Medal and Lecture
Professor Anthony Weiss AM FTSE

Australian Academy of Science John Booker Medal
Associate Professor Arnold Lining Ju

ARC DECRA
Dr Rachel North

Google Academic Research Award
Dr John Bartholomew and Professor Andrew Doherty

Eureka Prize for Outstanding Mentor of Researchers
Professor Kate Jolliffe

Picture of the Year Award

This annual award recognises exciting and engaging images that tell the story of research conducted by Sydney Nano Members and Research Student Members.

2024 Overall Winner (pictured on cover and above)
'Actin' Crazy
By William Ryder
Imaging technique: Confocal Microscopy

Runners up
Fock's Trot
By Vassili George Matsos

There's Plenty To "Sea" At The Bottom
By Zhenxu Yang

Curiosities on the Nanoscale Category Winner

Etch Test
By Brendan Harlech-Jones
Imaging Technique: Sem

Runner up
Milk in the Eye
By Xinying Liu

External engagement

Building an engaged community of champions, both inside and outside Sydney Nano, is foundational to our success.

We say innovation travels at the speed of trust, which is built through close, collaborative and mutually beneficial partnerships.

We are committed to providing opportunities for our researchers to communicate their research and impact and regard this as an essential component of the research journey.

Strategic visits to Sydney Nano in 2024:

- The Hon. Ed Husic MP, Minister for Industry and Science
- The Hon. Steve Whan MP, Minister for Skills, TAFE and Tertiary Education
- Chi Onwurah, UK Shadow Minister for Science, Research, and Innovation
- Infleqtion delegation
- Innovate UK Global Experts Mission (GEM)
- US Department for Homeland Security
- US IndoPacific Command
- Regional Career Advisor & Teachers visit
- University of Bristol visit
- Indian River State College
- Enterprise Singapore delegation
- Denholm Family Tour
- University of Glasgow
- Navantia Space (Monodon)
- Quantum Motion
- AFOSR
- University of Glasgow - Operations
- Department of Defence
- PsiQuantum
- Interplanetary Rover Initiative

Sydney Nano supported the following events with external partners:

- IceCubes Workshop with Microsoft
- NSW Government Innovation Strategy Ideas Summit
- Quantum Australia Conference
- AIP Careers Fair
- ANSTO and Faculty of Science

External engagement highlight

Quantum Australia

In January 2024, Sydney Nano Director, Professor Stephen Bartlett led the formation of a consortium to respond to the Commonwealth Government's call for an Australian Centre for Quantum Growth, a component of the National Quantum Strategy.

In April 2024, the Australian Government announced the University of Sydney was awarded $18.4m to establish Quantum Australia, an industry growth centre to grow the quantum ecosystem in Australia.

Quantum Australia will raise awareness of quantum technology, foster collaboration between industry and universities, encourage the creation and growth of quantum startups, and connect quantum companies on a national and international scale.

Quantum Australia will grow the Australian quantum industry by:

- supporting the adoption, development and commercialisation of quantum technologies and fostering collaborative research and development to drive innovation;
- building connections and driving collaborations across industry, research and government in the quantum ecosystem, both nationally and internationally;
- increasing awareness and educating industries across the broader economy and society on the implications and opportunities of emerging quantum technologies; and
- supporting the responsible and inclusive development of quantum technology in Australia.

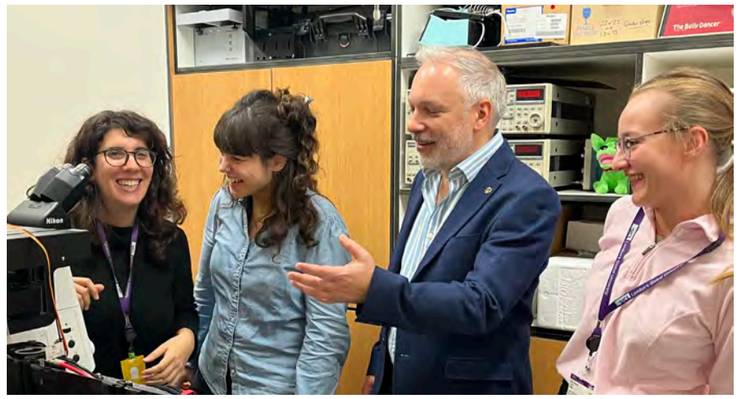
The announcement awarding the national quantum growth centre to the University of Sydney was made by The Hon. Ed Husic, Minister for Industry and Science, at the Sydney Nanoscience Hub, where the minister had the opportunity to connect with several of our Sydney Nano researchers.

Following this announcement, the Sydney Nano team led the establishment of the centre with a short runway, in order to meet funding and contractual obligations. This involved collaborating across the university, specifically with the Research Portfolio, Office of General Counsel and Strategy Portfolio and also externally with 12 university partners and 6 state and territory governments.

Establishing a formal governance structure, an Independent Board as well as individual grant agreements with each university contributor and state government were priority actions in 2024.

Quantum Australia

Strategic Partnership: UCL and Sydney Nano



Sydney Nano partnered with UCL on a joint funding bid for a UKRI Engineering and Physical Sciences Research Council (EPSRC) International Centre-to-Centre Research Collaboration on spin qubits.

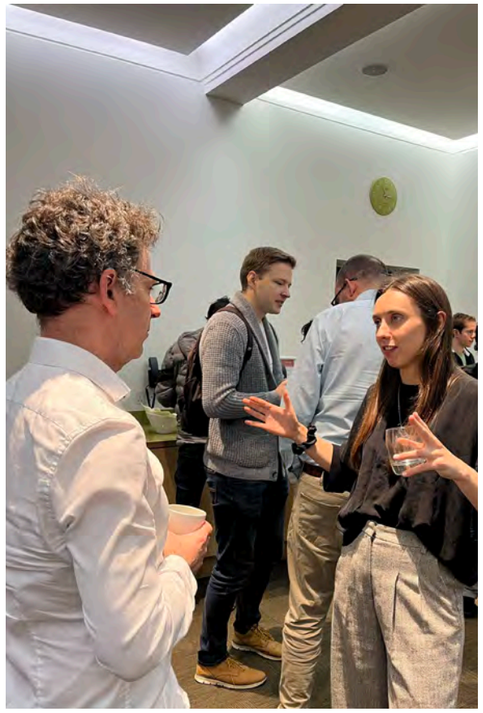
The grant was successful and awarded £1.2m in February 2024. In order to leverage this opportunity and expand the collaboration, a joint academic workshop was held in London in November 2024.

The two-day academic workshop spanned different areas of quantum science and technology with speakers from both UCL and the University of Sydney.

More than 60 researchers from UCL attended the workshop in addition to the 18 delegates from Sydney Nano, spurring several new research collaborations.

Delegates also visited a number of UK research facilities including the London Centre for Nanotechnology and the UK National Quantum Computing Centre.

Sydney Nano will continue developing this partnership in 2025 to ensure we are well placed to apply for joint funding opportunities in critical and emerging technologies as they arise.



Sydney Nano and UCL researchers in London.

Appendix

List of Research Members

- Abbas, Ali - Faculty of Engineering
- Adair, Liam - Faculty of Science
- Aguey-Zinsou, Francois - Faculty of Science
- Ahmadpour, Naseem - The University of Sydney School of Architecture, Design and Planning
- Akhtar, Shumi - The University of Sydney Business School
- Alase, Abhijeet Laxman - Faculty of Science
- Allioux, Francois - Faculty of Engineering
- Aminorroaya, Sima - Faculty of Engineering
- An, Xianghai - Faculty of Engineering
- Arafat Mahmud, Md - Faculty of Science
- Arifur Rahim, Md - Faculty of Engineering
- Azadi, Reza - Faculty of Science
- Bailey, Christopher - Faculty of Science
- Bailey, Constance - Faculty of Science
- Bailey, Dale - Faculty of Medicine and Health
- Balamurali, Mehala - Faculty of Engineering
- Barnett, Christopher - Faculty of Science
- Bartholomew, John - Faculty of Science
- Bartlett, Stephen - Faculty of Science
- Beardsley, Justin - Faculty of Medicine and Health
- Bedoya, Alvaro Casas - Faculty of Science
- Bennett, Peter - Faculty of Science
- Bhattacharjya, Jyotirmoyee - The University of Sydney Business School
- Bilek, Marcela - Faculty of Engineering
- Bing, Jueming - Faculty of Science
- Blinkhorn, Daniel - Sydney Conservatorium of Music
- Braet, Filip - Faculty of Medicine and Health
- Brambilla, Arianna - The University of Sydney School of Architecture, Design and Planning
- Bramley, Helen - Faculty of Science
- Bui, Cong Tinh - Faculty of Science
- Caillaud, Corinne - Faculty of Medicine and Health
- Cairney, Julie - Faculty of Engineering
- Cairns, Iver - Faculty of Science
- Caprar, Dan - The University of Sydney Business School
- Carey, Benjamin - Sydney Conservatorium of Music
- Chami, Belal - Faculty of Medicine and Health
- Chan, Hak-Kim - Faculty of Medicine and Health
- Chang, Li - Faculty of Engineering
- Chen, Hansheng - Faculty of Engineering
- Chen, Wei - Faculty of Engineering
- Chen, Yi-Sheng - Faculty of Engineering
- Chen, Yuan - Faculty of Engineering
- Cheng, Wenlong - Faculty of Engineering
- Chester, Diana - Faculty of Arts and Social Sciences
- Chew, Suen Xin - Faculty of Engineering
- Cho, Ann-Na - Faculty of Engineering
- Christopherson, Richard - Faculty of Science
- Chrzanowski, Wojciech - Faculty of Medicine and Health
- Chung, Vera - Faculty of Engineering
- Clarke, Ronald - Faculty of Science
- Cleary, Matthew - Faculty of Engineering
- Clement, Sandhya - Faculty of Engineering
- Cooper, Rae - The University of Sydney Business School
- Croot, Xanthe - Faculty of Science
- Crossley, Penelope - The University of Sydney Law School
- Cullen, PJ - Faculty of Engineering
- Da Silva Armi, Paulo - The University of Sydney Business School
- D'Alessandro, Deanna - Faculty of Science
- Dansereau, Donald - Faculty of Engineering
- Davis, Ryan - Faculty of Medicine and Health
- Day, Margot - Faculty of Medicine and Health
- Daymond, Jarryd - The University of Sydney Business School
- de Dear, Richard - The University of Sydney School of Architecture, Design and Planning
- de Graaf, Simon - Faculty of Science
- de Sterke, Martijn - Faculty of Science
- Dehghani, Fariba - Faculty of Engineering
- Der Derian, James - Faculty of Arts and Social Sciences
- Di Lernia, Cary - The University of Sydney Business School
- Dias-da-Costa, Daniel - Faculty of Engineering
- Divnic-Resnik, Tihana - Faculty of Medicine and Health
- Doherty, Andrew - Faculty of Science
- Doyle, Matthew - Faculty of Medicine and Health
- Duong, Hien - Faculty of Medicine and Health
- Eggleton, Benjamin - Faculty of Science
- El-Zein, Abbas - Faculty of Engineering
- Faisal, Shaikh - Faculty of Engineering
- Farajikhah, Syamak - Faculty of Engineering
- Fleming, Cassandra - Faculty of Science
- Fleming, Simon - Faculty of Science
- Gan, Yixiang - Faculty of Engineering
- Gasparri, Eugenia - The University of Sydney School of Architecture, Design and Planning
- Ghasemian, Mohammad Bagher - Faculty of Engineering
- Gheorghiu, Alex - Faculty of Medicine and Health
- Giaretta, Jacopo - Faculty of Engineering
- Gill, Peter - Faculty of Science
- Gillies, Mark - Faculty of Medicine and Health
- Globa, Anastasia - The University of Sydney School of Architecture, Design and Planning
- Goldys, Benjamin - Faculty of Science
- Gomes, Vincent - Faculty of Engineering
- Goodyear, Peter - Faculty of Arts and Social Sciences
- Gozman, Daniel - The University of Sydney Business School
- Grau, Georges - Faculty of Medicine and Health
- Gresham, Isaac - Faculty of Science
- Grewal, Thomas - Faculty of Medicine and Health
- Griffith, Matthew - Faculty of Engineering
- Grigg, John - Faculty of Medicine and Health
- Groutsis, Dimitria - The University of Sydney Business School
- Guerinoni, Elise - Faculty of Science
- Haddad, Shamila - The University of Sydney School of Architecture, Design and Planning
- Hadigheh, Ali - Faculty of Engineering
- Harding, Bradley - Faculty of Science
- Hardy, Catherine - The University of Sydney Business School
- Harlech-Jones, Brendan - Faculty of Science
- Hawkett, Brian - Faculty of Science
- Haworth, Annette - Faculty of Science
- Hespanhol, Luke - The University of Sydney School of Architecture, Design and Planning
- Hibbs, David - Faculty of Medicine and Health
- Hinterding, Joyce - Faculty of Arts and Social Sciences
- Ho-Baillie, Anita - Faculty of Science
- Holmes, Natalie - Faculty of Engineering
- Holsinger, Damian - Faculty of Medicine and Health
- Holz, Ralph - Faculty of Engineering
- Huang, Jun - Faculty of Engineering
- Hunt, Nicholas - Faculty of Medicine and Health
- Huynh, Vien - Faculty of Science
- Jabbarzadeh, Ahmad - Faculty of Engineering
- Jaiswal, Arun - Faculty of Engineering
- Jamieson, Robyn - Faculty of Medicine and Health
- Jiang, Haihui Joy - Faculty of Science
- Jin, Craig - Faculty of Engineering
- Johnson, Edward - The University of Sydney Business School
- Jolliffe, Katrina - Faculty of Science
- Jones, Brian - Faculty of Science
- Ju, Arnold Lining - Faculty of Engineering
- Kalantar-Zadeh, Kourosh - Faculty of Engineering
- Kang, Kaye Minkyung - Faculty of Science
- Kang, Lifeng - Faculty of Medicine and Health
- Kassal, Ivan - Faculty of Science
- Kassiou, Michael - Faculty of Science
- Kavehei, Omid - Faculty of Engineering
- Kennedy, Brendan - Faculty of Science
- Kenny, Katherine - Faculty of Arts and Social Sciences
- Kepert, Cameron - Faculty of Science
- King, Nicholas - Faculty of Medicine and Health
- Kuhlmey, Boris - Faculty of Science
- Kuncic, Zdenka - Faculty of Science
- Kuru, Aysu - The University of Sydney School of Architecture, Design and Planning
- Kwan, Ann - Faculty of Science
  Kwok, Simon - Faculty of Arts and Social Sciences
- Lakhwani, Girish - Faculty of Science
- Laplane, Cyril - Faculty of Science
- Large, Maryanne - Faculty of Science
- Lau, Yu Heng - Faculty of Science
- Law, Wing Cheung - Faculty of Engineering
- Lawson, Nicholas - Faculty of Engineering
- Lay, Peter - Faculty of Science
- Lee, Aeryne - Faculty of Engineering
- Lei, Chang - Faculty of Medicine and Health
- Lei, Chengwang - Faculty of Engineering
- Leong, Philip - Faculty of Engineering
- Leon-Saval, Sergio - Faculty of Science
- Li, Fengwang - Faculty of Engineering
- Li, Liwei - Faculty of Engineering
- Li, Wei - The University of Sydney Business School
- Li, Wei - Faculty of Engineering
- Liao, Xiaozhou - Faculty of Engineering
- Lim, Khoon - Faculty of Medicine and Health
- Lin, Zihuai - Faculty of Engineering
- Ling, Christopher - Faculty of Science
- Liu, Xiaochen - Faculty of Engineering
- Liu, Xinying - Faculty of Engineering
- Liu, Ying - Faculty of Engineering
- Liu, Zongwen - Faculty of Engineering
- Löschke, Sandra - The University of Sydney School of Architecture, Design and Planning
- Lowe, Kevin - The University of Sydney Business School
- Lu, Yan - Faculty of Engineering
- Lu, ZuFu - Faculty of Engineering
- Luu, Minh Tri - Faculty of Engineering
- Ma, Ping - Faculty of Engineering
- Macia, Laurence - Faculty of Medicine and Health
- Mackay, Joel - Faculty of Science
- MacLeod, Roy - Faculty of Arts and Social Sciences
- Maguire, Steven - The University of Sydney Business School
- Mahmoodian, Sahand - Faculty of Science
- Mai-Prochnow, Anne - Faculty of Engineering
- Malik, Arunima - Faculty of Science
- Malloch, Hamish - The University of Sydney Business School
- Marcellina, Elizabeth - Faculty of Science
- Markauskaite, Lina - Faculty of Arts and Social Sciences
- Martin, David Martinez - Faculty of Engineering
- Maschmeyer, Thomas - Faculty of Science
- Matar, Elie - Faculty of Medicine and Health
- Mathieu, Kimberly Mathieu - Faculty of Medicine and Health
- McEwan, Alistair - Faculty of Engineering
- McKenzie, David - Faculty of Science
- McLauchlan, Campbell - Faculty of Science
- Miletic, Vesna - Faculty of Medicine and Health
- Minasian, Robert - Faculty of Engineering

- Montoya, Alejandro - Faculty of Engineering
- Morris, Michael - Faculty of Medicine and Health
- Motion, Alice - Faculty of Science
- Müllner, Markus - Faculty of Science
- Murthy, Pradeep - Faculty of Engineering
- Naficy, Sina - Faculty of Engineering
- Neto, Chiara - Faculty of Science
- New, Elizabeth - Faculty of Science
- Newson, Ainsley - Faculty of Medicine and Health
- Niu, Ranming - Faculty of Engineering
- Nomoto, Keita - Faculty of Engineering
- North, Rachel - Faculty of Medicine and Health
- Ohki, Thomas - Faculty of Science
- O'Reilly, Chiara - Faculty of Arts and Social Sciences
- Owens, Katherine - The University of Sydney Law School
- Palomba, Stefano - Faculty of Science
- Paparella, Ashleigh - Faculty of Medicine and Health
- Paradowska, Anna - Faculty of Engineering
- Parameswaran, Sri - Faculty of Engineering
- Park, Susan - Faculty of Arts and Social Sciences
- Pashayan, Hakop - Faculty of Science
- Passam, Freda - Faculty of Medicine and Health
- Payne, Richard - Faculty of Science
- Pei, Zengxia - Faculty of Engineering
- Peñas, Pablo Fernandez - Faculty of Medicine and Health
- Persson, Ingemar - Faculty of Engineering
- Pohteh, Shiva - Faculty of Medicine and Health
- Postnova, Svetlana - Faculty of Science
- Proust, Gwenaelle - Faculty of Engineering
- Quack, Niels - Faculty of Engineering
- Ramaswamy, Yogambha - Faculty of Engineering
- Rath, Ronil - Faculty of Engineering
- Reilly, David - Faculty of Science
- Rendina, Louis - Faculty of Science
- Ricketson, Damien - Sydney Conservatorium of Music
- Rumyantseva, Maria - The University of Sydney Business School
- Rutledge, Peter - Faculty of Science
- Ryan, Renae - Faculty of Medicine and Health
- Ryder, William - Faculty of Science
- Saha, Shuvashis - Faculty of Engineering
- Schmid, Siegbert - Faculty of Science
- Schuitemaker, Alicia - Faculty of Science
- Seint Aye, San - Faculty of Engineering
- Seymour, Michael - The University of Sydney Business School
- Shariev, Arthur - Faculty of Medicine and Health
- Shen, Luming - Faculty of Engineering
- Shen, Yi - Faculty of Engineering
- Shi, Guodong - Faculty of Engineering
- Shparberg, Rachel - Faculty of Science
- Siahvashi, Arman - Faculty of Engineering
- Siddiquee, Rezwan - Faculty of Science
- Simunovic, Matthew - Faculty of Medicine and Health
- Singh, Gurvinder - Faculty of Engineering
- Sohail, Ayesha - Faculty of Science
- Song, Alex - Faculty of Engineering
- Spahr, Axel - Faculty of Medicine and Health
- Spence, Natalie - Faculty of Arts and Social Sciences
- Stampfl, Catherine - Faculty of Science
- Suaning, Gregg - Faculty of Engineering
- Sukkarieh, Salah - Faculty of Engineering
- Sunde, Margaret - Faculty of Medicine and Health
- Szyszka, Taylor - Faculty of Science
- Talebian, Sepehr - Faculty of Engineering
- Tan, Daniel - Faculty of Science
- Tan, Richard - Faculty of Medicine and Health
- Tan, Ting Rei - Faculty of Science
- Tara Christie, Mary - Faculty of Science
- Tegg, Levi - Faculty of Engineering
- Thilakarathna, Kanchana - Faculty of Engineering
- Tian, Xiaoyi - Faculty of Engineering
- Tien, Jianni - Faculty of Arts and Social Sciences
- Tong, Allison - Faculty of Medicine and Health
- Tran, Clara - Faculty of Engineering
- Tricoli, Antonio - Faculty of Engineering
- Tuniz, Alessandro - Faculty of Science
- Turpin, Geosmin - Faculty of Science
- Tuthill, Peter - Faculty of Science
- Valahu, Christophe - Faculty of Science
- Varamini, Pegah - Faculty of Medicine and Health
- Verstraete, Dries - Faculty of Engineering
- Vigolo, Daniele - Faculty of Engineering
- Waddington, David - Faculty of Medicine and Health
- Wang, David - Faculty of Engineering
- Warr, Gregory - Faculty of Science
- Waterhouse, Anna - Faculty of Medicine and Health
- Waters, Jayson - Faculty of Arts and Social Sciences
- Watson, Stephanie - Faculty of Medicine and Health
- Weaver, Alexis - Sydney Conservatorium of Music
- Wei, Li - Faculty of Engineering
- Weihs, Gustavo Fimbres - Faculty of Engineering
- Weiss, Tony - Faculty of Science
- Wickham, Shelley - Faculty of Science
- Widmer-Cooper, Asaph - Faculty of Science
- Williamson, Dominic - Faculty of Science
- Wise, Steven - Faculty of Medicine and Health
- Withana, Anusha - Faculty of Engineering
- Wolf, Robert - Faculty of Science
- Wu, Shuying - Faculty of Engineering
- Xia, Qingbo - Faculty of Science
- Xu, Aoni - Faculty of Engineering
- Xu, Chun - Faculty of Medicine and Health
- Xu, Jinqi - Faculty of Arts and Social Sciences
- Xu, Mingxin - Faculty of Engineering
- Yang, Edward - Faculty of Engineering
- Yap, Lim Wei - Faculty of Engineering
- Ye, Lin - Faculty of Engineering
- Yeadon, Daniel - Sydney Conservatorium of Music
- Yeo, Giselle - Faculty of Science
- Yi, Xiaoke - Faculty of Engineering
- Yin, Qiankun - Faculty of Engineering
- Yong, Ken-Tye - Faculty of Engineering
- Yu, Jiangshan - Faculty of Engineering
- Yu, Yan - Faculty of Medicine and Health
- Yuen, Alexander - Faculty of Science
- Zeng, Shaoxue - Faculty of Medicine and Health
- Zhang, Qianyi - Faculty of Science
- Zheng, Rongkun - Faculty of Science
- Zhu, Jianguo - Faculty of Engineering
- Zhu, Ling - Faculty of Medicine and Health
- Zomaya, Albert - Faculty of Engineering
- Zreiqat, Hala - Faculty of Engineering

Research Student Members:

- Ali, Rafia - Faculty of Medicine and Health
- Ashok, Deepu - Faculty of Engineering
- Austria, Elmer Jr. - Faculty of Engineering
- Bezerra de Campos, Luis Gustavo - Faculty of Engineering
- Cao, Summer - Faculty of Engineering
- Chen, Yue-Sheng - Faculty of Engineering
- Chong, Shin Wei - Faculty of Engineering
- English, Lucas - Faculty of Science
- Ferstl, Holly - Faculty of Engineering
- Fink, Christine - Faculty of Engineering
- Grover, Karandeep - Faculty of Science
- Jayamaha, Gunani - Faculty of Science
- Kerai, Simran - Faculty of Science
- Lam, Lois - Faculty of Engineering
- Leung, Tik Lun - Faculty of Science
- Liu, Siyuan - Faculty of Medicine and Health
- Loustau, Alex - Faculty of Science
- Lummis, Joel - Faculty of Engineering
- Matsos, Vassili - Faculty of Science
- Millican, Maverick - Faculty of Science
- Mishra, Karun - Faculty of Science
- Mukherjee, Chandrapaul - Faculty of Science
- Naylor, Jack - Faculty of Engineering
- Newman, Timothy - Faculty of Science
- Nicholls, Stuart - Faculty of Science
- Nootem, Jukkrit - Faculty of Science
- Obeng, Eugene - Faculty of Medicine and Health
- Pankhurst, Madelaine - Faculty of Science
- Parihar, Pooja Sharma - Faculty of Engineering
- Prabowo, Justin - Faculty of Engineering
- Radebold, Rebecca - Faculty of Science
- Rukmani Krishnan, Srivarshini - Faculty of Science
- Russell, Ryan - Faculty of Science
- Shahzad, Asim - Faculty of Science
- Sharma, Vipul - Faculty of Engineering
- Sun, Allan - Faculty of Engineering
- Tao, Yunyun - Faculty of Engineering
- Vatandoust, Leila - Faculty of Engineering
- Wang, Yu - Faculty of Engineering
- Wu, Jiacheng - Faculty of Engineering
- Xu, Zhejun - Faculty of Engineering
- Yan, Yuwei - Faculty of Engineering
- Yang, Zhenxu - Faculty of Engineering
- Yang, Yu - Faculty of Engineering
- Yuan, Yunong - Faculty of Medicine and Health
- Zeng, Ping - Faculty of Science
- Zhang, Xinyi - Faculty of Science
- Zhao, Yunduo Charles - Faculty of Engineering
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