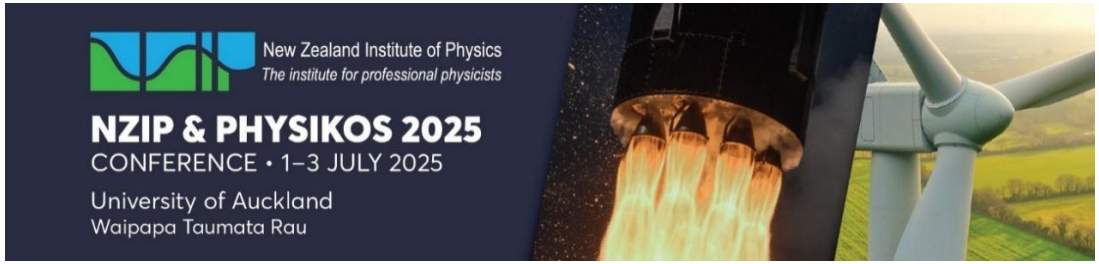

NZIP & PHYSIKOS 2025 Conference Programme

DAY 1 – Tuesday 1 July			
08:00	**Check in open @ Building 302 Foyer**		
08:45	**Conference Opening: Mihi whakatau & Welcome** **Room:** PLT1 Lecture Theatre (Building 303)		
09:15	**Keynote: Nicole Bell *"Searching for Dark Matter, on Earth and in the Stars"*** **Room:** PLT1 Lecture Theatre (Building 303) **Chair:** Richard Easther		
10:00	**Morning Tea + Exhibition open**		
10:45 - 12:15	**Session 1A: General**	**Session 1B: Education**	**Session 1C: Education**
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** Simon Granville	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)
10:45	Ocean monitoring using optical interferometry in subsea cables **Annette Koo**	A critical examination of generative AI technology **Benny Pan**	Why is thinking in Physics so difficult for many students? What are the issues? How can we help students learn to take the risks required? **Sue Napier**
11:15	Why your battery meter tells lies and it's hard to fix: Effect of pauses in cycling on sub-millihertz battery impedance **Marcus Wilson**		Learning How to Learn through Self-Assessment: A Study Skills Survey Tool for Secondary School Students **Yuanyuan Hu**
11:30	Measuring human vision – history of the photopic response curve **Ellie Molloy**		
11:45	Development of Microfluidic Ion Pipette Aspiration (IPA) for Single-Particle Mechanical Characterization **Chi Minh Truong**	The Visible Spectrum of Physics Students: Promoting Diversity in Physics Classrooms **Thalia Rutherfurd**	First-Year Physics and High School Outreach at Otago **Blair Blakie**
12:00	Analysis and Segmentation of AI-Denoised Propagation-Based X-ray Phase-Contrast CT Images of the Breast **Amritha Ramchandar**		

12:15	**Lunch in the Exhibition Area**		
13:15-14:45	**Session 2A: General**	**Session 2B: Education**	**Session 2C: Education**
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** Ben Ruck	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)
13:15	What is driving recent changes in Antarctic sea ice? **Inga Smith**	AI in the Classroom: Enhancing Teaching and Guiding Responsible Use **Kate Jackson**	Physics courses in NZ High schools; different pathways in a selection of schools **Jeffery Yang**
13:45	Big Bang Matter and Neutron Stars **Arno Tripolt**	Lighting Up Physics: Hands-On Electricity and Electromagnetism for Secondary School Students **Dulsha Kularatna-Abeywardana**	Practicals: Why do we do practicals **Chris Currie & Mark Standley**
14:00	Modelling and Analysis of Semiconductor Lasers Subject to Fiber Bragg Grating Feedback **Joe Steele**		
14:15	Temperature-dependent photoluminescence in rare-earth-doped $NaMgF_3$ **Shen Chong**		
14:30	First Principles Study of Square Tin-Oxide Nanotubes and Surface Modified Derivatives **Alex Barnes**		
14:45	**Afternoon Tea in the Exhibition Area**		
15:15-16:45	**Session 3A: General**	**Session 3B: Education**	**Session 3C: Education**
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** Michele Governale	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)
15:15	Galactic Archaeology in the Southern Sky **C.Clare Worley**	Teaching L2 mechanics and electricity with a potpourri of experiments, demonstrations, applets and videos etc. **Sue Napier & Brenda MacKechnie**	Rheostats, Eclipses, Planks, Surprises and Non-Sequiturs. A collection of small things that are useful and fun for teachers and students **Haggis Henderson**
15:45	An analogy between chemical and magnetic nozzles from the perspective of numerical simulations **Sashin Leuke Bandara Karunaratne**		
16:00	Controlling the activity of intrinsic and extrinsic defects in doped SnO2 by ion implantation and annealing **Abubakar Sadiq Yusuf**	NCEA External Assessment – an NZQA perspective **Ian Phillips**	
16:15	The Effects of Non-hydrostatic Pressure and Shear on Silicon Carbide **Samuel Case**		
16:30	Bound Excited States of Fröhlich Polarons in One Dimension **Jamie Taylor**	An update - Curriculum, NCEA and NEX **Dave Thrasher & David Housden**	
16:45	Odd-frequency superfluidity from a particle-number-conserving perspective **Joachim Brand**		

17:00 - 18:30	**Poster Networking Session in the Exhibition Area**
19:00	**PUBLIC LECTURE – Panel Discussion "*The Quantum Centuries*"** **MC: Kim Hill** **Panellists: Nicole Bell** (The University of Melbourne)**, Sara Bilal** (IBM)**, Joachim Brand** (Massey University), **Andrew Doherty** (The University of Sydney) PLT1 Lecture Theatre, University of Auckland, Science Centre Building 303 (23 Symonds Street)

DAY 2 – Wednesday 2 July				
08:30	**Registration desk & Exhibition Open**			
09:00	**Day 2 Welcome** **Room:** PLT1 Lecture Theatre (Building 303)			
09:15	**Keynote: Professor Manjula Sharma "*Rigour, relevance and reflection in physics education*"** **Room:** PLT1 Lecture Theatre (Building 303) **Chair:** Brenda MacKechnie			
10:00	**Morning Tea in the Exhibition Area**			
10:30-12:00	**Session 4A: Quantum Technologies Aotearoa**	**Session 4B: General**	**Session 4C: Education**	**Session 4D: Education**
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** Joachim Brand	**Room:** MLT1 Lecture Theatre (Building 303) **Chair:** Marcus Wilson	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)
10:30	Search for Chaos in the Quantum Three-Body Problem **Alex Kerin**	Materials for magnonics - optimised spin-wave propagation in magnetic Heusler alloys Co2MnGa1-xGex **Simon Granville**	Harnessing AI to Revolutionize Physics Education: Planning, Teaching, and Assessment **Kris Bhatt**	Folk Music Physics. Songs that boost retention of key ideas **Haggis Henderson**
11:00	How to make a p-wave superfluid with ultracold molecules? **Satyanand Kuwar**			From the takoto to the qubit – the story of measurement in New Zealand **Ellie Molloy & Annette Koo**
11:15	Pulsed Squeezed Driving of a Two-Level Atom as a Source of Wigner Negative Light **Rory Robertson**	AC voltage standard **Vladimir Bubanja**		

11:30	Multimode photon correlations from a single atom **Alex Elliott**	Akaike's Information Criterion for Linearly Separable Clusters **Maria Eda Arado**		
11:45	Lattice Bose polarons near a quantum phase transition **Matija Cufar**	Melting of noble gas systems under extreme conditions **Diana Yu**		Physics Scholarship Workshop **Matt McGovern**
12:00	**Lunch in the Exhibition Area**			
13:00	**Keynote: Andrew Doherty** **Room:** PLT1 Lecture Theatre (Building 303) **Chair:** David Hutchinson			
13.50	Transition to concurrent sessions			
14:00 - 15:00	**Session 5A: Quantum Technologies Aotearoa**	**Session 5B: Education**	**Session 5C: Education**	
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** Inga Smith	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)	
14:00	Entangled photon-pair emission in waveguide circuit QED from a Cooper pair splitter **Michele Governale**	Rural Physics-Contexts for reaching students from rural backgrounds **Haggis Henderson**	Quantum – What is the Hype? **Brenda MacKechnie**	
14:30	Inserting magnetic semiconductors into superconducting Josephson junctions **Ben Ruck**	Simple Harmonic Motion guided teaching with simulations, quizzes and graphing programs **Jeffery Yang**		
14:45			What I learned from doing Master's research in physics education **Matt McGovern**	
15:00	**Afternoon Tea in the Exhibition Area**			
15:30 – 17:00	**Session 6A: Quantum Technologies Aotearoa**	**Session 6B: Education**	**Session 6C: Education**	
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** David Hutchinson	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)	
15:30	Interfacing cold atoms with an optical nanofiber **Wayne Crump**	Testing Student-Focused STEM Workshops with Teachers: A Hands-On Electronics and Computing Experience **Wesley Key & Neha Desu**	Dark Matter and Gravitational Wave Detection: From the Lab to the Classroom **Jackie Bondell & Laura Burn**	
15:45				
16:00	Progress towards coherent transduction in a monolithic triple resonant electro-optic device **Nicholas Lambert**			
16:15	Maximum likelihood estimations for analysing photon counts in few-atom experiments **Marvin Weyland**	DC Circuits L2 **Chris Currie & Mark Standley**	Names of colleagues, students, places and concepts in Te Reo. A revisit from 2021 PLUS	

16:30	Long optical coherence times in a rare-earth-doped antiferromagnet **Masaya Hiraishi**		Mātauranga Māori and Physics: Some examples and contexts **Haggis Henderson & Mat Synge**
16:45	Quantum properties of parametrically driven cavity solitons in a bichromatically driven Kerr resonator **Sophie Shamailov**		
Break			
18:30 - late	**Conference Dinner @ Maritime Room**		

DAY 3 – Thursday 3 July

08:30	**Registration desk & Exhibition Open**		
08.55	**Day 3 Welcome** **Room:** PLT1 Lecture Theatre (Building 303)		
09:00	**Physics in the real world** 9.00am: Space Weather risk to New Zealand: Collaborative response by the Solar Tsunami research team and Industry – Daniel Mac Manus 9.30am: Non-rocket spacelaunch research at Rocket Lab - Hamish McDonald 10.00am: OpenStar Technologies: Exploring the Levitated Dipole as a Commercial Fusion Reactor - Craig Chisholm **Room:** PLT1 Lecture Theatre (Building 303) **Chair:** Richard Easther		
10:30	**Morning Tea in the Exhibition Area**		
11:00 - 12:30	**Session 7A: Quantum Technologies Aotearoa**	**Session 7B: Education**	**Session 7C: Education**
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** David Hutchinson	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)
11:00	A shorter introduction to Quantum-computing Aided Composition (QAC) **Omar Costa Hamido**	Reflection in linear videos **Manjula Sharma**	NCEA Internal Assessment – an NZQA perspective **Raymond Neal**
11:30	Rare-Earth ions in CaF_2 nanoparticles for scalable quantum technologies **Michael Moull**		
11:45			Showcasing our Smart Carts: Co-design an outreach activity with us! **Jenny Nguyen**
12:00	Three, Four and More Body Spinor Interactions via Nanofibre Cavity QED **Thomas Clarkson**		
12:15	Nonlinear Dynamics of Coupled Light-Matter Systems **Ofri Adiv**		

12:30	**Lunch in the Exhibition Area**		
13:30-15:00	**Session 8A: Quantum Technologies Aotearoa**	**Session 8B: Education**	**Session 8C: Education**
	Room: PLT1 Lecture Theatre (Building 303) **Chair:** Joachim Brand	**Room:** Studio Space G03 (Building 303)	**Room:** Case Room G20 (Building 302)
13:30	Progress towards simplified measurement schemes for optomechanical quantum-correlation thermometers **Ana Rakonjac**	NCEA Internal Assessment – an NZQA perspective (repeat) **Raymond Neal**	Python notebook for illustrating electrodynamics concepts like AC current/voltage, phasors and resonances (year 13 NCEA content) **Elke Pahl & Tristan O'Hanlon**
14:00	Analysis of frequency-dependent coupling for Josephson parametric devices **Waltraut Wustmann**		
14:15	Storing single photons in a rare-earth doped crystal **Luke Trainor**	Astronomy – Stars & Exoplanets **Chris Currie & Mark Standley**	
14:45	Trapping Dysprosium in a Magnetic Optical Trap Directly from a Thermal Beam **Liam Domett-Potts**		
15:00-15:30	**Closing Session** **Room:** PLT1 Lecture Theatre (Building 303)		

POSTER PRESENTATIONS Poster Session: Tuesday 1 July 2025, 17:00 – 19:00 Location: Exhibition Area		
P.01	Measuring 6Li(n,3H)4He Reaction Cross-Sections in the 1970's for Today's Requirements	Murray Bartle
P.02	Tracking a Space Mission: Engaging Classrooms with the Hēki Mission Aboard the International Space Station	Tane Butler
P.03	An in-depth Study of Phase-Shifted EPR-Bell States	J.J. Joshua Davis
P.04	Dynamics of Multiple Fields in Ultra-Light Dark Matter Models	Leon Ge
P.05	Microwave to Optical Frequency Conversion in Rare Earth Ions	Gavin King
P.06	Sea ice GPS trackers confirm the existence of the Victoria Land Coastal Current	Inga Smith
P.07	Can we have Newtonian Solitons in the Early Universe?	Chiara Testini

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