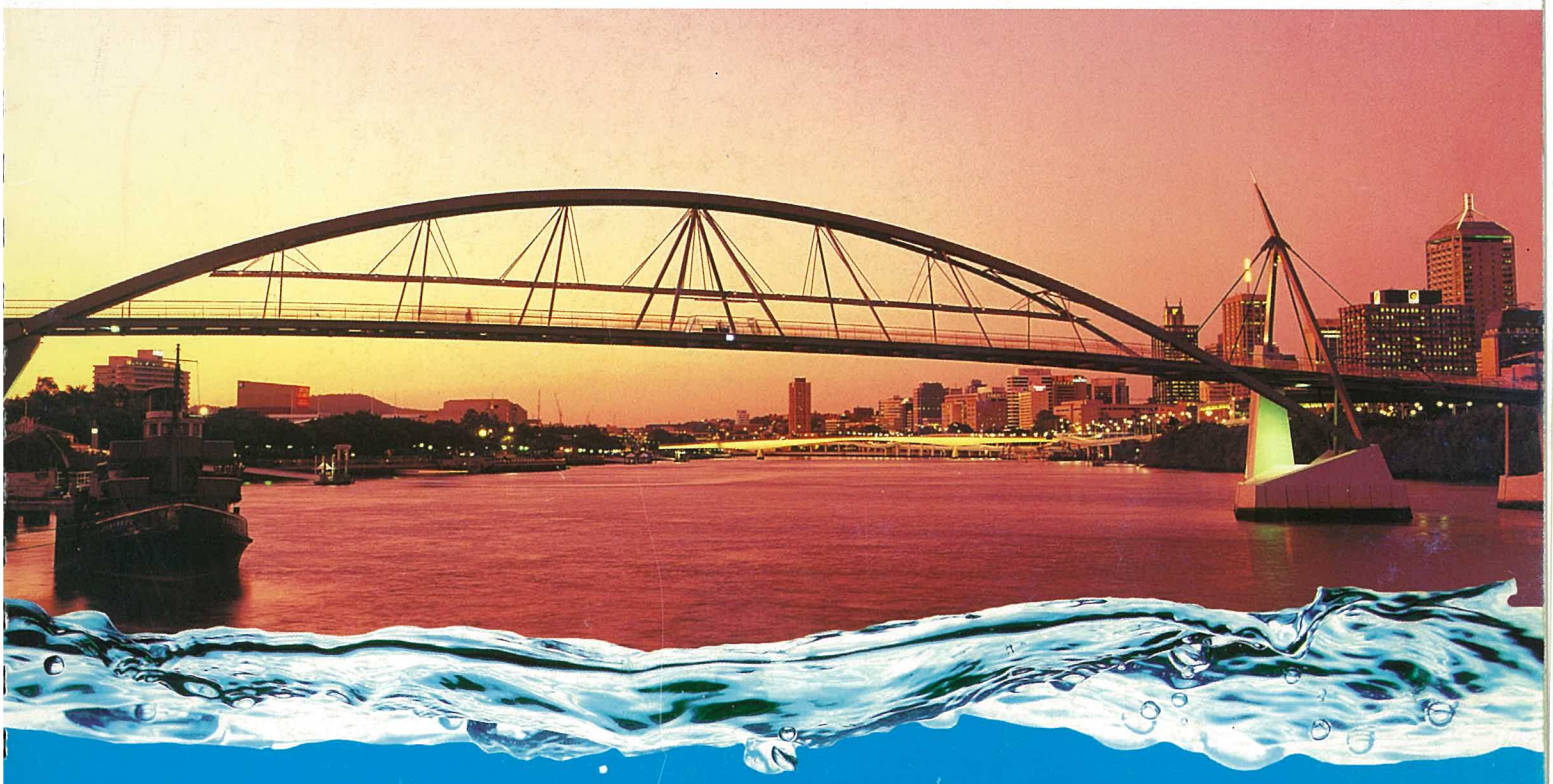
Australian Institute of Physics (AIP)
17th National Congress 2006

RiverPhys
AIP Congress
Brisbane 2006



Final Program & Abstract Book

3 – 8 December 2006

Brisbane Convention and Exhibition Centre
Queensland, Australia

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The Australian Institute of Physics promotes the role of Physics in research, education, industry and the community by:

- Representing and promoting the physics community to government and other legislative or policy-making bodies
- Organising meetings and conferences on research and professional topics
- Promoting and supporting physics teaching and education in schools, colleges and universities
- Encouraging investment in government and industrial research
- Setting and supporting professional standards and qualifications in physics
- Identifying and supporting the needs of physicists in all sectors of employment
- Recognising distinguished contributions to physics.

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Margaret Wegener, Physics Education Group (PEG) and Women in Physics Group (WIP)
Howard Wiseman, Quantum Information, Concepts and Coherence Group (QUICC)

Participating Societies

The Congress appreciates the participation support of the following physics based societies:

- Australian Institute of Physics (AIP)
  - Atomic and Molecular Physics and Quantum Chemistry Group (AMPQC)
  - Australian Institute of Nuclear Science and Engineering Nuclear & Particle Physics Group (AINSE - NUPP)
  - Physics Education Group (PEG)
  - Solar-Terrestrial and Space Physics (STSP)
  - Women in Physics Group (WIP)
- Astronomical Society of Australia (ASA)
- Australasian Society for General Relativity and Gravitation (ASGRG)
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- Australian Institute of Nuclear Science and Engineering (AINSE)
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- Australian Synchrotron Research Program (ASRP)
- Condensed Matter and Materials "Wagga" Meeting (CMM)
- Specialist Group on Solid Earth Geophysics, Geological Society of Australia (GSA)
- Vacuum Society of Australia (VSA)

Underwriting Support

The Congress Organisers thank the following organisations for their underwriting support:

- Australian Institute of Physics
- Australian Optical Society
- Australian Society of Exploration Geophysicists

Congress Theme

The theme of this meeting is *RiverPhys*, celebrating presentations of contemporary physics research in Australia, on the banks of the beautiful Brisbane river. Appropriately, our logo represents the Brisbane River with the water "tunnelling" under the Goodwill Bridge, which is directly adjacent to the meeting venue.

Topic Areas

Please be aware that the topic area abbreviations will be used throughout the Program timetable.

The following topic areas will be covered in the Congress Program:

- Acoustics and Music (AAS)
- Astronomy (ASA)
- Atomic and Molecular Physics and Quantum Chemistry (AMPQC)
- Biophysics and Medical Physics (BMP)
- Complex Systems, Computational and Mathematical Physics (CSCMP)
- Condensed Matter and Materials and Surface Physics (CMMSP)
- Education (PEG)
- Environmental Physics (EP)
- GeoPhysics (GP)
- History of Physics (HOP)
- Meteorology and Climate Change and Oceanography (AMOS)
- Nuclear and Particle Physics (NUPP)
- Optics, Photonics, Laser Physics (AOS)
- Plasma Physics (PP)
- Relatively and Gravitation (ASGRG)
- Renewable Energy (RE)
- Solar-Terrestrial and Space Physics (STSP)
- Synchrotron Science (ASRP)
- Women in Physics (WIP)

Program

Sunday, 3 December 2006

15:00-18:00	Registration Desk open
17:00-19:00	Welcome Reception
	Exhibition Area, Plaza Terrace Room

Monday, 4 December 2006

07:30-18:30	Registration Desk open
08:30-09:15	Official Opening and ANZAAS Presentation by Mr Gary Fenlon, MP, Parliamentary Secretary to the Minister for State Development, Employment and Industrial Relations
	Great Hall 1&2
09:15-10:00	Plenary Speaker: Confessions of a converted lecturer - 101 *Professor Eric Mazur, Harvard College Professor, and Gordon McKay Professor of Applied Physics and Professor of Physics, Division of Engineering and Applied Sciences, Department of Physics, Harvard University, Cambridge, USA*
	Great Hall 1&2
	Chairperson: Prof Halina Rubinsztein-Dunlop, University of Queensland, Australia
09:30-20:00	Exhibition Open
10:00-10:40	Morning Tea with Exhibitors

10:40-12:20	**Concurrent - 1.01**	**Concurrent - 1.02**	**Concurrent - 1.03**
	AOS - Lasers and Apps *Sponsored by Warsash Scientific*	**CMMSP - Fluids** *Sponsored by Griffith University Nanoscale Science and Technology Centre*	**PEG**
	Great Hall 1&2	**Room P1**	**Room P2**
	Chairperson: Dr Kenneth G H Baldwin, Australian National University, Australia		Chairperson: Margaret Wegener, Australia
10:40	Dynamic Interferometry - 102 *Dr James C Wyant, College of Optical Sciences, University of Arizona, United States*	Transport and dynamics in nanoporous systems: theoretical and computational results - 106 *Debra J Searles, School of Science and Nanoscale Science and Technology Centre, Griffith University, Australia*	A phenomenographic study of conceptual knowledge and its relationship to problem-solving ability in physics - 110 *Laura N Walsh, Dublin Institute of Technology, Ireland*
11:20	Continuous-wave, all-solid-state, yellow laser source at 588 nm - 103 *Helen M Pask, Macquarie University, Australia*	Slow dynamics and ageing of colloidal hard sphere glasses - 107 *Vincent Martinez, RMIT University, Australia*	A tale of peer instruction and radio frequency response units "Clickers" in a large first year physics course - 111 *Gary J Tuck, School of Physical Sciences, University of Queensland, Brisbane , Australia, Australia*
11:40	Lidar measurements of aerosol concentrations over Adelaide - 104 *Dr Murray W Hamilton, Physics Dept, University of Adelaide, Adelaide, Australia*	Dynamic deformation of an air bubble when pressed against a solid surface - 108 *Dr Jason N Connor, PELM Centre, Faculty of Sciences, Engineering & Health, Central Queensland University, Gladstone, Australia*	Misconceptions about the classroom: Which teaching practices improve conceptual understanding? - 112 *Derek A Muller, University of Sydney, Australia*
12:00	A 100W, Double-Clad, Nd:YAG Slab Laser - 105 *David Hosken, Department of Physics, University of Adelaide, Australia*	Structure and dynamics of surfactant bilayer mesophases - 109 *Dr William A Hamilton, Oak Ridge National Laboratory, United States*	Who needs more Physics Graduates? - 113 *Judith M Pollard, University of Adelaide, Australia*
12:20-14:00	Lunch (own arrangements)		
13:00-14:00	The chrysalis had emerged as a gorgeous butterfly: A history of the Australian Institute of Physics - 125 Anna Binnie		
	Great Hall 1&2		

Concurrent - 1.04	**Concurrent - 1.05**	**Concurrent - 1.06**
ASA / ASGRG	**STSP**	**AMPQC - Photon-Impact & Fundamental Interations**
Room P3	**Room P4**	**Room P5**
Chairperson: Michael Drinkwater	Chairperson: Brian J Fraser, University of Newcastle, Australia	Chairperson: Dr Robert T Sang, Griffith University, Australia
Listening to dark energy: Probing the cosmic equation of state with the Anglo-Australian telescope - 114 *Prof Karl Glazebrook, Swinburne University of Technology, Australia*	Recent scientific accomplishments in space physics in the Australian Antarctic program - 118 *Marcus L Duldig, Australian Antarctic Division, Department of the Environment and Heritage, Australia*	Photo-excitation of atoms and molecules using Synchrotron Radiation - 122 *Peter Hammond, University of Western Australia, Australia*
Black hole thermodynamics and the fine structure constant - 115 *Dr Susan M Scott, Centre for Gravitational Physics, The Australian National University, Australia*	Numerical modelling of ion-neutral coupling in earth's thermosphere - 119 *Shaun L Cooper, La Trobe University, Australia*	Absolute determination of the x-ray scattering and fluorescence cross-sections and their effects on x-ray attenuation measurements - 123 *A Prof Chris T Chantler, School of Physics, University of Melbourne, Australia*
Control of advanced gravitational wave interferometer configurations - 116 *David S Rabeling, The Australian National University, Australia*	Radar and 558 nm airglow observations at Adelaide, Australia - 120 *Iain M Reid, University of Adelaide, Australia*	Production of a slow, monoenergetic metastable neon beam for atom diffraction studies - 769 *Adam J Palmer, Griffith University, Australia*
Lensing of gravitational waves by extended mass distributions - 117 *Andrew Moylan, The Australian National University, Australia*	Dynamics of IGW and traveling Ionospheric disturbances in regions with sharp gradients of the Ionospheric parameters - 121 *Vasily Yu Belashov, Kazan State Power Engineering University, Russia* *Professor Sergey V Vladimirov, The University of Sydney, Australia*	Single-photon double ionization of helium in presence of the DC electric field - 124 *Igor Ivanov, The Australian National University, Australia*
		NITP Meeting
		Room P5

Monday, 4 December 2006

14:00-15:40	Concurrent - 2.01 AOS - Non Linear Photonics Great Hall 1&2	Concurrent - 2.02 ASRP Room P1	Concurrent - 2.03 PEG Room P2	Concurrent - 2.04 ASGRG Room P3	Concurrent - 2.05 STSP Room P4	Concurrent - 2.06 AMPQC - Electron Interactions with Atoms & Molecules Room P5
	Chairperson: Dmitri K Gramotnev, Queensland University of Technology, Australia	Chairperson: A/Prof Ian R Gentle, University of Queensland, Australia	Chairperson: Manjula D Sharma, University of Sydney, Australia	Chairperson: Dr Susan M Scott, Australian National University, Australia	Chairperson: Brad Carter, University of Southern Queensland, Australia	Chairperson: Prof Peter JO Teubner, Flinders University, Australia
14:00	Presentation - Oskar J Painter *Oskar J Painter, California Institute of Technology, United States*	*Prof Keith A Nugent, School of Physics, University of Melbourne, Australia*	Girls in physics - 134 *Maurizio Toscano, The University of Melbourne, Australia*	14:00 Precision microwave oscillators and Interferometers to test Lorentz Invariance in Electrodynamics - 138 *Michael E Tobar, University of Western Australia, Australia* 14:20 BEC-based analogues of signature change in curved space-time - 139 Angela White, Centre for Gravitational Physics, Department of Physics, Faculty of Science, The Australian National University, Australia	Asteroids and their significance for the origins of planetary systems - 143 *Marc D Norman, Australian National University, Australia*	Low energy electron - atom/molecule collisions: Recent advances and applications - 147 *Stephen J Buckman, Centre for Antimatter-Matter Studies, Australian National University, Australia*
14:40	Spatiotemporal control of slow light in nonlinear Bragg-grating waveguide arrays - 127 *Andrey A Sukhorukov, Australian National University, Australia*	Structure and function: Probing the role of morphology in organic electronic devices - 131 *Paul C Dastoor, University of Newcastle, Australia*	The attitude of girls taking high school science classes - 135 *Dr Gary J Turner, Girls Grammar School, Rockhampton, Australia*	Developing curvature singularity theorems for space-time recent work by Ashley and Scott has developed the use of the abstract - 140 *Dr Michael J Ashley, Centre for Gravitational Physics - The Australian National University, Australia*	Impact of dust on the plasma chemistry of cometary comae - 144 *Boris A Klumov, Max Planck Institute for Extraterrestrial Physics, Germany*	Electron-impact excitation and ionisation of calcium - 148 *Igor Bray, Murdoch University, Australia*
15:00	Slow-light modes in Bragg grating couplers - 128 *Sangwoo Ha, Nonlinear Physics Centre, Research School of Physical Sciences and Engineering, The Australian National University, Australia*	Two dimensional high energy X-Ray powder diffraction - 132 *LaReine A Yeoh, ANSTO, Bragg Institute., Australia*	Physics concepts: Engineering PBL at USQ - 136 *Jeff M Sabburg, USQ, Australia*	Coherent detection of gravitational wave bursts - 141 *Antony C Searle, The Australian National University, Australia*	Magnetic rotation of Saturn - 145 *David Southwood, Director of Science, European Space Agency*	Superelastic Electron scattering from Caesium - 149 *Daniel S Slaughter, SoCPES, Flinders University, Australia*
15:20	High Q-factor layered Bragg reflector resonators of cylindrical and spherical Geometry - 129 *Michael E Tobar, University of Western Australia, Australia* *Mr Jean-Michel le Floch, Institut de Recherche en Communications Optiques et Microondes, Faculte Des Sciences, France* *Prof Dominique Cros, Institut de Recherche en Communications Optiques et Microondes, Faculte Des Sciences, France* *Prof Jerzy Krupka, Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, Warsaw, Poland*	Pilatus a new approach to Protein Chrystalography - 133 *Jared R Winton, The University of Melbourne, Australia*	A medical physics masters by distance education: The RMIT experience - 137 *Prof Peter N Johnston, RMIT University, Australia*	Gravity with spin: Quantum spin coherence - 142 *Peter G Burton, Access Intelligence Pty Ltd, Australia*	Dynamic Spectra for 2-3 kHz Radiation from The Outer Heliospere - 146 *Jeremy J Mitchell, University of Sydney, Australia*	Magnetic field effects on spatial relaxation of swarm particles in idealized steady state Townsend experiment - 150 *Bo Li, School of Physics, University of Sydney, Australia*
15:40-16:20	Afternoon Tea with Exhibitors					

Monday, 4 December 2006

16:20-18:00	Concurrent - 3.01		Concurrent - 3.02	Concurrent - 3.03
	AOS - Spectroscopy		CMMSP - Instr / Neutrons / Xrays	PEG
	Great Hall 1&2		Room P1	Room P2
	Chairperson: Peter Hannaford, Swinburne University of Technology, Australia			Chairperson: Prof Marjan G Zadnik, Curtin University of Technology, Australia
16:20	Continuous-wave stimulated Raman gain spectroscopy with cavity-ringdown detection - 151 *Prof Brian J Orr, Centre for Lasers and Applications, Macquarie University, Australia*	16:20	Scientific opportunities at OPAL, the new Australian research reactor - 155 *Robert A Robinson, Bragg Institute, ANSTO, Australia*	Improving the immediacy and quality of feedback for physics students - 160 *Alex R Merchant, RMIT University, Australia*
		16:40	Phason mode in the incommensurate martensitic phase of Ni_2MnGa - observed by neutron spectroscopy - 156 *Peter W Vorderwisch, SIKA Project, Bragg Institute, ANSTO, Australia*	Preparatory exercises enhance student outcomes from lectures - 161 *Dr Anton Rayner, The University of Queensland, Australia*
17:00	Optical properties of Er-doped silicon-rich silicon oxides - 152 *Robert G Elliman, Australian National University, Australia*	17:00	Determination of the Distribution of Hydrogen Bubbles from Ultra & Small-Angle Neutron Scattering Data using a Size Dependent Contrast - 157 *Mr Mark P Paskevicius, Curtin University of Technology, Australia*	Do students and staff have the same perception of an exam question's difficulty? - 162 *Dr Gilbert J Vella, Biomedical Sciences, The University of Sydney, Australia*
17:20	Residual amplitude modulation effects and cancellation in modulation transfer spectroscopy - 153 *Dr Esa A Jaatinen, Queensland University of Technology, Australia*	17:20	In-situ study of phases and microstructures of Titanium Aluminides - 158 *Dr Klaus-Dieter Liss, Bragg Institute, ANSTO, Lucas Heights, Australia*	The UQ physics demo troupe: Science shows in rural Queensland - 163 *Mr Joel B Gilmore, University of Queensland, Australia* *Jennifer J Riesz, University of Queensland, Australia*
17:40	Dynamic electromagnetically induced absorption - 154 *Russell J McLean, ARC Centre of Excellence for Quantum Atom Optics, Swinburne University, Australia*	17:40	Manipulating 4f quadrupolar interactions in TbB_2C_2 by a magnetic field - 159 *Annemieke M Mulders, Curtin University, Australia*	
18:00-20:00	Poster Sessions Solar-Terestrial and Space Physics (STSP) Astronomy (ASA) Synchrotron Science (ASRP) Optics, Photonics, Laser Physics (AOS) Exhibition Area, Plaza Terrace Room			

16:20-18:20	Concurrent - 3.04	Concurrent - 3.05	Concurrent - 3.06
	ASGRG	STSP	AMPQC - Positron & Electron Interactions with Atoms & Molecules
	Room P3	Room P4	Room P5
	Chairperson: Michael E Tobar, University of Western Australia, Australia	Chairperson: Prof Iver H Cairns, University of Sydney, Australia	Chairperson: Prof Andris T Stelbovics, Murdoch University, Australia
16:20	Absolute motion and gravitational wave experiment results - 165 *Reginald T Cahill, Flinders University, Australia*	Recent advances in remote sensing of earth from space - 170 *Alex Held, CSIRO Office of Space Science and Applications, Australia*	Physics with Cold Antihydrogen - 174 *Michael Charlton, University of Wales Swansea, United Kingdom*
16:40	Causal structure for the abstract boundary - 166 *Ben E Whale, Australian National University, Australia*		
17:00	Thermal noise of a niobium flexure suspension - 167 *Conor M Mow-Lowry, The Australian National University, Centre for Gravitational Physics, Australia*	The relationship between ionospheric irregularity and plasma convection velocities: New results using coherent and incoherent radars - 171 *Roman Makarevich, La Trobe University, Australia*	Probing Collisions in the Molecular Frame - 175 *Julian Lower, Centre for Antimatter-Matter Studies, RSPhysSE, Australian National University, Australia*
17:20	Raytraced visualisation in the Kerr-Newman Geometry using the GRworkbench Software - 168 *Benjamin R Lewis, Australian National University, Australia*	On the need for a solar wind trigger for magnetospheric substorms - 172 *Steven K Morley, University of Newcastle, Australia*	Propagating exterior complex scaling method for calculating three-body and four-body atomic collisions - 176 *Philip L Bartlett, Murdoch University, Australia*
17:40	Control of instabilities in high optical power cavities - 169 *Dr Li Ju, School of Physics, The University of Western Australia, Australia*	SuperDARN spectral width, lifetime of ionospheric irregularities and particle precipitations - 173 *Dr Colin L Waters, Department of Physics, University of Newcastle, New South Wales, Australia*	The development of an electrostatic charged-particle orbit recycling system - 177 *Dr B Birdsey, University of Western Australia, Australia*
18:00	Properties of gravitational waves in Cosmological General Relativity - 164 *John G Hartnett, University of Western Australia, Australia*		

PROGRAM - TUESDAY

Tuesday, 5 December 2006

08:30-09:15 Plenary Speaker: John Hall *Sponsored by ACQAO, Ian Potter Foundation, Coherent Scientific*
Great Hall 1&2
Chairperson: Peter Hannaford, Swinburne University of Technology, Australia

09:15-10:00 Plenary Speaker: Entangled Photons: From Fundamental Tests to Quantum Communication and Quantum Computation
Sponsored by Griffith University Centre for Quantum Dynamics
Professor Anton Zeilinger, Institute of Experimental Physics, University of Vienna, Austria
Great Hall 1&2
Chairperson: Gerard J Milburn, The University of Queensland, Australia

09:30-20:00 Exhibition Open

10:00-10:40 Morning Tea with Exhibitors

10:40-12:20

Concurrent - 4.01	Concurrent - 4.02	Concurrent - 4.03
AOS/QUICC - Optical Quantum Info	**CMMSP - Soft / Bio / EXPT**	**NUPP**
Great Hall 1&2	**Room P1**	**Room P2**
Chairperson: Gerard J Milburn, The University of Queensland, Australia		Chairperson: Martin E Sevior, Australia
Quantum optical technology at the single-photon level and beyond - 201 *Alex I Lvovsky, University of Calgary, Canada*	Establishing structure-property relationships in organic condensed matter systems - 205 *Dr Paul Meredith, University of Queensland, Australia*	From Belle to the Super B-Factory - 209 *Tom Browder, University of Hawaii, United States*
Quantum memories and laser noise cleaners using rare earth ion dopants - 202 *Dr Jevon J Longdell, Australian National University, Australia*	The dipole strength of Melanin - 206 *Jennifer J Riesz, University of Queensland, Australia*	Enhancement and suppression of Quantum tunnelling in Nuclear Collisions - 210 *Dr M Dasgupta, The Australian National University, Australia*
Quantum control of a single photonic qubit - 203 *Rohan B Dalton, University of Queensland, Australia*	Understanding and improving solid-state Polymer/ Fullerene Bulk-Heterojunction Solar Cells using Ternary Porphyrin Blends - 207 *Paul C Dastoor, University of Newcastle, Australia*	Realization of the non-perturbative Green's functions - 211 *Dr Ayse Kizilersu, University of Adelaide-CSSM, Australia*
Arbitrary-strength, non-destructive unambiguous state discrimination - 204 *Dr Geoffrey J Pryde, Griffith University, Australia*	Block copolymers in selective solvents: Striped toroids, figure eights and other structures - 208 *David RM Williams, Australian National University, Australia*	

12:20-14:00 Lunch (own arrangements)

13:00-14:00 **Women in Physics Meeting**
Chez Laila Café, Soutbank

14:00-15:40

Concurrent - 5.01	Concurrent - 5.02	Concurrent - 5.03
AOS - Non Linear Photonics	**CMMSP - Unusual Conductors**	**NUPP**
Great Hall 1&2	**Room P1**	**Room P2**
Chairperson: Dragomir Neshev, Australian National University, Australia		Chairperson: David J Hinde, Australian National University, Australia
Single photonics - 225 *Gerard J Milburn, The University of Queensland, Australia*	New routes to organic electronic devices - 229 *Dr Adam P Micolich, University of New South Wales, Australia*	Superdeformation, hyperdeformation, wobbling and magnetic rotation: nuclear behaviour at the highest angular momenta - 233 *Anna N Wilson, Australian National University, Australia*
Direct mapping of dynamics of three-dimensional woodpile photonic crystals fabricated with two-photon polymerisation - 226 *Dr Baohua Jia, Centre for Micro-Photonics, Australia*	PALS detection of vacancy populations in yttria-stabilized zirconia - 230 *Mr Aaron Sudholz, Dept Materials Engineering, Monash University and CSIRO Manufacturing Infrastructure and Technology, Australia*	The search for the Higgs Boson at the LHC - 234 *Thomas M Atkinson, University of Melbourne, Australia*
Nanophotonic metamaterials - 227 *Ann Roberts, School of Physics, University of Melbourne, Australia*	Spin fluctuation theory of the normal state of the layered organic superconductors: A Phenomenological approach - 231 *Eddy Yusuf, University of Queensland, Australia*	Measurement of exclusive semileptonic B meson decays to light hadrons in the Belle experiment - 235 *Kevin E Varvell, The University of Sydney, Australia*
Gap plasmon waveguides for Plasmonics and Nano-Optics - 228 *Dmitri K Gramotnev, Queensland University of Technology, Australia*	Sr_2FeMo_0Double Perovskites And The Effects Of Aluminium Substitution - 232 *Mr Erwan K Hemery, MacDiarmid Institute of Advanced Materials and Nanotechnology, Victoria University, New Zealand*	Dynamical collective potential energy landscape: its impact on the formation of superheavy elements - 236 *Alexis Diaz-Torres, The Australian National University, Australia*

15:40-16:20 Afternoon Tea with Exhibitors

10:40-12:20

Concurrent - 4.04	Concurrent - 4.05	Concurrent - 4.06
GP - Geodesy	**STSP**	**AMPQC - Quantum Chemistry, Photochemistry and Molecular Physics**
Room P3	**Room P4**	**Room P5**
Co-Chair: Gary J Tuck, University of Queensland, Australia Chris Rizos, University of New South Wales, Australia	Chairperson: Dr Phil Wilkinson, IPS Radio and Space Services, Australia	Chairperson: A/Prof Michael J Brunger, Flinders University, Australia
Modern Geodesy, its capabilities and its contribution to a greater understanding of "system - 212 *Chris Rizos, University of New South Wales, Australia*	Space weather impacts on our communication and navigation - 216 *Endawoke Yizengaw, Institute of Geophysics and Planetary Physics, University of California, Los Angeles, United States*	10:40 The role of atomic and molecular data in the prediction of atmospheric electron density - 220 *Dr Laurence Campbell, ARC Centre for Antimatter-Matter Studies, SoCPES, Flinders University, Australia* 11:00 Rovibrational energy transfer in the $4\nu_{CH}$ manifold of acetylene, viewed by IR-UV double resonance spectroscopy: kinetics of a collision-induced quasi-continuous background - 221 *Prof Brian J Orr, Centre for Lasers and Applications, Macquarie University, Australia*
Geoscience Australia: Activities in Geodesy - 213 *Dr Ramesh Govind, Geoscience Australia, Australia*	TEC climatology of the night-time Weddell Sea Anomaly investigated by TOPEX/Poseidon radar altimetry - 217 *Ildiko Horvath, University of Queensland, Australia*	11:20 Electron scattering from plasma-based Fluorocarbons - 222 *Leigh R Hargreaves, ARC Centre for Antimatter-Matter Studies, School of Chemistry, Physics and Earth Sciences, Flinders University, Australia*
Measuring global change: The contribution of satellite laser ranging to earth monitoring - 214 *Dr Ramesh Govind, Geoscience Australia, Australia*	The daily variation of the vertical component of the earth's magnetic field around Australia - 218 *Dr Robert J Stening, University of New South Wales, Australia*	11:40 Molecular collisions in strategic gases: Experimental tests of Ab Initio calculations - 223 *Eric F May, University of Western Australia, Australia*
Australian - New Zealand Geodetic VLBI Network Project - 215 *Oleg Titov, Geoscience Australia, Australia*	Electron distributions upstream and downstream of Quasiperpendicular high mach number collisionless shocks - 219 *Professor David Jamieson, School of Physics, University of Sydney, Australia*	12:00 Electron collisions with biologically relevant molecules - 224 *Violaine Vizcaino, Centre for Antimatter-Matter Studies, Australian National University, Australia*
	STSP Business Meeting Room P4	12:20-14:00 **AOS Council Meeting** Room P3

14:00-15:40

Concurrent - 5.04	Concurrent - 5.05	Concurrent - 5.06
GP - Computational Geophysics	**STSP**	**AMPQC - Laser-Atom & Atom-Atom Interactions**
Room P3	**Room P4**	**Room P5**
Chairperson: Prof Peter Mora, University of Queensland, Australia	Chairperson: Prof Robert L Dewar, The Australian National University, Australia	Chairperson: Julian Lower, Australian National University, Australia
From quantum to planets: A new computational geophysical frontier - 237 *Klaus Regenauer-Lieb, Earth & Geographical Sciences , University of Western Australia & CSIRO Exploration and Mining, Australia*	The importance of alfvenic turbulence in space plasmas - 241 *Dr Chris C Chaston, University of California at Berkeley, United States*	Ultrafast lasers in atomic physics - 245 *David Kielpinski, Griffith University, Australia*
Computationally modelling lava morphology in effusive volcanic eruptions - 238 *Dr Alina J Hale, The University of Queensland, Australia*	Decoupling of electron and ion motions at the Alfven resonance - 242 *Eun-Hwa Kim, School of Physics, University of Sydney, Australia*	Zero-Field Fe^{3+} Sapphire Whispering-Gallery-Mode Solid-State MASER Oscillator - 246 *Michael E Tobar, School of Physics, University of Western Australia, WA, Australia*
Thermal evolution models of the moon - 239 *Dr Klaus D Gottschaldt, U Queensland, ACcESS/ESSCC, Australia*	Remote sensing the density of the inner Magnetosphere using field line resonance - 243 *Lachlan J Rogers, University of Newcastle, Australia* *Dr Colin L Waters, University of Newcastle, Australia* *Dr Brian J Fraser, University of Newcastle, Australia*	Total absolute collision cross section measurements using a metastable neon magneto optical trap - 247 *Miss Kristen J Matherson, Centre for Quantum Dynamics, Griffith University, Australia*
Stirring in three-dimensional mantle convection models: Differentiation of heavy tracers - 240 *Jinshui Huang, Research School of Earth Sciences, The Australian National University, Australia*	Complexity in the solar wind over multiple solar cycles - 244 *Mr Ryan C Healey, Department of Physics, La Trobe University, Bundoora, Victoria, Australia*	Spectroscopy of laser cooled Rubidium atoms with a train of Femtosecond light pulses - 248 *Mr Milan Maric, The University of Western Australia, Australia*

PROGRAM - TUESDAY

Tuesday, 5 December 2006

16:20-18:00	**Concurrent - 6.01** **AOS - Photonics** **Great Hall 1&2**	**Concurrent - 6.02** **CMMSP - Th. E Correlations** **Room P1**	16:20-18:40	**Concurrent - 6.03** **NUPP** **Room P2**	16:20-18:00	**Concurrent - 6.04** **GP** **Room P3**	16:20-18:20	**Concurrent - 6.05** **STSP** **Room P4**	**Concurrent - 6.06** **AMPQC / QUICC / AOS** **Room P5**
	Chairperson: Prof Norman R Heckenberg, University of Queensland, Australia			Chairperson: Kevin E Varvell, The University of Sydney, Australia		Chairperson: Gary J Tuck, University of Queensland, Australia		Chairperson: Iain M Reid, University of Adelaide, Australia	Chairperson: Dr Matthew J Davis, University of Queensland, Australia
16:20	Wrapping light around a hair - 249 *Professor Eric Mazur, Harvard College Professor, and Gordon McKay Professor of Applied Physics and Professor of Physics, Division of Engineering and Applied Sciences, Department of Physics, Harvard University, Cambridge, USA*	Frustration in (and over) strongly correlated quantum many-body systems - 253 *Dr Ben J Powell, University of Queensland, Australia*	16:20	Physics with the ATLAS Experiment in the Large Hadron Collider Era - 257 *Prof Geoffrey Taylor, University of Melbourne, Australia*	16:20	DEM simulation of dynamic slip on a rough fault - 265 *Steffen Abe, University College Dublin, Ireland*	16:20	An evaluation of the scientific, technological and other outcomes from Australia's Fedsat Small Satellite Mission - 270 *Andrew Parfitt, University of South Australia, Australia*	Condensed matter physics at nanograms/ cubic centimeter - 275 *Charles W Clark, NIST, United States*
					16:40	Numerical simulations of earthquakes and the dynamics of fault systems using the Finite Element method - 266 *Louise M Kettle, Earth System Science Computational Centre, University of Queensland, Australia*			
17:00	Testing the standard model of physics - 250 *Mr Samuel T Dawkins, University of Western Australia, Australia*	Strong quantum renormalizations of excitation spectra of helically ordered spin-1/2 antiferromagnets on (an-)isotropic triangular lattices - 254 *Dr John O Fjaerestad, University of Queensland, Australia*	17:00	New methods of mass spectrometry based on an Electron Cyclotron Resonance Ion Source - 258 *Dr Michael Hotchkis, Australian Nuclear Science and Technology Organisation, Australia*	17:00	Project Amati - A novel magnetic gradiometer: Description, design issues, and trial results - 267 *Howard C Golden, Gravitec Instruments, Australia* *Dr Wayne McRae, Gravitec Instruments, Australia*	17:00	Anisotropy, self- similarity and a stochastic dynamical model for solar wind turbulence - 271 *Professor Sandra Chapman, Professor of Astrophysics and Director of the Centre for Fusion, Space and Astrophysics, University of Warwick, United Kingdom*	Quantum effects in the nonlinear localization of Bose-Einstein condensates in optical lattices - 276 *Beata J. Dabrowska-Wuester, Nonlinear Physics Centre, Australian National University*
17:20	Sub-Hz optical frequency synthesis with fibre-laser-based frequency combs - 251 *John J McFerran, The University of Western Australia, Australia*	Anomalous van der Waals forces in nanostructures - 255 *John F Dobson, Griffith University, Australia*	17:20	Nuclear structure of ^{131,133}I - 259 *Dr H Watanabe, Department of Nuclear Physics, Research School of Physical Sciences & Engineering, Australian National University, Canberra, Australia*	17:20	Minimisation of the temperature coefficients of precise magnetic field strengths produced for low-field magnetometry - 268 *Malcolm W Gamlen, Amalgamag, Australia*	17:20	Effective antenna lengths and absolute intensities for type II and III Solar Radio Bursts - 272 *Amaal A Mohamed, University of Sydney, Australia*	Continuous and Pulsed Quantum Zeno Effect - 277 *Erik W Streed, Centre for Quantum Dynamics, Griffith University, Australia*
17:40	Realising photonic circuitry for future optical networks - 252 *Martin Ams, Macquarie University, Australia*	Quantum Monte Carlo investigation of van der Waals systems - 256 *Manolo Per, RMIT University, Australia*	17:40	Hadronic In Situ Calibration of the ATLAS detector - 260 *Miss Nadia M Davidson, University of Melbourne, Australia*	17:40	Mineralogical analysis of Weipa Bauxite using NIR spectroscopy - 269 *Mr Luke D McArthur, PELM, Central Queensland University, Australia*	17:40	Bursty Langmuir waves in type III radio burst source regions - 273 *Alix L Nulsen, School of Physics, The University of Sydney, Australia*	The condensed matter - atomic physics interface in ion quantum technology - 278 *Winfried K Hensinger, University of Sussex, United Kingdom*
18:00-20:00	**Poster Session** **Atomic and Molecular Physics and Quantum Chemistry (AMPQC)** **Condensed Matter and Materials, and Surface Physics (CMMSP)** **Nuclear and Particle Physics (NUPP)** **Meteorology and Climate Change, and Oceanography (AMOS)** **Exhibition Area, Plaza Terrace Room**		18:00	Searching for new physics in ATLAS with electrons - 261 *Jason SH Lee, University of Sydney, Australia*			18:00	Simulations of type III solar radio bursts in the presence of density inhomogeneities - 274 *Bo Li, School of Physics, University of Sydney, Australia*	
			18:10	Parameterisation of electromagnetic showers in the ATLAS Calorimeter - 262 *Anthony T Waugh, University of Sydney, Australia*					
			18:20	Dipole Bands in ^{192}Pb - 263 *Michael C East, Australian National University, Australia*					
			18:30	Charge collection characterization of PILATUS II pixel array - 264 *Mr Bryn A Sobott, The University of Melbourne, Australia*					

Wednesday, 6 December 2006

08:30-09:15 Plenary Speaker: Space Science in Europe - 301
Professor David Southwood, Director of Science, European Space Agency
Great Hall 1&2
Chairperson: Brian J Fraser, University of Newcastle, Australia

09:15-10:00 Plenary Speaker: Some higher order features in musical wind instruments and the vocal tract - 302
Professor Joe Wolfe, Professor of Physics, School of Physics, University of New South Wales, Sydney, Australia
Great Hall 1&2
Chairperson: Andrew G White, University of Queensland, Australia

09:30-16:00 Exhibition Open

10:00-10:40 Morning Tea with Exhibitors

10:40-12:20

Concurrent - 7.01		Concurrent - 7.02		Concurrent - 7.03	
AOS - Atom Lasers & BEC I		**CMMSP - Nanowires, Nanotubes, Quantum Dots etc.**		**PLASMA**	
Great Hall 1&2		**Room P1**		**Room P2**	
Chairperson: Andrew G Truscott, The Australian National University, Australia				Chairperson: Prof Robert L Dewar, The Australian National University, Australia	
10:40 Emergence of order in gaseous Bose-Einstein condensates - 303 *Prof Masahito Ueda, Tokyo Institute of Technology, Japan*	10:40	BN/SiOxNy core-shell nanowires synthesized by chemical vapour deposition - 307 *Rene R Chaustowski, University of Queensland, Australia*	10:40	Exploiting the flexibility of the H-1 national facility to explore fusion plasma physics - 312 *Boyd D Blackwell, Plasma Research Laboratory, Australian National University, Australia*	
	11:00	Towards the fabrication of a single walled carbon nanotube 2D helium detector - 308 *Dr Lars Thomsen, School of Mathematical and Physical Sciences, University of Newcastle, Callaghan, NSW, Australia, 2308, Australia*	11:00	Electron-sodium collision cross sections for fusion research - 313 *Igor Bray, Murdoch University, Australia*	
11:20 Quantum limits to the linewidth of an atom laser - 304 *Dr Mattias T Johnsson, The Australian National University, Australia*	11:20	ab initio simulations of the structuab initio simulations of the structure of diamond nanowires at 300K - 309 *Alex R Merchant, RMIT University, Australia* *Mr Arkadiusz P Lewandowski, RMIT University, Australia*	11:20	Dust particles as a plasma diagnostic - 314 *A/Prof Brian W James, School of Physics, University of Sydney, Australia*	
			11:30	Dust charge in complex plasma afterglow - 315 *Dr Alex A Samarian, School of Physics,University of Sydney, Australia*	
11:40 Focusing Bose-Einstein condensates by Fresnel zone plates - 305 *Thomas E Judd, University of Nottingham, United Kingdom*	11:40	Simulations and modeling of zero- and one-dimensional gold nanostructures - 310 *David Yu Hang Chui, RMIT University, Australia*	11:40	Three-view frequency swept interferometry for Alfven eigenmode studies on the H-1 Heliac - 316 *David Oliver, Plasma Research Laboratory, Research School of Physical Sciences and Engineering, Australian National University, Australia*	
			11:50	Effect of magnetic islands on the H-1NF plasma - 317 *Santhosh TA Kumar, The Australian National University, Australia*	
12:00 Instabilities leading to Vortex Lattice Formation in rotating Bose-Einstein condensates - 306 *Andrew M Martin, University of Melbourne, Australia*	12:00	High resolution spectroscopy of single CdSe colloidal quantum dots - 311 *Brad Littleton, University of Queensland, Australia*	12:00	Analysis of MHD activity in the H-1 Heliac using data mining techniques - 318 *David G Pretty, Plasma Research Laboratory, RSPhysSE, ANU, Australia*	
			12:10	Novel helium line ratio electron temperature diagnostic - 319 *Scott M Collis, Australian National University, Australia*	

12:20-14:00 Lunch (own arrangements)

Concurrent - 7.04	Concurrent - 7.05	Concurrent - 7.06
QUICC - Quantum Computing	**STSP**	**PEG**
Room P3	**Room P4**	**Room P5**
Chairperson: A/Prof Lloyd C L Hollenberg, University of Melbourne, Australia	Chairperson: Murray L Parkinson, Department of Physics, Australia	Chairperson: Anton Rayner, Physics, Australia
Quantum computation as geometry - 320 *Prof Michael A Nielsen, University of Queensland, Australia*	Low energy neutral atom imaging in space - 324 *Stephen A Fuselier, Lockheed Martin Advanced Technology Center Palo Alto, California, Australia*	Real time relativity - 328 *Dr Craig M Savage, ARC Centre of Excellence for Quantum-Atom Optics, Department of Physics, Australian National University, Australia*
Adiabatic protocols for operator measurement based entanglement and quantum computing - 321 *Andrew D Greentree, University of Melbourne, Australia*	A high performance digital radar for extended space weather investigations - 325 *Mr James S Whittington, Australia* *Dr John C Devlin, Department of Electronic Engineering, La Trobe University, Bundoora, Victoria, Australia*	Using the socratic method to teach general relativity - 329 *Dr Samuel P Drake, Defence Science and Technology Organisation, Australia*
Error tolerance and tradeoffs in loss- and failure-tolerant quantum computation schemes - 322 *Peter P Rohde, University of Queensland, Australia*	Directional wind measurements of the Southern Ocean using the TIGER and unwin SuperDARN radars - 326 *Robert I Greenwood, Department of Physics, La Trobe University, Australia*	Preliminary results from a new quantum mechanics conceptual survey - 330 *Sura Wuttiprom, Australia*
Continuous variable cluster state computation - 323 *Mile Gu, University of Queensland, Australia*	Towards an inaugural Australian decadal plan for space science - 327 *Prof Iver H Cairns, School of Physics, University of Sydney, Australia*	Assessing the development of students' understandings of introductory thermodynamic concepts - 331 *Shelley R Yeo, Curtin University of Technology, Australia* *Prof Marjan G Zadnik, Curtin University of Technology, Australia*
	STSP Decadal Plan Meeting	**PEG AGM**
	Room P4	**Room P5**

PROGRAM - WEDNESDAY

PROGRAM - WEDNESDAY

Wednesday, 6 December 2006

13:30-14:30 Medal Winners Presentations and Talks

Great Hall 1&2

14:30-15:15 Plenary Speaker: Complexity - when the whole is different from the sum of its parts - 332
Professor Sandra Chapman, Professor of Astrophysics and Director of the Centre for Fusion, Space and Astrophysics, University of Warwick, United Kingdom

Great Hall 1&2

Chairperson: Prof Iver H Cairns, University of Sydney, Australia

15:15-15:40 Afternoon Tea with Exhibitors

15:40-17:20

Concurrent - 8.01
QUICC - Quantum Fundamentals
Room P3

Chairperson: Howard M Wiseman, Griffith University, Australia

15:40 Liouville mechanics with an epistemic restriction - 333
Stephen D Bartlett, University of Sydney, Australia

16:00 What is the maximum observable correlation between two quantum systems? - 334
Michael JW Hall, Australian National University, Australia

16:20 Bounds on quantum correlations in Bell Inequality experiments - 335
Yeong-Cherng Liang, University of Queensland, Australia

16:40 Steering, entanglement and Quantum nonlocality - 336
Mr Steven J Jones, Centre for Quantum Computer Technology, Centre for Quantum Dynamics, School of Science, Griffith University, Australia

17:00 Choice of measurements in quantum state tomography - 337
Mark D de Burgh, University of Queensland, Australia

15:40-17:40

Concurrent - 8.02
STSP
Room P4

Chairperson: Ken J W Lynn, La Trobe University, Australia

15:40 Ionospheric physics in Australia's defence science and technology organisation - 338
Robert Gardiner-Garden, Signal Processing and Propagation Group, High Frequency Radar Branch, Intelligence, Surveillance & Reconnaissance Division

16:20 Characterisation of Narrowband HF Channels in the Mid and Low Latitude Ionosphere - 339
Trevor J Harris, DSTO, Australia

16:40 Backscatter sounder observations of Sporadic E - 340
Dr Philip S Whitham, Defence Science and Technology Organisation, Australia

17:00 Propagation of travelling Ionospheric disturbances over the Southern Ocean - 341
Prof Peter L Dyson, La Trobe University, Australia

17:20 Hemispheric ionospheric height rises during the Solar-Terrestrial event of 23 May 2002 - 342
Ken J W Lynn, La Trobe University, Australia

15:40-17:00

Concurrent - 8.03
AAS
Room P5

Chairperson: Hans Gottlieb

15:40 Aspects of numerical techniques for the design of musical structures - 343
Katherine A Legge, La Trobe University, Australia

16:20 Design Considerations in a Sound Recognition System for Wildlife Identification - 344
Neil J Boucher, Compustar, Australia

16:40 Quasi-Spherical resonators for physical metrology - 345
Eric F May, University of Western Australia, Australia

15:40-17:20

Meeting
ACQAO Meeting
Room P2

16:15-17:20

Panel Discussion - Should Australia Adopt the Nuclear Power Option?
Great Hall 1&2

Chairperson: Prof David N Jamieson, University of Melbourne, Australia

Panel Members:

Dr Ron Cameron (Australian Nuclear Science and Technology Organisation Chief of Operations)

Professor Aidan Byrne (ANU Nuclear Physicist and Head of the ANU Department of Physics)

Professor Sir Chris Llewellyn-Smith (Director of UKAEA Culham Division, which is responsible for the UK's thermonuclear fusion program)

Professor Andrew Blakers (Director - Centre for Sustainable Energy Systems and photovoltaics expert)

Dr Jim Green (National Nuclear Campaigner for Friends of the Earth and author of the report No Solution To Climate Change)

Dr Mark Diesendorf (UNSW Institute for Environmental Studies and expert on sustainability and energy)

19:00-23:00 Congress Dinner

Plaza Ballroom

Thursday, 7 December 2006

08:30-09:15	Plenary Speaker: First-principles calculations in catalysis, coatings and devices - 401 *Professor Catherine Stampfl, Federation Fellow, School of Physics, The University of Sydney, Sydney, Australia* **Great Hall 1&2** Chairperson: Prof Ross H McKenzie, University of Queensland, Australia					
09:15-10:00	Plenary Speaker *Professor Sir Chris Llewellyn Smith, Director of UKAEA Fusion Program and the Joint European Torus (JET), Culham Science Centre, England* **Great Hall 1&2** Chairperson: Prof Robert L Dewar, The Australian National University, Australia					
09:30-20:00	Exhibition Open					
10:00-10:40	Morning Tea with Exhibitors					
10:40-12:20	**Concurrent - 9.01** **AOS - Optics 1** **Great Hall 1&2**	**Concurrent - 9.02** **CMMSP - Modelling / DFT** **Room P1**	**Concurrent - 9.03** **NUPP** **Room P2**		**Concurrent - 9.04** **AOS - Atom Lasers & BEC II** **Room P3**	**Concurrent - 9.05** **QUICC/AOS - Quantum Optics** **Room P4**	**Concurrent - 9.06** **BMP** *Sponsored by QUT* **Room P5**
	Chairperson: Murray Hamilton, Australia		Chairperson: Bruce McKellar		Chairperson: Prof Hans A Bachor, Australian National University, Australia	Chairperson: Stephen D Bartlett, University of Sydney, Australia	Chairperson: James M Pope, Queensland University of Technology, Australia
10:40	Theory and computation in experimental optics - 403 *Dr Timo A Nieminen, The University of Queensland, Australia*	Presentation - Julian Gale *Prof Julian D Gale, Nanochemistry Research Institute, Curtin University of Technology, Australia*	Brane-worlds and extra dimensions - 411 *Prof Ray Volkas, University of Melbourne, Australia*	10:40	Towards atom laser feedback stabilization - 415 *Stuart D Wilson, Australia*	Quantum jumps and the quasiclassical motion of a trapped ion - 420 *Howard J Carmichael, University of Auckland, New Zealand*	Self-assembled, covalently bonded, organic structures on silicon: Hybrid Silicon-Organic Devices - 424 *Hans G L Coster, Biophysics and Bioengineering, School of Chemical and Molecular Engineering, University of Sydney, Australia*
				11:00	Methods for calculating the transverse beam profile of an unpumped atom laser - 416 *Graham R Dennis, Australian National University, Australia*		
11:20	Angular momentum and the Abraham--Minkowski controversy - 404 *Robert NC Pfeifer, The University of Queensland, Australia*	First-principles Investigations of Oxidation and Catalysis over Gold - 408 *Dr Hongqing Shi, University of Sydney, Australia*	Isolating K-mixing effects in isomeric states - 412 *George D Dracoulis, Australian National University, Australia*	11:20	Vortex arrays in hexagonal optical lattices - 417 *Tristram J Alexander, Australian National University, Australia*	From side-band squeezing to photon anti-bunching - 421 *Dr Thomas Symul, Australian National University, Australia*	Red and blue luminescent silicon nanocrystals prepared in coliodal solutions - 425 *Vladimir Svrcek, Nanoarchitectonics Research Center, AIST, Tsukuba, Ibaraki, Japan*
11:40	Optical force field mapping in microdevices - 405 *Adrian S Ratnapala, University of Queensland, Australia*	Embedded clustering and metastable magnetism in transition-metal doped III-Nitrides - 409 *Dr Carl Cui, School of Physics, University of Sydney, Australia*	Laser produced pair-production - 413 *Heinrich Hora, University of New South Wales, Australia*	11:40	A new class of permanent magnetic lattices for ultracold atoms and Bose-Einstein condensates - 418 *Saeed Ghanbari, Centre for Atom Optics and Ultrafast Spectroscopy, Swinburne University of Technology, Melbourne, Australia*	Propagation and 'storage of light' in coherently prepared atomic media - 422 *Alexander M Akulshin, Centre for Atom Optics and Ultrafast Spectroscopy, Swinburne University of Technology, Australia*	Nanodiamonds as optical scattering labels for biological imaging - 426 *Bradley R Smith, School of Physical Sciences, The University of Queensland, Australia*
12:00	Microrheology using rotating optical tweezers - 406 *Simon J W Parkin, The University of Queensland, Australia*	Ab initio investigation into the stability and electronic properties of GaN-nanowires - 410 *Damien J Carter, University of Sydney, Australia*	Determination of the CKM parameter V_{cb} and the b quark mass at Belle - 414 *Phillip Urquijo, University of Melbourne, Australia*	12:00	Dynamics of coupled ultra-cold atoms and molecules in an optical lattice - 505 *Dr Murray K Olsen, University of Queensland, Australia*	Independent photons in optical quantum technologies - 423 *Mr Till J Weinhold, University of Queensland, Australia*	Fundamentals of optical detection of small particles - 427 *Taras Plakhotnik, School of Physical Sciences, The University of Queensland, Australia*
12:20-14:00	**AIP Forum** **Great Hall 1&2**					**QUICC AGM** **Room P4**	
12:20-14:00	Lunch (own arrangements)						

PROGRAM - THURSDAY

Thursday, 7 December 2006

	Concurrent - 10.01	Concurrent - 10.02		Concurrent - 10.03
14:00-15:40	**AOS - Optics 2**	**CMMSP - Surfaces 1**		**NUPP**
	Great Hall 1&2	**Room P1**		**Room P2**
	Chairperson: Dr Timo A Nieminen, The University of Queensland, Australia			Chairperson: George D Dracoulis, Australian National University, Australia
14:00	Low noise optical frequency synthesis from a cryogenic microwave sapphire oscillator - 428 *A/Prof Andre N Luiten, The University of Western Australia, Australia*	Imaging and modelling semiconductor surface dynamics - 432 *Professor David E Jesson, School of Physics, Monash University, Australia*	14:00	Alpha-particle cluster structure in nuclear reactions - 436 *Martin Freer, School of Physics and Astronomy, University of Birmingham, United Kingdom*
14:40	Complete recovery of incoherent wavefields using phase-space tomography and its applications in x-ray imaging - 429 *Chanh Q Tran, School of Physics, University of Melbourne, Australia*	TEM characterization of MnO2 cathode in an aqueous lithium secondary battery - 433 *Mr Manickam Minakshi, Division of Science and Engineering, Murdoch University, Murdoch 6150, Western Australia, Australia*	14:40	Measurement of the branching fraction and time-dependent CP violation parameters in $B^0 \to D^{*+} D^{*-} K_S$ Decays - 437 *Jeremy P Dalseno, University of Melbourne, Australia*
15:00	Ultra-sensitive wavefront measurement using Hartmann sensors - 430 *Peter J Veitch, Department of Physics, University of Adelaide, Australia*	High resolution synchrotron XPS study of L-Cysteine and S-Benzyl-L-Cysteine on Platinum: Adhesion mechanisms and radiation damage - 434 *Murad Tayebjee, Bragg Institute, ANSTO, Australia*	15:00	High-spin isomer in ^{204}Hg - 438 *Gregory J Lane, Australian National University, Australia*
15:20	Finesse: a simulation package for classic and advanced laser interferometry - 431 *Paul T Cochrane, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Germany*	The effect of annealing on the mechanical properties and failure modes of PECVD deposited silicon-rich silicon oxide films on silicon - 435 *Robert G Elliman, Australian National University, Australia*	15:20	Properties of the recently discovered Y(4260) resonance, from e^+e^- collisions at Belle - 439 *Samuel T McOnie, University of Sydney, Australia*
			15:30	Rare Radiative B Meson decays at The Belle Detector - 440 *Robin H Wedd, University of Melbourne, Australia*
15:40-16:20	Afternoon Tea with Exhibitors			

	Concurrent - 10.04	Concurrent - 10.05	Concurrent - 10.06
	AOS - Atom Counting & Quantum Fluctuations	**QUICC - Quantum Control**	**BMP** *Sponsored by QUT*
	Room P3	**Room P4**	**Room P5**
	Chairperson: Prof Peter D Drummond, University of Queensland, Australia	Chairperson: Michael JW Hall, Australian National University, Australia	Chairperson: Brian J Thomas, Queensland University of Technology, Australia
14:00	Experiments with a metastable atom laser - 441 *Beata J. Dabrowska-Wuester, Research School of Physical Sciences and Engineering, Australian National University, Australia*	Applications of control theory to coherent spectroscopy and quantum information science - 446 *Navin Khaneja, United States*	Modern medical imaging for better targeting cancers in radiotherapy - 450 *Tomas Kron, Peter MacCallum Cancer Centre, Australia*
14:20	Generating controllable atom-light entanglement with a Raman atom laser system - 442 *Simon A Haine, Australian National University, Australia*		
14:40	A Raman scheme for homodyne measurements of an atom laser beam - 443 *Dr Ashton S Bradley, ARC Center of excellence for Quantum-Atom Optics, University of Queensland, Brisbane, Australia, Australia*	Reconsidering rapid qubit purification by feedback - 447 *Howard M Wiseman, Australia*	A comparison of the temperature rise from ultrasound exposure at soft tissue/soft tissue and soft tissue/air boundaries - 451 *Dr Gilbert J Vella, School of Biomedical Sciences, The University of Sydney, Australia*
15:00	When superfluids are a drag: Quantum fluctuations and superfluidity - 444 *Dr Matthew J Davis, ARC Centre for Quantum-Atom Optics, School of Physical Sciences, University of Queensland, Brisbane, QLD 4069, Australia*	Modern quantum control applied to optical cavity locking - 448 *Prof Matthew R James, Department of Engineering, Faculty of Engineering and Information Technology, Australian National University, Australia*	Monte Carlo investigation of standard gel dosimetry calibration techniques - 452 *Dr Jamie V Trapp, RMIT University, Australia*
15:20	Quantum limits to bosonic centre-of-mass measurements - 445 *Mr Timothy G Vaughan, Australian Centre for Quantum Atom Optics, University of Queensland, Australia*	Closed-loop guidance and control for solid state qubits - 449 *Dr Jason F Ralph, The University of Liverpool, United Kingdom*	Application of the Lattice Boltzmann Method to non-Newtonian flow in a carotid artery model - 453 *Joshua Boyd, University of New England, Australia*

PROGRAM - THURSDAY

Thursday, 7 December 2006

	Concurrent - 11.01		Concurrent - 11.02		Concurrent - 11.03		Concurrent - 11.04	Concurrent - 11.05	Concurrent - 11.06
16:20-18:00	AOS - Optics 3		CMMSP - Surfaces 2	16:20-18:20	NUPP		AOS - Many-body Simulations	QUICC/CMMSP - Quantum Info in Solid State	BMP
	Great Hall 1&2		Room P1		Room P2		Room P3	Room P4	Room P5
	Chairperson: Taras Plakhotnik, The University of Queensland, Australia				Chairperson: Prof Aidan P Byrne, Australian National University, Australia		Chairperson: Howard J Carmichael, University of Auckland, New Zealand	Chairperson: Dr He-Bi Sun, Griffith University, Australia	Chairperson: Hans G L Coster, University of Sydney, Australia
16:20	Fabricating Opals to control the flow of light - 454 *L A Stewart, Macquarie University, Australia*	16:20	Growth of diamond-like carbon and carbon nitride films using bi-modal ion beam sputter deposition - 458 *Mr Maksym Rybachuk, Centre for Built Environment and Engineering Research, Queensland University of Technology, Australia*	16:20	A search for the SUSY Higgs in the decay H/A->tau+tau at the ATLAS experiment - 463 *Markus Bischofberger, University of Melbourne, Australia*		First-principles simulation of quantum dynamics in BEC collisions - 471 *Prof Peter D Drummond, ACQAO Centre, University of Queensland, Australia*	Electron spin qubit transport and fault-tolerant architectures for Si:P quantum computing - 476 *A/Prof Lloyd CL Hollenberg, Centre for Quantum Computer Technology, School of Physics, University of Melbourne, Australia*	fMRI Hemodynamic Responses: Linear analysis of a physiologically-based model of spatiotemporal response - 480 *Dr Peter M Drysdale, School of Physics, University of Sydney; Brain Dynamics Centre, Westmead Millenium Institute, Westmead Hospital, Australia*
		16:40	Quasi-two-dimensional nanostructures synthesized via the neutral and ionized gas routes - 459 *Kostya Ostrikov, University of Sydney, Australia*	16:40	Superconducting resonator for very low velocity heavy ions - 464 *Dr David C Weisser, Australia*		Collisions between bright solitary waves of three-dimensional Bose-Einstein condensates - 472 *Dr Nicholas G Parker, University of Melbourne, Australia*		Birth of a neuron-spike is a phase transition from linear stochastics to nonlinear dynamics - 481 *Dr Alistair Steyn-Ross, Dept of Physics & Electronic Engineering, Waikato University, Hamilton, New Zealand*
17:00	Nano-electronics and optical metamaterials - 455 *Tim J Davis, CSIRO MIT, Australia*	17:00	Avalanche detector technology for low energy single ion implantation - 460 *Dr David Jamieson, University of Melbourne, Australia*	17:00	Multiphonon couplings in the fusion reactions involving Ni nuclei - 465 *Matias D Rodriguez, Australian National University, Australia*		Quantum correlations in degenerate four-wave mixing of BECs in optical lattices - 473 *Mr Andrew J Ferris, University of Queensland, Australia*	Scalable quantum computing using solid-state optically active centres - 477 *Dr Matthew J Sellars, Australian National University, Australia* *Dr Jevon J Longdell, Australian National University, Australia* *Mr Elliot Fraval, Australian National University, Australia*	Neuronal population modeling of the brainstem ascending arousal system and sleep-wake dynamics - 482 *Andrew JK Phillips, School of Physics, University of Sydney, Australia*
17:20	Nano-focusing using a sharp metal wedge on a dielectric substrate - 456 *Kristy C Vernon, Queensland University of Technology, Australia*	17:20	Thermal tweezers with dynamic evolution of the heat source - 461 *Dmitri K Gramotnev, Queensland University of Technology, Australia*	17:20	Long-lived nuclear states in neutron-rich thulium isotopes - 466 *R O Hughes, Australian National University, Australia*		The Berezinskii-Kosterlitz-Thouless transition in 2D Bose gases - 474 *Christopher J Foster, University of Queensland, Australia*	Entanglement and boundary critical phenomena - 478 *Dr John O Fjaerestad, University of Queensland, Australia*	Performing running gait analysis using dead reckoning from body mounted accelerometers - 483 *Justin P Channells, Centre for Wireless Monitoring and Applications, Griffith University, Australia*
17:40	Controlling features produced in near-field scanning optical lithography of PPV - 457 *Daniel V Cotton, University of Newcastle, Australia*	17:40	Atomic-scale identification of acetone on Si(001) - 462 *Steven R Schofield, The University of Newcastle, Australia*	17:40	Software alignment of complex tracking detectors - 467 *Anthony K Morley, Univeristy of Melbourne, Australia*		Optimizing sonic horizons in Bose-Einstein condensates - 475 *Sebastian Wuester, ARC Centre of Excellence for Quantum-Atom Optics, Australian National University, Australia*	Realistic radio-frequency detection of charge qubit states - 479 *Mr Neil P Oxtoby, Centre for Quantum Computer Technology, Centre for Quantum Dynamics, School of Science, Griffith University, Australia*	Applications for inertial sensors in elite level half pipe snowboarding - 484 *Jason W Harding, Australian Institute of Sport, Australia*
				17:50	Dissipation and fluctuations in nuclear fusion forming heavy elements - 468 *David J Hinde, Australian National University, Australia*				
18:00-20:00	**Poster Session** **Environmental Physics (EP)** **Renewable Energy (RE)** **Biophysics and Medical Physics (BMP)** **Quantum Information Concepts and Coherence (QUICC)** **Acoustics and Music (AAS)** **Plasma Physics (AINSE)** **Complex Systems, Computational and Mathematical Physics (CSCMP)** **Atom Optics (AO)** **Exhibition Area, Plaza Terrace Room**			18:00	Solitaire: A new generation separator for products of nuclear fusion - 469 *Michael Brown, Australian National University, Australia*				
				18:10	Isomeric and intrinsic states in ^{184}W - 470 *Justin T Werner, Australian National University, Australia*				
19:00-20:00	Public Lecture: Stopping time - 485 *Professor Eric Mazur, Harvard College Professor, and Gordon McKay Professor of Applied Physics and Professor of Physics, Division of Engineering and Applied Sciences, Department of Physics, Harvard University, Cambridge, USA* **Great Hall 1&2**								

PROGRAM - THURSDAY

PROGRAM - FRIDAY

Friday, 8 December 2006

08:30-09:15	Plenary Speaker: *Sponsored by National Institute of Theoretical Physics* *Professor Michael Wiescher, Director of the Joint Institute for Nuclear Astrophysics Department of Physics, University of Notre Dame, Notre Dame, USA* **Great Hall 1&2** Chairperson; Prof G D Dracoulis, Australian National University, Australia										
09:15-10:00	Plenary Speaker: Proteins, aggregation and polymer physics - 501 *Sponsored by Paul Meredith-Soft Condensed Matter Group* *Professor Athene Donald, Professor of Experimental Physics, Cavendish Laboratory, Physics Department, University of Cambridge, United Kingdom* **Great Hall 1&2** Chairperson: A/Prof Alex R Hamilton, University of New South Wales, Australia										
09:30-14:00	Exhibition Open										
10:00-10:40	Morning Tea with Exhibitors										
10:40-12:20	**Concurrent - 12.01** **AOS - Fermions & Molecular Condensates** **Great Hall 1&2**	10:40-12:40	**Concurrent - 12.02** **CMMSP - Superconductivity 1** **Room P1**	10:40-12:20	**Concurrent - 12.03** **NUPP** **Room P2**		**Concurrent - 12.04** **CSCMP** **Room P3**	**Concurrent - 12.05** **CMMSP/QUICC - Qcomp Devices** **Room P4**		**Concurrent - 12.06** **BMP** **Room P5**
	Chairperson: Dr Chris J Vale, The University of Queensland, Australia				Chairperson: Prof Geoffrey Taylor, University of Melbourne, Australia		Chairperson: Tony Bracken, Australia			Chairperson: Tomas Kron, Peter MacCallum Cancer Centre, Australia	
10:40	New kinds of molecules from ultracold atomic gases - 502 *Deborah Jin, University of Colorado, United States*	10:40	On the nature of the superconducting transition in YBCO - 506 *Mohana Yethiraj, Oak Ridge National Laboratory, United States*	10:40	Looking for a hidden-beauty partner to the hybrid charmonium candidate Y(4260) - 511 *Bruce D Yabsley, University of Sydney, Australia*		Physics and the ARC complex open systems research network (COSNet) - 516 *Prof Robert L Dewar, The Australian National University, Australia*	Single atom nanoelectronics and spintronics for silicon-based qubits - 520 *Robert Clark, Centre for Quantum Computing Technology, University of New South Wales, Australia*	10:40	Changes in microstructure of articular cartilage visualised using diffusion tensor Magnetic Resonance Imaging (MRI) - 524 *James M Pope, School of Physical and Chemical Sciences, Queensland University of Technology, Australia*	
				11:00	Estimating total cross sections from neutron-nucleus collisions using a simple functional form - 512 *Deb K Pradip, Queensland University of Technology, Australia*		Downfall of Granular columns: Analogue models and numerical simulations - 517 *Dr Vincent Lemiale, Monash University - School of mathematical sciences, Australia*		11:00	Small-angle X-ray scattering and second-harmonic generation imaging studies of collagen in invasive carcinoma - 525 *Sarah J Pearson, University of New England, Australia*	
11:20	First-principles quantum simulations of dissociation of molecular condensates - 503 *Dr Craig M Savage, ARC Centre of Excellence for Quantum-Atom Optics, Department of Physics, Australian National University, Australia*	11:20	*Prof Ross McKenzie, School of Physical Sciences, University of Queensland, Australia*	11:20	Conversion Coefficients - How good are they now? - 513 *Dr Tibor Kibedi, Dep. of Nuclear Physics, RSPhysSE, The Australian National University, Canberra, ACT 0200, Australia, Australia*		Demonstration of the fluctuation theorem in a viscoelastic solution using optical tweezers - 518 *Dr Genmiao Wang, The Australian National University, Australia*	Ion beam lithography using a nano-aperture - 521 *Prof Peter N Johnston, RMIT University, Australia*	11:20	Optical spectroscopy of Eumelanin Monomers and Dimers - 526 *Stephen P Nighswander-Rempel, University of Queensland, Australia*	
11:40	Visualization of vortex bound states in polarized Fermi gases at unitarity - 504 *Hui Hu, Renmin University of China, China*	11:40	Co-existence of Vortex Flux Lattice and Magnetic Ordering in HTSC - 508 *Dr Ujjual Divakar, University of Queensland, Australia*	11:40	A novel spectrometer for characterising exotic nuclei - 514 *Dr Paivi Nieminen, Department of Nuclear Physics, Australian National University, Canberra, Australia*		Simulating quantum many-body systems with phase-space methods - 519 *Joel F Corney, University of Queensland, Australia*	Recent developments in electronic raman spectroscopy of interacting Phosphorus donors in silicon - 522 *Nikolas Stavrias, The University of Melbourne, Australia*	11:40	Spectroscopic observation of Melanin formation - 527 *Jennifer J Riesz, University of Queensland, Australia*	
12:00	Mott-state quantum dynamics of an atomic-molecular gas in an optical lattice - 419 *Karen V Kheruntsyan, ARC Centre of Excellence for Quantum-Atom Optics, University of Queensland, Australia*	12:00	Presentation - Simon Lam *Dr Simon K Lam, CSIRO Industrial Physics, Australia, Australia* A new 45 degree tilted YBa2Cu3O7-x Josephson junction for the investigation of d-wave superconductivity in a high temperature superconductor - 510 *Dr Simon K Lam, CSIRO Industrial Physics, Australia, Australia*	12:00	A global computing grid for analysis of data in the era of the large hadron collider - 515 *Glenn R Moloney, University of Melbourne, Australia*			Readout of solid-state charge qubits using a single-electron pump - 523 *A/Prog Jingbo Wang, University of Western Australia, Australia*	12:00	Optical response functions in vertebrate photoreceptor models - 528 *Leigh Fischer, School of Physical Sciences, The University of Queensland, Australia*	
12:20-14:00	Lunch (own arrangements)				**ITER Meeting** **Room P2**						

PROGRAM - FRIDAY

Friday, 8 December 2006

	Concurrent - 13.01	Concurrent - 13.02		Concurrent - 13.03	Concurrent - 13.04	Concurrent - 13.05	Concurrent - 13.06
14:00-15:40	AOS - Quantum Optics	CMMSP - Superconductivity 2		PLASMA	CSCMP	CMMSP - Opt Props / Overflow	EP / RE
	Great Hall 1&2	Room P1		Room P2	Room P3	Room P4	Room P5
	Chairperson: Dr Geoff J Pryde, University of Queenland, Australia			Chairperson: Dr Boyd B Blackwell, Australian National University, Australia	Chairperson: Jon Links, Australia		Chairperson: Liudmila A Uvarova, Moscow State University of Technology, Russia
14:00	Generation of audio band squeezing for gravitational wave detectors - 529 *Stefan Gossler, Australian National University, Australia*	Development of advanced magnesium diboride conductors by nano-dping - 533 *S X Dou, Institute for Superconducting and Electronic Materials. University of Wollongong, Australia*	14:00	The development of the high-current pulsed cathodic arc system at the University of Sydney - 537 *Richard N Tarrant, The University of Sydney, Australia*	A Quantum model of the Riemann zeros - 543 *German Sierra*	Solid oxide fuel cells: A SAXS study of the effects of solution concentration on particle size - 547 *Mr Geoffrey A Carter, Curtin University of Technology, Australia*	Cloud effects on evaporation at a sub-tropical site - 552 *Amber R Young, University of Southern Queensland, Australia*
			14:20	New aspects for low cost energy by inertial fusion using Petawatt lasers - 538 *Heinrich Hora, University of New South Wales, Australia*		User-defined single photon pulses controlled by an electric field in solid-state cavity QED systems - 548 *Dr Mark J Fernee, University of Queensland, Australia*	Assessment of Plutonium as a tracer of soil transport using Accelerator Mass Spectrometry - 553 *Sarah E Everett, Australian National University, Australia*
14:40	Squeezing at Rubidium wavelength - 530 *Mr Gabriel Hetet, Australian National University, Australia*	A cryocooled SQUID-based metal detector with improved noise reduction and signal extraction - 534 *Florian A Oppolzer, CSIRO Industrial Physics, Australia*	14:40	Reconciling 3D toroidal plasma confinement and Hamiltonian chaos theory - 539 *Dr Matthew J Hole, Research School of Physical Sciences and Engineering, ANU, Australia*	Bethe ansatz methods for the study of attractive bosons - 544 *Norman Oelkers, Mathematics, University of Queensland, Australia*	Radiation induced changes in the optical properties of Manganese Doped Fluoroperovskites - 549 *Christian Dotzler, Victoria University of Wellington, New Zealand*	Doped Fe_2O_3 nanostructured electrodes for photoelectrochemical hydrogen production - 554 *Ms Julie A Glasscock, CSIRO Industrial Physics, Australia*
			14:50	Zonal flow generation by modulational instability - 540 *Raden Farzand Abdullatif, The Australian National University, Australia*	Theoretical and experimental simulations of Quantum Random Walks - 545 *Kia Manouchehri, The University of Western Australia, Australia* *A/Prog Jingbo Wang, University of Western Australia, Australia*		
15:00	Quantum dynamics of polarisation squeezing in optical fibres - 531 *Joel F Corney, University of Queensland, Australia*	Influence of multilayering and doping on thickness dependence of superconducting properties in $YBa_2Cu_3O_7$ films - 535 *Dr Alexey V Pan, Institute for Superconducting and Electronic Materials, University of Wollongong, Australia*	15:00	Homodyne polarimetry for sensing Alfven activity in the H-1 - 541 *David J Byrne, Australian National University, Australia*	Generalised exclusion statistics and anyons - 546 *Murray T Batchelor, The Australian National University, Australia*	The mechanism behind the polar nano-domain structure in relaxor ferroelectric $Pb(Zn_{1/3}Nb_{2/3})O_3$, PZN - 550 *Dr D J Goossens, Research School of Chemistry, Australian National University, Canberra, ACT 0200, Australia, Australia*	20% efficient SLIVER solar cells - 555 *Andrew W Blakers, Australian National University, Australia*
15:20	Effect of spatial coherence of a pseudo-thermal beam on classical ghost-imaging experiments - 532 *Ann Roberts, University of Melbourne, Australia*	The influence of fly ash morphology and phase distribution on collection in an electrostatic precipitator - 536 *Richard D Metcalfe, Central Queensland University, Australia*	15:10	Bifurcation structure in resistive drift wave turbulence - 542 *Dr Ryusuke Numata, Department of Theoretical Physics, RSPhysSE, The Australian National University, Australia*		Computer modelling of P-P+ artificial molecule microwave spectroscopy experiments - 551 *Mr Vincent I Conrad, University of Melbourne, Australia*	Accelerator mass spectrometry of plutonium - 556 *Stephen G Tims, Australian National University, Australia*
15:40-16:40	Congress Close and Presentation of Student Prizes for OSA & SPIE						
	Great Hall 1&2						
	Chairperson: Professor David Jamieson, President, Australian Institute of Physics						

Monday, 4 December 2006

18:00-20:00	**Poster - PS01.1**
	Solar-Terestrial and Space Physics (STSP)
	Exhibition Area, Plaza Terrace Room

A new Fabry Perot Spectrometer for thermospheric airglow observations above Davis Station in Antarctica - 601
Prof Peter L Dyson, La Trobe University, Australia

Energy deposition of ULF wave energy in the Magnetosphere-Ionosphere-Ground system - 602
Dr Colin L Waters, School of Mathematical and Physical Science, University of Newcastle, Australia., Australia

The use of Spherical Cap Harmonic analysis in predicting ground magnetic perturbations from Lonospheric electric field and conductance models - 603
Dr Colin L Waters, Center for Space Physics Research, University of Newcastle, Callaghan, Australia

Towards a synthesis of substorm electrodynamics: HF radar and auroral observations - 604
Dr Murray L Parkinson, Department of Physics, La Trobe University, Victoria, Australia
Prof Peter L Dyson, La Trobe University, Australia

ULF wave fields measured in the low latitude ionosphere - 605
Dr Colin L Waters, The University of Newcastle, Australia

Cusp latitude field line resonances: Two-dimensional cross-phase gradients and diurnal azimuth angle variation - 606
Dr Sean T Ables, University of Newcastle, Australia

Dynamics of coupled magnetosphere-ionosphere energy subsystems - 607
Dr Rowena Ball, The Australian National University, Australia

Space physics research at the University of Sydney - 608
Prof Iver H Cairns, School of Physics, University of Sydney, Australia

Statistics and correlation functions of stochastically growing waves - 609
Prof Iver H Cairns, School of Physics, University of Sydney, Australia
Amplitude and time distributions of ionospheric scatter - 610
David G Cole, IPS Radio and Space Service, Australia

Future data management at the WDC for Solar-Terrestrial Science - 611
Dr David G Cole, Department of Industry, Tourism and Resources, IPS Radio and Space Services, Australia

Jet planes and cosmic rays - 612
Marcus L Duldig, Australian Antarctic Division, Department of the Environment and Heritage, Australia

High time-resolution observations of the 630nm airglow emission above Davis, Antarctica - 613
Prof Peter L Dyson, La Trobe University, Australia

Space physics research at La Trobe University - 614
Prof Peter L Dyson, La Trobe University, Australia

Research on solar-terrestrial and space physics at the University of Newcastle - 615
Brian J Fraser, School of Mathematical and Physical Sciences, University of Newcastle, Australia

Simultaneous observations of ULF waves in the magnetosphere, Ionosphere and on the ground - 616
Brian J Fraser, School of Mathematical and Physical Sciences, University of Newcastle, Australia

Enhanced Beam steering capabilities for the TIGER SuperDARN radars - 617
Mr Ryan C Healey, Department of Physics, La Trobe University, Bundoora, Victoria, Australia

Dr Murray L Parkinson, Department of Physics, La Trobe University, Bundoora, Victoria, Australia

Impact of Jan 10 1997 storm on night-time space weather investigated by TOPEX/ Poseidon radar altimetry - 618
Ildiko Horvath, University of Queensland, Australia

TEC climatology of the daytime Weddell Sea Anomaly investigated by TOPEX/ Poseidon radar altimetry - 619
Ildiko Horvath, University of Queensland, Australia

An Auroral Westward Flow Channel (AWFC) and its relationship to field-aligned current, ring current, and plasmapause location Determined Using the Cluster and Iridium Satellites - 620
Dr Murray L Parkinson, Department of Physics, La Trobe University, Victoria, Australia

Observations of a phase transition in the plasma turbulence across the HF radar spectral width boundary - 621
Dr Murray L Parkinson, Department of Physics, La Trobe University, Victoria, Australia

Real-time Ionospheric mapping with outlier samples - 622
Dr Mike D Turley, Australia

Plasma mass density during a magnetic storm in March 2004 - 623
Dr Colin L Waters, Department of Physics, University of Newcastle, New South Wales 2038, Australia

Space weather reports for Antarctica during the international polar year - 624
Dr Phil Wilkinson, IPS Radio and Space Services, Australia

Evidence of the De Vries, Gleissberg and Hale Cycles in the Sun's Barycentric Motion - 625
Ian R Wilson, University of Southern Queensland, Australia

18:00-20:00	**Poster - PS01.2**
	Education (PEG)
	Exhibition Area, Plaza Terrace Room

A preliminary study of the hard-easy effect using physics conceptual inventories - 626
Dr Manjula Sharma, University of Sydney, Australia

Aether theories: A physics fairytale re-told - 627
Dr Timo A Nieminen, The University of Queensland, Australia

Detection of quantum noise in laser light: A portable and educational system - 628
M Colla, The Australian National University, Australia

Connecting celestial and terrestrial physics - 629
Stephen W Hughes, Queensland University of Technology, Australia

Simple experiments to obtain resonance curves using resonance tubes - 630
Professor Bandara S Karunaratne, University of Peradeniya, Sri Lanka

3D link maps for learning: Consolidating fundamental concepts across topics in physics - 631
Ms Christine LindstrØm, Australia

Project-based assessment for graduate coursework - 632
Dr Timo A Nieminen, The University of Queensland, Australia

Our space-time universe in powers of 100 - 633
Dr Peter D Norman, Monash University, Peninsula campus, Australia

Surveying Sydney introductory physics students' understandings of heat and temperature - 634
Choksin Tanahoung, Australia

18:00-20:00	**Poster - PS01.3**
	Relativity and Gravitation (ASRG)
	Exhibition Area, Plaza Terrace Room

Spiral galaxy rotation curves determined from carmelian general relativity - 635
John G Hartnett, University of Western Australia, Australia

Nature of gravitation - 636
Boris Litvak, Australia

Monday, 4 December 2006

18:00-20:00	**Poster - PS01.4**
	Astronomy (ASA)
	Exhibition Area, Plaza Terrace Room

The Solar-Stellar connection - 637
Brad Carter, University of Southern Queensland, Australia

High-resolution observations of the magellanic stream - 638
Prof Peter L Dyson, La Trobe University, Australia

Broadening of alkali doublets by helium perturbers in brown dwarf atmospheres - 639
Mr Stephen J Gibson, School of Mathematical and Physical Sciences, James Cook University, Townsville, Australi 4811, Australia

Variable star and stellar properties - 640
Khadijeh Najafi, Zanjan University, Iran

Red giant stars and Bethe's C-N-O cycle - 641
Dr Peter D Norman, Monash University, Peninsula campus, Australia

18:00-20:00	**Poster - PS01.5**
	Synchrotron Science (ASRP)
	Exhibition Area, Plaza Terrace Room

Studies of residual stress distributions in single bead on plate using high energy synchrotron radiation and neutron scattering - 642
Trevor R Finlayson, Monash University, Australia

Real time fill pattern monitor at the Australian synchrotron - 643
Mr David J Peake, University of Melbourne, Australia

Complete reconstruction of the coherence function for optical wavefields - 130
Samuel Flewett, School of Physics, University of Melbourne, Australia

18:00-20:00	**Poster - PS01.6**
	Optics, Photonics, Laser Physics (AOS)
	Exhibition Area, Plaza Terrace Room

Entangled-State Cycles of Atomic Collective-Spin States - 644
A Chia, University of Auckland, New Zealand

A UV Diode Laser System for Cooling Yb+ - 645
Geoff Genn, Centre for Quantum Dynamics, School of Science, Griffith University, Australia

Soliton production in unbiased self-defocusing Photorefractive Media - 646
Dr Esa A Jaatinen, Queensland University of Technology, Australia

Lagrangian approach for dissipative optical solitons - 647
Prof Nail N Akhmediev, Optical Sciences Group, Research School of Physical Sciences and Engineering, Australia

Nanotrapping and the thermodynamics of optical tweezers - 648
Dr Timo A Nieminen, The University of Queensland, Australia

Studies of the coherent nature of high-order harmonics of femtosecond laser pulses - 649
Mr Sven Teichman, Swinburne University of Technology, Australia

Study of solidification process by tunable mid-infrared Laser Spectroscopy and Raman Spectroscopy - 650
K Monowar Abedin, Tohoku University, Japan

Optically fabricated and driven micromachines - 651
Theodor Asavei, University of Queensland, Australia

Calculating correlation functions for 1D Bose gases - 652
Mr David W Barry, Australian Centre for Quantum-Atom Optics, University of Queensland, Australia

Quasi-stationary optical solitons with dual-power law nonlinearity - 653
Anjan Biswas, Delaware State University, United States

Microscopic characterization of a fibre Bragg grating - 654
Stephen F Collins, Victoria University, Australia

Progress towards coupled quantum dot/microcavities for cavity QED - 655
Dr Steven J Cooper, University of Queensland, Australia

Production of High-Q Fused Silica Microcavities - 656
Mr Michael J Dalley, University of Queensland, Australia

The refractive index of damaged diamond by Ion implantation - 657
Martin A Draganski, RMIT University Melbourne, Australia

Near-Infrared Polymer/PCBM blend photovoltaic device response. - 658
Benjamin Duck, University of Newcastle, Australia

Electronic structures and optical properties of InGaAsN quantum wells - 659
Dr W J Fan, Singapore

Numerical modeling of optical traps using rigorous vectorial diffraction and FDTD method - 660
Xiaosong Gan, Swinburne University of Technology, Australia

Broadband diffraction management and self-collimation of light in photonic lattices - 661
Ivan L Garanovich, Nonlinear Physics Centre and CUDOS, Australian National University, Australia

Light localization at nonlinear lattice interfaces - 662
Ivan L Garanovich, Nonlinear Physics Centre and CUDOS, Australian National University, Australia

Optical characterisation and restoration of MPCVD processed Titanium-diffused $LiNbO_3$ waveguides - 663
Dr Brant C Gibson, Quantum Communications Victoria, University of Melbourne, Australia

Tomographic reconstruction for complex-structured optical fibres - 664
Xiao Ming Goh, University of Melbourne, Australia

Coating-free mirrors for ultra-high precision interferometry - 665
Mr Conor Mow-Lowry, Australian National University, Australia

Harmonic entanglement from second-order nonlinearity - 666
Dr Thomas Symul, Australian National University, Australia

Photon statistics of single colour centres in diamond - 667
Joanne P Harrison, Australian National University, Australia

Sapphire cryogenic oscillators: Preparation for a new test of violation of Lorentz invariance using ultra-stable precision microwave oscillators - 668
John G Hartnett, University of Western Australia, Australia

Frequency stabilisation of a tunable diode laser: novel optical feedback schemes - 669
Dr Yabai He, Centre for Lasers and Applications, Macquarie University, Australia

Trace gas detection by rapidly swept cavity ringdown spectroscopy - 670
Dr Yabai He, Centre for Lasers and Applications, Macquarie University, Australia

Development of a Time-domain Analysis to study the High-Pressure Regime of modulation transfer spectroscopy - 671
Dr Esa A Jaatinen, QUT, Australia
David J Hopper, QUT, Australia

Experimental realization of spatial entanglement for bright optical beams - 672
J Janousek, Centre for Quantum-Atom Optics, The Australian National University and Department of Physics, Technical University of Denmark, Australia

Titanium doped cryogenic sapphire resonator oscillators - 673
Dr Yann Kersale, University of Western Australia, France

Intra-grating sensing with a chirped fibre Bragg grating using and integration method - 674
Dr Daniel J Kitcher, Victoria University, Australia

Monday, 4 December 2006

18:00-20:00	**Poster - PS01.6 Continued**
	Optics, Photonics, Laser Physics (AOS)
	Exhibition Area, Plaza Terrace Room

Forces from highly focused laser beams: Modeling, measurement and application to refractive index measurements - 675
Gregor Knöner, Centre for Biophotonics and Laser Science, University of Queensland, Australia

A simple technique for measuring the indices of refraction of a photorefractive medium - 676
Mr Martin L Kurth, Queensland University of Technology, Australia

Computational modeling of optical trapping of vaterite microspheres - 677
Mr Vincent L Y Loke, The University of Queensland, Australia

Gas detection by use of a Sagnac Interferometer - 678
Mr Sean R McConnell, Queensland University of technology, Australia
Dr Esa A Jaatinen, Queensland University of Technology, Australia

Imaging techniques for supersonic combustion ramjet flows - 679
Timothy J McIntyre, The University of Queensland, Australia
Ms Kim M Hajek, University of Queensland, Australia

Coupled Modeling Of Strained AlN/GaN Heterojunctions - 680
Prof Roderick Melnik, Wilfrid Laurier University, Waterloo, Canada

Localization of polychromatic light in nonlinear photonic lattices - 681
Dr Kristian Motzek, Nonlinear Physics Centre, RSPhysSE, ANU, Germany

Numerical simulation of spectral purity and dynamics in an injection-seeded pulsed optical parametric oscillator - 682
Brian J Orr, Macquarie University, Australia
Dr Yabai He, Centre for Lasers and Applications, Macquarie University, Sydney, Australia
Dr Kenneth G H Baldwin, Research School of Physical Sciences and Engineering, Australian National University, Australia

Quantifying Orbital Angular Momentum Transfer in Optical Tweezers - 683
Simon J W Parkin, The University of Queensland, Australia

Data storage in photorefractive phase masks in $LiNbO_3$:Fe - 684
Daniel M Sando, Queensland University of Technology, Australia

Multiplexed waveguide phase masks in Fe:$LiNbO_3$ - 685
Daniel M Sando, Queensland University of Technology, Australia

Imaging of the erbium ion distribution in fibres with Near Field Scanning Microscopy - 686
Fotios Sidiroglou, School of Physics, University of Melbourne, Australia

Phonon induced population inversion in driven quantum dots - 687
Tom Stace, University of Queensland, School of Physical Sciences, Australia

Nd:YAG laser micro machining: The evolution of the cavity cross section shape - 688
Stephan Stiess, University of Newcastle, Australia

Dynamic Multi-Beam laser trapping of Birefringent materials - 689
Alexander B E Stilgoe, University of Queensland, Australia

Analytical-numerical investigation of propagation of localized electromagnetic structures in layered media - 690
Alexander I Sukov, Moscow State University of Technology, Russia

Double variational method to solve the problem of wave diffraction by a periodic surface - 691
Alexander I Sukov, Moscow State University of Technology, Russia

Fabrication of silicon nanocrystals by nanosecond laser fragmentations of silicon micro-grains in colloidal suspensions - 692
Vladimir Svrcek, Nanoarchitectonics Research Center, AIST, Higashi, Tsukuba, Ibaraki, Japan

Time domain simulation of plasmonics in metallic nanoparticles - 693
Brian J Thomas, School of Physical & Chemical Sciences, Queensland University of Technology, Australia

Techniques for pure frequency generation in the microwave spectrum - 694
Michael E Tobar, University of Western Australia, Australia

Influence of higher order dispersion on soliton dynamics - 695
Eduard N Tsoy, University of Sydney, Australia

Localisation of channel Plasmon-Polaritons in dielectric-filled V-grooves in a metal substrate - 696
Kristy C Vernon, Queensland University of Technology, Australia

Analyses of Adiabatic Nano-Focusing in Metal Tips and Nano-Holes in the presence of dissipation - 697
Mr Michael W Vogel, Queensland University of Technology, Australia

Optical reflection from a monolayer of capped embedded semiconductor nano-objects - 698
Professor Chistianus Martinus Jopsephus Wijers, National Chiao Tung University, Taiwan
Professor Oleksandr Voskoboynikov, National Chiao Tung University, Taiwan

Effects of transverse strain on dips at 2/3 of the Bragg wavelength in a non-birefringent fibre Bragg grating - 699
Mr Sui P Yam, Victoria University, Australia

Thermal, optical and carrier transport properties of porous Silicon and Metal Silicide layers on silicon Substrate - 700
W Mahmood Mat Yunus, University Putra Malaysia, Malaysia

Characterization of InSbN alloys fabricated by ion implantation - 701
Prof D H Zhang, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

InSbN/InSb quantum wells for terahertz photodetectors - 702
Prof D H Zhang, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

Tuesday, 5 December 2006

18:00-20:00	**Poster - PS02.2**
	Atomic and Molecular Physics and Quantum Chemistry (AMPQC)
	Exhibition Area, Plaza Terrace Room

Cooling of atomic species with ultrafast lasers - 703
M McDonnell, Centre for Quantum Dynamics, School of Science, Griffith University, Australia

Interaction of sugar-base in an anti cancer drug Cytosine deoxyriboside - 704
Saumitra Saha, Centre for Molecular Simulation, Swinburne University of Technology, Australia

Adsorption and interaction of 5-fluorouracil with montmorillonite and saponite by IR and Raman Spectroscopy - 705
Prof Sevim Akyuz, Istanbul University, Turkey

Iron nanodots created via metastable atom lithography with a standing wave optical mask - 706
Mr Joshua P Beardmore, Griffith University, Australia

The radiative potential and calculations of QED radiative corrections to energies and E1 amplitudes in many-electron atoms; application to parity nonconservation in cesium - 707
Jacinda Ginges, University of New South Wales, Australia

Experimental and Theoretical NMR Study of 4-Phenylpyridine - 708
Ozgur Alver, Turkey

Vibrational spectroscopic study of two dimensional polymer compounds of Pyrazinamide - 709
Gönül Basar, Istanbul University, Turkey

(e,2e) Study of molecules: Investigations into molecular frame dynamics - 710
Dr Susan Bellm, Australian National University, Australia

Pierce geometry electron guns as off-the-shelf nanosecond pulsed electron sources - 711
Dr Benjamin G Birdsey, University of Western Australia, United States

Circular dichrosim from stepwise laser/electron impact autoionising levels in Rubidium - 712
Mr William E Guinea, Centre for Quantum Dynamics, Australia

A photodissociation model of molecular nitrogen for planetary studies - 713
Alan N Heays, AMPL, Australia

An experimental and theoretical study into the outer valence electronic structure of Bicyclo[2.2.2]octa-2,5-dione - 714
Darryl B Jones, School of Chemistry, Physics & Earth Sciences, Flinders University, Australia

(e,2e) Measurements using a magnetic angle changer - 715
Mr Anthony J Keehn, Centre for Quantum Dynamics, Griffith University, Australia

Elastic scattering of electrons and positrons from Noble gases - 716
Professor Robert P McEachran, CAMS, RSPhySSE, Australian National University, Canberra, ACT, Australia

Near-Threshold Cross Sections for electronic excitation of atoms and molecules by electron impact - 717
Stan Newman, Centre for Antimatter-Matter Studies, RSPhysSE, Australian National University, Australia

Intermolecular interactions probed via electron momentum spectroscopy of van der Waals molecules - 718
Kate L Nixon, Flinders University, Australia

Vibrational analysis and quantum chemical calculation of 2,2'-bipyridine Zn(II) Cu(II)Fe(II) halide complexes - 719
Aysen E Ozel, Istanbul University, Turkey

$^{171}Yb^{+}$ Microwave Frequency Standard - 720
Dr Sung Jong Park, National Measurement Institute, Australia

Experimental and Theoretical NMR Study of 4-(3-Cyclohexen-1-yl)Pyridine - 721
Cemal Parlak, Turkey

FT-IR spectroscopic study on some Hofmann type complexes - 722
Cemal Parlak, Plant Drug and Scientific Research Center, ANADOLU UNIV., Turkey

Stochastic geometry optimization in variational Monte Carlo - 723
Manolo Per, RMIT University, Australia

Dynamics of bright solitons in one-dimensional Bose-Einstein condensates - 724
Mr Masum Rab, The University of Melbourne, Australia

Absolute cross sections for electron impact excitation of the electronic states of water - 725
Penny A Thorn, ARC Centre for Antimatter-Matter Studies, SoCPES, Flinders University, Australia
Miss Nicole Diakomichalis, ARC Centre for Antimatter-Matter Studies, SoCPES, Flinders University, Australia

Absolute optical frequency measurement with a fibre-laser frequency comb - 726
Dr Michael Wouters, National Measurement Institute, Australia

Long-range interactions between two Helium atoms - 727
Jun-Yi Zhang, School of Engineering and Logistics, Charles Darwin University, Australia

18:00-20:00	**Poster - PS02.3**
	Condensed Matter and Materials, and Surface Physics (CMMSP)
	Exhibition Area, Plaza Terrace Room

Electron energy loss spectroscopy: Mapping optical properties at the Nanometre scale - 728
Dr Vicki J Keast, School of Mathematical and Physical Science, The University of Newcastle, Australia

Superfluidity versus disorder in a Bose-Einstein condensate - 729
M Ogren, Mathematical Physics, Sweden

A novel 2-D frustrated antiferromagnet - The Union-Jack Lattice - 730
Jaan Oitmaa, School of Physics, University of New South Wales, Australia

Characterization of single ion tracks in PMMA created by light and heavy ion microprobes - 731
Prof Peter N Johnston, RMIT University, Australia

Magnetic signals from proton implanted microstructures in graphite - 732
Peter N Johnston, RMIT, Australia

Reflectance of Terahertz emitter materials - 733
Roger A Lewis, University of Wollongong, Australia

SIKA - a new triple-axis-spectrometer for cold neutrons - 734
Peter W Vorderwisch, SIKA Project, Bragg Institute, ANSTO, Australia

Time-resolved studies of ferroelectric materials using Neutron Stroboscopic techniques during the application of electric fields - 735
Trevor R Finlayson, Monash University, Australia

Ion beam modification of materials- focus on silicon based nanotechnology for next generation CMOS applications - 736
Shuja Ahmed, COMSATS Institute of Information Technology, Islamabad, Pakistan

Anisotropy of the electrical-conductivityof layered crystals with the scattering of charge carriers by impurity ions - 737
Bahram M Askerov, Baku State University, Azerbaijan

Glass-like behaviour in silica films under ambient conditions - 738
Vicky Au, IP Australia, Australia

Investigations of hydrogen uptake in ball milled TiMgNi - 739
Craig E Buckley, Department of Imaging and Applied Physics, Australia

X-ray studies and analysis of the optical constants of transparent IZO thin film deposited by spray pyrolysis method - 740
Mujdat Caglar, Anadolu University, Turkey

Production and characterization of indium-doped zinc oxide nano-semiconductor material by spray pyrolysis method - 741
Dr Yasemin Caglar, Anadolu University, Turkey

Entanglement and Bell states in superconducting flux qubits - 742
Sam Young Cho, University of Queensland, Australia

Quasielastic neutron scattering in copper selenide superionic conductor - 743
Sergey A Danilkin, ANSTO, Australia

The TAIPAN thermal triple-axis spectrometer at the OPAL reactor - 744
Sergey A Danilkin, ANSTO, Australia

Tuesday, 5 December 2006

18:00-20:00 **Poster - PS02.3 Continued**

Condensed Matter and Materials, and Surface Physics (CMMSP)

Exhibition Area, Plaza Terrace Room

Role of Nitrogen vacancies and impurities in Indium Nitride: First-principles investigations - 745
Xiangmei Duan, Australia

Material issues in the micro-fabrication of sub micron layers single-crystal diamond - 746
Barbara A Fairchild, University of Melbourne, Australia

Stability and chemistry of Cerium Oxide surfaces: First-principles investigations - 747
Marco Fronzi, University of Tor Vergata of Rome, Italy and School of Physics, University of Sydney, Australia

Stochastic eEvaporation/degradation processes in complex structures with multiple bonds - 748
Dmitri K Gramotnev, Queensland University of Technology, Australia

Hydrogen storage properties of C14-type laves phase alloys Ti1-xZrx(Mn0.5Cr0.5)2 - 749
Ms Xiumei Guo, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, China

One-particle spectral weights in the transverse ising model - 750
A/Prof Chris J Hamer, School of Physics, University of New South Wales, Australia

Quokka: The small-angle neutron scattering instrument at OPAL - 751
W A Hamilton, Bragg Institute, ANSTO, Menai, NSW, Australia

PLATYPUS - The time-of-flight neutron reflectometer at Australia's New 20 MW OPAL research reactor - 752
Dr William A Hamilton, Oak Ridge National Laboratory, United States

Optical and electrical properties of plasma modified polystyrene by using plasma immersion ion implantation technique - 753
Zhao Jun Han, Nanyang Technological University, Singapore

Effect of screening on the metallic behaviour of two-dimensional hole systems using a high-mobility AlGaAs/GaAs double quantum well structure - 754
Mr Lap-hang Ho, School of Physics, University of New South Wales, Sydney NSW, Australia

Use of avalanche generation for the detection of single low-energy ions implanted into silicon - 755
Toby Hopf, University of Melbourne, Australia

The single-oscillator model and optical constants of non-doped and fluorine-doped ZnO thin films - 756
Dr Saliha Ilican, Anadolu University, Turkey

The Kadowaki-Woods ratio in organic superconductors - 757
Mr Anthony C Jacko, University of Queensland, Australia

Quantum charge transport in counted-atom silicon devices - 758
Lenneke Jong, Centre for Quantum Computer Technology, University of Melbourne, Australia

Novel crack patterns and propagation modes in PECVD silica films - 759
Mr Taehyun Kim, Australian National University, Australia

Spin wave parametric instability in in-plane confined magnetic films - 760
Dr Mikhail Kostylev, School of Physics, University of Western Australia, Australia

ECHIDNA - Getting OPAL's High Resolution Powder Diffractometer into operation - 761
Dr Klaus-Dieter Liss, Bragg Institute, ANSTO, Lucas Heights, Australia

Energy spectrum of new density-quasiparticles excited in the superfluid liquid Helium - 762
Dr Vahan Minasyan, Armenia

Subtle errors in the method of "collective variables" for a non-ideal Bose system by Bogoliubov-Zubarev, and in the theory of superconductivity of Bardeen, Cooper, Schrieffer, and Bogoliubov - 763
Dr Vahan Minasyan, Armenia

Subtle errors in the models of Bogoliubov- Huang-Yang-Lee, and London - 764
Dr Vahan Minasyan, Armenia

Determination of the a-Si:H/c-Si Interface Activation Energy - 765
Mr Jonathon Mitchell, The Australian National University, Australia

Calculation of bulk viscosity from a new formula - 766
Ali Hossein Mohammad Zaheri, Azad University of Arak, Iran

Proton conductivity in melanins - A novel class of Bio-Macromolecule - 767
Mr Albertus B Mostert, University of Queensland, Australia

Technical challenges in the fabrication of a spatially resolved helium field ionization detector - 768
Kane M O'Donnell, University of Newcastle, Australia

Raman measurements of Hydrogen Ions implanted into Silicon - 770
Mr Daniel J Pyke, MicroAnalytical Research Centre, University of Melbourne, Australia

Luminescence behavior of laser-irradiated porous silicon - 771
Dr M Shahid Rafique, University of Engineering and Technology, Pakistan

Empty and occupied Tamm surface states and resonances on Cu(111) surface - 772
Marlene N Read, University of New South Wales, Australia

Damage profiles in silicon after low energy P+ implantations - 773
Toby Hopf, University of Melbourne, Australia

Effective field theory of self-dual Josephson Junction arrays - 774
Dr Said Sakhi, American University of Sharjah, United Arab Emirates

Spin liquid vs Néel State: First principles studies of the magnetic ordering and the mott insulating state in organic charge transfer salts - 775
Edan P Scriven, University of Queensland, Australia

Buffer layer effect on the structural and electrical properties of rubrene-based organic thin-film transistors - 776
J H Seo, Institute of Physics and Applied Physics, Yonsei University, Korea

First-principles Investigations into Ceria-based Catalysts for the Direct Oxidation of Methane - 777
Mr Elvis Shoko, University of Queensland, Australia

Hygroscopic insulator organic field-effect transistor for biosensing applications - 778
Kathleen Sirois, The University of Newcastle, Australia

Catalyst for the oxygen-assisted water-gas shift reaction: An ab initio investigation of the copper oxide catalyst - 779
Aloysius Soon, The University of Sydney, Australia

Conducting and Superconducting Ion Implanted Polymers - 780
Andrew P Stephenson, University of Queensland, Australia

Single crystal neutron diffraction on the clathrates of Sr8Ga16Ge30, Ba8Ga16Ge30 and Sr4Ba4Ga16Ge30 - 781
Mr Murad JY Tayebjee, Bragg Institute, ANSTO, Australia

Ion implantation and annealing of indium nitride - 782
Dr Heiko Timmers, School of Physical, Environmental and Mathematical Sciences, University of New South Wales at ADFA, Australia

Ions implantation on Cadmium - 783
Dr M Khaleeq Ur-Rahman, Unversity of Engineering and Technology, Pakistan

Tuesday, 5 December 2006

18:00-20:00	**Poster - PS02.4**
	Nuclear and Particle Physics (NUPP)
	Exhibition Area, Plaza Terrace Room

Laser transmutation of 93Zr(γ,n) 92Zr using ultra intense lasers - 784
Professor Rasol Sadighi, Sharif University of Technology, Iran
Bahareh Safaei, Sharif University of Technology, Iran

Improved electron tracking in the ATLAS inner detector - 785
Will E Davey, University of Melbourne, Australia

Motion blur in PET imaging - 786
Vivien Lee, University of Melbourne, Australia

RF control system for the superconducting LINAC ANU - 787
Nikolai R Lobanov, Australian National University, Australia

Tag variable-based continuum suppression in b -> d gamma - 788
Clement J Ng, University of Melbourne, Australia

Detection of a light top squark with ATLAS - 789
Anna Phan, University of Melbourne, Australia

Possibility of laser-induced photo transmutation of hazardous nuclear waste of 126Sn into short-lived isotope of 125Sn - 790
Professor Rasol Sadighi, Sharif University of Technology, Iran

Lepton flavour violating decays in the ATLAS detector - 791
Suzie Sheehy, University of Melbourne, Australia

Gamma shielding design studies for Am-Be and Californium neutron sources - 792
A R Vejdani Noghreeyana, Physics Department, School of Sciences, Ferdowsi University of Mashhad, Iran

18:00-20:00	**Poster - PS02.5**
	Meteorology and Climate Change, and Oceanography (AMOS)
	Exhibition Area, Plaza Terrace Room

Solidification of leads: Analytical approach to nonlinear problem with moving boundaries - 793
Prof Dmitri V Alexandrov, Urals State University, Russia

Type II polar stratospheric cloud detection over east Antarctica using satellite imagery - 794
Mr Alexander D Fraser, University of Tasmania/Australian Antarctic Division, Australia

Thursday, 7 December 2006

18:00-20:00	**Poster - PS03.1**
	Environmental Physics (EP)
	Exhibition Area, Plaza Terrace Room

Anti-Symmetric correlation pattern for particle modes in combustion and background aerosols: Fragmentation theorem - 795
Dmitri K Gramotnev, Queensland University of Technology, Australia

Deposition and surface evolution of composite aerosol particles - 796
Dmitri K Gramotnev, Queensland University of Technology, Australia

Multi-channel statistical analysis for the detailed investigation of combustion aerosols - 797
Mrs Galina Gramotnev, Queensland University of Technology, Australia

Characterization of beach rocks of South East Coast of Tamilnadu, India by spectroscopic techniques - 798
Ravisankar R Ravi, SSN College of Engineering, Kalavakkam, India

Development of a high exposure underwater solar UV dosimeter - 799
Peter Schouten, University of Southern Queensland, Australia

Stochastic physic model for estimation of river's pollution - 800
Nikolay Vasilievich Sokolov, Russian Academy of Sciences, Russia

Development of a photosensitive Polymer for measurement of damaging blue light exposures - 801
Dr David J Turnbull, Faculty of Sciences, University of Southern Queensland, Australia

Qwasi-stationary heterogeneous burning of sperical particle in caseous Medium at large temperature differenses and large consentrations of Chemically active component - 802
Liudmila A Uvarova, Moscow State University of Technology, Russia

18:00-20:00	**Poster - PS03.2**
	Renewable Energy (RE)
	Exhibition Area, Plaza Terrace Room

Solar cells with electron beam produced junctions - 803
Heinrich Hora, University of New South Wales, Australia

Design considerations for enhancing the performance of conducting polymer/ nanocrystal solar cells - 804
Paul E Schwenn, The University of Queensland, Australia

18:00-20:00	**Poster - PS03.3**
	Biophysics and Medical Physics (BMP)
	Exhibition Area, Plaza Terrace Room

Towards a hand-held SPR Biosensor - 805
Tim J Davis, CSIRO MIT, Australia

Investigate the open kinematic model for tennis swing using networked sensors - 806
Amin Ahmadi, Centre for Wireless Monitoring Applications, Griffith University, Australia

Quantum tunneling of hydrogen species in enzymes: A minimal model - 807
Jacques P Bothma, University of Queensland, Australia

Accelerometer-based analysis of cricket shots - 808
Andrew W Busch, Griffith University, Australia

Comparing variations in the UV facial exposure received by school children in South-East Queensland - 809
Mr Nathan J Downs, University of Southern Queensland, Australia

Quantum mechanics in biology - minimal models for the protein and solvent - 810
Mr Joel B Gilmore, University of Queensland, Australia

Compact continuum models of brain dynamics in cortex - 811
Dr Jong-Won Kim, School of Physics, University of Sydney, Australia

Enhancement of the Peak-to-Valley Dose Ratio in a Synchrotron X-Ray Microbeam Array - 812
Michael LF Lerch, University of Wollongong, Australia

Time-Resolved Spectroscopy of Eumelanin and Eumelanin Analogues - 813
Stephen P Nighswander-Rempel, University of Queensland, Australia

Is melanin broadband absorbance due to scattering? - 814
Jennifer J Riesz, University of Queensland, Australia

Physiologically based modeling of epileptic seizures - 815
James A Roberts, School of Physics, University of Sydney, Australia

Analysis of alpha power to determine intention using a computer simulated targeting exercise - 816
David D Rowlands, Griffith University, Australia

Characterisation of optical properties of organosilica microspheres - 817
Katrina Y T Seet, The University of Queensland, Australia

Flow estimation of a double output centrifugal artificial heart pump as a Biventricular assist device by computational fluid dynamics - 818
Mr DongChoon Sin, Queensland University of Technology, Australia

Ultraviolet Radiation, Shade and Vitamin D3 - 819
Dr David J Turnbull, Faculty of Sciences, University of Southern Queensland, Australia

an orbital based study of the methyl fragment: thymine and uracil - 820
Feng Wang, Swinburne University of Technology, Australia

Including higher-order statistics in cortical mean-field modelling - 821
Marcus T Wilson, University of Waikato, New Zealand

Thursday, 7 December 2006

18:00-20:00	**Poster - PS03.4**
	Quantum Information Concepts and Coherence (QUICC)
	Exhibition Area, Plaza Terrace Room

Time optimal quantum evolution of mixed states - 822
A Carlini, Tokyo Institute of Technology, Japan and Center for Quantum Computer Technology, Macquarie University, Australia

Quantum Control from a Linear Algebraic Viewpoint - 823
P G Morrison, Centre of Quantum Computer Technology, Macquarie University, Australia

Quantum computing with spin qubits interacting through delocalized excitons: Overcoming hole mixing - 824
Dr Ahsan Nazir, Centre for Quantum Computer Technology, Centre for Quantum Dynamics, School of Science, Griffith University, Australia

Quantum teleportation of resonance fluorescence: Analytical results for spectra and photon correlations - 825
Changsuk Noh, University of Auckland, New Zealand

Quantum simulations of the Riemann Zeta function and other higher transcendentals - 826
J Twamley, Macquarie University, Centre for Quantum Computer Technology, Australia

On finding the general form of master equations - 827
Dr James D Cresser, Center for Quantum Computer Technology, Physics Department, Macquarie University, Australia

Strongly coupled single-electron transistor backaction and sensitivity for charge qubit measurements - 828
Dr He-Bi Sun, Centre for Quantum Computer Technology, Centre for Quantum Dynamics, School of Science, Griffith University, Australia

Subspace confinement of qubit systems - 829
Mr Jared H Cole, Centre for Quantum Computer Technology, School of Physics, University of Melbourne, Parkville 3010, Australia

Remote implementation of multipartite unitary operations - 830
Dr Dominic W Berry, Centre for Quantum Computer Technology, Macquarie University, Australia

Loss tolerant optical quantum computation with weak nonlinearities - 831
Ms Agata M Branczyk, University of Queensland, Australia

Entanglement transfer between two distant systems - 832
Mr Stanley Chan, University of Queensland, Australia

Rapid state-purification of a register using Quantum Feedback Control - 833
Joshua Combes, Centre for Quantum Computer Technology,Centre for Quantum Dynamics, School of Science Griffith University, Australia

Geodesics and optimal Quantum simulation - 834
Mr Mark R Dowling, University of Queensland, Australia

A comparison of gate characterisation methods - 835
Mr Zac W E Evans, Centre for Quantum Computer Technology, School of Physics, The University of Melbourne, Australia

Consistent description of quantum-classical interactions - 836
Michael JW Hall, Australian National University, Australia

Circuit-based quantum computing with a loss-tolerant error code - 837
Mr Alexander J F Hayes, University of Queensland, Australia

A quantum study of information delay via electromagnetically induced transparency - 838
Magnus TL Hsu, Australian National University, Australia
Dr Ben C Buchler, Australian National University, Australia

Quantum study of information delay via electromagnetically induced transparency - 839
Magnus TL Hsu, Australian National University, Australia

Pulse design for quantum computation in the Kane architecture - 840
Mr Gajendran Kandasamy, Centre for Quantum Computer Technology, School of Physics, University of Melbourne, Parkville, Victoria, Australia

Spatial quantum tomography with real-world holograms - 841
Nathan K Langford, University of Queensland, Australia

Transforming Biphotonic Qutrits - 842
Mr Benjamin P Lanyon, University of Queensland, Australia

Improving fidelity of skewed output states of optical zeno gates - 843
Patrick M Leung, University of Queensland, Australia

Loss in coherent state quantum computing - 844
Austin P Lund, Centre for Quantum Computer Technology, Australia

Radiative properties of a linear chain of qubits - 845
Courtney J Mewton, The University of Queensland, Australia

Quantum mechanics with final as well as initial boundary conditions - 846
David J Miller, University of New South Wales, Australia

Using a coplanar waveguide as a quantum limited transducer for a nano-electromechanical oscillator - 847
Mr A K Ringsmuth, The University of Queensland, Australia

Tight informationally complete quantum measurements - 848
Andrew J Scott, Centre for Quantum Dynamics, School of Science, Griffith University, Australia

Fault tolerant quantum computation on isolated logical cells - 849
Mr Ashley M Stephens, Centre for Quantum Computer Technology, School of Physics, The University of Melbourne, Australia

Progress toward ion trap quantum computing at Griffith - 850
Erik W Streed, Centre for Quantum Dynamics, Griffith University, Australia

Implementing a robust CNOT gate to correct for fabrication induced variations in donor based exchange coupling - 851
Mr Matthew J Testolin, Centre for Quantum Computer Technology, School of Physics, University of Melbourne, Australia

Optimal reference ancillas for maximising accessible entanglement of identical particles - 852
Mr Graham A White, Centre for Quantum Dynamics, Griffith University, Australia

Quantum direction indicators using indistinguishable particles - 853
Daniel Yardley, University of Sydney, Australia

18:00-20:00	**Poster - PS03.5**
	Acoustics and Music (AAS)
	Exhibition Area, Plaza Terrace Room

Measurement the sound speed dependence of the sound speed in gasses - 854
Khadijeh Najafi, Zanjan University, Iran

Optical determination of sound speed in liquids - 855
Khadijeh Najafi, Zanjan University, Iran

18:00-20:00	**Poster - PS03.6**
	Plasma Physics (AINSE)
	Exhibition Area, Plaza Terrace Room

Spatial dust distribution and plasma dynamics in the Tokamak edge - 856
Sergey V Vladimirov, University of Sydney, Australia

SF_6Plasma functionalisation of Carbon surfaces - 857
Anders J Barlow, Flinders University South Australia, Australia

Stability of horseradish peroxidase on plasma modified ultra high molecular weight polyethylene - 858
Miss Joan Pui Yee Ho, University of Sydney, Australia

Electron transport in crossed E and B fields of a closed electron drift discharge - 859
Dr Igor Levchenko, School of Physics, University of Sydney, Australia

Complex plasma afterglow - 860
Dr Alex A Samarian, School of Physics,University of Sydney, Australia

Dynamics of two particles in a plasma sheath - 861
Dr Alex A Samarian, School of Physics,University of Sydney, Australia

Thursday, 7 December 2006

18:00-20:00	**Poster - PS03.7**
	Complex Systems, Computational and Mathematical Physics (CSCMP)
	Exhibition Area, Plaza Terrace Room

Small-world quantum routers - 862
C Facer, Macquarie University, Centre for Quantum Computer Technology, Australia

Origin of symmetry and self-organization in Sub-Nano patterns - 863
Dr Igor Levchenko, School of Physics, University of Sydney, Australia

Self-organization of large scale quantum dot patterns - 864
Dr Igor Levchenko, School of Physics, University of Sydney, Australia

A functional wireless radio system before Hertz - 865
Neil J Boucher, Compustar, Australia

Application on some the physics problems of Open Riemann Surface - 866
Guner Ilican, Anadolu University, Turkey

Prabolic potentials in quantum mechanics - 867
Abidin Kilic, Anadolu University, Turkey

In-silico demonstration of the Crooks' relation for a Brownian particle in a time-dependent harmonic trap - 868
Ranganathan Prabhakar, Australian National University, Australia

Characteristics of the trajectory of a projectile in a linear resisting medium and the Lambert W function - 869
Seán M Stewart, The Petroleum Institute, United Arab Emirates

Critical exponents for structural transitions in a complex plasma - 870
Mr James DE Stokes, University of Sydney, Australia

Peculiarities of stochastic resonance in disperse systems - 871
Liudmila A Uvarova, Moscow State University of Technology, Russia

The simulation of the propagation of the information in the complex systems - 872
Liudmila A Uvarova, Moscow State University of Technology, Russia
Prof Dr Tatiana V Kazarova, Moscow State University of Technology, Russia

Optical trapping of a cube - 873
Ms Agata M Branczyk, University of Queensland, Australia

18:00-20:00	**Poster - PS03.8**
	Atom Optics (AO)
	Exhibition Area, Plaza Terrace Room

Origin of a disorder potential on a magnetic film atom chip - 874
Prof Andrei I Sidorov, ACQAO and CAOUS, Swinburne University of Technology, Australia

Progress towards a Molecular BEC via the Association of Ultracold Fermionic Atoms - 875
Grainne Duffy, ARC Centre of Excellence for Quantum Atom Optics and Centre for Atom Optics and Ultrafast Spectroscopy, Swinburne University, Australia

Photoassociation spectroscopy of magnetically trapped metastable Helium - 876
Lesa J Byron, Australia

Phase space methods for fermions - 877
A/Prof Bryan J Dalton, ARC COE for Quantum Atom Optics, Swinburne University of Technology, Melbourne, Australia, Australia

Dynamics of Bose-Einstein condensates in an asymmetric double-well - 878
Brenton V Hall, ARC Centre of Excellence for Quantum Atom Optics, Center for Atom Optics and Ultrafast Spectroscopy, Swinburne University of Te, Australia

First results using the Hybrid phase-space method - 879
Mr Scott E Hoffmann, ACQAO, University of Queensland, Australia

Classical and quantum reflection of Bose-Einstein condensates from arrays of current carrying wires - 880
Thomas E Judd, University of Nottingham, United Kingdom

Phonon superradiance from dilute gas Bose-Einstein condensates - 881
Ms Sarah L Midgley, ARC Centre of Excellence for Quantum-Atom Optics, Physics Dept., The Australian National University, Australia

Two-time correlation functions in the Wigner representation - 882
Dr Murray K Olsen, University of Queensland, Australia

Magnetic lattices for ultracold atoms and quantum degenerate gases - 883
Mr Mandip Singh, ARC Centre of Excellence for Quantum-Atom Optics and Centre for Atom Optics and Ultrafast Spectroscopy, Swinburne University, Australia

Dispersion of the ^{87}Rb cycling transition - 884
Paul N Summers, Australian National University, Australia

Quantum phase transition in a circular waveguide - 885
Andrew G Sykes, Australian Centre for Quantum and Atom Optics, Australia

ESA's atomic clock ensemble in space mission - 886
Michael E Tobar, University of Western Australia, Australia

Coherence of elongated quasi-condensates - 887
Mr Otto Vainio, University of Turku, Finland

Atom counting in ultra-cold gases using photoionisation - 888
Dr Chris J Vale, University of Queensland, Australia

Bose-Einstein condensate dynamics in combined optical and magnetic potentials - 889
Dr Chris J Vale, University of Queensland, Australia

Supersonic optical tunnels for Bose-Einstein condensates - 890
Sebastian Wuester, ARC Centre of Excellence for Quantum-Atom Optics, Australian National University, Australia

Update on GPS Carrier Phase and TWSTFT comparisons of clock ensembles based at UWA and NMI - 891
John G Hartnett, University of Western Australia, Australia