Te Mana Tangata Whakawhanake
MacDiarmid Institute
Advanced Materials & Nanotechnology

AMN 10

10th International Conference on Advanced Materials & Nanotechnology

Conference Programme

7–10 February 2023 • Rotorua, New Zealand






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Day 1 – Tuesday 7 February 2023

09.10 – 10.15	**Pōhiri (Welcome Ceremony)** **Conference Opening**				Bay Trust Forum, Energy Event Centre
10.15 – 10.45	**PLENARY 1** **Pl.01** Growing a Mātauranga Māori space in the MacDiarmid Institute *Pauline Harris* *Chair: Jenny Malmstrom*				Bay Trust Forum
10.45 – 11.15	**Morning Tea**				Grand Hall
KEYNOTES	**Room: Bay Trust Forum** *Chair: Justin Hodgkiss*		**Room: Skellerup + WSP** *Chair: Simon Brown*		
11.15 – 11.55	**KEYNOTE 1** **K.01** Science and Mātauranga Māori: Some Thoughts *Charles Royal*		**KEYNOTE 2** **K.02** Integration of low dimensional materials for sensing applications *Rebecca Cheung*		
11.55 – 12.35	**KEYNOTE 3** **K.03** Technology for Bioelectronic Medicine *George Malliaras*		**KEYNOTE 4** **K.04** The grand design of new class of materials and properties *Xiaolin Wang*		
12.35 – 13.30	**Lunch**				Grand Hall
SESSIONS	**1A** Science in Society **Room: Bay Trust Forum** *Chair: Pauline Harris*	**1B** Catalysis 1 – electrocatalysis and nanomaterials **Room: Skellerup** *Chair: Anna Garden*	**1C** Liquid metals **Room: WSP** *Chair: Elke Pahl*	**1D** Optical materials 1 **Room: Downer** *Chair: Keith Gordon*	**1E** Bio 1 – Devices and materials **Room: Sigma** *Chair: Michel Nieuwoudt*
INVITED SPEAKERS					
13.30 – 13.50	**I1A.1** Te Tai Hauāuru O Te Ika Whenua – Convergence of West Coast terrestrial ecosystefrom the great fish of Māui *Diane Bradshaw*	**I1B.1** Uncovering electron transfer pathways: towards the rational design of light-harvesting molecules *Georgina Shillito*	**I1C.1** Remarkable nano-patterning in liquid metals *Krista Grace Steenbergen*	**I1D.1** Two-dimensional materials for next-generation electronics and optoelectronics technologies *Sumeet Walia*	**I1E.1** A Subdural Bioelectronic Implant for use following Spinal Cord Injury in Rats *Darren Svirskis*
13.50 – 14.10	**I1A.2** Nanoscience Education as a Vehicle to Enhance Scientific Literacy *Swarna Basu*	**I1B.2** Modelling light absorption in hybrid core-satellite metal nanostructures *Baptiste Auguie*	**I1C.2** Surface-Grown Crystalline Patterns and Structures from Liquid Metal Solvents *Jianbo Tang*	**I1D.2** III-V Quantum Dots, Seeing Light and Dark *Zeger Hens*	**I1E.2** Development progress towards a diamond and carbon fibre brain implant for epilepsy management *David Garrett*
ORAL PRESENTATIONS					
14.10 – 14.25	**1A.1** Ngā Wai Ariki O Whakarewarewa He Kohikohinga Hau Kāinga - Perspectives, partnerships social-natural hazard materials of geothermal taonga *Ringahora Huata*	**1B.1** Phase Transition and Electrocatalytic Performance of Dichalcogenides of Transitions Metal Alloys *Hong Seok Kang*	**1C.1** Liquid metal-based synthesis of functional 2D materials for electronic applications *Torben Daeneke*	**1D.1** Hybrid organic/inorganic nanomaterials - A new type of optoelectronic material *Nathaniel Davis*	**1E.1** Sustainable Solution for Gut Microbiota Sampling *Ebubekir Avci*
14.25 – 14.40	**1A.2** Knowing and growing a student's strengths profile: How to assess and enhance transferrable skills in a university student *Andrea Kolb*	**1B.2** Vibrational analysis of host-guest interactions in porous materials as revealed by synchrotron infrared and DFT studies *Courtney Ennis*	**1C.2** Atomistic control for self-assembly of nanostructure *Nicola Gaston*	***1D.2** Whispering Gallery Mode Lasing from Perovskite Nanocrystals Chemically Attached to Microcavities *Chase Zemke-Smith*	**1E.2** Stiffness-patterned and hierarchical GelMA hydrogels towards in vitro cardiac scar tissue models *Anaïs Chalard*
14.40 – 14.55	**1A.3** Research mentoring to increase diversity in STEM *Colleen Marlow*	**1B.3** Something about bubbles - a novel system design for testing catalysts for PEM/AEM electrolysis in an approximated MEA stack *Michelle Cook*	***1C.3** Two-dimensional (2D) p-type semiconducting oxide from liquid metal alloy *Patjaree Aukarasereenont*	***1D.3** Gallium Phosphide nanostructures as versatile platform for nonlinear and ultrafast nanophotonics *Benjamin Tilman*	**1E.3** Deep Eutectic Solvents as Cryoprotective Agents *Saffron Bryant*
14.55 – 15.10	**1A.4** Hydrogen: An opportunity to teach thermodynamics *Aaron Marshall*	***1B.4** Development of Non-Noble Metal Based Catalysts For Hydrogen Production By Seawater Electrolysis *Sana Fathima*	**1C.4** Liquid metal derived atomically thin indium nitride (InN) filfeaturing 2D electron gases *Nitu Syed*	***1D.4** Single-mode THz vibronic coherence contributes to suppression of nonradiative rates in molecular aggregates *Yu-Chen Wei*	***1E.4** Temporal analysis of human mesenchymal stem cells under electrical stimulation with AFM *Kaiwen Zhang*
15.10 – 15.30	**1A.5** Poster highlights	**1B.5** Poster highlights	**1C.5** Poster highlights	**1D.5** Poster highlights	**1E.5** Poster highlights
15.30 – 16.00	**Afternoon Tea**				Grand Hall
KEYNOTES	**Room: Bay Trust Forum** *Chair: James Storey*		**Room: Skellerup + WSP** *Chair: Duncan Sutherland*		
16.00 – 16.40	**KEYNOTE 5** **K.05** New Applications of 2D Materials from Wearable Health to Memory Devices and 6G Switches *Deji Akinwande*		**KEYNOTE 6** **K.06** Characterisation of 3D cell cultures syste- challenges and opportunities *Sally McArthur*		
PLENARY	**Bay Trust Forum** Chair: Catherine Whitby				
16.45 – 17.35	**PLENARY 2** **Pl.02** Dynamic Hydrogel Matrices to Study Biology in the 4th Dimension *Kristi Anseth*				
17.35 – 19.30	**WELCOME FUNCTION AND POSTER SESSION 1** *Sponsored by:* Victoria University of Wellington Te Herenga Waka; Wellington UniVentures Te Paewai				Grand Hall & Unison 1

**Student Presentations*

Day 2 – Wednesday 8 February 2023

KEYNOTES	Room: Bay Trust Forum Chair: Nicola Gaston			Room: Skellerup + WSP Chair: Jadranka Travas Sejdic	
08.30 – 09.10	**KEYNOTE 7** **K.07** Carbon Nanotube Field Effect Transistor Platforfor Sensitive and Real-time Sensing *Natalie Plank*			**KEYNOTE 8** **K.08** Design of Novel Non-benzenoid π-Electron Systetoward Unusual Yet Stable Functional Materials *Aiko Fukazawa*	
09.10 – 09.50	**KEYNOTE 9** **K.09** Low melting point liquid metals based on post transition metals *Kourosh Kalantar-Zadeh*			**KEYNOTE 10** **K.10** Hydrophilic Zwitterionic Polymer Coatings for Preventing the Adhesion of Bacteria on Medical Grade Polymers *Richard Kaner*	
09.50 – 10.20	**Morning Tea**				Grand Hall
SESSIONS	**2A** Commercial 1 **Room: Bay Trust Forum** *Chair: Geoff Willmott* *Sponsored by:* BRIDGEWEST VENTURES	**2B** Bio 2 – Nanomedicine and agricultural applications **Room: Skellerup** *Chair: Sally McArthur*	**2C** Energy storage, electrolytes and ionic liquids **Room: WSP** *Chair: Duncan McGillivray*	**2D** Nanoscale magnetism and characterisation **Room: Downer** *Chair: Simon Granville*	**2E** Bio 3 – Nanomedicine and functional biomaterials **Room: Sigma** *Chair: Taniela Lolohea* *Sponsored by:* ELSEVIER
INVITED SPEAKERS					
10.20 – 10.40	**I2A.1** Enabling a Circular Economy: Carbon-Negative Fuel and Chemical Production by eliminating waste *Sean Simpson*	**I2B.1** Microfluidics at the interface of plants and pathogens *Volker Nock*	**I2C.1** Ionic liquid systems: exploring partial charges, charge transfer and polarizability *Patricia Hunt*	**I2D.1** Setting spins into a spin – single molecule toroidal systems *Annie Powell*	**I2E.1** Some new nanotechnologies for applications in cancer and immunotherapy *Matt Trau*
10.40 – 11.00	**I2A.2** Bringing ion beams out of the lab *Jérôme Leveneur*	**I2B.2** Metabolic labelling as a novel approach for targeting the gastrointestinal tract *Ben Boyd*	**I2C.2** Tools for the search of new organic active materials for new redox flow batteries *Jens Noack*	**I2D.2** Nanoscale magnetophotonics *Alexandre Dmitriev*	**I2E.2** Chemical design of functional materials via surface-initiated polymerization *Harm-Anton Klok*
ORAL PRESENTATIONS					
11.00 – 11.15	**2A.1** The KakaPore start-up: Capturing carbon dioxide *Shane Telfer*	**2B.1** Studying the growth of oomycetes in an oxygen gradient on chip *Ayelen Tayagui*	**2C.1** Interface Stabilization as a Key for Promoted Safety and Energy Density of Nickel-rich Cathode Material-based Lithium-ion Batteries *Seung-Wan Song*	**2D.1**	**2E.1** PEGylated liposome encapsulating nido-carborane: boron neutron capture therapy (BNCT) and in vivo trafficking study by PET imaging in animal models *Jeongsoo Yoo*
11.15 – 11.30	**2A.2** TasmanIon: Moving towards sustainable aluminium-ion batteries *Shalini Divya*	**2B.2** Targeted nano-formulations in agriculture: Lessons from medicine *David Britt*	**2C.2** Polysulfide Sieving Strategy through Tunable Ultralight Catalytic Interlayer for Stable Li-S Battery *Hyun Young Jung*	**2D.2** New Developments in Electronic Structure Investigation: Combining APRES and Microscopy Solutions *Deler Langenberg*	***2E.2** Crystallins to Keratoplasties: Improving Biomimetic Corneal Stromal Materials *Judith Glasson*
11.30 – 11.45	***2A.3** Effect of processing conditions on suspension polymerization reaction of molecularly imprinted adsorption media *Steven Wu*	**2B.3** Eco-friendly nanocarriers actualise biomolecule agrochemicals in crop production *Peng Li*	***2C.3** Tailoring charge transfer processes in organic radical batteries *Clara Zens*	**2D.3** Holistic approaches to Advanced Characterisation of Novel Materials *Natasha Wright*	**2E.3** Bio-functionalization of titanium dioxide nanoparticles surface for controlling their cellular uptake in skin cells *Raweewan Thiramanas*
11.45 – 12.00	***2A.4** A scalable solution-processed organic thermoelectric generator with record high thermocouple density *Nathan James Pataki*	**2B.4** Fabrication and characterisation of drug-eluting bioabsorbable surgical sutures *Xiaoxuan Deng*	**2C.4** Towards predictive design of electrolyte solutions by accelerating ab initio simulation with neural networks *Timothy Duignan*	**2D.4** Peering into the Computational Microscope: Insights from 3D printing through to virtual reality *Jacob Martin*	**2E.4** In Vitro Trans-Blood Brain Barrier Delivery of Neurotrophin Loaded Nanoparticles to Address Neuronal Damage *Sheikh Mohamed Mohamed*
12.00 – 12.15	**2A.5** Wet-printing of Conformable and Stretchable Conducting Polymer Microelectrode Arrays for Gastric Slow Wave Recording *Peikai Zhang*	**2B.5** Raman spectroscopy and chemometric analysis in phytoplankton monitoring *M. Cather Simpson*	**2C.5** Ultrafast photoexcitation dynamics in ternary organic solar cells *Kai Chen*	**2D.5** Spin coating curved surfaces: simulation and experiments *Mathieu Sellier*	**2E.5** Real-Time Imaging of Nanoparticle Transcytosis in a Microfluidic Blood–Brain Barrier Model *Yueying Cao*
12.15 – 13.15	**Lunch**				Grand Hall

Student Presentations

Day 2 – Wednesday 8 February 2023 *afternoon*

SESSIONS	**3A** Commercial 2 **Room: Bay Trust Forum** *Chair: Kathryn de Ridder* *Sponsored by:* BRIDGEWEST VENTURES	**3B** Catalysis 2 - Hydrogen production and storage **Room: Skellerup** *Chair: Antonio Tricoli*	**3C** Topological, quantum and superconducting materials **Room: WSP** *Chair: Uli Zuelicke*	**3D** Optical materials 2 **Room: Downer** *Chair: Ben Ruck*	**3E** Bio 4 – responsive and biological materials **Room: Sigma** *Chair: Sierin Lim*
INVITED SPEAKERS					
13.15 – 13.35	**I3A.1** Waste as a resource… a rethink *Brandon Swanepoel*	**I3B.1** German-New Zealand: Green Hydrogen *Sally Brooker*	**I3C.1** Introducing Disorder and Magnetism into Topological Materials *Golrokh Akhgar*	**I3D.1** Thermoluminescence of $MgAl_2O_4$ and $ZnAl_2O_4$ Spinels *Luiz Jacobsohn*	**I3E.1** Dynamics at the interfaces & spontaneous motions in liquid-liquid and gas-liquid-solid systems *Emilia Nowak*
13.35 – 13.55	**I3A.2** Facile dissociation of molecular nitrogen using lanthanide surfaces: Towards ambient temperature ammonia synthesis *Franck Natali*	**I3B.2** Metal Hydride Materials for Solid-State Hydrogen Storage Applications: Utilizing the Synergy of Experiment & Theory for Materials Design Challenges *Paul Jerabek*	**I3C.2** The Topological Transistor as a Low-Voltage Switch *Michael S. Fuhrer*	**I3D.2** Wide band gap nanoparticle thin filas photoconductive sensors of high-energy radiation *Marilou Raduban*	**I3E.2** See the Light: Advanced Light Activated Materials for 3D Bioprinting & Regenerative Medicine *Tim Woodfield*
13.55 - 14.15	**I3A.3** Quantifying flow in bone with ultrasound and photoacoustic imaging *Jami Shepherd*	**I3B.3** The Rocky Road Towards Earth-Abundant Metals in Photocatalysis – A Quantum Chemical Perspective *Stephan Kupfer*	**I3C.3** Materials Nanoarchitectonics: World-smallest car race to artificial brain *Tomonobu Nakayama*	**I3D.3** Identification of single optically addressable spins in a two-dimensional material *Hannah Stern*	**I3E.3** Design and synthesis of 'smart', self-assembling molecular subunits with DNA origami *Lawrence Lee*
ORAL PRESENTATIONS					
14.15 – 14.30	**3A.1** Rare earth nitrides: From the lab to the world *William Holmes-Hewett*	***3B.1** Exploring the potential for water-based upconversion to enhance hydrogen production by photolysis *Lara Browne*	**3C.1** Thin-film multilayers of the high-temperature superconductor $YBa_2Cu_3O_7$ and manganates $RMnO_3$ *Ben Mallett*	**3D.1** Deep Blue-Emissive Molecules With Combined Hot Exciton and Aggregation-induced emission (AIE) Features as Efficient Emitters for Non-Doped OLEDs *Vinich Promarak*	***3E.1** Toxicity and selectivity studies of linear lipopeptide battacin analogues using model membrane *Nur Maizura Mohd Darbi*
14.30 – 14.45	***3A.2** Boosting the Performance and Longevity of CO_2 Capture and Conversion using Micro-nano Engineered Gas-Capturing Surfaces *Sami Khan*	**3B.2** Computational Recipes for High-Throughput Screening of Metal Hydrides for Hydrogen Storage *Kai Sellschopp*	**3C.2** Zeeman Interactions in Rare-Earth Doped Nanocrystals *Michael Reid*	**3D.2** Optical Gain Spectroscopy of Nanostructured Materials: Bigger is Better *Pieter Geiregat*	**3E.2** Exosome inspired RNA compartmentalisation in complex systems *Alexander Cook*
14.45 – 15.00	**3A.3** A High-Valent Organic Linker-Based Metal-Organic Framework for Selective Methane Capture *Lujia (Luke) Liu*	**3B.3** Ion beam synthesis of metastable, high temperature transition metal carbides at room temperature *Holger Fiedler*	***3C.3** Designing high-performance superconducting thin filusing ion beam technology *Arya A. Soman*	***3D.3** Triplet-Triplet Annihilation: Magnetic Field Effects in Solution *Roslyn Forecast*	**3E.3** Structural Characterisation of Silk Fibroin Based Hydrogels Using Small and Ultra-Small Angle Neutron Scattering Techniques *Jitendra Mata*
15.00 – 15.15	***3A.4** Antibacterial and Antiviral Solid-State Carbon Cloth Supercapacitor *Sara Beikzadeh*	***3B.4** Synthesis of nano-structured Li4Ti5O12 via a superhydride-driven wet chemistry method as a highly sustainable anode material for lithium-ion batteries *Kumar Debajyoti Jena*	***3C.4** Reducing Thermal Conductivity in n-type Thermoelectric Oxides Using a Novel Cold Sintering Process *Stephanie Mudd*	***3D.4** Optical Fiber Sensors in Tokamak Fusion Reactors *Fernando Solis Fernandez*	**3E.4** Controlled Spatial Fabrication of Metalloprotein Nanostructures for Bio-Interfacing *Lorenzo Travaglini*
15.15 – 15.30	**3A.5** Poster highlights	**3B.5** Poster highlights	**3C.5** Poster highlights	**3D.5** Poster highlights	**3E.5** Poster highlights
15.30 – 16.00	**Afternoon Tea**				Grand Hall
KEYNOTES	**Room: Bay Trust Forum** *Chair: Renee Goreham*		**Room: Skellerup + WSP** *Chair: Michael Kozicki*		
16.00 – 16.40	**KEYNOTE 11** **K.11** Guiding Peptide-driven Exfoliation and Organization of 2D Nanomaterials *Tiffany Walsh*		**KEYNOTE 12** **K.12** New mechanism in memristors revealed – prospective and challenges *Ilia Valov*		
PLENARY	**Room: Bay Trust Forum** *Chair: Franck Natali*				
16.45 – 17.35	**PLENARY 3** **Pl.03** Academic Entrepreneurship – Selling Out or Delivering Value? *M. Cather Simpson*				
17.35 – 20.00	**POSTER SESSION 2** (Unison 1) + **Tech Tasters Pitch Sessions** (Bay Trust Forum)				Unison 1 & Bay Trust Forum

Student Presentations

Day 3 – Thursday 9 February 2023

08.30 – 17.00	**Matū Investor advisory sessions (all day)** matū				One Foundation Room
PLENARY	**Room: Bay Trust Forum** *Chair: Uli Zuelicke*				
08.30 – 09.20	**PLENARY 4** **Pl.04** Semiconductor Nanostructures for Optoelectronics Applications *Chennupati Jagadish*				
KEYNOTES	Room: Bay Trust Forum Chair: Paul Kruger		Room: Skellerup + WSP Chair: Jenny Malmstrom		
09.25 – 10.05	**KEYNOTE 13** **K.13** Conductive Dithiolene-Based Metal-Organic Frameworks *Smaranda Marinescu*		**KEYNOTE 14** **K.14** Dynamic protein coatings modulate nanomaterials interactions in the context of nanotoxicology and nanomedicine *Duncan Sutherland*		
10.05 – 10.45	**KEYNOTE 15** **K.15** The photoprotection mechanism in the black-brown pigment eumelanin *Justin Hodgkiss*		**KEYNOTE 16** **K.16** 3D printed fluoropolymers: From Energy Harvesting to Microfiltration *Amanda Ellis*		
10.45 – 11.15	**Morning Tea**				Grand Hall
SESSIONS	**4A** Functional materials, 2D materials and ferroelectrics **Room: Bay Trust Forum** *Chair: Anna Garden*	**4B** Catalysis and porous materials **Room: Skellerup** *Chair: Nigel Lucas*	**4C** Magnetism magnetoelectronics **Room: WSP** *Chair: Jared Cole*	**4D** Nanostructures & novel materials, neuromorphic devices and transistors **Room: Downer** *Chair: Richard Taylor*	**4E** Soft and dynamic matter **Room: Sigma** *Chair: Jitendra Mata*
INVITED SPEAKERS					
11.15 – 11.35	**I4A.1** Melting in Extreme Environments Using Monte Carlo Simulations *Elke Pahl*	**I4B.1** Synthesis of hierarchical metal nanostructures with high electrocatalytic surface areas *Lucy Gloag*	**I4C.1** Topology and magnetism in Heusler alloy Co_2MnGa – outstanding magnetoelectronic properties for physics and applications *Simon Granville*	**I4D.1** Neuromorphic properties of nanowire networks *Zdenka Kuncic*	**I4E.1** Phase tools for synthetic biology: shaping condensate dynamics with ATP:Mg2+ *Amy Yewdall*
11.35 – 11.55	**I4A.2** Functional van der Waals Materials: A New Avenue for Next-Generation Electronics *Michael Susner*	**I4B.2** Conversion of CH_4 to high value chemicals by photocatalysis *Junwang Tang*	**I4C.2** Towards spintronics functionalization of nitrides *Maciej Sawicki*	**I4D.2** Dendrites as Digital Triggers *Michael Kozicki*	**I4E.2** Amphiphilic Self-Assembly Structure and Dynamics in Ionic Liquids *Gregory Warr*
11.55 – 12.15	**I4A.3** In-silico prediction of functional on-surface supramolecular materials *Daniel Packwood*	**I4B.3** What makes Ruthenium Dioxide a benchmark electrocatalyst for the water splitting reaction? Root causes from a condensed-matter physics perspective *Vedran Jovic*	**I4C.3** Multiferroics beyond electric-field control of magnetism *Nicola Spaldin*	**I4D.3** Anisotropic epitaxial stabilization of a low-symmetry ferroelectric with enhanced electromechanical response *Daniel Sando*	**I4E.3** 3D printing cellulose: the influence of process parameters on crystal alignment *Marie-Joo Le Guen*
ORAL PRESENTATIONS					
12.15 – 12.30	**4A.1** Highly Processable Edge Functionalised Graphene: From Dough to Dispersions *David Officer*	***4B.1** Enhancing regeneration kinetics by tailoring the structure of the donor systein organic dyes *Mantra Dheendayal*	***4C.1** Switchable Magnetic Dots for Cryogenic MRAM *Catherine Pot*	***4D.1** Behaviour of Ag-Ag_2S-Ag Atomic Switch Networks with the Addition of a Carbon Nanotube Network Layer *Ned Treacher*	**4E.1** Dynamics and Behaviour of Ultra-Small Gold Nanoparticles at Bio-Membranes – Combining Experiment with Simulation *Aaron Elbourne*
12.30 – 12.45	**4A.2** A comprehensive first-principles investigation on the defect chemistry of high performance lead-free BZT-BCT ferroelectric material *Bushra Anam Khalil*	**4B.2** Tuning alkane/alkene adsorption separation selectivity through acidic H-ZSM-5 zeolites *Mutjalin Limlamthong*	**4C.2** Heusler Alloy-Based Magnetic tunnel Junctions with Perpendicular Easy Axis for Magnetoresistive Sensors *Susant Acharya*	***4D.2** Brain-like properties of percolating networks of nanoparticles *Zachary Heywood*	**4E.2** Unusual Geometries Following Drop Impacts Using Advanced Materials *Geoff Willmott*
12.45 – 13.00	**4A.3** Bio-Inspired Approaches Towards Graphene/h-BN Nanosheet Assembly Under Sustainable Conditions *Marc Knecht*	***4B.3** Pure and mixed gas adsorption kinetics of ethylene and ethane in Mordenite, Zeolite 13X and ZJU-74a *Samuel Edens*	**4C.3** Magnetism, magneto-elasticity, and magnetostriction at 3D/2D and at interfaces *Dominik Legut*	**4D.3** Transfer-free n- and p-channel graphene field-effect transistors using graphene grown directly at 100ºC *Soongil Yoon*	***4E.3** Topographical surface tension gradients for passive motion of water micro-droplets *Kirill Misiiuk*
13.00 – 14.00	**Lunch**				Grand Hall

***Student Presentations**

Day 3 – Thursday 9 February 2023 *afternoon*

14.00 – 16.00	**WNT Ventures KCA Advanced materials commercialisation workshop**				Millennium Hotel
SESSIONS	**5A** Replacement materials **Room: Bay Trust Forum** *Chair: Catherine Whitby*	**5B** Catalysis 4 - carbon mitigation **Room: Skellerup** *Chair: Duncan McGillivray*	**5C** Polymers and biosensors **Room: WSP** *Chair: Patricia Hunt*	**5D** Optical materials 3 **Room: Downer** *Chair: Ben Mallett*	**5E** Bio 5 – Engineered environments and characterisation **Room: Sigma** *Chair: Emilia Nowak*
INVITED SPEAKERS					
14.00 – 14.20	**I5A.1** Linear to Circular Bioeconomy – New Zealand's opportunities and challenges in the 21st century *Florian Graichen*	**I5B.1** Zero-CO_2 ironmaking in a hydrogen fluidised bed *Chris Bumby*	**I5C.1** Quantum dots and extracellular vesicles as detection strategies for disease and bacteria *Renee Goreham*	**I5D.1** Interfacial Energetic Landscape in Non-fullerene Acceptor Organic Solar Cells and its Impact on Device Performance *Frédéric Laquai*	**I5E.1** External Stimulation Platforfor Stem Cell Fate Control *Amy Gelmi*
14.20 – 14.40	**I5A.2** The Scientific Basis of Our Reactive Metals Based Civilization *Digby Macdonald*	**I5B.2** Electrochemical Reduction of Carbon Dioxide *Jie Zhang*	**I5C.2** Novel conducting polymers biointerfaces for bioelectronics *Jadranka Travas-Sejdic*	**I5D.2** Accumulation of Dark Excitons in Thin Quasi-2D Perovskites Limits Amplified Spontaneous Emission *Isabella Wagner*	**I5E.2** Directing the differentiation of stem cells using cell-imprinted culture platforms *Azadeh Hashemi*
ORAL PRESENTATIONS					
14.40 – 14.55	**5A.1** Harvesting (and Using) Motion via Polymers *Peter Sherrell*	**5B.1** Carbon Dioxide Conversion Using Low Melting point Gallium Magnesium Liquid Metal Alloys *Ali Zavabeti*	**5C.1** Biodegradable piezoelectric nanogenerators from biological materials *Alireza Akbarinejad*	***5D.1** Performance Evaluation of Solid State Luminescent Solar Concentrators based on InP/ZnS–Rhodamine 101 Hybrid Inorganic-Organic Luminophores *Calum Gordon*	***5E.1** Gelatin methacryloyl microspheres to enhance the survival and maturation of directly reprogrammed neurons for cell replacement therapy in Huntington's Disease *Linh Nguyen*
14.55 – 15.10	**5A.2** A circular approach to valorize greenhouse tomato by-products in biobased and biodegradable injected materials for horticulture sectors *Johnny Beaugrand*	**5B.2** Electrochemical CO_2 extraction from seawater *Ting Wu*	***5C.2** Synthesis and characterization of antimicrobial colloidal polyanilines *Ajay Jose*	**5D.2** Theoretical studies of thermally activated delayed fluorescence (TADF) emitters: Exciplex-type and multiple resonance type emitters *Dongwook Kim*	***5E.2** Biomolecule incorporation and release from engineered biointerfaces for cell behavioral studies *Matthew Horrocks*
15.10 – 15.25	**5A.3** Ball-Milling for the Green Synthesis of Metal-Organic Frameworks: a Design-of-Experiment Approach *Mi Tian*	**5B.3** Data-Driven Structure-Function Mapping of Organic Solar Cell Materials *Geoffrey Weal*	***5C.3** The exploitation of dynamic S-S bonds in 50-poly(S-r-DCPD) for erasable data storage and encoding messages *Abigail Mann*	**5D.3** High-performance colorful semitransparent organic solar cells *Jin Young Kim*	***5E.3** Eutectic gels with 2D black phosphorus nanoflakes for antimicrobial treatments *Mx. Zo Shaw*
15.25 – 15.40	***5A.4** Bioactive biomaterials derived from chitosan for active and sustainable food packaging *Shuva Bhowmik*	**5B.4** Characterising the structure and dynamics of liquid GaAu *Stephanie Lambie*	**5C.4** Conductive composites of an elastomeric biopolyester and their application in 3D printed sensor devices *Robert Abbel*	***5D.4** Ruddlesden-Popper Mixed-Dimensional Perovskites for Triplet-Triplet Annihilation and Singlet Fission *Jake Hardy*	***5E.4** Characterisation of collagen: the use of synchrotron small-angle X-ray scattering (SAXS) and surface-enhanced Raman spectroscopy (SERS) *Yi (Ethan) Zhang*
15.40 – 16.10	**Afternoon Tea**				Grand Hall
PLENARY	**Room: Bay Trust Forum** *Chair: Natalie Plank*				
16.10 – 17.00	**PLENARY 5** **Pl.05** Active colloidal particles in nematics for physically intelligent micro-robotics and reconfigurable materials *Kathleen Stebe*				
18.30 - Late	**CONFERENCE DINNER** **Skyline Rotorua** **Transport:** Buses will depart from the Energy Events Centre at 6.15pm. A shuttle bus service will run from 10pm back to the main conference hotels Sponsored by: SCION FORESTS • PRODUCTS • INNOVATION				Skyline

Student Presentations

Day 4 – Friday 10 February 2023

KEYNOTES	Room: Bay Trust Forum *Chair: Geoff Willmott*	Room: Skellerup + WSP *Chair: Bill Williams*
09.00 – 09.40	**KEYNOTE 17** **K.17** Nanoporous materials with different functional elements: unique materials with multiple functions *Ajayan Vinu*	**KEYNOTE 18** **K.18** Resolving the Light-Activated Processes of DNA Bound Transition Metal Polypyridyl Complexes Towards Imaging and Therapeutic Applications *Susan Quinn*
09.40 – 10.20	**KEYNOTE 19** **K.19** Controlled assembly of retinal cells on fractal and Euclidean electrodes *Richard Taylor*	
10.20 – 10.50	**Morning Tea**	Grand Hall

SESSIONS	6A Nanomaterials and diagnostic devices **Room: Bay Trust Forum** *Chair: Daniel Sando*	6B MOFs, MOCs and cages **Room: Skellerup** *Chair: Shane Telfer*	6C Condensed-matter theory **Room: WSP** *Chair: James Storey*	6D Optical materials and extreme environments **Room: Downer** *Chair: Alexandre Dmitriev*	6E Bio 6 – proteins, diagnostics and devices **Room: Sigma** *Chair: Amy Yewdall*
INVITED SPEAKERS					
10.50 – 11.10	**I6A.1** Shedding light on skin cancers and skin diseases with Raman spectroscopy *Michel Nieuwoudt*	**I6B.1** A device-based approach to measuring the electrical conductivity of microscale metal-organic-framework (MOF) single crystals *Adam Micolich*	**I6C.1** What happens when you make a quantum well antiferromagnetic? *Ulrich Zuelicke*	**I6D.1** Perylene derivatives for polariton lasing *Girish Lakhwani*	**I6E.1** Protein Assemblies at Interfaces: Fundamentals and Opportunities *Sierin Lim*
11.10 – 11.30	**I6A.2** Exclusive liquid repellency enabled under-oil open microfluidic systems *David Beebe*	**I6B.2** Operando Infrared and Nuclear Magnetic Resonance Methodologies for Probing Chemistry of Working Batteries *Yuye Tong*	**I6C.2** Electrically-induced spin torques due to the bulk states of topological insulators *Dimitrie Culcer*	**I6D.2** Engineering Scalable Electrocatalysts for Affordable Production of Green Hydrogen *Antonio Tricoli*	**I6E.2** Amyloid fibril proteins: health, disease and applications *Vanessa Morris*
11.30 – 11.50	**I6A.3** (Cancer) Theranostics with Radiolabeled Nanomaterials *Weibo Cai*	**I6B.3** Metal-organic cage assemblies for gel engineering *Shuhei Furukawa*	**I6C.3** A natural surprise: The superconductivity of $Rh_{17}S_{15}$ *Philip Brydon*	**I6D.3** Plasmonic and dielectric nanostructures for enhanced light harvesting, emission control, and nanometrology *Stefan Maier*	**I6E.3** Coevolution-driven and likelihood-based design of proteins for industrial applications *Davide Mercadante*
ORAL PRESENTATIONS					
11.50 – 12.05	**6A.1** Tubular glassy carbon microneedles with fullerene-like tips for biomedical applications *Sharali Malik*	***6B.1**	**6C.1** Quantum transport in a background medium: Fluctuations versus correlations *Holger Fehske*	**6D.1** Photo-triggered Charge Transfer of 2D-TMD-based Heterostructures: Implications in Exciton Optoelectronics *Jinsoo Joo*	**6E.1** Measurement of Cell Motility using Differential Dynamic Microscopy (DDM) *Gary Bryant*
12.05 – 12.20	**6A.2** Moiré superlattices in reciprocal space *Maxime Le Ster*	**6B.2** Robust organic cages from cavitands: construction and cargo logistics *Nigel Lucas*	**6C.2** Using nano-electronics as a tool in materials science: unravelling the mystery of two-level defects in amorphous solids *Jared Cole*	**6D.2** Metafibre Optics: Principles, Fabrication, and Applications *Haoran Ren*	**6E.2** A transparent platform for cell capture and single cell isolation *Jiaxin Lian*
12.20 – 12.35	**6A.3** Homojunction organic thin film transistors by selective molecular doping *Han Young Woo*	**6B.3** Using metal complexes to open the door to long-lived excited states *Keith Gordon*	**6C.3** "Topotronics" with 2D-Xenes - from quantum matter to emerging devices *Bhaskaran Muralidharan*	**6D.3** Novel Inverted S-T gap TADF emitters as a future of OLEDs *Przemyslaw Data*	**6E.3** Real-time monitoring of cancer cell metastasis in mice using lanthanide nanoparticles *Yiqing Lu*
12.35 – 12.50	**6A.4** Desalination Performance of a Passive Solar-Driven Membrane Distiller: Effect of Middle Layer Material and Thickness *Glebert Dadol*	***6B.4** MOFs for CO2 Electroreduction *Shae Patel*	**6C.4** Topological-Insulator Nanocylinders *Michele Governale*	**6D.4** Plasmon-enhanced optical properties of molecular chromophores coupled with size-tuned silver nanoparticles *Róisín Mooney and Marcus Jones*	**6E.4** Sustainable electronics with carbon nanofibres for flexible sensor applications *Yi Chen*
12.50 – 13.50	**Lunch**				Grand Hall

PLENARY	Room: Bay Trust Forum *Chair: Simon Brown*
13.50 – 14.40	**PLENARY 6** **Pl.06** The physics of quantum processors: making machines at the atomic-limit *Michelle Simmons*
14.40 – 15.00	**Conference Closing** — Bay Trust Forum

Student Presentations

Poster Session 1

POSTER HIGHLIGHT	POSTER	PRESENTING AUTHOR	POSTER TITLE
	P1.001	Saeedeh Afsar	ATR-FTIR spectroscopy and chemometric analyses of bumble bee secretions from hungry queens and workers
	P1.002	Khalid Alhooshani	N-sulfonyl-4-(phenanthren-9-yl)-1,2,3-triazole functionalized silica as sorbent for the stir bar supported micro-solid-phase extraction of nitrosamines in water samples
1D	P1.003*	Martin Allen	1D.8 Microfluidic Chip Fabrication: Micromilling to Application
	P1.004*	Abdulrahman S Alotabi	Suppression of Phosphine-Protected Au_9 Clusters Agglomeration on $SrTiO_3$ Particles Using a Chromium Hydroxide Layer
	P1.005	Abdulaziz Al-Saadi	Silver-loaded silica/HZSM5 nanocomposite as a novel SERS substrate for sulfur compound sensing in diesel samples
	P1.007	Mat Anker	Synthesis and Reactivity of Organolanthanide(II) Hydrides
	P1.009	Ebu Avci	Automation of Protein Crystal Harvesting
	P1.010	Mahima Bansal	Interpenetrating and patternable conducting polymer hydrogel coatings for neuronal recording and electrically stimulated drug delivery
	P1.011	Swarna Basu	Biological Applications of Gold Nanoparticles: From Cytotoxicity and Immunomodulation to Protein Crosslinking
1D	P1.012*	Karen Bayros	1D.7 The effect of pinholes on Josephson transport in aluminium-oxide tunnel junctions
	P1.013*	Maicon Bertin	Reactive compatibilization of PP-PA6 blends using in-situ plasma treatment
	P1.014	Gabriel Bioletti	Non-linear pressure effects on Tc and Jc in Phosphorous doped BaFe2As2
	P1.015	David Britt	Enhanced ganciclovir activity against cytomegalovirus in combination with nanocarrier delivered quercetin
	P1.016	Karel Carva	Controlling spins with THz pulses
	P1.017	Eddie Chan	Conducting oligomers grafted biopolymer for transient electronics
	P1.019	Linda Chen	Solar Cell Fabrication Lab Teaching during the COVID-19 pandemic
	P1.020	Claire Mayer-Laigle	Sustainable powders for laser-assisted additive manufacturing
	P1.021	Bo-Han Chen	Coherent Raman spectro-microscopy using multiple-plate continuum
	P1.022	Shen Chong	Alignment and insulation of Fe-Si nanocrystalline alloy for magnetic composite cores
	P1.023*	Marlus Chorilli	Evaluation of the hypericin-loaded nanostructured lipids potential as a strategy in vulvovaginal candidiasis therapy
	P1.025	Aaron Colby	Pilot-scale production of expansile nanoparticles: Practical methods for clinical scale-up
	P1.027	Torben Daeneke	Direct conversion of CO2 to solid carbon by Ga-based liquid metals
	P1.028*	Ghadir Dahalan	Multicomponent Metal-Organic Frameworks (MOFs) Using Amino Acid and Peptide Ligands
	P1.029	Paweena Dana	Chitosan-Coated Selenium Nanoparticles Suppress Metastasis and Enhances Chemosensitivity of Glioma Cells
	P1.030	Paul Ewart	Using geometrical modelling to determine key mechanical variables of the fibre-fibre interactions in calamus manau rattan.
	P1.031	Marco Fronzi	Active Machine Learning for Efficient Predictions of the Functional Properties of Millions of Novel Layered Van der Waals Heterostructures
	P1.032	Petrik Galvosas	Diffusion and exchange in nanoporous materials studied with Magic Angle Spinning (MAS) Ndiffusometry
	P1.033	Anna Garden	Computational modelling of heterogeneous catalysis: The challenges posed by electro- and nano- catalysts
	P1.034	Katarzyna Gas	Magnetic properties and spontaneous anomalous Hall effect in bulk hexagonal MnTe - an unconventional antiferromagnet
	P1.035*	Ankush Girdhar	Electron correlation effects in spin-polarized quasi-one-dimensional quantum fluid
	P1.036	Sofiane Guessasma	Adaptive cellular designs for the monitoring of the structural integrity of conductive materials using additive manufacturing route
1A	P1.037*	Hazel Hogan-Murphy	1A.5 Three anti-wrinkle European Renaissance recipes as sustainable cosmetic alternatives
	P1.038	Jackson Miller	Exchange/Zeeman Competition in the Rare-Earth Nitrides and the Resulting Magnetic Compensation
1D	P1.039*	I-Sheng Hsu	1D.9 Direct laser patterning of semi-transparent organic solar cells with average visible transparency (AVT) approaching 50%.
	P1.040	Masooma Ibrahim	Recent Advances in Molecular Multimetallic Systems: Design and Synthesis of Polyoxometalate-Based Novel Systems
1B	P1.041*	Manju Kumari Jaiswal	1B.9 Hole-Mediated Photocatalysis in Hydrated Mixed-Phase o/h-WO3 Core-Shell Nanoribbons
	P1.043	Sung Mi Jung	Multifunctional ultrafine inorganic nanomaterial aerogel as high performance chemical sensor platform
	P1.044	John Kennedy	Enhanced piezoelectric modulus of wurtzite AlN by ion beam strain engineering
	P1.045	Byung-Kwon Kim	Electrochemical measurement of serotonin concentration in platelets using single particle collision on microelectrode
	P1.046	Joohoon Kim	Controllable Synthesis of Pt Nanoparticles Encapsulated Inside Dendrimers as Tunable Oxidase Mimics for Spatially Resolved Measurement of Oxygen
	P1.047	Young-Rok Kim	Enhancing the peroxidase-like activity of iron oxide nanoparticles by surface functionalization with polysaccharides and its analytical applications
1E	P1.049*	Jaemin Kim	1E.7 A novel personal glucose meter-based method for miRNA detection by utilizing peroxidase mimicking DNAzyme
	P1.050	JunYoung Kim	Inverted polymer solar cell device using various ZnO interfacial layer
	P1.051	Associate Professor Jonathan Kitchen	Lanthanide-Based Supramolecular Materials
1D	P1.052*	Aditi Kumar	1D.5 Organic silicon? Towards single component organic solar cells.
1E	P1.056*	Jinhwan Lee	1E.9 A simple and label-free strategy for creatine kinase assay on a personal glucose meter
	P1.057	Chang-Lyoul Lee	Preparation of Highly Stable Perovskite Quantum Dots and Light-Emitting Diode Applications
	P1.058	Dixon Leung	The use of DHM nano-profilometry to inform the design and manufacturing of a MEMS-based medical implant
1C	P1.059*	Chao-Yang Lin	1C.7 Ultrafast photoexcitation dynamics of organic photodetector
	P1.060	Chih-Hsuan Lu	Advanced light source based ultrafast transient spectroscopy system for material characterization
	P1.061	Bartholomew Ludbrook	Optical sensors for superconducting magnet quench protection: optimizing temperature sensitivity in a quasi-continuous fiber Bragg grating array
	P1.062	Ben Mallett	Using Optical Spectroscopy to Probe the Impact of Atomic Disorder on the Heusler alloy, Co2MnGa

*Student Presentations

Poster Session 1

POSTER HIGHLIGHT	POSTER	PRESENTING AUTHOR	POSTER TITLE
	P1.063	Josh Mallinson	Reservoir Computing using Percolating Networks of Nanoparticles
	P1.064	Jacob Martin	Observing graphite form through annihilation of screw dislocations
	P1.065	Jitendra Mata	Small and Ultra Small Angle Scattering for Nano- and Micro-Structural Characterisation at ACNS, ANSTO
	P1.066	Hannah Matthews	Raman imaging of vaterite inclusions in fish otoliths
	P1.067*	Brooke Matthews	Synthesis of Hofmann-based metal-organic frameworks incorporating pyrazole linkers, for various gas separations
1E	P1.068*	Ira Mautner	1E.5 Development of Portable Raman Spectroscopy as a Clinic Tool for Assessing Photodamage in Skin
	P1.069	Claire Mayer	3D printing of flax shives conjugated to fluorophores to design 4D pH-responsive biobased materials
	P1.070	A/Arlene McDowell	Nanoparticles surface-functionalised with a branched cell penetrating peptide enhances interactions at the nano-bio interface
	P1.071	Kim Mckelvey	Pseudocapacitance of Monolayer MXenes
	P1.073	Uttam Mittal	Effect of Post-synthesis Processing on the Electrochemical Performance of Y2W3O12 in Lithium-ion Batteries
	P1.074	Ciaran Moore	Microfluidic Models for Spiking Neural Networks
	P1.075	Peter Murmu	Thermoelectric properties of nanocomposite indium-tin-oxide thin fil
	P1.076	Hellen Nalumaga	NaMgF3:Ln (Ln = Eu, Sm) nanoparticles sensitisation using 2-thenoyltrifluoroacetone
	P1.078	Maryam Nurhuda	Machine learning for metal-organic framework-based chemiresistive sensor
	P1.079*	Andrea O'Reilly	Functionalisation of Ethene via an Aluminacyclopropane
	P1.080	Jake Oh	Development of a serum-free suspension culture system for scalable production of bovine satellite cells for cultured meat
	P1.081	Jiří Olejníček	High rate deposition of oxide semiconducting filusing hot hollow cathode discharge
	P1.082	Marco Pandullo	Multi-component MOFs as modular heterogeneous asymmetric catalysts
1C	P1.085*	Ludwig Petters	1C.8 A New Design for Asymmetric Catalysts
	P1.086*	Jasmine Jasmine Pople	Recyclable sulfur polymers synthesised by electrochemical induced ring opening polymerisation
1E	P1.087*	Harrison Porritt	1E.8 Creation of highly specialised composite hydrogels for modelling of cardiac pathologies
	P1.091*	Peter Remoto	Elucidating the Dehydration Mechanism of Nitrofurantoin Monohydrate II Using Low-Frequency Raman Spectroscopy
	P1.092*	Georgia Richardson	Synthesis and Reactivity of Lanthanide(II) Hydrides
	P1.094	Charlie Ruffman	Flicking the switch to carbon dioxide reduction by melting metallic alloys
1B	P1.095*	Gaby Sansom	1B.5 On Surface CO2 catalysis: Lanthanide-based coatings for CO2 activation – towards a CO2 economy
	P1.096	Joe Schuyt	Optical temperature sensing using sensitised nanoparticles: Thermal quenching of the Ln3+ luminescence in NaMgF3:Ln,TTFA
1B	P1.097*	Shailendra Kumar Sharma	1B.7 Application of RuO2-based materials as oxygen evolution catalysts in a PEM water electrolyser
	P1.098	Celina Sikorska	Superalkalis: catalysts for carbon dioxide activation
	P1.099	Ying Sim	Strategic Hydrometallurgical Processes for End-of-Life photovoltaics to achieve different outcomes
	P1.100	Younga Son	Fluorescent Colorants With Rigid Molecular Structures To Enhance Light Stability Functions
	P1.101	Prasanth Gupta	Electrochemical Ammonia Production: Challenges and Promises
1C	P1.102*	Emily Stephens	1C.5 Holey Moley: Toward 3D Covalent Organic Frameworks
	P1.103*	Tylah Sweet	Synthesis and Reactivity of the Indyl Anion
	P1.104	Prattana Tanyapanychon	Flutamide-loaded nanostructured lipid carrier exhibits its male contraceptive effects by disrupting blood-testis barrier
	P1.105	Siriluck Tesana	Single-Atom Catalysts for Electrochemical Ammonia Production
1C	P1.106*	Benjamin Tilmann	1C.9 New promising materials for efficient nonlinear and ultrafast nanophotonics
1A	P1.107*	Edward Trewick	1A.9 Electronic properties on a dense k-grid: Applications of Wannier interpolation to the rare-earth nitrides
	P1.109	Ben Westberry	Structural Studies of Amorphous SysteUsing Molecular Dynamics Simulations and X-ray Scattering Experiments: Developing Models for the Carrageenan Disorder-Order Transition
3D	P1.110*	Emma Vincent	3D.5 Multi-scale modelling of charge carrier dynamics in cluster assemblies
1B	P1.111*	Filip Vukovic	1B.6 HierGO: a modular tiling approach to capturing the complexity of graphene oxide
	P1.112	Geoffrey Weal	Data-Driven Structure-Function Mapping of Organic Solar Cell Materials
	P1.113	Chayanit Wechwithayakhlung	Machine Learning for Exciton Diffusion Rates of Pentacene Dimers
	P1.114*	Kiri van Koughnet	Vibration frequencies in rare-earth nitrides; Raman spectroscopy and DFT modelling
1D	P1.115*	Isabelle Williams	1D.6 Development and implementation of a multi-spectroscopic platform for the identification and biochemical characterization of cellular differences found in phytoplankton communities
	P1.116*	Joey Williamson	Magnetic study of CoMoO4: observation of a spin flop transition
	P1.117*	Kate Wislang	Properties of Sn- and Si-Doped Gallium Oxide Thin FilProduced Using Sol-Gel Techniques
	P1.118*	Hui Yang	Stimuli-responsive colloides for sustainable chemistry
	P1.119	Jonghun Yoon	Multi-layer welding of dissimilar materials by utilizing Vaporizing Foil Actuator Welding process
3C	P1.120*	Diana Yu	3C.5 Basin-Hopping Optimisation and Structure Characterisation Methods For Noble Gas Clusters In Strong Magnetic Fields
1E	P1.121	Maria Zafar	1E.6 Shelf-life enhancement of agricultural products via coating of simply synthesized nanoparticles
	P1.122*	Amira Ramadan Alghamdi	Materials Intermixing and the Dipole Formation at the TQ1/Conjugated Polymer P(NDI3N-T-Br) Interface

*Student Presentations

Poster Session 2

POSTER HIGHLIGHT	POSTER	PRESENTING AUTHOR	POSTER TITLE
	P2.001	Robert Abbel	SmartBioplastics – Extending food shelf-life and reducing environmental impact through bio-based active packaging materials
	P2.002	Devi Prasad Adiyeri Saseendran	Watching Ternary Oxides with Dual Eyes:in-situ Two-Colour XES Studies of Chemical Transformations & Electronic Structure in Ferric Pseudobrookite (Fe2TiO5) Photoanodes
	P2.003	Martin Allen	Use of solar-powered wearable UV monitoring clothing and public health displays in school-based skin cancer prevention programmes
3A	P2.004*	Zarinah Amin	3A.5 Targeting Extracellular Vesicles from Breath as a Diagnostic Tool
3E	P2.005*	Philippa-Kate Andrew	3E.6 Opportunities for 3D-printed Nanomachines in Biological Studies with Optical Tweezers
	P2.006	Tanzeel Arif	Electro-reduction of Ilmenite in Alkaline Media
	P2.008	Kean Aw Jonathan Stringer Debes Bhattacharyya	Elucidating the Conducting Mechanism in Reduced-Graphene Oxide Porous Film as Pressure Sensor
	P2.010*	Alex Barnes	Classification Model of Paper used in New Zealand One Penny Stamps (1936 to 1953) utilizing Near Infrared Hyperspectral Imaging Spectroscopy
	P2.011*	Andrew Battley	Towards a circular silicone economy in Aotearoa
	P2.013*	Simon Blue	Novel Long-Term Packaging Material for Wireless Implantable Devices
	P2.014	Emeritus Phil Bones	Three-dimensional percolating networks of nanoparticles
	P2.015*	Daniel Carleton	A Novel Approach Towards Plasma Assisted Landing of Biomolecular Structures
	P2.016*	Nicholas Carlisle	Assembling At The Interface: Introducing Automation Into Colloidal Swarm Dynamics With Optical Tweezers
1A	P2.017*	Hsin-Yu Chang	1A.7 Packing microstructures and thermal properties of compressed emulsions: effect of droplet size
	P2.018*	Qun Chen	Cell scaffolds formed from protein nanofibrils
	P2.019	Soo Jin Choi	Oral toxicokinetics and fates of differently manufactured food additive silicon dioxide in rats
3D	P2.020*	Sruthi Choppalli	3D.6 Nano and micro-interdigitated electrodes for enhanced electrochemical biosensing
	P2.021	Taek Dong Chung	Single Electrode-to-Single Neuron Interface via Specific Biomolecular Association
	P2.022*	Stephen D. S. Chung	Investigating Reversible Assemblies of Janus Particles
	P2.023*	Ryan Cowan	Reconfigurable droplets from light-switchable supramolecular building blocks
1A	P2.024*	Shailja Data	1A.6 Understanding the Forever Chemical Problem in Aotearoa NZ
3D	P2.025*	Robert Deas	3D.8 Fabrication of Gas Sensors Using Plasma Jets
	P2.026*	Suvankar Deka	Piezo-photocatalytic and Photocatalytic traits of monoclinic BiVO4 with Anti-bacterial Property
3B	P2.027*	Kieran DeMonte	3B.8 Porphyrin-like designer catalysts for electrocatalytic H2 evolution and selective CO2 reduction
	P2.029*	Samuel Edens	An upper bound visualization of design trade-offs in adsorbent materials for gas separations.
	P2.030	Paul Ewart	Determination of the impact forces applied to the polo ball during match play.
	P2.031*	Sana Fathima T K	An impedimetric, antibody-free 25-hydroxyvitamin D3 sensor based on silver/silver oxide/carbon nanotube composite
	P2.032	Petrik Galvosas	Flow dynamics in triply periodic minimal surface (TPMS) porous materials using MRI
3E	P2.033*	Donn Adam Gito	3E.5 Exploring the Non-Classical Properties of Protein Structure
	P2.034	Katarzyna Gas	Advanced Integral Magnetometry of Miniscule Powder Specimens and Thin Layers on Bulky Substrates
	P2.035*	Stefania Glukhova	Scattering simulations for Bessel beanear a plane substrate in the framework of the discrete dipole approximation
3C	P2.036*	Joshua Gray	3C.9 Electronic properties of 1T–TiSe2, numerical models of the formulation and melting of the charge density wave state
	P2.038*	Johan Hamonnet	Pyrolysed cobalt-based Macrocycles for the Electroreduction of CO2
	P2.039*	Samuel Harris	Fine Tuning of Electronic Excited States in Donor-Acceptor Dyes; Steps Towards Designer Compounds for Modern Technologies.
3A	P2.040*	Nathan Harvey-Reid	3A.7 Robust Hybrid Ultramicroporous Materials (HUMs) for Efficient Gas Separation
	P2.041	Daniel Mak	Development and Application of Self-sealing cFET Valves to Capillary Circuits for Commercial Applications
3A	P2.042*	Alex Heenan	3A.8 Electrocatalytic Reduction of CO2 to C2+ Compounds on Oxide-Derived Copper Nanoparticles
	P2.043*	Simon Higham	Nano-diamond Coated Carbon Fibers for improved Dopamine Sensing Applications.
	P2.044	Prof Shujuan Huang	Surface Passivation Strategies for Colloidal Quantum Dot Solar Cells
	P2.045*	Guan-Jie Huang	Time-dependent Transient Nonlinearity In Silicon Nanostructures
	P2.046*	Chris Hughes	Coating-free Surface-tension Gradient Networks for Condensing Heat-transfer Surfaces
1A	P2.047*	Mohsin Ijaz	1A.8 Optically Active Quantum Dots on Plasmonic Resonators for Visible Light Hydrogen Photocatalysis
	P2.049*	Atif Islam	Reversible Voltage Control of Magnetic Anisotropy by Ionic Liquid Gating in MgO/CoFeB/W Stack for Voltage Tuneable Magneto Resistive Sensor
	P2.051	Hyoung-Joon Jin	High voltage-durable electrolyte system for multivalent-ion supercapacitors
	P2.052	Hyun Young Jung	A New Type of Conformal Fractions Binder Bolstering Electrochemical Performance: Toward Flame Retardant High-power Lithium-Sulfur Flexible Batteries
	P2.053	Ji-Min Lee	Heterogeneous ion-exchange membranes fabricated with ionomer binder and nanofiber
	P2.054	Hyeon-Jung Park	Organic-inorganic composite all-solid electrolytes with high ion conductivity improved through electric field alignment
	P2.055*	Trishamoni Kashyap	Photocatalytic Performance of Mono and Bimetallic Ag, Au Decorated CN: Effect of Semiconductor and Surface Plasmon Excitation Synergy
3B	P2.056*	Saurabh Lamba	3B.9 Self-assembled Peptide Porphyrin Nanofibers as Cheaper Light Harvesting Systems

*Student Presentations

Poster Session 2

POSTER HIGHLIGHT	POSTER	PRESENTING AUTHOR	POSTER TITLE
	P2.057	Chang-Lyoul Lee	Preparation of Highly Stable Perovskite Quantum Dots by B-site Passivation
	P2.058*	Yik Kheng Lee	Modelling transport properties of a transverse magnetic focusing system with spin-orbit coupling
	P2.059*	Wing Ho Leung	Using catalytic transesterification for synthesizing aromatic-aliphatic copolymers by melt blending
	P2.060*	Sheung Yin Li	Smart membrane with permeate flux control through a redox switch
	P2.061*	Dian Luo	Near-infrared organic light-emitting diodes with thermally activated delayed fluorescent host sensitization.
	P2.062	Fryderyk Lyzwa	Nanoscale polarization control in oxide heterostructures studied via infrared and confocal Raman spectroscopy
	P2.063	Digby Macdonald	Redefining the Electrochemical Kinetics of Redox Reactions on Passive Surfaces.
	P2.064*	Anmol Mahendra	Tailoring Perpendicular Magnetic Anisotropy of Heusler alloy thin filusing Ion Irradiation
3B	P2.065*	Bavinesh Maisuria	3B.5 Hydrogen reduction of raw and pre-oxidised NZ titanomagnetite ironsands in a small-scale high-temperature fluidised bed.
1B	P2.066*	Niall Malone	1B.8 Synthesis of transition metal carbide nano-catalytic surfaces for hydrogen evolution reaction by ion implantation
	P2.067*	Ramkrishna Mandal	Chiral cages by template-directed narcissistic assembly
	P2.068*	Martin Markwitz	Electronic and thermoelectric properties of chalcogenide doped copper iodide
	P2.069*	Tom Maslin	Fibrosis, flexibility, and functionality: Totally internal cochlear implants as a case for what we when engineering for medicine
	P2.071	Sophie McArdle	Heterogeneous Nature of Carbon Felt Investigated by Single Fibres and Intact Electrodes to Highlight Performance Variations
3C	P2.072*	Samantha McIntyre	3C.6 Electroreduction of N03- to N2 on Pt(111) and Pd(111) Surfaces
	P2.073*	Svenja Meissner	The development of a controlled release hydrogel-based drug delivery system to present growth factors
3E	P2.074*	Shaira Mendoza	3E.9 Pelletization and Sintering of New Zealand Titanomagnetite Ironsand
	P2.075	Peter Murmu	Effect of iron implantation into piezochromic properties of cobalt molybdate fil
	P2.076	Samita Mishra	Elucidating the effect of surface passivation on crystal growth and charge carrier relaxation dynamics
3E	P2.077*	Siti Mokhtar	3E.8 PEDOT in On-Skin Wearables: Study of the Polymer Electrochemical Stability
3A	P2.078*	Róisín Mooney	3A.9 Correlation of optical and structural properties of silver nanorods
	P2.079	Bhaskaran Muralidharan	Transport spectroscopy and the search for Majorana zero modes
3C	P2.080*	Christopher Mills	3C.7 Understanding vanadium redox flow batteries and their reactions to improve performance
	P2.082*	Manash Nath	Adsorption and plasmonic photocatalysis in an Au-CeO2 nanosystem work in concert: experimental confirmation and plasmonic modeling
3A	P2.083*	Tehreema Nawaz	3A.6 Electrospun magnetic (Ni1-xFex, MnFe2O4, and MnSmxFe2-xO4) nanofibers for potential flux-guiding applications
	P2.084	Sevgi Onal Volker Nock	Investigation of mechanical cell compression and recovery at the microscale
	P2.085*	Thomas Nott	Modification of superconductivity in lead through the use of embedded nanoparticles
	P2.086*	Sam Otter	Tracking Exciton Diffusion in Framework Materials via Ultrafast Transient Absorption Spectroscopy
	P2.087*	Luke Park	Exploring the Selectivity of Copper-catalysed Phosphoramidate Synthesis in Ionic Liquids
	P2.088*	Maximilian Pitto	Assessing interfacial strength of CF/thermoplastic composites after continuous air plasma jet fibre treatment
	P2.089*	Urawadee Rajchakit	Antimicrobial peptide-conjugated nanoparticles against bacterial pathogens
	P2.090*	Matthew Robb	Incorporation of Switchable Inorganic Building Blocks into Heterometallic Coordination Polymers
	P2.091*	Zulfitri Rosli	Electrochemical Synthesis of Ammonia Based on Transition Metal Nitrides
3E	P2.092*	Sarah Sale	3E.7 Rust fungi culture on artificial flat and heterogenous surfaces – A key stepping stone to Lab-on-a-Chip devices
	P2.093*	Joel Christopher Schuurman	Electrochemically Grafting of Aryldiazonium Filonto Perovskite Surfaces to Act as Charge Extraction Layers
	P2.094	Yu-Jane Sheng	Atypical vesicles and membranes with monolayer and multilayer structures formed by graft copolymers with diblock side-chains
3D	P2.095*	Seunghwan Seo	3D.9 All-Gel Sensor based Wearable Device for measuring blood pressure
	P2.096	Joe Schuyt Prof Grant Williams	Luminescence and electron trapping properties of isoelectronic Ln3+/Ln2+ ions in fluoroperovskites
	P2.099*	George Smith	A New Family of Group 14 Aluminium Bimetallic Complexes
	P2.100*	Nicholas Smith	Use of structure and memory for the global optimisation of atomic clusters
	P2.101*	Jamie Steel	Complexity Analysis of Physical Percolating Nanoparticle Networks
	P2.102*	Campbell Stevens Katie Ellis	The Role of Optimized Parameters for Simple Geometries in the Production of Complex Architectures
3D	P2.103*	Sofie Studholme	3D.7 Computing using spiking behaviour of percolating networks of nanoparticles
3B	P2.104*	Xin Sun	3B.6 Gelatin-Based Water-Soluble Conductors for Transient Electronics
	P2.106	Andris Sutka	Tribovoltaic effects on metal-TiO2 heterojunction interfaces for mechanical-to-electrical energy conversion
	P2.107*	Nargiss Taleb	Exploring the detection of nanoplastics through the spatial interactions of gold nanoparticles in a gold-polystyrene SERS system.
	P2.108	Jeff Tallon	At last, a theory of high-Tc superconductivity?
	P2.109*	Ross Taylor	Transport current characterisation of the magnetic field-angular dependence of the critical current density for bulk REBCO superconductors
	P2.110*	Samuel Tonkin Prof Justin Chalker	Sulfur copolymers for thermal imaging and clandestine surveillance

*Student Presentations

Poster Session 2

POSTER HIGHLIGHT	POSTER	PRESENTING AUTHOR	POSTER TITLE
	P2.111*	Filip Vukovic	Structural Models of Carbon Nanomembranes
	P2.112*	Yu-Hao Tsao	Thermally assisted mobility of nanodroplets on surfaces with weak defects
	P2.113	Gary Turner	Two-photon polymerisation 3D printing and its applications
	P2.114*	Kiri van Koughnet	Vibration frequencies in rare-earth nitrides; Raman spectroscopy and DFT modelling
1C	**P2.115***	Kiri van Koughnet	1C.6 Infrared study of the magnetic van der Waals Semiconductor, $Co_2P_2S_6$
	P2.116	Heng-Kwong Tsao	UV-resistant Self-healing Emulsion Glass as a New Liquid-like Solid Material for 3D Printing
	P2.118*	Benjamin Watts	A Journey Towards Azo-connected Covalent Organic Frameworks
	P2.119*	John Whiting	A computational study on the activity and selectivity of single-atom catalysts for electrochemical reduction of N2 to NH3
3C	**P2.120***	Jiazun Wu	3C.8 High Solar Water Evaporation Rate using Silver Nanoparticles Decorated Diatom Frustules for Water Purification
	P2.121	Haesik Yang	Escherichia coli Detection Using Proteolytic Cleavage by Its Outer Membrane OmpT
	P2.122*	Cheng-Yang You	High Performance Tri-Gate InAlN/GaN High-K MOSHEMTs with Light Fluorine Dopants
	P2.123*	Chaoyue Zhao	Predicting Ion Transport through Structurally Complex Graphene Oxide Structures
	P2.124*	Kirill Zhurenkov	Fibrillar Surface Topography Modulates Corneal Keratocytes Fate and Behaviour
	P2.125	Susav Pradhan	Interfacial colloidal assembly guided by optical tweezers and tuned via surface charge.

Student Presentations

AMN 10

10th International Conference on Advanced Materials & Nanotechnology

7–10 February 2023
Rotorua, New Zealand

Te Mana Tangata Whakawhanake
MacDiarmid Institute
Advanced Materials & Nanotechnology

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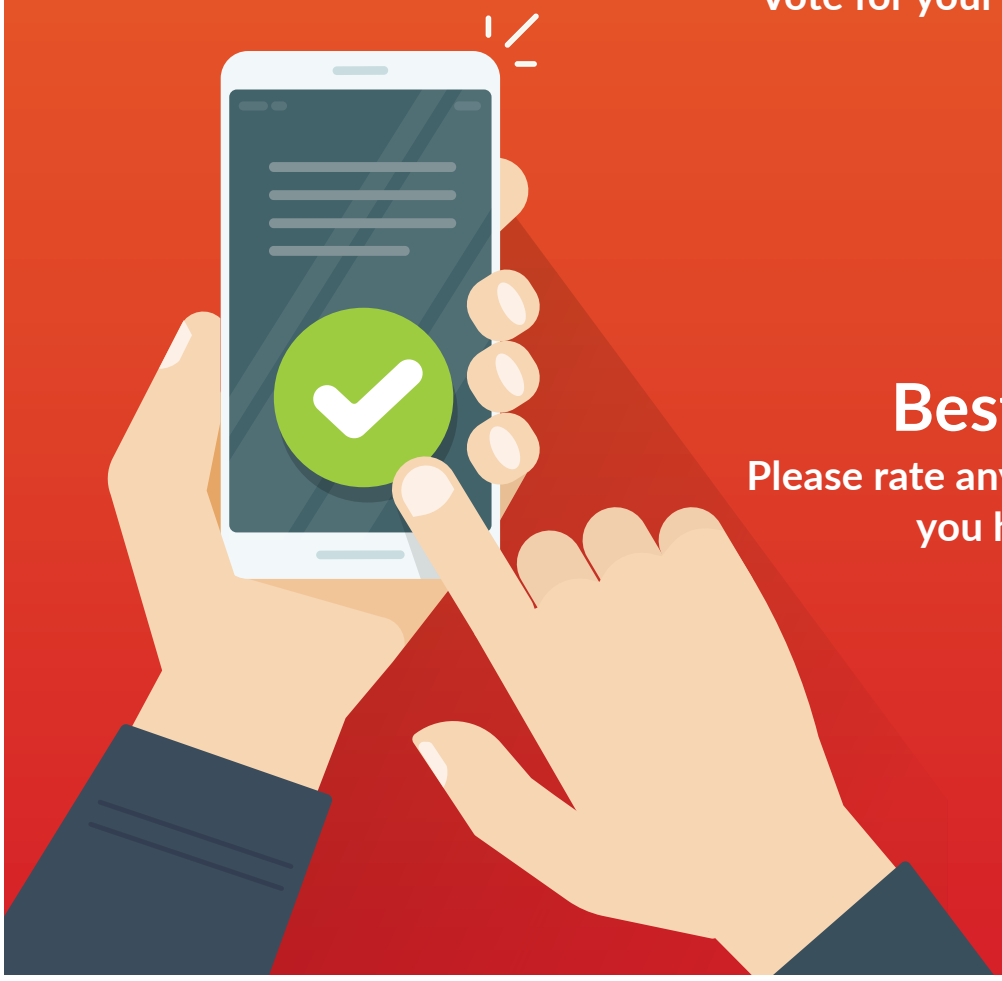

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MacDiarmid Institute Code of Conduct As a Centre of Research Excellence (CoRE), we value the free exchange of ideas and respectful debate, and we understand our responsibilities in ensuring that our community supports these values.

The MacDiarmid Institute is therefore committed to providing a harassment-free experience for participants at our hosted and sponsored events. Harassment and hostile behaviour are unwelcome at any MacDiarmid Institute event. This includes speech or behaviour (including in public presentations and online discourse) that intimidates, creates discomfort, or interferes with a person's participation or opportunity for participation in the event.

We aim for MacDiarmid Institute events to be an environment where harassment in any form does not happen, including but not limited to harassment based on: Race, Gender, Religion, Age, Colour, National origin, Ancestry, Disability, Sexual Orientation, or Gender Identity. We expect cooperation from all attendees to help ensure a safe environment for everybody.

COVID Policy

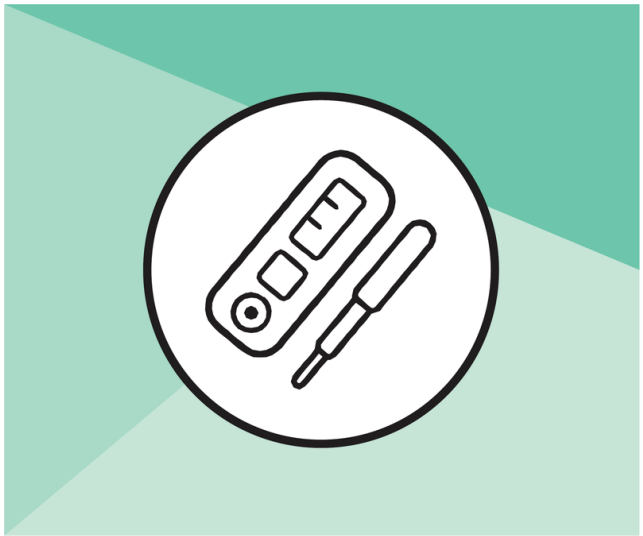
The resumption of international conferences has provided ample evidence that these events have the potential to be super-spreaders.

In order to protect the health of all attendees, we request that all conference participants wear masks when attending sessions and in high-density indoor spaces, when not eating or drinking. We ask that you bring your own mask but we will have a limited supply available at the registration desk if you forget or lose yours. We also request that all attendees perform a RAT test before travelling to the event, and to test again if they develop any symptoduring the conference.

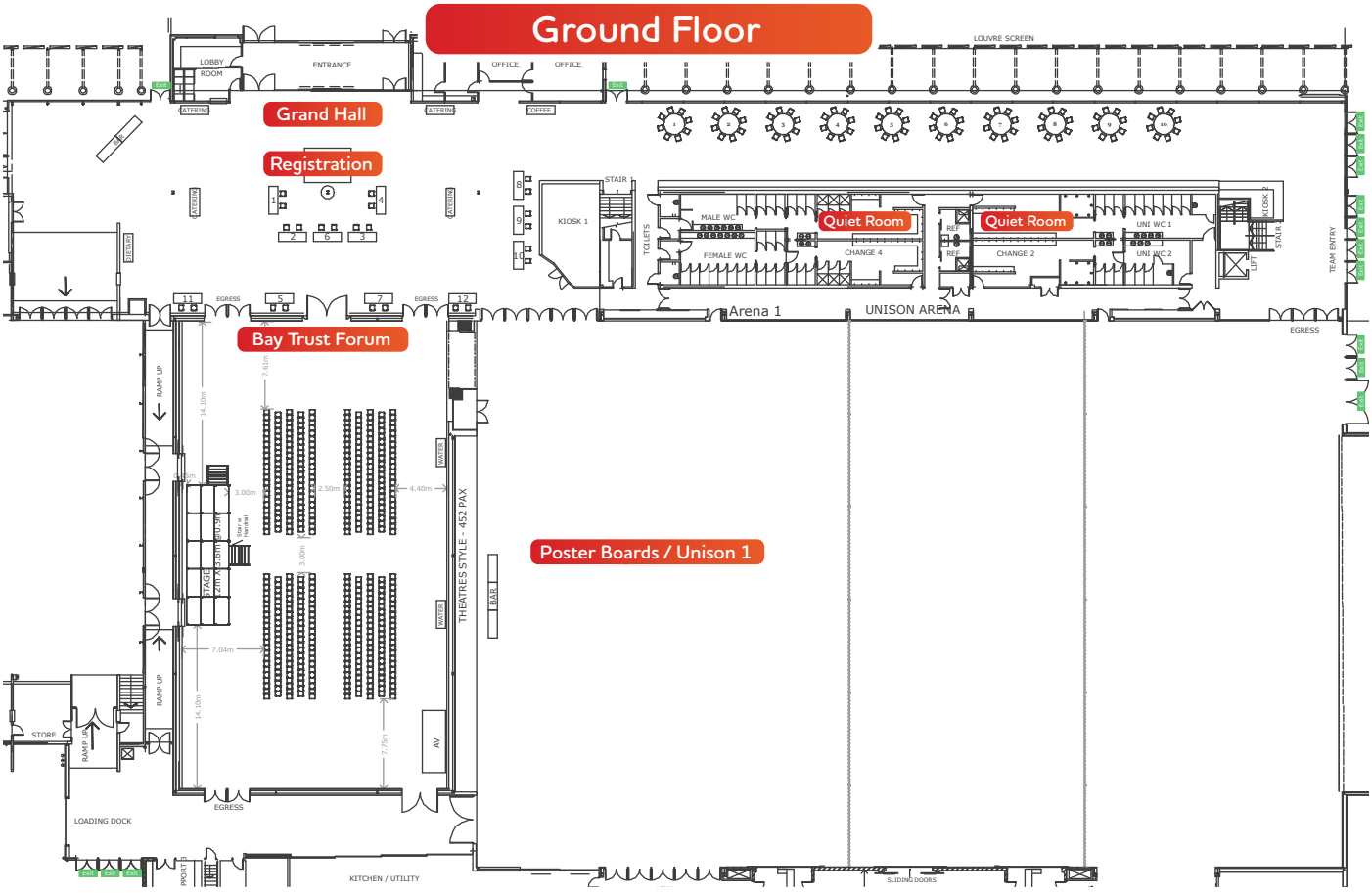
We would be grateful if participants could bring a few RATs with them to the conference, but we will also have a stock of RATs on hand at registration.

THE KEY POINTS ARE:

- **Wear as mask when attending sessions and in high-density indoor spaces, when not eating or drinking;**
- **Do not come to the conference if you are sick;**
- **If you get COVID-19 whilst in Aotearoa New Zealand, you must isolate yourself for seven days.** Please also email the conference organisers (amn10@confer.co.nz) to let us know if you test positive.



Ground Floor



Level 1