

# PROGRAMME

# NZIP 2017 CONFERENCE

## Monday 10th July

8.00 - 7.00pm	Registration   Room: 1877 Gallery	
10.00 - 10.30	Mihi Whakatau   Room: Hutton Theatre John Broughton (Chair, Māori Advisory Committee)   Ian Griffin (Otago Museum Director)   David Hutchinson (President of NZIP)	
10.30 - 11.00	Morning Tea & Exhibition   Room: 1877 Gallery	
11.00 - 11.30	Keynote Speaker: Kathleen Foote From Lecture to Studio: How and why Auckland changed stage one physics   Room: Hutton Theatre	
	Academic   Session 1A   Hutton Theatre	Education   Session 1B   Barclay Theatre
11.30 - 11.50	Shaun Hendy   Pass the dutchie on the left hand side	Terry Scott   Misconceived worldviews in first year University physics students
11.50 - 12.10	Danny Baillie   Quantum gas droplets	T. Haggis Henderson   An easy way in (to the technology used in teaching physics)
12.10-12.30	Shijie Chai   Large momenta transfer from finite-duration standing-wave pulses	Steven Turnbull   A leaky pipe dream? A study of gender differences in under graduate physics
12.30-13.30	Lunch & Exhibition   Room: 1877 Gallery	
13.30 - 15.00	Invited Speaker: Nigel Latta - The art and science of science communication   Room: Hutton Theatre	
15.00 - 15.30	Afternoon Tea + Exhibition   Room: 1877 Gallery	
15.30-16.00	Keynote speaker: Natalie Plank - Carbon nanotube device platforms for electronic aptasensors   Room: Hutton Theatre	
	Academic   Session 2A   Hutton Theatre	Academic   Session 2B   Barclay Theatre
16.00 - 16.20	Jenni Adams   Messengers from high energy universe	Marcus Wilson   An illustration of interdisciplinary science: Small-scale coils for transcranial magnetic stimulation
16.20 - 16.40	Max Scheel   Open source array radio telescope	Andrew Martin   Bayesian inference using physics: Using physics to work things out!
16.40 - 17.00	M. Rayhan Uddin   Image artifact library for MARS spectral CT	Annika Seppala   The Sun - influencing the Earth from the aurora to ozone loss and regional climate
17.00 - 18.30	<b>Welcome Function &amp; Poster Presentation   Room: 1877 Gallery</b> Joni White: Centrifugal microfluidics for a near real-time bacteria counting device Sanduni Malluwawadu: Exploring population spiking behaviour of neurons in human cortex Jeremy Lee-Hand: Properties of a uniform dipolar condensate Aldritt Madathiparambil: Optically stimulated luminescence study of NaMgF3(Mn) and NaMgF3(Eu) Amir Irani: Homogalacturonans illuminate the role of counterion condensation in polyelectrolyte transport Yuhui Chen: Efficient conversion of microwave and optical photons: to connect quantum computers Malithi Chandrasiri: Examining critical fluctuation of the Waikato mean-field cortical model near phase transition Hadis Bagherpour: Search for neutrinos using IceCube at the South Pole Laura Crane: Fun physics and engaging projects Daniel Solis: Low-budget infrared directional device for counting visits to museum exhibitions Esther Haines: Science for supper Tim Bishop: The water cycle inside the home - psychrometrics and electronics with Dunedin school students	
18.30	End of conference programme for the day	
19.00 - 20.00	Public Lecture with Dianna Cowern "Physics Girl" - Where supernovas meet cat videos   Venue: St David Theatre at Otago University	

## Tuesday 11th July

8.30	Registration   Room: Hutton Theatre	
9.00 - 9.10	Dan Walls Awards Ceremony   Room: Hutton Theatre	
9.10 - 10.10	Dianna Cowern aka "Physics Girl" - Workshop   Room: Hutton Theatre	
10.10 - 10.30	Richard Blaikie - 150th Anniversary of RSNZ   Room: Hutton Theatre	
10.30 - 11.00	Morning Tea & Exhibition   Room: 1877 Gallery	
11.00 - 12.30	Gender equity within the Physics community   Room: Hutton Theatre Keynote speaker: Jessica Wade (IOP, UK)   Nicola Gaston   Brenda MacKechnie   Esther Haines	
12.30-13.30	Lunch & Exhibition   Room: 1877 Gallery	
13.00-13.30	NZIP Annual General Meeting   Room: Hutton Theatre	
13.30 - 14.00	Keynote speaker: Harald Schwefel - Resonant Optics - enhancing light for nonlinear fun   Room: Hutton Theatre	
	Academic   Session 3A   Hutton Theatre	Education   Session 3B   Barclay Theatre
14.00 - 14.20	Sebastian Horvath   Crystal-field modelling of hyperfine structure for low symmetry rare-earth doped insulators	Tony Zaloum & Kate Jones   STEM Online NZ - a free interactive teaching and learning resource for NCEA external standards in STEM subjects
14.20 - 14.40	Luke Trainor   Second harmonic generation in a whispering gallery mode resonator enhanced by polarisation-selective outcoupling	Alistair Steyn-ross   Using your iPhone to measure angular motion, linear acceleration, and magnetic fields in 3D
14.40 - 15.00	Uli Zuelicke   Fame and obsolescence: Disentangling growth and aging dynamics of patent citations	Kerry Parker   Does a teacher's growth mindset rub off on their students?
15.00 - 15.30	Afternoon Tea + Exhibition   Room: 1877 Gallery	
15.30-17.20	Career Pathway Panel Discussion   Keynote speaker: Paul Bracewell   Room: Hutton Theatre Representatives from: Paul Bracewell (Dot loves data)   Mark Seaton (Scott Technologies)   TBA (Weta Digital)   Kirsten Edgar (Callaghan Innovation) Shaun Hendy (TPM, Uni. Auckland)   Karen Coleman (Radiation Therapy, Medical Imaging & Medical Physics, Uni. Otago)   Sophie Chen (RF Test)	
17.20	End of conference programme for the day	
17.45	Bus Pick up for the conference dinner   Locations: Either Otago Museum or Distinction Hotel Please inform the registration desk which pick up point you'll be at	
18.15 - 23.00	Conference Dinner - Larnach Castle The bus will drop you off to the location you were picked up	

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Wednesday 12th July

8.30	Registration   Room: Hutton Theatre	
9.00 - 9.30	Keynote speaker: Michael Jack - Teaching the physics behind sustainable energy   Room: Hutton Theatre	
	Academic   Session 4A   Hutton Theatre	Education   Session 4B   Barclay Theatre
9.30 - 9.50	Tim Molteno   Nature's wind turbines: The measured aerodynamic efficiency of spinning seeds exceeds	Mark Standley (NZQA)   An overview of the NCEA moderation system
9.50 - 10.10	Inga Smith   The "far from frozen" antarctic sea ice measurements	Phil Bones   A proposal for a revised NCEA Physics 3.6 achievement standard
10.10-10.30	Andrew Pauling   Antarctica, sea ice and ice shelves in climate models	Matt Stewart   Physics technology for a modern classroom
10.30 - 11.00	Morning Tea & Exhibition   Room: 1877 Gallery	
11.00 - 11.30	Keynote speaker: Murray Early - The last SI revolution?   Room: Hutton Theatre	
	Academic   Session 5A   Hutton Theatre	Education   Session 5B   Barclay Theatre
11.30 - 11.50	Sue Ann Oh   Quantum effects in photosynthesis	Denis Burchill   Woohoo physics – a smorgasboard of activities and resources
11.50 - 12.10	Madeleine Cormack   Acousto-optic imaging using rare-earth doped crystals as an optical filter	Kirsten Franklin   Factor analysis and item response analysis for improving testing and feedback
12.10-12.30	Murugathas Thanihaichelvan   Role of nanotube junction density on electrostatic gating in carbon nanotube aptasensors	Dave Thrasher   How to help students remember external material taught in the first half of the year
12.30-13.30	Lunch & Exhibition   Room: 1877 Gallery	
13.30 - 13.40	Rutherford Trophy ceremony   Room: Hutton Theatre	
	Academic   Session 6A   Hutton Theatre	Education   Session 6B   Barclay Theatre
13.40 - 14.00	Joseph Schuyt   The effect of ionising radiation on the optical properties of NaMgF <sub>3</sub> (Mn)	Andy Wang   Low cost photometric measurement of water contaminants for outreach activities
14.00 - 14.20	Eyal Schwartz   High fidelity preparation of a single atom in the 2d quantum ground state of optical tweezers	Emily Hall   Fight like a physicist
14.20 - 14.40	Pimonpan Sompert   Spin correlations between two atoms in optical tweezers	Fariya Naseem, Brent Cummack   Physics olympics and other games In year 12 physics
14.40 - 15.00	Luke Symes   Quench dynamics of an antiferromagnetic spin-1 condensate	Zak Whiting   Beambox: An audio-visual experience of the electromagnetic spectrum
15.00 - 15.30	Afternoon Tea + Exhibition   Room: 1877 Gallery	
15.30-16.00	Peter Derrick Memorial Lecture   Keynote speaker: Bill Williams   Room: Hutton Theatre	
	Academic   Session 7A   Hutton Theatre	Academic   Session 7B   Barclay Theatre
16.00 - 16.20	David Wiltshire   Black holes as laboratories for fundamental physics	Geoffrey Willmott   Janus particles as active matter
16.20 - 16.40	Alistair Steyn-ross   Spinodal decomposition as a novel mechanism for pattern formation in the human cortex	Jelena Rakonjac   Zero-field spin echoes in erbium-167-doped yttrium orthosilicate
16.40 - 17.10	Lewis Williamson   Thermalisation of a ferromagnetic Bose-Einstein condensate	Srinidhi Bheesette   Medipix3RX neutron camera for ambient radiation measurements
17.10 - 17.30	Naomi Fleming   Cross-shelf coastal transport derived from a 3-D volume and heat budget	Shen V. Chong   Magnetoelectric effect in magnetostrictive-piezoelectric composites containing magnetite nanoparticles
17.30	Closing speech, David Hutchinson	

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