
**Sunday 5th July**

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| 19.30 – 21.00 | **Public Lecture: DAWN'S EARLY LIGHT**<br>**Richard Easther** | **Price Waterhouse Coopers Lecture Theatre** |

**Monday 6th July**

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| 08.00 – 18.00 | **Registration Desk Open S block 1st floor foyer** | **S Block 1st Floor Foyer** |
| 09.00 – 09.30 | **Conference Opening. Chair: Alistair Steyn-Ross**<br>09.00 – 09.05 University of Waikato Vice Chancellor<br>09.05 – 09.20 Prof Ilanko, Faculty of Science and Engineering, University of Waikato<br>09.20 – 09.30 Peter Derrick, NZIP President | **S.1.04** |
| 09.30 – 10.30 | **Keynote 1: QUANTUM OPTICS & LASERS - MARVELLOUS INNOVATION AND A BRIGHT FUTURE**<br>**Hans Bachor** *(Chair: Alistair Steyn-Ross)* | **S.1.04** |
| 10.30 – 11.00 | **Morning Tea S-block 1st floor foyer** | **S Block 1st Floor Foyer** |
| 11.00 – 12.30 | **A Physics Showcase** *(Chair: Peter Derrick)* | **S.1.04** |
| 11.00 - 11.30 | **O-01**<br>**MODELLING THE BRAIN AT DIFFERENT SCALES: FROM SINGLE NEURON TO POPULATION**<br>*Moira Steyn-Ross,* University Of Waikato | **S.1.04** |
| 11.30 – 11.50 | **O-02**<br>**HARNESSING MOBILE DEVICES TO ENRICH PHYSICS LABORATORY EXPERIENCE**<br>*Anna Yang, University of Auckland* | **S.1.04** |
| 11.50 – 12.10 | **O-03**<br>**DEVELOPMENT AND APPLICATION OF HIGH-SPEED PHOTOGRAPHY**<br>*Geoff Willmott,* The *University of Auckland* | **S.1.04** |
| 12.10 – 12.30 | **O-04**<br>**SHEDDING LIGHT ON DARKNESS: THE EARLY UNIVERSE IN THE TIMESCAPE COSMOLOGY**<br>*David Wiltshire, University of Canterbury* | **S.1.04** |
| 12.30 – 13.30 | **Lunch and Poster Viewing** | **S Block 1st Floor Foyer** |

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| 13.30 – 15.00 | **Physikos** (*Chair: David Housden)*<br>**Room: S.1.02** | **Biophysics and Applied Physics** (Chair: TBC)<br>**Room: S.1.04** |
| 13.30 – 14.00 | **O-05**<br>**WOOHOO PHYSICS 2.0**<br>*Denis Burchill, University of Auckland* | **O-09**<br>**USEFUL NUCLEAR REACTIONS FOR DETECTING AND STUDYING LIGHT ELEMENTS**<br>*Bill Trompetter, GNS Science* |
| 14.00 – 14.20 | **O-06**<br>**INTERACTIVE PLAYGROUND: ILLUMINATING PHYSICS THROUGH INTERACTION AND PLAY**<br>*Neelam Hari,* T*he University of Auckland and The Dodd-Walls Centre for Photonics and Quantum Technologies* | **O-10**<br>**PERSPECTIVES ON A 1.5 T CRYOGEN FREE MRI SYSTEM BUILT USING 2ND GENERATION (YBCO) HTS CONDUCTOR**<br>*Ben Parkinson, Victoria University of Wellington* |
| 14.20 – 14.40 | **O-07**<br>**THE WAVES CAME BACK**<br>*Dave Corner, Pakuranga College* | **O-11**<br>**MONITORING BACTERIAL VIABILITY USING THE OPTRODE – A NEAR REAL TIME PORTABLE FLUORIMETER**<br>*Fang Ou,The Dodds-Walls Centre for Photonic and Quantum Technologies and The University of Auckland* |
| 14.40 – 15.00 | **O-08**<br>**TO SHARE STRATEGIES FOR USING PERSONAL LEARNING DEVICES (PLDS) IN SENIOR PHYSICS EXPERIMENTS.**<br>*Jason Morgan, Morrinsville College* | **O-12**<br>**NEAR REAL-TIME BACTERIAL CONCENTRATIONS WITH FLUORESCENCE SPECTROSCOPY**<br>*Cushla McGoverin, The Dodds-Walls Centre for Photonic and Quantum Technologies and The University of Auckland* |
| 15.00 – 15.30 | **Afternoon Tea** | **S Block**<br>**1st Floor Foyer** |
| 15.30 – 16.30 | **Keynote 2: INVESTIGATIVE SCIENCE LEARNING ENVIRONMENT (ISLE): MAKING YOUR STUDENTS COLLABORATIVE PARTICIPANTS IN THE PRACTICE OF PHYSICS**<br>**Eugenia Etkina** *(Chair: Marcus Wilson)* | **S.1.04** |
| 16.30 – 17.30 | **Speed Talks** | **S.1.04** |
| | **S-01**<br>**MEASURING THE IMPEDANCE CHARACTERISTICS OF NORMAL AND SEIZING CORTICAL TISSUE IN VITRO FROM 20 HZ TO 2 MHZ**<br>*Oliver Lin, University of Waikato and the University of Auckland* | |
| | **S-02**<br>**BRIGHT, RIGHT, TIGHT LIGHT IN SIGHT**<br>*T. "Haggis" Henderson, Whangarei Girls' High School* | |
| | **S-03**<br>**EXPLORING THE DYNAMICS OF THE FITZHUGH-NAGUMO SPIKING NEURON MODEL**<br>*Malithi Chandrasiri, University of Waikato* | |
| | **S-04**<br>**QUANTIFYING BREAST COMPOSITION**<br>Kaier Wang, Matakina Technology Ltd | |
| | **S-05**<br>**THE BREAKUP AND MELTING OF METAL NANOWIRES USING MOLECULAR DYNAMICS**<br>*Kannan Ridings, University of Auckland* | |

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| | **S-06**<br>**TOKYO SCIENCE AND TECHNOLOGY TEACHERS' FORUM**<br>*John Watson, Burnside High School* | |
| | **S-07**<br>**WHY DO SO FEW WOMEN DO PHYSICS?**<br>*Inga J. Smith, University of Otago* | |
| | **S-08**<br>**SAAC PHYSICS: AN ONLINE PHYSICS AND MATHS RESOURCE FOR SECONDARY SCHOOLS**<br>*Geoff Willmott, The University of Auckland and the MacDiarmid Institute for Advanced Materials and Nanotechnology* | |
| | **S-09**<br>**TRENDS, INTERESTING ASPECTS, DISCUSSION AND EVOLUTION OF HIGH SCHOOL PHYSICS COURSES**<br>*David Thrasher, Takapuna Grammar School, Auckland, New Zealand* | |
| | **S-10**<br>**USING WEB-BASED SOFTWARE FOR TEACHING AND LEARNING DATA ANALYSIS IN NCEA LEVEL 1 - 3 PHYSICS**<br>*Darcy Fawcett, Gisborne Boys' High School, Gisborne, New Zealand* | |
| | **S-11**<br>**FOLLOWING ULTRACOLD ATOM DYNAMICS IN REAL TIME**<br>*Bianca Sawyer, University of Otago, Dunedin, New Zealand* | |
| 17.30 – 19:00 | **Welcome Reception/Poster Session** | **S Block**<br>**1st Floor Foyer** |
| 19:30 – 21:00 | **Public Lecture: LASERS ARE PART OF YOUR LIFE**<br>**Hans Bachor** *(Chair: Moira Steyn-Ross)* | **Academy of Performing Arts** |

**Tuesday 7th July**

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| 08.30 – 17.00 | **Registration Desk Open** | | **S Block**<br>**1st Floor Foyer** |
| 09.00 – 10.00 | **Keynote 3: CLIMATE MODELLING AND CLOUDS: CURRENT CHALLENGES**<br>**Gilles Bellon** *(Chair: TBC)* | | |
| 10.00 – 10:30 | **Morning Tea** | | **S Block**<br>**1st Floor Foyer** |
| 10.30 – 12.30 | **Room: D.2.08**<br>**O-13**<br>**REFORMS IN INTRODUCTORY LABS: WHAT DOES IT ENTAIL?**<br>*Eugenia Etkina& Gorazd Planinsic*<br>*(Limited Numbers)* | **Physikos Workshops**<br>**Room: S.1.02**<br>10.30-11.10<br>**O-14**<br>**LIGHT AND SIGHT – ILLUMINATING NZ RESEARCH AND RESOURCES TO ENGAGE STUDENTS**<br>*Steve Chrystall, Hamilton Boys' High School and University of Waikato,* | **Climate and Light**<br>**Room: S.1.04**<br>10.30-10.50<br>**O-17**<br>**LIGHT, SEA ICE, AND TEMPERATURE: HOW DO ICE SHELVES INFLUENCE SEA ICE AND CLIMATE?**<br>*Inga J. Smith, University of Otago* |

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| | | 11.10 – 11.50<br>**O-15**<br>**IMPACT OF ELECTRIC VEHICLES IN NEW ZEALAND IN TERMS OF SOCIO-ECONOMICS AND ENVIRONMENT. *(IDEAS REGARDING RESEARCH STANDARDS AT LEVEL 2 AND 3)***<br>*Alvin Chand, Hamilton Girls' High School* | 10.50-11.10<br>**O-18**<br>**ELECTRICALLY AND OPTICALLY MODULATED DIFFRACTION GRATINGS IN ORGANIC CHROMOPHORE THIN FILMS**<br>*Sebastiampillai Raymond, Callaghan Innovation* |
| | | | 11.10-11.30<br>**O-19**<br>**REGISTERING OPTICAL MEASUREMENTS TO SIMULATION MODELS**<br>Nathan Tomer, *Plant and Food Research LLC* |
| | | | 11.30 – 11.50<br>**O-20**<br>**PHOTO-ACOUSTIC TOMOGRAPHY IMAGING SYSTEM FOR MONITORING MOLECULAR DIFFUSION IN SCATTERING TISSUE-LIKE PHANTOMS**<br>*Fan Hong, University of Otago* |
| | | 11.50-12.30<br>**O-16**<br>**AN INTRODUCTION TO 'MASTERING PHYSICS' WHICH IS AN ONLINE HOMEWORK, TUTORIAL AND ASSESSMENT PROGRAM**<br>*Stephen Matheson, New Zealand International College* | 11.50-12.10<br>**O-21**<br>**INTERNAL STANDARD CONSIDERATIONS FOR LASER-INDUCED BREAKDOWN SPECTROSCOPY MEASUREMENTS ON PELLETIZED GRASS SAMPLES**<br>*Harrisson Jull, University of Waikato, Waikato* |
| | | | 12.10-12.30<br>**O-22**<br>**DEVELOPMENT OF A MULTISPECTRAL IMAGING SYSTEM FOR APPLE FIRMNESS PREDICTION**<br>*Jason Sun, University of Waikato* |
| 12.30 – 13.30 | **Lunch/Poster viewing** | | **S Block**<br>**1st Floor Foyer** |
| 13.30 – 15.00 | **Physikos and Pedagogy** *(Chair: Denis Burchill)*<br>**Room: S.1.04** | 13.40 – 15.00 | **Room: S.1.02** |
| 13.30 – 14.00 | **O-23**<br>**EXPERIMENTS IN USING GOOGLE-CLASSROOM AND OTHER GOOGLE-TOOLS IN SENIOR PHYSICS AND JUNIOR SCIENCE**<br>*Dave Thrasher, Takapuna Grammar School* | 13.40 – 14.00 | **O-27**<br>**ICT AS A TOOL TO SUPPORT PHYSICS (OPTICS) TEACHING AND LEARNING**<br>*Nhung Nguyen, University of Waikato* |

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| 14.00 – 14.20 | **O-24**<br>**LANGUAGE INTERVENTION IN BRIDGING PHYSICS: A CROSS-DISCIPLINARY APPROACH**<br>*Teresa Fernandez & Rose Granger, The University of Waikato* | 14.00 – 14.20 | **O-28**<br>**NEUTRINO WINDOW ON THE UNIVERSE**<br>*Jenni Adams, University of Canterbury* |
| 14.20 – 14.40 | **O-25**<br>**ENHANCING LEARNING IN A SECONDARY SCHOOL CONTEXT: INTERLEAVING OR BLOCKING?**<br>*Daryl Smith, Cambridge High School* | | |
| 14.40 – 15.00 | **O-26**<br>**SATELLITES – REVOLUTIONARY NZ RESEARCH AND TEACHING IDEAS TO ENGAGE STUDENTS**<br>*Steve Chrystall, Hamilton Boys' High School and University of Waikato* | 14.20 – 15.00 | **O-29**<br>**INTEGRATING E-LEARNING TOOLS TO CREATE A SELF-DIRECTED LEARNING ENVIRONMENT**<br>*Mark Mack, Elim Christian College* |
| 15.00 – 15.30 | **Afternoon Tea** | | **S Block 1st Floor Foyer** |
| 15.30 – 16.30 | **Keynote 4: MIRACLE MATERIALS AND MYSTERY PARTICLES**<br>**Uli Zuelicke** *(Chair: Peter Derrick)* | | **S.1.04** |
| 18.30 | **Buses pick up from conference hotels** | | **Novotel, Ibis, Ventura Inn** |
| 18.45 – Late | **Conference Dinner**<br>**After Dinner Speaker: PHYSICS IN SOCIETY - A HISTORICAL PERSPECTIVE**<br>**Geoff Austin**<br>(buses return to conference hotels after dinner) | | **Academy of Performing Arts** |

**Wednesday 8th July**

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| 08.00 – 15:00 | **Registration Desk Open** | | **S Block 1st Floor Foyer** |
| 09.00 – 10.45 | **Physikos workshops** *(Chair: TBC)*<br>**Room: S.1.02** | **Solid State Physics** *(Chair: TBC)*<br>**Room: S.1.04** | **Nanotechnology and quantum physics**<br>*(Chair: TBC)*<br>**Room: S.1.05** |
| | 09.00 – 10.00<br>**O-30**<br>**INTRODUCTION TO LASER SAFETY**<br>*Rainer Künnemeyer (1 hour)* | 9.00–9.20<br>**O-32**<br>**INHOMOGENEITY IN QUATERNARY AND TERNARY IRON-ARSENIDE SUPERCONDUCTORS**<br>*Shen V. Chong, Victoria University of Wellington, Wellington* | 9.00–9.20<br>**O-37**<br>**DUAL NANO-ELECTROSPRAY AND MIXING PROCESS IN THE TAYLOR CONE**<br>*Anna Radionova, The University of Auckland, Auckland* |

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| | | 9.20–9.40<br>**O-33**<br>**VORTICES AND RING DARK SOLITONS IN TOROIDAL BOSE-EINSTEIN CONDENSATES**<br>*Lauri Toikka, University, Auckland* | 9.20–9.40<br>**O-38**<br>**STRUCTURAL, MAGNETIC, AND OPTICAL STUDY OF ION BEAM SPUTTERED MULTIFERROIC BIFEO3 NANOCRYSTALLINE THIN FILMS**<br>*Pierre Couture, National Isotope Centre and Victoria University of Wellington* |
| | | 9.40–10.00<br>**O-34**<br>**ROEBEL CABLE, ROTATING MACHINES AND THE ROBINSON RESEARCH INSTITUTE: APPLIED SUPERCONDUCTIVITY IN NEW ZEALAND**<br>*Stuart Wimbush, Robinson Research Institute of Victoria University of Wellington* | 9.40–10.00<br>**O-39**<br>**SHINING LIGHT ON MULTIFERROIC PROPERTIES: MAGNETO-OPTICAL CHARACTERISATION OF NANOSTRUCTURED BISMUTH IRON OXIDE THIN FILMS**<br>*Jerome Leveneur, GNS Science, and the MacDiarmid Institute for Advanced Materials and Nanotechnology* |
| | 10.00 – 10.40<br>**O-31**<br>**SPEED OF LIGHT EXPERIMENT - LOW COST METHOD USING PASCO SCIENTIFIC EQUIPMENT**<br>*Steve Williams, Electrotest Ltd* | 10.00–10.20<br>**O-35**<br>**RADIOLUMINESCENCE STUDY OF FLUOROPEROVSKITES DOPED WITH TRANSITION METALS AND RARE EARTHS**<br>*Jamie McMahon, MacDiarmid Institute, SCPS, Victoria University of Wellington* | 10.00–10.20<br>**O-40**<br>**TOWARDS AN ISOLATED QUANTUM ENGINE**<br>*Oleksandr Fialko, Massey University* |
| | | 10.20–10.40<br>**O-36**<br>**HALF-METALLIC DOUBLE PEROVSKITE OXIDES AND HEUSLER ALLOYS: THIN MAGNETIC FILMS FOR MAGNETIC SENSING**<br>*Simon Granville, Victoria University of Wellington and MacDiarmid Institute for Advanced Materials and Nanotechnology* | 10.20-10.40<br>**O-41**<br>**SUB-POISSONIAN COUNTING OF ATOMS AT HIGH DENSITIES**<br>*Pimonpan Sompet, Dodd Walls Centre for Photonic and Quantum Technologies* |

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| 10.45 – 11.15 | **Morning Tea** | **S Block**<br>**1st Floor Foyer** |
| 11.15 – 11.45 | **O-42 QUANTUM ELECTRICAL METROLOGY**<br>*Vladimir Bubanja, Callaghan Innovation, Lower Hutt, New Zealand* | **S.1.04** |
| 11.45 – 12.45 | **Keynote 5: GEONET, EARTHQUAKES AND PHYSICS**<br>**Ken Gledhill** | **S.1.04** |
| 12.45 – 13.00 | **Conference closing and prize giving**<br>**Peter Derrick** | **S.1.04** |
| 13.00 – 14.00 | **Lunch** | **S Block**<br>**1st Floor Foyer** |
| 14.00 – 15.15 | **NZIP AGM** - *All members welcome* | **S.1.04** |