

DRAFT AIP 2018 Congress Program

Sunday 9 December 2018

0830 - 1830	Registration open Location: University Club Conference Foyer
1000 - 1630	Room: University Club Auditorium ANFF Short Course on Nanofabrication Technologies: Engineering your Imagination This workshop includes lunch and afternoon tea
1800-2000	WELCOME RECEPTION Venue: Ground Floor Terrace, University Club




Monday 10 December 2018

0700-1800	Registration open Location: University Club Conference Foyer
0845 - 0855	Room: Octagon Theatre Official Opening - Prof Peter Klinken (Chief Scientist of WA)
0855 - 0900	WELCOME TO COUNTRY
	PLENARY SESSION 1 0900-0945 - Prof Julia Yeomans FRS (Oxford University) – Active Matter Chair - Evelynne Deplazes 0945-1035 - Prof Jian-wei Pan (University of Science and Technology of China) – Quantum Foundation, Quantum Optics, Quantum Information Introduced by Prof Lloyd Hollenberg (Centre for Quantum Computation and Communication Technology) Co-Chairs - Jingbo Wang and Lloyd Hollenberg





1035-1100	Morning Tea - Banquet Hall, University Club
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Session:	1A - AIP Gravitational Waves & Relativity	1B - AIP Nuclear & Particle Physics	1C - AIP CMM	1D - AIP ATOMP	1E - AIP QUICC	1F - AOS/ACOFT	1G - AOS/ACOFT	1H - COMMAAD
Topic:			Semiconductors	Bose gases	Quantum neuroscience, metrology and imaging	Nanostructures and metasurfaces	Biophotonics and imaging	Wide bandgap semiconductors 
Chair:	Daniel Terno	Anton Wallner	Hannah Joyce	Meera Parish	Tom Stace	Ben Eggleton	Robert McLaughlin	Fouad Karouta
Room:	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Arts Building Room 5 [G.61]	Physics Building Ross Lecture Theatre [G.41]	Physics Building Clews Lecture Theatre [2.43]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium
1100-1130	Technology Development for Next Generation Gravitational Wave Detectors Li Ju	Exploring fundamental physics with gravitational waves Archil Kobakhidze	Semiconductor Nanowires for Optoelectronics Applications Chennupati Jagadish	Evolution of large-scale flow from turbulence in a two-dimensional superfluid Kristian Helmersson	Quantum Processing in the Brain? Matthew Fisher	Mie-resonant meta-optics, metasurfaces, and topological photonics Yuri Kvshar	Intravascular polarimetry with catheter-based optical coherence tomography Martin Villiger	GaN Power Electronics: From Lateral to Vertical Shu Yang
1130-1145	An heuristic approach to understanding spinors using Maple software with applications to general relativity Peter Huf	Radiation measurements in Australia's deepest mines in view of the construction of an underground physics laboratory Francesco Nuti	Fixing up the holes -- p-GaAs nanowire transistors with near-thermal limit gating Jan Glusckke	Giant vortex clusters in a 2D superfluid Tyler Neely	Spin-Qubit Molecular Microscopy Viktor Perunicic	A Novel Hybrid Plasmon Nano-Focusing Mode Converter Oliver Bickerton	Endoscopic optical coherence tomography in dental and otolaryngological research Julia Walther	Pseudo-Hall effect in an AlGaIn/GaN van der Pauw device under mechanical strain Quan Nguyen
1145-1200	Early Earthquake Detection with the TorPeDO Sensor David McManus	Higgs physics with the ATLAS experiment, and the upgrade for the high luminosity LHC Elisabetta Barberio	Electronic Structure and Electron Dynamics in Single-Layer Semiconducting and Metallic Transition Metal Dichalcogenides Antonija Grubisic-Csabo	Roton-induced features of a Bose polaron in the presence of spin-orbit coupling Jia Wang	Ab-initio optical phase estimation at the exact Heisenberg limit Sergei Slussarenko	Giant third-harmonic emission based on mirror-enhanced anapole resonator Lei Xu		Nitrate ion detection using GaN/AlGaIn/GaN-based reference-electrode-free sensors with triodal receptor functionalisation Jianan Wang
1200-1215	GOTO: a new telescope network for transient detection Duncan Galloway	Origin of neutrino masses at the ATLAS experiment Frederico Scutti		Impurity-induced multi-body resonances in a Bose gas Zheyu Shi	Quantum trilateration by photon measurement: Finding two particles with three measurement locations Josef Worboys	Optical phased array on a chip using scalable silicon waveguides David Gozzard	Imaging genetically-modified airway cells with a miniaturised multimodal optical coherence tomography + fluorescence probe Jiawen Li	Lithography-free microfabrication of silicon carbide on insulator using UV laser ablation Hoang-Phuong Phan
1215-1230	Low Frequency Squeezing Measurement with Double Carriers and High Frequency Squeezing Injection Jue Zhang	BREAK	Quantum correlated photons from strongly interacting semiconductor cavity polaritons Guillermo Muñoz Matutano	Building time crystals with ultracold atoms Peter Hannaford	Robust symmetry-protected metrology with the Haldane phase Gavin Brennen	Tunable optical spin Hall effect in a liquid crystal microcavity Wiktor Piecsek	Early caries detection by depolarization imaging based on PS-OCT Jonas Golde	Single crystal diamond membranes containing germanium vacancy color centers Blake Regan
1230-1330	Lunch - Banquet Hall, University Club							AOS Annual General Meeting 1230 - 1400 Seminar Room 1, University Club



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1330-1500 CONCURRENT SESSION 2								
Session:	2A - AIP Gravitational Waves & Relativity	2B - AIP Nuclear & Particle Physics	2C - AIP CMM	2D - AIP ATMOP	2E - AIP QUICC	2F - AOS/ACOFT	2G - AOS/ACOFT	2H - COMMAD
Topic:			Organic and carbon based materials	Atomic superfluids	Quantum metrology, algorithms and simulation	Nanostructures and plasmonics	Optical fibres and sensing	Nanodevices 
Chair:	Magdalena Zych	Mahananda Dasgupta	Jamie Quinton	Peter Hannaford	Jingbo Wang	Mohsen Rahmani	Jiawen Li	Mariusz Martyniuk
Room:	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Arts Building Room 5 [G.61]	Physics Building Ross Lecture Theatre [G.41]	Physics Building Clews Lecture Theatre [2.43]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium
1330-1345	Quantum effects in gravitational collapse Daniel Terno	Nuclear reaction cross sections in hadron therapy Edward Simpson	Local charge accumulation at iron-based trinuclear metal-organic nanostructures on a surface Marina Castelli	Ebb and flow of superfluids far from equilibrium Matt Davis	Ichtyosaurs (and other pets) in the quantum laboratory Klaus Moelmer	Engineering light-matter interactions at the nanoscale Kenneth Crozier	Simple fibre designs for complex photonics: what do nanoparticles, bubbles, and semiconductors have in common with lasers and Anderson localisation John Ballato	Nanodiamonds for imaging and sensing in biology Philipp Reineck
1345-1400			Carbon Surface Hybridisation Mapping with Auger Electron Spectromicroscopy Jamie Quinton					
1400-1415	Microresonators for optically diluted optomechanical filters Xu Chen	Full reconstruction of leptonic and semileptonic B decays at the Belle II experiment Kevin Varvell	Dense and Tunable 3D Graphene Networks from Carbide-Derived Carbons Irene Suarez-Martinez	Elementary excitations of a fermionic superfluid with strong interactions Sascha Hainke	Encoding Electronic Spectra in Quantum Circuits with Linear T Complexity Dominic Berry	Vertically Stacked Silicon Nanowire Photodetectors for Spectral Reconstruction Jiajun Meng	Simultaneous measurement of temperature and refractive index using an exposed core microstructured optical fibre Xuegang Li	Metallic Nanoparticles-Embedded Glass towards Light Modulation Jiangbo Zhao
1415-1430	Progress on solving the Einstein-Dirac equations for a massive sterile neutrino Malcolm Anderson	Electron reconstruction and searches for new physics with the ATLAS experiment Abhishek Sharma	Loss of superelasticity in glassy carbon after high-pressure compressions Carla de Tomas	Low-momentum dynamic structure factor of a strongly interacting Fermi gas at finite Hui Hui	A quantum walk assisted approximate algorithm for bounded NP optimisation problems Samuel Marsh	Topological photonics meets Terahertz Shakhik Atakaramians	Drawn Optics - the Artistry of Spiders and their (Photonics) Webs Douglas Little	Chiral graphene plasmonic nanostructure for on-chip photodetection of MIR spin angular momentum Jingyang Peng
1430-1445	Commissioning of the Advanced LIGO Detectors for Observation Run 3 Carl Blair	Accelerator mass spectrometry measurement of the reaction $92Zr(n,\gamma)93Zr$ and its relevance to nuclear astrophysics and nuclear technology Stefan Pavetich	Spin Coherence and Dynamics of Singlet Fission in Molecular Dimers Amir Asadpoor Darvis	Breathing modes in strongly interacting Fermi gases Brendan Mulkerin	Graph comparison via nonlinear quantum search Mitchell Chiew	A novel nanocomposite based on rare-earth doped nanocrystals towards super-resolution optical data storage Simone Lamon	Asymptotic simulation of drawing Ge ₂ Sb ₁₂ Se ₆₀ chalcogenide glass microstructured optical fiber process including effects of pressure and surface tension Shengling Wu	Threshold Switching in NbO _x and its Application as a Relaxation Oscillator Robert Elliman
1445-1500	Quantum Metrology in the Kerr Metric Sebastian Kish	BREAK	Spatially Dependent Charging in a Single-Component Organic Nanofilm on a Metal Dhaneesh Kumar Gopalakrishnan	Negative-mass effects in spin-orbit coupled Bose-Einstein condensates David Colas	Controlled Quantum Search Kooper De Lacy	Free spectral range electrical tuning of a high quality double disk microcavity Christiaan Bekker	Towards Optical Filtering in Lithium Niobate On Insulator Inna Krasnokutska	High-Q cavity modes in a single dielectric nonspherical nanocavity Lujun Huang
1500-1530 Afternoon Tea - Banquet Hall, University Club								
1530-1730 CONCURRENT SESSION 3								
Session:	3A - AIP Gravitational Waves & Relativity	3B - AIP Nuclear & Particle Physics	3C - AIP CMM	3D - AIP ATMOP	3E - AIP QUICC	3F - AIP QUICC	3G - AOS/ACOFT	3H - COMMAD
Topic:			Superconductors	Precision atomic physics	Quantum foundations and quantum time	Continuous variables quantum information	Biophotonics and imaging	Semiconductor and thin film devices 
Chair:	Sundae Chen	Keith Fifield	Stephan Rachel	Dmitry Fursa	Gavin Brennen	Austin Lund	Peijun Gong	Philipp Reineck
Room:	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Physics Building Clews Lecture Theatre [2.43]	Arts Building Room 5 [G.61]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium	Physics Building Ross Lecture Theatre [G.41]
1530-1545	Science Benefits of an Asia-Australian pair of Gravitational Wave Observatories David Blair	Heavy element nucleosynthesis in red-giant stars Amanda Karakas	Nature of the spin liquid in lightly doped cuprate superconductors Oleg Sushkov	Lifting the cloud on the hyperfine structure; a brighter future for atomic parity violation Jacinda Ginges	Causal Asymmetry in a Quantum World Jayne Thompson	High-fidelity squeezing gate for continuous-variable quantum light field Jie Zhao	Recent developments in polarisation-sensitive optical coherence tomography for retinal imaging Barry Cense	III-V Solar Cells - present status and future prospects N.J. Ekins-Daukes
1545-1600					Quantum physics on indefinite causal structures: foundations and applications Fabio Costa			
1600-1615	Numerical scalar curvature deformation and a gluing construction Boris Daszuta	The Belle II experiment at the SuperKEKB e+e- collider Phillip Urquijo	Dynamical admittance of Josephson junction arrays Samuel Wilkinson	Enhanced electronic-bridge coupling to the 76 eV U-235 nuclear transition in ions with chaotic spectra Julian Berengut	Tightening quantum speed limits for almost all processes Felix Pollock	Modular-qubit cluster states Giacomo Pantaleoni	Dynamic quantitative optical imaging of blood thrombus Woei Ming (Steve) Lee	CuI-TiO ₂ Composite Thin Film for Flexible Electronic Applications Vidur Raj
1615-1630	EPR induced Frequency Dependent Squeezing for Gravitational Wave Detectors Min Jet Yap		Modelling three-dimensional electron transport in tunnel junctions Martin Cyster	Keldysh-Rutherford Model for the Attoclock Alexander Bray	Witnessing quantum non-Markovianity Christina Giarmatzis	Restricted memory attacks in continuous-variable quantum key distribution Nedasadat Hosseindehagh		Released all-porous-silicon microstructure for spectrometer applications Xiao Sun

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1630-1645	Precession measurability in black hole binary coalescences Grant Meadors	60Fe and 244Pu on Earth – Access to the Solar Neighbourhood, Stars and the Past of Earth Dominik Koll	Factors affecting magnetic field sensitivity of one and two dimensional SQUID arrays Emma Mitchell	Spheroidal Convergent Close-Coupling calculations of electron scattering on the metastable $c3Pu$ state of H2 Jeremy Savage	Tensor Network Holography For A Family of Unitary Minimal Models Nathan McMahon	Optimal estimation of joint parameters with Gaussian probes Mark Bradshaw	Radio-photoluminescence and optically stimulated luminescence in NaMgF3:Sm and NaMgF3:Mn suitable for novel optics-based dosimeters Joseph Schuyt	Using thermography to investigate thermal characteristics of porous silicon Adrian Keating
1645-1700	High Frequency Technology for Next Generation Gravitational Wave Detectors Chunnong Zhao	Forecasting the next fundamental discovery Csaba Balazs	Pressure dependant measurements of critical current density in iron-based superconductors Gabriel Bioletti	Measurement of the Characteristic Radiation of Copper K α 1,2 Jonathan Dean	Quantum satellites and tests of relativity Daniel Terno	Quantum State Smoothing for Gaussian States Kiarn Laverick	A scintillating fibre array for medical imaging and dosimetry Zhangkai Cheng	Fabrication of free-standing, high-efficiency terahertz devices using cyclo olefin co-polymer Rajour Tanyi Ako
1700-1715	The role of Gravitational-Wave Optical Transient Observer (GOTO) in the era of advanced gravitational-wave detectors Kendall Ackley	Fusion dynamics in Super Heavy Element synthesis with atomic number $Z = 114$ Kaushik Banerjee	Effect of air annealing on the structure and magnetic properties of FeSe $_{1-x}$ Tex David Uhrig	Isotope shift, non-linearity of King plots and the search for new particles Amy Geddes	BREAK	Multiparameter optimisation of a magneto-optical trap using deep learning Aaron Tranter	Gamma irradiation effects in photonic crystal fibre Bragg gratings Steven Hinckley	BREAK
1715-1730	Design, build and results of an Advanced Low Frequency Rotational Accelerometer 'ALFRA' for tilt measurement in gravitational wave detectors Joshua McCann	Decay properties of neutron-rich molybdenum isotopes AJ Mitchell	Impurity Induced Anomalous Thermal Hall Effect in Chiral Superconductors Vudtiwat Ngampruetikorn	Proton impact differential ionisation of atomic hydrogen Ilkhom Abdurakhmanov	BREAK	Simulation of Gaussian channels via teleportation and error correction of Gaussian states Spyros Tserkis	Using low refractive index cladding materials to improve the imaging performance of a plastic scintillating fibre array detector in radiotherapy Samuel Blake	BREAK
1730-1830	Sundowner Poster Session Venue: Banquet Hall, University Club							 

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Tuesday 11 December 2018 - Sponsored by SPIE



0730-1800 Registration open
 Location: University Club Conference Foyer
 Room: Octagon Theatre

0855-1030 **PLENARY SESSION 2**
0855-0900 - Maryellen Giger (SPIE 2018 President)
0900-0945 - Prof Teri Odom (Northwestern University, USA) – Reconfigurable Flat Nanoparticle Optics
 Chair - Robert McLaughlin
0945-1030 - Prof Willie Padilla (Duke University, USA) – Exotic Physics with All-Dielectric Metasurfaces
 Chair - Marius Martyniuk

DE-GAP Workshop and Brunch
 Time: 10.30am – 1.00pm
 Venue: Seminar Room 1
 Speaker: Maureen Frank

1030-1100 Morning Tea - Banquet Hall, University Club
1100-1230 CONCURRENT SESSION 4

Session:	4A - Focus Session – Optical & Quantum Bio-Sensing	4B - Focus Session – Dark Matter Detection	4C - AIP CMM	4D - AIP ATMOP	4E - AIP QUICC	4F - AIP QUICC	4G - AOS/ACOFT	4H - COMMAD
Topic:			Strongly correlated electrons, Magnetism	Sensing & dynamics	Optomechanics & hybrid systems	Quantum memories & networks	Biophotonics & intelligent algorithms	Quantum & Optical Devices
Chair:	Liam Hall	Michael Tobar	Oleg Sushkov	Jacinda Ginges	Jason Twamley	Bill Munro	Robert McLaughlin	Shu Yang
Room:	Arts Building Fox Lecture Theatre [G.59]	University Club Auditorium	Arts Building Room 5 [G.61]	Arts Building Room 8 [1.60]	Physics Building Ross Lecture Theatre [G.41]	Physics Building Clews Lecture Theatre [2.43]	Arts Building Austin Lecture Theatre [1.59]	Arts Building Room 9 [1.61]
1100-1130	Quantum sensing and imaging in biology using the nitrogen-vacancy centre Lloyd Hollenberg	A Southern Hemisphere perspective on Dark Matter Elisabetta Barberio	Correlated Nanoelectronics Jeremy Levy	Rapid optical measurement of ¹³ CO ₂ and ¹² CO ₂ number density Sarah Scholten	Circuit optomechanics with carbon nanotubes and nm-thick membranes: towards quantum motion Natalia Ares	Hybrid quantum systems based on surface acoustic waves Yasunobu Nakamura	Quantitative Radiomics with Deep Learning in Breast Cancer Diagnosis Maryellen Giger	Quantum technologies with Hexagonal Boron Nitride Igor Aharonovich
1130-1145	Atom and Molecular Sensors for Biosensing Andre Luiten	The ORGAN Experiment, and other axion detection schemes at UWA Benjamin McAllister	Monolayer Topological Superconductivity and Quantum Design of Majorana Fermions Stephan Rachel	Time-dependent ionization processes in acetylene Igor Litvinyuk	Using Filter Functions to Improve Strong Measurements in Optomechanics Chao Meng	A passive on-chip, superconducting circulator using a ring of tunnel junctions Tom Stace	An artificial neural network for aberration compensation Benjamin Cumming	Next-generation single-photon sources in two-dimensional hexagonal boron nitride for space applications Tobias Vogl
1145-1200		Axion Detection with Precision Frequency Metrology Maxim Goryachev	The Fundamental Sharpness of Magnetic Interfaces Formed by Chemical Disorder Using a He-Beam: Theory and Experiment Grace Casner	Emergence of relativistic non-dipole effects in strong field atomic ionization at moderate intensities Nida Haram	Coupling a high quality factor quartz bulk acoustic wave resonator to a microwave cavity Jeremy Bourhill	Chip-to-chip entanglement of transmon qubits using engineered measurement fields Nathan Langford	Towards rapid OCT imaging: iterative learning control of MEMS mirrors Daniel Firth	Effects of high energy electron irradiation on quantum emitters in hexagonal boron nitride Ngoc My Hanh Duong
1200-1215	Fluorescent nanodiamonds: from the creation and characterization of optical defects to applications in biology Phillip Reineck	Searching for ultra-light Dark Matter using clocks at the Paris Observatory Peter Wolf	Understanding the structural effects on magnetic order in the 2D quantum magnet atacamite, Cu ₂ C(OH) ₃ Kirrilj Rule	Dynamics of molecular excitons interacting with twisted light Hugh Sullivan	Fast and coherent mechanical squeezing with optomechanics James Bennett	Demonstration of a capacitively shunted superconducting granular aluminum Yannick Schon	Correction of peak tracking ripple in solid state spectrometers Peter Cook	Fabrication of Near-Identical Single Photon Emitters in Hexagonal Boron Nitride for Integrated Quantum Photonics Noah Mendelson
1215-1230	Nanoscale quantum sensing Simon Schmitt		Magnetolectric Coupling Mechanism of Hexagonal Magnet Co ₄ Nb ₂ O ₉ with Large In-plane Anisotropy Guochu Deng	Isomer-specific action spectroscopy of molecular ions Eduardo Carrascosa	Phonon Confinement by the Force of Light Xin (Eric) He	Nonreciprocal device realized with quantum nonlinearity Tom Stace	First-order quasi-Bessel optical 'funnel' beam for trapping particles in air Sebastian Lavin Varela	Optical Modelling and Characterization of the MEMS based filters for the spectroscopic imaging applications Dhiendra Tripathi

Workshops

Arts Building Room 10 [1.62]

Discussion: Theoretical & Mathematical Physics in Australia
 Time: 1245 - 1315
 Room: Arts Room 10 [1.62]

1230-1330 Lunch - Banquet Hall, University Club

1330-1515 CONCURRENT SESSION 5


Session:	5A - AIP Combined GW and Astronomy session	5B - Focus Session – Dark Matter Detection	5C - AIP CMM	5D - AIP ATMOP	5E - AIP QUICC	5F - Education for Physics and Related Disciplines	5G - AOS/ACOFT	5H - COMMAD	Education for Physics and Related Disciplines Additional
Topic:			Materials & Characterisation	Precision measurement	Optomechanics, hybrid systems, quantum thermodynamics	Novel Approaches of Teaching Physics	Quantum optics	Quantum computing & spin ensembles 	
Chair:	Grant Meadors	Maxim Goryachev	Gunther Andersson	Andre Luiten	Kae Nemoto	David Hoxley	Mikkel Andersen	N.J Ekins-Daukes	
Room:	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Physics Building Ross Lecture Theatre [G.41]	Arts Building Fox Lecture Theatre [G.59]	University Club Auditorium	Physics Building Clews Lecture Theatre [2.43]	Arts Building Austin Lecture Theatre [1.59]	Arts Building Room 5 [G.61]	Physics Building Room 215

Workshops

Arts Building Room 6 [G.62]



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1330-1345	Constraining the morphology of gamma-ray bursts with gravitational waves and gamma rays Eric Thrane	Search for dark matter with the ATLAS experiment at the LHC Francesca Ungaro	New frontiers in atom probe tomography Julie Cairney	Optical networks and clock comparisons at the 18th-decimal place Tara Fortier	Topological transport of phonons and photons Florian Marquardt	Design and evaluation of an innovative approach to teaching electric circuits Jan-Philipp Burde	Photonic Quantum Networks Ian Walmsley	Computing at the atomic scale with quantum dots Konrad Walus	Teaching Nexus: Evolving Physics Education in our Schools The forces and how physicists interpretations have changed over the centuries Presenter: Jason Dicker Room: Physics 215	Scientific Writing Workshop The Secrets of Scientific Publishing Igor Aharanovich 1330-1500 Room: Arts Room 6
1345-1400	The Smoking Gun of Inflation: searching for gravitational waves with the South Pole Telescope Christian Reichardt	Direct detection of Mirror Dark Matter Robert Foot								
1400-1415	Detecting the gravitational-wave background from the whole population of binary black hole mergers Rory Smith	The search for dark matter with the SABRE experiment Ibtihal Mahmood	Macroscopic Kelvin Probe Microscopy on Perovskites Iain Baikie	Ultracold Cs ⁺ Yb molecules by photoassociation in an optical dipole trap John McFerran	Quantum entanglement of the motion of massive objects Matt Woolley	Using colour and history to engage students with a thermal experiment Aesha Bhansali	Parallel quantum random number generation from homodyne measurements Daniel Peace	Single spin qubits for STM-fabricated donor devices in silicon Ludwik Kranz		
1415-1430	Unveiling the violent Universe with gravitational wave astronomy Eric Howell	Directional Dark Matter Detection with CYGNUS Lindsey Bignell	Theoretical Study of the Hydration of the Polar (0001) and (000 $\bar{1}$) Surfaces of Wurtzite GaN with a Native Ga2O3 Dino Spagnoli	Giant Spin Squeezing for metrology using Geometric Quantum Gates Jason Twamley	Evaporation of a giant quantum vortex Yauhen Sachkou	Paleolithic aerodynamics: the straight-flying boomerang Timo Nieminen	Reduction of Quantum Radiation Pressure Noise via Squeezed Light in the Audio-Frequency Band Min Jet Yap	Two-electron spin correlations and exchange between phosphorus donors in silicon Sam Gorman		
1430-1445	A search for continuous gravitational waves from H.E.S.S. sources Deeksha Benival	Radioimpurity characterisation of high-purity dark matter detector materials using Accelerator Mass Spectrometry Anton Wallner	Metal Clusters on Surfaces for Photocatalysis Applications Gunter Andersson		Interconversion of finite-size quantum resources Kamil Korzekwa	Beyond Flipped! Challenged-Based Learning in 1st year Physics and Chemistry Jamie Quinton	Integrated device for Continuous Variable quantum optics Mirko Lobino	Microsecond spin qubit readout with a strong-response single electron transistor Daniel Keith		
1445-1500	Inferring population properties of binary neutron stars with gravitational waves Xingjiang Zhu	Broadband Detection of Axion Wind using Magnons Graeme Flower	Plasmon-Coupling Theory of the Electron Inelastic Mean Free Path, energy loss functional and the dielectric function for LEEEM, for low energy electrons Christopher Chantler	Compact Two-Photon Rubidium Clock Chris Perrella	Autonomous Quantum Heat Engine Using an Electron Shuttle Behnam Tonekaboni	Even better than the real thing? Improving remote access undergraduate experiments Manuel Pumarole	Survival resonances in a dissipatively driven atom optics system and their application to gravity measurements Mikkel F Andersen	Isotopically Pure Silicon-28 Whispering Gallery Mode Resonators: A Host for Narrow Linewidth Spin Ensembles Michael Tobar		
1500-1515			Defect engineering in graphene using ion irradiation Robert Elliman			Enhancing learning of physics concepts using interactive simulations Margaret Wegener				
1500-1530	Afternoon Tea - Banquet Hall, University Club									
1530-1745	CONCURRENT SESSION 6									
Session:	6A - AIP Gravitational Waves & Relativity	6B - AIP Nuclear & Particle Physics	6C - AIP Plasma Physics	6D - AIP ATMP	6E - AIP QUICC	6F - Focus Session - Optical & Quantum Bio-Sensing	6G - AOS/ACOFT	6H - COMMAD	AIP Education for Physics & Related Disciplines	
Topic:				Exotic cold-atom systems	Quantum foundations & quantum algorithms		Light sources	Nanowires & nanostructures 		
Chair:	Ju Li	Kevin Varvell	Matthew Hole	Sean Hodgman	Halina Rubinsztein-Dunlop	Brant Gibson	Igor Aharovich	Konrad Walus		
Room:	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Arts Building Room 5 [G.61]	Arts Building Fox Lecture Theatre [G.59]	Physics Building Ross Lecture Theatre [G.41]	University Club Auditorium	Arts Building Austin Lecture Theatre [1.59]	Physics Building Clews Lecture Theatre [2.43]	University Club Club Restaurant	
1530-1545	Quantum optomechanics in gravity (quantum) experiments Markus Aspelmeyer	Recent results from the ATLAS Experiment at Run 2 of the CERN LHC Paul Jackson	On the fundamental of Rayleigh-Taylor instability and interfacial Rayleigh-Taylor mixing Snezhana I. Abarzhi	Coherent microwave-to-optical conversion via six-wave mixing in Rydberg atoms Wenhui Li	Mesosopic steerable and superposition states of massive systems Margaret Reid	The blinking mechanisms in colloidal quantum dots Gangcheng Yuan	Emission from GeV, GaN and 2D heterostructures for light-matter interaction Weibo Gao	Engineering optoelectronic devices based on III-V nanowires: From growth to terahertz Hannah Joyce	PEG High Tea - Physics for all Time: 3.30pm-4.30pm Keynote: Chandrelakha Singh Chair: Maria Parapilly Venue: Club Restaurant, University Club IOP Publishing	
1545-1600										
1600-1615	BILBY: A User-Friendly Package for Parameter Estimation in Gravitational Wave Astronomy Moritz Huebner	Probing astrophysical s-process and r-process in the laboratory Michael Paul	Ammonia production in atmospheric-pressure plasmas: progress and prospects Tony Murphy	Rapid Production of Large Quanta BEC Supercurrents Thomas Bell	Unifying nonlocality and contextuality as violations of classical causality Eric Cavalcanti	Quantum techniques for optical biosensing Warwick Bowen	Pure-quartic solutions under the perturbative effects of quadratic dispersion Kevin Tam	Stress Induced Bending of GaAs Nanowires by Metal Deposition Fouad Karouta		
1615-1630	A novel vibration isolation technique for future gravitational wave detectors Joris van Heijningen			Dressing ultra-cold atoms for control and quantum technology Barry Garraway	Bell's inequalities and EPR steering with metastable helium BECs Sean Hodgman		A superfluid Brillouin laser with ultra-high gain Christopher Baker	Multi-wavelengths Luminescence from Single InGaAs/InP Quantum Well Nanowire Light Emitting Diode Ziyuan Li		
1630-1645	Possible physical signature of the quantum nature of time Joan Vaccaro	Quantifying dissipation in nuclear reactions en route to equilibration: experimental Mahananda Dasgupta	Completing the picture of linear energetic geodesic acoustic mode Zhisong Qu	Universality of an Impurity in a Bose-Einstein Condensate Jesper Levinsen	Quantum optical simulation of classical stochastic processes over multiple time steps Nora Tischler	Tuning of Long-Range Hyperfine Interactions for Maximally Efficient Dynamic Nuclear Polarisation Liam Hall	Heterodyne fibre interferometer for frequency-noise reduction and rapid wide-band tunability of a conventional laser source Philip Light	Shape engineering of InP nanostructures grown by selective area epitaxy Naiyin Wang	Chair: Maria Parapilly 1630-1730 Teaching tips - invited panel Moderator: Jasmina Lazendic-Galloway Panel: Manju Sharma, Joe Hope, Jamie Quinton, Elizabeth Angstrom Room: Physics Building, 215 Lecture Room	


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1645-1700	Multi-stage Damper for Parametric Instability Suppression in Gravitational Wave Detectors Hamedan Jaberian	Analysis of the first Belle II collision data Jo-Frederik Krohn		Superfluid dynamics of two-component BEC in a toroidal trap Mark Baker	Dirac quantum walks on triangular and honeycomb lattices Gareth Jay	Determining the quantum coherence of optically trapped nanodiamonds Peter Reece	Automatically optimising cavity transmission using 2 SLMs and digitally enhanced Tarquin Ralph	Effect of temperature heating rate and growth pressure on the morphology of CVD-grown two-dimensional Bi ₂ Te ₃ nanostructures Junliang Li
1700-1715	Quantum formulation of the Einstein Equivalence Principle Magdalena Zych	The evolution of shape coexistence between doubly magic ⁴⁰ Ca and ⁵⁶ Ni through pair-conversion spectroscopy Jackson Dowie	Highly symmetric interfacial coherent structures in Rayleigh Taylor instability with time-dependent acceleration Desmond Hill	Dynamics of a harmonically trapped Tonks-Girardeau gas under periodic driving Karen Kheruntsyan	Black-box quantum state preparation without arithmetic Yuval Sanders		Wavelength swept operation of an acousto-optically tuned semiconductor laser cavity Adam Gambell	Using ultra-thin parylene films as an organic gate insulator in nanowire field-effect Jan Gluschke
1715-1730	BREAK	BREAK	Maximum initial growth-rate of strong-shock-driven Richtmyer-Meshkov instability Arun Pandian	Route to Observing Fulde-Ferrell Superfluids via a Dark-State Control of Feshbach Resonances Xia-Ji Liu	Assisted Macroscopic Quantumness Austin Lund	Quantum magnetic microscopy of biomineralisation in a marine mollusc Julia McCoe	BREAK	Probing charge and energy transfer across the HIOS interface by electron transport in silicon nanowires Mykhailo Kljmenko
1730-1745	Public Event - separate to AIP Main Program Room: Octagon Theatre							
Public Lecture - Must register with Institute of Advanced Studies to attend this event. Not included in AIP registration								
1745-1825 1825-1845 1845-1945	Markus Aspelmeyer - What is a photon? Interval David Shoemaker, MIT							


DRAFT AIP 2018 Congress Program

Wednesday 12 December 2018 - INDUSTRY DAY sponsored by IOP




0730-1930	Registration open University Club Conference Foyer Room: Octagon Theatre									Room: Physics Building - Physics Lab 0900-1030
0855-1030	PLENARY SESSION 3 0855-0900 - Professor Dame Julia Higgins (IOP President) 0900-0945 - Prof Thomas Krauss (University of York, UK) – Photonic Crystals and Nanostructures – Phoenix of Photonics? Chair: Almantas Pivrikas 0945-1035 - Prof Philippa Browning (University of Manchester, UK) – Plasma Physics of Solar and Fusion Plasmas Introduced by Andrew Peele, ANSTO Co-Chair - Richard Garrett and Andrew Peele 									Teaching Nexus: Evolving Physics Education in Our Schools: Electricity and magnetism for years 11 and 12. Theory and demonstrations. Presenter: Mr Jason Dicker
1035-1100	Morning Tea - Banquet Hall, University Club									
1100-1230	CONCURRENT SESSION 7									
Session:	7A - AIP Astron and Astro + Focus Next-gen Astro with new observatories	7B - AIP Biophysics & Soft Matter Physics	7C - AIP Geophysics, Solar, Terrestrial & Space Physics	7D - AIP Industrial & Applied Physics	7E - AIP QUICC	7F - Education for Physics and Related Disciplines	7G - AOS/ACOFT	7H - COMMAD	Education for Physics & Related Disciplines	
Topic:					Quantum information processing	Creating Effective Learning Environments & Assessments	Biophotonics & imaging	Infrared detectors & II-VI semiconductors		
Chair:	Stuart Wyithe	Henning Stumf	Brett Carter	Stuart Midgley	Nathan Langford	Maria Parappilly	Brendan Kennedy	Lorenzo Faraone		
Room:	Physics Building Ross Lecture Theatre [G.41]	Arts Building Room 8 [1.60]	Arts Building Room 5 [G.61]	Arts Building Room 9 [1.61]	Arts Building Fox Lecture Theatre [G.59]	Physics Building Crews Lecture Theatre [2.43]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium	Physics Building Old Spice Computer Lab (B48)	
1100-1115	Cosmology with the Dark Energy Survey Tamara Davis	Mapping DNA target search in the nucleus of a living cell Elizabeth Hinde	Using physics-based ionospheric modelling to understand the daily variability in the equatorial ionosphere Brett Carter	Medical Physics: the science that saves lives Natalia Suchowska	Silicon photonic quantum computing Jeremy O'Brien	Facilitating thinking and learning in and beyond the classroom using evidence-based approaches Chandralekha Singh	Endoscopic optical coherence tomography for the detection, diagnosis and monitoring of pulmonary disease Melissa Suter	Recent advances in III-V semiconductor infrared detectors David Ting		
1115-1130			Satellite and debris characterisation with Adaptive Optics Imaging Michael Copeland							
1130-1145	TeV Gamma-Ray Astronomy with The Cherenkov Telescope Array (CTA) Gavin Rowell	Analysing E.coli behaviour in viscous medium using optical tweezers Declan Armstrong	Free-space quantum communication with adaptive optics Francis Bennet	Plasmonic colour sensors for digital camera pixels Evgeniy Panchenko	Towards high-fidelity two-qubit CNOT gates based on phosphorus donor qubits in silicon Muhammad Usman	Using online testing effectively in a large first year physics course Elizabeth Angstmann	Simultaneous imaging and temperature sensing within brain tissue by a miniaturised multimodal fibre-optic probe Jiawen Li	Recent advances in IR imaging focal plane arrays technology at UWA Jarek Antoszewski	Teaching Nexus: Evolving Physics Education in Our Schools Presenter: Dr David Hoxley (La Trobe University)	Room: Physics Building, Old Spice Computer Lab (B48)
1145-1200		A new dynamic optical tweezers toolbox Isaac Lenton	Geodetic VLBI, Earth Rotation and Sagnac effect Oleg Titov	Antireflection coating of barriers to enhance electron tunnelling: exploring the matter wave analogy of superluminal optical phase velocity Zijun Zhao	Using real Clifford gates to demonstrate fault tolerance in the IBM Q Experience Robin Harper	Gender Differences in Approach to a Competitive Examination Umaira Malik	Towards a smart surgical glove for the intraoperative detection of breast cancer Rowan Sanderson	Neutron transmutation doping of isotope enriched ZnO nanorods to produce p-type material Charlie Ironside		
1200-1215	Jets from stellar-mass black holes and neutron stars James Miller-Jones	Quantifying the response of <i>Arabidopsis thaliana</i> to applied pressure using nanoindentation Jodie Bradby	Secondary Observations Relevant to the Pioneer Anomaly Craig Watkins	Recent progress in terahertz spectroscopy and its applications Krunal Radhanpura	Statistical mechanical models for correlated noise in arbitrary stabiliser codes Chris Chubb	Self-assessment for learning: setting an assessment to encourage regulation in learning Jasmina Lazendic-Galloway	Mechanical and spectroscopic differences in prostate cancer cell lines David McGloin	Comparison of band engineering methods in HgCdTe nBn detector Nima Dehdashti		
1215-1230	Mid-Infrared Properties of compact Active Galactic Nuclei selected from the high-radio-frequency Australia Telescope 20 GHz (AT20G) Survey Rajan Chhetri	Manipulating zebrafish inner ear with Optical tweezers to trick the brain Itia Favre-bulle	Link acquisition and beam steering with a 7-emitter 1550nm optical phased array James Spollard	Blockage risk in subsea oil and gas pipelines: application of classical nucleation theory to experimental measurements of natural gas hydrate formation Peter Metaxas	Calderbank-Steane-Shor Holographic Quantum Error Correcting Codes Rob Harris	Reflection in physics multimedia: A comparison of a general audience to first year physics Petr Lebedev	The impact of feature size on resolution in compression optical coherence elastography Matt Hepburn	Optical property study of mid-wave infrared Hg _{0.79} Cd _{0.21} Se grown on GaSb (211) by molecular beam epitaxy Wenwu Pan		
1230-1330	Lunch - Banquet Hall, University Club									Room: Arts Room 6 [G.62]
										PEG Business - Physics Education Medal invited talk Maria Parappilly (Flinders University)
1245-1315	AIP Head of School meeting Seminar Room 1, University Club									

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1330-1500	CONCURRENT SESSION 8								Workshops
Session:	8A - AIP Astron and Astro + Focus Next-gen Astro with new observatories	8B - AIP Biophysics & Soft Matter Physics	8C - AIP Plasma Physics	8D - Focus Session – Nanostructures & Metamaterials	8E - AIP QUICC	8F - Education for Physics & Related Disciplines	8G - AOS/ACOFT	8H - COMMAD	
Topic:					Quantum computation, hybrid qubits & applications	High School Physics	Optical fibres & sensing	Phononic Devices 	
Chair:	Hayley Bignall	Philipp Schönhofer	Tony Murphy	Ann Roberts & Mohsen Rahmani	Barry Sanders	Elizabeth Angstmann	Daniel Gomez	David Ting	
Room:	Physics Building Ross Lecture Theatre [G.41]	Arts Building Room 8 [1.60]	Arts Building Room 5 [G.61]	Arts Building Room 9 [1.61]	Arts Building Fox Lecture Theatre [G.59]	Physics Building Clews Lecture Theatre [2.43]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium	Arts Building Room 6 [G.62]
1330-1400	Fast Radio Bursts - Astronomy's next great physical laboratory Ryan Shannon	The Effect of H ₂ O ⁺ on Membrane Structure, Hydrogen Bonding and Interfacial Water Layering in Phospholipid Bilayers Evelyne Deplazes	The Australian Coherence Imaging Diagnostic for ITER Richard Garrett	2D-Materials in Optical Coatings and high-Q Bragg Cavities: a Robust Platform for Strong Coupling, Quantum Emission and Nonlinear Optics Falk Eilenberger	Building a Quantum Computer Using Quantum Dots in Silicon/Silicon-Germanium Heterostructures Susan Coppersmith	Science as a Human Endeavour - what does this mean? Jason Dicker	Heavy metal oxide glass fibers: New opportunities for sensing Heike Ebendorff-Heidepriem	Towards Low-Power Reconfigurable Photonic ICs Based on MEMS Technology Banafsheh Abasahl	Scientific Writing Workshop The Secrets of Scientific Publishing Igor Aharonovich 1330-1500
1400-1415	Multi-messenger astronomy in the Gravitational Wave Detection Era Matthew Bailes	The impact of 3D surface curvature on tissue growth and organization Sebastian Ehrig	Systematic studies on 2 dependence of extreme ultraviolet and soft X-ray spectra using high-temperature fusion plasmas Chihiro Suzuki	Practical Metamaterials Fabricated by Fibre Drawing Simon Fleming	A hybrid quantum memory for microwave photons Mykhailo Savvitskyi	Public and Teacher Response to Einsteinian Physics in Schools Rahul Choudhary	Rare-earth glass coatings on exposed core fibres for high spatial resolution temperature sensing Daniel Stavrevski	Temperature effects on microcantilever based hydrogen sensors Jega Thisan Gurusamy	
1415-1430		Alice in Wonderland: How to understand Dementia from fundamental X-ray Optics Christopher Chantler		Dynamically Switchable Colloidal Au Nanorod Plasmonic Pixels Nicholas Greybush	Exchange-based 2-qubit logic gates with donors in silicon Mateusz Madzik	The new HSC physics syllabus – what support do teachers need? Lorna Jarrett	Multi-wavelength third harmonic generation using exposed-core microstructured optical fibre Stephen Warren-Smith	A New Approach to Modelling the Coherence of Optical Feedback in Dynamical Semiconductor Laser Systems Deb Kane	
1430-1445	Positron annihilation in the Milky Way Fiona Helen Panther	Bridging the short and long term mechanics of articular cartilage extracellular matrix Bruce Gardiner	Energetic particle driven mode activity: advances in understanding from linear through hard nonlinear regime Matthew Hole	Realization of Complex-Valued Birefringence with Dielectric Metasurfaces Shaun Lung	Fidelity benchmarks for two qubit gates in silicon Wister Huang	Embedding high school Physics teachers within the university system – reflections by a 'Visiting Teaching Fellow' Jessica Budden	SPDC spectroscopy on a lithium niobate chip Alexander Soltsev	Focused electron beam induced processing for nanophotonic applications James Bishop	
1445-1500	Characterising "Hot Jupiter" Exoplanets Graeme Melville	Influence of hydration in molecular dynamics simulations of DOPC membranes with glycerol and DMSO Christopher Malajczuk	Mourou's very extreme CPA-Laser Pulses for Non-Thermal Laser Boron Fusion Reactor for Clean Electricity like Nuclear Fission Heinrich Hora	Meeting the challenges of accurate dimensional measurements at the nanoscale Bakir Babic	Fidelity benchmarks for two qubit gates in silicon Stephen Bartlett	General relativity in upper secondary school: Design and evaluation of an online learning environment using the model of educational reconstruction Magdalena Kersting	Thermally drawn polyurethane optical fibres for sensing applications Simon Fleming	Comparison of Si, SiGe and GaAs photovoltaic microcells for power-over-fibre Steven Hinkley	
1500-1530	Afternoon Tea - Banquet Hall, University Club								



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1530-1700 CONCURRENT SESSION 9									
Session:	9A - AIP – Medical Physics Combined with AIP - Synchrotron Science, Scattering, Microscopy, Imaging	9B - Focus Session – Dark Matter Detection	9C - AIP Plasma Physics	9D - Focus Session – Nanostructures & Metamaterials	9E - AIP ATMOP	9F - Focus Session –Optical & Quantum Bio-Sensing	9G - AOS/ACOFT	9H - Focus Session – 50 years of Bicontinuous Cubic Phases	Education for Physics and Related Disciplines - Additional
Topic:					Scattering		Biophotonics & physiology		
Chair:	Richard Garrett & Azin Azadi	Elisabetta Barberio	Snezhana I. Abarzhi	Ann Roberts & Mohsen Rahmani	Julian Berengut	David Simpson	Jiawen Li	Bodo Wilts & Gerd Schroeder-Turk	
Room:	Physics Building Clews Lecture Theatre [2.43]	University Club Auditorium	Arts Building Room 5 [G.61]	Arts Building Room 8 [1.60]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	Arts Building Room 9 [1.61]	Physics Building Ross Lecture Theatre [G.41]	Physics Building Room 215 Lecture Theatre
1530-1545	Use of novel pixelated semiconductor detectors in Targeted Alpha Therapy Eva Bezak	Heating up Neutron Stars with Dark Matter Nicole Bell	Materials under extreme plasma environments: Efficient one-step plasma synthesis of surface nanostructures Cormac Corr	Three-Dimensional Tuning of the Near-Field in Coupled Metal Nanostructures Alison Funston	Applications of the convergent close-coupling theory: from antihydrogen formation through to collisions with molecular targets Igor Bray	Nanoscale BioPhotonics: using nanomaterials and light to understand the inner workings of the body Brant Gibson	Farms and Photonics: Lasers, Milk and Sperm Sorting Cather Simpson	Theory and experiments of novel polycontinuous liquid crystals Stephen Hyde	Teaching Nexus: Evolving Physics Education in Our Schools Presenter: Prof David Blair (UWA) Einsteinian Physics Time: 1530-1700
1545-1600									
1600-1615	Kidney nephrons and podocytes - towards in vivo imaging and improved clinical management John Bertram	Searching for fuzzy dark matter in the Galaxy with Parkes Pulsar Timing Array Xingjiang Zhu	New experimental findings of non-local transport in J-TEXT and KSTAR Yuejiang Shi	Synthetic optical nonlinearity in dielectric and plasmonic nanosuspensions Zhigang Chen	Vibrationally-resolved electron-impact excitation of molecular hydrogen Liam Scarlett	Dynamic quantum sensing of paramagnetic species using nitrogen-vacancy centre Melissa Mather	A minimum optical fibre setup for REDOX measurements Wen Qi Zhang	Broadband circular dichroism in metallic gyroid micro-structures Benjamin Cumming	
1615-1630		Search for QCD Axion Dark Matter with Radio Telescopes Peter Quinn			Auger and conversion spectroscopy of medical radioisotope 125I Bryan Pi Ern Tee		Light Scattering by Double-Cylinder Spider Silk Optical Micro-fibres Deb Kane	Self-assembly of hexagons into infinite bicontinuous cubic polyhedra Tomonari Dotera	
1630-1645	A call to arms: engaging physicists in the fight against cancer Martin Ebert	Detector characterisation for the SABRE South dark matter experiment Greg Lane	Particle motion in 3D MHD equilibria versus relaxed states David Pfefferlé	Effect of Shape and Aggregation in Plasmonic Random Lasers Judith Dawes	Treating electron and positron transport through liquids from first principles Danny Cocks	Smart microscopy: An adaptive way of scanning Nicolas Mauranyapin	Tracking and manipulating the fish inner ear to understanding sound localization Michael Taylor	Origin of Spontaneous Mirror Symmetry Breaking in Bicontinuous Cubic and Non-cubic Phases Goran Ungar	
1645-1700	New Diffractive Optics for Soft X-ray Ptychography Alaleh Aminzadeh	Ionisation signatures of sub-GeV dark matter due to absorption and scattering of electrons Benjamin Roberts		Plasmene: a metasurface perfect absorber Daniel Gomez	Convergent close-coupling approach to proton collisions with helium Shukhrat Alladustov	Quantum enhanced non-linear microscopy Cabxere Casacio	Red meat quality parameters measured using polarisation sensitive OCT Sam Hitchman	Bicontinuous Cubic Phases for Protein Encapsulation Charlotte Conn	
1700-1715	Impact of highly charged ions created by a femto-second X-ray pulse on the biological molecule structure reconstruction Alexander Kozlov	Searching for Transient Dark Matter Signatures with Atomic Clock Networks Benjamin Roberts	Results from Langmuir Probe arrays in the scrape off layer of the Wendelstein 7X Advanced Stellarator Boyd Blackwell	Mechanistic study of precursor conversion chemistry in Co9S8, Ni3S2, Co and Ni nanowire synthesis John Scott	Positron mass stopping powers in atomic and molecular hydrogen Ravshanbek Utamuratov	Mid-infrared molecular barcoding with dielectric metasurfaces Dragomir Neshev	Interferometric multiplexed fibre sensing using C-shaped fibre Liushun Xie		
1715-1730	Which glue to choose? A neutron-scattering study of various adhesive materials and their effect on background scattering Kirilly Rule	Aspects of Dark Matter Axion Clumps Mark Hertzberg	An attempt for the thermal transport modelling of fusion plasmas based on the statistical approach Masayuki Yokoyama	Ruby Payne Scott Prize Session 1715-1740 Mary Jacqueline Romero	Engineering Pentacene Derivatives towards High-Performance Singlet-Fission Dane McCamey	Ultrafast viscosity measurement in the ballistic regime with optical tweezers Lars Madsen	Diffuse light-sheet microscopy for stripe-free calcium imaging of neural populations Michael Taylor	Repeated evolutionarily independent quasi-order to order transitions in feather barb biophotonic nanostructures Vinodkumar Saranathan	
1730-1745			Plasma Physics Discipline and Australian ITER Forum Discussion Led by Matthew Hole			Laser threshold magnetometry with nitrogen-vacancy colour centres in diamond Lachlan Rogers		A literal alytral rainbow: Tunable structural colors in Pachyrhynchus weevils using single diamond biophotonic crystals Bodo Wilts	
1730-1800	Break								
1800-1845	PLENARY SESSION 4 David Shoemaker, Massachusetts Institute of Technology Co Chairs - David Blair and Tom Riddill-Smith								
1930-2200	CONGRESS DINNER - includes presentation of Harrie Massey Medal by Dame Julia Higgins IOP Venue: Ground Floor Terrace, University Club								




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Thursday 13 December 2018								
0730-1800	Registration open Location: University Club Conference Foyer							
Room: Octagon Theatre								
0900-1030	PLENARY SESSION 5 0900-0945 - Prof Monika Ritsch-Marte (Medical University of Innsbruck, Austria) – Synthetic holography to shape up optical imaging and trapping Chair - Halina Rubinsztein-Dunlop 0945-1030 - Prof Garth Illingworth (UC Santa Cruz/Lick Observatory) – Galaxies at Cosmic Dawn: Exploring the First Billion Years with the Hubble Space Telescope Chair - Cathryn Trott							
1030-1100	Morning Tea - Ground Floor Terrace - University Club							
1100-1230	CONCURRENT SESSION 10							
Session:	10A - AIP Astron and Astro - Focus Next-gen Astro with new observatories	10B - AIP Nuclear & Particle Physics	10C - AIP CMM	10D - AIP ATMOP	10E - AIP QUICC	10F - AIP QUICC	10G - AOS/ACOFT	10H - AIP Biophysics & Soft Matter Physics
Topic:			Microwave, Terahertz, Optical & X-Ray spectroscopy	Exotic atomic systems & applications	Spins & qubits	Quantum information processing, ion traps	Structured light & material interactions	
Chair:	Lister Staveley-Smith	Michael Paul	Stephen Thurgate	Nick Robins	Chunming Yin	Xinhua Peng	John Harvey	Evelyn Deplazes
Room:	Physics Building Clews Lecture Theatre [2.43]	Physics Building Ross Lecture Theatre [G.41]	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium	Arts Building Room 5 [G.61]
1100-1130	Science highlights from the ASKAP radio telescope Elaine Sadler	Tracking the emergence of 'simple' collective nuclear excitations in nuclei. How do they arise from the underlying complex nucleonic motion? Andrew Stuchbery	Terahertz Frequency Phenomena in Condensed Matter and Materials Physics Roger Lewis	Droplet crystal ground states of a dipolar Bose gas Blair Blakie	Superradiance and thermalization in hybrid quantum systems Kae Nemoto	Differential evolution for ion-trap gate design Barry Sanders	Structured light for nano- and micro manipulation Halina Rubinsztein-Dunlop	Physics of cell adhesion: The role of the membrane in the protein recognition process Henning Stumpf Ana-Suncana Smith
1130-1145	The Phase II Murchison Widefield Array: Current Status and Future Plans Melanie Johnston-Hollitt	Physics of the non-Hermitian free parafermion Z(N) spin chain Murray Batchelor	Advanced liquid crystalline materials for laser applications characterised with high-Transmission of light (T>97.5%) and very low Reflection (R<0.7%) at Visible, Near, Short and Medium InfraRed regions Zbigniew Raszeski	Novel Correlations near an Orbital Feshbach Resonance Emma Laird	Microwave mixing by a strongly driven quantum dot Mark Hogg	Trapped ion fast gates scale favourably in microtrap arrays in the presence of micromotion Joe Hope	Towards stabilization of an optically levitated macroscopic mirror Jinyong Ma	Spherical tilings with ABC star polymers - a three colored Thomson problem? Tobias Hain
1145-1200		On the origin of asymmetric fission Cedric Simenel	Ultrasensitive Microwave Spectroscopy of Spin Ensembles in Multi-Mode Dielectric Crystal Resonators at 20 mK Md Akhter Hosain	Finite-temperature dynamics of shock waves in an ultra-cold Fermi gas Ria Joseph	Nuclear Electric Resonance of the 7/2 spin of a single 123Sb ion Vincent Mourik	Ex-vacuum phase Fresnel lenses for Trapped Ion Quantum Information Processing Erik Streed	Robust thermo-optic stabilisation of optical springs Paul Altin	Self-assembly of cubic phases in pear-shaped nanoparticle systems Philipp Schönhöfer
1200-1215	The SKA-Low Aperture Array Verification System: results and plans Randall Wayth	Deep Neural Networks for analysis of rare B-decays at Belle and Belle II Martin Sevior	X-Ray Spectrometry by Microcalorimetry - Multi Detector System with real time data analysis Stephen Thurgate	A finite temperature model of the early universe King Ng	Imaging valley interference to tackle exchange variations for donors in silicon Benoit Voisin	High Performance Raman Memory with Spatio-temporal Reversal Karun Paul	Thermodynamic microscopic machine Shu Zhang	Equilibrium reasoning for active particles - what does it really mean? René Wittmann
1215-1230	JWST Status: Insights into the Challenges of Constructing the most Complex Space Telescope Ever Garth Illingworth	Accelerator Mass Spectrometry: the State of its Art with a 15MV Accelerator Keith Fifield	Interaction of Bessel-beam-structured ultrashort laser pulses with transparent media Ludovic Rapp	Gouy phase interferometer and its applications Mumta Hena Mustary	Rotation-symmetric encodings of a qubit into an oscillator Ben Baragiola	Single-photon non-reciprocal transport controlled by a single atom Keyu Xia	High-speed three-dimensional direct optical force measurement Timo Nieminen	Soft interactions in the Lorentz model: anomalous transport in crowded media Charlotte Petersen
1230-1330	Lunch - Ground Floor Terrace - University Club							
1245 - 1315	Decadal Plan Town Hall Meeting Time: 1245 - 1315 Room: Physics Building 215							
1230 - 1430	AOS Council Meeting Room: Seminar Room 1, University Club							

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1330-1500 CONCURRENT SESSION 11								
Session:	11A - AIP Astron and Astro + Focus Next-gen Astro with new observatories	11B - AIP Nuclear & Particle Physics	11C - AIP CMM	11D - AIP ATMOP	11E - AIP QUICC	11F - AIP QUICC	11G - AOS/ACOFT	11H - AIP Complex Systems & Computational Physics
Topic:			Space Science & Defects in diamond	Quantum measurement	Spin qubits & applications	Spin & Topological quantum computing	Nanostructures, plasmonics & metasurfaces	
Chair:	Claudia Lagos	Andrew Stuchbery	Alastair Stacey	Jesper Levisen	Geoff Pryde	Mile Gu	Robert McLaughlin	Tobias Hain
Room:	Physics Building Clews Lecture Theatre [2.43]	Physics Building Ross Lecture Theatre [G.41]	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium	Arts Building Room 5 [G.61]
1330-1345	Global 21-cm signal from Cosmic Dawn and the Epoch of Reionisation Ravi Subrahmanyan	Simple (but not too simple) descriptions of particle dark matter Nicole Bell	Space physics research projects at RMIT Physics Gail Iles	Quantum control of physically rotating qubits Andy Martin	Quantum Control of Spins in Solids Chunming Yin	Zero- to ultralow-field nuclear magnetic resonance and its applications Xinhua Peng	Plasmonic approaches to optical information processing Ann Roberts	Grassmann Phase Space Theory for Fermions Bryan Dalton
1345-1400								Brain-like collective dynamics in a neuromorphic nanowire switch network Zdenka Kuncic
1400-1415	Forecasting and interpreting observations of the first galaxies and the Epoch of Reionisation Simon Mutch	Determination of precision fusion cross sections with a superconducting solenoidal separator Lauren Bezzina	Magnetic circular dichroism spectroscopy of the nitrogen-vacancy centre in diamond Michael Barson	Correlated electron-ion pairs as a source of heralded ions Andrew McCulloch	Silicon-vacancy centres in nanodiamonds for engineered quantum applications Lachlan Rogers	Engineering longitudinal coupling in Majorana qubit systems Thomas Smith	III-V semiconductor resonators on insulator for nanoscale nonlinear optics Mohsen Rahmani	Combining Computational Physics and Evolutionary Algorithms to Create New Tailored for Purpose Granular Materials Gary Delaney
1415-1430	Measuring the evolution of the early Universe with radio observations of the Moon Benjamin McKinley	A Leptoquark Model to Address Flavour Anomalies and Generate Radiative Neutrino Mass Innes Bigaran	Primal surface defects of diamond: surface noise sources Alastair Stacey	Spinning spins: exploring rotational physics with quantum sensors Alexander Wood	Spin charge separation with quantum criticality Xiwen Guan	Topological Quantum Computation with Non-Abelian Vortex Anyons Tapio Simula		Machine Learning for Viscous Drag of Particles in a Fluid Lachlan Gibson
1430-1445	Astrophysical And Space Weather Studies of Interplanetary Scintillation with the Murchison Widefield Array John Morgan	Precision multiple Coulomb excitation in Cd-111 with GRETINA Ben Coombes	Increased density of fluorescent defects in diamond by high-temperature electron beam irradiation Philipp Reineck	Thermally-robust spin correlations between two atoms Stuart Szigeti	Discovery and engineering of optically-addressable spin-defects in diamond and hexagonal boron nitride Marcus Doherty	Evaluation of Threshold for Topological Codes under biased noise Wei-Wei Zhang	Reversible Control of the Image Contrast via Thermally Tunable Metasurfaces Khosro Zangeneh Kamali	Universal hidden order in amorphous cellular geometries Gerd Schroeder-Turk
1445-1500	A tale of TAILS: Testing the Association of Intra-hour quasar variability with Local Stars Hayley Bignall	Belle II Silicon Vertex Detector reconstruction software James Webb	Spatial mapping of band bending in semiconductor devices using in-situ quantum sensors Jean-Philippe Tetienne	Harnessing simultaneous optical and acoustic Purcell effects Mikolaj Schmidt	Donor spin qubits in silicon with robust long-distance coupling Tim Botzem	Fault-tolerant Logical Gates in Topological Quantum Error Correcting Codes Paul Webster	Efficient Beam Deflection Based on Off-resonance a Dielectric Metasurface Andrey Miroshnichenko	Wavelength stable field-only surface integral solution of 3-D frequency and time-domain electromagnetics based on the Helmholtz equation Qiang Sun
1500-1530	Afternoon Tea - Ground Floor Terrace - University Club							

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1530-1700 CONCURRENT SESSION 12								
Session:	12A - AIP Astron and Astro + Focus Next-gen Astro with new observatories	12B - Focus Session – Dark Matter Detection	12C - AIP CMM	12D - AIP ATMOP	12E - AIP QUICC	12F - AIP QUICC	12G - AOS/ACOFT	12H - AOS/ACOFT
Topic:			Condensed Matter theory	Quantum measurement & dynamics	Discrete variable quantum optics	Hybrid & superconducting systems	Nanostructures & nanophotonics	Optical devices
Chair:	Elaine Sadler	Peter Wolf	Meera Parish	Chris Vale	Klaus Moelmer	Dominic Berry	Shakhik Atakaramians	Simon Fleming
Room:	Physics Building Clews Lecture Theatre [2.43]	Physics Building Ross Lecture Theatre [G.41]	Arts Building Room 8 [1.60]	Arts Building Room 9 [1.61]	Arts Building Fox Lecture Theatre [G.59]	Arts Building Austin Lecture Theatre [1.59]	University Club Auditorium	Arts Building Room 5 [G.61]
1530-1545	Status Report on the SKA and SKA Regional Centres Peter Quinn	Atomic Probes of Axionlike Particles and Dark Matter Yevgeny Stadnik	Lifetime and Dynamics of (Anti)Skyrmions Oleg Tretiakov	The physics of moving lab based quantum sensors to the field Nick Robins	Observation of conclusive one-way quantum steering Geoff Pryde	Quantum Networking William Munro	All-dielectric resonant nanophotonics Andrey Miroschnichenko	Mass Manufacturing Ultra-Stable Frequency Transfer Technology Sascha Schediwy
1545-1600			Correlated many-body states of exciton-polaritons Meera Parish					Heliostat sensors for solar thermal power plants David Farrant
1600-1615	Radio Surveys with the Murchison Widefield Array Natasha Hurley-Walker	Dual oscillator resonant cavity for axion detection Catriona Thomson	Quantum chaos and entanglement entropy James Quach	Collective oscillations of a strongly interacting 2D Fermi gas Ivan Herrera Benzaquen	Single-shot quantum advantage in simulating stochastic processes Farzad Ghafari	Quantum Routing of Single Optical Photons using a Superconducting Flux Qubit Jason Twamley	Harmonic generation in AlGaAs nanoantennas using cylindrical vector beams Dragomir Neshev	On-chip precision magnetometry using cavity optomechanical systems Beibei Li
1615-1630	Searching for the First Black Holes with the Murchison Widefield Array Nicholas Seymour	BREAK	Yang-Mills Theory of Electron-Phonon Interactions Jamie Booth	Chiral displacement and spin-orbit coupling in free-space photon emission Daniel Higginbottom	Solid-state single photons for quantum photonics Azwa Zakaria	Realizing Modular Computation in the Quantum Regime Mile Gu	All-Si vertical slab waveguide arrays as wavelength selective photodetectors Jasper Cadusch	Frequency Selective Optical Mode Imaging Huy Tuong Cao
1630-1645	Cold gas and star formation in galaxies Barbara Catinella	BREAK	Casimir Torque between Uniaxial Magnetodielectric Plates Wijnand Broer	Testing QED With Precision Metrology of the Helium Tune-Out Wavelength Sean Hodgman	The Quest for Nonclassicality using Number-Resolving Single-Photon Detectors Raphael Abrahao	Optical Quantum Information Processing with Atom-Filled Hollow-Core Photonic Crystal Fibres Ben Sparkes	Addressing high multipolar resonances with high angular momentum modes of light Xavier Vidal	Parametric Instability Observations and Control through Optical Injection Vladimir Bossilkov
1645-1700	Characterising Cosmological simulations of galaxy formation and evolution Claudia Lagos	BREAK	Modelling electron transport properties in low-dimensional systems and high kinetic inductance films Tommy Bartolo	Dual Colour Magic Wavelength for Correction of Inhomogeneous Broadening in Tightly Confined Cold Atom Ensembles Philip Light	Enhanced single photons from electrically-controlled quantum-dot micropillars Jihun Cha	Quantum Sneakernet: Backbone to the quantum internet Simon Devitt	Nanostructured dielectric fractals on resonant metasurfaces for superior plasmonic gas-phase sensing Mohsen Rahmani	Phase-stabilised optical-frequency transfer for future ground-to-space laser links Sascha Schediwy
Room: Octagon Theatre								
1715-1725	CONFERENCE AWARDS AND PLENARY SESSION 6 Jodie Bradby, conference remarks and award announcements AWARDS: People's Choice Poster Award, presented by Gino Putrino (UWA)							
1725-1810	Prof Susan Scott (Australian National University) & Prof Paul Lasky (Monash University) New discoveries by LIGO during its first and second observing runs Chair: Eric Thrane						 Advancing Technology for Humanity	