Te Mana Tangata Whakawhanake
MacDiarmid Institute
Advanced Materials & Nanotechnology

We hope the new year is treating you well. Ours has started off apace, with 11 new researchers joining us as Associate Investigators, 10 researchers becoming Principal Investigators, and 8 researchers moving to Emeritus Investigator. We're advertising for over 30 PhD projects for 2025-2028.

We welcome Professor Nicola Gaston into the role of sole Director. Nicola has been Co-Director of the Institute since 2018, and before that was Deputy Director for Stakeholder Engagement (2015-2018). Nicola is a Professor of Physics at the University of Auckland.

News and Updates

New PhD projects

From altermagnetism to sustainable energy harvesting devices, from catalysts for CO_2 reduction to plasma-assisted electrochemical ammonia synthesis, we are advertising over 30 new PhD projects for 2025-2028 for chemists, physicists, engineers and biologists interested in interdisciplinary materials science for sustainability.

Young New Zealander of the Year

Congratulations Nu'uali'i Eteroa Lafaele, our Discovery Camp alumna (2012) who was named Young New Zealander of the Year for Championing Digital Equity for her work as a digital equity advocate and FIBRE FALE co-founder, bridging the digital divide for Pacific communities.

22 Discovery Scholarships Awarded

We have awarded 22 scholarships this year: two Piki Ake Award - Step It Up Award recipients; three Te Kainga Rua Award - Second Chance Learner Award recipients; three Te Mātauranga Pūtaiao Award - Māori Science Award recipients; four Te Taumata Award - High Achiever Award recipients; and ten Te Huarahi Ki Mua Award recipients. Congratulations to all our new Discovery Scholarship award recipients! Ka rawe!

NZ first in the world to commemorate the International Year of Quantum Science and Technology (IYQ)

INTERNATIONAL YEAR OF
Quantum Science and Technology

Aotearoa New Zealand was the first place in the world to commemorate the IYQ, kicking off the public celebrations with the MacDiarmid Institute public lecture on 15 January: *'A Century of Quantum Mechanics: How 100 Years of Quantum Mechanics changed our perspective on reality.'*

Institute for Complex and Adaptive Matter (ICAM) Week of Science

The public lecture for IYQ took place as part of the 'ICAM Week of Science 2025' (Wellington, 13-17 January). The ICAM conference convened an exceptional group of scientists from across the globe, discussing emergent behaviours at the frontiers of soft matter and quantum materials.

AMN11

Nearly 500 researchers from NZ and around the world joined us in Ōtautahi Christchurch in February for our biennial interdisciplinary materials science conference. Talks ranged from materials for new energy systems, to quantum computing and the study of protein structures. The conference opened with a warm powhiri by kuia and kaumatua from Te Taumata Tapu o Ngāi Tūāhuriri (and a wonderful performance by their rangatahi).

AMN11 Plenary speaker Beatriz Roldan Cuenya, Director of The Fritz Haber Institute, spoke about how understanding how the active sites of a catalyst change, is critical to green energy generation and storage technologies.

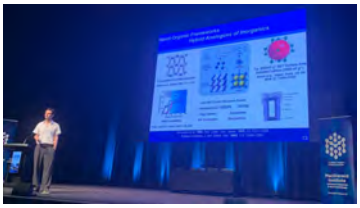
Plenary speaker Jackie Ying spoke about designing nanomaterials for biomedical and energy applications, including Li-ion batteries, the direct conversion of CO_2 to methanol, hydrosilylation and anti-microbial nanoparticles.

Our researchers took science to schools and the public during AMN11, with role modelling workshops, panel talks and a shared breakfast, plus hands-on outreach at Tūranga Otago Museum, reaching over 100 students and families.

Nobel Laureate and AMN11 Plenary speaker Moungi Bawendi gave a public lecture on Quantum Dots to 600 people in a packed auditorium at Te Pae conference centre.

Alongside AMN11, we ran Tech Tasters, our deep tech showcase and networking event. We heard from NZ scientists and entrepreneurs from Open Star, Munro Medical, Fabrum, Aspiring Materials and Dual Axis spin coating, who are making an impact on the global stage with innovations in clean energy, hydrogen, medical technology and other materials science discoveries.

[Glass's newest chemical cousin]



'I later realised that these 'hybrid glasses' could separate gases, like a MOF'. Read more here about the work of one of our new Associate Investigators, Professor Tom Bennett.

[Turning Waste into Wealth]

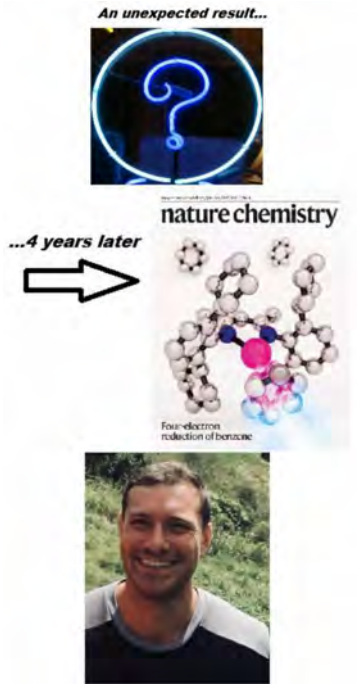
Recycling less than 10% of plastics is a disaster for the planet. And yet plastics recycling is a tremendous business opportunity worth trillions of dollars.' Professor Alexander Friemann Dmitriev, (Sweden-based collaborator of AMN11 Plenary speaker Principal Investigator Jenny Malmström, and Principal Investigator Simon Granville), is a self-described 'super nerd', who has co-founded startup company NeoSort using nanotechnology, new optical sensing tech, and AI, to sort plastics for recycling.

[New Royal Society Fellows]

Congratulations also to the three MacDiarmid Institute Investigators announced as Fellows of the Royal Society Te Apārangi. Associate Investigator Renwick Dobson ("*advances in molecular interactions critical to biological function)",* Emeritus Investigator John Kennedy, ("*pre-eminent research in ion-beam and materials science*"), and Principal Investigator Geoffrey Waterhouse, ("*an internationally renowned expert in single-atom catalysts")* are all longstanding members of and contributors to the Institute.

[Global Young Scientists Summit (GYSS) 2025]

We nominated Massey-based PhD student Cynthia Andriani to attend the GYSS Summit in Singapore in January. Cynthia's nomination was accepted by GYSS, and she travelled to the Summit where she met, amongst others, Nobel Prize winner Prof Steven Chu (pictured with Cynthia).



[Can you afford to wait years for the possibility of a high-level publication?]
Interesting read from the Royal Society Te Apārangi about the path from fundamental science discovery to publishing in a premier journal, the essential role that collaboration with other researchers plays, and a vital piece of funding that kept a new PhD grad on in the lab for a few key months to collect additional critical data. A nice aspect of this paper from Associate Investigator Mat Anker was that the work involved many MacDiarmid Institute affiliated people (including Principal Investigators Simon Granville and Luke Liu, Associate Investigator Nate Davis, alumnus Tane Butler and alumna Georgia Richardson).

DiscoveryCamp and NanoCamp 2025
Our annual camps for 20 secondary school science students ran in January: DiscoveryCamp in Ōtautahi Christchurch and NanoCamp in Ōtepoti Dunedin.

Recent Media

New Principal Investigator Associate Professor Erin Leitao gave a great interview on Radio NZ about her work making silicone recyclable.

‘So you and me, not just acting as a particle, but as a wave
Professor Smitha Vishveshwara from the University of Illinois Urbana-Champaign (who was here in NZ for our ICAM week of science) spoke with Mihirangi Forbes on RNZ about ‘crazy notions’ about ‘radiation happening in little bundles, little quanta of energy’ and the

realisation that ‘If it’s light, why not matter as well?’.

AMN11 Plenary speaker Róisín Owens, Professor of Bioelectronics at the University of Cambridge, spoke with RNZ about her research into the gut brain axis, using innovative and groundbreaking ways of testing human cells.

Director Nicola Gaston contributed to several pieces concerning the recent announcement regarding major structural changes to scientific research institutions, including an opinion piece for The Conversation, an expert reaction from the Science Media Centre and a response to the merging of Crown Research Institutes on RNZ.

New government agency Invest NZ will be working on the launch of their Cleantech Investment prospectus (which cites the Cleantech report we were involved in last year).

Thank you for your support of and interest in the MacDiarmid Institute – we can't wait to share more news with you as the year goes on!