19th AUSTRALIAN INSTITUTE OF PHYSICS CONGRESS

INCORPORATING THE

35th AUSTRALIAN CONFERENCE ON OPTICAL FIBRE TECHNOLOGY

Associated event:

AUSTRALIAN OPTICAL SOCIETY CONFERENCE

5-9 December 2010

MELBOURNE CONVENTION & EXHIBITION CENTRE VICTORIA AUSTRALIA

Congress Handbook
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CONGRESS HANDBOOK








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www.aip.org.au

AUSTRALIAN OPTICAL SOCIETY

ENGINEERS AUSTRALIA

ACOFT

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Welcome from the CONGRESS CHAIRS

On behalf of the organising committee, we are delighted to welcome you to the 19th Congress of the Australian Institute of Physics (AIP) and the 35th Australian Conference on Optical Fibre Technology (ACOFT). Whilst ACOFT has been staged in Melbourne many times, this marks the third time the AIP Congress has been held in Melbourne, the last being in 1992 and the first in 1980.

The 2010 AIP Congress also incorporates the annual meeting of the Australian Optical Society as well as meetings of many of the AIP's technical groups. With over 700 delegates, the AIP/ACOFT 2010 Congress will be the most diverse scientific meeting in the Australian physics calendar. It provides a forum for discussions within specialist physics topic areas and opportunities for physicists from academia, government, industry and the commercial sector to keep up to date in areas outside their core interests. The 2010 Congress represents only the second time that it has been co-located with ACOFT which attracts optical fibre researchers investigating issues ranging from fundamental challenges in fibre design and fabrication to applications including telecommunications, biomedicine and imaging. First held in 1977, as a workshop on guided wave photonics, ACOFT is the second oldest conference series in the world in this topic area and of ongoing significance in the "information age".

In 2010 we also celebrate the 50th anniversary of the laser with our opening plenary lectures highlighting developments in ultrafast and optical fibre lasers and special Laserfest sessions exploring the past and future of this extraordinary invention. Other special sessions include the Women in Physics forum and a short course on nanofabrication. We look forward to meeting you in the relaxed environment of the welcome reception on Sunday evening, catered poster sessions on Monday and Wednesday evenings and the Congress Dinner on Tuesday night at the Plaza Ballroom on Collins Street. The Congress venue, Melbourne's new Convention and Exhibition Centre, is located a short stroll along the Yarra River from Melbourne's CBD. We hope that you will find an opportunity to explore Melbourne, its architecture, laneways, galleries, excellent shopping and world-class restaurants.

A large conference such as this relies on the inspired efforts of a dedicated team and we thank our program committee chairs, Elisabetta Barberio and Peter Hannaford (AIP) and David Moss (ACOFT), as well as all members of the organising committee and the AIP and ACOFT programme committees, the AIP stream convenors and the abstract and paper reviewers as well as our ever-attentive conference managers Kymberlee Senior and Janette Sofronidis. We also would like to extend a special thanks to Gaby Bright, Stuart Wyithe and Peter Johnston who made significant contributions to the early organisation of the conference.

We would also like to take the opportunity to express our deep appreciation for the generous support of our sponsors and exhibitors that has made this Congress possible. Please take time to visit the exhibition, meet our exhibitors and explore the diverse range of products and services on display.

Away from the busy lives we lead at our universities, research institutions and businesses we hope that this conference will provide you with a relaxed, but stimulating, meeting place to reflect on your research, get together with old and new friends, establish collaborations and see the future of physics in our students and early-career scientists. We hope you enjoy your participation in the 2010 Australian Institute of Physics Congress and the Australian Conference on Optical Fibre Technology: *Living Physics*.

Associate Professor
ANDREW PEELE
La Trobe University
AIP 2010 co-chair

Associate Professor
ANN ROBERTS
The University of Melbourne
AIP 2010 co-chair

Associate Professor
STEPHEN COLLINS
Victoria University
ACOFT 2010 chair

Welcome from the President – Australian Institute of Physics

Welcome to the 19th Australian Institute of Physics Congress, incorporating the 35th Australian Conference on Optics and Fibre Technology (ACOFT). As with previous congresses, many societies or common interest groups have combined to hold their specialist meetings during the period of the Congress. As the biggest gatherings of Australian physicists, our congresses provide opportunities for networking across the discipline and allow all delegates to hear talks by distinguished speakers on a wide range of physics topics. Of particular note this year will be recognition of the 50th anniversary of the first operation of a laser, a reminder of how physics continues to shape modern technology and provide tools that facilitate advances in other fields of science. To run a congress like this requires dedicated effort by many people. I thank all those who have contributed, in particular co-chairs of the Congress organising committee, Andrew Peele and Ann Roberts, and Stephen Collins, chair of ACOFT.

I wish all delegates an enjoyable and rewarding Congress.

BRIAN JAMES
President – Australian Institute of Physics

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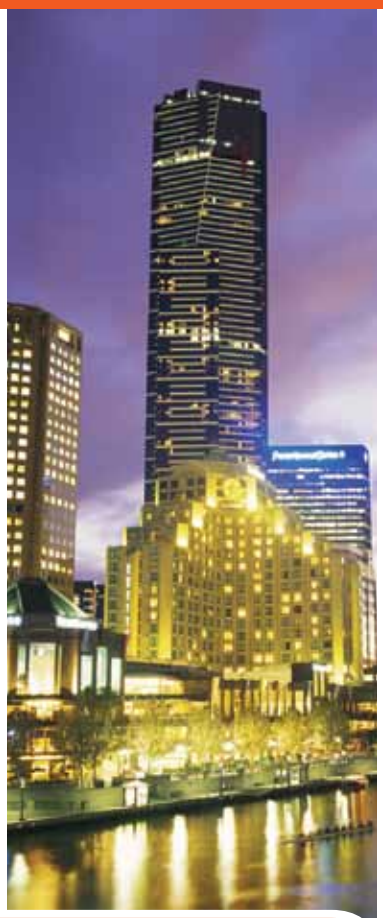

Wireless internet is available to Congress delegates – with access available in the exhibition hall and foyer area only. To log in please search and select the AIP 2010 Congress wireless network and enter the password: **CongressAIP**

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ORGANISING COMMITTEE

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Associate Professor
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University of Melbourne
AIP 2010 Co-Chair

Associate Professor
Stephen Collins
Victoria University
ACOFT 2010 Chair

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University of Melbourne
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Peter Hannaford
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Renewable Energy

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Roger Rasool

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Vasili Lobzin
Roman Makarevich
Dave Neudegg
Iain Reid
Colin Waters

Synchrotron Science

Martin de Jonge
Karen Siu

Women in Physics

Nicoleta Dragomir

MEDIA

Science in Public are assisting with the Congress media program.
You can find them in Banquet Dressing Rooms 201 & 202 (Level 2 - MCEC) or contact Niall Byrne direct:

Mobile: 0417 131 977
Email: niall@scienceinpublic.com.au

For further information visit:
www.scienceinpublic.com.au/blog/aip

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www.waldronsmith.com.au
aip2010@wsm.com.au

THE UNIVERSITY OF MELBOURNE

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www.physics.unimelb.edu.au

PhD opportunities in physics at the University of Melbourne

The School of Physics at the University of Melbourne is one of the largest physics departments in Australia. We have well-funded, world class research programs in astrophysics, optics, condensed matter physics and particle physics.

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Outstanding international and interstate PhD students for 2011/12 who are awarded an APA will also be awarded a scholarship of up to $10,000.

For more information please visit:

physics.unimelb.edu.au/Future-Students/Postgraduates

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Artwork by Chris Henschke

Australian Synchrotron

TURNING BRIGHT IDEAS INTO BRILLIANT OUTCOMES

The Australian Synchrotron's world-leading capabilities provide unique tools for analysing human tissue, plants, proteins, artefacts, fibres, fluids, gases, minerals, metals and many other diverse materials.

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EXHIBITOR DIRECTORY

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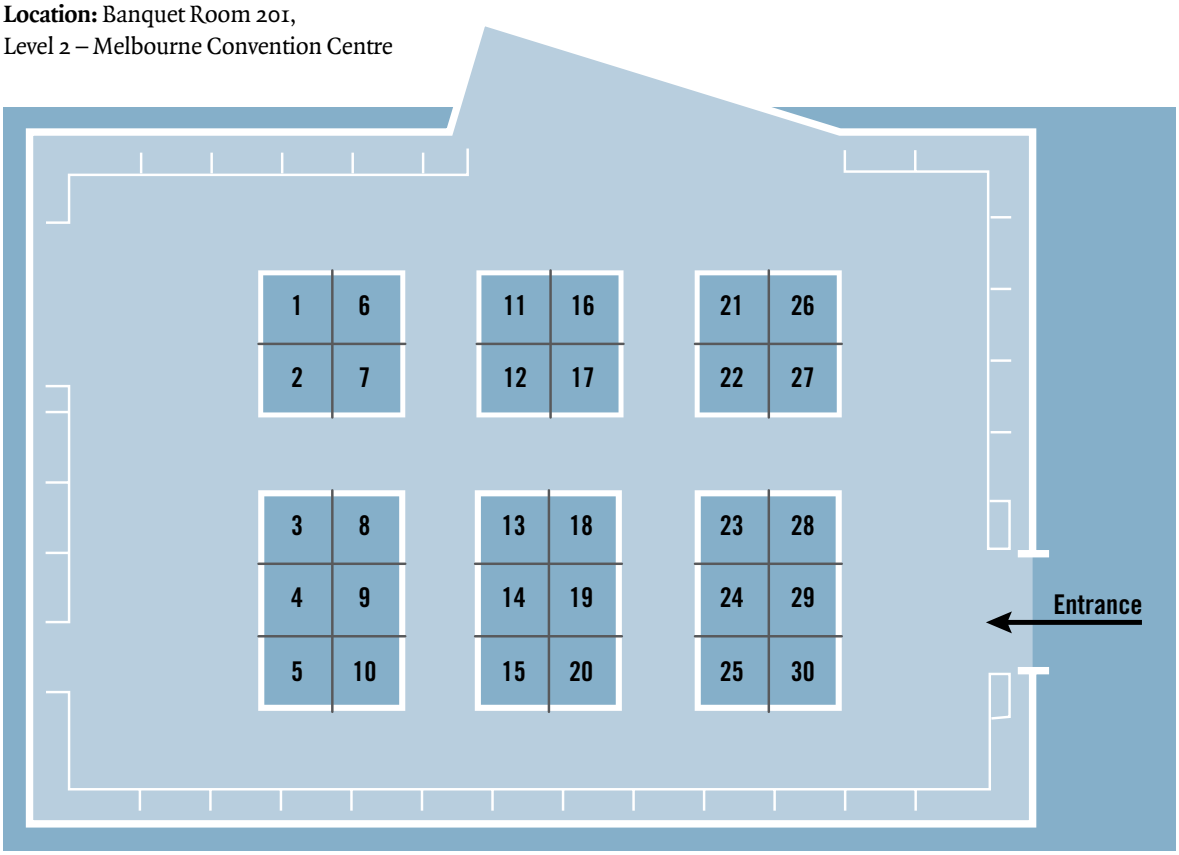
EXHIBITION FLOOR PLAN

Location: Banquet Room 201,
Level 2 – Melbourne Convention Centre



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Science

GROUP OF EIGHT

School of Physics

Low energy electron microscope (LEEM) for imaging nanostructures in real time
www.physics.monash.edu.au/research/leem.html

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Visit us at our web site:
www.physics.monash.edu

VENUE

MELBOURNE CONVENTION AND EXHIBITION CENTRE

2 Clarendon Street
Southbank VIC 3006
(South Wharf, Melbourne)

Tel: +61 (3) 9235 8000
www.mcec.com.au

MELBOURNE CONVENTION CENTRE

All meeting rooms, the plenary hall, public lecture, Congress exhibition, poster displays as well as the Registration Desk and Speaker Preparation Room are all conveniently located on Level 2 of the Melbourne Convention Centre.

Directions and Transport

The superb central location of the venue means it is easily accessed by the city's roadways, freeways, public transport and on foot. The City Link automated tollway connects the venue to the airport in just 20 minutes. The venue is also serviced by six parking areas suitable for public, exhibitor and bus parking with additional parking available within walking distance of the centre.

Public Transport

TRAMS

- Route 96
  - St Kilda to East Brunswick
- Route 109
  - Port Melbourne to Box Hill
- Route 112
  - West Preston to St Kilda

TRAINS

Southern Cross and Flinders Street stations are both a short stroll from the venue. These stations are major hubs for suburban, regional and interstate rail services. Directions and ticketing information is available from Centre staff.

For tram and train timetables go to: www.metlinkmelbourne.com.au

TAXIS

Central Booking System tel: 13 2227

Taxi ranks are right on the doorstep:

- Melbourne Exhibition Centre
- Melbourne Convention Centre
- Crown Entertainment Complex
- Southern Cross Station

AIRPORT TRANSFERS

Skybus Super Shuttle is the official transit link between Melbourne Airport and the central business district. It departs every 15 minutes from Southern Cross station, a five-minute walk from the venue.

Purchase tickets and view the timetable at the Skybus website: www.skybus.com.au

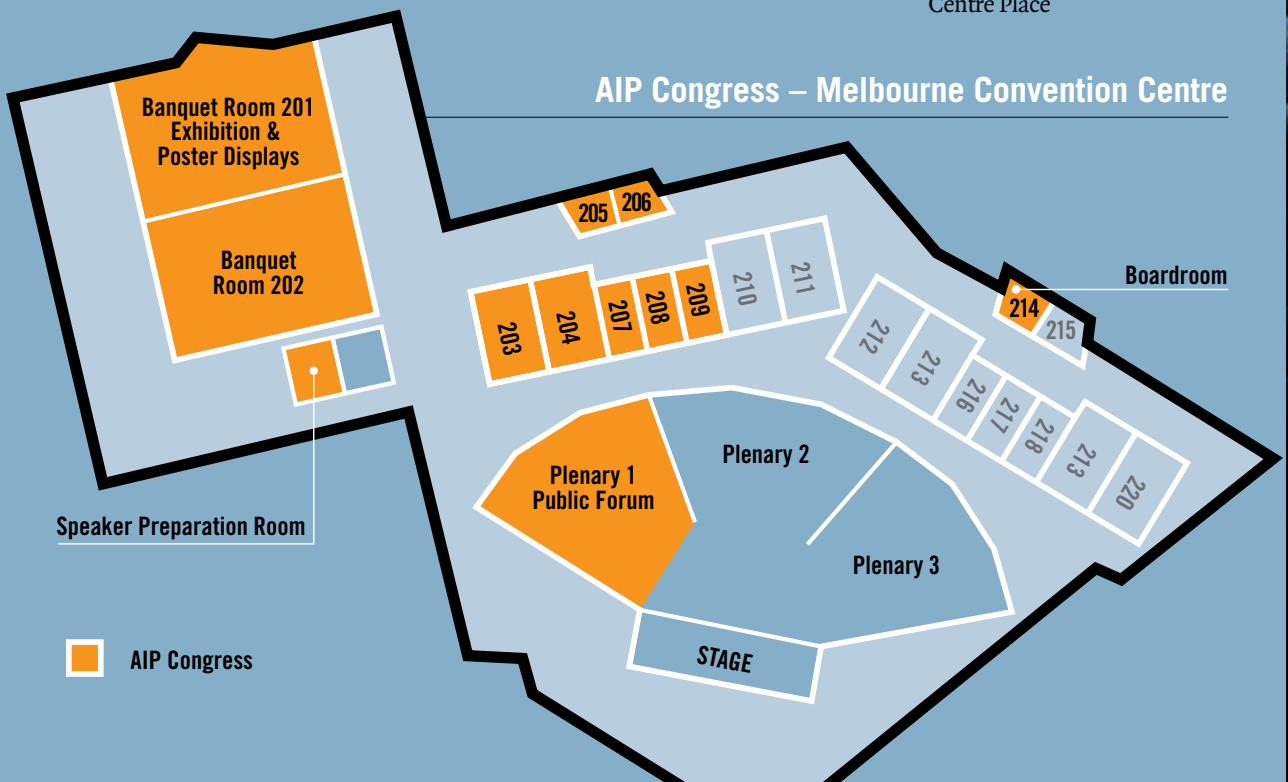
CAR PARK LOCATIONS

For car park locations, rates and open hours go to the venue website: www.mcec.com.au/Attend/Visitor-Info/Parking

BICYCLE PARKING RACKS ARE LOCATED AT:

- Melbourne Exhibition Centre: Bicycle racks are located on the river side of the Clarendon street forecourt near the pedestrian foot bridge.
- Melbourne Convention Centre: Bicycle racks are located on the river side of Convention Centre Place near the intersection to Wright Walk.
- Outside Melbourne Convention Centre front entrance: 1 Convention Centre Place

AIP Congress – Melbourne Convention Centre



GENERAL INFORMATION

Registration and Information Desk

The Congress Registration and Information Desk will be located on Level 2 of the Melbourne Convention Centre. Attendees should collect their name badge and conference materials prior to attending any sessions. Open hours are as follows:

OPEN HOURS:

Sunday 5 Dec	1300 – 1900
Monday 6 Dec	0730 – 1730
Tuesday 7 Dec	0730 – 1700
Wednesday 8 Dec	0800 – 1700
Thursday 9 Dec	0800 – 1530

Speaker Preparation Room

Speakers are asked to submit and preview their presentations preferably as soon as possible or the day before but not later than 4 hours prior to the start of their session. The Speaker Preparation Room is located in Speaker Room 201 on Level 2 (refer to venue floor plan).

Speakers should arrive at their meeting room **15 minutes** before the scheduled start time of the session and introduce themselves to the session chair.

OPEN HOURS:

Sunday 5 Dec	1500 – 1900
Monday 6 Dec	0730 – 1730
Tuesday 7 Dec	0730 – 1700
Wednesday 8 Dec	0800 – 1700
Thursday 9 Dec	0800 – 1600

Exhibition Hall

The Congress exhibition will be held in Banquet Room 201, Level 2 of the Melbourne Convention Centre and will be open as follows:

Sunday 5 Dec	1700 – 1900
Monday 6 Dec	0800 – 1830
Tuesday 7 Dec	0800 – 1700
Wednesday 8 Dec	0830 – 1830
Thursday 9 Dec	0830 – 1530

Name Badges & Tickets

Your name badge is your entry to all sessions, exhibition, social functions, morning and afternoon teas. Please wear it at all times – lost name badges cannot be replaced. The swapping of the Congress lanyard with your own company lanyard is not permitted. Tickets are required for admission to the Congress Dinner and are collected on entrance. Tickets are issued with your name badge material – lost tickets cannot be replaced.

Catering

Morning and afternoon tea will be served in the Congress exhibition hall. Lunch is at own arrangement – this can be purchased at the cash-bar kiosk in the Level 2 foyer areas (near the Registration Desk) or alternatively, cafes and restaurants are located along Southbank, South Wharf DFO or the Crown Entertainment Complex – all within walking distance.

Refreshments will be served during the Welcome Reception as well as both Poster Sessions.

Dietary Requirements

Every effort has been made to cater for all notified special dietary requirements. Unfortunately specially prepared meals for individuals will not be provided.

Disclaimer

Every effort has been made to present, as accurately as possible, all of the information contained in this publication. Neither the Congress organisers/hosts, committees, the conference organisers, its agents or servants, nor the sponsors/exhibitors will be held responsible for any changes in the structure or content of the technical program including speakers and any general or specific information published relative to the conference.

Dress

Smart casual will be appropriate for all scientific sessions and social functions at the venue.

Congress Dinner: Cocktail wear or Business/Lounge Suit.

People with Special Needs

Every effort has been made to ensure that people with special needs are catered for. Should you require special assistance, please see staff at the registration desk to enable us to make your attendance at the conference a pleasant and comfortable experience.

Speaker Q&A

Should time permit and if agreed to by speakers, a question and answer session will be run by session chairs at the conclusion of each presentation.

Messages and Notices

Messages and notices can be posted on the message board alongside the Registration Desk. Please check the board regularly on passing. Unfortunately, messages cannot be personally delivered by registration desk staff.

Restaurants

Melbourne is famous for the range and quality of its restaurants and bars. Information about a wide variety of restaurants, cafes, bars and theatres can be found at: www.citysearch.com.au

Smoking Policy

The Melbourne Convention Centre is a non-smoking venue.

Local Car Hire

Avis:	13 63 33	www.avis.com.au
Hertz:	13 30 39	www.hertz.com.au
Budget:	13 27 27	www.budget.com.au

Melbourne Online Info

What's on in Melbourne
www.citysearch.com.au
Visit Victoria www.visitvictoria.com

CD of Conference Proceedings

Abstracts and full papers are available on the CD of Conference Proceedings.

REGISTRATION ENTITLEMENTS

FULL REGISTRATION

- Entry to program sessions and the exhibition area
- Satchel and name badge
- Morning tea
- Afternoon tea
- Free Public Lecture
- Inclusive special sessions – Short Course on Nanofabrication; Women in Physics Forum; Industry Forum
- Inclusive social functions – Welcome Reception; Poster Session 1 and 2

DAY REGISTRATION

- Entry to program sessions and the exhibition area on the day of your registration
- Satchel and name badge
- Morning tea on the day of your registration
- Afternoon tea on the day of your registration
- Free Public Lecture
- Inclusive special sessions if on the day of your registration – Short Course on Nanofabrication; Women in Physics Forum; Industry Forum
- Inclusive social functions if on the day of your registration – Poster Session 1 or 2

EXHIBITOR/SPONSOR REGISTRATION

- Entry to program sessions (for "Complimentary Exhibitor Registrations" only) and the exhibition area
- Name badge only
- Morning tea
- Afternoon tea
- Free Public Lecture
- Inclusive social functions – Welcome Reception; Poster Session 1 and 2

Lunch

Lunch is NOT included in registration fees and is by own arrangement – this can be purchased at the cash-bar kiosk in the Level 2 foyer areas (near the Registration Desk) or alternatively, cafes and restaurants are located along Southbank, South Wharf DFO or the Crown Entertainment Complex – all within walking distance.

HOTEL LOCATIONS

1. HILTON SOUTH WHARF
2 Convention Place,
South Wharf VIC 3006
Tel: +61 3 9027 2000

2. HOLIDAY INN ON FLINDERS
575 Flinders Lane,
Melbourne VIC 3000
Tel: + 61 3 9629 4111

3. MEDINA EXECUTIVE NORTHBANK
550 Flinders Street,
Melbourne VIC 3000
Tel: +61 3 9246 0000

4. QUALITY HOTEL BATMAN'S HILL ON COLLINS
623 Collins Street,
Melbourne VIC 3000
Tel: +61 3 9614 6344

5. HOTEL ENTERPRIZE
44 Spencer Street,
Melbourne VIC 3000
Tel: +61 3 9629 6991

6. ALL NATIONS BACKPACKERS
2 Spencer Street
(cnr Spencer & Flinders),
Melbourne
Tel: +61 3 9620 1022

7. NOMADS MELBOURNE BACKPACKERS HOSTEL
198 A'Beckett Street,
Melbourne
Tel: +61 3 9328 4383

8. THE GREENHOUSE BACKPACKER
Lvl 6, 228 Flinders Lane,
Melbourne
Tel: 1800 249 207

9. HOTEL UNILODGE ON FLINDERS
238 Flinders Street,
Melbourne
Tel: +61 3 9224 1500

10. KINGSGATE HOTEL
131 King Street,
Melbourne
Tel: 1300 734 171

11. URBAN CENTRAL
334 City Road,
Southbank
Tel: 1800 631 288

12. INTERNATIONAL HOUSE, UNIVERSITY OF MELBOURNE
241 Royal Parade,
Parkville
Tel: +61 3 9345 7576

13. TRINITY COLLEGE, UNIVERSITY OF MELBOURNE
Royal Parade,
Parkville

SOCIAL PROGRAM

"Conference networking provides a great opportunity to build new scientific and business relationships and is one of the main reasons delegates attend."

The AIP/ACOFT 2010 Congress will provide plenty of opportunities to interact with several social & networking functions planned. All functions, except the Congress Dinner, are included with registration. Day Registrants can only attend functions that are held on the day of their registration.

Welcome Reception

Date: Sunday 5 December 2010
Time: 1700 – 1900 hrs

LOCATION
Congress Exhibition Hall
Banquet Room 201, Level 2 –
Melbourne Convention Centre

Enjoy fine Melbourne canapes and wine as you mingle amongst the industry trade exhibitors and poster displays - a great opportunity to catch up with old friends and make new acquaintances.

ADMISSION
- Included with all registration types (name badge required)
- Additional ticket: $60 (can be purchased at Registration Desk)

Welcome Reception is sponsored by:
IOP Institute of Physics

Poster Sessions

Poster Sessions will be held over two days:

POSTER SESSION 1:
Monday 6 December 2010
1700 – 1830 hrs

POSTER SESSION 2:
Wednesday 8 December 2010
1700 – 1830 hrs

LOCATION
Congress Exhibition Hall
Banquet Room 201, Level 2 –
Melbourne Convention Centre

Posters will be scheduled according to topic with presenting authors standing next to posters and available for informal discussion. Refreshments will be served.

ADMISSION
- Included with full registration, including sponsor/exhibitor registration (name badge required)
- Included with Monday or Wednesday Day Registration (ie. as per the day of registration)
- Additional ticket: $60 (can be purchased at Registration Desk)

Congress Dinner

Date: Tuesday 7 December 2010
Time: 1900 – 2330 hrs

LOCATION
Plaza Ballroom, Regent Theatre
191 Collins Street, Melbourne
(refer to Locations map on page 13)

The Congress Dinner is the premier social & networking function of the meeting and promises to be a memorable evening.

The Plaza Ballroom is a magnificent heritage listed venue situated in the very heart of Melbourne on Collins Street, at the famous Regent Theatre. Featuring extraordinary Spanish Rococo architecture, this stunning venue brings together the highest quality culinary experience with unmatched history, grandeur and ambience.

ADMISSION
- Tickets required all: $140
(This is an additional function and is not included with registration)

HOW TO GET TO THE CONGRESS DINNER
Congress Dinner guests are required to make their own way to the Plaza Ballroom – Regent Theatre.

Tram 109 departs from the Clarendon Street entrance and will turn right into Collins Street. Best times to catch the tram for the Dinner: 1836 or 1848 hrs.

Guests should disembark the tram at the corner of Swanston and Collins Street. The Plaza Ballroom is on the right-hand side of Collins Street as you walk uphill.

Walking Distance:
Alternatively, the venue is less than a 30 min walk.

Taxis can be called for your return.

Plaza Ballroom, Regent Theatre

AIP – MEDALS AND AWARDS

The Congress will highlight contributions to Physics through the awarding of prizes for excellence. These will be awarded at the Congress dinner on Tuesday evening.

Alan Walsh Medal for Service to Industry

This award recognizes significant contributions by a practicing physicist to industry in Australia. It commemorates the late Sir Alan Walsh, Kt, FAA, FTS, FRS, one of Australia's most eminent and distinguished scientists, who was the originator and developer of Atomic Absorption Spectrophotometry (AAS) and pioneered its application as a tool in chemical analysis.

Born in Lancashire in 1916 and educated at Darwen Grammar School, Sir Alan studied physics at Manchester University. After a few years in industry in the UK, he was recruited in 1946 to join the newly created Chemical Physics Section of the CSIR Division of Industrial Chemistry in Melbourne. In 1952 he had the idea of using atomic absorption spectra, rather than atomic emission and molecular absorption spectra, in spectrochemical analysis. The subsequent development of AAS as a simple, rapid and inexpensive method for the analysis of minute traces of metals (and some non metals) is a tribute to Sir Alan's extraordinary creativity, his business acumen and his infectious enthusiasm. He promoted the establishment of an Australian manufacturer of the atomic absorption spectrophotometer, the original company Techtron Pty Ltd eventually growing into Varian Australia, now one of the world's leading spectroscopic instrument companies.

Winner: Associate Professor Robert Scholten

Bragg Gold Medal for Excellent in Physics

The Bragg Gold Medal for the best PhD thesis by a student from an Australian University was established in 1992 as an initiative of the South Australian Branch, to commemorate Sir Lawrence Bragg and his father Sir William Bragg. The medal is awarded annually to the student who is judged to have completed the most outstanding PhD in physics under the auspices of an Australian University.

Winner: Dr Clancy James for a University of Adelaide thesis entitled: *Ultra-High Energy Particle Detection with the Lunar Cherenkov Technique*

For approximately 50 years, scientists have been observing `ultra-high energy cosmic rays': particles (mostly protons) hitting the Earth from space with more than ten million times more energy than humans can achieve on Earth. And yet we still don't know what is producing these extreme particles. A key to this puzzle is the observation (or lack thereof) of ultra-high energy neutrinos, which are predicted both from models of cosmic ray production, and from their interactions whilst travelling through the universe. Dr James' thesis focused on the LUNASKA project, searching for the astrophysical neutrinos produced when an ultra high energy particle interacts in the Moon's outer layers.

Harrie Massey Medal and Prize

This prize is awarded every two years for contributions made by an Australian physicist working anywhere in the world, or to a non-Australian for work they have carried out in Australia.

The Massey Medal was proposed at the AIP Congress in 1988 and established in 1990 as a gift of the Institute of Physics, UK, to mark the 25th anniversary of the founding of the AIP as a separate institution in 1963.

Sir Harrie Massey, born near Melbourne in 1908, had a distinguished career in the UK and in 1931, with Edward Bullard, published the first experimental evidence for electron diffraction in gases. He saw the potential of using direct rocket probes of the atmosphere layers and eventually, as Chairman of the British National Committee for Space Research, he guided the entire UK space research program. From 1960 – 64 he was President of the European Preparatory Commission for Space Research. He was knighted in 1960.

Winner: Professor Hans-A Bachor

AIP Education Medal

The purpose of this prize is to recognise an outstanding contribution to physics education in Australia.

The award was proposed as an initiative of the Physics Education Group at the 2002 AIP Congress in Adelaide. The prize is awarded to any member of the AIP who is judged to have made a significant contribution to physics education in Australia. In determining the recipient of the award, the quality of the work, the significance to physics education and the creativity displayed will be taken into account.

Winner: Professor Joe Wolfe

Walter Boas Medal

The Medal was established in 1984 to promote excellence in research in Physics and to perpetuate the name of Walter Boas. The award is for physics research carried out in the five years prior to the date of the award, as demonstrated by both published papers and unpublished papers prepared for publication.

Winner: Professor Kostya Ostrikov

AIP Women in Physics Lecturer

The Australian Institute of Physics Women in Physics Lecture Tour celebrates the contribution of women to advances in physics. Under this scheme, a woman who has made a significant contribution in a field of physics gives lectures across the country to both specialist and non-specialist audiences. Presentations include school lectures, public lectures and research colloquia. Public lectures are expected to increase awareness among students and their families of the possibilities offered by a career in physics. In 2009 the Women in Physics group suggested that a medal should be awarded to each one of these remarkable women in order to recognise the outstanding contribution they have each made to physics. The medals will be presented retrospectively to all AIP Women in Physics Lecturers (see list below). The presentation will be made at this Congress for those attending.

2010 – Professor Elizabeth Winstanley, University of Sheffield, UK

2009 – Associate Professor Christine Charles, Space Plasma, Power & Propulsion Group, Australian National University

2007 – Professor Tanya Monro, School of Chemistry and Physics, University of Adelaide

2006 – Professor Deb Kane, Physics Department, Macquarie University

2005 – Professor Helen Quinn, Stanford Linear Accelerator Center, Menlo Park, CA, USA

2004 – Dr Nanda Dasgupta, Department of Nuclear Physics, Research School of Physical Sciences and Engineering, Australian National University

2003 – Professor Halina Rubinsztein-Dunlop, School of Physical Sciences, University of Queensland

2002 – Associate Professor Lidia Morawska, School of Physical and Chemical Sciences, Queensland University of Technology

2001 – Dr Gabriela Gonzalez, Department of Physics, Pennsylvania State University, USA

2000 – Dr Michelle Simmons, School of Physics, University of New South Wales

1999 – Professor Jocelyn Bell Burnell, Open University, UK

1998 – Dr Christine Davies, Department of Physics & Astronomy, University of Glasgow, UK

1997 – Dr Rachel Webster, School of Physics, University of Melbourne

AOS – Prize Winners

The Australian Optical Society proudly announces the 2010 AOS Prize winners:

AOS W.H. (Beattie) Steel Medal

PROFESSOR HANS BACHOR

Awarded for outstanding contributions to the field of Optics within Australia.

AOS Technical Optics Award

MS KATIE GREEN

Recognising significant achievement in technical optics.

AOS Geoff Opat Early Career Researcher Prize

DR ALEX ARGYROS

Recognizing an outstanding early career researcher for his contribution to the field of optics.

AOS PostGrad Prize

MR SEBASTIAN SALIBA

A grant towards national or international conference travel awarded to an outstanding student member of AOS.

Warsash Science Communication Prize

MS ELAINE MILES

Recognising effective communication of published scientific research by an AOS student member. (sponsored by Warsash)

Reminder: *The deadline for submission of 2011 prize nominations is 31 March 2011.*

Community Forum: LIGO Australia

Date: Thursday 9 December 2010

Time: 1245 – 1330 hrs

Venue: Meeting Room 204

A community forum will be held to inform the Australian physics community about the current status of the LIGO-Australia project: the science, the international context, implementation and funding issues, and the cross-disciplinary, collaborative scientific opportunities the project will offer.

Questions and feedback from the whole community will be particularly welcome.

How to win a Nobel Prize with Sticky Tape and a Pencil

Date: Wednesday 8 December 2010
Time: 1240 – 1325 hrs
Venue: Meeting Room 203

All welcome.

This informal talk will review the discovery and properties of graphene, a thin flake of carbon only one atom thick. Using regular adhesive tape, this year's winners of the Physics Nobel prize, Andre Geim and Konstantin Novoselov, managed to isolate and characterize a flake of carbon only one atom thick. Since it is practically transparent and a good conductor, graphene is suitable for producing transparent touch screens, light panels, and maybe even solar cells on flexible substrates.

Andre Geim is the only person to have won first the IgNobel prize (for levitating a frog using magnetic fields) and subsequently the Nobel prize.

This year's prize is a testament to the fact there is still much room for playfulness in Physics, that one always learns something in process, and that sometimes you can hit the jackpot.

The Melbourne Materials Institute is pleased to sponsor this lunchtime talk

The Physics Decadal Plan

The Australian Academy of Science in collaboration with the Australian Institute of Physics are developing a new Physics Decadal Plan for Australia. A similar process was last run in 1993 which produced "Physics: A vision for the future". The Australian Research Council has granted funds to support the development of the new plan.

The Decadal Plan consists of two broad components. The first is an inward looking component which will consist of a survey of Physics in Australia today to show how the discipline has evolved since 1993 and identify the significant areas of activity and expertise. The second is a forward looking component that aims to identify emerging opportunities that can be highlighted and developed. The Plan aims to have a broad audience and will serve to make the excitement and potential of Physics in the 21st Century accessible to a wide audience.

You will see in the Congress program that we have allocated four parallel "Town Hall" meeting sessions where people working in four broadly defined clusters of Physics disciplines can provide their views.

In these sessions a panel will seek views from the floor on the discipline strengths and accomplishments, issues that the discipline will face in the next ten years and the consequences if these issues are not addressed.

A further six months of consultation and review will follow before the draft plan, provisionally titled "Investing in the future of Physics" is presented to the Academy in July 2011.

For more information see: www.physicsdecadalplan.org.au

To comment on the plan, send your emails to: info@physicsdecadalplan.org.au

PROFESSOR JOCELYN BELL BURNELL

University of Oxford and Mansfield College Oxford

United Kingdom

Sponsored by

FACULTY OF SCIENCE
THE UNIVERSITY OF MELBOURNE

PUBLIC LECTURE

Will the World End in 2012? The Astronomical Evidence

Open to the Public

Date: Wednesday 8 December 2010

Time: 1900 – 2030 hrs

Location:
Plenary 1, Ground Level
Enter via doors 5&6
Melbourne Convention Centre

Admittance: FREE – also open to the general public

The public lecture, *Will the World End in 2012? The Astronomical Evidence: An Evening with Professor Jocelyn Bell Burnell* will be held on Wednesday 8 December 2010 at the Congress venue, the Melbourne Convention and Exhibition Centre.

Professor Bell Burnell is an astrophysicist and best known for the discovery of pulsars when a graduate student in Cambridge (UK). Subsequently she has researched stars and galaxies in most wavelength bands.

She is a Past President of the United Kingdom's Royal Astronomical Society and has just completed her term as (the first female) President of the UK/Ireland Institute of Physics. The Royal Society of London, of which she is a Fellow, has awarded her its 2010 Prize for Science Communication and she is also a Foreign Member of the US National Academy of Science.

Professor Bell Burnell is currently a Visiting Professor at the University of Oxford and Mansfield College Oxford.

ADMISSION

The public lecture is **open to the public** and is **FREE to attend.**

PROGRAM

Abstracts and full papers are **AVAILABLE ON THE CD** of Conference Proceedings

Sunday 5th December

1300 - 1900	**Registration Open** – Level 2, Pre-Function Area
1200 - 1600	*Exhibitors Move In*
1500 - 1900	**Speaker Preparation Room Open** – Speaker Room 201
1700 - 1900	**Exhibition Hall Open** – Banquet Room 201
1700 - 1900	**WELCOME RECEPTION** – Exhibition Hall – Banquet Room 201. Refreshments served, included with Registration Welcome Reception: Sponsored by *IOP Institute of Physics*
1700 - 1900	*Authors to set up posters for Session 1*

Monday 6th December

0730 - 1730	**Registration Open** – Level 2, Pre-Function Area
0730 - 1730	**Speaker Preparation Room Open** – Speaker Room 201
0800 - 1030	*Authors to continue poster set up for Session 1*
0800 - 1830	**Exhibition Open** – Banquet Room 201
0830 - 0900	**CONGRESS OPENING** *Banquet Room 202*
0900 - 0945	**PLENARY 1 – Professor Margaret Murnane** University of Colorado, USA **Attosecond Light and Science at the Timescale of the Electron** *Banquet Room 202* **– Chair: Keith Nugent** Session sponsor – *ARC Centre of Excellence for Coherent X-ray Science*
0945 - 1030	**PLENARY 2 – Professor David Payne** University of Southampton, UK **Presentation Title to be advised** *Banquet Room 202* **– Chair: Stephen Collins**
1030	*All Session 1 posters to be on display*
1030 - 1100	**Morning Tea** – *Banquet Room 201* – Sponsored by *La Trobe University* **Casual Poster Viewing** – *Exhibition Hall*

1100 - 1230 CONCURRENT SESSION 1

	1A **ACOFT** **KEYNOTE SESSION 1** Session sponsor: *CUDOS*	1B **Astronomy & Astrophysics**	1C **Nuclear & Particle Physics 1**	1D **Meteorology, Oceanography, Environmental Physics & Climate Change 1**	1E **AOS – Sensing/Lasers**	1F **Solar, Terrestrial & Space Physics 1**	1G **AOS – Diamond Photonics**	1H **CMMSP – Surface & Materials**
	Banquet Room 202	Meeting Room 203	Meeting Room 204	Meeting Room 207	Meeting Room 208	Meeting Room 209	Meeting Room 205	Meeting Room 206
	Chair: David Moss	**Chair: Duncan Galloway**	**Chair: Martin Sevior**	**Chair: John Zillman**	**Chair: Ann Roberts**	**Chair: Iver Cairns**	**Chair: Snjezana Tomljenovic-Hanic**	**Chair: Chris Pakes**
1100 - 1130	Dr Rene Essiambre *Alcatel-Lucent USA* **Fiber Capacity Limits: Information Theory meets Optical Communication and Fiber Physics** (Keynote 30 mins)	Krzysztof Bolejko (#632) *Australian National University ACT* **Evolution of Dark Energy in the Inhomogeneous Universe**	Martin White (Invited 30 mins) *University of Melbourne VIC* **First results from the ATLAS Experiment**	Neville Nicholls (Invited 30 mins) *Monash University VIC* **Myths about Global Warming & the IPCC**	Katarina Svanberg (Invited 30min) *Lund University Hospital SWEDEN* **Diagnostics & Treatments of Tumours using Laser Techniques**	Iain Reid (Invited 30 mins) *University of Adelaide SA* **Long Term Mesospheric Nightglow Observations**	Thomas Babinec (Invited, 30 mins) *Harvard University USA* **Diamond Nanophotonics and Quantum Optics**	Alastair Stacey (30 mins, #439) *University of Melbourne VIC* **Near Edge X-Ray Absorption Fine Structure as a Tool for Diamond Surface Engineering**
1115 - 1130		Victor Flambaum (#182) *University of New South Wales NSW* **Variation of the Fundamental Constants from Big Bang to Atomic Clocks: Theory and Observations**						
1130 - 1200	Professor Arthur Lowery *Monash University VIC* **Optical Frequency Division Multiplexing** (Keynote 30 mins)	Michael Brown (#188) *Monash University VIC* **Does Every Massive Galaxy Host an Active Galactic Nucleus?**	Ahmad Galea (#68) *University of Melbourne VIC* **Late Decaying WIMP Dark Matter and the Disruption of Large Scale Structure**	Jorgen Frederiksen (#315) *CSIRO Marine And Atmospheric Research VIC* **Changes and Projections in Southern Hemisphere Climate and Weather Systems**	Peter Domachuk (#765) *University of Sydney NSW* **Biopolymer Photonics: Unnatural Uses for Natural Materials**	Joel Younger (#526) *University of Adelaide SA* **Analysis of Radar Detected Meteor Showers**	Matthew Henderson (#516) *University of Adelaide SA* **Fabrication of a Hybrid Diamond-Tellurite Material for Quantum Photonics Applications**	Dougal McCulloch (#736) *RMIT University VIC* **The Electron Loss Near-Edge Structure of Cubic Boron Nitride**
1145 - 1200		Taissa Danilovich (#594) **Ms Taissa Danilovich** *University of Melbourne VIC* **The Physical Basis of the Tully-Fisher Relation**	Anna Phan (#180) *University of Melbourne VIC* **Search for the Light Scalar Top in ATLAS at the LHC for a Centre-of-Mass Energy of 7 TeV**	Joanna Turner (#276) *University of Southern Queensland QLD* **Ultraviolet Reflection and Outdoor Workers: Why Warm Seasons Have Less Influence on Reflected UV Exposures than Cool Seasons**	William Olds (#527) *Queensland University of Technology QLD* **Non-Invasive Identification of Substances in Opaque Containers Based on Raman Spectroscopy**	Svetlana Petelina (#111) *La Trobe University VIC* **Ice Layers in the Polar Summer Mesosphere: Properties and Indications of Climate Change**	Brant Gibson (#296) *The Innovation Group VIC* **Emission Dipole Imaging in Diamond Single Emitters**	Barbara Fairchild (#346) *University of Melbourne VIC* **The Amorphous Carbon/Diamond Interface in Ion Implanted Diamond**
1200 - 1230	Seb Savory *University College London UNITED KINGDOM* **Digital Coherent Transceivers: From Access to Core** (Keynote 30 mins)	Duncan Galloway (#432) *Monash University VIC* **Fundamental Physics from Accreting Neutron Stars**	David Jennens (#234) *University of Melbourne VIC* **ATLAS Calorimeter Response to Single Isolated Hadrons**	Bronwyn Dolman (#447) *ATRAD SA* **A Comparison of Radiosonde and Radar Measurements of Winds**	Peter McGlynn (#475) *RMIT University VIC* **A Modern Replacement for the Dobson Spectrometer**	Peter Dyson (#360) *La Trobe University VIC* **Stability of Large Fabry-Perot Spectrometer at a Remote Site**	Brant Gibson (#501) *The Innovation Group VIC* **Single Photon Emission from Diamond Embedded in Tellurite Glass**	Keal Byrne (#518) *University of Western Australia WA* **Optical and Structural Properties of the Argyle Pink Diamond Defect Centre**
1215 - 1230		Simon Ellis (#442) *Australian Astronomical Observatory NSW* **GNOSIS: A Fibre Bragg Grating OH Suppression Unit for Near-Infrared Spectrographs**	Mark Boland (#143) *Australian Synchrotron VIC* **The Australian Collaboration for Accelerator Science**	TBC	Nick Chang (#484) *University of Adelaide SA* **An Efficient Q-Switched Er:YAG Laser for Coherent Remote Sensing**	Robert Greenwood (#365) *Bureau Of Meteorology VIC* **Ocean Wind-Wave Measurements using the TIGER SuperDARN Radars**	Taras Plakhotnik (#515) *University of Queensland QLD* **NV-Centers in Nanodiamonds At Temperatures Between 300 K And 700 K: Perspectives on Nanothermometry and Other Applications**	TBC
1230 - 1330	**Lunch Break** (please note, lunch is not provided by congress) **Casual Poster Viewing** – *Exhibition Hall*					**The Decadal Plan Discussion** Solar, Terrestrial & Space Physics (Business Lunch) 1245 - 1315		

CONCURRENT SESSION 2

1330 - 1500	2A ACOFT KEYNOTE SESSION 2	2B AOS – Optics in Astronomy	2C Nuclear & Particle Physics 2	2D Meteorology, Oceanography, Environmental Physics & Climate Change 2	2E Special Session: INDUSTRY FORUM	2F Solar, Terrestrial & Space Physics 2	2G AOS – Plasmonics: Fundamentals	2H CMMSP – Semiconductors I
	Banquet Room 202	Meeting Room 203	Meeting Room 204	Meeting Room 207	Meeting Room 208	Meeting Room 209	Meeting Room 205	Meeting Room 206
	Chair: Ben Eggleton	**Chair: Judith Dawes**	**Chair: Ray Volkas**	**Chair: Neville Nicholls**	**Chair: Peter Kappen**	**Chair: Fred Menk**	**Chair: James Chon**	**Chair: Gerard Milburn**
1330 - 1400	Dr Maurice O'Sullivan *Ciena ONTARIO CANADA* **Coherent Optical Transmission in Commercial Optical Networks** (Keynote 30 mins)	Chris Dainty (Invited 30 mins) *National University of Ireland Galway* **Adaptive Optics in Astronomy, Vision Science and Beyond**	Victor Flambaum (Invited 30 mins) *University of NSW* **Higgs-Induced Bound States of Heavy Particles and Bariogenesis**	Martin Green (Invited 30 mins *University of NSW* **Photovoltaic Physics: Light Emission, Ultimate Efficiencies and Light Trapping**	Dr Richard Brown *Davies Collison Cave VIC* Dr Chris Deller *CISRA NSW*	Murry Salby (Invited 30 mins) *Macquarie University NSW* **Changes of Ozone and CO2: Relationship to the General Circulation**	Dmitri Gramotnev (30 mins, #448) *Nanophotonics Pty Ltd QLD* **Nanofocusing in Metallic Nanostructures: Recent Progress and New Results**	Andrea Morello (30 mins, #337) *University of New South Wales NSW* **Single-Shot Readout of an Electron Spin in Silicon**
1400 - 1430	Dr Sylvain Charbonneau *National Research Council of Canada CANADA* **Advanced Photonic Devices Research at NRCC** (Keynote 30 mins)	Nick Cvetojevic (#507) *Macquarie University NSW* **Miniature Photonic Spectrographs for Astronomical Applications**	Archil Kobakhidze (#209) *University of Melbourne VIC* **Scale Invariance and the Origin of Mass**	Galina Gramotnev (#554) *University of Queensland QLD AUSTRALIA* **Antisymmetric Correlation Patterns for Particle Modes in Background Aerosols**	Dr Richard Garrett *Australian Nuclear Science and Technology Organisation NSW*	Vickal Kumar (#321) *La Trobe University VIC* **TIGER Bruny Island HF Radar Observations of the Ionospheric Backscatter and Convection during Geomagnetically Disturbed Periods**	Ann Roberts (#333) *University of Melbourne VIC AUSTRALIA* **Angle-and Polarization-Independent Resonant Transmssion through Nanostructured Metal Films**	Zachary Keane (#251) *University of New South Wales NSW* **Nuclear Magnetic Resonance in GaAs-AlGaAs Nanostructure Devices**
1415 - 1430		Will Brown (#472) *Swinburne University of Technology VIC* **Characterization and Modelling of Multi-Notch Rugate Filters for Ground-Based Astronomy**	Nadine Pesor (#31) *University of Melbourne VIC* **Neutrino Masses and Sparticle Spectra from Stochastic Superspace**	Galina Gramotnev (#561) *University of Queensland QLD AUSTRALIA* **Fluctuation Approach to the Analysis of Atmospheric Aerosols and Their Sources**	Dr Gerry Roe *CRC for Biomedical Imaging Development VIC*	Jason Siddaway (#418) *La Trobe University VIC* **Trends in the Zonal Asymmetry of Antarctic Stratospheric Ozone: CCMVal-2 Assessment**	Tim Davis (#156) *CSIRO Materials Science & Engineering VIC* **A Simple Model for Hybrid States In Plasmonic Circuits**	Paul Spizzirri (#510) *University of Melbourne VIC A* **Electronic Raman Spectroscopy of Phosphorus Donor States Under Stress**
1430 - 1500	Professor Stojan Radic *University of California USA* **Parametric Mixer Technology and its Implications in Signal Processing** (Keynote 30 mins)	Nemanja Jovanovic (#541) *Macquarie University NSW* **Photonic Based Pupil Remapping for Optical Stellar Interferometry**	Jayne Thompson (#30) *University of Melbourne VIC* **S0(10) Domain-Wall Brane Models**	Jorgen Frederiksen (#630) *CSIRO Marine And Atmospheric Research VIC AUSTRALIA* **Seasonal Ensemble Forecasting with a Coupled Ocean-Atmosphere Model**	Dr Paul Wardill *Coherent Scientific SA*	Murray Sciffer (#480) *University of Newcastle NSW* **Estimating Equatorial Ultra Low Frequency Wave Electric Fields from the Ground**	Lorenzo Rosa (#121) *Swinburne University of Technology VIC* **Properties of 3D-Tailored Au Plasmonic Nanoparticles**	Wee Han Lim (#349) *University of New South Wales NSW* **Spin Filling and Valley Splitting in a Few-electron Silicon Quantum Dot**
1445 - 1500		Nikita Simakov (#319) *DSTO SA* **An Elongation-Free Sodium Guide-Star Laser for Large Telescopes**	Albert Lee (#452) *Australian National University ACT* **Shape Coexistence in 187Tl**	Anthony Morfa (#738) *University of Melbourne VIC AUSTRALIA* **Printable ZnO, Tunable Size and Electronic Properties Below 200 °C**	Panel Q & A	Shaun Cooper (#172) *La Trobe University VIC* **Numerical Modelling of the Thermospheric Response to Pulsating Aurora**	Kristy Vernon (#98) *CSIRO VIC* **Influence of Particle Substrate Interaction on Localised Plasmon Resonances**	Jung-Hyun Kang (#664) *Australian National University ACT* **Vertical GaAs Nanowires Grown on Si substrates Coated with Buffer Layers**
1500 - 1530	**Afternoon Tea** – *Banquet Room 201* – Sponsored by *La Trobe University* **Casual Poster Viewing** – *Exhibition Hall*							

CONCURRENT SESSION 3

	3A ACOFT/AOS – Laserfest Symposium 1	3B AOS – Optics and Interferometry	3C Nuclear & Particle Physics 3	3D Meteorology, Oceanography, Environmental Physics & Climate Change 3	3E Quantum Information, Concepts & Coherence Group 1	3F Solar, Terrestrial & Space Physics 3	3G AOS – Plasmonics: Devices	3H CMMSP – Theory
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Stuart Jackson	**Chair: John Holdsworth**	**Chair: Kevin Varvell**	**Chair: Neville Nicholls**	**Chair: Andrew White**	**Chair: Trevor Harris**	**Chair: Dmitri Gramotnev**	**Chair: Les Allen**
1530 - 1600	Laserfest 1: Stuart Jackson – Introduction (10 mins) *Univeristy of Sydney NSW* **Introduction**	Jan Burke (30 mins, #604) *CSIRO Materials Science And Engineering NSW* **Interferometry: A Method to Build and Use an Instrument for Monitoring Earth's Gravity Field**	Anthony Brown (Invited 30 mins) *University of Canterbury NZ* **Latest Results from the IceCube Experiment**	Guy Metcalfe (#581) *CSIRO VIC* **Sub-surface Fluid Trapping Using Chaotic Advection** Bronwyn Dolman (#486) *ATRAD SA AUSTRALIA* **Dropsize Distribution Retrievals Using Two Co-located VHF Profilers**	Paul Kwiat (30 mins, #622) *University of Illinois ILLINOIS USA* **Optical Quantum State Synthesis**	Marc Duldig (Invited 30 mins) *Australian Antarctic Division TAS* **Bullets from the Sun: A Review of Relativistic Solar Cosmic Rays**	Tim Davis (30 mins, #760) *CSIRO Materials Science & Engineering VIC* **Nanoscale Optical Circuits: Controlling Light Using Localized Surface Plasmon Resonances**	Gerard Milburn (30 mins, #199) *University of Queensland QLD* **Vibration Enhanced Quantum Transport**
1600 - 1615	Laserfest 2: Professor Jim Piper (20 mins) *Macquarie University NSW* **A Short History of Copper Lasers**	Danielle Wuchenich (#362) *Australian National University ACT* **Simultaneous Displacement Measurements Using Digital Interferometry**	Antonio Limosani (#119) *University of Melbourne VIC* **Performance of the ATLAS Inner Detector with proton-proton collisions at the Large Hadron Collider**	Andrew MacKinnon (#744) *University of Adelaide SA* **VHF Spaced Antenna Boundary Layer Radar: Long-Term Performance**	Geoff Pryde (#525) *Griffith University QLD* **Optimal Multi-Photon Phase Sensing with a Single Interference Fringe**	Manuel Cervera (#293) *Defence Science And Technology Organisation SA A* **Modelling of the Effects of Ionospheric Disturbances Using 3D Magneto-Ionic Raytracing Techniques**	Daniel Gomez (#157) *CSIRO VIC* **Coupling of Surface Plasmons and Quantum Dots**	Andy Martin (#388) *University of Melbourne VIC* **Zone Plate Focusing of Bose-Einstein Condensates for Erasable High-Speed Lithography of Quantum Electronic Components**
1615 - 1630	Laserfest 3: A/Professor Jesper Munch (20 mins) *University of Adelaide SA* **Lasers for Precision Measurements**	Wamid Al-Shabib (#722) *Nottingham Trent University UNITED KINGDOM* **Voltage Programmable Liquid-Based Diffraction Grating**	Tony Shao (#139) *University of Melbourne VIC* **Z Boson to Two Tauons Cross-Section Measurement Using ATLAS at the LHC for 7 TeV Centre-of-Mass Energy**	Andrew MacKinnon (#743) *University of Adelaide SA* **Mini VHF Boundary Layer Radar**	Sacha Kocsis (#384) *Griffith University QLD* **Observing the Trajectories of a Single Photon Using Weak Measurement**	Iver Cairns (#12) *University of Sydney NSW* **Probing Temperature Variations in Solar Corona via Type III Solar Radio Bursts**	Md Muntasir Hossain (#86) *Swinburne University of Technology VIC A* **Plasmonic Nano-Structures for Waveguiding with Subwavelength Confinement**	Liam Hall (#549) *University of Melbourne VIC* **Quantum Decoherence Imaging Using NV Centres in Diamond**
1630 - 1645	Laserfest 4: Professor Judith Dawes (20 mins) *Macquarie Univesity NSW* **What Can We Do with A Diode Laser?**	Galiya Sharafutdinova (#277) *University of Newcastle NSW* **Comparative Scan Engine Field Flatness**	Thomas Jacques (#17) *University of Melbourne VIC* **Electroweak Radiative Corrections as the Dominant Channel in Dark Matter Annihilation**	TBC	Raisa Karasik (#301) *Griffith University QLD* **How Many Bits Does It Take to Track a Multi-Qubit System?**	John Humble (#100) *University of Tasmania TAS* **Cosmic Ray Flux at the Recent Solar Minimum**	Shiaw Juen Tan (#140) *Queensland University of Technology QLD* **Heating Effect in Nanofocusing Metal Wedges**	David Neilson (#88) *University of Camerino ITALY* **Anomalous Transport in Mesoscopic Inhomogeneous 2D Electron Systems at Low Temperature**
1645 - 1700	Laserfest 5: A/Professor David Coutts (20 mins) *Macquarie University NSW* **Cerium Lasers: The Ti:Sapphire of the Ultraviolet**	Fred Baynes (#514) *University of Western Australia WA* **Stable Optical Fabry-Perot Cavities for Tests of Physics**	Rohan Dowd (#203) *Australian Synchrotron VIC* **Damping Ring Studies for Future Linear Colliders**	TBC	Boris Hage (#389) *Australian National University ACT* **Iterative Entanglement Distillation: Approaching full Elimination of Decoherence**	Claire Delides (#443) *University of Newcastle NSW* **Spherical Cap Harmonic Basis in Geophysical Data Assimilation**	Ricardas Buividas (#52) *Swinburne University of Technology VIC* **Gold Coated Ripple-Patterned SiC Substrates for SERS**	James Quach (#393) *University Of Melbourne VIC* **A New Class of Dynamic Quantum Metamaterials**

1700 - 1830 **POSTER SESSION 1** – *Exhibition Hall – Banquet Room 201*
Presenting authors to be available for discussion
Refreshments served, included with Registration

Tuesday 7th December

0730 - 1700	**Registration Open** – *Level 2, Pre-Function Area*						
0730 - 1700	**Speaker Preparation Room Open** – *Speaker Room 201*						
0800 - 1700	**Exhibition Hall Open** – *Banquet Room 201*						
	AIP PLENARY SESSIONS 3 & 4				**ACOFT – Bragg Gratings and Novel Fibers** *Meeting Room 203* **Chair: Tom White**		**ACOFT – Fibres for Novel Applications** *Meeting Room 204* **Chair: Mark Pelusi**
0830 - 0915	**PLENARY 3 – Dr Tim Fuller-Rowell** University of Colorado, USA **Space Weather and its Impact on Technology and Society** *Banquet Room 202* **Chair: Peter Dyson**				Professor John Canning (Invited 30 mins) *University of Sydney NSW* **Optical Fibre Nanophotonics**		Professor Joss Bland-Hawthorne (Invited 30 mins) *University of Sydney NSW* **Astrophotonics: the Next Wave in Observational Cosmology**
					Kevin Cook (#426) *University of Sydney NSW* **Complex Bragg Grating Writing in Acoustically Excited Optical Fiber**		Eki Setijadi (#223) *University of New South Wales NSW* **Polymer Optical Fibre (POF) from P(Methyl Methacrylate) Bearing Chiral Materials: Novel Mechanism of Light Gudiance**
0915 - 1000	**PLENARY 4 – Professor Mike Norman** Argonne National Laboratory, USA **Fermi Surface Reconstruction and the Origin of High Temperature Superconductivity** *Banquet Room 202* **Chair: Steven Prawer** Session Sponsor: *Melbourne Materials Institute*				Kevin Cook (#412) *University of Sydney NSW* **Bragg Gratings in the Germanium-Doped Cladding Rings of a Yb3+-Doped Solid Bandgap Fibre**		Wei Liu (#71) *Australian National University ACT* **Complete Spectral Gap in Coupled Hollow Metallic Waveguides**
					John Arkwright (#524) *CSIRO Materials Science And Engineering NSW* **Variations in Fibre Draw Tower Velocities Inferred from the Location of Bragg Grating Structures WrittenDuring the Draw**		Professor Simon Fleming (Invited 30 mins) *University of Sydney NSW* **Frequency Doubling and Sensing Using Poled Fiber**
					John Arkwright (#699) *CSIRO Materials Science And Engineering NSW* **Calibrating Phase Mask Motion using Direct Phase Modulation of the Diffracted Orders**		
1000 - 1030	**Morning Tea** – *Banquet Room 201*– Sponsored by *La Trobe University*						
1030 - 1400	*All Session 1 posters to be removed by authors (left over posters will be discarded)*						
1030 - 1115	**PLENARY 5 – Professor Rolf-Dieter Heuer** European Organization for Nuclear Research Geneva, Switzerland **The Large Hadron Collider LHC: Entering a New Era of Fundamental Science** – *Banquet Room 202* **Chair: Geoffrey Taylor**						
1115 - 1230	**CONCURRENT SESSION 4**						
	4A **ACOFT – Direct Writing and Novel Gratings**	**4B** **AOS – X-Ray/XUV**	**4C** **Nuclear & Particle Physics 4**	**4D** **ACOFT – Nonlinear Pulse Propagation in Fibers and Waveguides**	**4E** **Quantum Information, Concepts & Coherence Group 2**	**4F** **Solar, Terrestrial & Space Physics 4**	**4G** **AOS – Plasmonics: Optics**	**4H** **CMMSP – Modelling & Simulations**
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Francois Ladouceur	**Chair: Andrew Peele**	**Chair: Geoff Taylor**	**Chair: Dragomir Neshev**	**Chair: Geoff Pryde**	**Chair: Marc Duldig**	**Chair: Tim Davis**	**Chair: Salvy Russo**
1115 - 1130	Professor Peter R. Herman (Invited 30 mins) *University of Toronto Canada* **Direct Laser Writing of Photonic Integrated Circuits**	Angela Torrance (#467) *University of Melbourne VIC* **Curved Beam Fluctuation X-ray Microscopy**	Nicole Bell (Invited 30 mins) *University of Melbourne VIC* **Indirect Detection of Particle Dark Matter**	Graham Town (#154) **Professor Graham Town** *Macquarie University NSW* **Optical Continuum Generation Seeded by Stimulated Raman Scattering**	Andrew White (30 mins, #681) *University Of Queensland QLD* **Exponentially Faster Measurement of Quantum Dynamics via Compressed Sensing**	Iver Cairns (invited 30 mins) *University of Sydney NSW* **Solar Radio Bursts and Properties of the Solar Corona**	Michael Larkins (#670) *Queensland University of Technology QLD* **Coupling of Light into Arrays of Nanoholes Via the Kretschmann Geometry**	Yuan Ping Feng (Invited 30 mins) *National University of Singapore* **First-principles Prediction of Unconventional Dilute Magnetic Semiconductors**

1130 - 1145		Clare Henderson (#478) *ARC Centre of Excellence for Coherent X-Ray Science VIC* **Phase Retrieval of an X-ray Vortex**		Claude Aguergaray (#55) *Auckland University NEW ZEALAND* **Pulse Propagation and Break-up in Fiber Amplifiers with Third-Order Dispersion**			Xiao Ming Goh (#69) *University of Melbourne VIC* **Nanometallic Spatially Modulated Aperture Arrays for Wavefront Control**	
1145 - 1200	Professor Michael Withford (Invited 30 mins) *Macquarie University NSW* **Recent Developments in Active and Passive Glass Photonics, Fabricated Using Ultrafast Laser Direct-Write Methods**	Lap Van Dao (#655) *Swinburne University of Technology VIC* **Generation and Application of Phase-Matched Small Bandwidth Coherent Extreme Ultraviolet Radiation**	David Krofcheck (#287) *University of Auckland NEW ZEALAND* **Heavy Ions and pp Collisions at the Large Hadron Collider using the CMS Detector: Recent Results**	Wenqi Zhang (#728) *University of Adelaide SA* **Supercontinuum Generation in Dispersion-Tailored Bismuth Microstructured Optical Fibre**	Seiji Armstrong (#164) *Australian National University ACT* **Experimental Demonstration of Computer Reconfigurable Multimode Entanglement**	Christine Charles (#19) *Australian National University ACT* **Oblique Double Layers: A Comparison between Terrestrial and Auroral Measurements**	Dmitri Gramotnev (#440) *Nanophotonics Pty Ltd QLD* **Plasmonic Fabry-Perot Resonators**	Daniel Drumm (#476) *University of Melbourne VIC* **Models for the Xe Centre in Diamond**
1200 - 1215		Bo Chen (#236) *University of Melbourne VIC* **Reconstruction of Coherent Function of X-Ray Source with Wigner-Deconvolution**	Adi Paterson (Invited 30 mins) *Australian Nuclear Science and Technology Organisation NSW* **ANSTO and the Future of the Great Traditions in Nuclear Science and Technology**	Professor Roberto Morandotti (Invited 30 mins) *INRS-EMT Canada* **Continuous Wave Second Harmonic Generation in Ultra-Compact AlGaAs Photonic Wire Waveguides**	Helen Chrzanowski (#417) *Australian National University ACT* **Schrödinger Kitten States Characterisation Using Only Continuous Variables and Gaussian Resources**	Phil Richards (#21) *George Mason University VA USA* **On The Consistency of Satellite Measurements of Thermospheric Composition and Solar EUV Irradiance with Australian Ionosonde Electron Density Data**	Artur Davoyan (#314) *Australian National University ACT* **Nonlinear plasmonic tapered wavegudies**	Andrew Smith (#357) *Monash University VIC* **Chemical Bonding in Aluminium: A Comparison between Convergent Beam Electron Diffraction and Density Functional Theory**
1215 - 1230	Ryuichiro Goto (#338) *University of Sydney NSW* **Point-by-Point Bragg Grating Inscription into Single-Polarisation All-Solid Photonic Bandgap Fibre**	Benedicta Arhatari (#166) *La Trobe University VIC* **Phase Retrieval Tomography in Application**			Matthew Palsson (#407) *Griffith University QLD* **Violation Of A Bell Inequality By Weak Values**	Fred Menk (#511) *University of Newcastle NSW* **Propagation of Solar Wind Shocks through the Magnetosphere**	Adam Taylor (#218) *Swinburne University of Technology VIC* **Scattering Continuous-Wave Readout on Gold Nanorods Based Five-Dimensional Optical Recording**	Haibo Guo (#216) *CSIRO VIC* **Morphology of Iron Oxide Nanocrystals from Thermodynamic Modelling**
1230 - 1400	**Lunch Break** *(please note, lunch is not provided by congress)*							
1400	*All Session 1 posters to have been removed*		**Women in Physics Forum** 1230 - 1345					
1400 - 1700	*Authors to set up posters for Session 2*							

1400 - 1515 CONCURRENT SESSION 5

	5A ACOFT – High Speed Signal Processing and Devices	5B AOS/AMP – Fermi Gases	5C Nuclear & Particle Physics 5	5D ACOFT – Biomedical and Sensing	5E Quantum Information, Concepts & Coherence Group 3	5F Solar, Terrestrial & Space Physics 5	5G AOS – Metamaterials	5H CMMSP – Soft Matter
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Steve Madden	**Chair: Andy Martin**	**Chair: Bruce Yabsley**	**Chair: John Arkwright**	**Chair: Howard Wiseman**	**Chair: Colin Waters**	**Chair: Dragomir Neshev**	**Chair: Gary Bryant**
1400 - 1415	Dr J Schröder (Invited 30 mins) *University of Sydney NSW* **Controlling the Dynamics of A Passive Mode-Locked Laser with An In-Cavity Pulse-Shaper: Ultra-High Repetition Rates and Dark And Bright Pulses**	Chris Vale (30 mins, #437) *Swinburne University of Technology VIC A* **Universal Properties of Strongly Interacting Fermi Gases**	Jose Bellido (Invited 30 mins) *University of Adelaide SA* **Latest Results from the Pierre Auger Observatory**	Yih Miin Liew (#684) *Optical+Biomedical Engineering Laboratory WA* **Assessment and Correction of Imaging Artifacts in Skin Imaging Using Fibre-based Optical Coherence Tomography**	Robert Spekkens (#731) *Perimeter Institute for Theoretical Physics Canada* **Specker's Parable of the Over-protective Seer: Implications for Contextuality, Nonlocality and Complementarity**	Dan Meehan (Invited 30 mins) *Defence and Science Technology Organisation* **Presentation title to be advised**	Kirsty Hannam (#171) *Australian National University ACT* **Rotational Tuning of Metamaterials**	William Van Megen (30 mins, #18) *RMIT VIC* **Solidification: Perspectives from Experiments with Colloidal Suspensions**
1415 - 1430				Navin Prakash Ghimire (#24) **Mr Navin Prakash Ghimire** *Swinburne University VIC* **Nonlinear Optical Endoscopy Enabled by Fibre-Based Dispersion Compensation**	Hans Westman (#504) *The University Of Sydney NSW* **A New Form of Contextuality**		Alexander Minovich (#185) *Australian National University ACT* **Tunability of Optical Fishnet Metamaterials**	

CONCURRENT SESSION 5 continues next page

1430 - 1445	Roberto Morandotti (#692) *INRS-EMT CANADA* **Sub-ps Laser Modelocked Dissipative Soliton Laser in a CMOS Compatible Integrated Microring Resonator**	Paul Dyke (#505) *Swinburne University of Technology VIC* **Quasi-2D Fermi Gases**	Tibor Kibedi (#191) *Australian National University ACT* **Novel Approach to Determining the Radiative Width of the Hoyle State**	Huy Nguyen (#694) *Victoria University VIC* **Metallic Nanostructures on Optical Fiber End-faces for Refractive Index Sensing**	Jingbo Wang (#62) *University of Western Australia WA* **Quantum Walk Based Search and Implementation**	Thomas Kane (#23) *La Trobe University VIC* **Quiet-time HF Radar Backscatter from the F-region Ionosphere**	Iryna Khodasevych (#302) *RMIT University VIC* **Tunable Fluid Infiltrated Optical Fishnet Metamaterial**	Hans Joachim Schöpe (30 mins, #50) *University of Mainz GERMANY* **Crystallization and Vitrification of a Hard Sphere Like Colloidal Model System**
1445 - 1500	Owen Brasier (#435) *University of Sydney NSW* **Simultaneous Multi-channel OSNR Monitoring at 40 Gb/s OOK and DPSK Using a Wavelength Selective Switch**	Hui Hu (#624) *Swinburne University of Technology VIC* **First Principle Many-Body Theory for Strongly Interacting Ultracold Fermi Atoms**	Kong Guan Tan (#148) *University of Melbourne VIC* **Improving the Efficiency of Hadronic Tauon Reconstruction at ATLAS**	Nicoleta Dragomir (#607) *Victoria University VIC* **Fibre Bragg Grating Sensors for Human Skin Pressure Measurements**	Tom Stace (#696) *University of Queensland QLD* **Remarkably High Thresholds in Topological Quantum Codes Suffering Loss**	Christopher Nolan (#409) *University of Newcastle NSW* **Kelvin-Helmholtz Instability at the Magnetopause**	Parry Chen (#545) *University of Sydney NSW* **Folded Bands in Metamaterial Photonic Crystals**	
1500 - 1515	Mark Pelusi (#369) *University of Sydney NSW* **Dispersion Compensation of 100 GHz Spaced WDM 40 Gb/s Signals by Phase Conjugation in As2S3**	Joel Corney (#378) *University of Queensland QLD* **Quantum Dynamics of the Dissociation of a Condensate of Dimers into Fermionic Atoms**	Cameron Cuthbert (#336) *University of Sydney NSW* **Performance of the ATLAS Semiconductor Tracker**	Paul Stoddart (#713) *Swinburne University VIC* **Influence of Cladding Refractive Index on a Distributed Optical Fibre Chemical Sensor**	Casey Myers (#255) *University of Queensland QLD* **Coherent State Topological Cluster State Production**	Peter Dyson (#361) *La Trobe University VIC A* **Spatial Sampling of the Thermospheric Vertical Wind Field at Auroral Latitudes**	TBC	Robert Robson (#391) *James Cook University QLD* **Positron Transport in Soft Matter for PET**
1515 - 1545	**Afternoon Tea** – *Banquet Room 201* – Sponsored by *La Trobe University* **Casual Poster Viewing – Exhibition Hall**							
1545 - 1700	**CONCURRENT SESSION 6**							
	6A **ACOFT – Nonlinear Waveguides**	**6B** **AMP/AOS – Atom Light Interactions**	**6C** **Nuclear & Particle Physics 6**	**6D** **ACOFT – Sensors**	**6E** **Quantum Information, Concepts & Coherence Group 4**	**6F** **Solar, Terrestrial & Space Physics 6**		**6H** **CMMSP – Nanoscience**
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Michael Withford	**Chair: Halina Rubinsztein-Dunlop**	**Chair: Mahananda Dasgupta**	**Chair: Dominic Murphy**	**Chair: Andrew Greentree**	**Chair: Svetlana Petelina**		**Chair: Yuan Ping Feng**
1545 - 1600	Professor Barry Luther-Davies (Invited 30 mins) *Australian National University ACT* **Chalcogenide Glasses for Nonlinear Photonics**	Victor Flambaum (#125) *University of New South Wales NSW* **Atomic Ionization by Axions and Dark Matter Search**	Gerald Miller (Invited 30 mins) *University of Washington USA* **Transverse Charge Densities**	Harpreet Kaur Bal (#663) *Victoria University VIC* **Fabrication of a Fibre Bragg Grating Liquid Composition Sensor Based on Wet Etching Technique**	Warwick Bowen (#649) *University of Queensland QLD* **Quantum Mechanics in Opto-Mechanical Systems**	Colin Waters (Invited 30 mins) *University of Newcastle NSW* **Research Using Over-the-Horizon HF Radars: The Australian Connection**		Brian Rodrigue (30 mins, #595) *University College Dublin IRELAND* **Probing Electromechanical Coupling at the Nanoscale**
1600 - 1615		Laurence Campbell (#161) *Flinders University SA* **Modeling the 557.7-nm Nightglow**		Timothy Lam (#197) *Australian National University ACT* **Fiber Optic Strain Sensing Using an Absolute Frequency Reference**	Glen Harris (#739) *University of Queensland QLD* **Optimal Feedback Cooling of a Microresonator**			
1615 - 1630	Khu Vu (#159) *Australian National University ACT* **2.8dB/cm Internal Gain Tellurium Dioxide Erbium Waveguide Amplifiers**	Valentin Ivannikov (#716) *Swinburne University of Technology VIC* **AC Zeeman Shifts in a Trapped Atom Clock**	Benjamin Callen (#350) *University of Melbourne VIC* **Fermion Masses and Mixing in a 4+1-Dimensional SU(5) Domain-Wall Brane Model**	Kevin Cook (#297) *University of Sydney NSW* **Dip-Style Viscometer Based on Acoustic Wave Excitation of Long Period Fibre Grating**	Alessandro Fedrizzi (#686) *University of Queensland QLD* **Downconversion of a Single Photon**	Trevor Harris (#324) *Defence Science And Technology Organisation SA* **SpICE: A Program to Study Small-Scale Disturbances in the Ionosphere**		Robert Elliman (#653) *Australian National University ACT* **Growth and Functionalization of Silica Nanowires**
1630 - 1645	Ting Han (#122) *Australian National University ACT* **Low Loss Chalcogenide Glass Waveguides Fabricated by Hot Embossing**	Andrew Hayward (#382) *University of Melbourne VIC* **Quantum and Classic Chaos in Coupled Kicked Jaynes-Cummings Cavities**	Aditya Wakhle (#248) *Australian National University ACT* **Quasi-fission as a Competitor to Fusion in the Synthesis of Super-heavy Elements**	Alessio Stefani (#596) *Technical University of Denmark DENMARK* **Polymer Optical Fiber Bragg Grating Sensors: Measuring Acceleration**	Devin Smith (#703) *University of Queensland QLD* **Optical Quantum Information with Highly Efficient Photon-Number Resolving Transition Edge Sensors**	Sean Ables (#562) *University of Newcastle NSW* **Ultra-low Frequency Waves and Auroral Emmissions in the Polar Cap**		Taras Plakhotnik (#512) *University of Queensland QLD* **Anomalous Power-Laws of Random Fluctuations in the Transition Frequencies of Semiconductor Quantum Dots: A Possible Connection to Luminescence Intermittency**

1645 - 1700	Xin Gai (#671) *Australian National University ACT* **Ge11.5As24Se64.5 Chalcogenide Glass Nanowires with a Nonlinear Parameter of 136,000W-1km-1 at 1550nm**	Alexander Akulshin (#697) *Swinburne University of Technology VIC* **Coherence-and Optical Pumping-Based Methods For Enhancing Frequency Up-Conversion In Atomic Media**	Andrew Melatos (#635) *University of Melbourne VIC* **Nuclear Physics Experiments with Gravitational Wave Interferometers**	TBC	Michael Hush (#328) *Australian National University ACT* **Number Phase Wigner Representation for Efficient Stochastic Simulation**	Zahra Bouya (#643) *Bureau of Meteorology NSW* **Spherical Cap Harmonic Analysis Applied to Regional Ionospheric Total Electron Content Modeling for Australia**	Leslie Allen (#446) *University of Melbourne VIC* **Quantitative Scanning Transmission Electron Microscopy - Counting Atoms**
1700 - 1800		Decadal Plan Town Hall Meeting A	Decadal Plan Town Hall Meeting B	Decadal Plan Town Hall Meeting C	Decadal Plan Town Hall Meeting D		
1900 - 2330	**CONGRESS DINNER – Plaza Ballroom – Regent Theatre, 191 Collins Street, Melbourne** *(Tickets Required – this function is not included with Registration)* *Congress Dinner guests are required to make their own way to the Plaza Ballroom – Regent Theatre.* *Catch Tram 109 outside Melbourne Exhibition Centre (Clarendon Street) or 5 minute taxi ride.*						

Wednesday 8th December

0800 - 1700	**Registration Open** – *Level 2, Pre-Function Area*		
0800 - 1700	**Speaker Preparation Room Open** – *Speaker Room 201*		
0830 - 1830	**Exhibition Hall Open** – *Banquet Room 201*		
0830 - 1030	*Authors to continue poster set up for Session 2*		
0900 - 1030	**AIP PLENARY SESSIONS 6 & 7**	**ACOFT – Radio over Fiber** *Meeting Room 203* **Chair: Jochen Schroeder**	**ACOFT – Photonic Crystals** *Meeting Room 204* **Chair: Micheal Steel**
0900 - 0945	**PLENARY 6 – Professor Bruce Allen** Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Germany **The Einstein@Home Search for New Neutron Stars** *Banquet Room 202* **Chair: Susan Scott**	Dr Christina Lim (Invited 30 mins) *University of Melbourne VIC* **Digital Photonic Transmission of Analogue RF Signals for Fibre-Radio**	Thomas White (30 mins, #59) *Australian National University ACT* **Experimental Observation of Evanescent Modes in Slow-Light Photonic Crystal Waveguides**
		Professor Robert Minasian (Invited 30 mins) *University of Sydney NSW* **Photonic Signal Processing of Microwave Signals**	Snjezana Tomljenovic-Hanic (#364) *University of Melbourne VIC* **Ultrahigh-Q Photoinduced Microcavities in Defect-Free Photonic Crystals**
0945 - 1030	**PLENARY 7 – Professor David Karoly** University of Melbourne, Australia **Lies, Damn Lies and Climate Change Sceptics: What Has Really Caused Recent Global Warming?** *Banquet Room 202* **Chair: John Zillman**		Andrey Sukhorukov (#233) *Australian National University ACT* **Phase Transitions of Nonlinear Waves in Lithium Niobate Waveguide Arrays**
		Kerry Hinton (#415) *Institute For A Broadband Enabled Society VIC* **Technology & Upgrade Options for Broadband Networks**	Thomas White (#60) *Australian National University ACT A* **Raman-Induced Slow and Fast Light in Silicon Photonic Crystal Waveguides**
		Lam Bui (#756) *RMIT University VIC* **Remoted Instantaneous Frequency Measurement System using Optical Mixing in Highly Nonlinear Fiber**	Felix Lawrence (#493) *University of Sydney NSW* **Bloch-mode Based Homogenisation of Photonic Crystals**
1030	*All Session 2 posters to be on display*		
1030 - 1100	**Morning Tea** – *Banquet Room 201* – Sponsored by *RMIT University* **Casual Poster Viewing – Exhibition Hall**		

CONCURRENT SESSION 7

1100 - 1230	7A ACOFT – Microstructured Fibers and Novel Devices	7B AOS – Quantum Optics	7C Education 1	7D ACOFT – Novel Devices I	7E Biophysics / Biomedical Physics 1	7F Plasma Science 1	7G AOS – Optical Trapping	7H Relativity & Gravitation 1
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Snjezana Tomljenovic-Hanic	**Chair: Ken Baldwin**	**Chair: Pam Mulhall**	**Chair: John Canning**	**Chair: Harry Quiney**	**Chair: Christine Charles**	**Chair: Robert Scholten**	**Chair: Susan Scott**
1100 - 1130	Professor Tanya Monro (Invited 30 mins) *University of Adelaide SA* **Optical Fibres: Nanostructures Enabling New Properties and Applications**	Hans Bachor (30 mins, #151) *ACQAO ACT* **Quantum Optics - quo vadis ?**	Neil Champion (30 mins, #583) *Williamstown High School VIC* **Australian Curriculum: Physics. How Did They Get It So Wrong?**	Warren McKenzie (#450) *University of New South Wales NSW* **Fabricating Novel Diamond Waveguides Using the Focused Ion Beam Hard Mask**	Samantha Lichter (#395) *University of Melbourne VIC* **Diamond Encapsulation for a Bionic Eye**	Tony Murphy (Invited 30 mins) *CSIRO Materials Science and Engineering NSW* **Waste Treatment Using Arc Plasmas**	Timo Nieminen (#547) *University of Queensland QLD* **Computational Modelling of Imaging of Vaterite Microspheres through Crossed Polarizers**	Bram Slagmolen (30 mins, #170) *Australian National University ACT* **The Australian National University Contribution to Advanced LIGO**
1115 - 1130				Scott Jones (#351) *Electrical Engineering & Telecommunications NSW* **Electroactive Self-Assembling Hydrogels for Flexible Display Technology**	Rebecca Ryan (#451) *University of Melbourne VIC* **Structure Determination**		Guillaume Maucort (#201) *University of Queensland QLD* **Measurements of Micro-Viscoelasticity Using Constant Power Optical Tweezers with Controllable Torque**	
1130 - 1145	Pourandokht Naseri (#488) *The University of Sydney NSW* **Air Core Metallic Light Guides for Scintillation Dosimetery in Radiotherapy**	Murray Olsen (#220) *University of Queensland QLD* **Analysis of a Continuous Variable Cluster State**	Philip Dooley (#677) *University of Sydney NSW* **Building a Successful Outreach Program**	Kok Hou Wong (#286) *University of New South Wales NSW* **Polymer Optical Fiber with Enhanced Surface Properties via Surface Chemistry Modifications**	Evan Curwood (#461) *University of Melbourne VIC* **Reconstructing Single Biomolecules in the Presence of Damage**	Roman Kompaneets (#544) *University of Sydney NSW AUSTRALIA* **Vibrations of a Quantum Plasma of Arbitrary Degeneracy**	Daryl Preece (#645) *University of Queensland QLD* **Optical Tweezers for Wide-Band Micro-Rheology**	Adam Mullavey (#136) *Australian National University ACT AUSTRALIA* **Arm Length Stabilisation for Advanced LIGO**
1145 - 1200	Alessandro Tuniz (#41) *University of Sydney NSW* **Design of an Optically Invisible Metamaterial Fibre**	Michael Stefszky (#318) *Australian National University ACT* **Advancements in Low Frequency Squeezing for Gravitational-Wave Detection**	Maria B Parappilly (#332) *Flinders University SA* **AstroFest- Promoting Physics Careers through Astronomy**	Zourab Brodzeli (#463) *University of New South Wales NSW* **State of Charge of Battery Indicator Based on Fibre Optic Probe**	Darren Alvares (#292) *University of New South Wales NSW* **Inkjet Printed Low Power Organic Transistors for Integrated Biomedical Sensors**	Daniel Graham (#43) *University of Sydney NSW* **Three-Dimensional Electromagnetic Strong Turbulence: Scaling Behavior, Spectra, Field Statistics, and Wave Packet Structure**	Theodor Asavei (#658) *University of Queensland QLD* **Optical Paddle-Wheel**	Sheon Chua (#200) *Australian National University ACT* **Squeezed State Injection for the Sensitivity-Improvement of Advanced Gravitational-Wave Interferometers**
1200 - 1215	Geraldine Marien (#577) *Macquarie Univsersity NSW* **Profiles of Fibre Bragg Grating Stopbands for Temporal Spectral Astronomy**	Anton Desyatnikov (#477) *Australian National University ACT* **Collapse of Elliptic Optical Beams with Orbital Angular Momentum**	Judith Pollard (#471) *University of Adelaide SA* **Is There a Gender Bias in Pre- and Post-Testing?**	Nicolas Riesen (#651) *Australian National University ACT* **Dispersion Equalisation in Few-Mode Fibres**	Ajay Tikka (#347) *Victoria University VIC* **Wireless Implant Communication using Inductive Coupling**	Roman Kompaneets (#538) *University of Sydney NSW* **Shielding of a Moving Test Charge in a Quantum Plasma**	Alexander Stilgoe (#679) *University of Queensland QLD* **Non-Conservative Behaviour of Complex Optical Force Fields**	Thanh Nguyen (#331) *Australian National University ACT* **Control of the Complex Optical Springs**
1215 - 1230	Tilanka Munasinghe (#499) *University of Adelaide SA* **Highly Nonlinear, Low Dispersion Fibres for Telecommunications Applicaitons**	Brendan Wilson (#456) *University of Melbourne VIC* **Large Dipole Systems in Ultrasmall Cavities: Extreme Cavity QED**	Neil Champion (#106) *Williamstown High School VIC* **Electric Circuits: The Design and Implementation of a Constructivist Approach to Learning**	Kunimasa Saitoh (#473) *Hokkaido University JAPAN* **Limitation on Effective Area of Large-Mode-Area Leakage Channel Fibers Under Bent Condition**	Jeffrey Davis (#726) *Swinburne University of Technology VIC* **Coherent Effects in Photosynthesis and Associated Biomolecules**	Rod Boswell (#45) *Australian National University ACT* **Focussed Inert Ion Beam systems for 3D rock tomography on the nano-scale**	Michael Taylor (#706) *University of Queensland QLD* **Sagnac Interferometer Enhanced Particle Tracking in Optical Tweezers**	Andrew Wade (#344) *Australian National University ACT* **A Benchtop Polarisation Speed Meter for Gravitational Wave Detection**
1230 - 1330	**Lunch Break** *(please note, lunch is not provided by congress)* **Casual Poster Viewing – Exhibition Hall**							
1240 - 1325		**Nobel Prize in Physics 2010** *How to win a Nobel Prize with a pencil and sticky tape* 1240 - 1325 Session Sponsor: *Melbourne Materials Institute*						

CONCURRENT SESSION 8

1330 - 1500	8A ACOFT – Silicon Photonics	8B AOS/AMP – Spectroscopy	8C Education 2	8D ACOFT – Novel Devices II	8E Biophysics / Biomedical Physics 2	8F Plasma Science 2	8G AOS – Lasers	8H Relativity & Gravitation 2
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Arnan Mitchell	**Chair: Andre Luiten**	**Chair: Maurizio Toscano**	**Chair: Peter Domachuk**	**Chair: Harry Quiney**	**Chair: Rod Boswell**	**Chair: David Coutts**	**Chair: Susan Scott**
1330 - 1345	Bill Corcoran (#425) *University of Sydney NSW* **Silicon-chip-based THz Bandwidth Radio-frequency Spectrum Analyser**	Gar-Wing Truong (#523) *University of Western Australia WA* **Progress in Determining the Boltzmann Constant Using Alkali Metal Spectroscopy**	Margaret Wegener (#96) *University of Queensland QLD* **Virtual Realities for Learning Introductory Physics**	Michael Stevenson (#208) *University of Sydney NSW* **Controlled Fabrication of Tunable Delay Using Compound Phase Shifted Resonators**	Kumar Ganesan (#274) *University of Melbourne VIC* **Diamond Penetrating Electrode Array for Bionic Eye**	Sally L McArthur (Invited 30 mins) *Swinburne University of Technology VIC* **Plasma Polymers in Biotechnology: Power, Patterning and PDMS**	Helen Pask (#353) *Macquarie University NSW* **Diode-Pumped Terahertz Laser Source**	Jude Prezens (#25) *University of Melbourne VIC* **The Double Kerr Solution as a Possible Mechanism for Controlled Causality Violation**
1345 - 1400	David Moss (#693) *University of Sydney NSW* **CMOS Compatible All-Optical Waveguides**	Christopher Perrella (#186) *University of Western Australia WA* **Non-Linear Spectroscopy of Rubidium in Hollow Core Fibres For Compact Clocks and Quantum Optics**	Anton Rayner (#250) *University of Queensland QLD* **The Influence of Tablet Technology on Learning in Engineering Thermodynamics**	Stephen Collins (#659) *Victoria University VIC* **Modelling of an Alternative Pi-phase-shifted Fibre Bragg Grating Operating at Twice the Bragg Wavelength**	Heiko Timmers (#133) *University of New South Wales ACT* **Micro-Scratching and Scanning Probe Microscopy towards Understanding Wear in Knee Prostheses**		David Ottaway (#680) *University of Adelaide SA* **Microstructured Erbium Doped Tellurite Fibre Laser**	Phil Threlfall (#39) *Australian National University ACT* **The Conformal Structure of FRW Space-Times**
1400 - 1415	Trung Duc Vo (#489) *University of Sydney NSW* **Silicon Chip Based Instantaneous Dispersion Monitoring for a 640 Gbit/s DPSK Signal**	Feng Wang (#227) *Swinburne University of Technology VIC* **Electron Correlation Effects of Bound Electronic Wavefunctions to Gamma-Ray Spectra of Positron Annihilation in Atoms and Small Molecules**	Gary Tuck (#108) *University of Queensland QLD* **Radioactivity Experiments on iLab at The University of Queensland**	Mattias Åslund (#599) *University of Sydney NSW* **Comparison between a Mach-Zender and a Michelson Interferometer Employing Farady Mirrors for the Delayed Self-Heterodyne Interferometry Technique**	Christian Steinhauer (#144) *University of Munich GERMANY* **Imaging DNA Nanostructures with Super-Resolution Fluorescence Microscopy**	Yuriy Tyshetskiy (#228) *University of Sydney NSW AUSTRALIA* **Charging of Nanoparticles in Complex Plasmas: The Role of Quantum Tunneling of Electrons**	Alexander Sabella (#366) *DSTO SA* **Efficient Diamond Raman Lasers Operating at 1240 nm and 1485 nm**	Richard Barry (#73) *Australian National University ACT* **Contact Properties of the Abstract Boundary Construction**
1415 - 1430	Fangxin Li (#691) *University of Sydney NSW* **All-Optical Time-Division Demultiplexing at 160Gb/s and 640Gb/s via FWM in a Silicon Nanowire**	Christopher Chantler (#584) *University of Melbourne VIC* **A Facility for Testing Quantum Electro-Dynamics, Plasma Physics, Laboratory Astrophysics and the Fundamental Constants of Nature – A Visible, VUV, X-Ray Synchrotron Source Allied with an Electron Beam Ion Trap**	Joe Wolfe (#606) *University of New South Wales NSW* **Multimedia Learning and Teaching: The Physclips Example**	Fotios Sidiroglou (#629) *Victoria University VIC* **Improving the Radial Dopant Distribution in Silica Optical Fibres**	Chathurika Abeyrathne (#354) *University of Melbourne VIC* **Signal Recovery from Noise in Biological Systems**	Kunwar Singh (#42) *University of Sydney NSW* **Radiation Propagation in Fluctuating Plasmas Using Kinetic Equations: Theory and Simulations**	David Lancaster (#441) *University of Adelaide SA* **Towards Realisation of a 2m Thulium Chip Laser**	Krzysztof Bolejko (#631) *Australian National University ACT* **Pre-Inflationary Homogenization of the Universe**
1430 - 1445	Thach Nguyen (#757) *RMIT University VIC* **Polarisation Dependent Scattering Loss in Thin, Shallow-Ridge Silicon-on-Insulator Waveguides with Resonant Lateral Leakage**	Lucas Smale (#592) *University of Melbourne VIC* **Towards a Characterization of Kß Spectral Profiles for Scandium, Titanium, Chromium and Manganese**	Joanna Turner (#278) *University of Southern Queensland QLD* **Remote Laboratories and Experiment Kits for Tertiary Physics Distance Education Students**	Scott Wade (#431) *Swinburne University of Technology VIC* **Bend Effects on Fibre Bragg Gratings in Standard and Low Bend Loss Optical Fibres**	Jon Swaim (#705) *University of Queensland QLD* **Ultra-Sensitive Biosensing Using Optical Microresonators**	Roman Kompaneets (#535) *University of Sydney NSW* **Kinetic Modes in Field-Driven Plasma Flows**	Matthew Petrasiunas (#712) *Griffith University QLD* **A High-Power Ultrafast Laser Source with 300 MHz Repetition Rate for Trapped-Ion Quantum Logic**	TBC
1445 - 1500	Fangxin Li (#689) *University of Sydney NSW* **Low Propagation Loss Silicon-on-Sapphire Integrated Waveguides**	TBC	David Mills (#534) *Monash University VIC* **Communication and Confidence in Student-Designed Experiments**	Keiron Boyd (#479) *University of Adelaide SA* **Elliptical CO2 Laser Beam Tapering of Pressurised Bismuth Microstructured Optical Fibe**	Dirk Lorenser (#676) *University of Western Australia WA* **Miniaturized Optical Probe using Gradient-Index Optics for In-Vivo Confocal Microscopy**	Mushtaq Ahmad (#416) *University of Sydney NSW* **Nonlinear Waves in Quantum Plasmas**	Miftar Ganija (#498) *University of Adelaide SA* **Power Scaling and Reliable Cryogenic Cooling of a High Power Solid State Laser**	TBC
1500 - 1530	**Afternoon Tea** – *Banquet Room 201* – Sponsored by *RMIT University* **Casual Poster Viewing – Exhibition Hall**							

CONCURRENT SESSION 9

1530 - 1700	9A ACOFT/AOS – Laserfest Symposium 2	9B AOS/AMP – BEC I: Correlations	9C Education 3	9D Nuclear & Particle Physics 7	9E Biophysics / Biomedical Physics 3	9F CMMSP – Semiconductors II	9G AOS – Photonic Crystals	9H Relativity & Gravitation 3
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Stuart Jackson	**Chair: John Close**	**Chair: Pam Mulhall**	**Chair: Antonio Limosani**	**Chair: Harry Quiney**	**Chair: Trevor Finlayson**	**Chair: Brant Gibson**	**Chair: Susan Scott**
1530 - 1600	Laserfest 6: Professor Luther-Davies (20 mins) *Australian National University ACT* **A Quarter Century of Using Lasers Used for Physics at ANU**	Ken Baldwin (30 mins, #668) *Australian National University ACT* **Quantum Statistics of Atomic Speckle**	Esther Siam (#244) *Monash University VIC* **First Year University Students' Learning in Electromagnetic Experiments**	Aldo Saavedra (#520) *University of Sydney NSW* **Inclusive Hadronic Tau Studies in ATLAS**	Park Fung (#34) *University of Sydney NSW* **Neural Field Theory ofLarge-Scale Synaptic Plasticity**	Wenxin Tang (#56) *Monash University VIC* **Surface Dynamics during Langmuir Evaporation of GaAs**	Kanna Aoki(Invited, 30 min) *Metamaterials Laboratory Riken Japan* **Assembly of Three-Dimensional Photonic Structures**	Benjamin Lewis (#647) *Australian National University ACT* **Numerical Techniques for Differential Geometry**
1545 - 1600			Jennifer Coopersmith (#38) *La Trobe University VIC* **A Different Way to Teach Energy**	Gregory Lane (#453) *Australian National University ACT* **TAGS at CARIBU - A New Experimental Facility for the Study of Neutron-Rich Nuclei**	Marcus Wilson (#72) *University of Waikato NEW ZEALAND* **Measuring Electrical Conductivity of Brain Slices**	Heiko Timmers (#130) *University of New South Wales ACT* **Local Lattice Information for GaN and ZnO Relevant to Spintronics**		Katie Howard (#132) *Macquarie University NSW* **Relativistic Emissions from the Galactic Centre**
1600 - 1615	Laserfest 7: Professor Brian Orr (20 mins) *Macquarie University NSW* **Atomic and Molecular Spectroscopy in Australia - Fifty Years with and without Lasers**	Tod Wright (#531) *University of Queensland QLD AUSTRALIA* **Nonperturbative Approach to Correlations and Interactions in the Finite-Temperature Bose Gas**	Devon Biggerstaff (#715) *University of Queensland QLD* **Quantum Optics Experiments for Advanced Undergraduate Laboratory**	Lucas Ong (#348) *University of Melbourne VIC* **Diamond-Based Tracking Detectors For High Energy Physics**	Alistair Steyn-Ross (#281) *University of Waikato NEW ZEALAND* **Precursive Ringing in a Subthreshold Neon-bulb Oscillator**	Oleh Klochan (#120) *University of New South Wales NSW* **Fabrication and Characterization of an Undoped Gaas Single Hole Transistor**	Alvaro Casas Bedoya (#323) *University of Sydney NSW* **Dispersion Engineering of Photonic Crystal Waveguides Using Selective Microfluidic Infiltration**	Ra Inta (#205) *Australian National University ACT* **The Search for Gravitational Waves from Non-Pulsing Young Neutron Stars**
1615 - 1630	Laserfest 8: A/Professor David Lancaster (20 mins) *University of Adelaide SA* **An Incomplete Account of Laser Research for Defence Applications in Australia**	Karen Kheruntsyan (#316) *University of Queensland QLD* **What Can We Learn from the Measurement of the Third Moment of Density Fluctuations in a Quantum Gas?**	Marcus Wilson (#76) *University of Waikato NEW ZEALAND* **A Mixed 'Cookbook' and Student-Designed Laboratory Course at the University of Waikato in 2010**	Curtis Black (#423) *University of Sydney NSW* **Lepton Flavour Violation in Supersymmetry at the LHC**	Guillaume Maucort (#308) *University of Queensland QLD* **Biophysical Studies of the Actin Network Action on Neurosecretory Vesicles during Stimulation of Exocytosis**	Jessica Van Donkelaar (#429) *University of Melbourne VIC* **An Ordered Donor Array in a Nanoscale Semiconductor Device**	Andrey Sukhorukov (#687) *Australian National University ACT* **Paired Resonances of Heterostructure Cavities Based on Dispersion-Engineering of Slow-Light**	Graeme Gossel (#126) *University of New South Wales NSW* **Energy Levels of a Scalar Particle in a Static Gravitational Field Approaching the Black Hole**
1630 - 1645	Laserfest 9: Dr Helen Pask (20 mins) *Macquarie University NSW* **Crystalline Raman Lasers: Past, Present and Future**	Qiongyi He (#708) *Swinburne University of Technology VIC* **EPR Entanglement in a Four-Mode BEC**	Helen Georgiou (#189) *University of Sydney NSW* **A Comparison of Students' Thermal Physics Conceptions across Three English-Speaking Countries**	Justin Matthys (#290) *University of Melbourne VIC* **Prospects for Dark Matter Detection through the 21cm Line**	Ben Kent (#464) *RMIT University VIC* **The Effects of Sugars on Lipid Membrane Phase Behaviour and Their Role as Protectants during Freezing and Dehydration**	Simon Ruffell (#173) *Australian National University ACT* **Silicon XII: A Novel Semiconductor That Can Be Electrically Doped and Patterned at Room Temperature**	Mark Turner (#78) *Swinburne University of Technology VIC* **Fabrication of Chiral Gyroid Photonic Crystals**	TBC
1645 - 1700	Laserfest 10: A/Professor Rich Mildren (20 mins) *Macquarie University NSW* **Diamond Raman Lasers**	Simon Haine (#414) *Australian Centre for Quantum Atom Optics QLD* **Squeezing the Most out of Your Atom Laser: Optimizing the Output of an Atom Laser for Precision Measurement**	Jiradawan Huntula (#345) *Mahidol University PATHOM THAILAND* **Encouraging Student Learning in Physics Laboratory Classes by Using CTTQ (Concepts, Tools and Techniques Questioning Method)**	TBC	Brendan Kennedy (#652) *University of Western Australia WA* **Imaging Tissue Mechanical Properties with Optical Coherence Elastography**	Christopher Hall (#666) *Swinburne University VIC* **Observation of Spatially Separated Coherent Coupling near the LO Phonon Resonance within Asymmetric Double Quantum Wells**	Ivan Garanovich (#54) *Australian National University ACT* **Two-Dimensional Dynamic Localization of Light in Photonic Lattices**	TBC
1700 - 1830	**ACOFT – Postdeadline Session & Student Awards** *Banquet Room 202* **Chair: David Moss**	**POSTER SESSION 2** – *Exhibition Hall – Banquet Room 201* Presenting authors to be available for discussion *Refreshments served, included with Registration*						
1900 - 2030	**OPEN TO THE PUBLIC & included with registration** **PUBLIC LECTURE** – **Professor Jocelyn Bell Burnell** *University of Oxford and Mansfield College Oxford, UK* **Will the world end in 2012? The Astronomical Evidence** *Melbourne Convention & Exhibition Centre – Plenary Hall 1, Ground Floor - Enter via doors 5 & 6* **Chair: David Jamieson** Sponsored by *Melbourne University - School of Physics*							

Thursday 9th December

0800 - 1530	**Registration Open** – *Level 2, Pre-Function Area*
0800 - 1600	**Speaker Preparation Room Open** – *Speaker Room 201*
0830 - 1530	**Exhibition Hall Open** – *Banquet Room 201*
0900 - 0945	**PLENARY 8 – Professor Jeremy Mould** University of Melbourne, Australia **Dark Matter in the Local 200 Mpc** – *Banquet Room 202* – **Chair: Marcus Duldig**
0945 - 1030	**PLENARY 9 – Dr Tobias Kippenberg** Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne Switzerland **Cavity Optomechanics: Coupling Light and Mechanical Motion** – *Banquet Room 202* – **Chair: Gerard Milburn**
1030 - 1100	**Morning Tea** – *Banquet Room 201* – Sponsored by *RMIT University* **Casual Poster Viewing – Exhibition Hall**

1100 - 1230 CONCURRENT SESSION 10

	10A Nuclear & Particle Physics 8	10B AOS – Nonlinear Optics	10C AOS – Fabrication	10D AOS/AMP – Control and Trapping of (ultra) Cold Gases	10E Quantum Information, Concepts & Coherence Group 5	10F Synchrotron Science 1	10G Complex Systems, Computational & Mathematical Physics	10H AOS – Devices and Systems
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Gerald Miller	**Chair: Anton Desyatnikov**	**Chair: Andrei Rode**	**Chair: Peter Hannaford**	**Chair: Warwick Bowen**	**Chair: Martin de Jonge**	**Chair: Andrew Melatos**	**Chair: Stephen Collins**
1100 - 1115	Mahananda Dasgupta (Invited 30 mins) *Australian National University ACT* **Quantum Tunnelling and Nuclear Fusion**	Ksawery Kalinowski (#167) *Australian National University ACT* **Second and Third Harmonic-Parametric Scattering in Disordered Quadratic Media**	Martin Ams (#497) *Macquarie University NSW* **Optically-Tunable Waveguide Coupler Directly Written in Glass Using Femtosecond Laser Pulses**	Robert Scholten (30 mins, #221) *University of Melbourne VIC* **Electron Bunch Shaping with an Ultracold Plasma**	Matthew Sellars (30 mins, #568) *Australian National University ACT* **Demonstration of an Efficient Quantum Memory for Light**	David Paganin (Invited 30 min) *Monash University VIC* **Coherent X-Ray Optics: A Very Broad Overview**	Markus Brede (Invited 30 mins) *CSIRO Marine and Atmospheric Research* **Optimizing Coupled Oscillators for Synchronization**	Gary Allwood (#633) *Edith Cowan University WA* **Photovoltaic Micro-Cell Design for Distributed Power-over-Fibre Optimized for 850nm & 980nm**
1115 - 1130		Adrian Ankiewicz (#70) *Australian National University ACT* **Discrete Rogue Waves**	Simon Gross (#502) *Macquarie University NSW* **Laser Direct Written Depressed Cladding Waveguides in Fluoride Glass**					Anna Lurie (#536) *University of Western Australia WA* **Towards a Photonic Crystal Fibre Clock**
1130 - 1145	Andrew Stuchbery (#387) *Australian National University ACT* **Nuclear and Atomic Physics through Hyperfine Interactions of Highly Charged Free Ions**	Francis Bennet (#162) *Australian National University ACT* **Observation of Truncated Nonlinear Bloch Waves in LiNbO3 Waveguide Arrays**	Cyril Hnatovsky (#101) *Australian National University ACT* **Materials Processing with a Tightly Focused Femtosecond Vortex Laser Pulse**	Stuart Szigeti (#379) *Australian National University ACT* **Feedback Control of an Interacting Bose-Einstein Condensate Using Dispersive Imaging**	Ben Sparkes (#202) *Australian National Univerisity ACT* **An AC Stark Gradient Echo Memory**	Corey Putkunz (#90) *University of Melbourne VIC* **Phase Diverse Coherent Diffractive Imaging: High Sensitivity with Low Dose**	Andrey Sokolov (#67) *University of Melbourne VIC* **Dynamics of the Australian Interbank Loan Flows**	Adam Mullavey (#135) *Australian National University ACT* **Fibre Phase Noise Cancellation for Long Baseline Optical Networks**
1145 - 1200	Duc Huy Luong (#85) *Australian National University ACT* **New Insights into the Mechanisms and Timescales of Breakup in Reactions of Weakly-Bound Nuclei**	Yan Sheng (#115) *Australian National University ACT* **Cerenkov-Type Second Harmonic Generation in Twodimensional Nonlinear Photonic Structures**	Malte Duering (#646) *Australian National University ACT* **Ablation and Deposition of Polymersusing High-Power Mid-Infrared Laser Pulses**	Sebastian Schnelle (#305) *University of Queensland QLD* **Time Averaged Optical Traps for the Investigation of Superfluidity in BEC**	John Bartholomew (#390) *Australian National University ACT* **Detecting Coherent Emission from Hundreds of Rare Earth Ions**	Mac Luu (#245) *La Trobe University VIC* **Phase Imaging Using X-ray Polychromatic Sources**	Jonathan Wylie (#600) *City University of Hong Kong CHINA* **Stretching of Viscous Threads at Low Reynolds Numbers**	Yasar Kutuvantavida (#103) *Massey University PALMERSTON NEW ZEALAND* **Photostability and Electro-Optic Response of Organic Non-Linear Optical Films**
1200 - 1215	Cédric Simenel (#107) *Australian National University ACT* **Actinide Collisions for QED and Superheavy Elements**	Zhiyong Xu (#15) *Australian National University ACT* **All-Optical Logic Gates Based on Nonlinear PT-Symmetric Photonic Couplers**	Benjamin Cumming (#165) *Swinburne University of Technology VIC* **Photonic Crystal Fabrication with an Adaptive Optic Direct Laser Writing System**	Smitha Jose (#719) *Swinburne University Of Technoilogy VIC* **Trapping of Ultracold Atoms in a 10 Micrometer-Period Permanent Magnetic Lattice**	Marcus Doherty (#229) *University of Melbourne VIC* **Room-Temperature 3D Electric Field Sensing Using a Single Spin in Diamond**	Christopher Hall (#207) *Australian Synchrotron VIC* **Combined X-Ray Fluorescence and Absorption Computed Tomography**	Robert Dewar (#734) *Australian National University ACT* **Action-Based Definitions of Almost-Invariant Tori in Close-To-Integrable Hamiltonian Systems**	James Quilty (#673) *Industrial Research Limited NEW ZEALAND* **Tunable Polymer Thin Film Bragg Gratings**
1215 - 1230	Maurits Evers (#110) *Australian National University ACT* **Coherent to Dissipative Dynamics in Nuclear Reactions: The Role of (Multi-) Nucleon Transfer**	Qian Kong (#58) *Australian National University ACT* **Analytical Theory of Dark Solitons in Nonlinear Materials with Arbitrary Degree of Nonlocality**	Yaoyu Cao (#160) *Swinburne University of Technology VIC* **Nano-Photolithography Using Doughnut Beam Induced Photoinhibition**	TBC	Andy Martin (#381) *University of Melbourne VIC* **Large Aharonov-Casher Phase in Single Atom-Scale Diamond Defects**		TBC	Joshua Toomey (#177) *Macquarie University NSW* **Chaos-Based Secure Communication System**

1230 - 1330	**Lunch Break** *(please note, lunch is not provided by congress)* **Casual Poster Viewing – Exhibition Hall**

1245 - 1330			**Community Forum: LIGO Australia** 1245 - 1330					
1330 - 1530	*All Session 2 posters to be removed by authors (left over posters will be discarded)*							
1330 - 1500	**CONCURRENT SESSION 11**							
	11A **Nuclear & Particle Physics 9**	**11B** **AIP Prize Lectures 1**	**11C** **NANO SCHOOLS 1** Sponsored by: *Australian National Fabrication Facility*	**11D** **AOS/AMP BEC II: Excitations**	**11E** **Quantum Information, Concepts & Coherence Group 6**	**11F** **Synchrotron Science 2**	**11G** **AOS – Applications of Nonlinear Optics**	**11H** **CMMSP – Condensed Matter**
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Nicole Bell	**Chair: Brian James**	**Chair: TBC**	**Chair: Kristian Helmerson**	**Chair: Andrew Greentree**	**Chair: David Paganin**	**Chair: Adrian Ankiewicz**	**Chair: Robert Elliman**
1330 - 1345	Kevin Varvell (Invited 30 mins) *University of Sydney NSW* **Prospects for Physics Beyond the Standard Model at the Belle II Experiment**	Joe Wolfe **AIP Education Medal Lecture**		Matthew Davis (30 mins, #385) *University of Queensland QLD* **On the Scaling of Vortex Number in the Formation of Trapped Bose-Einstein Condensates**	Howard Wiseman (30 mins, #306) *Griffith University QLD* **EPR-Steering of Bell-local States**	Garry Foran Invited 30 mins) *Australian Synchrotron VIC* **Science Case 2 - A Roadmap for the Scientific Development of the Australian Synchrotron**	Dragomir Neshev (#253) *Australian National University ACT* **Ultrafast All-Optical Switching in Directional Couplers with Second Order Nonlinearity**	Adrian D'Alfonso (#430) *University of Melbourne VIC* **Atomic Resolution Chemical Mapping Using Energy Dispersive X-Ray Spectroscopy**
1345 - 1400							Yana Izdebskaya (#404) *Australian National University ACT* **Higher-Order Modes of Nematicon Waveguides**	Andrew Princep (#669) *University of New South Wales ACT* **A Theoretical Framework for Soft X-ray Resonance Enhanced Bragg Diffraction**
1400 - 1415	Martin Sevior (#97) *University of Melbourne VIC* **Recent Results from the Belle Experiment**	Kostya Ostrakov **Walter Boas Medal Lecture**		Jacopo Sabbatin (#358) *University Of Queensland QLD* **Kibble-Zurek Mechanism in a Spin-1/2 Bose-Einstein Condensate**	Margaret Reid (#710) *Swinburne University of Technology VIC* **Criteria for Multipartite Qudit Nonlocality**	Sarah Harmer (#422) *University of South Australia SA* **Spectroscopic Photoemission and Low Energy Electron Microscope (SPELEEM) Investigation of the Galvanic Effects between Cu Sulfides**	Alexander Solntsev (#48) *Australian National University ACT* **Simultaneous Frequency Conversion and Pulse Compression in Nonlinear Tapered Waveguides**	Christopher Chantler (#588) *University of Melbourne VIC* **Nano-Roughness in Gold Revealed from X-Ray Signature**
1415 - 1430	T'Mir Julius (#190) *University of Melbourne VIC* **The Measurement of xx at the Belle Experiment**			Lila Warszawski (#718) *University of Melbourne VIC* **Triggers for Collective Superfluid Vortex Behaviour**	Tony Downes (#219) *University of Queensland QLD* **QKD in Non-Inertial Frames**	David Paterson (#612) *Australian Synchrotron VIC* **X-Ray Fluorescence Microscopy: A Versatile Tool for Microanalysis**	Irina Kabakova (#380) *University of Sydney NSW* **Bragg Grating Based All-optical Switch in Highly Nonlinear Bismuth-Oxide Fiber**	Saulius Juodkazis (#275) *Swinburne University of Technology VIC* **Super-Dense Body-Centered-Cubic Al Formed by Ultrafast Microexplosion**
1430 - 1445	Thomas Cunningham (#411) *University of Sydney NSW* **Catching More B Mesons at a B-factory**			Andy Martin (#386) *University of Melbourne VIC* **Excitation Frequencies and Static Solutions of Trapped Dipolar Bose-Einstein Condensates in the Thomas-Fermi Regime**	Eric Cavalcanti (#304) *Griffith University QLD* **Closed Timelike Curves, Nonlinear Quantum Evolution and the Measurement Problem**	Martin de Jonge (#602) *Australian Synchrotron VIC* **Quantitative Fluorescence Tomography of /Cyclotella Meneghiniana/ at 400-nm Resolution**	Juna Thomas (#601) *Queensland University of Technology QLD* **Intensity Dependent Amplitude Modulation Contamination in Electro-Optic Phase Modulators**	Michelle Spencer (#759) *RMIT University VIC* **Gas Sensing Properties of ZnO Nanostructures: A Density Functional Theory Approach**
1445 - 1500	Nikhul Patel (#341) *University of Sydney NSW* **Searching for a Charged Higgs Boson with ATLAS**			Mikhail Egorov (#656) *Swinburne University of Technology VIC* **Long Coherence Time of Interacting Bose-Einstein Condensates**	Michael Hall (#537) *IP Australia ACT* **How Much Determinism, Locality, and Free Will Does Quantum Mechanics Require Giving up?**	Boshra Afra (#662) *Australian National University ACT* **SAXS Measurements of Ion Tracks in Natural Mineral Materials**	Rezaul Hoque Akanda (#637) *Bangladesh University BANGLADESH* **Effect of XPM Crosstalk Due to Second Order GVD in WDM Fiber-Optic Transmission System**	Trevor Finlayson (#327) *University of Melbourne VIC* **Stresses Borne by Inclusions in a Model Metal-Matrix Composite Under Load**
1500 - 1530	**Afternoon Tea** – *Banquet Room 201* – Sponsored by *RMIT University*							

1530	*All Session 2 posters to have been removed by authors (left over posters will be discarded)*							
1530 - 1730	*Exhibitors Move Out*							
1530 - 1630	**CONCURRENT SESSION 12**							
	12A **Nuclear & Particle Physics 10**	**12A** **AIP Prize Lectures 2**	**12C** **NANO SCHOOLS 2** Sponsored by: *Australian National Fabrication Facility*			**12F** **Synchrotron Science 3**		**12H** **History of Physics**
	Banquet Room 202	*Meeting Room 203*	*Meeting Room 204*	*Meeting Room 207*	*Meeting Room 208*	*Meeting Room 209*	*Meeting Room 205*	*Meeting Room 206*
	Chair: Andrew Stuchbery	**Chair:Marc Duldig**	**Chair: TBC**			**Chair: David Paterson**		**Chair: Maurizio Toscano**
1530 - 1600	Ross Young (Invited 30 mins) *University of Adelaide SA* **Precision Test of the Weak Nuclear Force**	Rob Scholten **Alan Walsh Prize Lecture**				Christopher Chantler (30mins, #585) *University of Melbourne VIC* **The X-ray Extended Range Technique – A Model for Developing New Fields of Physics at a Synchrotron**		Norman Heckenberg (#44) *University of Queensland QLD* **Thomas Parnell and Sumpner's Reflecting Electrodynamometer**
1600 - 1615		Hans Bachor **Harrie Massey Medal and AOS Medal Lecture**						Jennifer Coopersmith (#37) *La Trobe University VIC* **Daniel Bernoulli, Unsung Hero of Energy**
1600 - 1615	Tristan Skawronski (#565) *Flinders University SA* **Achieving crossing symmetry, gauge invariance, and unitarity in the ?N ? ?N system**					Harris Panopoulos (#457) *University of Melbourne VIC* **Electron Beam Energy Measurement by Resonant Spin Depolarisation at the Australian Synchrotron**		Brian James (#529) *University of Sydney NSW* **The ZETA Controlled Fusion Project 1955-68: The Politics, the Physics and the Australian Connection**
1615 - 1630	Kalman Robertson (#102) *Australian National University ACT* **Atomic Radiations in Nuclear Decay**					TBC		Neil Boucher (#210) *SoundID QLD A* **A New and Improved Four-Dimensional Spectrogram.**
1630 - 1645	**CONGRESS CLOSING** *Banquet Room 202* Presentation of the CiSRA, OSA and SPIE student prizes							

PAPER SUMMARIES

Abstracts and full papers are **AVAILABLE ON THE CD** of Conference Proceedings

Monday 6 December

0900 - 0945

Plenary Session 1

Room: *Banquet Room 202, Level 2*
Chair: Keith Nugent, ARC Centre of Excellence for Coherent X-Ray Science, PARKVILLE, AUSTRALIA
Session Sponsor: ARC Centre of Excellence for Coherent X-ray Science

Time

0900 0945 **Prof Margaret Murnane**
University of Colorado USA

Attosecond Light and Science at the Timescale of the Electron

Extreme nonlinear optics can upshift femtosecond lasers to much higher photon energies, creating a coherent version of the Roentgen x-ray tube. Ultrafast x-rays can capture the complex dynamics of electrons in atoms, molecules and materials.

Monday 6 December

0945 - 1030

Plenary Session 2

Room: *Banquet Room 202, Level 2*
Chair: Stephen Collins, Victoria University, MELBOURNE, AUSTRALIA

Time

0945 1030 **Prof David Payne**
Optoelectronics Research Centre UNITED KINGDOM

Presentation title to be confirmed

Summary not provided.

Monday 6 December

1100 - 1230

Concurrent Session 1A: ACOFT Keynote Session 1

Room: *Banquet Room 202, Level 2*
Chair: David Moss, University of Sydney, SYDNEY, AUSTRALIA
Session Sponsor: CUDOS

Time

1100 1130 **Dr Rene-Jean Essiambre**
Alcatel-Lucent USA

Fiber Capacity Limits: Information Theory meets Optical Communication and Fiber Physics

Determining a fundamental limit to the rate of transmission of information in optical fibers, or fiber capacity, requires bringing together concepts of information theory, nonlinear dynamics and optical physics. An overview of an approach to estimate fiber capacity is presented.

1130 1200 **Prof Arthur Lowery**
Monash University VIC AUSTRALIA

Optical Frequency Division Multiplexing

OFDM is widely used in radio systems for efficient data transmission over dispersive channels. Australian researchers were the first to promote OFDM for long-haul optical transmission. This talk reviews innovations over the last 4 years.

1200 1230 **Dr Seb Savory**
University College London UNITED KINGDOM

Digital Coherent Transceivers: From Access to Core

Digital coherent transceivers have emerged as a disruptive technology for next generation optical networks. We will examine the fundamental issues associated with such a transceiver and discuss their application in both core and access networks.

Monday 6 December

1100 - 1230

Concurrent Session 1B: Astronomy & Astrophysics

Room: *Meeting Room 203, Level 2*
Chair: Duncan Galloway, Monash University, CLAYTON, AUSTRALIA

Time

1100 1115 **Dr Krzysztof Bolejko**
Australian National University ACT AUSTRALIA
Evolution of Dark Energy in the Inhomogeneous Universe
Dark energy is one of the most important problems in cosmology. However, in order to reveal its nature not only precise observations are needed but also a proper framework.

1115 1130 **Prof Victor Flambaum**
University of New South Wales NSW AUSTRALIA
Variation of the Fundamental Constants from Big Bang to Atomic Clocks: Theory and Observations
I present a review of works devoted to the variation of the fine structure constant alpha, strong interaction and fundamental masses (Higgs vacuum). There are some hints for the variation in quasar absorption spectra and Big Bang nucleosynthesis data. A very promising method to search for the variation consists in comparison of different atomic clocks. Huge enhancement of the variation effects happens in transitions between very close atomic, nuclear and molecular energy levels.

1130 1145 **Dr Michael Brown**
Monash University VIC AUSTRALIA
Does Every Massive Galaxy Host an Active Galactic Nucleus?
Massive galaxies have little star formation, as the plasma in which they reside is not cooling. We explore if active galactic nuclei could be heating the plasma, by searching for radio emission from nearby galaxies.

1145 1200 **Ms Taissa Danilovich**
University of Melbourne VIC AUSTRALIA
The Physical Basis of the Tully-Fisher Relation
I investigate the physical origins of the Tully-Fisher relation by studying initial conditions and what affect these may have on scatter in the Tully-Fisher relation.

1200 1215 **Dr Duncan Galloway**
Monash University VIC AUSTRALIA
Fundamental Physics from Accreting Neutron Stars
Astrophysical observations of accreting neutron stars provide the opportunity to 1) measure the properties of ultradense matter and 2) test general relativity in the strong field limit. Results from such a project will be presented.

1215 1230 **Dr Simon Ellis**
Australian Astronomical Observatory NSW AUSTRALIA
GNOSIS: A Fibre Bragg Grating OH Suppression Unit for Near-Infrared Spectrographs
GNOSIS is an instrument designed to filter the extremely bright atmospheric emission lines from infrared astronomical observations using fibre Bragg gratings. It will deliver the darkest background of any ground-based infrared spectrograph.

Monday 6 December

1100 - 1230

Concurrent Session 1C: Nuclear & Particle Physics 1

Room: Meeting Room 204, Level 2
Chair: Martin Sevior, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1100 1130 **Dr Martin White**
University of Melbourne VIC AUSTRALIA
First Results from the ATLAS Experiment
The Large Hadron Collider at CERN, Geneva, is in its first year of searches for new theories of particle physics. I will review the first results from the ATLAS detector.

1130 1145 **Mr Ahmad Galea**
University of Melbourne VIC AUSTRALIA
Late Decaying WIMP Dark Matter and the Disruption of Large Scale Structure
In this work we attempt to solve various discrepancies between theoretical prediction and observation of large scale galactic structure, by constructing a dark matter model in which the candidate is unstable to decay.

1145 1200 **Ms Anna Phan**
University of Melbourne VIC AUSTRALIA
Search for the Light Scalar Top in ATLAS at the LHC for a Centre-of-Mass Energy of 7 TeV
The observation of a light scalar top quark at the LHC can be evidence of electroweak baryogenesis. We present a feasibility

study and initial results of the search for a light scalar top in the dilepton final state.

1200 1215 **Mr David Jennens**
University of Melbourne VIC AUSTRALIA
ATLAS Calorimeter Response to Single Isolated Hadrons
For the ATLAS detector to reach its full discovery potential, jet energy must be calculated to high accuracy. It is therefore important that the calorimeter response for both neutral and charged hadrons is well known.

1215 1230 **Dr Mark Boland**
Australian Synchrotron VIC AUSTRALIA
The Australian Collaboration for Accelerator Science
The Australian Collaboration for Accelerator Science (ACAS) has been formed between the Australian Synchrotron, Australian Nuclear Science and Technology Organisation, The University of Melbourne and The Australian National University. It aims to develop accelerator science.

Monday 6 December
1100 - 1230

Concurrent Session 1D: Meteorology, Oceanography, Environmental Physics & Climate Change 1

Room: *Meeting Room 207, Level 2*
Chair: John Zillman, University of Melbourne, MELBOURNE, AUSTRALIA
Time

1100 1130 **Prof Neville Nicholls**
Monash University VIC AUSTRALIA
Myths about Global Warming & the IPCC
Some myths about global warming and the Intergovernmental Panel on Climate change (eg., global warming has "stopped" or is caused by the Urban Heat Island, or the IPCC assessments include "dozens" of exaggerations) are rebutted.

1130 1145 **Dr Jorgen Frederiksen**
CSIRO Marine And Atmospheric Research VIC AUSTRALIA
Changes and Projections in Southern Hemisphere Climate and Weather Systems
Changes in the major atmospheric modes of variability during the 20th century are related to observed changes in southern hemisphere rainfall and circulation. Projected changes in circulation and rainfall during the 21st century are obtained from skilful climate models.

1145 1200 **Ms Joanna Turner**
University of Southern Queensland QLD AUSTRALIA
Ultraviolet Reflection and Outdoor Workers: Why Warm Seasons Have Less Influence on Reflected UV Exposures than Cool Seasons
UV reflection from vertical metal surfaces can potentially increase cooler seasonal UV exposures. Proportions of direct to diffuse UV radiation, surface type and wall structure are proposed to contribute to this observation.

1200 1215 **Dr Bronwyn Dolman**
ATRAD SA AUSTRALIA
Dropsize Distribution Retrievals Using Two Co-located VHF Profilers
Wind profiling radars are useful tools in rainfall studies as they can measure the dropsize distribution. This work looks at differences in the retrieved DSD, and associated integral parameters, using two co-located VHF profilers.

Monday 6 December
1100 - 1230

Concurrent Session 1E: AOS - Sensing/Lasers

Room: *Meeting Room 208, Level 2*
Chair: Ann Roberts, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1100 1130 **Prof Katarina Svanberg**
Lund University Hospital SWEDEN
Diagnostics and Treatment of Tumours Using Laser Techniques
Applications of optical and laser spectroscopy to the medical field, including photodynamic therapy and laser-induced fluorescence diagnostics for cancer treatment and diagnostics, respectively, will be presented.

1130	1145	**Dr Peter Domachuk** *University of Sydney NSW AUSTRALIA* **Biopolymer Photonics: Unnatural Uses for Natural Materials** The use of silk fibroin as a biophotonic material will be presented. Silk's properties will be discussed in the context as a photonic material, as well as demonstrations of silk-based photonics components.
1145	1200	**Dr William Olds** *Queensland University of Technology QLD AUSTRALIA* **Non-Invasive Identification of Substances in Opaque Containers Based on Raman Spectroscopy** We present the optical design for conducting the newly devised SORS (spatially-offset Raman spectroscopy) technique, demonstrate the identification of substances concealed in opaque containers and explore its implementation in airport security, screening and pharmaceutical analysis.
1200	1215	**Mr Peter McGlynn** *RMIT University VIC AUSTRALIA* **A Modern Replacement for the Dobson Spectrometer** The Dobson spectrometer, introduced in 1926, is still used worldwide for measuring atmospheric ozone abundance. A replacement instrument capable of remote operation and application to a wider range of measurements is being developed.
1215	1230	**Mr Nick Chang** *University of Adelaide SA AUSTRALIA* **An Efficient Q-Switched Er:YAG Laser for Coherent Remote Sensing** Q-switched Er;YAG lasers are required for eye-safe coherent lidar. We report the first CW diode-pumped, Q-switched Er:YAG laser, and discuss its power scaling and application to coherent lidar.

Monday 6 December

1100 - 1230

Concurrent Session 1F: Solar, Terrestrial & Space Physics 1

Room: Meeting Room 209, Level 2

Chair: Iver Cairns, University of Sydney, SYDNEY, AUSTRALIA

Time		
1100	1130	**Prof Iain Reid** *University of Adelaide SA AUSTRALIA* **Long Term Mesospheric Nightglow Observations** We consider the seasonal variability of the 730 nm OH (8,3) and 558 nm OI nightglow emission intensity over one solar cycle and compare them with OH (6,2) and O2 (0,1) rotational temperature measurements.
1130	1145	**Mr Joel Younger** *University of Adelaide SA AUSTRALIA* **Analysis of Radar Detected Meteor Showers** A survey of meteor showers by Southern Hemisphere radars during 2006-2007 yielded 36 shower systems, including 9 new discoveries. An in-depth analysis of the results including orbital parameters and ablative behaviour is presented.
1145	1200	**Dr Svetlana Petelina** *La Trobe University VIC AUSTRALIA* **Ice Layers in the Polar Summer Mesosphere: Properties and Indications of Climate Change** Nucleation and growth rate of mesospheric ice particles are discussed. Relationship between the observed ice properties and parameters of the surrounding environment are analysed.
1200	1215	**Prof Peter Dyson** *La Trobe University VIC AUSTRALIA* **Stability of Large Fabry-Perot Spectrometer at a Remote Site** A frequency-stabilised laeer and pressure and temperature sensors are compared for reliability in monitoring drift of a stand-alone 150mm Fabry-Perot Spectrometer at Davis, Antarctica used to study the aurora and airglow.
1215	1230	**Dr Robert Greenwood** *Bureau of Meteorology VIC AUSTRALIA* **Ocean Wind-Wave Measurements using the TIGER SuperDARN Radars** HF Radio waves transmitted from the TIGER SuperDARN radars propagate through the ionosphere to the Southern Ocean where they are backscattered via a reciprocal path. Surface wind-directions are estimated from the backscattered echoes.

Monday 6 December

1100 - 1230

Concurrent Session 1G: AOS - Diamond Photonics

Room: *Meeting Room 205, Level 2*
Chair: Snjezana Tomljenovic-Hanic, University of Melbourne, PARKVILLE, AUSTRALIA

Time

1100 1130 **Mr Thomas Babinec**
Harvard University MA USA
Diamond Nanophotonics and Quantum Optics
We describe a high-flux, room temperature, source of single photons based on an individual Nitrogen-Vacancy (NV) center embedded in a top-down nanofabricated, single crystal diamond nanowires.

1130 1145 **Mr Matthew Henderson**
University of Adelaide SA AUSTRALIA
Fabrication of a Hybrid Diamond-Tellurite Material for Quantum Photonics Applications
We present the fabrication of a tellurite soft glass fibre with embedded diamond colour centres. After fibre and glass processing the diamond nanocrystals retained single-photon emission.

1145 1200 **Dr Brant Gibson**
The Innovation Group VIC AUSTRALIA
Emission Dipole Imaging in Diamond Single Emitters
We present direct imaging of the emission pattern of Cr-based individual single photon emitters in monolithic diamond and a measurement of their quantum efficiency. By imaging the excited state transition dipole intensity distribution of single Cr centres in bulk diamond and nano-diamonds, we reconstructed their 3D orientation.

1200 1215 **Dr Brant Gibson**
The Innovation Group VIC AUSTRALIA
Single Photon Emission from Diamond Embedded in Tellurite Glass
We demonstrate single photon emission from a diamond nano-particle, containing a single quantum emitter, incorporated with 'soft' tellurite glass. This new hybrid material provides a platform for enhanced quantum photonics applications.

1215 1230 **Dr Taras Plakhotnik**
University of Queensland QLD AUSTRALIA
NV-Centers in Nanodiamonds At Temperatures Between 300 K And 700 K: Perspectives on Nanothermometry and Other Applications
It has been shown recently that the intensity of photoluminescence of nitrogen-vacancy (NV) centers in nanodiamond decreases 4-fold (with a wide spread among nanocrystals) when the surrounding temperature rises from 300 K to 670 K. Here we present new experiments investigating the properties of NV centers and nanodiamonds at elevated temperatures.

Monday 6 December

1100 - 1230

Concurrent Session 1H: CMMSP - Surface & Materials

Room: *Meeting Room 206, Level 2*
Chair: Chris Pakes

Time

1100 1130 **Mr Alastair Stacey**
University of Melbourne VIC AUSTRALIA
Near Edge X-Ray Absorption Fine Structure as a Tool for Diamond Surface Engineering
Near Edge X-Ray Absorption Fine Structure is discussed as a crucial tool in diamond surface engineering. Measurements sensitive to surface termination are also presented which explain some effects previously ascribed to quantum confinement in nano-diamonds.

1130 1145 **Prof Dougal McCulloch**
RMIT University VIC AUSTRALIA
The Electron Loss Near-Edge Structure of Cubic Boron Nitride
The electron-loss near edge structure of cubic boron nitride has been calculated using a range of different theoretical approaches and compared to experiment. Core holes were found to be essential to reproduce features found experimentally.

1145 1200 **Ms Barbara Fairchild**
University of Melbourne VIC AUSTRALIA
The Amorphous Carbon/Diamond Interface in Ion Implanted Diamond
The damage interface of ion implanted single crystal diamond is investigated before and after annealing using various techniques TEM, RBS-C, NEXAFS and EELS. A thin film of non etched material is identified and discussed.

1200 1215 **Mr Keal Byrne**
University of Western Australia WA AUSTRALIA
Optical and Structural Properties of the Argyle Pink Diamond Defect Centre
The nature of the crystal defect responsible for the colouration of natural Argyle pink diamond is not yet known. Analysis of this defect will be presented, including a discussion of pink diamond photochromism.

Monday 6 December
1330 - 1500

Concurrent Session 2A: ACOFT Keynote Session 2

Room: Banquet Room 202, Level 2
Chair: Benjamin Eggleton, University of Sydney, SYDNEY, AUSTRALIA
Time

1330 1400 **Dr Maurice O'Sullivan**
Ciena ONTARIO CANADA
Coherent Optical Transmission in Commercial Optical Networks
The availability of transmission based on coherent detection and enabled by DSP is defining an epoch in the delivery of commercial optical networks.

1400 1430 **Dr Sylvain Charbonneau**
National Research Council of Canada CANADA
Advanced Photonic Devices Research at NRCC
The presentation will focus on two different but complementary research themes undertaken within our Institute. The first part of the talk will focus on the use of III-As and III-P semiconductor quantum dots (QD) in the fabrication of multiwavelength lasers and of single photon emitters at 1.55 µm. The second theme will focus on the latest development of our III-Sb laser program in the 3.x µm spectral region.

1430 1500 **Prof Stojan Radic**
University of California USA
Parametric Mixer Technology and its Implications in Signal Processing
We review recent efforts made in pursuit of general optical processor and its underlying parametric physics. Basic implications of the technology that include jitterless signal sampling or bandwidth-unlimited, coherent preprocessing are outlined.

Monday 6 December
1330 - 1500

Concurrent Session 2B: AOS - Optics in Astronomy

Room: Meeting Room 203, Level 2
Chair: Judith Dawes, Macquarie University, SYDNEY, AUSTRALIA
Time

1330 1400 **Prof Chris Dainty**
National University of Ireland Galway IRELAND
Adaptive Optics in Astronomy, Vision Science and Beyond
In this talk I shall review the technology and applications of adaptive optics, including those in astronomy, vision science, confocal microscopy, optical storage and multiple scattering.

1400 1415 **Mr Nick Cvetojevic**
Macquarie University NSW AUSTRALIA
Miniature Photonic Spectrographs for Astronomical Applications
We present the first miniature integrated photonic spectrograph for use in astronomy. These devices are many orders of magnitude smaller in size than existing astronomical spectrographs and will potentially be substantially less costly.

1415	1430	**Mr Will Brown** *Swinburne University of Technology VIC AUSTRALIA* **Characterization and Modelling of Multi-Notch Rugate Filters for Ground-Based Astronomy** Imaging filters that suppress OH emission lines require multiple narrow notches in order to improve imaging performance. In order to achieve the required level of performance, prototype filter designs are analysed to identify critical fabrication parameters.
1430	1445	**Dr Nemanja Jovanovic** *Macquarie University NSW AUSTRALIA* **Photonic Based Pupil Remapping for Optical Stellar Interferometry** Integrated photonic components offer numerous advantages over aperture masks for stellar-interferometry. In this publication we present the design, fabrication and characterisation of an integrated photonic pupil remapping device by employing the laser direct write technique.
1445	1500	**Mr Nikita Simakov** *DSTO SA AUSTRALIA* **An Elongation-Free Sodium Guide-Star Laser for Large Telescopes** Guide star elongation is expected to be a significant limitation for adaptive optics in extremely large telescopes. We demonstrate for the first time a pulsed sodium-resonant laser that is optimized to eliminate this elongation.

Monday 6 December

1330 - 1500

Concurrent Session 2C: Nuclear & Particle Physics 2

Room: *Meeting Room 204, Level 2*

Chair: Raymond Volkas, University of Melbourne, PARKVILLE, AUSTRALIA

Time		
1330	1400	**Prof Victor Flambaum** *University of New South Wales NSW AUSTRALIA* **Higgs-Induced Bound States of Heavy Particles and Bariogenesis** Bags with depleted Higgs vacuum are formed after Big Bang and stabilised by capture of t-quarks, W,Z-bosons or new heavy particles which have zero mass inside. These bags may play important role in the baryogenesis.
1400	1415	**Dr Archil Kobakhidze** *University of Melbourne VIC AUSTRALIA* **Scale Invariance and the Origin of Mass** We suggest that the observed masses of visible and dark matter in the universe are generated quantum-mechanically in scale-invariant theories. The simplest, theoretically consistent models are presented.
1415	1430	**Miss Nadine Pesor** *University of Melbourne VIC AUSTRALIA* **Neutrino Masses and Sparticle Spectra from Stochastic Superspace** We outline a new method of softly breaking supersymmetry where the Grassmannian coordinates are considered to be stochastic variables. Sparticle spectra are presented and we discuss its phenomenology.
1430	1445	**Miss Jayne Thompson** *University of Melbourne VIC AUSTRALIA* **SO(10) Domain-Wall Brane Models** We will investigate a grand unified model where the universe is a domain-wall brane embedded in 4+1-dimensional space-time.
1445	1500	**Mr Albert Lee** *Australian National University ACT AUSTRALIA* **Shape Coexistence in 187Tl** Shape coexistence in near closed shell nuclei has been investigated in the odd proton nucleus 187Tl. Many new high spin states have been identified, including the first observation of levels lying above the two previously known microsecond isomers.

Monday 6 December

1330 - 1500

Concurrent Session 2D: Meteorology, Oceanography, Environmental Physics & Climate Change 2

Room: *Meeting Room 207, Level 2*
Chair: Neville Nicholls, Monash University, CLAYTON, AUSTRALIA

Time

1330 1400 **Prof Martin Green**
University of New South Wales NSW AUSTRALIA
Photovoltaic Physics: Light Emission, Ultimate Efficiencies and Light Trapping
Recent progress in photovoltaic physics in three areas is described: the surprising reciprocity between solar cells and light emitting diodes (LEDs); the ultimate efficiency potential of photovoltaics; and limits on light absorption relevant to nanophotonics

1400 1415 **Dr Galina Gramotnev**
University of Queensland QLD AUSTRALIA
Antisymmetric Correlation Patterns for Particle Modes in Background Aerosols
We analyse mirror symmetry of correlation patterns between particle modes in background aerosols and demonstrate high stability of their major features, which makes these patterns instrumental for the analysis of aerosol sources and evolutionary mechanisms.

1415 1430 **Dr Galina Gramotnev**
University of Queensland QLD AUSTRALIA
Fluctuation Approach to the Analysis of Atmospheric Aerosols and Their Sources
We conduct statistical analysis of fluctuations of particle numbers in different channels of the size distribution as a new tool for the analysis of sources and evolutionary processes in atmospheric urban and background aerosols.

1430 1445 **Dr Jorgen Frederiksen**
CSIRO Marine And Atmospheric Research VIC AUSTRALIA
Seasonal Ensemble Forecasting with a Coupled Ocean-Atmosphere Model
A coupled ocean-atmosphere model is employed to understand the dynamics of the El Niño – Southern Oscillation and for seasonal prediction. The effectiveness of ensemble methods for improving seasonal to annual prediction is studied.

1445 1500 **Dr Anthony Morfa**
University of Melbourne VIC AUSTRALIA
Printable ZnO, Tunable Size and Electronic Properties Below 200 °C
ZnO, prepared using a new synthetic method, has a tunable crystallinity, affecting electronic properties. We demonstrate electron mobilities of 0.1 cm2V-1s-1 at processing temperatures below 200 °C are achievable.

Monday 6 December

1330 - 1500

Concurrent Session 2E: Special Session - Industry Forum

Room: *Meeting Room 208, Level 2*
Chair: Peter Kappen

Time

1330 1345 **Dr Richard Brown**
Davies Collison Cave VIC AUSTRALIA
Industry Forum

1345 1400 **Dr Christine Deller**
Canon Information Systems Research Australia NSW AUSTRALIA
Industry Forum

1400 1415 **Dr Richard Garrett**
Australian Nuclear Science and Technology Organisation NSW AUSTRALIA
Industry Forum

1415 1430 **Dr Gerard Roe**
CRC for Biomedical Imaging Development Ltd VIC AUSTRALIA
Industry Forum

1430 1445 **Dr Paul Wardill**
Coherent Scientific SA AUSTRALIA
Industry Forum

Monday 6 December

1330 - 1500

Concurrent Session 2F: Solar, Terrestrial & Space Physics 2

Room: *Meeting Room 209, Level 2*
Chair: Fred Menk, University Of Newcastle, CALLAGHAN, AUSTRALIA
Time

1330 1400 **Prof Murry Salby**
Macquarie University NSW AUSTRALIA
Changes of Ozone and CO2: Relationship to the General Circulation
Two greenhouse gases figure prominently in environmental issues. This talk develops their evolution during the satellite era and what it establishes about how they are controlled.

1400 1415 **Dr Vickal Kumar**
La Trobe University VIC AUSTRALIA
TIGER Bruny Island HF Radar Observations of the Ionospheric Backscatter and Convection during Geomagnetically Disturbed Periods
The occurrence and motion of ionospheric irregularities during magnetically disturbed periods in sub-auroral and auroral ionosphere was quantified using a 4-year database (2000–2003) of the TIGER Bruny Island radar.

1415 1430 **Mr Jason Siddaway**
La Trobe University VIC AUSTRALIA
Trends in the Zonal Asymmetry of Antarctic Stratospheric Ozone: CCMVal-2 Assessment
Seasonal trends in the quasi-stationary wave pattern of total column ozone at southern polar latitudes are evaluated from modern era satellite measurements and are compared with results from the second Chemistry-Climate Model Validation (CCMVal-2) assessment.

1430 1445 **Dr Murray Sciffer**
University of Newcastle NSW AUSTRALIA
Estimating Equatorial Ultra Low Frequency Wave Electric Fields from the Ground
ULF electric fields may accelerate electrons to relativistic energies. We improve the technique of using ULF ground magnetometer data to estimate this electric field through realistic modeling of ULF wave passage through the ionosphere.

1445 1500 **Mr Shaun Cooper**
La Trobe University VIC AUSTRALIA
Numerical Modelling of the Thermospheric Response to Pulsating Aurora
Energy deposition from pulsating aurora has been simulated in the model to examine whether the resulting pressure perturbations included infrasonic waves.

Monday 6 December

1330 - 1500

Concurrent Session 2G: AOS - Plasmonics: Fundamentals

Room: *Meeting Room 205, Level 2*
Chair: James Chon, Swinburne University of Technology, HAWTHORN, AUSTRALIA
Time

1330 1400 **Dr Dmitri Gramotnev**
Nanophotonics Pty Ltd QLD AUSTRALIA
Nanofocusing in Metallic Nanostructures: Recent Progress and New Results
In this paper, we present the most recent new results on plasmon nanofocusing in tapered metallic structures and its applications in near-field optical microscopy, nanorefractometry, nanosensors, trapping and manipulation of nanoparticles and

single molecules.

1400 1415 **A/Prof Ann Roberts**
University of Melbourne VIC AUSTRALIA
Angle- and Polarization-Independent Resonant Transmssion through Nanostructured Metal Films
We study the transmission properties of nanometric cross-shaped aperture arrays in metal films and show that high transmission arising from the excitation of localized surface plasmon resonances is robust to the illumination condition.

1415 1430 **Dr Tim Davis**
CSIRO Materials Science & Engineering VIC AUSTRALIA
A Simple Model for Hybrid States In Plasmonic Circuits
We present an analytical method for deriving the optical properties of hybrid states in ensembles of plasmonics nanostructures. Although approximate in form, the method predicts many properties of coupled plasmonic systems, such as Fano resonances, dark modes and plasmon-induced transparency.

1430 1445 **Dr Lorenzo Rosa**
Swinburne University of Technology VIC AUSTRALIA
Properties of 3D-Tailored Au Plasmonic Nanoparticles
EBL patterning of plasmonic nanoparticles enables free 3D slotting and tailoring. Through numerical simulation we show the creation of strong light field enhancement on Si and SiO2 substrates for SERS, sensing, and solar cell applications.

1445 1500 **Dr Kristy Vernon**
CSIRO VIC AUSTRALIA
Influence of Particle Substrate Interaction on Localised Plasmon Resonances
We present a theory for determining the plasmon resonance of arbitrarily shaped metal nanoparticles on a substrate. The theory is verified against measured scattering spectra of nanorods on substrates.

Monday 6 December
1330 - 1500

Concurrent Session 2H: CMMSP - Semiconductors I

Room: Meeting Room 206, Level 2
Chair: Gerard Milburn, University of Queensland, BRISBANE, AUSTRALIA
Time

1330 1400 **Dr Andrea Morello**
University of New South Wales NSW AUSTRALIA
Single-Shot Readout of an Electron Spin in Silicon
We present the first demonstration of single-shot readout of an individual electron spin in a silicon nanostructure, with readout fidelity better than 90% and spin lifetime up to 6 s.

1400 1415 **Dr Zachary Keane**
University of New South Wales NSW AUSTRALIA
Nuclear Magnetic Resonance in GaAs-AlGaAs Nanostructure Devices
We present preliminary measurements of nuclear magnetic resonance (NMR) in GaAs-AlGaAs quantum point contacts. Nuclei are polarized through the hyperfine interaction with carriers; this polarization can be manipulated with a radio-frequency magnetic field and detected through the four-terminal resistance.

1415 1430 **Dr Paul Spizzirri**
University of Melbourne VIC AUSTRALIA
Electronic Raman Spectroscopy of Phosphorus Donor States Under Stress
Electronic Raman spectroscopy has been used to directly monitor stress induced changes to the phosphorus donor 1s(E) excited state. The magnitude and direction of the applied force can be determined spectrally from changes to the multiplicity and energy of the transitions.

1430 1445 **Dr Wee Han Lim**
University of New South Wales NSW AUSTRALIA
Spin Filling and Valley Splitting in a Few-electron Silicon Quantum Dot
We report the demonstration of a silicon quantum dot, containing a tunable number of electrons, starting from zero. The spin dependence of the Coulomb peaks and observation of the valley splitting are also presented.

1445 1500 **Mr Jung-Hyun Kang**

Australian National University ACT AUSTRALIA

Vertical GaAs Nanowires Grown on Si substrates Coated with Buffer Layers

Vertical GaAs nanowires were grown on Si (111) substrate by metal-organic chemical vapor deposition. Morphology of the nanowires was dramatically improved by coating thin GaAs buffer layers on the Si substrates.

Monday 6 December

1530 - 1700

Concurrent Session 3A: ACOFT/AOS Laserfest Symposium 1

Room: *Banquet Room 202, Level 2*

Chair: Stuart Jackson, University of Sydney, SYDNEY, AUSTRALIA

Time

1530 1540 **Dr Stuart Jackson**

University of Sydney NSW AUSTRALIA

Introduction

Summary not provided.

1540 1600 **Prof Jim Piper**

Macquarie University NSW AUSTRALIA

A Short History of Copper Lasers

For 2 decades at the end of the 20th century there was strong interest worldwide in high-average power copper vapour lasers mainly due to their potential application as sources for pumping tunable visible lasers for Atomic Vapour Laser Isotope Separation. Research focussed on overcoming the limitations to average power scaling imposed by a combination of several key kinetic processes in the repetitively pulsed gas discharge. After 10 years of research examining these processes, and taking advantage of research results from the US, UK and Russia, the CVL team in the Centre for Lasers and Applications at Macquarie University came up with a solution which was ultimately easy to implement and increased average power volumeric extraction efficiencies from CVLs by an order of magnitude. The talk will describe this work and its implications, and some diversions along the way in commercial development of CVLs for medical and other applications.

1600 1620 **Prof Jesper Munch**

University of Adelaide SA AUSTRALIA

Lasers for Precision Measurements

The quest for single frequency lasers for precision length and Doppler measurements will be recounted, concentrating on solid state lasers. The challenges of the exquisite sensitivity for the detection of gravitational waves will be described.

1620 1640 **A/Prof Judith Dawes**

Macquarie University NSW AUSTRALIA

What Can We Do with A Diode Laser?

I. Diode-pumped self-frequency-doubling lasers based on yttrium aluminium borate crystals are versatile and efficient lasers, transforming IR diode light into tunable visible laser radiation. II. Laser-cured protein solders enable microsurgical repair of severed arteries and nerves

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1640 1700 **A/Prof David Coutts**

Macquarie University NSW AUSTRALIA

Cerium Lasers: The Ti:Sapphire of the Ultraviolet

Cerium lasers are efficient all-solid-state tunable ultraviolet lasers. With an (energy) spectral bandwidth similar to Ti:sapphire but lasing directly in the ultraviolet, these lasers are emerging as the Ti:sapphire of the UV.

Monday 6 December

1530 - 1700

Concurrent Session 3B: AOS - Optics and Interferometry

Room: *Meeting Room 203, Level 2*

Chair: John Holdsworth, University of Newcastle, CALLAGHAN, AUSTRALIA

Time

1530 1600 **Dr Jan Burke**

CSIRO Materials Science And Engineering NSW AUSTRALIA

Interferometry: A Method to Build and Use an Instrument for Monitoring Earth's Gravity Field

Optical interferometry offers nanometre sensitivity with relatively simple experimental means. It is used in science projects such as GRACE (Gravity Recovery And Climate Experiment), for precision manufacturing of subsystems and then detecting relative

length changes of 10-15.

1600 1615 **Miss Danielle Wuchenich**

Australian National University ACT AUSTRALIA

Simultaneous Displacement Measurements Using Digital Interferometry

Digital interferometry (DI) can be used to distinguish between interferometric signals and simultaneously monitor object displacements with picometre sensitivity. We present the first experimental demonstration of DI's signal multiplexing capabilities.

1615 1630 **Mr Wamid Al-Shabib**

Nottingham Trent University UNITED KINGDOM

Voltage Programmable Liquid-Based Diffraction Grating

A sinusoidal wrinkle has been created on an oil film surface using dielectrophoresis forces. The device acts as a voltage tunable phase grating which gives fast modulation of the intensity of the transmitted diffracted orders.

1630 1645 **Mrs Galiya Sharafutdinova**

University of Newcastle NSW AUSTRALIA

Comparative Scan Engine Field Flatness

A four mirror (flat, off-axis parabola, off-axis parabola, flat) scan engine correcting for beam divergence allows for a flatter field in a scanning microscope image plane than an ideal single mirror scan engine.

1645 1700 **Mr Fred Baynes**

University of Western Australia WA AUSTRALIA

Stable Optical Fabry-Perot Cavities for Tests of Physics

Many precision experiments require highly stable optical frequency references that are based on Fabry-Perot cavities. Two sapphire cavities in temperature controlled environments have been constructed with fractional frequency stability of 6×10^-15 on short timescales.

Monday 6 December

1530 - 1700

Concurrent Session 3C: Nuclear & Particle Physics 3

Room: Meeting Room 204, Level 2

Chair: Kevin Varvell, University of Sydney, SYDNEY, AUSTRALIA

Time

1530 1600 **Dr Anthony Brown**

University Of Canterbury NEW ZEALAND

Latest Results from the IceCube Experiment

The IceCube Collaboration is building a neutrino detector at the South Pole to observe high energy neutrinos from a variety of astrophysical sources. We review the current status of IceCube highlighting some recent results.

1600 1615 **Dr Antonio Limosani**

University of Melbourne VIC AUSTRALIA

Performance of the ATLAS Inner Detector with proton-proton collisions at the Large Hadron Collider

ATLAS is a multipurpose experiment that records the products of the LHC collisions. The performance of the ATLAS Inner Detector is reported with emphasis on track reconstruction and its bearing on new physics discoveries.

1615 1630 **Mr Tony Shao**

University of Melbourne VIC AUSTRALIA

Z Boson to Two Tauons Cross-Section Measurement Using ATLAS at the LHC for 7 TeV Centre-of-Mass Energy

The measurement of the Z to two tauons cross-section is integral to the discovery of a low-mass Supersymmetric Higgs boson at the LHC. The Supersymmetric Higgs boson decays predominantly into tauons making the Z boson to two tauon decays an irreducible background.

1630 1645 **Mr Thomas Jacques**

University of Melbourne VIC AUSTRALIA

Electroweak Radiative Corrections as the Dominant Channel in Dark Matter Annihilation

DM (Dark Matter) annihilation to leptons must be accompanied by electroweak radiative corrections. This can lift helicity suppression, such that branching ratios Br(lνW) and Br(l+l−Z) dominate over Br(l+l−). We discuss implications for ``leptonic'' DM models.

1645 1700 **Dr Rohan Dowd**
Australian Synchrotron VIC AUSTRALIA
Damping Ring Studies for Future Linear Colliders
A summary of the research conducted at the Australian Synchrotron into ultra low vertical emittance tuning techniques and their application in the design of the damping rings for the next generation linear collider is presented.

Monday 6 December
1530 - 1700

Concurrent Session 3D: Meteorology, Oceanography, Environmental Physics & Climate Change 3

Room: *Meeting Room 207, Level 2*
Chair: Neville Nicholls, Monash University, CLAYTON, AUSTRALIA
Time

1530 1545 **Dr Guy Metcalfe**
CSIRO VIC AUSTRALIA
Sub-surface Fluid Trapping Using Chaotic Advection
Subsurface scalar transport (concentration/heat) from/into saturated porous media is crucial for solution mining, contaminant remediation, and harvesting geothermal energy. With theory and experiment we show that chaotic advection can increase transport rates or confine aquifer volumes.

1545 1600 **Dr Bronwyn Dolman**
ATRAD SA AUSTRALIA
A Comparison of Radiosonde and Radar Measurements of Winds
Radiosonde measurements of winds are considered standard in meteorology, while wind profiling radars are gaining favor. This work looks at the comparison of radiosonde and radar measurements of winds, and aims to characterize the differences.

1600 1615 **Dr Andrew MacKinnon**
University of Adelaide SA AUSTRALIA
VHF Spaced Antenna Boundary Layer Radar: Long-Term Performance
VHF Spaced Antenna Boundary Layer Radars have gone from being research tools to operational meteorological devices over the last 15 years. This paper will present the long-term performance and accuracy of these systems in a many different locations

1615 1630 **Dr Andrew MacKinnon**
University of Adelaide SA AUSTRALIA
Mini VHF Boundary Layer Radar
This paper discusses the performance of a miniature VHF Boundary Layer Radar. Utilizing only three antennas this system has shown to have comparable low height performance as radar systems with much larger antenna arrays

Monday 6 December
1530 - 1700

Concurrent Session 3E: Quantum Information, Concepts & Coherence Group 1

Room: *Meeting Room 208, Level 2*
Chair: Andrew White, University of Queensland, BRISBANE, AUSTRALIA
Time

1530 1600 **Prof Paul Kwiat**
University of Illinois ILLINOIS USA
Optical Quantum State Synthesis
Using a time-multiplexed downconversion source of photon pairs, we realize a pseudo-deterministic single-photon source. An extension allows efficient creation of higher photon number states, and also more exotic states.

1600 1615 **A/Prof Geoff Pryde**
Griffith University QLD AUSTRALIA
Optimal Multi-Photon Phase Sensing with a Single Interference Fringe
We investigate detection in quantum-enhanced metrology, experimentally demonstrating that the well-known “NOON” state is suboptimal for single-fringe measurements. We use a different six-photon entangled state to achieve near-optimal phase sensitivity, well below the shot-noise limit.

1615 1630 **Mr Sacha Kocsis**
Griffith University QLD AUSTRALIA
Observing the Trajectories of a Single Photon Using Weak Measurement
We used weak measurement with post-selection to simultaneously gain information about the average momentum and position of single photons from a quantum dot. We were thus able to reconstruct the photon's trajectories.

1630 1645 **Dr Raisa Karasik**
Griffith University QLD AUSTRALIA
How Many Bits Does It Take to Track a Multi-Qubit System?
We study resource requirements for tracking the state of an open quantum system subject to continuous observation. This problem is of great importance to quantum control.

1645 1700 **Dr Boris Hage**
Australian National University ACT AUSTRALIA
Iterative Entanglement Distillation: Approaching full Elimination of Decoherence
We present the experimental demonstration of an iterative entanglement distillation protocol. The distilled state was characterized by means of complete unbiased tow mode quantum state tomography.

Monday 6 December

1530 - 1700

Concurrent Session 3F: Solar, Terrestrial & Space Physics 3

Room: Meeting Room 209, Level 2
Chair: Trevor Harris, Defence Science and Technology Organisation, EDINBURGH, AUSTRALIA
Time

1530 1600 **Dr Marcus Duldig**
Australian Antarctic Division TAS AUSTRALIA
Bullets from the Sun: A Review of Relativistic Solar Cosmic Rays
Cosmic rays generally come from beyond the solar system but rarely they can come from the Sun. This review discusses the solar source, propagation to Earth and impact of highly relativistic solar protons.

1600 1615 **Dr Manuel Cervera**
Defence Science and Technology Organisation SA AUSTRALIA
Modelling of the Effects of Ionospheric Disturbances Using 3D Magneto-Ionic Raytracing Techniques
DSTO has initiated an experimental programme, SpICE, to investigate and understand ionospheric disturbances at scales < 150 km and temporal resolutions under 1 minute. In this paper we use 3D magneto-ionic Hamiltonian raytracing techniques to model and understand the various ionospheric disturbances giving rise to the effects we observe in our data.

1615 1630 **Prof Iver Cairns**
University of Sydney NSW AUSTRALIA
Probing Temperature Variations in Solar Corona via Type III Solar Radio Bursts
A new tool to probe the spatial profiles of electron and ion temperatures in the solar corona is developed, by using simulations and observations of nonthermal type III solar radio bursts.

1630 1645 **Dr John Humble**
University of Tasmania TAS AUSTRALIA
Cosmic Ray Flux at the Recent Solar Minimum
Cosmic Ray flux detected by neutron monitors at the recent solar minimum was higher than expected. The response to the advent of the new solar cycle, cycle 24, has also been prompt.

1645 1700 **Miss Claire Delides**
University of Newcastle NSW AUSTRALIA
Spherical Cap Harmonic Basis in Geophysical Data Assimilation
Spherical harmonic analyses are a common method for orthonormal basis expansion fitting of experimental data. We present a matrix method for obtaining these functions over a spherical cap and apply the vector form to ground magnetometer data.

Monday 6 December

1530 - 1700

Concurrent Session 3G: AOS - Plasmonics: Devices

Room: *Meeting Room 205, Level 2*

Chair: Dmitri Gramotnev, Nanophotonics Pty Ltd, BRISBANE, AUSTRALIA

Time

1530 1600 **Dr Tim Davis**

CSIRO Materials Science & Engineering VIC AUSTRALIA

Nanoscale Optical Circuits: Controlling Light Using Localized Surface Plasmon Resonances

We discuss the idea of metallic nanoparticles as elements in optical circuits for controlling and manipulating light at the nanoscale. The nanoparticles act like passive electrical components, controlling the flow of energy and its resonances.

1600 1615 **Dr Daniel Gomez**

CSIRO VIC AUSTRALIA

Coupling of Surface Plasmons and Quantum Dots

We discuss our work aimed at understanding the process of energy exchange between excitons in quantum dots and surface plasmon, including localized resonances in metallic nanoparticles, guided modes in nanowires and propagating modes in thin films.

1615 1630 **Mr Md Muntasir Hossain**

Swinburne University of Technology VIC AUSTRALIA

Plasmonic Nano-Structures for Waveguiding with Subwavelength Confinement

A hybrid metallic nano-structure is reported for waveguiding with subwavelength mode confinement. The excitation of resonant plasmon modes in metallic nano-shelled dielectric cylinders can guide electromagnetic radiations.

1630 1645 **Mr Shiaw Juen Tan**

Queensland University of Technology QLD AUSTRALIA

Heating Effect in Nanofocusing Metal Wedges

In this paper, the heating effect in nanofocusing metal wedges was analysed. Conditions for significant heat release and temperature rise on the nanoscale near the tip are investigated and discussed.

1645 1700 **Mr Ricardas Buividas**

Swinburne University of Technology VIC AUSTRALIA

Gold Coated Ripple-Patterned SiC Substrates for SERS

Ripples with ~190nm periodicity were formed on large surface area SiC substrates. Formation mechanism is explained by temporal evolution of sub-surface plasma nano-volumes. Ripples were coated with gold nanostructures for light enhancement in sensing applications.

Monday 6 December

1530 - 1700

Concurrent Session 3H: CMMSP - Theory

Room: *Meeting Room 206, Level 2*

Chair: Leslie Allen, University of Melbourne, PARKVILLE, AUSTRALIA

Time

1530 1600 **Prof Gerard Milburn**

University of Queensland QLD AUSTRALIA

Vibration Enhanced Quantum Transport

Electronic energy transport in conjugated polymers relies on collective vibrations. We show that a driven common vibrational mode, modulating on-site energy, leads to an enhancement in the transport of excitations across a dipole network.

1600 1615 **Dr Andy Martin**

University of Melbourne VIC AUSTRALIA

Zone Plate Focusing of Bose-Einstein Condensates for Erasable High-Speed Lithography of Quantum Electronic Components

We propose a new technique to create erasable quantum electronic components in two-dimensional electron gases (2DEG). This is done via zone-plate focusing of alkali Bose-Einstein condensates onto a semiconductor surface, causing depletion in the underlying 2DEG.

1615 1630 **Mr Liam Hall**
University of Melbourne VIC AUSTRALIA
Quantum Decoherence Imaging Using NV Centres in Diamond
A new qubit-based imaging technique, wherein decoherence rates are measured and spatially mapped across a given nano-scale sample, provides statistical information about fluctuations as well as time-averaged properties of the environment.

1630 1645 **Prof David Neilson**
University of Camerino ITALY
Anomalous Transport in Mesoscopic Inhomogeneous 2D Electron Systems at Low Temperature
We show that low-T transport properties of 2D electron insulators in mesoscopic semiconductors is controlled not by hopping but by tunnelling between adjacent conducting domains, which has a dramatic effect on the low-T transport properties.

1645 1700 **Mr James Quach**
University of Melbourne VIC AUSTRALIA
A New Class of Dynamic Quantum Metamaterials
We describe a new class of dynamic quantum metamaterials, based on the properties of coupled atom-cavity arrays. We show how it can be used to design a reconfigurable quantum superlens.

Tuesday 7 December
0830 - 0915

Plenary Session 3

Room: Banquet Room 202, Level 2
Chair: Peter Dyson, La Trobe University, ROSANNA, AUSTRALIA
Time
0830 0915 **Dr Tim Fuller-Rowell**
University of Colorado COLORADO USA
Space Weather and its Impact on Technology and Society
Space Weather affects many of our technological systems, and can be driven by the Sun or through connections with terrestrial weather. Modern society and technology have yet to experience the full force of the Sun.

Tuesday 7 December
0915 - 1000

Plenary Session 4

Room: Banquet Room 202, Level 2
Chair: Steven Prawer, Melbourne Materials Institute, PARKVILLE, AUSTRALIA
Session Sponsor: Melbourne Materials Institute
Time
0915 1000 **Dr Michael Norman**
Argonne National Laboratory IL USA
Fermi Surface Reconstruction and the Origin of High Temperature Superconductivity
Quantum oscillation studies reveal a profound rearrangement of the Fermi surface in underdoped cuprates. The cause of the reconstruction, and its implication for high temperature superconductivity, is a subject of active debate.

Tuesday 7 December
0830 - 1000

ACOFT - Bragg Gratings and Novel Fibers

Room: Meeting Room 203, Level 2
Chair: Thomas White, Australian National University, CANBERRA, AUSTRALIA
Time
0830 0900 **Prof John Canning**
University of Sydney NSW AUSTRALIA
Optical Fibre Nanophotonics
Tailoring and structuring optical fibres to nanoscale dimensions is rapidly becoming a focus area of research and is important for the eventual success of future in-fibre optical systems and novel technologies. Here, I review one aspect of our work in establishing and pursuing this field: localizing light for sensing.

0900	0915	**Dr Kevin Cook** *University of Sydney NSW AUSTRALIA* **Complex Bragg Grating Writing in Acoustically Excited Optical Fiber** Direct grating writing was modified by adding an acousto optic modulator in the optical fibre assembly. The acoustic wave changes the properties of the fibre while the beam is scanned along the fiber, creating a complex FBG profile that depends on the acoustic driver parameters.
0915	0930	**Dr Kevin Cook** *University of Sydney NSW AUSTRALIA* **Bragg Gratings in the Germanium-Doped Cladding Rings of a Yb3+- Doped Solid Bandgap Fibre** We demonstrate the inscription of Bragg gratings in the germanium-doped cladding rings of a large-mode-area, ytterbium-doped photonic-bandgap fibre. The gratings are inscribed in these doped rings that can support several modes, the refractive indices of which are derived from experiment and calculated theoretically.
0930	0945	**Dr John Arkwright** *CSIRO Materials Science and Engineering NSW AUSTRALIA* **Variations in Fibre Draw Tower Velocities Inferred from the Location of Bragg Grating Structures Written During the Draw** The precise location of Bragg gratings written into optical fibre during the drawing process provides an accurate method of inferring variations in draw velocity and hence any potential subtle variations in fibre characteristics.
0945	1000	**Dr John Arkwright** *CSIRO Materials Science and Engineering NSW AUSTRALIA* **Calibrating Phase Mask Motion using Direct Phase Modulation of the Diffracted Orders** The motion of a transmission phase mask used to write fibre Bragg gratings has been calibrated to within +/-1nm by retro-reflecting pairs of diffraction orders to form a simple Michelson interferometer.

Tuesday 7 December

0830 - 1000

ACOFT - Fibres for Novel Applications

Room: *Meeting Room 204, Level 2*

Chair: Mark Pelusi, University of Sydney, SYDNEY, AUSTRALIA

Time		
0830	0900	**Prof Joss Bland-Hawthorne** *University of Sydney NSW AUSTRALIA* **Astrophotonics: the Next Wave in Observational Cosmology** Astrophotonics-the interface of photonics and astronomy-will revolutionize astronomical instrumentation in the coming decade. Recent developments include the PIMMS multimode photonic spectrograph which is arguably the most radical development in spectroscopy in almost a century.
0900	0915	**Mr Eki Setijadi** *University of New South Wales NSW AUSTRALIA* **Polymer Optical Fibre (POF) from P(Methyl Methacrylate) Bearing Chiral Materials: Novel Mechanism of Light Gudiance** POFs were fabricated using poly(methyl methacrylates), PMMA bearing chirality from (-)-menthly methacrylates ((-)-MnMA) or L-lactide via free radical polymerisation. This approach potentially enables the development of a light guiding mechanism in POF.
0915	0930	**Mr Wei Liu** *Australian National University ACT AUSTRALIA* **Complete Spectral Gap in Coupled Hollow Metallic Waveguides** We demonstrate a complete spectral gap based on the coupling between forward and backward modes in a symmetric structure composed of four coupled hollow metallic waveguides.
0930	1000	**Prof Simon Fleming** *University of Sydney AUSTRALIA* **Frequency Doubling and Sensing Using Poled Fiber** Applications of poling induced second-order nonlinearity in silica optical fibres for electro-optic switching have been limited. Recent developments show good prospects for applications in frequency doubling and sensing.

Tuesday 7 December

1030 - 1115

Plenary Session 5

Room: *Banquet Room 202, Level 2*
Chair: Geoff Taylor, University of Mebourne, PARKVILLE, AUSTRALIA
Time

1030 1115 **Prof Rolf-Dieter Heuer**
CERN - European Organization for Nuclear Research SWITZERLAND
The Large Hadron Collider LHC: Entering a New Era of Fundamental Science
The LHC will open up a new chapter in high-energy physics, providing a deeper understanding of the universe and any of the insights gained could change our view of the world.

Tuesday 7 December

1115 - 1230

Concurrent Session 4A: ACOFT - Direct Writing and Novel Gratings

Room: *Banquet Room 202, Level 2*
Chair: Francois Ladouceur, University of New South Wales, KENSINGTON, AUSTRALIA
Time

1115 1145 **Prof Peter R Herman**
University of Toronto CANADA
Direct Laser Writing of Photonic Integrated Circuits
Summary not provided at time of publication.

1145 1215 **A/Prof Michael Withford**
Macquarie University NSW AUSTRALIA
Recent Developments in Active and Passive Glass Photonics, Fabricated Using Ultrafast Laser Direct-Write Methods
The field of ultrafast laser direct-writing of glass photonic devices has been growing steadily for the last 10 years. During this time the propagation losses of waveguides fabricated with this method have decreased to a point where they rival those of silicon waveguides. Similarly, the performance characteristics of ultrafast laser written integrated glass photonics have also improved, in some cases out-performing those produced using conventional lithographic processes. In this talk recent developments in directly written compact DFB waveguide lasers, and 2- and 3-D passive photonics will be reviewed.

1215 1230 **Mr Ryuichiro Goto**
University of Sydney NSW AUSTRALIA
Point-by-Point Bragg Grating Inscription into Single-Polarisation All-Solid Photonic Bandgap Fibre
We demonstrate Point-by-Point Bragg grating inscription into the core of a single-polarisation all-solid photonic bandgap fibre. Grating strength of 7.5 dB (>80% reflectivity) was realised at 1064 nm with linearly-polarised feedback.

Tuesday 7 December

1115 - 1230

Concurrent Session 4B: AOS - X-Ray/XUV

Room: *Meeting Room 203, Level 2*
Chair: Andrew Peele, La Trobe University, BUNDOORA, AUSTRALIA
Time

1115 1130 **Miss Angela Torrance**
University of Melbourne VIC AUSTRALIA
Curved Beam Fluctuation X-ray Microscopy
Fluctuation X-ray Microscopy analyses medium range order in amorphous materials. Fresnel Coherent Diffractive Imaging is used to adapt Fluctuation X-ray Microscopy to utilise the curved beam from an x-ray zone-plate.

1130 1145 **Ms Clare Henderson**
ARC Centre of Excellence for Coherent X-Ray Science VIC AUSTRALIA
Phase Retrieval of an X-ray Vortex
The astigmatic phase retrieval algorithm is presented. The technique is applied to optical vortices, for which their handedness and charge are uniquely determined. Preliminary results for the retrieval of an X-ray vortex are presented.

1145 1200 **Prof Lap Van Dao**
Swinburne University of Technology VIC AUSTRALIA
Generation and Application of Phase-Matched Small Bandwidth Coherent Extreme Ultraviolet Radiation
Using a semi-infinite gas cell we can generate a high photon flux of narrow bandwidth coherent extreme ultraviolet radiation which provides a suitable source for applications such as coherent diffraction imaging and time resolved spectroscopy.

1200 1215 **Dr Bo Chen**
University of Melbourne VIC AUSTRALIA
Reconstruction of Coherent Function of X-Ray Source with Wigner-Deconvolution
The mutual coherence function (MCF) is one of the most important quantities in coherent X-ray optics. The paper will present Wigner deconvolution method to measure the MCF of a full beam.

1215 1230 **Dr Benedicta Arhatari**
La Trobe University VIC AUSTRALIA
Phase Retrieval Tomography in Application
We used phase retrieval tomography with an X-ray source to elucidate the 3D structure of an Aerosil granule and hydrated bentonite gel. The resulting data is suitable for further analysis by segmenting into regions of different composition.

Tuesday 7 December
1115 - 1230

Concurrent Session 4C: Nuclear & Particle Physics 4

Room: *Meeting Room 204, Level 2*
Chair: Geoff Taylor, University of Mebourne, PARKVILLE, AUSTRALIA
Time

1115 1145 **Dr Nicole Bell**
University of Melbourne VIC AUSTRALIA
Indirect Detection of Particle Dark Matter
We discuss indirect detection of dark matter, via annihilation or decay, and set model independent bounds using Galactic gamma ray, neutrino and cosmic ray data. We explain the importance of electroweak bremsstrahlung.

1145 1200 **Dr David Krofcheck**
University of Auckland NEW ZEALAND
Heavy Ions and pp Collisions at the Large Hadron Collider using the CMS Detector: Recent Results
The Large Hadron Collider is producing proton-proton collisions at 7 TeV in the center-of-mass. The Compact Muon Solenoid Detector is in operation. Recent results on proton beam and lead beam collisions will be presented.

1200 1230 **Dr Adi Paterson**
Australian Nuclear Science and Technology Organisation NSW AUSTRALIA
ANSTO and the Future of the Great Traditions in Nuclear Science and Technology
The great include particle accelerators, reactors, and the nuclear fuel cycle. These are complemented by nuclear interactions at many length scales, materials development, computation and modelling. ANSTO's and Australia's role and future will be discussed.

Tuesday 7 December
1115 - 1230

Concurrent Session 4D: ACOFT - Nonlinear Pulse Propagation in Fibers and Waveguides

Room: *Meeting Room 207, Level 2*
Chair: Dragomir Neshev, Australian National University, CANBERRA, AUSTRALIA
Time

1115 1130 **Prof Graham Town**
Macquarie University NSW AUSTRALIA
Optical Continuum Generation Seeded by Stimulated Raman Scattering
An optical continuum was generated in microstructured optical fibre using an incoherent pump generated by stimulated Raman scattering in a step index fibre with normal dispersion. Accelerated spectral broadening to longer wavelengths was observed.

1130 1145 **Dr Claude Aguergaray**
Auckland University NEW ZEALAND
Pulse Propagation and Break-up in Fiber Amplifiers with Third-Order Dispersion
We present a novel analytical solution and the conditions leading to accurate description of propagating pulses and critical

length describing pulse break-up for the generalized nonlinear Schrödinger equation with third-order fiber dispersion and constant gain.

1145 1200 **Mr Wenqi Zhang**
University of Adelaide SA AUSTRALIA
Supercontinuum Generation in Dispersion-Tailored Bismuth Microstructured Optical Fibre
We report supercontinuum generation (SCG) in a dispersion-tailored bismuth-glass microstructured optical fibre. Simulations of near-infrared femtosecond pumping predict SCG spanning the near- and mid-infrared. Preliminary experiments show SCG from 0.8 ¦Ìm to at least 1.75 ¦Ìm.

1200 1230 **Prof Roberto Morandotti**
INRS-EMT CANADA
Continuous Wave Second Harmonic Generation in Ultra-Compact AlGaAs Photonic Wire Waveguides
Efficient modal phase-matched second harmonic generation is obtained in sub-wavelength AlGaAs waveguides using a continuouswave laser at telecommunication wavelengths. The tunability and robust fabrication process make this device ideal for integrated wavelength conversion.

Tuesday 7 December

1115 - 1230

Concurrent Session 4E: Quantum Information, Concepts & Coherence Group 2

Room: *Meeting Room 208, Level 2*
Chair: Geoff Pryde, Griffith University, BRISBANE, AUSTRALIA
Time

1115 1145 **Prof Andrew White**
University of Queensland QLD AUSTRALIA
Exponentially Faster Measurement of Quantum Dynamics via Compressed Sensing
We overcome a fundamental problem in engineering quantum systems: characterising dynamics, where resources grow exponentially with system-size. Using compressed-sensing, we develop and demonstrate an efficient method for quantum process-tomography, proving it both accurate and robust.

1145 1200 **Mr Seiji Armstrong**
Australian National University ACT AUSTRALIA
Experimental Demonstration of Computer Reconfigurable Multimode Entanglement
Quantum protocols require multiple entangled modes. We demonstrate a set of tools that generate, manipulate and detect multimode entanglement within a single beam of light. This new method is flexible and computer controlled.

1200 1215 **Miss Helen Chrzanowski**
Australian National University ACT AUSTRALIA
Schrödinger Kitten States Characterisation Using Only Continuous Variables and Gaussian Resources
Quantum superposition states are central to many proposed quantum information and communication protocols. We experimentally demonstrate a protocol for the reconstruction of the Wigner non-Gaussian Schrödinger kitten state using only squeezed states and homodyne detection.

1215 1230 **Mr Matthew Palsson**
Griffith University QLD AUSTRALIA
Violation Of A Bell Inequality By Weak Values
We used weak measurement with postselection to simultaneously gain information about noncommuting measurements on a maximally entangled state, demonstrating CHSH inequality violation in a way that does not require non-locality if objective reality is discarded.

Tuesday 7 December

1115 - 1230

Concurrent Session 4F: Solar, Terrestrial & Space Physics 4

Room: *Meeting Room 209, Level 2*
Chair: Marcus Duldig, Australian Antarctic Division, KINGSTON, AUSTRALIA
Time

1115	1145	**Prof Iver Cairns** *University of Sydney NSW AUSTRALIA* **Solar Radio Bursts and Properties of the Solar Corona** Novel observational analyses of solar radio bursts and detailed data-theory comparisons are used to illustrate their strong potential for predicting space weather at Earth and for probing the corona's properties and origin.
1145	1200	**A/Prof Christine Charles** *Australian National University ACT AUSTRALIA* **Oblique Double Layers: A Comparison between Terrestrial and Auroral Measurements** Satellites observations of electric field structures in the Earth's aurora have been identified as belonging to a `U' shaped potential structure that supports oblique electric double layers. This interpretation is verified by terrestrial laboratory measurements.
1200	1215	**Dr Phil Richards** *George Mason University VA USA* **On The Consistency of Satellite Measurements of Thermospheric Composition and Solar EUV Irradiance with Australian Ionosonde Electron Density Data** Using a comprehensive ionosphere model, we demonstrate that satellite measurements of solar EUV irradiances, neutral densities, and temperatures are consistent with Australian ionosonde measurements of the electron density from 2002 to 2006.
1215	1230	**Prof Fred Menk** *University of Newcastle NSW AUSTRALIA* **Propagation of Solar Wind Shocks through the Magnetosphere** We use multipoint spacecraft and ground observations to investigate the generation, propagation and consequences of magnetospheric waves associated with solar wind shocks. Features such as field line resonances, cavity oscillations, and particle precipitation, are considered.

Tuesday 7 December

1115 - 1230

Concurrent Session 4G: AOS - Plasmonics: Optics

Room: *Meeting Room 205, Level 2*

Chair: Tim Davis, CSIRO Materials Science & Engineering, CLAYTON, AUSTRALIA

Time		
1115	1130	**Mr Michael Larkins** *Queensland University of Technology QLD AUSTRALIA* **Coupling of Light into Arrays of Nanoholes Via the Kretschmann Geometry** Arrays of nanohole structures in thin supported gold films are fabricated. The Kretchmann geometry is used to couple light into the array for the generation of enhanced fields within the nanohole structures.
1130	1145	**Miss Xiao Ming Goh** *University of Melbourne VIC AUSTRALIA* **Nanometallic Spatially Modulated Aperture Arrays for Wavefront Control** Localised resonances residing within apertures are accompanied by wavelength-dependent phase shifts in the transmitted fields. Here, we demonstrate one-dimensional and two-dimensional focusing, achieved by spatially modulating aperture geometries in thin-film metallic aperture arrays.
1145	1200	**Dr Dmitri Gramotnev** *Nanophotonics Pty Ltd QLD AUSTRALIA* **Plasmonic Fabry-Perot Resonators** In this paper, we simulate and optimise nanoscale Fabry-Perot resonators in plasmonic nanowires. A range of applications of the proposed structures in integrated nano-optics, signal processing, sensors, and non-linear plasmonics are discussed.
1200	1215	**Mr Artur Davoyan** *Australian National University ACT AUSTRALIA* **Nonlinear Plasmonic Tapered Wavegudies** We study propagation of surface plasmon polaritons in a nonlinear tapered slot waveguide and demonstrate taper-induced plasmon nanofocusing and the formation of a plasmon soliton.

1215 1230 **Mr Adam Taylor**
Swinburne University of Technology VIC AUSTRALIA
Scattering Continuous-Wave Readout on Gold Nanorods Based Five-Dimensional Optical Recording
Surface plasmon resonance enhanced scattering from gold nanorods is employed as a continuous wave readout mechanism for 5-D optical storage, which addresses slow speed and low efficiency of the previous readout scheme.

Tuesday 7 December
1115 - 1230

Concurrent Session 4H: CMMSP - Modelling & Simulations

Room: *Meeting Room 206, Level 2*
Chair: Salvy Russo, RMIT University, MELBOURNE, AUSTRALIA
Time

1115 1145 **Prof Yuan Ping Feng**
National University of Singapore SINGAPORE
First-principles Prediction of Unconventional Dilute Magnetic Semiconductors
First-principles method is used successfully to predict dilute magnetic semiconductors without magnetic elements. Interesting trend is observed based on studies of carbon and nitrogen doped II-VI and III-V semiconductors.

1145 1200 **Mr Daniel Drumm**
University of Melbourne VIC AUSTRALIA
Models for the Xe Centre in Diamond
Density Functional Theory lattice dynamics models of the Xe centre in diamond are constructed, relative defect formation free energies calculated and relative stabilities established from 0-1500K. Vibrational modes of the structures are predicted.

1200 1215 **Dr Andrew Smith**
Monash University VIC AUSTRALIA
Chemical Bonding in Aluminium: A Comparison between Convergent Beam Electron Diffraction and Density Functional Theory
Quantitative Convergent Beam Electron Diffraction and ab initio WIEN2k calculations both demonstrate that aluminium bonding charge density resides preferentially in the tetrahedral interstices. This result highlights the role of strengthening precipitates in aluminium alloys.

1215 1230 **Mr Haibo Guo**
CSIRO VIC AUSTRALIA
Morphology of Iron Oxide Nanocrystals from Thermodynamic Modelling
Iron oxide nanoparticles display diverse morphologies in a variety of environments. We construct a nanomorphological phase diagram of iron oxides using thermodynamic model with first-principles calculations.

Tuesday 7 December
1400 - 1515

Concurrent Session 5A: ACOFT - High Speed Signal Processing and Devices

Room: *Banquet Room 202, Level 2*
Chair: Steve Madden, Laser Physics Centre, ACTON, AUSTRALIA
Time

1400 1430 **Dr Jochen Schroeder**
University of Sydney NSW AUSTRALIA
Controlling the Dynamics of A Passive Mode-Locked Laser with An In-Cavity Pulse-Shaper: Ultra-High Repetition Rates and Dark And Bright Pulses
We controlled the dynamics of a passive mode-locked laser via complex spectral filtering with an in-cavity pulse-shaper. Repetition rate tuning of up to 640 GHz and tuning between dark and bright output pulses will be demonstrated.

1430 1445 **Prof Roberto Morandotti**
INRS-EMT CANADA
Sub-ps Laser Modelocked Dissipative Soliton Laser in a CMOS Compatible Integrated Microring Resonator
We present a dissipative four wave mixing tunable laser based on a integrated CMOS-compatible high-Q nonlinear ring resonator, emitting subpicosecond pulses at 200GHz-repetition rate. Quasi-sinusoidal 800GHz emission regime is also demonstrated.

1445 1500 **Mr Owen Brasier**
University of Sydney NSW AUSTRALIA
Simultaneous Multi-channel OSNR Monitoring at 40 Gb/s OOK and DPSK Using a Wavelength Selective Switch
We show the first simultaneous OSNR monitoring of two 40 Gb/s channels, using a wavelength selective switch and two photodetectors. This approach is bit-rate and format independent and can be easily integrated in existing reconfigurable networks.

1500 1515 **Dr Mark Pelusi**
University of Sydney NSW AUSTRALIA
Dispersion Compensation of 100 GHz Spaced WDM 40 Gb/s Signals by Phase Conjugation in As2S3 Glass
We demonstrate dispersion compensation of a WDM 3x40 Gb/s (100 GHz spaced) RZ-DPSK signal in a 162 km standard fibre link by using optical phase conjugation via CW pumped four wave mixing in a As2S3 planar waveguide.

Tuesday 7 December
1400 - 1515

Concurrent Session 5B: AOS/AMP - Fermi Gases

Room: *Meeting Room 203, Level 2*
Chair: Andy Martin, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1400 1430 **Dr Chris Vale**
Swinburne University of Technology VIC AUSTRALIA
Universal Properties of Strongly Interacting Fermi Gases
We report measurements showing the universal behaviour of the static structure factor and the temperature dependence of pair correlations in a strongly interacting Fermi gas.

1430 1445 **Dr Paul Dyke**
Swinburne University of Technology VIC AUSTRALIA
Quasi-2D Fermi Gases
We report experiments on a quasi-2D Fermi gas of Lithium-6 atoms. Here, we observe the transition from a 3D to 2D Fermi gas and observe a confinement induced resonance.

1445 1500 **Dr Hui Hu**
Swinburne University of Technology VIC AUSTRALIA
First Principle Many-Body Theory for Strongly Interacting Ultracold Fermi Atoms
We report some recently developed theoretical techniques that are providing successful theoretical predictions for strongly interacting atomic Fermi gases.

1500 1515 **Dr Joel Corney**
University of Queensland QLD AUSTRALIA
Quantum Dynamics of the Dissociation of a Condensate of Dimers into Fermionic Atoms
We numerically simulate the exact quantum many-body dynamics of ultracold dimers dissociating into fermionic atoms by applying a Gaussian phase-space representation. We calculate higher-order correlactions, and find clear departures from mean-field theory

Tuesday 7 December
1400 - 1515

Concurrent Session 5C: Nuclear & Particle Physics 5

Room: *Meeting Room 204, Level 2*
Chair: Bruce Yabsley, University of Sydney, SYDNEY, AUSTRALIA
Time

1400 1430 **Dr Jose Bellido-Caceres**
The University of Adelaide SA AUSTRALIA
Latest Results from the Pierre Auger Observatory
The Pierre Auger Observatory detects cosmic rays with energies above 10^18 eV. It consists of an array of particle detectors deployed over an area of 3000 km^2 , and of a set of fluorescence telescopes. A summary of our latest results on energy spectrum, arrival directions and mass composition will be presented.

1430	1445	**Dr Tibor Kibedi** *Australian National University ACT AUSTRALIA* **Novel Approach to Determining the Radiative Width of the Hoyle State** The radiative width of the Hoyle-state in 12C is a critical parameter in determining the rate of 12C production in stars. We propose a novel approach to measuring its radiative width, currently uncertain to 10%. We will exploit pair conversion for the 7.654 MeV E0 and 3.215 MeV E2 transitions to the 0+ and 2+ states respectively, and will reduce the uncertainty to <5%.
1445	1500	**Mr Kong Guan Tan** *University of Melbourne VIC AUSTRALIA* **Improving the Efficiency of Hadronic Tauon Reconstruction at ATLAS** The reconstruction of tauons at ATLAS is essential to the search for the Higgs particle. This study quantifies the current performance of tauon track selection and details a strategy for its improvement.
1500	1515	**Mr Cameron Cuthbert** *University of Sydney NSW AUSTRALIA* **Performance of the ATLAS Semiconductor Tracker** Aspects of the performance of the Semiconductor Tracker (SCT) of the ATLAS detector at the LHC, CERN, are presented in the context of early collision data, focusing on calibration and validation of Monte Carlo simulation.

Tuesday 7 December

1400 - 1515

Concurrent Session 5D: ACOFT - Biomedical and Sensing

Room: *Meeting Room 207, Level 2*

Chair: John Arkwright, CSIRO Materials Science and Engineering, LINDFIELD, AUSTRALIA

Time		
1400	1415	**Ms Yih Miin Liew** *Optical+Biomedical Engineering Laboratory WA AUSTRALIA* **Assessment and Correction of Imaging Artifacts in Skin Imaging Using Fibre-based Optical Coherence Tomography** This study reports two types of imaging artifacts in 3D optical coherence tomography images of human skin – intensity deficits and geometrical distortion, and describes their reduction through the application of refractive index matching media.
1415	1430	**Mr Navin Prakash Ghimire** *Swinburne University VIC AUSTRALIA* **Nonlinear Optical Endoscopy Enabled by Fibre-Based Dispersion Compensation** A fibre-based dispersion compensation method is newly used in nonlinear optical endoscopy to compensate for normal dispersion and compress pulse width for high fluorescence generation efficiency.
1430	1445	**Mr Huy Nguyen** *Victoria University VIC AUSTRALIA* **Metallic Nanostructures on Optical Fiber End-faces for Refractive Index Sensing** This paper describes the integration of a periodic array of gold nanostructures onto the end-face of an optical fiber and demonstrates the usefulness of this device as a compact and sensitive liquid refractive index sensor.
1445	1500	**Dr Nicoleta Dragomir** *Victoria University VIC AUSTRALIA* **Fibre Bragg Grating Sensors for Human Skin Pressure Measurements** We demonstrate a low pressure sensor based on a fibre Bragg grating (FBG) for human skin pressure underneath compression stockings. Calibration and comparison with conventional pressure sensors is presented.
1500	1515	**Dr Paul Stoddart** *Swinburne University VIC AUSTRALIA* **Influence of Cladding Refractive Index on a Distributed Optical Fibre Chemical Sensor** Refractive index dispersion in core and cladding materials affects the range and sensitivity of evanescent wave distributed optical fibre sensors. A convenient way of characterizing the broadband performance based on a supercontinuum light source is described.

Tuesday 7 December

1400 - 1515

Concurrent Session 5E: Quantum Information, Concepts & Coherence Group 3

Room: *Meeting Room 208, Level 2*
Chair: Howard Wiseman, Griffith University, NATHAN, AUSTRALIA

Time

1400 1415 **Dr Robert Spekkens**
Perimeter Institute for Theoretical Physics CANADA
Specker's Parable of the Over-protective Seer: Implications for Contextuality, Nonlocality and Complementarity
We explore a thought-experiment by Ernst Specker from 1960 which has novel applications for a number of modern topics in quantum foundations, in particular proofs of nonlocality and contextuality.

1415 1430 **Dr Hans Westman**
University of Sydney NSW AUSTRALIA
A New Form of Contextuality
We show that for any deterministic hidden variable theory, capable of reproducing the statistics of quantum theory, the outcome of a measurement of two commuting observables A and B in general depend on which measurement, A or B, is carried out first.

1430 1445 **Prof Jingbo Wang**
University of Western Australia WA AUSTRALIA
Quantum Walk Based Search and Implementation
We present families of graphs that allow both efficient quantum walk based search and quantum circuit implementation. The circuits provide a practical springboard to explore quantum walk based algorithms with the aim of eventual real-world applications.

1445 1500 **Dr Tom Stace**
University of Queensland QLD AUSTRALIA
Remarkably High Thresholds in Topological Quantum Codes Suffering Loss
I describe a body of work demonstrating high quantum error thresholds against logical errors, loss errors and entanglement generation errors. These thresholds have a close connection to classical phase transitions in randomised Ising models.

1500 1515 **Dr Casey Myers**
University of Queensland QLD AUSTRALIA
Coherent State Topological Cluster State Production
We present a topological cluster state construction from coherent states, using both a basic beam splitter CSIGN gate and a teleported CSIGN gate, considering the trade-off between success probability and fidelity for these two schemes

Tuesday 7 December

1400 - 1515

Concurrent Session 5F: Solar, Terrestrial & Space Physics 5

Room: *Meeting Room 209, Level 2*
Chair: Colin Waters, University of Newcastle, NEWCASTLE, AUSTRALIA

Time

1400 1430 **Dr Dan Meehan**
Defence and Science Technology Organisation SA AUSTRALIA
Presentation title to be advised
Summary not provided at time of publication.

1430 1445 **Mr Thomas Kane**
La Trobe University VIC AUSTRALIA
Quiet-time HF Radar Backscatter from the F-region Ionosphere
HF radar backscatter occurrence is analysed statistically to identify controlling factors during geomagnetically quiet periods. The radar backscatter occurrence is compared with the peak F-region electron density, NmF2, and ionospheric conductances.

1445 1500 **Mr Christopher Nolan**
University of Newcastle NSW AUSTRALIA
Kelvin-Helmholtz Instability at the Magnetopause
The shear solar wind flow dynamics near the magnetopause of the terrestrial magnetosphere is a source of ULF wave energy. Wave over-reflection related to the Kelvin-Helmholtz instability is studied by comparing Cluster and numerical simulation data.

1500 1515 **Prof Peter Dyson**
La Trobe University VIC AUSTRALIA
Spatial Sampling of the Thermospheric Vertical Wind Field at Auroral Latitudes
Bi-static measurements are presented of thermospheric vertical winds at multiple locations between Mawson and Davis stations in Antarctica, showing vertical wind upwellings correlated on both large (~480 km) and small (< 150 km) scales.

Tuesday 7 December
1400 - 1515

Concurrent Session 5G: AOS - Metamaterials

Room: *Meeting Room 205, Level 2*
Chair: Dragomir Neshev, Australian National University, CANBERRA, AUSTRALIA
Time

1400 1415 **Miss Kirsty Hannam**
Australian National University ACT AUSTRALIA
Rotational Tuning of Metamaterials
We tune the interaction between metamaterial elements by modifying their relative rotational orientation. This results in a crossing of resonances, and we find good agreement between experimental and numerical results.

1415 1430 **Mr Alexander Minovich**
Australian National University ACT AUSTRALIA
Tunability of Optical Fishnet Metamaterials
We demonstrate the tunability of left-handed optical fishnet metamaterials by infiltrating the structure with a nematic liquid crystal, and achiving its tunability by applying an external voltage

1430 1445 **Ms Iryna Khodasevych**
RMIT University VIC AUSTRALIA
Tunable Fluid Infiltrated Optical Fishnet Metamaterial
We show that infiltrating fishnet metamaterial with fluids of different permittivity can provide tuning at infrared frequencies. Substantial tunability range of the material is achieved with very minor changes in the permittivity of the fluid.

1445 1500 **Mr Parry Chen**
University of Sydney NSW AUSTRALIA
Folded Bands in Metamaterial Photonic Crystals
Band structures of photonic crystals containing both positive and negative index materials are shown to possess folded bands that do not span the entire Brillouin zone. These folded bands are anisotropic such that group velocities change from positive to negative values as propagation directions change.

Tuesday 7 December
1400 - 1515

Concurrent Session 5H: CMMSP - Soft Matter

Room: *Meeting Room 206, Level 2*
Chair: Gary Bryant, RMIT University, MELBOURNE, AUSTRALIA
Time

1400 1430 **Prof William Van Megen**
RMIT University VIC AUSTRALIA
Solidification: Perspectives from Experiments with Colloidal Suspensions
The experiments, analogous to neutron and X-ray scattering conventionally used in condensed matter, are based on laser light spectroscopy and fall into two classes; One measures the formation of crystals in the under-cooled colloidal “melt” by following the growth of Bragg reflections. The second measures structural relaxation dynamics. The results of the experiments challenge the both classical theory of freezing and the prevailing views of the glass transition.

1430 1500 **Prof Hans Joachim Schöpe**
University of Mainz GERMANY
Crystallization and Vitrification of a Hard Sphere Like Colloidal Model System
A detailed analysis of the solidification kinetics in gravity matched colloidal hard spheres clearly show strong deviations from the classical picture of crystallization and vitrification.

1500 1515 **Prof Robert Robson**
James Cook University QLD AUSTRALIA
Positron Transport in Soft Matter for PET
We analyse transport of positrons in soft condensed matter in a prototype model of positron emission tomography (PET), and address in particular spatial resolution issues caused by the finite range of positrons in biological tissue.

Tuesday 7 December
1545 - 1700

Concurrent Session 6A: ACOFT - Nonlinear Waveguides

Room: *Banquet Room 202, Level 2*
Chair: Michael Withford, Macquarie University, SYDNEY, AUSTRALIA
Time

1545 1615 **Prof Barry Luther-Davies**
Australian National University ACT AUSTRALIA
Chalcogenide Glasses for Nonlinear Photonics
Chalcogenide glasses are important amorphous semiconductors used for phase-change memories, solar cells and in photonics. Here I will review their photonic applications with an emphasis on new glasses for high speed all-optical signal processing.

1615 1630 **Mr Khu Vu**
Australian National University ACT AUSTRALIA
2.8dB/cm Internal Gain Tellurium Dioxide Erbium Waveguide Amplifiers
We report Erbium doped Tellurium dioxide single-mode planar rib waveguide amplifiers with net gain and wide bandwidth operation. Peak internal gains of up to 14dB have been achieved in 5cm long rib waveguides (2.8dB/cm).

1630 1645 **Mr Ting Han**
Australian National University ACT AUSTRALIA
Low Loss Chalcogenide Glass Waveguides Fabricated by Hot Embossing
We report the fabrication of Chalcogenide glass rib waveguides by thermal nano-imprint. Waveguides 2–4μm wide and 1μm high were fabricated with optical losses of 0.24dB/cm and 0.29dB/cm for TM and TE polarizations at 1550nm.

1645 1700 **Mr Xin Gai**
Australian National University ACT AUSTRALIA
Ge11.5As24Se64.5 Chalcogenide Glass Nanowires with a Nonlinear Parameter of 136,000W-1km-1 at 1550nm
We have fabricated nanowires from Ge11.5As24Se64.5 glass. The loss of nanowire was measured to be 2.6dB/cm for fundamental TM mode. The nonlinear coefficient (¡Ã) was determined to be ¡Ö136¡À7W-1m-1 at 1550nm. Supercontinuum (SC) was produced in an 18mm long nanowire.

Tuesday 7 December
1545 - 1700

Concurrent Session 6B: AMP/AOS - Atom Light Interactions

Room: *Meeting Room 203, Level 2*
Chair: Halina Rubinsztein-Dunlop, University of Queensland, BRISBANE, AUSTRALIA
Time

1545 1600 **Prof Victor Flambaum**
University of New South Wales NSW AUSTRALIA
Atomic Ionization by Axions and Dark Matter Search
Using the relativistic Hartree-Fock approximation, we calculate the rates of atomic ionization by absorption of axions or any other pseudoscalar dark matter particles. We present numerical results for atoms relevant for the direct axion and dark matter searches (e.g. Ar, Ge, I and Xe), as well as the analytical formula which fits numerical calculations with few per cent accuracy and may be used for multi-electron atoms, molecules and condensed matter systems.

1600 1615 **Dr Laurence Campbell**
Flinders University SA AUSTRALIA
Modeling the 557.7-nm Nightglow
Kinetic, ionospheric and auroral processes are included in a computational model of the 557.7-nm emission in the Earthâ€™s nightglow. Results are compared with an experimental record measured over the previous solar cycle.

1615 1630 **Mr Valentin Ivannikov**
Swinburne University of Technology VIC AUSTRALIA
AC Zeeman Shifts in a Trapped Atom Clock
We measure radiation shifts induced by the dynamic Zeeman effect in a trapped atom clock on an atom chip.

1630 1645 **Mr Andrew Hayward**
University of Melbourne VIC AUSTRALIA
Quantum and Classical Chaos in Coupled Kicked Jaynes-Cummings Cavities
We consider two Jaynes-Cummings cavities coupled periodically with a photon hopping term and investigate the resulting chaotic system. We observe dynamic localization and tunneling in the quantum case, and a correspondence with the semi-classical behavior.

1645 1700 **Dr Alexander Akulshin**
Swinburne University of Technology VIC AUSTRALIA
Coherence-and Optical Pumping-Based Methods For Enhancing Frequency Up-Conversion In Atomic Media
We present an investigation of coherent blue light generation in Rb vapour using the process of wave mixing enhanced by lightinduced atomic coherence and velocity selective optical pumping.

Tuesday 7 December
1545 - 1700

Concurrent Session 6C: Nuclear & Particle Physics 6

Room: *Meeting Room 204, Level 2*
Chair: Mahananda Dasgupta, Australian National University, CANBERRA, AUSTRALIA
Time

1545 1615 **Prof Gerald Miller**
University of Washington WA USA
Transverse Charge Densities
Electromagnetic form factors probe charge and magnetization densities of hadrons and nuclei. Traditional three-dimensional Fourier transforms are not applicable for systems with relativistically moving constituents. The transverse charge density is a rigorous way to analyze electromagnetic form factors. This talk will discuss the meaning of the transverse charge density and existing results.

1615 1630 **Mr Benjamin Callen**
University of Melbourne VIC AUSTRALIA
Fermion Masses and Mixing in a 4+1-Dimensional SU(5) Domain-Wall Brane Model
We show that fermion mass hierarchy problem can be explained naturally by splitting quarks and leptons in the extra-dimension of the SU(5) 4+1d domain-wall brane model of Davies, George and Volkas, and that the generation of quark mixing also looks promising.

1630 1645 **Mr Aditya Wakhle**
Australian National University ACT AUSTRALIA
Quasi-fission as a Competitor to Fusion in the Synthesis of Super-heavy Elements
Formation of super-heavy elements is hindered by quasi-fission, a competitor to fusion. A detailed study of its dependence on mass-asymmetry, deformation alignment and charge of super-heavy species will be presented.

1645 1700 **Dr Andrew Melatos**
University of Melbourne VIC AUSTRALIA
Nuclear Physics Experiments with Gravitational Wave Interferometers
Neutron stars are ideal laboratories for studying the equation of state of bulk nuclear matter. High-precision measurements with the current generation of gravitational-wave interferometers will revolutionize such studies following dramatic increases in sensitivity.

Tuesday 7 December

1545 - 1700

Concurrent Session 6D: ACOFT - Sensors

Room: *Meeting Room 207, Level 2*
Chair: Dominic Murphy, University of Adelaide, ADELAIDE, AUSTRALIA

Time

1545 1600 **Mrs Harpreet Kaur Bal**
Victoria University VIC AUSTRALIA
Fabrication of a Fibre Bragg Grating Liquid Composition Sensor Based on Wet Etching Technique
An alternative fabrication process targeting the etching of fibre Bragg gratings (FBGs) is presented. The performance of the resulting grating is demonstrated by developing a glycerine composition sensor based on refractive index changes.

1600 1615 **Mr Timothy Lam**
Australian National University ACT AUSTRALIA
Fiber Optic Strain Sensing Using an Absolute Frequency Reference
We present a quasi-static fiber optic strain sensing system. Strain signals are encoded onto a laser and read off using a H13C14N absorption line. Resolutions below a nanostrain for frequencies above 20 mHz were achieved.

1615 1630 **Dr Kevin Cook**
University of Sydney NSW AUSTRALIA
Dip-Style Viscometer Based on Acoustic Wave Excitation of Long Period Fibre Grating
A viscometer based on damping of an acoustically excited fibre long period grating (LPG) is described.

1630 1645 **Mr Alessio Stefani**
Technical University of Denmark DENMARK
Polymer Optical Fiber Bragg Grating Sensors: Measuring Acceleration
Fiber-optical accelerometers based on polymer optical fiber Bragg gratings are reported. We have written fiber Bragg gratings for 1550 nm and 850 nm operations, characterized their temperature and strain response, and tested their performance in a prototype accelerometer.

Tuesday 7 December

1545 - 1700

Concurrent Session 6E: Quantum Information, Concepts & Coherence Group 4

Room: *Meeting Room 208, Level 2*
Chair: Andrew Greentree, University of Melbourne, MELBOURNE, AUSTRALIA

Time

1545 1600 **Dr Warwick Bowen**
University of Queensland QLD AUSTRALIA
Quantum Mechanics in Opto-Mechanical Systems
Mechanical systems with behavior dominated by quantum effects are now feasible. We report the development of key techniques to engineer non-classical mechanical states. Particularly, ultrasensitive mechanical homodyne detectors, strong mechanical actuation; and progress toward nonlinear mechanics and phonon counters.

1600 1615 **Mr Glen Harris**
University of Queensland QLD AUSTRALIA
Optimal Feedback Cooling of a Microresonator
Micro-mechanical resonators are ideally placed to study the elusive quantum regime for macroscopic mechanical oscillators. This requires milli-Kelvin temperatures which can be achieved via a combination of cryogenic refrigeration and feedback cooling. We report a theoretical treatment of optimal feedback cooling using a Kalman filter as well as progress towards its experimental realization.

1615 1630 **Dr Alessandro Fedrizzi**
University of Queensland QLD AUSTRALIA
Downconversion of a Single Photon
We report the direct generation of single-photon triplets produced via cascaded spontaneous parametric downconversion in two nonlinear crystals.

1630 1645 **Mr Devin Smith**
University of Queensland QLD AUSTRALIA
Optical Quantum Information with Highly Efficient Photon-Number Resolving Transition Edge Sensors
Transition edge sensors provide near-unit efficiency for detecting single photons, allowing for improved quantum information processing. Here that improvement is demonstrated experimentally, and a quantum process is characterized from photon creation to detection.

1645 1700 **Mr Michael Hush**
Australian National University ACT AUSTRALIA
Number Phase Wigner Representation for Efficient Stochastic Simulation
We introduce and investigate a novel number phase Wigner representation. We demonstrate it can be used to simulate multimode quantum systems with a large nonlinearity for longer times than competing methods.

Tuesday 7 December
1545 - 1700

Concurrent Session 6F: Solar, Terrestrial & Space Physics 6

Room: *Meeting Room 209, Level 2*
Chair: Svetlana Petelina, La Trobe University, BUNDOORA, AUSTRALIA
Time

1545 1615 **Prof Colin Waters**
University of Newcastle NSW AUSTRALIA
Research Using Over-the-Horizon HF Radars: The Australian Connection
The Super Dual Auroral Radar Network (SuperDARN) is an international consortium involving 25 HF radars to study ionosphere dynamics. In this invited talk, the Australian involvement and contributions to SuperDARN will be summarised. Keywords: ionosphere physics, over-the-horizon radar

1615 1630 **Dr Trevor Harris**
Defence Science and Technology Organisation SA AUSTRALIA
SpICE: A Program to Study Small-Scale Disturbances in the Ionosphere
SpICE is a DSTO experiment based program to investigate small- scale ionospheric disturbances. These are often seen on vertical incidence HF soundings and are uncorrelated with soundings from greater than 500km away and with soundings from the same site less than 15 minutes later. This paper will discuss the SpICE program goals and highlight some of the unusual features observed so far. The temporal behaviour of medium and small scale disturbances will also be explored.

1630 1645 **Dr Sean Ables**
University of Newcastle NSW AUSTRALIA
Ultra-low Frequency Waves and Auroral Emmissions in the Polar Cap
Three years of magnetometer data and auroral imagery from Antarctica has been analysed. We use ULF wave diagnosis of the open-closed polar-cap boundary as a means of determining the possible energisation mechanisms for polar-cap aurora.

1645 1700 **Dr Zahra Bouya**
Bureau of Meteorology NSW AUSTRALIA
Spherical Cap Harmonic Analysis Applied to Regional Ionospheric Total Electron Content Modeling for Australia
The paper proposes an approach to the regional Total Electron Content (TEC) representation by the SCHA applied to the values of the TEC ionospheric parameter as observed by the Australian Regional GPS Network (ARGN).

Tuesday 7 December
1545 - 1700

Concurrent Session 6H: CMMSP - Nanoscience

Room: *Meeting Room 206, Level 2*
Chair: Yuan Ping Feng, National University of Singapore, SINGAPORE
Time

1545 1615 **Dr Brian Rodriguez**
University College Dublin IRELAND
Probing Electromechanical Coupling at the Nanoscale
In the past decade, piezoresponse force microscopy has become a powerful tool for nanoscale imaging, spectroscopy, and manipulation of ferroelectric and piezoelectric materials. Here, an overview of PFM is provided and recent advances are

summarized.

1615 1630 **Prof Robert Elliman**
Australian National University ACT AUSTRALIA
Growth and Functionalization of Silica Nanowires
This study investigates the growth of amorphous silica nanowires during high temperature annealing of metal-coated silicon substrates together with methods for functionalizing the nanowires for particular applications.

1630 1645 **Dr Taras Plakhotnik**
University of Queensland QLD AUSTRALIA
Anomalous Power-Laws of Random Fluctuations in the Transition Frequencies of Semiconductor Quantum Dots: A Possible Connection to Luminescence Intermittency
Contrary to expectations, the wandering of transition frequencies in colloidal quantum dots does not follow the statistics of ordinary diffusive processes. A theory that treats electronic states of the exciton in a quantum dot as interacting with an ensemble of two-level systems or a number of degrees of freedom represented by continuously diffusing reaction-coordinates suggests a common origin of spectral diffusion and luminescence intermittency due to similar power-law distributions of the correlation times.

1645 1700 **Prof Leslie Allen**
University of Melbourne VIC AUSTRALIA
Quantitative Scanning Transmission Electron Microscopy - Counting Atoms
We discuss the first quantitative atomic-resolution Z-contrast imaging and its application to counting atoms in a gold foil. Quantitative bright-field imaging results are also presented and the implications for conventional transmission electron microscopy discussed.

Wednesday 8 December
0900 - 0945

Plenary Session 6

Room: *Banquet Room 202, Level 2*
Chair: Susan Scott, Australian National University, CANBERRA, AUSTRALIA
Time

0900 0945 **Prof Bruce Allen**
Albert Einstein Institute GERMANY
The Einstein@Home Search for New Neutron Stars
Einstein@Home is a volunteer distributed computing project with more than a quarter-million participants. This talk will describe the current status of its search for new neutron stars, using data from gravitational-wave and radio observatories.

Wednesday 8 December
0945 - 1030

Plenary Session 7

Room: *Banquet Room 202, Level 2*
Chair: John Zillman, University of Melbourne, PARKVILLE, AUSTRALIA
Time

0945 1030 **Prof David Karoly**
University of Melbourne VIC AUSTRALIA
Lies, Damn Lies and Climate Change Sceptics: What Has Really Caused Recent Global Warming?
A rebuttal is provided of a number of common arguments and misinformation that question the role of human activity, particularly increasing concentrations of atmospheric greenhouse gases, as the main cause of recent observed global warming.

Wednesday 8 December
0900 - 1030

ACOFT - Radio over Fiber

Room: *Meeting Room 203, Level 2*
Chair: Jochen Schroeder, University of Sydney, SYDNEY, AUSTRALIA
Time

0900	0930	**Dr Christina Lim** *University of Melbourne VIC AUSTRALIA* **Digital Photonic Transmission of Analogue RF Signals for Fibre-Radio** This paper reviews a digitised wireless signal transport scheme based on bandpass sampling theory to overcome inherent issues associated with analog photonic link to establish high performance fibre-radio links.
0930	1000	**Prof Robert Minasian** *University of Sydney NSW AUSTRALIA* **Photonic Signal Processing of Microwave Signals** Photonic signal processing offers a new powerful paradigm for processing high bandwidth signals, overcoming inherent electronic limitations. Recent new methods in wideband signal processors including high-resolution, arbitrary response, tunability and low noise processing, are presented.
1000	1015	**Dr Kerry Hinton** *Institute For A Broadband Enabled Society VIC AUSTRALIA* **Technology & Upgrade Options for Broadband Networks** New technology and design options for broadband networks are described. A modified Arrayed Wave Guide router and long reach PON provide improved service resilience, future cost-effective capacity upgradeability and increase network coverage.
1015	1030	**Dr Lam Bui** *RMIT University VIC AUSTRALIA* **Remoted Instantaneous Frequency Measurement System using Optical Mixing in Highly Nonlinear Fiber** A novel instantaneous frequency measurement using all optical mixing is demonstrated. This system can provide a measurement of RF frequency while requiring no high speed electronic components and remoting all components of the measurement system to the receiver.

Wednesday 8 December

0900 - 1030

ACOFT - Photonic Crystals

Room: *Meeting Room 204, Level 2*
Chair: Michael Steel, Macquarie University, SYDNEY, AUSTRALIA
Time

0900	0930	**Dr Thomas White** *Australian National University ACT AUSTRALIA* **Experimental Observation of Evanescent Modes in Slow-Light Photonic Crystal Waveguides** We report the first experimental measurements of evanescent modes associated with slow light in photonic crystal waveguides. Evanescent modes enable efficient light coupling from regular waveguides to slow and ``frozen'' modes of photonic crystals.
0930	0945	**Dr Snjezana Tomljenovic-Hanic** *University of Melbourne VIC AUSTRALIA* **Ultrahigh-Q Photoinduced Microcavities in Defect-Free Photonic Crystals** We demonstrate that cavities with Q>10 6 can be designed in defect-free photonic crystals made of photosensitive material (chalcogenide). Both positive and negative refractive index change can result in high-Q cavities.
0945	1000	**Dr Andrey Sukhorukov** *Australian National University ACT AUSTRALIA* **Phase Transitions of Nonlinear Waves in Lithium Niobate Waveguide Arrays** We study two-color nonlinear modes in waveguide arrays with quadratic nonlinear response and observe experimentally a new type of phase transition due to an interplay of localization and synchronization in parametrically driven discrete systems.
1000	1015	**Dr Thomas White** *Australian National University ACT AUSTRALIA* **Raman-Induced Slow and Fast Light in Silicon Photonic Crystal Waveguides** We study new possibilities for dynamically tuning the pulse velocity from slow- to fast-light regimes through stimulated Raman scattering in silicon photonic crystal waveguides, where light-matter interactions are enhanced by tuning the linear slow-light dispersion.

1015 1030 **Mr Felix Lawrence**
University of Sydney NSW AUSTRALIA
Bloch-mode Based Homogenisation of Photonic Crystals
We propose a method for photonic crystal homogenisation based on our rigorous impedance-based method for calculating reflectances. We find that the homogenised impedance can accurately predict surface modes where it fails to calculate reflection coefficients.

Wednesday 8 December
1100 - 1230

Concurrent Session 7A: ACOFT - Microstructured Fibers and Novel Devices

Room: *Banquet Room 202, Level 2*
Chair: Snjezana Tomljenovic-Hanic, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1100 1130 **Prof Tanya Monro**
University of Adelaide SA AUSTRALIA
Optical Fibres: Nanostructures Enabling New Properties and Applications
Advancing fabrication technologies are enabling the inclusion of ever-smaller features within optical fibres, opening up opportunities for the control of light. Current state of the art in fabrication will be presented, along with advances in modeling and new device concepts.

1130 1145 **Ms Pourandokht Naseri**
The University of Sydney NSW AUSTRALIA
Air Core Metallic Light Guides for Scintillation Dosimetery in Radiotherapy
Cerenkov radiation generated in optical fibres guides, that carry the signal from scintillation dosimeters used in radiotherapy, is a serious problem. We analyse options for using air core light guides to avoid this problem.

1145 1200 **Mr Alessandro Tuniz**
University of Sydney NSW AUSTRALIA
Design of an Optically Invisible Metamaterial Fibre
We present the simple design of an invisible metamaterial fibre operating at optical frequencies, which could be potentially fabricated using existing fibre drawing techniques.

1200 1215 **Miss Geraldine Marien**
Macquarie Univsersity NSW AUSTRALIA
Profiles of Fibre Bragg Grating Stopbands for Temporal Spectral Astronomy
Temporal spectral astronomy studies astrophysical phenomena showing spectral variability on very short timescales. The use of fibre Bragg gratings converts the spectral detection into a photometric one, allowing for short timescale variations to be resolved.

1215 1230 **Mr Tilanka Munasinghe**
University of Adelaide SA AUSTRALIA
Highly Nonlinear, Low Dispersion Fibres for Telecommunications Applicaitons
We present here some models of fibres designed with high index materials to provide very high nonlinearity and sufficiently low dispersion for use in telecommunications applications. In our analysis we look at soft glass nanowires and also investigate the properties of two glass systems and how index contrast can be used to tailor the dispersion.

Wednesday 8 December
1100 - 1230

Concurrent Session 7B: AOS - Quantum Optics

Room: *Meeting Room 203, Level 2*
Chair: Ken Baldwin, Australian National University, CANBERRA, AUSTRALIA
Time

1100 1130 **Prof Hans Bachor**
ACQAO ACT AUSTRALIA
Quantum Optics - quo vadis ?
Quantum optics has evolved in the last two decades from a field of fundamental research to the foundation of future quantum technologies, relating closely to information science. What might the future bring ?

1130 1145 **Dr Murray Olsen**
University of Queensland QLD AUSTRALIA
Analysis of a Continuous Variable Cluster State
We investigate a proposed continuous-variable cluster state system using full quantum calculations of the relevant correlations. We find that, while not perfect, they may be useful for some quantum information protocols.

1145 1200 **Mr Michael Stefszky**
Australian National University ACT AUSTRALIA
Advancements in Low Frequency Squeezing for Gravitational-Wave Detection
We report on the current state of low frequency squeezed light production for gravitational-wave interferometry. We investigate the many design concepts, showing our latest low frequency squeezing results and the methods used by which to achieve these results.

1200 1215 **Dr Anton Desyatnikov**
Australian National University ACT AUSTRALIA
Collapse of Elliptic Optical Beams with Orbital Angular Momentum
We suggest a novel approach to suppress catastrophic self-focusing or collapse of laser beams in Kerr media. We demonstrate theoretically that the collapse threshold power is significantly increased for spiraling beams with elliptic cross-section.

1215 1230 **Mr Brendan Wilson**
University of Melbourne VIC AUSTRALIA
Large Dipole Systems in Ultrasmall Cavities: Extreme Cavity QED
This work probes the strong coupling regime of cavity QED, pushing beyond the limits of the point dipole approximation. This will guide future experimental work involving nanorods in ultrasmall cavities.

Wednesday 8 December
1100 - 1230

Concurrent Session 7C: Education 1

Room: Meeting Room 204, Level 2
Chair: Pam Mulhall, Melbourne Graduate School Of Education, PARKVILLE, AUSTRALIA
Time

1100 1130 **Mr Neil Champion**
Williamstown High School VIC AUSTRALIA
Australian Curriculum: Physics. How Did They Get It So Wrong?
The draft Australian physics curriculum lacks breadth, fails to connect with critical global or local issues and is constructed without pedagogical logic. Emerging science and regional expertise are poorly represented. Back to the drawing board.

1130 1145 **Dr Philip Dooley**
University of Sydney NSW AUSTRALIA
Building a Successful Outreach Program
We describe three examples from the extensive Physics outreach program at the University of Sydney: Three-hour syllabus-based workshops for year 12 students; an innovative meet and greet format, and shows for lower high school students.

1145 1200 **Dr Maria B Parappilly**
Flinders University SA AUSTRALIA
AstroFest- Promoting Physics Careers through Astronomy
In this paper we report on an AIP event promoting Physics among year-9 school students in South Australia. We have used Astronomy as a catalyst to enhance the students' passion for Science.

1200 1215 **Dr Judith Pollard**
University of Adelaide (AIP) SA AUSTRALIA
Is There a Gender Bias in Pre- and Post-Testing?
Is there gender bias in responses to pre-tests and post-tests administered to introductory physics classes in Australia? If so, what are the implications for the use of these test instruments?

1215 1230 **Mr Neil Champion**
Williamstown High School VIC AUSTRALIA
Electric Circuits: The Design and Implementation of a Constructivist Approach to Learning
A constructivist approach used to teach electric circuits in Year 11 Physics was evaluated. Students compared their own and

peers' ideas with those of younger students, while developing their skills in circuit design and measurement.

Wednesday 8 December

1100 - 1230

Concurrent Session 7D: ACOFT - Novel Devices I

Room: *Meeting Room 207, Level 2*
Chair: John Canning, University of Sydney, SYDNEY, AUSTRALIA

Time

1100 1115 **Dr Warren McKenzie**
University of New South Wales NSW AUSTRALIA
Fabricating Novel Diamond Waveguides Using the Focused Ion Beam Hard Mask
The Focused ion beam has been used to direct write a hard mask against the plasma etching of diamond. Nano-waveguides were fabricated from diamond-on-silica thin films close to ideal dimensions predicted via FIMMWAVE simulations.

1115 1130 **Mr Scott Jones**
Electrical Engineering & Telecommunications NSW AUSTRALIA
Electroactive Self-Assembling Hydrogels for Flexible Display Technology
The well-known redox-active molecule anthraquinone has been functionalised with glycine to produce an electroactive self-assembling molecular gel. Spectroelectrochemical experiments show a reversible variation in transmittance over the entire visible spectrum suggesting direct electrical control over the self-assembly process. This may have applications in flexible conformal displays.

1130 1145 **Dr Kok Hou Wong**
University of New South Wales NSW AUSTRALIA
Polymer Optical Fiber with Enhanced Surface Properties via Surface Chemistry Modifications
Surface properties of POF can be readily modified by various surface chemistry modification techniques. Many practical and novel properties including chemical resistance, thermal stability and electrical conductivity can be incorporated onto POF via these techniques.

1145 1200 **Dr Zourab Brodzeli**
University of New South Wales NSW AUSTRALIA
State of Charge of Battery Indicator Based on Fibre Optic Probe
A low-cost, high-accuracy fibre optic sensor probe to determine state of charge (SOC) of battery is demonstrated. Capability of extension to multipoint measurements of SOC of stock batteries is also discussed.

1200 1215 **Mr Nicolas Riesen**
Australian National University ACT AUSTRALIA
Dispersion Equalisation in Few-Mode Fibres
Dispersion equalization of the modes of cylindrically symmetric graded-index few-mode fibres is investigated using an equivalent planar waveguide representation. By treating each mode as an independent data transmission channel, such fibres could help substantially increase the capacity of telecommunications systems.

1215 1230 **Prof Kunimasa Saitoh**
Hokkaido University JAPAN
Limitation on Effective Area of Large-Mode-Area Leakage Channel Fibers Under Bent Condition
The bending characteristics of two-ring leakage-channel-fibers are investigated to achieve large-mode-area and effectively-single-mode operation with a practically allowable bending radius for Yb-doped fiber applications, enhancing differential bending loss >10dB/m between the fundamental and higher-order modes.

Wednesday 8 December

1100 - 1230

Concurrent Session 7E: Biophysics / Biomedical Physics 1

Room: *Meeting Room 208, Level 2*
Chair: Harry Quiney, University of Melbourne, MELBOURNE, AUSTRALIA

Time

1100 1115 **Miss Samantha Lichter**
University of Melbourne VIC AUSTRALIA
Diamond Encapsulation for a Bionic Eye
Bionic eye research has revealed a unique challenge: a hermetically sealed package with high density feedthroughs and ~80yr

lifetime. A polycrystalline diamond box design is being developed to attach onto a high density electrode array.

1115 1130 **Miss Rebecca Ryan**
University of Melbourne VIC AUSTRALIA
Structure Determination
Novel methods using ultrafast and brilliant X-ray sources are being investigated for the application of protein structure determination. A powder diffraction technique will be investigated for solving the structures of single nanocrystals of membrane proteins.

1130 1145 **Mr Evan Curwood**
University of Melbourne VIC AUSTRALIA
Reconstructing Single Biomolecules in the Presence of Damage
Coherent diffractive imaging at new fourth generation x-ray sources provides a route to structure determination of single biomolecules. The intense illumination is expected to adversely effect the measurement. Studies of scheme to analyse damaged measurements are presented.

1145 1200 **Mr Darren Alvares**
University of New South Wales NSW AUSTRALIA
Inkjet Printed Low Power Organic Transistors for Integrated Biomedical Sensors
Biomedical applications such as tactile sensors and artificial retinas require low power consumption, flexibility and conformability. Polymer electronics offers the opportunity to realise electrical amplification and unit sensor addressing on flexible substrates. This paper presents the fabrication and characteristics of low power organic transistors designed for integrated biomedical sensors.

1200 1215 **Dr Ajay Tikka**
Victoria University VIC AUSTRALIA
Wireless Implant Communication using Inductive Coupling
The use of inductive coupling for remote interrogation and powering of a human implantable microvalve is presented. The modelling, characterisation and development of a reliable communication link is outlined by analyzing the electromagnetic field interactions with the human body.

1215 1230 **Dr Jeffrey Davis**
Swinburne University of Technology VIC AUSTRALIA
Coherent Effects in Photosynthesis and Associated Biomolecules
We have observed long lived coherences in a range of light-harvesting complexes and isolated chromophores using femtosecond transient four-wave mixing and our recently developed non-interferometric phase retrieval techniques.

Wednesday 8 December

1100 - 1230

Concurrent Session 7F: Plasma Science 1

Room: *Meeting Room 209, Level 2*
Chair: Christine Charles, Australian National University, CANBERRA, AUSTRALIA
Time

1100 1130 **Dr Tony Murphy**
CSIRO Materials Science and Engineering NSW AUSTRALIA
Waste Treatment Using Arc Plasmas
The use of arc plasmas for treatment of waste and production of valuable byproducts is described. The development of the PLASCON process, in particular its application to ozone-depleting substances and greenhouse gases, is considered.

1130 1145 **Dr Roman Kompaneets**
University of Sydney NSW AUSTRALIA
Vibrations of a Quantum Plasma of Arbitrary Degeneracy
The spectrum of electrostatic vibrations of a one-component weakly coupled Fermi-Dirac plasma of arbitrary degeneracy is investigated using the Wigner-Poisson system.

1145 1200 **Mr Daniel Graham**
University of Sydney NSW AUSTRALIA
Three-Dimensional Electromagnetic Strong Turbulence: Scaling Behavior, Spectra, Field Statistics, and Wave Packet Structure
The first three-dimensional large-scale electromagnetic strong turbulence simulations are performed by numerically solving the

Zakharov equations, and compared to previous theory. Scalings, spectra, field statistics, and wave packet structure depend on the electron thermal speed.

1200 1215 **Dr Roman Kompaneets**
University of Sydney NSW AUSTRALIA
Shielding of a Moving Test Charge in a Quantum Plasma
The linearized potential of a moving test charge in a one-component fully degenerate fermion plasma is studied using the Lindhard dielectric function.

1215 1230 **Prof Rod Boswell**
Australian National University ACT AUSTRALIA
Focussed Inert Ion Beam systems for 3D rock tomography on the nano-scale
A new plasma source Focused Ion Beam system has been developed and commercialized. The very high milling speed allows reverse engineering and rock tomography to be carried out up to 20 times faster than with present FIB systems.

Wednesday 8 December

1100 - 1230

Concurrent Session 7G: AOS - Optical Trapping

Room: *Meeting Room 205, Level 2*
Chair: Robert Scholten, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1100 1115 **Dr Timo Nieminen**
University of Queensland QLD AUSTRALIA
Computational Modelling of Imaging of Vaterite Microspheres through Crossed Polarizers
We calculate the scattering of light by micron-scale vaterite microspheres and hence calculate images expected through crossed polarizers. Agreement with observed images strongly supports the "sheaf of wheat" structure of the particles.

1115 1130 **Mr Guillaume Maucort**
University of Queensland QLD AUSTRALIA
Measurements of Micro-Viscoelasticity Using Constant Power Optical Tweezers with Controllable Torque
We present a new way of using optical tweezers to measure micromechanical properties of various fluids.

1130 1145 **Mr Daryl Preece**
University of Queensland QLD AUSTRALIA
Optical Tweezers for Wide-Band Micro-Rheology
Optical tweezers have been widely studied as a means of conducting micro-rheological experiments. We demonstrate a novel technique utilising a holographic optical tweezers to extend the available frequency range measurable with optical tweezers.

1145 1200 **Mr Theodor Asavei**
University of Queensland QLD AUSTRALIA
Optical Paddle-Wheel
Since a free-floating optically-driven microrotor can be moved to any desired position, it can allow the controlled application of a directed flow in a particular location. Here we demonstrate the control and rotation of such a device, an optical paddle-wheel, using a multiple-beam trap. In contrast to the usual situation where rotation is around the beam axis, here we demonstrate rotation normal to this axis.

1200 1215 **Mr Alexander Stilgoe**
University of Queensland QLD AUSTRALIA
Non-Conservative Behaviour of Complex Optical Force Fields
Optical force fields have conservative and non-conservative components which dictate trapped particle behaviour. Non-conservative forces are typically small and undetectable in single-beams. Here we examine complex optical fields which can have large non-conservative forces.

1215 1230 **Mr Michael Taylor**
University of Queensland QLD AUSTRALIA
Sagnac Interferometer Enhanced Particle Tracking in Optical Tweezers
We propose implementing optical tweezers within a Sagnac interferometer. Symmetry relations cause the optical field component containing particle position information to constructively interfere at the detector, where other fields destructively interfere, thus improving detection sensitivity.

Wednesday 8 December

1100 - 1230

Concurrent Session 7H: Relativity & Gravitation 1

Room: *Meeting Room 206, Level 2*
Chair: Susan Scott, Australian National University, CANBERRA, AUSTRALIA

Time

1100 1130 **Dr Bram Slagmolen**
Australian National University ACT AUSTRALIA
The Australian National University Contribution to Advanced LIGO
We present the contribution by The Australian National University to the Advanced LIGO project. They include the delivery of an Arm Length Stabilization system and suspended steering mirrors.

1130 1145 **Mr Adam Mullavey**
Australian National University ACT AUSTRALIA
Arm Length Stabilisation for Advanced LIGO
We will give an overview of the Arm Length Stabilisation system being developed for the Advanced Laser Interferometric Gravitational Wave Observatory as well as the details of a prototype experiment carried out.

1145 1200 **Mr Sheon Chua**
Australian National University ACT AUSTRALIA
Squeezed State Injection for the Sensitivity-Improvement of Advanced Gravitational-Wave Interferometers
We report on the progress of an Australian partnered-international collaborative experiment to inject squeezed light into a kilometre-scale gravitational-wave interferometer, the LIGO Squeezed Light Injection Experiment.

1200 1215 **Miss Thanh Nguyen**
Australian National University ACT AUSTRALIA
Control of the Complex Optical Springs
We actively control the effective optical spring by manipulating the phase and magnitude of the feedback system used to lock a resonant cavity to a laser to observe the optical damping and pure optical spring regimes.

1215 1230 **Mr Andrew Wade**
Australian National University ACT AUSTRALIA
A Benchtop Polarisation Speed Meter for Gravitational Wave Detection
A bench-top quantum polarization speed meter for gravitational wave detection is demonstrated. Its gravitational wave frequency response is measured and compared to previous results of an external sloshing cavity speed meter.

Wednesday 8 December

1330 - 1500

Concurrent Session 8A: ACOFT - Silicon Photonics

Room: *Banquet Room 202, Level 2*
Chair: Arnan Mitchell, RMIT University, MELBOURNE, AUSTRALIA

Time

1330 1345 **Mr Bill Corcoran**
University of Sydney NSW AUSTRALIA
Silicon-chip-based THz Bandwidth Radio-frequency Spectrum Analyser
We demonstrate a silicon-chip-based radio-frequency spectrum analyser capable of measuring terabaud optical data. We investigate application to optical performance monitoring and show that free-carrier effects have a negligible impact on device operation.

1345 1400 **A/Prof David Moss**
University of Sydney NSW AUSTRALIA
CMOS Compatible All-Optical Waveguides
We demonstrate a wide range of novel functions in integrated, CMOS compatible, devices. This platform has promise for telecommunications and on-chip WDM optical interconnects for computing.

1400 1415 **Mr Trung Duc Vo**
University of Sydney NSW AUSTRALIA
Silicon Chip Based Instantaneous Dispersion Monitoring for a 640 Gbit/s DPSK Signal
We demonstrate for the first time silicon chip based instantaneous chromatic dispersion monitoring of an ultra-high bandwidth 640 Gbit/s DPSK signal. This monitoring scheme is based on cross-phase modulation in an ultra-high nonlinear silicon

nano-wire.

1415 1430 **Dr Fangxin Li**
University of Sydney NSW AUSTRALIA
All-Optical Time-Division Demultiplexing at 160Gb/s and 640Gb/s via FWM in a Silicon Nanowire
We demonstrate all-optical time division demultiplexing from 160Gb/s and 640Gb/s, down to10Gb/s in the C-band, based on four-wave mixing (FWM) in a silicon nanowire. We achieve efficient demultiplexing at both bit rates and at 160Gb/s obtain error-free operation with a system penalty of ~ 3.9dB at 10-9 BER.

1430 1445 **Dr Thach Nguyen**
RMIT University VIC AUSTRALIA
Polarisation Dependent Scattering Loss in Thin, Shallow-Ridge Silicon-on-Insulator Waveguides with Resonant Lateral Leakage
We present an analysis of the polarisation dependent scattering loss due to surface and sidewall roughness in thin, shallow-ridge silicon-on-insulator (SOI) waveguides using three dimensional coupled mode theory. The impact on resonant lateral leakage is discussed.

1445 1500 **Dr Fangxin Li**
University of Sydney NSW AUSTRALIA
Low Propagation Loss Silicon-on-Sapphire Integrated Waveguides
We report low loss silicon-on-sapphire nanowires for potential applications to mid infrared optics. We achieve propagation losses < 1dB/cm in the 1550nm wavelength range and show these devices have potential out to 6 ìm.

Wednesday 8 December

1330 - 1500

Concurrent Session 8B: AOS/AMP - Spectroscopy

Room: *Meeting Room 203, Level 2*
Chair: Andre Luiten, University of Western Australia, NEDLANDS, AUSTRALIA
Time

1330 1345 **Mr Gar-Wing Truong**
University of Western Australia WA AUSTRALIA
Progress in Determining the Boltzmann Constant Using Alkali Metal Spectroscopy
Thermal broadening of spectroscopic absorption lines in alkali metals were used to measure the Boltzmann constant with a relative uncertainty of 4.1E-4. The effect of optical pumping on this determination will be discussed.

1345 1400 **Mr Christopher Perrella**
University of Western Australia WA AUSTRALIA
Non-Linear Spectroscopy of Rubidium in Hollow Core Fibres For Compact Clocks and Quantum Optics
Observations of Rubidium within Hollow Core Optical Fibre have relieved large AC Stark Shifts, atomic guiding, Light Induced Atomic Desorption and strongly driven two-photon transition. These effects can be used to create an optical clock or quantum optics device.

1400 1415 **Prof Feng Wang**
Swinburne University of Technology VIC AUSTRALIA
Electron Correlation Effects of Bound Electronic Wavefunctions to Gamma-Ray Spectra of Positron Annihilation in Atoms and Small Molecules
Calculations of gamma-ray spectral linewidths for positron annihilation of noble gases and small molecules are presented. It is found useful to reveal electron correlation contributions from atomic or molecular electrons in the annihilation processes.

1415 1430 **A/Prof Christopher Chantler**
University of Melbourne VIC AUSTRALIA
A Facility for Testing Quantum Electro-Dynamics, Plasma Physics, Laboratory Astrophysics and the Fundamental Constants of Nature – A Visible, VUV, X-Ray Synchrotron Source Allied with an Electron Beam Ion Trap
Recent Australian expertise in developing new tests of Quantum Electro-Dynamics, Plasma Physics and Synchrotron Science is pooled in a proposal to unite the novel sources of a synchrotron beam-line across energy regimes with an Electron Beam Ion Trap to produce a unique tool for advancing fundamental research and physics including plasma physics, laboratory astrophysics, investigations of the constancy of fundamental constants of nature and tests of QED.

1430 1445 **Mr Lucas Smale**
University of Melbourne VIC AUSTRALIA
Towards a Characterization of Kß Spectral Profiles for Scandium, Titanium, Chromium and Manganese
We discuss developments towards experimental characterization of K β spectral profiles for transition metals of prime relevance for testing QED in medium-Z systems. [1,2]

Wednesday 8 December
1330 - 1500

Concurrent Session 8C: Education 2

Room: *Meeting Room 204, Level 2*
Chair: Maurizio Toscano, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1330 1345 **Dr Margaret Wegener**
University of Queensland QLD AUSTRALIA
Virtual Realities for Learning Introductory Physics
We investigate game-like interactive simulations for learning physics. We have developed, and evaluated effectiveness of, simulations in the fields of special relativity and quantum mechanics. These enable new types of learning that challenge traditional curricula.

1345 1400 **Dr Anton Rayner**
University of Queensland QLD AUSTRALIA
The Influence of Tablet Technology on Learning in Engineering Thermodynamics
A trial of tablet computer technology had substantial impact in improving learning processes in Engineering Thermodynamics. Changes included the introduction of collaborative group work; greater emphasis on continuing assessment; and more efficient and comprehensive feedback.

1400 1415 **Dr Gary Tuck**
University of Queensland QLD AUSTRALIA
Radioactivity Experiments on iLab at The University of Queensland
Two first level radioactivity experiments which are now available on the Internet via the iLab program have applications to physics, mathematics, chemistry and biology curricula.

1415 1430 **Prof Joe Wolfe**
University of New South Wales NSW AUSTRALIA
Multimedia Learning and Teaching: The Physclips Example
Physclips is an on-line multimedia resource for students and teachers in introductory physics. We report how it relates to research-based principles in multimedia learning, and why and how we developed it.

1430 1445 **Ms Joanna Turner**
University of Southern Queensland QLD AUSTRALIA
Remote Laboratories and Experiment Kits for Tertiary Physics Distance Education Students
Take-home experiment kits, portable experiments in a box, remote laboratories and a solar web experiment have been implemented to enhance the practical component of external Physics students studying through the University of Southern Queensland.

1445 1500 **Dr David Mills**
Monash University VIC AUSTRALIA
Communication and Confidence in Student-Designed Experiments
Students use a range of scientific abilities to design an experiment. Our study of talented and typical students, their confidence and communication, helps better matching of the task to the students.

Wednesday 8 December
1330 - 1500

Concurrent Session 8D: ACOFT - Novel Devices II

Room: *Meeting Room 207, Level 2*
Chair: Peter Domachuk, University of Sydney, SYDNEY, AUSTRALIA
Time

1330	1345	**Mr Michael Stevenson** *University of Sydney NSW AUSTRALIA* **Controlled Fabrication of Tunable Delay Using Compound Phase Shifted Resonators** Fine tuned, narrowband group delay ("slow light") is obtained using a compound phase shifted grating and superposing resonances. Both simulation and experiments are reported.
1345	1400	**Dr Stephen Collins** *Victoria University VIC AUSTRALIA* **Modelling of an Alternative Pi-phase-shifted Fibre Bragg Grating Operating at Twice the Bragg Wavelength** The spectrum of an alternative type of pi-phase-shifted Bragg grating that operates at twice the Bragg wavelength, has been analysed according to a model developed for a conventional pi-phase-shifted Bragg grating.
1400	1415	**Dr Mattias Åslund** *University of Sydney NSW AUSTRALIA* **Comparison between a Mach-Zender and a Michelson Interferometer Employing Farady Mirrors for the Delayed Self-Heterodyne Interferometry Technique** The use of a Michelson interferometer configuration employing Farady rotator mirrors is shown to significantly improve stability for the delayed self-heterodyne interferometry technique. The improvement is attributed to redeced fringe fading due to the polarization rotation and reduced gyroscopic effects in the delay line.
1415	1430	**Dr Fotios Sidiroglou** *Victoria University VIC AUSTRALIA* **Improving the Radial Dopant Distribution in Silica Optical Fibres** A novel approach for controlling and flattening the radial distribution of the erbium ions within an aluminium enriched silica core glass as part of the modified chemical vapour deposition and solution doping techniques is presented.
1430	1445	**Dr Scott Wade** *Swinburne University of Technology VIC AUSTRALIA* **Bend Effects on Fibre Bragg Gratings in Standard and Low Bend Loss Optical Fibres** The effects of relatively small bend diameters on fibre Bragg gratings written in standard and low bend loss fibre have been investigated. Results including Bragg wavelength shifts with bending are reported.
1445	1500	**Mr Keiron Boyd** *University of Adelaide SA AUSTRALIA* **Elliptical CO2 Laser Beam Tapering of Pressurised Bismuth Microstructured Optical Fibe** We demonstrate controlled, adiabatic tapering of pressurized bismuth hexagonal microstructured optical fibers, enabling holes of diameters < 300 nm, with controlled collapse, and core sizes < 1 μm using an elliptical CO2 laser beam profile.

Wednesday 8 December

1330 - 1500

Concurrent Session 8E: Biophysics / Biomedical Physics 2

Room: *Meeting Room 208, Level 2*

Chair: Harry Quiney, University of Melbourne, PARKVILLE, AUSTRALIA

Time

1330	1345	**Dr Kumar Ganesan** *University of Melbourne VIC AUSTRALIA* **Diamond Penetrating Electrode Array for Bionic Eye** This paper presents application and characterization methods of diamond penetrating electrode arrays for Bionic Eye. The design and histology of electrode arrays made from polycrystalline diamond implanted into rat retinae are discussed.
1345	1400	**Dr Heiko Timmers** *University of New South Wales ACT AUSTRALIA* **Micro-Scratching and Scanning Probe Microscopy towards Understanding Wear in Knee Prostheses** Micro-Scratching and Scanning Probe Microscopy are combined to shed light on wear processes creating polyethylene particles in knee prostheses which are linked to bone osteolysis and ultimately prosthesis failure.

1400	1415	**Mr Christian Steinhauer** *University of Munich GERMANY* **Imaging DNA Nanostructures with Super-Resolution Fluorescence Microscopy** With the DNA origami technique, DNA can be folded into arbitrary shapes on a nanometer scale. To resolve these patterns optically, we use new localization based super-resolution methods to image below the diffraction limit.
1415	1430	**Ms Chathurika Abeyrathne** *University of Melbourne VIC AUSTRALIA* **Signal Recovery from Noise in Biological Systems** There are signal enhancement methods in biological systems which are similar to those used in the electronic systems. In this paper we investigated the possibility of extracting weak electromagnetic signals from noise.
1430	1445	**Mr Jon Swaim** *University of Queensland QLD AUSTRALIA* **Ultra-Sensitive Biosensing Using Optical Microresonators** We propose a novel biosensing system that incorporates a silica microtoroid resonator into a microfluidic channel for enhanced delivery and optical trapping of target molecules. We show that binding yield can be enhanced by 50%.
1445	1500	**Dr Dirk Lorenser** *University of Western Australia WA AUSTRALIA* **Miniaturized Optical Probe using Gradient-Index Optics for In-Vivo Confocal Microscopy** We demonstrate a miniaturized 350-micrometer diameter confocal probe with a lateral resolution of 1 micrometer and an axial resolution of 11 micrometers. We discuss the optical design and characterization of the fabricated probe.

Wednesday 8 December

1330 - 1500

Concurrent Session 8F: Plasma Science 2

Room: Meeting Room 209, Level 2

Chair: Rod Boswell, Australian National University, CANBERRA, AUSTRALIA

Time		
1330	1400	**Dr Sally L McArthur** *Swinburne University of Technology VIC AUSTRALIA* **Plasma Polymers in Biotechnology: Power, Patterning and PDMS** Plasma polymerisation creates coatings of different chemistries that can be translated to a variety of substrate materials. As a result they are well suited to controlling interactions between biomolecules and the surfaces used in biotechnology today.
1400	1415	**Dr Yuriy Tyshetskiy** *University of Sydney NSW AUSTRALIA* **Charging of Nanoparticles in Complex Plasmas: The Role of Quantum Tunneling of Electrons** Quantum tunneling of plasma electrons onto an immersed negatively charged grain is considered, and its contribution into charging current and equilibrium charge of the grain is analyzed for different grain sizes and plasma parameters.
1415	1430	**Dr Kunwar Singh** *University of Sydney NSW AUSTRALIA* **Radiation Propagation in Fluctuating Plasmas Using Kinetic Equations: Theory and Simulations** Kinetic equations for propagation of electromagnetic radiation in fluctuating magnetized plasmas are developed, including refraction, scattering, and linear mode conversion. Initial results of resulting numerical simulations are also reported.
1430	1445	**Dr Roman Kompaneets** *University of Sydney NSW AUSTRALIA* **Kinetic Modes in Field-Driven Plasma Flows** It is shown that the higher-order Landau modes of ion plasma waves in a weakly ionized plasma can become unstable in the presence of an ion flow driven by an electric field.
1445	1500	**Dr Mushtaq Ahmad** *University of Sydney NSW AUSTRALIA* **Nonlinear Waves in Quantum Plasmas** Nonlinear equations for electrostatic/electromagnetic waves are derived using fluid description of plasmas. Quantum Korteweg–deVries (KdV)/ Kadomstev–Petviashvilli (KP) for ion acoustic/magnetosonic waves are derived with coefficients contain quantum parameters.

Wednesday 8 December

1330 - 1500

Concurrent Session 8G: AOS - Lasers

Room: *Meeting Room 205, Level 2*
Chair: David Coutts, Macquarie University, SYDNEY, AUSTRALIA

Time

1330 1345 **Dr Helen Pask**
Macquarie University NSW AUSTRALIA
Diode-Pumped Terahertz Laser Source
We report a diode-pumped Terahertz intracavity parametric oscillator which generates tunable THz radiation between 1 and 3 THz. Threshold occurs for 7 W diode pump power which is 3 times less than previously reported.

1345 1400 **Dr David Ottaway**
University of Adelaide SA AUSTRALIA
Microstructured Erbium Doped Tellurite Fibre Laser
We have successfully fabricated structured fibres out of in house melted tellurite glass. This fibre has been used in the construction of an erbium doped fibre laser lasing at around 1550nm.

1400 1415 **Mr Alexander Sabella**
DSTO SA AUSTRALIA
Efficient Diamond Raman Lasers Operating at 1240 nm and 1485 nm
We demonstrate efficient 1064nm pumped diamond Raman lasers operating with conversion efficiencies to 1240nm or 1485nm of 61% and 44% respectively. Reduced threshold is observed for pump polarisation aligned with the <111> crystal orientation.

1415 1430 **A/Prof David Lancaster**
University of Adelaide SA AUSTRALIA
Towards Realisation of a 2m Thulium Chip Laser
We report here characterisation of an ultrafast-laser-written depressed-cladding waveguide Tm3+ doped ZBLAN device designed for laser operation.

1430 1445 **Mr Matthew Petrasiunas**
Griffith University QLD AUSTRALIA
A High-Power Ultrafast Laser Source with 300 MHz Repetition Rate for Trapped-Ion Quantum Logic
We implement a scalable laser source with a 300 MHz repetition rate, and watt-level average power, to generate ultrafast pulses at 370 nm for use in fast two-qubit quantum logic gates with trapped Yb+ ions.

1445 1500 **Mr Miftar Ganija**
University of Adelaide SA AUSTRALIA
Power Scaling and Reliable Cryogenic Cooling of a High Power Solid State Laser
Power scaling in room-temperature solid-state lasers is limited by thermally induced distortion and birefringence. We describe the development of a cryogenic conduction–cooled high power Yb:YAG slab laser that is robust and power scalable.

Wednesday 8 December

1330 - 1500

Concurrent Session 8H: Relativity & Gravitation 2

Room: *Meeting Room 206, Level 2*
Chair: Susan Scott, Australian National University, CANBERRA, AUSTRALIA

Time

1330 1345 **Mr Jude Prezens**
University of Melbourne VIC AUSTRALIA
The Double Kerr Solution as a Possible Mechanism for Controlled Causality Violation
For over 25 years, a solution has existed to Einstein's vacuum equation that describes a space-time with two Kerr black holes. This solution has been thoroughly researched with varied implications. Causality violation is one.

1345 1400 **Mr Phil Threlfall**
Australian National University ACT AUSTRALIA
The Conformal Structure of FRW Space-Times
The singularities in Friedmann-Robertson-Walker (FRW) space-times are discussed and compared to the conformal singularities defined by Höhn and Scott, namely the Isotropic Past Singularity (IPS), Isotropic Future Singularity (IFS) and the

Future Isotropic Universe (FIU).

1400 1415 **Mr Richard Barry**
Australian National University ACT AUSTRALIA
Contact Properties of the Abstract Boundary Construction
The Abstract Boundary construction produces a boundary for an n-dimensional manifold by considering multiple embeddings at once. It therefore provides us with an ideal tool with which to construct `optimal embeddings'. Results concerning this problem will be discussed.

1415 1430 **Dr Krzysztof Bolejko**
Australian National University ACT AUSTRALIA
Pre-Inflationary Homogenization of the Universe
Inflation explains a large number of cosmological problems. However, it cannot start if initial state is inhomogeneous. Therefore inflation requires initial homogenisation mechanism. The study of this problem is presented here.

1430 1500 **A/Prof Li Ju**
University of Western Australia WA AUSTRALIA
LIGO-Australia
We will present the planning and progress of the exciting new development of building a km southern hemisphere gravitational wave detector--the LIGO-Australia Project--in Gingin near Perth.

Wednesday 8 December

1530 - 1710

Concurrent Session 9A: ACOFT/AOS - Laserfest Symposium 2

Room: *Banquet Room 202, Level 2*
Chair: Stuart Jackson, University of Sydney, SYDNEY, AUSTRALIA
Time

1530 1550 **Prof Barry Luther-Davies**
Australian National University ACT AUSTRALIA
A Quarter Century of Using Lasers Used for Physics at ANU
Research in the Laser Physics Centre at ANU spans laser-matter interaction physics; nonlinear optics; photonics; quantum information processing; and optical materials. In this talk I will outline some highlights of our recent research.

1550 1610 **Prof Brian Orr**
Macquarie University NSW AUSTRALIA
Atomic and Molecular Spectroscopy in Australia - Fifty Years with and without Lasers
Since 1960, there have been significant developments in Australian atomic and molecular spectroscopy - many of them (but by no means all!) reliant on the availability of lasers.

1610 1630 **A/Prof David Lancaster**
University of Adelaide SA AUSTRALIA
An Incomplete Account of Laser Research for Defence Applications in Australia
This talk will introduce the role of lasers in defence, touch on several research projects conducted in Australia to develop lasers for defence applications, and offer some observations on future laser research for defence purposes.

1630 1650 **Dr Helen Pask**
Macquarie University NSW AUSTRALIA
Crystalline Raman Lasers: Past, Present and Future
Stimulated Raman scattering in crystalline materials was observed soon after the first laser was demonstrated. Today, crystalline Raman lasers offer a practical, versatile and efficient approach to frequency conversion

1650 1710 **A/Prof Rich Mildren**
Macquarie University NSW AUSTRALIA
Diamond Raman Lasers
Advances in the growth of synthetic diamond has recently stimulated efforts to develop practical diamond Raman laser devices. This work, which has been pioneered in Australia, will be reviewed and the outlook for future discussed.

Wednesday 8 December

1530 - 1700

Concurrent Session 9B: AOS/AMP - BEC I: Correlations

Room: *Meeting Room 203, Level 2*
Chair: John Close, Australian National University, CANBERRA, AUSTRALIA
Time

1530 1600 **Prof Ken Baldwin**
Australian National University ACT AUSTRALIA
Quantum Statistics of Atomic Speckle
We image, for the first time, matter wave speckle from a multimode metastable helium atomic beam guided in an optical potential, and measure the second order correlation function to demonstrate atom bunching for multimode guiding.

1600 1615 **Mr Tod Wright**
University of Queensland QLD AUSTRALIA
Nonperturbative Approach to Correlations and Interactions in the Finite-Temperature Bose Gas
Most approaches to describing finite-temperature Bose gases make use of Gaussian factorization approximations or perturbation theory. We demonstrate a nonperturbative approach to calculating higher-order correlations of the Bose field, and discuss their interpretation.

1615 1630 **Dr Karen Kheruntsyan**
University of Queensland QLD AUSTRALIA
What Can We Learn from the Measurement of the Third Moment of Density Fluctuations in a Quantum Gas?
We measure density fluctuations and the third moment of atom number distribution in a quasi-1D Bose gas. We show that this constitutes a very sensitive test of the thermodynamic equation of state of the gas.

1630 1645 **Dr Qiongyi He**
Swinburne University of Technology VIC AUSTRALIA
EPR Entanglement in a Four-Mode BEC
Criteria suitable for measuring entanglement between two different potential wells in a Bose-Einstein condensation (BEC) are evaluated. We show how to generate the required entanglement, which involves spatial separation as in the Einstein-Podolsky-Rosen (EPR) paradox.

1645 1700 **Dr Simon Haine**
Australian Centre for Quantum Atom Optics QLD AUSTRALIA
Squeezing the Most out of Your Atom Laser: Optimizing the Output of an Atom Laser for Precision Measurement
An atom laser is a device that shows promise for precision measurement. We investigate various methods of improving the performance of such a device by generating an atom laser with a nonclassical output.

Wednesday 8 December

1530 - 1700

Concurrent Session 9C: Education 3

Room: *Meeting Room 204, Level 2*
Chair: Pam Mulhall, Melbourne Graduate School Of Education, PARKVILLE, AUSTRALIA
Time

1530 1545 **Ms Esther Siam**
Monash University VIC AUSTRALIA
First Year University Students' Learning in Electromagnetic Experiments
Students' learning in electromagnetism experiments was investigated via observations and surveys. This led to major revisions to an LCR resonance experiment for better understanding of electromagnetism. Students' perceived goals, purposes and learning outcomes were evaluated.

1545 1600 **Dr Jennifer Coopersmith**
La Trobe University VIC AUSTRALIA
A Different Way to Teach Energy
A new pedagogy for the teaching of energy is suggested. The variational mechanics of Lagrange and Hamilton, and also the history of the emergence of energy, are emphasized. This leads to a deeper understanding.

1600 1615 **Mr Devon Biggerstaff**
University of Queensland QLD AUSTRALIA
Quantum Optics Experiments for Advanced Undergraduate Laboratory
Two-photon quantum optics experiments for advanced undergraduate quantum laboratory provide clear and achievable demonstrations of lecture concepts including quantization, wave-particle duality, the Heisenberg picture, and distinguishability.

1615 1630 **Dr Marcus Wilson**
University of Waikato NEW ZEALAND
A Mixed 'Cookbook' and Student-Designed Laboratory Course at the University of Waikato in 2010
We discuss an approach to a second-year undergraduate physics class involving a combination of 'cookbook'-style instructions and student designed laboratories. Students learn both to use equipment and implement good experimental methods.

1630 1645 **Ms Helen Georgiou**
University of Sydney NSW AUSTRALIA
A Comparison of Students' Thermal Physics Conceptions across Three English-Speaking Countries
We present the results of a qualitative analysis to a short free response question covering basic thermal physic concepts. The question was given to tertiary (physics) students in the US, South Africa and Australia.

1645 1700 **Miss Jiradawan Huntula**
Mahidol University PATHOM THAILAND
Encouraging Student Learning in Physics Laboratory Classes by Using CTTQ (Concepts, Tools and Techniques Questioning Method)
This study aims to present the Concepts, Tools and Techniques Questioning method (CTTQ), which is for creating questions for student learning. The paper will present the use of the CTTQ at the University of Sydney.

Wednesday 8 December

1530 - 1700

Concurrent Session 9D: Nuclear & Particle Physics 7

Room: *Meeting Room 207, Level 2*
Chair: Antonio Limosani, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1530 1545 **Dr Aldo Saavedra**
University of Sydney NSW AUSTRALIA
Inclusive Hadronic Tau Studies in ATLAS
Inclusive studies featuring hadronic tau leptons recorded by the ATLAS detector at the LHC in early 7 TeV data are presented, including reconstruction performance using Standard Model decays as a precursor to new physics searches.

1545 1600 **Dr Gregory Lane**
Australian National University ACT AUSTRALIA
TAGS at CARIBU - A New Experimental Facility for the Study of Neutron-Rich Nuclei
Total Absorption Gamma-ray Spectroscopy will be used to study neutron-rich radioactive nuclei from the new CARIBU facility at Argonne, with an initial focus on nuclei identified as important for understanding decay heat in Generation IV nuclear reactors.

1600 1615 **Mr Lucas Ong**
University of Melbourne VIC AUSTRALIA
Diamond-Based Tracking Detectors For High Energy Physics
Properties such as a large band gap, radiation hardness, efficient room temperature operation and chemical inertness make synthetic diamond a suitable substance for next generation radiation detectors in high energy particle physics experiments.

1615 1630 **Mr Curtis Black**
University of Sydney NSW AUSTRALIA
Lepton Flavour Violation in Supersymmetry at the LHC
We present the potential of discovering decays of supersymmetric neutralinos and staus with the ATLAS detector at the LHC where the stau decays into a muon and the lightest neutralino, violating tau lepton number.

1630 1645 **Mr Justin Matthys**
University of Melbourne VIC AUSTRALIA
Prospects for Dark Matter Detection through the 21 cm Line
The indirect observability of dark matter decay or annihilation in the high-redshift universe ($30 < z < 300$) through observations of the 21 cm line of hydrogen in next-generation x-ray astronomy is tested.

Wednesday 8 December

1530 - 1700

Concurrent Session 9E: Biophysics / Biomedical Physics 3

Room: *Meeting Room 208, Level 2*
Chair: Harry Quiney, University of Melbourne, PARKVILLE, AUSTRALIA

Time

1530 1545 **Mr Park Fung**
University of Sydney NSW AUSTRALIA
Neural Field Theory ofLarge-Scale Synaptic Plasticity
The large-scale synaptic plasticity of the human cortex is studied using a neural field model with a generalized plasticity rule. Findings include frequency dependency of plasticity and synaptic saturation conditions.

1545 1600 **Dr Marcus Wilson**
University of Waikato NEW ZEALAND
Measuring Electrical Conductivity of Brain Slices
We present an experimental methodology for measuring the electrical conductivity of mouse brain slices by a four electrode method. Measurements are supported by computer modelling.

1600 1615 **A/Prof Alistair Steyn-Ross**
University of Waikato NEW ZEALAND
Precursive Ringing in a Subthreshold Neon-bulb Oscillator
Analysis and simulation of the circuit equations for an RC neon-bulb relaxation oscillator predict emergence of low-amplitude ringing behavior when the circuit is biased close to the threshold for current spike oscillations.

1615 1630 **Mr Guillaume Maucort**
University of Queensland QLD AUSTRALIA
Biophysical Studies of the Actin Network Action on Neurosecretory Vesicles during Stimulation of Exocytosis
Dynamics of neurosecretory vesicles are studied during the process of exocytosis in order to retrieve information on the role of the actin network.

1630 1645 **Mr Ben Kent**
RMIT University VIC AUSTRALIA
The Effects of Sugars on Lipid Membrane Phase Behaviour and Their Role as Protectants during Freezing and Dehydration
The nature of the interaction between sugars and lipid membranes is investigated and discussed in terms of the current understanding of how sugars alter lipid membrane phase behaviour and protect membranes during dehydration.

1645 1700 **Dr Brendan Kennedy**
University of Western Australia WA AUSTRALIA
Imaging Tissue Mechanical Properties with Optical Coherence Elastography
Optical coherence elastography (OCE) is a biomedical imaging technique which measures tissue mechanical properties with microscopic resolution. In OCE, tissue response to mechanical perturbation is quantitatively imaged using optical coherence tomography.

Wednesday 8 December

1530 - 1700

Concurrent Session 9F: CMMSP - Semiconductors II

Room: *Meeting Room 209, Level 2*
Chair: Trevor Finlayson, University of Melbourne, PARKVILLE, AUSTRALIA

Time

1530 1545 **Dr Wenxin Tang**
Monash University VIC AUSTRALIA
Surface Dynamics during Langmuir Evaporation of GaAs
Surface electron microscopy is used to image Langmuir evaporation of GaAs (001). Key dynamic phenomena are observed, including droplet motion and daughter droplet nucleation, which have important implications for positioning quantum structures.

1545	1600	**Dr Heiko Timmers** *University of New South Wales ACT AUSTRALIA* **Local Lattice Information for GaN and ZnO Relevant to Spintronics** Local Lattice Information for GaN and ZnO has been obtained from perturbed angular correlation spectroscopy and RBS-Channeling in an effort to ascertain how transition metals are incorporated into the lattice of these compounds.
1600	1615	**Dr Oleh Klochan** *University of New South Wales NSW AUSTRALIA* **Fabrication and Characterization of an Undoped Gaas Single Hole Transistor** We have fabricated and characterized a single hole transistor in an undoped AlGaAs-GaAs heterostructure. Our device exhibits Coulomb blockade oscillations and shows stable electrical characteristics with little drift and improved noise performance.
1615	1630	**Ms Jessica Van Donkelaar** *University of Melbourne VIC AUSTRALIA* **An Ordered Donor Array in a Nanoscale Semiconductor Device** We have fabricated semiconductor channels containing an ordered array of dopants with deterministic ion implantation. Contrasts to disordered channels are evident down to a pitch comparable to the straggle of the incident 14keV P+ ions.
1630	1645	**Dr Simon Ruffell** *Australian National University ACT AUSTRALIA* **Silicon XII: A Novel Semiconductor That Can Be Electrically Doped and Patterned at Room Temperature** We illustrate writing of electrically conducting and insulating zones in silicon by nanoindentation. Additionally, we show that Si-XII, a phase that can be formed by nanoindentation, is semiconducting and can be doped at room temperature.
1645	1700	**Mr Christopher Hall** *Swinburne University VIC AUSTRALIA* **Observation of Spatially Separated Coherent Coupling near the LO Phonon Resonance within Asymmetric Double Quantum Wells** We examine the dynamics of coherently coupled heavy hole excitons localized within spatially separated quantum wells with an energy difference equal to the LO phonon energy.

Wednesday 8 December

1530 - 1700

Concurrent Session 9G: AOS - Photonic Crystals

Room: Meeting Room 205, Level 2

Chair: Brant Gibson, The Innovation Group, SYDENHAM, AUSTRALIA

Time		
1530	1600	**Dr Kanna Aoki** *Metamaterials Laboratory, RIKEN JAPAN* **Assembly of Three-Dimensional Photonic Structures** Unique fabrication techniques for three-dimensional photonic crystals and metamaterials are introduced. Micromanipulation and self-assembly stimulated by magnetic field are the key techniques in the established fabrication methods for 3D photonic crystal and metamaterials, respectively.
1600	1615	**Mr Alvaro Casas Bedoya** *University of Sydney NSW AUSTRALIA* **Dispersion Engineering of Photonic Crystal Waveguides Using Selective Microfluidic Infiltration** We use optofluidic infiltration to precisely and reversibly engineer the dispersion of a photonic crystal defect waveguide post-fabrication. The amount of fluid infiltrated into the photonic crystal microstructure strongly influences the waveguide dispersion
1615	1630	**Dr Andrey Sukhorukov** *Australian National University ACT AUSTRALIA* **Paired Resonances of Heterostructure Cavities Based on Dispersion-Engineering of Slow-Light** We predict that double heterostructure cavities created in dispersion-engineered photonic crystals waveguides featuring two band-edge slow-light states support a pair of localized modes, whose frequency detuning can be controlled simply by changing the cavity length.

1630 1645 **Mr Mark Turner**
Swinburne University of Technology VIC AUSTRALIA
Fabrication of Chiral Gyroid Photonic Crystals
We present the direct last writing of chiral photonic crystals based on the gyroid surface. This structure possesses strong three-dimensional geometrical chirality providing the ability to engineer chiral band gaps in all three-dimensions.

1645 1700 **Dr Ivan Garanovich**
Australian National University ACT AUSTRALIA
Two-Dimensional Dynamic Localization of Light in Photonic Lattices
We report on the first experimental observation of the two-dimensional dynamic localization effect. We demonstrate suppression of light diffraction in femtosecond laser-written modulated waveguide arrays of (i) hexagonal and (ii) zig-zag geometries.

Wednesday 8 December
1530 - 1700

Concurrent Session 9H: Relativity & Gravitation 3

Room: Meeting Room 206, Level 2
Chair: Susan Scott, Australian National University, CANBERRA, AUSTRALIA
Time

1530 1545 **Mr Benjamin Lewis**
Australian National University ACT AUSTRALIA
Numerical Techniques for Differential Geometry
The GRworkbench software is here used to see the rainbow-like caustic of a negative mass black hole solution. The same ray-tracing technique can poduce videos such as from an observer falling through an event horizon of a black hole space-time. We demonstrate generation of other visualisations, such as null cones and scalar quantities, for the investigation of different new space-times.

1545 1600 **Mrs Katie Howard**
Macquarie University NSW AUSTRALIA
Relativistic Emissions from the Galactic Centre
We investigate the physical processes responsible for the variable radio emissions from Sgr A* at the Galactic Centre and offer a time-dependent model for the evolution of the emission region, using general relativistic ray-tracing techniques.

1600 1615 **Dr Ra Inta**
Australian National University ACT AUSTRALIA
The Search for Gravitational Waves from Non-Pulsing Young Neutron Stars
We describe a programme to search for monochromatic gravitational waves expected to be emitted by a number of young non-pulsing neutron stars.

1615 1630 **Mr Graeme Gossel**
University of New South Wales NSW AUSTRALIA
Energy Levels of a Scalar Particle in a Static Gravitational Field Approaching the Black Hole Field
We calculate the energy spectrum of a scalar particle in a static, finite gravitational field. Zero energy bound states exist only in the black-hole limit, where the energy spectrum is shown to become quasi-continuous.

Wednesday 8 December
1900 - 2030

Public Lecture

Room: Plenary Hall 1 - Ground Floor (enter via doors 5 & 6)
Chair: David Jamieson, University of Melbourne, PARKVILLE, AUSTRALIA
Sponsored by: Melbourne University - School of Physics
Time

1900 2030 **Prof Jocelyn Bell Burnell**
Oxford University Astrophysics UNITED KINGDOM
Will the World End in 2012? The Astronomical Evidence
What's all this about the world ending in 2012? Will it really? This public lecture investigates the suggested astronomical reasons for the end of the world and assess their reality.

Thursday 9 December

0900 - 0945

Plenary Session 8

Room: *Banquet Room 202, Level 2*
Chair: Marcus Duldig, Australian Antarctic Division, KINGSTON, AUSTRALIA
Time

0900 0945 **Prof Jeremy Mould**
University of Melbourne VIC AUSTRALIA
Dark Matter in the Local 200 Mpc
The upcoming WALLABY and Skymapper surveys will map gravitationally induced velocities of galaxies superposed on the Hubble flow. These reflect primarily the dark matter distribution in the Universe which can be recovered from the data.

Thursday 9 December

0945 - 1030

Plenary Session 9

Room: *Banquet Room 202, Level 2*
Chair: Gerard Milburn, University of Queensland, BRISBANE, AUSTRALIA
Time

0945 1030 **Prof Tobias Kippenberg**
Max Planck Institute of Quantum Optics SWITZERLAND
Cavity Optomechanics: Coupling Light and Mechanical Motion
Cavity optomechanics is a new research field that has brought together the field of photonics with the field of nano- and micromechanical oscillators. Research ranges from verifying fundamental postulates of quantum measurement theory to novel light driven devices and accessing the quantum regime of mechanical systems. In this talk I will review this paradigm change.

Thursday 9 December

1100 - 1230

Concurrent Session 10A: Nuclear & Particle Physics 8

Room: *Banquet Room 202, Level 2*
Chair: Gerald Miller, University Of Washington, SEATTLE, USA
Time

1100 1130 **Prof Mahananda Dasgupta**
Australian National University ACT AUSTRALIA
Quantum Tunnelling and Nuclear Fusion
Fusion of heavy nuclei is exquisitely sensitive to their quantum nature. Dramatic effects of coherence have been observed. Recent investigations open up the possibility of understanding the loss of coherence and irreversibility in nuclear collisions.

1130 1145 **Prof Andrew Stuchbery**
Australian National University ACT AUSTRALIA
Nuclear and Atomic Physics through Hyperfine Interactions of Highly Charged Free Ions
Systematic measurements and model calculations are being performed to characterize the hyperfine fields of highly charged free ions, with a view to their application to moment measurements on exotic nuclei produced as radioactive beams.

1145 1200 **Mr Duc Huy Luong**
Australian National University ACT AUSTRALIA
New Insights into the Mechanisms and Timescales of Breakup in Reactions of Weakly-Bound Nuclei
Experimental results show that breakup of weakly-bound 6,7Li are predominantly triggered by nucleon transfer. This promises to be a key insight for understanding and predicting reactions of weakly-bound nuclei near the limits of nuclear existence.

1200 1215 **Dr Cedric Simenel**
Australian National University ACT AUSTRALIA
Actinide Collisions for QED and Superheavy Elements
Collisions of actinide nuclei are studied in dynamical mean-field theory. The strong electric fields may generate spontaneous emission of electron-positron pairs from QED vacuum decay while multi-nucleon transfer can produce superheavy elements.

1215 1230 **Mr Maurits Evers**

Australian National University ACT AUSTRALIA

Coherent to Dissipative Dynamics in Nuclear Reactions: The Role of (Multi-) Nucleon Transfer

Measurements of (multi-)nucleon transfer reactions populating highly excited states in the residual nuclei are presented. They are proving to be crucial for understanding the emergence of dissipative dynamics and decoherence in nuclear collisions.

Thursday 9 December

1100 - 1230

Concurrent Session 10B: AOS - Nonlinear Optics

Room: *Meeting Room 203, Level 2*

Chair: Anton Desyatnikov, Australian National University, CANBERRA, AUSTRALIA

Time

1100 1115 **Mr Ksawery Kalinowski**

Australian National University ACT AUSTRALIA

Second and Third Harmonic-Parametric Scattering in Disordered Quadratic Media

We study frequency conversion via interaction of two fundamental beams in quadratic media with random distribution of ferroelectric domains. We demonstrate experimentally and confirm theoretically spatial and polarization properties of the broadband second and third harmonics.

1115 1130 **Dr Adrian Ankiewicz**

Australian National University ACT AUSTRALIA

Discrete Rogue Waves

We show that the Ablowitz-Ladik equation, which is an integrable form of the discretized nonlinear Schrodinger equation (NLSE), has rogue wave solutions in the form of rational solutions.

1130 1145 **Mr Francis Bennet**

Australian National University ACT AUSTRALIA

Observation of Truncated Nonlinear Bloch Waves in LiNbO3 Waveguide Arrays

We observe self localised truncated Bloch waves in a one dimensional photonic lattice. Unlike usual gap solitons, such localised states can have an arbitrary width defined by the width of the input beam.

1145 1200 **Dr Yan Sheng**

Australian National University ACT AUSTRALIA

Cerenkov-Type Second Harmonic Generation in Twodimensional Nonlinear Photonic Structures

We study the conical second-harmonic generation via Čerenkov-type phase matching in two-dimensional nonlinear photonic structure. We discuss the properties of the emitted harmonic and show that its pattern is dependent on the pump condition.

1200 1215 **Dr Zhiyong Xu**

Australian National University ACT AUSTRALIA

All-Optical Logic Gates Based on Nonlinear PT-Symmetric Photonic Couplers

A novel design of all-optical logic gates based on nonlinear PT-symmetric couplers is proposed. AND, OR and NOR logic gates are effectively demonstrated by employing the interplay between gain/loss and nonlinearity of materials.

1215 1230 **Ms Qian Kong**

Australian National University ACT AUSTRALIA

Analytical Theory of Dark Solitons in Nonlinear Materials with Arbitrary Degree of Nonlocality

We employ the variational technique and describe properties of dark solitons and the interaction of dark solitons in nonlocal materials, for the first time to our knowledge, in the whole range of degree of nonlocality

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Thursday 9 December

1100 - 1230

Concurrent Session 10C: AOS - Fabrication

Room: *Meeting Room 204, Level 2*

Chair: Andrei Rode, Australian National University, CANBERRA, AUSTRALIA

Time

1100 1115 **Dr Martin Ams**
Macquarie University NSW AUSTRALIA
Optically-Tunable Waveguide Coupler Directly Written in Glass Using Femtosecond Laser Pulses
We report on the application of the femtosecond laser direct-write technique to create a 2x2 single-mode waveguide coupler with an optically-tunable splitting ratio. Optical tuning is achieved through resonant optical excitation of ytterbium dopant ions.

1115 1130 **Mr Simon Gross**
Macquarie University NSW AUSTRALIA
Laser Direct Written Depressed Cladding Waveguides in Fluoride Glass
We report on the fabrication and characterization of waveguides in bulk fluoride glass. The waveguides are formed in between a depressed cladding fabricated by the laser direct writing technique.

1130 1145 **Dr Cyril Hnatovsky**
Australian National University ACT AUSTRALIA
Materials Processing with a Tightly Focused Femtosecond Vortex Laser Pulse
Double-charge femtosecond vortices were synthesized with the polarization-singularity beam converter [1] and then tightly focused to ablate glass samples. By controlling the pulse energy we machine micron-size ring-shaped structures with <100 nm uniform groove thickness.

1145 1200 **Mr Malte Duering**
Australian National University ACT AUSTRALIA
Ablation and Deposition of Polymersusing High-Power Mid-Infrared Laser Pulses
We report on pulsed laser ablation and deposition experiments conducted with polymeric materials. The laser pulses (100μJ) were generated by a two stage optical parametric amplifier tuned to mid-infrared absorption features (3.3μm) of the polymer.

1200 1215 **Mr Benjamin P. Cumming**
Swinburne University of Technology VIC AUSTRALIA
Photonic Crystal Fabrication with an Adaptive Optic Direct Laser Writing System
In this work we present the use of adaptive optics to compensate for index mismatch aberration present when three-dimensional photonic crystals are fabricated via direct laser writing in a high refractive index lithium niobate crystal.

1215 1230 **Dr Yaoyu Cao**
Swinburne University of Technology VIC AUSTRALIA
Nano-Photolithography Using Doughnut Beam Induced Photoinhibition
Conventional photolithography has difficulties in realising resolution higher than half the wavelength of the illumination light due to the diffraction limit. We demonstrate an approach with a doughnut beam induced photoinhibition to improve the resolution for fabricating nanostructures.

Thursday 9 December

1100 - 1230

Concurrent Session 10D: AOS/AMP - Control and Trapping of (ultra) Cold Gases

Room: Meeting Room 207, Level 2
Chair: Peter Hannaford, Swinburne University of Technology, HAWTHORN, AUSTRALIA
Time

1100 1130 **A/Prof Robert Scholten**
University of Melbourne VIC AUSTRALIA
Electron Bunch Shaping with an Ultracold Plasma
We demonstrate a method to control the spatial density distribution of electrons in bunches extracted from an ultracold plasma, formed by photoionisation of a cold atom cloud.

1130 1145 **Mr Stuart Szigeti**
Australian National University ACT AUSTRALIA
Feedback Control of an Interacting Bose-Einstein Condensate Using Dispersive Imaging
Atom lasers could be utilised for precision measurement. However, density fluctuations in the Bose-Einstein condensate from which the beam is outcoupled broaden the linewidth. We present a control scheme that reduces such density fluctuations.

1145	1200	**Mr Sebastian Schnelle** *University of Queensland QLD AUSTRALIA* **Time Averaged Optical Traps for the Investigation of Superfluidity in BEC** We will present a new trap design that allows us to create almost arbitrary 2D potentials for ultra-cold atoms and show first results in using this trap design to measure the critical velocity of superfluidity in BEC.
1200	1215	**Ms Smitha Jose** *Swinburne University Of Technoilogy VIC AUSTRALIA* **Trapping of Ultracold Atoms in a 10 Micrometer-Period Permanent Magnetic Lattice** We report the trapping and cooling of 87Rb |F = 1, mF = -1> atoms in a 1D magnetic lattice constructed from TbGdFeCo magnetic film on a 10 μm-period grooved structure on an atom chip. The cold atoms at a temperature of 10 μK are trapped in about 100 traps of the lattice and optically resolved .

Thursday 9 December

1100 - 1230

Concurrent Session 10E: Quantum Information, Concepts & Coherence Group 5

Room: *Meeting Room 208, Level 2*

Chair: Warwick Bowen, University of Queensland, BRISBANE, AUSTRALIA

Time		
1100	1130	**Dr Matthew Sellars** *Australian National University ACT AUSTRALIA* **Demonstration of an Efficient Quantum Memory for Light** A solid-state quantum memory for light with an efficiency of 69% and operating above the no-cloning limit is demonstrated.
1130	1145	**Mr Ben Sparkes** *Australian National Univerisity ACT AUSTRALIA* **An AC Stark Gradient Echo Memory** Currently there exists a demand for quantum memories. One promising candidate is gradient echo memory (GEM). We present a new gradient creation technique - the ac Stark effect - and moving to cold atoms to improve GEM.
1145	1200	**Mr John Bartholomew** *Australian National University ACT AUSTRALIA* **Detecting Coherent Emission from Hundreds of Rare Earth Ions** A simple technique has been implemented to detect coherent emission from less than 500 rare earth ions in a crystalline host. Further applications include decoherence studies of thin films and surfaces, and single site detection.
1200	1215	**Mr Marcus Doherty** *University of Melbourne VIC AUSTRALIA* **Room-Temperature 3D Electric Field Sensing Using a Single Spin in Diamond** Room-temperature three dimensional electric field detection using a single Nitrogen-Vacancy (NV) centre in diamond is demonstrated. With potential nanometre resolution, this demonstration highlights the NV centre as the system of choice to image at the nanoscale.
1215	1230	**Dr Andy Martin** *University of Melbourne VIC AUSTRALIA* **Large Aharonov-Casher Phase in Single Atom-Scale Diamond Defects** Through control of the internal magnetic states of a nitrogen vacancy in a diamond crystal an Aharonov-Casher phase two orders of magnitude lager than that previously measured in any other atom-scale system is predicted.

Thursday 9 December

1100 - 1230

Concurrent Session 10F: Synchrotron Science 1

Room: *Meeting Room 209, Level 2*

Chair: Martin de Jonge, Australian Synchrotron, CLAYTON, AUSTRALIA

Time		
1100	1130	**A/Prof David Paganin** *Monash University VIC AUSTRALIA* **Coherent X-Ray Optics: A Very Broad Overview** Coherent X-ray optics is a rapidly advancing field of science whose applications continue to proliferate with time. This talk will

give a very broad overview of the past, present and future of coherent X-ray optics.

1130 1145 **Mr Corey Putkunz**
University of Melbourne VIC AUSTRALIA
Phase Diverse Coherent Diffractive Imaging: High Sensitivity with Low Dose
Phase diverse CDI is a diffraction microscopy technique that extends the ideas of ptychography to provide a high resolution, high sensitivity approach for the imaging of materials and biological samples using low X-ray dose.

1145 1200 **Mr Mac Luu**
La Trobe University VIC AUSTRALIA
Phase Imaging Using X-ray Polychromatic Sources
We introduce theoretically and demonstrate experimentally the applicability of an extension of contrast transfer function (CTF) based phase retrieval to reconstruct the projected thickness of a homogeneous sample of interest using laboratory polychromatic sources.

1200 1215 **Dr Christopher Hall**
Australian Synchrotron VIC AUSTRALIA
Combined X-Ray Fluorescence and Absorption Computed Tomography
We present a method for performing simultaneous synchrotron CT and FXCT. A modulated sheet beam is used to illuminate the object allowing absorption and fluorescence images to be obtained in a single acquisition cycle.

Thursday 9 December
1100 - 1230

Concurrent Session 10G: Complex Systems, Computational & Mathematical Physics

Room: *Meeting Room 205, Level 2*
Chair: Andrew Melatos, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1100 1130 **Dr Markus Brede**
CSIRO Marine and Atmospheric Research ACT AUSTRALIA
Optimizing Coupled Oscillators for Synchronization
Synchronization between oscillators on networks plays an important role for many applications, ranging from biology to society. In this talk I give an overview over some recent results about network topologies that facilitate synchronization.

1130 1145 **Dr Andrey Sokolov**
University of Melbourne VIC AUSTRALIA
Dynamics of the Australian Interbank Loan Flows
We analyse the network properties of interbank transactions on the Australian real-time gross settlement system and study the dynamics of the overnight loan flows and the network stability.

1145 1200 **Dr Jonathan Wylie**
City University of Hong Kong CHINA
Stretching of Viscous Threads at Low Reynolds Numbers
We investigate the classical problem of the extension of an axisymmetric viscous thread by a fixed applied force with small initial inertia. Under a long-wavelength approximation, we derive leading-order asymptotic expressions for the solution of the full initial-boundary value problem for arbitrary initial shape.

1200 1215 **Prof Robert Dewar**
Australian National University ACT AUSTRALIA
Action-Based Definitions of Almost-Invariant Tori in Close-To-Integrable Hamiltonian Systems
Transport in partially chaotic Hamiltonian systems, such as electrons moving along 3D magnetic fields, is limited by "almost-invariant" tori, which act as transport barriers. Techniques for identifying such surfaces by minimizing action gradients are presented.

Thursday 9 December
1100 - 1230

Concurrent Session 10H: AOS - Devices and Systems

Room: *Meeting Room 206, Level 2*
Chair: Stephen Collins, Victoria University, MELBOURNE, AUSTRALIA
Time

1100	1115	**Mr Gary Allwood** *Edith Cowan University WA AUSTRALIA* **Photovoltaic Micro-Cell Design for Distributed Power-over-Fibre Optimized for 850nm & 980nm** We present a new study of power over optical fibre, using silicon-based photovoltaic micro-cells. The thickness of the micro-cells is optimized for incident light of 850nm and 980nm producing efficiencies of up to 43%.
1115	1130	**Ms Anna Lurie** *University of Western Australia WA AUSTRALIA* **Towards a Photonic Crystal Fibre Clock** We lock a laser to an iodine loaded hollow core photonic crystal fibre (HC-PCF) and provide a preliminary measurement of the stability of the system as well as performing spectroscopic studies of the iodine.
1130	1145	**Mr Adam Mullavey** *Australian National University ACT AUSTRALIA* **Fibre Phase Noise Cancellation for Long Baseline Optical Networks** We demonstrate a technique for the stable transfer of an optical frequency reference over a kilometre scale optical fibre link. The fractional frequency stability achieved is as low as 1.7 × 10 - 18 / Hz.
1145	1200	**Mr Yasar Kutuvantavida** *Massey University PALMERSTON NEW ZEALAND* **Photostability and Electro-Optic Response of Organic Non-Linear Optical Films** We report a measured EO coefficient of 640 pm/V at 1310 nm and a photodegradation quantum efficiency in air of less than 10e-4 for organic NLO films made by mixing IND-7 chromophores with amorphous polycarbonate.
1200	1215	**Dr James Quilty** *Industrial Research Limited NEW ZEALAND* **Tunable Polymer Thin Film Bragg Gratings** Non-linear optical polymer thin films inscribed with Bragg gratings were created. It is shown that the grating's Bragg wavelength may be tuned by the application of a moderate electric field across the film
1215	1230	**Mr Joshua Toomey** *Macquarie University NSW AUSTRALIA* **Chaos-Based Secure Communication System** Transmitter and receiver chaotic electronic circuits are synchronized over an optical link. Transmission and recovery of a chaotically masked message has been successfully demonstrated using this hybrid electronic/optical secure communication system.

Thursday 9 December

1330 - 1500

Concurrent Session 11A: Nuclear & Particle Physics 9

Room: *Banquet Room 202, Level 2*
Chair: Nicole Bell, University of Melbourne, PARKVILLE, AUSTRALIA

Time		
1330	1400	**A/Prof Kevin Varvell** *University of Sydney NSW AUSTRALIA* **Prospects for Physics Beyond the Standard Model at the Belle II Experiment** The highly successful KEKB accelerator and Belle experiment will be upgraded during the next three years. The program, complementary to that of the LHC, to search for physics beyond the Standard Model will be described.
1400	1415	**A/Prof Martin Sevior** *University of Melbourne VIC AUSTRALIA* **Recent Results from the Belle Experiment** The Belle experiment employs an electron-position collider which operates in the range of 10-11 GeV CMS energy at the KEK laboratory in Japan. Belle has made many measurements of CP-violation, mixing and rare decays of B and D mesons and τ leptons. This presentation will present a survey of recent results from Belle, some of which show tension with the Standard Model.

1415 1430 **Ms T'Mir Julius**
University of Melbourne VIC AUSTRALIA
The Measurement of xx at the Belle Experiment
We present a new measurement of B -> pi0 pi0 using data gathered by the Belle experiment at KEK, Japan. This result will make it possible to tighten the bound phi 2, an observable parameter that describes CP violation within the Standard Model.

1430 1445 **Mr Thomas Cunningham**
University of Sydney NSW AUSTRALIA
Catching More B Mesons at a B-factory
We present a study of the performance of, and possible improvements to, the algorithm used for full reconstruction of B meson decays in the Belle detector at KEK, Japan.

1445 1500 **Mr Nikhul Patel**
University of Sydney NSW AUSTRALIA
Searching for a Charged Higgs Boson with ATLAS
Charged Higgs bosons are predicted by a number of extensions to the Standard Model (SM). We use data collected by ATLAS, during 7TeV proton-proton collisions at the LHC, to study SM backgrounds for predicted charged Higgs decays.

Thursday 9 December

1330 - 1500

Concurrent Session 11D: AOS/AMP BEC II: Excitations

Room: Meeting Room 207, Level 2
Chair: Kristian Helmerson, Monash University, CLAYTON, AUSTRALIA
Time

1330 1400 **A/Prof Matthew Davis**
University of Queensland QLD AUSTRALIA
On the Scaling of Vortex Number in the Formation of Trapped Bose-Einstein Condensates
The Kibble-Zurek mechanism predicts the scaling of the density of topological defects in phase transitions from knowledge of the system critical exponents. We investigate the Kibble-Zurek scaling in the formation of trapped Bose-Einstein condensates.

1400 1415 **Mr Jacopo Sabbatin**
University of Queensland QLD AUSTRALIA
Kibble-Zurek Mechanism in a Spin-1/2 Bose-Einstein Condensate
A binary Bose-Einstein condensate with atoms in different hyperfine states undergoes phase transition between miscible and immiscible states thanks to the variation of the coupling between the atoms. This phase transition is used to explore defects formation dynamics.

1415 1430 **Miss Lila Warszawski**
University of Melbourne VIC AUSTRALIA
Triggers for Collective Superfluid Vortex Behaviour
Collective, many-vortex dynamics is an unexplored frontier in the study of quantum condensates. We present the first large-scale simulations of avalanche processes in these systems, with applications to laboratory and astrophysical experiments.

1430 1445 **Dr Andy Martin**
University of Melbourne VIC AUSTRALIA
Excitation Frequencies and Static Solutions of Trapped Dipolar Bose-Einstein Condensates in the Thomas-Fermi Regime
We present an accessible methodology for determining the static solutions and excitation frequencies of trapped dipolar Bose-Einstein condensates, in the Thomas Fermi limit. This allows us to identify the modes responsible for global collapse of the condensate.

1445 1500 **Mr Mikhail Egorov**
Swinburne University of Technology VIC AUSTRALIA
Long Coherence Time of Interacting Bose-Einstein Condensates
Dephasing and rephasing of a trapped two-component Bose-Einstein condensate is observed using Ramsey interferometry. The rephasing is enhanced by applying a spin-echo pulse. Coherence time of 5 s is observed.

Thursday 9 December

1330 - 1500

Concurrent Session 11E: Quantum Information, Concepts & Coherence Group 6

Room: *Meeting Room 208, Level 2*
Chair: Andrew Greentree, University of Melbourne, MELBOURNE, AUSTRALIA

Time

1330 1400 **Prof Howard Wiseman**
Griffith University QLD AUSTRALIA
EPR-Steering of Bell-local States
Steering, a generalization of the Einstein-Podolsky-Rosen paradox introduced by Schrödinger, was formalized only in 2007. We show experimentally that using more measurement settings makes EPR-steering more robust to noise, allowing demonstrations using Bell-local states.

1400 1415 **Prof Margaret Reid**
Swinburne University of Technology VIC AUSTRALIA
Criteria for Multipartite Qudit Nonlocality
Criteria for three forms of nonlocality - entanglement, steering and Bell's nonlocality - are derived for multipartite qudit systems. The extent of Einstein-Podolsky-Rosen (EPR) entanglement gives information about the number of particles, that are EPR-entangled.

1415 1430 **Mr Tony Downes**
University of Queensland QLD AUSTRALIA
QKD in Non-Inertial Frames
Using a continuous variable quantum key distribution protocol we investigate the effects of uniform acceleration on the ability to transmit a secret key.

1430 1445 **Dr Eric Cavalcanti**
Griffith University QLD AUSTRALIA
Closed Timelike Curves, Nonlinear Quantum Evolution and the Measurement Problem
We will review recent works in the quantum information literature on quantum mechanics in the presence of closed timelike curves (CTCs). We show that the so-called "linearity trap" problem raised by Bennett et al. is ill-founded and that verifiable nonlinear evolution must lead to exotic effects in CTCs.

1445 1500 **Dr Michael Hall**
IP Australia ACT AUSTRALIA
How Much Determinism, Locality, and Free Will Does Quantum Mechanics Require Giving up?
It is shown that Bell inequality violation by quantum systems implies at least 20% indeterminism, or at least 60% nonlocal signaling, or at most 86% free will.

Thursday 9 December

1330 - 1500

Concurrent Session 11F: Synchrotron Science 2

Room: *Meeting Room 209, Level 2*
Chair: David Paganin, Monash University, MELBOUNE, AUSTRALIA

Time

1330 1400 **Dr Garry Foran**
Australian Synchrotron VIC AUSTRALIA
Science Case 2 - A Roadmap for the Scientific Development of the Australian Synchrotron
An aggressive and forward-looking development plan is vital to ensure that the Australian Synchrotron is positioned to deliver world-competitive capabilities to the Australian and New Zealand scientific communities. Details of Science Case 2 that embodies this plan will be presented.

1400 1415 **Dr Sarah Harmer**
University of South Australia SA AUSTRALIA
Spectroscopic Photoemission and Low Energy Electron Microscope (SPELEEM) Investigation of the Galvanic Effects between Cu Sulfides
SPELEEM was used to characterize the surfaces speciation changes due to the galvanic interaction between CuFeS2 and Cu2S when in physical contact and leached for up to 0.5 hrs at a pH of 1.

1415 1430 **Dr David Paterson**
Australian Synchrotron VIC AUSTRALIA
X-Ray Fluorescence Microscopy: A Versatile Tool for Microanalysis
The microanalysis capabilities of the X-ray fluorescence microscopy beamline at the Australian Synchrotron are described. An ultrafast X-ray fluorescence detection scheme called Maia enables fluorescence tomography and chemical imaging within practical time frames.

1430 1445 **Dr Martin de Jonge**
Australian Synchrotron VIC AUSTRALIA
Quantitative Fluorescence Tomography of /Cyclotella Meneghiniana/ at 400-nm Resolution
High-resolution x-ray fluorescence tomography is greatly desired but has not been available for routine use due to a number of technological challenges. We demonstrate the technique, and present recent progress towards fast fluorescence tomography.

1445 1500 **Ms Boshra Afra**
Australian National University ACT AUSTRALIA
SAXS Measurements of Ion Tracks in Natural Mineral Materials
The damage morphology and annealing kinetics of ion tracks in natural apatite and olivine are studied using synchrotron small-angle x-ray scattering. The technique yields important quantitative information on fission-track parameters for geo- and thermochronology.

Thursday 9 December

1330 - 1500

Concurrent Session 11G: AOS - Applications of Nonlinear Optics

Room: Meeting Room 205, Level 2
Chair: Adrian Ankiewicz, Australian National University, CANBERRA, AUSTRALIA
Time

1330 1345 **Dr Dragomir Neshev**
Australian National University ACT AUSTRALIA
Ultrafast All-Optical Switching in Directional Couplers with Second Order Nonlinearity
We study experimentally the temporal and spectral characteristics of all-optical switching in nonlinear directional couplers in periodically poled lithium niobate. Pulse break-up and back-switching are shown to play an important role in the studied process.

1345 1400 **Dr Yana Izdebskaya**
Australian National University ACT AUSTRALIA
Higher-Order Modes of Nematicon Waveguides
We report the first experimental observation of higher-order modes guided by soliton-induced waveguides in nematic liquid crystals, identifying the power domains where guided modes are supported.

1400 1415 **Mr Alexander Solntsev**
Australian National University ACT AUSTRALIA
Simultaneous Frequency Conversion and Pulse Compression in Nonlinear Tapered Waveguides
We suggest an application of four-wave mixing process in tapered waveguides for generation of ultrashort pulses with tunable central frequency. Efficient conversion is predicted for strongly chirped pump pulses, which experience reduced nonlinear absorption.

1415 1430 **Ms Irina Kabakova**
University of Sydney NSW AUSTRALIA
Bragg Grating Based All-optical Switch in Highly Nonlinear Bismuth-Oxide Fiber
We demonstrate ultrafast on/off switching in highly-nonlinear bismuth-oxide fiber using 3d-order Bragg grating. In our experiment the probe reflection is changed by 60% using contra-propagating sub-nanosecond pump pulse with energy of 20 nJ.

1430 1445 **Mrs Juna Thomas**
Queensland University of Technology QLD AUSTRALIA
Intensity Dependent Amplitude Modulation Contamination in Electro-Optic Phase Modulators
We present experimental results that demonstrate for the first time the dependence of residual amplitude modulation production in electro-optic phase modulators on beam intensity. These results show that the underlying mechanism is nonlinear photorefractive effect.

1445 1500 **Mr Rezaul Hoque Akanda**
Bangladesh University BANGLADESH
Effect of XPM Crosstalk Due to Second Order GVD in WDM Fiber-Optic Transmission System
An analytical model of cross-phase modulation crosstalk is developed in presence of second order group velocity dispersion (GVD) and simulation is carried out in long-haul high bit rate WDM first order GVD

Thursday 9 December

1330 - 1500

Concurrent Session 11H: CMMSP - Condensed Matter

Room: Meeting Room 206, Level 2
Chair: Robert Elliman, Australian National University, CANBERRA, AUSTRALIA
Time

1330 1345 **Dr Adrian D'Alfonso**
University of Melbourne VIC AUSTRALIA
Atomic Resolution Chemical Mapping Using Energy Dispersive X-Ray Spectroscopy
We demonstrate atomic-resolution chemical mapping using energy-dispersive x-ray spectroscopy in scanning transmission electron microscopy. Theoretical simulations of the imaging process are discussed and demonstrate that these images are directly interpretable.

1345 1400 **Mr Andrew Princep**
University of New South Wales ACT AUSTRALIA
A Theoretical Framework for Soft X-ray Resonance Enhanced Bragg Diffraction
In order to model complex resonance spectra, we introduce a phenomenological multipole splitting of the atomic core hole due to the excited electron.

1400 1415 **A/Prof Christopher Chantler**
University of Melbourne VIC AUSTRALIA
Nano-Roughness in Gold Revealed from X-Ray Signature
We study the roughness of gold foils and find that, for the first time, nanoroughness can be measured using non-invasive synchrotron techniques with X-rays, as represented by the recent Phys. Lett, publication. This technique is complementary to other techniques but can measure surface roughness, interface roughness and integrated column density roughness due to voids, impurities or layer deposition or growth procedures.

1415 1430 **Prof Saulius Juodkazis**
Swinburne University of Technology VIC AUSTRALIA
Super-Dense Body-Centered-Cubic Al Formed by Ultrafast Microexplosion
Micro-explosions triggered by tightly focused femtosecond laser pulses are used to create new phases inside transparent host saqpphire. The high pressure body-centered-cubic (bcc)-Al is identified at the irradiation sites by synchrotron X-ray diffraction (XRD).

1430 1445 **Dr Michelle Spencer**
RMIT University VIC AUSTRALIA
Gas Sensing Properties of ZnO Nanostructures: A Density Functional Theory Approach
ZnO nanostructures are promising gas sensing materials, however, the gas-sensor surface reaction is not fully understood. We use density functional theory molecular dynamics simulations to examine the interaction of nitrogen oxides with ZnO nanorod surfaces.

1445 1500 **A/Prof Trevor Finlayson**
University of Melbourne VIC AUSTRALIA
Stresses Borne by Inclusions in a Model Metal-Matrix Composite Under Load
Strains (and hence stresses) in the Si particles of an Al-7Si-0.4Mg casting are measured by neutron diffraction, in samples cyclically strained to +/- 2%. The results are compared with theories of stress partitioning in metal-matrix composites.

Thursday 9 December

1530 - 1630

Concurrent Session 12A: Nuclear & Particle Physics 10

Room: *Banquet Room 202, Level 2*
Chair: Andrew Stuchbery, Australian National University, CANBERRA, AUSTRALIA
Time

1530 1600 **Dr Ross Young**
University of Adelaide SA AUSTRALIA
Precision Test of the Weak Nuclear Force
We report recent results on the low-energy electron-quark electroweak interaction. Excellent agreement with the Standard Model is observed - with a precision the provides constraints on new physics candidates at the TeV scale.

1600 1615 **Mr Tristan Skawronski**
Flinders University SA AUSTRALIA
Achieving crossing symmetry, gauge invariance, and unitarity in the ?N ? ?N system
We present a unified model of ?N ? ?Nsatisfying crossing symmetry, gauge invariance, and unitarity. This is achieved by attaching external pions and photons to a dressed nucleon propagator of a potential model.

1615 1630 **Mr Kalman Robertson**
Australian National University ACT AUSTRALIA
Atomic Radiations in Nuclear Decay
The spectra of X-rays and Auger electrons accompanying internal conversion and electron capture nuclear transitions are determined by calculating initial vacancy distributions and atomic transition probabilities.

Thursday 9 December

1530 - 1630

Concurrent Session 12F: Synchrotron Science 3

Room: *Meeting Room 209, Level 2*
Chair: David Paterson, Australian Synchrotron, CLAYTON, AUSTRALIA
Time

1530 1600 **A/Prof Christopher Chantler**
University of Melbourne VIC AUSTRALIA
The X-ray Extended Range Technique – A Model for Developing New Fields of Physics at a Synchrotron
New techniques at synchrotrons can not only drive higher accuracy, structural information and insight in traditional fields such as XAFS [1-5], XANES and powder diffraction [6], but can initiate new fields including those of nanoroughness measurement [7], measurement of electron inelastic mean free paths [8,9], bonding information at an accuracy of crystallographic determination [10], and similar advances for fluorescence and scattering investigations. We summarise and present some of the key opportunities for Australian research and development.

1600 1615 **Mr Harris Panopoulos**
University of Melbourne VIC AUSTRALIA
Electron Beam Energy Measurement by Resonant Spin Depolarisation at the Australian Synchrotron
The energy of the storage ring electron beam was measured to be 3.0133 ± 0.0002 GeV. This high precision was achieved by measuring the resonant spin depolarisation frequency using a fast beam loss monitor.

Thursday 9 December

1530 - 1630

Concurrent Session 12H: History of Physics

Room: *Meeting Room 206, Level 2*
Chair: Maurizio Toscano, University of Melbourne, PARKVILLE, AUSTRALIA
Time

1530 1545 **Prof Norman Heckenberg**
University of Queensland QLD AUSTRALIA
Thomas Parnell and Sumpner's Reflecting Electrodynamometer
An instrument now in the collection of the Physics Museum gives insight into the first Physics research published from the University of Queensland by Thomas Parnell in 1917.

1545	1600	**Dr Jennifer Coopersmith** *La Trobe University VIC AUSTRALIA* **Daniel Bernoulli, Unsung Hero of Energy** The contributions of Daniel Bernoulli (1700-82), including potential 'live force', the kinetic theory and the work done by an expanding gas, are examined. Bernoulli was the first natural philosopher to appreciate the concept of energy.
1600	1615	**A/Prof Brian James** *University of Sydney NSW AUSTRALIA* **The ZETA Controlled Fusion Project 1955-68: The Politics, the Physics and the Australian Connection** When fusion research was declassified in 1958 the most significant results had been achieved by the ZETA device in the UK under leadership of Australian Peter Thonemann. Initial optimism was later found to be unjustified.
1615	1630	**Mr Neil Boucher** *SoundID QLD AUSTRALIA* **A New and Improved Four-Dimensional Spectrogram.** A new and improved FFT-based spectrogram based on a 4- dimensional graphical display that includes phase. Other improvements significantly increase the accuracy of the display to approach the theoretical limits of the FFT.

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International Quantum Electronics Conference (IQEC) and Conference on Lasers and Electro-Optics (CLEO) Pacific Rim

Incorporating the Australasian Conference on Optics, Lasers and Spectroscopy and the Australian Conference on Optical Fibre Technology

CALL FOR ABSTRACTS OPENS:

February 2011

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– University of Sydney, Australia

Ken-ichi Kitayama
– Osaka University, Japan

Ferenc Krausz
– Max-Planck-Institut für Quantenoptik, Germany

Ed Moses
– National Ignition Facility, Lawrence Livermore National Laboratory, USA

Oskar Painter
– California Institute of Technology, USA

Jun Ye
– University of Colorado, USA

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- Integrated and guided-wave optics and thin film optics
- Laser chemistry, biophotonics and applications
- Laser metrology and remote sensing
- Laser processing, laser microfabrication, and industrial applications
- Optical communications and networking
- Semiconductor and electro-optic devices
- Solid-state laser and other lasers, and laser materials

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- Nanophotonics
- Ultrafast laser science
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- Precision measurements and fundamental tests
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Hosts

AUSTRALIAN OPTICAL SOCIETY

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POSTER PROGRAM

Monday 6 December
1700 - 1830

Poster Session 1: Acoustics, Music & Ultrasonics (AAS)

Room: Banquet Room 201, Level 2

Poster Board No

1 **Mr Neil Boucher**
SoundID QLD AUSTRALIA
Insights Into Sound Structure Using the New Four Dimensional Spectrogram
In a companion paper we discuss a new four-dimensional spectrogram. Here we look at what this new tool can tell us about sound structure.

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2 **Dr Voichita Bucur**
CSIRO -Material Science And Engineering VIC AUSTRALIA
Nondestructive Delamination Detection in Wood-Based Composites
Development of nondestructive acoustic and ultrasonic techniques for delamination detection in wood-based composites used mainly as large structures in civil engineering is a very important issue in the context of structural health monitoring.
Keywords- wood laminated structures; nondestructive testing; ultrasonic technique; low freqiuency techniques; structural health monitoting

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3 **Prof Peter Robinson**
University of Sydney NSW AUSTRALIA
Traveling Waves in Spatiotemporal Hemodynamics
This study uses a recent model for cerebral hemodynamics to derive a spatiotemporal hemodynamic that predicts damped traveling hemodynamic waves of and confirm them experimentally.

Monday 6 December
1700 - 1830

Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)

Room: Banquet Room 201, Level 2

Poster Board No

4 **Mr Gary Allwood**
Edith Cowan University WA AUSTRALIA
Power-over-Fibre for Distributed Optical Fibre Smart Sensor Networks
This study analyses losses associated with network architectures for power-over-fibre in distributed optical fibre smart sensor networks. We show that multiplexing communication and power signals together does not significantly affect the power generated.

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18 **Dr Mattias Åslund**
University of Sydney NSW AUSTRALIA
Internal Reaction Temperatures of a Modified Chemical Vapour Deposition (MCVD) Optical Fibre Preform Lathe Dynamically Measured with Regenerated Fibre Bragg Gratings
The temperature profile of the reaction zone inside the substrate tube of a modified chemical vapour deposition (MCVD) optical fibre perform lathe has been characterised using regenerated fibre Bragg gratings (FBGs) to allow for the development of new dynamic deposition methods.

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5 **Dr Zourab Brodzeli**
University of New South Wales NSW AUSTRALIA
Electrical Energy Harvesting Device for Current/Voltage Fibre-based Sensors
In the context of current/voltage sensing by electric field monitoring it can be of importance to amplify the effect of the field at the sensor's head. We present such an amplification – or energy harvesting – device in the form of a simple antenna coupled with a liquid crystal-based sensor for the monitoring of high-power lines.

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6 **Mr Will Brown**
Swinburne University of Technology VIC AUSTRALIA
Optical Fibres in Biomedical Applications: Effect of a Biological Medium on Static Fatigue
Optical fibres are finding expanding applications in medicine. This work presents time-to-failure measurements of optical fibres under static stress in a simulated bodily fluid; intended for use in the development of medical fibre optic devices.

7 **Mr Ching K Chia**
Institute of Materials Research and Engineering SINGAPORE
Low Noise Multiwavelength Avalanche Photodiode
A Monte Carlo simulation suggests extremely low noise can be obtained in the Ge/AlxGa1-xAs avalanche photodiodes (APDs). These APDs are versatile for multiple-wavelength detection at 850, 1310 and 1550 nm for applications in data- and tele-communications.

8 **Dr Farzin Emami**
Shiraz University of Technologyo IRAN
Effect of the Fiber Radious Core Variations on Far-Field Distribution of Twin Core Optical Tweezers
Twine core optical tweezers are studied and simulated in this work. We found that it is possible to have better action of these structures using a proper dimension of the fiber cores at tip

9 **Dr Florian Englich**
University of Adelaide SA AUSTRALIA
Fusion Splicing Soft-Glass Suspended Core Fibers to Solid Silica Fibers for Optical Fiber Sensing
We report fusion splicing of soft-glass suspended small-core fibers to conventional silica single-mode fibers for integration with conventional fiber systems. Heat-induced damage to the microstructured fiber region is minimized by using a low-power iridium filament.

11 **Mr Ravi McCosker**
Macquarie University NSW AUSTRALIA
An Electro-Optic Switch Based on a Multi-Channel Directional Coupler
We describe a novel delta-k electro-optic switch for 1310 nm using a multi-channel directional coupler structure incorporating an organic electro-optic crystal for the cladding layer.

12 **Ms Chiara Paviolo**
Swinburne University of Technology VIC AUSTRALIA
Angle Cleaving Optical Fibers using a CO2 Laser
A CO2 laser at λ = 9.3 µm was used to cleave optical fibers at a given angle. The defects that might occur during the process are explained and resolved. The good surface quality obtained on the cleaved surface is demonstrated by SEM and AFM images.

13 **Prof Edwin Pun**
City University of Hong Kong CHINA
Er3+/Yb3+ Codoped Heavy Metal Germanium Tellurite Glass Fiber Amplifiers
Er3+/Yb3+ codoped heavy metal germanium tellurite glass fiber amplifiers were prepared using the rod-in-tube method. The properties of the fiber ampifiers were investigated, and an internal gain of 2.4dB/cm at 1.535um was obtained.

14 **Mr Anthony Rizk**
Defence Science Technology Organisation VIC AUSTRALIA
Reliability and Durability Studies for Fabricating, Packaging and Bonding Fibre Bragg Gratings
The relationship between the failure strains for Fibre Bragg gratings (FBGs) and the techniques used for their fabrication, packaging and bonding is investigated to better understand the reliability and durability of FBGs for strain sensing.

15 **Dr Shailendra Kumar Tiwary**
Jabalpur Engineering College, Jabalpur ,Madyapradesh India INDIA
Performance of High Speed Optical Communication System with Minimum Distortion Loss
The present paper analyzes a novel all optical multilevel multiclass optical code division multiple access (OCDMA) system, using optical analog-to-digital converter (ADC) and advanced optical logic gate elements. This paper includes a method of compensation for attenuation in an OF system.

16 **Dr Graham Wild**
Edith Cowan University WA AUSTRALIA
Analytical Modelling of Interrogation Systems for Fibre Bragg Grating Sensors
We present an analytical model of interrogation systems used to detect dynamic signals from optical fibre Bragg grating sensors. We compare several of the most common passive interrogation systems used to detect high frequency signals.

17 **Mr Eike Zeller**
RMIT University VIC AUSTRALIA
Design of A Fluid-Infiltrated Planar Polymer Integrated Optic Refractive Index Sensor
We report a novel design of a planar polymer integrated refractive index sensor based on an asymmetric fluid-infiltrated coupler architecture. Modal and beam propagation analysis revealed a sensitivity comparable to the most sensitive fibre-based concepts.

Monday 6 December
1700 - 1830

Poster Session 1: Astronomy & Astrophysics (ASA)

Room: Banquet Room 201, Level 2

Poster Board No

19 **Mr Anthony Coogan**
Civil Service IRELAND
Optical Study of Rotation of Mercury & Other Bodies
"Optical Study of Rotation of Mercury & Other Bodies" The planet Mercury and electrons show anomalous rotation. Rotation of everyday objects seen by diffuse light appears normal while reflection by mirrors doubles the rate of angular rotation. Anomalies can be dismissed by simple means.

20 **Dr Allan Ernest**
Charles Sturt University NSW AUSTRALIA
Naturally Occurring Weak Gravity Eigenstates
Certain gravitational eigenstates make excellent candidates for Dark Matter. We discuss these eigenstates, whose invisibility, lifetimes and substantial thermal isolation from the rest of the universe distinguish them from visible baryonic particles with Maxwellian/localization-determined eigensprectra.

21 **Dr Ra Inta**
Australian National University ACT AUSTRALIA
Using Gravitational Wave Triggers to Direct Multi-Messenger Astronomy
We present an update on a multi-messenger astronomy project, whereby triggers generated by the LIGO-Virgo network of gravitational-wave observatories are sent to partner telescopes, in order to verify the occurrence of an extra-solar transient event

22 **Dr Peter Norman**
Monash University VIC AUSTRALIA
Nucleosynthesis in Supergiant Stars
On the basis of data concerning reactions of the main products of nucleosynthesis in supergiant stars a consistent set of nuclear bond models of these nuclei is proposed. .

23 **Ms Sarah Traine**
University of Melbourne VIC AUSTRALIA
Using Thermal Emission to Decode Neutron Star Magnetic Fields
Neutron star thermal emission is modified as it passes through the atmosphere, encoding the magnetic field structure. Studying the polarisation of the thermal emission can then be used to map the magnetic field structure.

Monday 6 December
1700 - 1830

Poster Session 1: Renewable Energy (RE)

Room: Banquet Room 201, Level 2

Poster Board No

24 **Mr Alex Barry**

Defence Science and Technology Organisation VIC AUSTRALIA

Effect of Gap-Size ? on the Output Power of a VibroImpacting Power Harvester

The output power of a vibro-impacting power harvester has been examined for three different gap-sizes, Δ = 900 μm, 450 μm and 350 μm. As Δ decreased the frequency band-width increased from 12 Hz to 18.3 Hz, and the output power reduced from 3.4 mW to 0.95 mW.

Monday 6 December

1700 - 1830

Poster Session 1: Solar, Terrestrial & Space Physics (STSP)

Room: Banquet Room 201, Level 2

Poster Board No

26 **Dr Marcus Duldig**

Australian Antarctic Division TAS AUSTRALIA

High Resolution Modelling of Stratospheric Chemistry Changes During Large Solar Proton Events

A detailed model of ionization-induced changes in atmospheric chemistry is validated for the 2005 Jan 20 Solar Proton Event (SPE). The potential effects of other large SPEs on chemistry in the lower stratosphere are discussed.

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25 **Dr Marcus Duldig**

Australian Antarctic Division TAS AUSTRALIA

The 10Be Solar Activty Proxy in Ice from Law Dome, Antarctica: Intercomparison of Observed and General-Circulation-Modelled Data

We present a monthly resolution ice core record of the 10Be solar activity proxy spanning 1999-2010. We use this record, alongside general circulation model results, to constrain solar activity and climate influences on 10Be.

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27 **Dr John Humble**

University of Tasmania TAS AUSTRALIA

Observations of Forbush Decrease Precursors on 14 December 2006

Observations by the Global Muon Detector Network revealed a strong precursor to the 14 December 2006 Forbush Decrease more than a day before the SSC.

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28 **Dr Vickal Kumar**

La Trobe University VIC AUSTRALIA

A Connection between Thunderstorm, Lightning and F-Region Ionosphere

Here we report statistically significant, reproducible responses of mid-latitude F-region plasma drift (or electric field, since v=E„eB/B2) associated with terrestrial thunderstorms and lightning. These results can be explained by thunderstorm-generated atmospheric gravity waves.

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29 **Mr Jens Lautenbach**

University of Adelaide SA AUSTRALIA

Laser Remote Sensing for A Better Understanding of the Middle Atmosphere

This presentation reports the ongoing development of the lidar facility at Buckland Park (35°S, 138°E), the first of its kind in Australia. The aim of this facility is to combine different types of lidars to measure atmospheric temperature and dynamical processes with high spatial and temporal resolution from 15 to 110 km altitude. The scientific outcomes of this project will greatly enhance our understanding of the middle atmosphere and will contribute to the evaluation of meteorological satellite data and improvement of climate models.

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30 **Dr Kenneth Lynn**

Ionospheric Systems Research (Retired) QLD AUSTRALIA

Middle to Low Latitude VLF Reflection Height Rises at Night Associated with Solar Proton Events at High Latitudes

The well-known reduction in VLF diurnal phase shift at high latitudess observed during three SPE events was found to be associated with a previously unrecognised increase in diurnal phase shift at middle to low latitudes.

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31 **Dr Dave Neudegg**

Bureau of Meteorology NSW AUSTRALIA

Spacecraft Interactions with the Solar-Terrestrial Environment and Resultant Anomalies

An overview of interactions between spacecraft and the solar-terrestrial environment in geostationary, medium and low Earth

orbits with resultant spacecraft anomalies and emphasis on the METSATs that the Bureau of Meteorology use data from.

32 **Dr Murray Parkinson**
IPS Radio & Space Services NSW AUSTRALIA
IPS Radio and Space Services: Next Generation HF-VHF-UHF Propagation Prediction Tools
The Ionospheric Prediction Service is developing new HF-VHF-UHF propagation prediction capabilities including the Advanced Standalone Alone Prediction System 6, the Ground Wave Prediction System 3.1, and Network to Area, Digital HF, and atmospheric ducting tools.

33 **Mr Jason Siddaway**
La Trobe University VIC AUSTRALIA
Australian 2009 Black Saturday Bushfire Smoke in the Lower Stratosphere: Study with Odin/OSIRIS
The smoke material injected into the lower stratosphere by the Australian 2009 Black Saturday bushfire is analyzed using modern satellite data. The temporal and spatial evolution of the smoke plume in the extratropical region, as well as its gradual dispersion over time, is discussed.

34 **Mr Hongang Yang**
University of Newcastle NSW AUSTRALIA
Test Particle Simulations of Electron Energies and Diffusion with EMIC Waves
We developed a test-particle code to study radiation belt electron energization and diffusion in the EMIC waves, which were generated by solving the ideal MHD equations. The simulation results are compared with observations.

35 **Mr Joel Younger**
University of Adelaide SA AUSTRALIA
Meteor Radar Positional Accuracy and Post Statistical Steering
Meteor radar observations are affected by errors in the form of receiver noise, equipment biases, and antenna coupling. The impact of these errors and strategies for their mitigation are described.

36 **Mr Joel Younger**
University of Adelaide SA AUSTRALIA
Atmospheric Density Scale Height and Meteor Ionization Heights
Simulations indicate that the height range of meteors detected by radar is proportional to the atmosphere's density scale height. This can be derived from first principles and is confirmed by observations.

Monday 6 December
1700 - 1830

Poster Session 1: Nuclear & Particle Physics (NUPP)

Room: Banquet Room 201, Level 2

Poster Board No

37 **Prof Victor Flambaum**
University of New South Wales NSW AUSTRALIA
The Effect of Spin-Orbit Nuclear Charge Density Corrections Due to the Anomalous Magnetic Moment on Halonuclei
The contribution of the anomalous magnetic moments of protons and neutrons to the nuclear charge density, which has been neglected in recent nuclear calculations, is shown to be important in light halonuclei.

38 **Mr Andrew Horsley**
Australian National University ACT AUSTRALIA
A Radioactive Ion Beam Capability at the Australian National University
An Australian Radioactive Ion Beam Capability is nearing completion at the Australian National University Heavy Ion Accelerator Facility. This talk describes the design, development and commissioning of this apparatus. Tagged radioactive beams of light clustered nuclei will soon be ready for experiments.

Monday 6 December

1700 - 1830

Poster Session 1: Atomic & Molecular Physics (AMP)

Room: Banquet Room 201, Level 2

Poster Board No	
39	**Prof Pratim Kumar Chattaraj** *Indian Institute of Technology, Kharagpur INDIA* **All-metal Aromaticity and Conceptual DFT** Conceptual density functional theory based reactivity descriptors and the associated electronic structure principles as well as the nucleus independent chemical shift values are used to analyze the aromatic and antiaromatic behavior of several metal clusters.

Monday 6 December

1700 - 1830

Poster Session 1: Optics, Photonics & Lasers (AOS)

Room: Banquet Room 201, Level 2

Poster Board No	
40	**Mr Christopher Artlett** *Macquarie University NSW AUSTRALIA* **Remote Sensing of Ocean Temperature Using Raman Spectroscopy** We investigate a Raman-based remote spectroscopic sensing system for the measurement of water temperature. Statistical (multivariate) analysis of spectral parameters is used to develop an approach for real-time temperature monitoring of temperature vs. depth profiles.
41	**Dr Hongchun Bao** *Swinburne University of Technology VIC AUSTRALIA* **Superresolution Nonlinear Endonanoscopy** Abstract: Nonlinear endoscopy using laser beams at two wavelengths for excitation can realise three dimensional imaging with resolution breaking optical diffraction limitation.
42	**Mr John Scott Brownless** *University of Sydney NSW AUSTRALIA* **Hexagonal Lattice Photonic Crystal Waveguides: Coupling with a Twist** We examine the coupled-modes of hexagonal-lattice photonic crystal waveguides. We explain the serpentine nature of dispersion curves as the result of interference between evanescent Bloch-modes and describe the modes as complex superpositions of a single-waveguide.
43	**Mr Robert Chapman** *University of Queensland QLD AUSTRALIA* **Nitrogen Vacancy Centres in Diamond Nanocrystals: Absorption Cross-Section, Luminescense Yield, and Emitter Enumeration** Using an improved experimental method, we demonstrate the ability to count the number of nitrogen vacancy centres in a diamond nanocrystal and determine their absorption cross-section and luminescence yield using wide-field epifluorescence microscopy.
44	**A/Prof Judith Dawes** *Macquarie University NSW AUSTRALIA* **Fabrication of Large Single Domain Photonic Crystals** We describe two methods to improve the fabrication of photonic crystals. In contrast to the well known vertical deposition method we achieved predictable crack alignment and crack-free single crystalline domains larger than 22mm².
45	**Prof Chikara Egami** *Shizuoka University JAPAN* **Jitter-Free Nanoparticles Optical Storage Disk with Buffer Ring** An optical storage disk composed of nanoparticles with buffer rings is proposed for high density recording without jitter. Nonlinear organic dyes were doped in the nanoparticles as recordable bits. A new process has been devised.

46 **Mr Chao Feng**
University of Queensland QLD AUSTRALIA
Superfluid Critical Velocity in Trapped Bose-Einstein Condensates
The superfluid critical velocity in a trapped Bose-Einstein condensate is difficult to measure as it is a function of the inhomogeneous local density. We propose a method by treating it as composed of homogeneous sub-regions.

47 **Mr Zongsong Gan**
Swinburne University of Technology VIC AUSTRALIA
Localisation of Single Semiconductor Quantum Dots inside a Three-Dimesional Photonic Crystal
Localisation of single quantum dots inside a three-dimensional photonic crystal has been demonstrated using a super-resolution imaging technique based on the differential fluorescence amplitude as a function of time of quantum dots providing the possibility to explore the local optical property of photonic crystals.

48 **Mr Anthony Hope**
RMIT University VIC AUSTRALIA
Interferometric Measurement of Lens Aberrations
An interferometric method is described for measuring lens aberrations. A phase map is produced that can be incorporated into a computer-generated hologram that compensates for the aberrations.

49 **Mr Jonas Jakutis Neto**
Macquarie University NSW AUSTRALIA
Quasi-cw Nd:LiYF4 Blue Laser
A high power Nd:YLF blue laser operating in a quasi-CW regime, using second harmonic generation of the 908 nm Neodymium transition, provided about 5.5W peak power at 908 nm and 3.5W at 454 nm.

50 **Dr Baohua Jia**
Swinburne University of Technology VIC AUSTRALIA
Superprism Effect in 3D Nonlinear Photonic Crystals
We investigate the superprism effect in three-dimensional photonic crystals with high third-order nonlinearity. The light induced large Kerr-index change was found to impact significantly the dispersion properties of the three-dimensional superprisms.

51 **Mr Michael Jones**
Queensland University of Technology QLD AUSTRALIA
The Effect of the Imaginary Part of the Intensity Dependent Refractive Index in Photorefractive Media
An analysis of low-power Gaussian fields propagating in self-defocusing photorefractive media including an imaginary component of the intensity dependent refractive index shows that it can have a focusing effect independent of the real component.

52 **Mr Martin Kurth**
Queensland University of Technology QLD AUSTRALIA
Nanofluidics versus Diffusion: Molecule Delivery to Nanofocusing Tapered Rod
We analyse a new nanosensor combining nanofocusing in tapered metal rods with nanofluidics for molecule delivery to the field hot spots. The delivery rates of various vapour molecules to the sensing region through nanofluidics and diffusion are compared.

53 **Mr Martin Kurth**
Queensland University of Technology QLD AUSTRALIA
Effect of Inlet Pressure on the Delivery of Vapour Molecules to a Nanoscale Aperture
The effect of inlet pressure on the delivery rates of vapour molecules to the field hot spot of a nanoscale aperture is investigated. These rates are then compared with the delivery rate due to diffusion.

Monday 6 December
1700 - 1830

Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)

Room: Banquet Room 201, Level 2

Poster
Board No

54 **Miss Rose Ahlefeldt**
Australian National University ACT AUSTRALIA
Ligand Isotope Structure of the Optical Transition in EuCl3.6H2O
The structure of the x optical transition of EuCl3.6H2O is investigated and is shown to be a combination of the hyperfine structure of 151Eu and 153Eu and isotope shifts caused by Cl, O and H ligands.

55 **Dr Andrew Alves**
University of Melbourne VIC AUSTRALIA
The Nanoscale Implant of keV Ions with a Scanned SiN Aperture
The spatial confinement of a 14 keV P ion implant has been demonstrated at approximately 40 nm. The results of the implant have been characterised with scanning probe microscopy.

56 **Mr Maciej Bartkowiak**
University New South Wales NSW AUSTRALIA
Determination of the Structure of the Ferroelectric Srti18o3 by Density Functional Theory and Phonon Band Calculations
We determined the structure of the ferroelectric phase of strontium titanate enriched with oxygen-18 using density functional theory and phonon band calculations. Calculated properties match the experimental results.

57 **Mr Jay Bourke**
University of Melbourne VIC AUSTRALIA
Novel Measurement of Low Energy Electron Inelastic Mean Free Paths in Copper
We present a new approach to the measurement of low energy electron inelastic mean free paths by using X-ray absorption non-invasive analysis combined with advanced cluster theory computations for XAFS. This reveals a new approach highly sensitive to IMFP's below 150 eV, as shown in recent Phys. Rev. Letts

58 **Dr Jodie Bradby**
Australian National University ACT AUSTRALIA
Pressure-induced Phase Transformations in Deposited Amorphous Silicon
Differences in the high-pressure behavior of crystalline and amorphous silicon are observed. Whilst both materials transform via a series of crystalline phases on loading, upon pressure release only the amorphous sample reverts back to its amorphous form.

59 **Mr Jack Burgess**
University of Melbourne VIC AUSTRALIA
Effect of Implanted Boron on Silicon Luminescent Centres
The effect of implanted, and thermally activated, boron and phosphorous on W centre luminescence is investigated. Boron is found to strongly quench the W centre luminescence, while displaying a different temperature dependence to phosphorus.

60 **Dr Duk-Yong Choi**
Australian National University ACT AUSTRALIA
Fabrication of Germanium-on-Insulator by Ion Implantation and Oxidation
We present a modified Germanium condensation technique to produce Germanium-on-insulator structure in which Germanium was implanted into silicon layer. Structural investigations confirmed that relaxed, thin germanium crystalline layer was successfully formed.

61 **Dr Shen Chong**
Industrial Research Limited NEW ZEALAND
Heat Capacity and Magnetic Field Alignment Studies on Polycrystalline CeFeAsO(1-x)Fx Samples
Differential heat capacity has been employed to probe the Ce3+ magnetic ordering, the magneto-structural transition, and superconductivity in polycrystalline CeFeAsO1-xFx. Magnetic field alignment of these microcrystallites shows good c-axis and ab-plane stacking.

62 **Mr Geoffrey Cousland**
University of Sydney VIC AUSTRALIA
The Structure of Yttria-Stabilised Zirconia: A Combined Medium Energy Photoemission and Ab-Initio Investigation
Cubic zirconia-based materials are candidates for use in the nuclear fuel cycle. A simulated model of yttria-stabilised-zirconia with 9.375 Mol % yttria is compared with photoemission studies on a sample of 9.5 Mol % yttria.

63 **Dr Sergey Danilkin**

Australian Nuclear Science and Technology Organisation NSW AUSTRALIA

Short Range Ordering and Soft Phonon Modes in Superionic Copper Selenide

Paper reports lattice dynamical measurements of Cu1.8Se superionic conductor. We found that TA1 [110] and TA [111] phonon branches demonstrate a presence of soft mode at q/qm > 0.5 in addition to the flat optic-like mode observed previously.

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64 **Mr Laurence Deam**

University of Melbourne VIC AUSTRALIA

Defect Evolution in Phosphorus-Implanted MOS Capacitors for Nano-Scale Device Development

Phosphorus was implanted into Si-MOS capacitors at either liquid-nitrogen- or room-temperature to compare the types and concentrations of defects created. Capacitance-voltage and CC-DLTS measurements were used in the study.

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65 **Ms Sarita Deshmukh**

Australian National University ACT AUSTRALIA

Nanoindentation Induced Phase Transformations in Amorphous Germanium

Nanoindentation-induced phase transformations in amorphous Ge have been investigated. We show that under appropriate indentation conditions amorphous Ge can be transformed to polycrystalline Ge with formation of intermediate high pressure phases.

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66 **Mr Daniel Drumm**

University of Melbourne VIC AUSTRALIA

Effective Mass - Local Density Models of Infinite Ultra-?-Doped Phosphorus in Silicon

An Effective Mass Theory model of an infinite ultra-δ-doped P:Si sheet is constructed. The energies of the Γ1-Γ2- and Δ-bands are self-consistently calculated, including exchange and correlation effects and allowing for the valley-splitting.

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67 **Prof Robert Elliman**

Australian National University ACT AUSTRALIA

Resistive Switching in Transition Metal Oxides

Resistive switching is investigated in NiO and HfO2-based dielectric films and modeled in terms of a thermo-chemical process in which a field-induced conductive filament is formed and broken by Joule heating.

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68 **Ms Jinghua Fang**

University of Melbourne VIC AUSTRALIA

Growth of Self-Assembled, Silicon Carbide Nanorods using Plasma Enhanced, Chemical Vapour Deposition

The self-assembled, seeded growth of single crystal, silicon carbide nano-rods on quartz produced using a microwave plasma enhanced, chemical vapour deposition technique is reported. These nanostructures have been characterised using electron microscopy.

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69 **Mr Benjamin Forbes**

University of Melbourne VIC AUSTRALIA

A Quantum Mechanical Model for Phonon Excitation in Electron Diffraction and Imaging Using a Born-Oppenheimer Approximation

Phonon excitation is a significant scattering process in electron microscopy. Existing models are lacking in some respects; we propose a new model that overcomes these issues.

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70 **Mr Ahmed Halima**

University of Melbourne VIC AUSTRALIA

Growth and Characterisation of Nitrogen Doped Ultrananocrystalline Diamond for the Bionic Eye

The use of ultrananocrystalline diamond (UNCD) in the fabrication of electrode arrays within bionic eye devices is evaluated. UNCD films were fabricated using microwave enhanced chemical vapor deposition with varying Nitrogen content plasmas and their electrical and structural properties are reported.

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71 **Dr Wayne Hutchison**

University of New South Wales ACT AUSTRALIA

Phosphorus Spin Coherence Times in Silicon at Very Low Temperatures

Phosphorus donor spin coherence in isotopically pure 28 silicon is measured at very low temperatures using pulsed electron spin resonance. The isolated spin T2 varies unexpectedly with phosphorus concentration.

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72 **Mr Pawan Kashyap**
University of Melbourne VIC AUSTRALIA
Refractive Index Modification of Diamond by High Energy Ions in the Electronic Stopping Regime
We implanted 3MeV hydrogen ions through a thin diamond membrane (38μm) to study refractive index and absorption changes caused by electronic stopping. This has potential for future diamond photonic devices.

73 **Mr Shane Kennedy**
Monash University VIC AUSTRALIA
Laplacian and Caustic Imaging of Surface Topography in Mirror Electron Microscopy
We discuss a new approach to interpreting mirror electron microscopy image contrast. This contrast can be directly related to surface curvature, or understood via caustics, depending on the size of surface topographical and/or potential variations.

74 **Mr Jon Knott**
University of Wollongong NSW AUSTRALIA
Annealing of Sb-doped GaAs to Optimize for Terahertz Emission
The effects of annealing on the Terahertz emission of low-temperature-grown Sb-doped GaAs for several compositions are presented. Annealing below a critical temperature is shown to enhance Terahertz emission, however annealing above the critical temperature reduces Terahertz performance significantly.

75 **Mr Nai Shyan Lai**
Centre for Quantum Computer Technology NSW AUSTRALIA
Few-Electron Silicon Double Quantum Dot With Tunable Tunnel Coupling
We demonstrate the ability of a silicon double quantum dot to control the inter-dot coupling over a wide range, enabling measurements in both the weakly coupled and strongly coupled regime. The device exhibits robust charge stability over wide range of electron occupancy of the lithographically-defined dots.

76 **Mr Mark Leong**
University of Melbourne VIC AUSTRALIA
Advanced Germanium Devices: The Development of Materials and Processing
The development and optimization of materials and processes used for germanium metal-oxide-semiconductor devices are investigated. The gate oxide and the source-drain are examined using electrical and optical techniques.

77 **Miss Jayde Livingstone**
University of Wollongong NSW AUSTRALIA
Track Structure Microdosimetric Calculation of Relative Glow Peak Intensities following 5 MeV He Irradiation of LiF:Mg,Ti (TLD-100)
Relative thermoluminescence intensities of glow peaks 7 and 8 in the glow curve of LiF:Mg,Ti (TLD-100) following 5 MeV alpha particle irradiation are demonstrated to be inconsistent with calculations using Modified Track Structure Theory.

78 **Mr Nathan Lugg**
University of Melbourne VIC AUSTRALIA
Low-Voltage Scanning Transmission Electron Microscopy
Effects of varying the accelerating voltage in scanning transmission electron microscopy is explored with respect to inelastic transitions and elastic channelling

79 **Mr Benjamin Mallett**
Victoria University of Wellington WELLINGTON NEW ZEALAND
Raman study of Bi2-xPbxSr1.6Ln0.4CuO6+?
To better understand ion-size effects in Bi2-xPbxSr1.6Ln0.4CuO6+δ Raman spectra are presented for Ln=La,Nd,Sm,Eu and x=0,0.35. Changing δ or Ln does not affect the high frequency phonon modes but Pb substitution affects a low frequency modes.

80 **Mr Jonathan Newnham**
University of Melbourne VIC AUSTRALIA
Towards Definitive Electrical Identification of Single Paramagnetic Donors in Nano-Structured Devices
Preliminary work towards the electrical detection of the (spin) magnetic resonance from a small number of phosphorus donor atoms in nano-structured (50-150nm) silicon devices is presented.

Monday 6 December

1700 - 1830

Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)

Room: Banquet Room 201, Level 2

Poster Board No

81 **Ms Ekaterina Babourina**
University of Queensland QLD AUSTRALIA
Conditional Entanglement of Two Optomechanical Resonators
A strong coherent laser drive is applied to a cavity containing two weakly coupled optomechanical membranes. Entanglement is demonstrated through the conditional measurement of the cavity output mode.

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82 **Dr Cyril Branciard**
University of Queensland QLD AUSTRALIA
Characterizing the Nonlocal Correlations Created In Entanglement Swapping Experiments
Quantum systems that have never interacted can become nonlocally correlated through entanglement swapping. To characterize nonlocality in this context, we introduce local models where systems that are initially uncorrelated are described by uncorrelated local variables. This additional assumption leads to stronger tests of nonlocality.

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83 **Mr Courtney Brell**
University of Sydney NSW AUSTRALIA
Topological Phases from Two-Body Hamiltonians
We present a procedure for realizing the topologically ordered ground states of spin-lattice models as the low-energy limits of entirely two-body Hamiltonians.

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84 **Mr Matthew Broome**
University of Queensland QLD AUSTRALIA
Discrete Time Single-Photon Quantum Walks with Tunable Decoherence
We implement discrete-time quantum walks with single-photons in space [1]. We investigate energy transport and elements of topological phases for bound and unbound states in topological insulators.

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85 **Mr Geoff Campbell**
Australian National University ACT AUSTRALIA
Suspension of a Cavity Mirror on an Optical Spring
We present a proposal to levitate a mirror solely using the radiation pressure force of light fields. The goal is to experimentally study the opto-mechanical effects of the system in the quantum regime.

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86 **Dr Andre Carvalho**
Australian National University ACT AUSTRALIA
Multipartite Entanglement Production Using Feedback
We present a scheme for generating steady state entanglement in a small number of particles using jump-based feedback.

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87 **Dr Andre Carvalho**
Australian National University ACT AUSTRALIA
Entanglement in Open Quantum Systems via Quantum Trajectories
We show that entanglement dynamics under decoherence can be characterised by the average entanglement of physically realisable trajectories. We propose an experiment to monitor this dynamics, and to determine the disentanglement time from a single trajectory.

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88 **Mr Andy Chia**
Grifith University QLD AUSTRALIA
The Quantum Theory of Multiple-Input Multiple-Output Markovian Feedback Control via Diffusive Unravellings for Nonlinear Systems
A parameterisation of arbitrary quantum measurements with Gaussian white noise is formulated in the Heisenberg picture. The most general Markovian master equation describing feedback mediated by such measurements is derived.

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89 **Mr Mauro Cirio**
Macquarie University NSW AUSTRALIA
High-Q Electromechanical Oscillators
In this work we theoretically propose a quantum-electromechanical system that should possess extremely low motional losses

and high motional-Q. We show how to cool the system to a temperature where quantum effects are apparent.

90 **Mr James Colless**
University of Sydney NSW AUSTRALIA
Microwave Cryogenic Interconnects for Multi-Qubit Readout and Control
The challenge of controlling multiple quantum dot spin qubits requires new technical developments in cryogenic microwave hardware. We describe a milli-Kelvin setup enabling 16, several-GHz control lines to be integrated in a dilution refridgerator.

91 **Mr Matthew Collins**
University of Sydney NSW AUSTRALIA
Mesoscopic Spin Resonance Using On-Chip Radio Frequency Magnetic Fields
We report progress towards generating and controlling local radio frequency magnetic fields for spin manipulation in mesoscopic semiconductor devices. Biases applied to surface gates on a GaAs heterostructure create a transmission line with voltage-tunable geometry.

92 **Mr Anthony Coogan**
Civil Service IRELAND
Alias The Electron
Alias The Electron" Treating an electron as an analogue waveform, information reaches observers via discrete or digital photons. Aliasing may occur, i.e. undesirable signals of lower frequency may be observed. Perhaps 'quantum decoherence' is actually aliasing?

93 **Mr Andrew Darmawan**
University of Sydney NSW AUSTRALIA
Measurement-Based Quantum Computing Using a Spin-3/2 Ground State
We study how a spin-3/2 interacting system of particles, a straightforward 2-dimensional generalisation of the AKLT state, may be used for measurement-based quantum computing. Properties like string order and energy gap are also investigated.

94 **Mr David Evans**
Griffith University QLD AUSTRALIA
In Pursuit of a Loophole-Free Test of EPR-Steering
Violation of EPR-Steering inequalities demonstrates that certain experimental results cannot be sufficiently explained by local hidden states (LHS) alone. We present a form of such an inequality for the (more realistic) case of inefficient detectors.

95 **Mr Adil Gangat**
University of Queensland QLD AUSTRALIA
Direct Monitoring of Phonon Number Quantum Jumps in an Optomechanical System
We analyze the "membrane in the middle" optomechanical model in the case of a strongly driven cavity. Under continuous homodyne measurement, the cavity field is shown to resolve quantum jumps in the membrane's phonon number.

96 **Mr John Hornibrook**
CSIRO NSW AUSTRALIA
Dielectric Loss in Niobium Coplanar Waveguide Resonators
We report the fabrication and characterization of niobium coplanar resonators for application in superconducting quantum circuits. Measurement of the resonator Q-factor is consistent with loss mechanisms from two-level fluctuators in the substrate.

97 **Mr Mahdi Hosseini**
Australian National University ACT AUSTRALIA
High Efficient Gradient Echo Memory
We have observed a high efficiency photon echo using the Gradient Echo Memory technique in warm Rb gas cell. Efficiencies higher than 80% were coherently measured using heterodyne detection. The current results reveal the great potential of this memory for quantum repeater applications.

98 **Miss Vesna Lukic**
University of Melbourne VIC AUSTRALIA
Light Absorption in Quantum Photosynthesis
Light absorption by chromophores is modeled using two-level atoms in linear and bi-linear arrays in a Dicke model. These models are used to determine the potential role of quantum coherence in photosynthetic absorption.

99 **Dr Austin Lund**
Griffith University QLD AUSTRALIA
Measuring Measurement--Disturbance Relationships with Weak Values
We show that generalised measurement disturbance relationships can be measured using weak-measurements and give an example of how such a measurement may be performed with three qubits.

100 **Ms Melissa Makin**
University of Melbourne VIC AUSTRALIA
Waveguides and Beamsplitters in the 1D Jaynes-Cummings-Hubbard System
The Jaynes-Cummings-Hubbard (JCH) model describes N single-mode photonic cavities connected via evanescent coupling, each containing a single two-level system. We investigate actively guiding a single excitation via the application of a time dependent Stark shift, producing a beam splitter.

101 **Mr Iman Marvian**
Perimeter Institute for Theoretical Physics CANADA
The Theory of Manipulations of Asymmetric Pure Quantum States
We develop a theory of how the asymmetry of pure quantum states, that is, the manner in which they break symmetries, can be quantified and manipulated under symmetric transformations.

102 **Ms Laura McKemmish**
University of Sydney NSW AUSTRALIA
Spectral Congestion in Frequency-Based Quantum Computers
We present a simple general model that provides the framework to analyse the scalability of quantum computers that are addressed in frequency space, such as liquid-state NMR and newer vibrational qubit proposals, in terms of spectral congestion.

103 **Mr Terry McRae**
University of Queensland QLD AUSTRALIA
Towards Time Delayed Entanglement from Coherently Coupled Nonlinear Cavities
Microtoroid cavities have the potential to produce time delayed entangled states not typically available in nonlinear optical systems [1]. We show microtoroids produce nonlinear optical phenomena and outline progress towards producing nonclassical light.

Monday 6 December
1700 - 1830

Poster Session 1: Late Submission

Room: Banquet Room 201, Level 2

Poster Board No

105 **Miss Nor Azah Abdul Aziz**
University of Melbourne VIC AUSTRALIA
Characterization of High Harmonic Generation Source Using Young's Double Slit
We have studied the coherence properties across the beam for 20 um and 50 um double slit in Argon using different size of pinholes. This study demonstrates that the harmonic produce high spatial coherence and good fringe pattern in case with 2 mm size pinhole.

104 **Mr Igor Aharonovich**
University of Melbourne VIC AUSTRALIA
Impurities in Diamond: New Sources for Quantum Information
Controlled fabrication and identification of bright single-photon emitters is at the heart of quantum optics and solid state physics. In this paper we report on the fabrication of novel ultra bright emitters, based on chromium impurities in diamond. We show that the emitters can be engineered in both nanodiamonds and in single crystal diamond. Finally, we measure their quantum efficiency and highlight future direction to improve the collection efficiency of the emitted light for future incorporation into quantum key distribution networks.

106 **A/Prof Bryan Dalton**
Swinburne University VIC AUSTRALIA
Theory of Two-Component BEC Interferometry
A two mode theory for interferometry with two-component BECs has been developed giving coupled generalised Gross-Pitaevskii equations for spatial mode functions and matrix mechanics equations for state amplitudes. Calculations using

the Josephson model are also presented.

Wednesday 8 December
1700 - 1830

Poster Session 2: Atomic & Molecular Physics (AMP)

Room: Banquet Room 201, Level 2

Poster Board No	
1	**Mr Christopher Feigl** *RMIT University VIC AUSTRALIA* **Safe, Stable and Effective Nanotechnology: Modelling the Equilibrium Structures of Zinc-Sulphide Nanoparticles** Ab initio calculations and an advanced shape dependent thermodynamic model are used to produce an equilibrium nanomorphology phase map based on the Gibbs free energy of zinc-sulphide nanoparticles in cubic, hexagonal and amorphous phases.
2	**Prof Victor Flambaum** *University of New South Wales NSW AUSTRALIA* **Space-Time Variation of the Fundamental Constants and Nuclear Clocks** I present a review of recent results on the variation of the fundamental constants. A most interesting result is the discovery of the spacial variation of the fine structure constant alpha. The proposals of new laboratory measurements with strongly enhanced effects include nuclear clocks operating at 7.6 eV UV transition in 229Th, atomic clocks based on multiply charged ions and molecular clocks.
3	**Mr Michael Garrett** *University of Queensland QLD AUSTRALIA* **Formation Dynamics of Nonequilibrium Bose-Einstein Condensates** Experiments have witnessed formation of strongly nonequilibrium Bose-Einstein condensates, evidenced by shape oscillations, vortices, and solitons. We study the formation dynamics using a modified stochastic Gross-Pitaevskii equation with a nonequilibrium thermal cloud that evolves hydrodynamically.
4	**A/Prof Igor Litvinyuk** *Griffith University QLD AUSTRALIA* **Charge Resonance Enhanced Ionization of CO_2 Probed by Coulomb Explosion Imaging with Laser Pulses of Varying Duration** We confirm both experimentally and theoretically for the first time charge-resonance enhanced ionization in a tri-atomic molecule (CO_2) by measuring dependence of molecular structure reconstructed via Coulomb explosion imaging on laser pulse duration
5	**Mr John Lowe** *University of Melbourne VIC AUSTRALIA* **Ab Initio Determination of K? Line Strengths, Energies and Spectator Intensities in Transition Metal Atoms** We present a new methodology for determining complex inner-shell and open shell processes in atomic systems, leading to potential application to a wide range of phenomena including parity violation, fundamental constants and laboratory astrophysics as well as fundamental atomic physics
6	**Dr Andy Martin** *University of Melbourne VIC AUSTRALIA* **Spatial Coherent Transport of Interacting Dilute Bose Gases** Generalizing stimulated Raman adiabatic passage, for a three well system, we show how it is possible to adiabatically transport a Bose-Einstein condensate, of 2000 7Li atoms, between two wells with minimal occupation in the intervening well.
7	**Mr Bogdan Opanchuk** *Swinburne University of Technology VIC AUSTRALIA* **Simulation of Trapped Bose-Einstein Condensates Using Phase-Space Methods** A Wigner representation based method to simulate the behavior of multicomponent BEC is presented. We demonstrate the results of 1-dimensional simulations and simulations for Ramsey interferometry with 87Rb in 3-dimensional trap in comparison with experimental results and conventional coupled GPE approach.

8 **Mr Andrew Payne**
University of Melbourne VIC AUSTRALIA
Optimisation of the Spatial Linearity in Backgammon-Type Multi-Wire Gas Proportional Counters
We discuss developments of multiwire gas proportional counters used in tests of Quantum Electrodynamics and elsewhere. Increases of resolution, efficiency or characterization of these instruments and others are crucial for high accuracy measurements of all sorts including tests of our fundamental laws of nature including QED [1]

9 **Mr Shi-Guo Peng**
Tsinghua University CHINA
Confinement-Induced Resonance in Quasi-One-Dimensional Systems under Transversely Anisotropic Confinement
This paper investigates theoretically the confinement-induce resonance as a function of transverse anisotropy for a model of simple two-body s-wave scattering and we find a single resonance only, which is in agreement with the observed downshifted resonance [1].

10 **Mr Daniel Sigle**
University of Queensland QLD AUSTRALIA
All-Optical Rubidium BEC
We report progress on our all-optical Rb87 Bose-Einstein condensate experiment. We use a 1064nm fibre laser for a single beam dipole trap, which is loaded from a conventional magneto-optical trap. We are also working on an Rb85 BEC using a Feshbach resonance to minimize the three-body losses.

Wednesday 8 December
1700 - 1830

Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)

Room: Banquet Room 201, Level 2

Poster Board No

11 **Mr Park Fung**
University of Sydney NSW AUSTRALIA
Plasticity under Transcranial Magnetic Stimulation: Dynamics and Optimization
Transcranial Magnetic Stimulation (TMS) is a noninvasive technique to stimulate the brain and modify its activity. Using insights from a neural field theory of plasticity, we examine how to understand and optimize TMS.

12 **Ms Berrak Gol**
Victoria University VIC AUSTRALIA
Lab on a Chip for the Study of Skeletal Muscle Fibres
We demonstrate a lab-on-a-chip platform for long-term studies of muscle fibres. Preliminary results show this system can serve as an improved in-vitro model for studying muscle cells and their response to chemical and mechanical stimuli.

13 **Ms Elise Pogson**
University of Wollongong NSW AUSTRALIA
Analysis of EBT2 Gafchromic Film using Terahertz
Terahertz (THz) Time Domain Spectroscopy (TDS) has been used to study EBT2 Gafchromic film. THz cannot be used to readout radiation doses or distinguish spectroscopic resonances. THz has no effect upon film sensitivity enabling possible dual THz/x-ray systems

14 **Mr Andrew Ringsmuth**
University of Queensland QLD AUSTRALIA
Renormalized Excitation Energy Transfer in Photosynthesis
We present a novel renormalization procedure by which to assess the length scale up to which quantum coherence may be present in excitation transfer through a simple chromophoric network in a thermal environment.

15 **Dr Heiko Timmers**
University of New South Wales ACT AUSTRALIA
Tracing and Size Characterisation of Wear Debris from Knee Prostheses
Wear debris particles from knee prostheses, which are linked to prosthesis failure, have been characterized using radioisotope tracing and atomic force microscopy. Results inform a better understanding of the pathways and effects of the particles in the knee.

16 **Mr Boon (Teddy) Yeo**

University of Western Australia WA AUSTRALIA

Novel Intraoperative Probe Combining Optical Coherence Tomography and Magnetic Tracking

Optical coherence tomography (OCT) has potential to be a valuable tool for intraoperative tumour margin assessment. We have developed a novel hand-held OCT needle probe using an electromagnetic tracker for intraoperative margin assessment in situ.

Wednesday 8 December

1700 - 1830

Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)

Room: Banquet Room 201, Level 2

Poster Board No

17 **Dr Talib Hashim Hasan Almasoodi**

International Islamic University GOMBAK MALAYSIA

Solving Electrical Circuit System Using Homotopy Differential Equation

This paper presents an efficient algorithm for solving an electrical circuit system. In our algorithm, the system f(x) = 0 is solved by a homotopy method, in which a homotopy H(x, t) = f(x)-(1-t)f(x0) is introduced and the solution path of H(x, t) = 0 is followed from an obvious solution (x0, 0)to the solution (x*,1) which we seek. An ordinary differential equation based on Newton homotopy is used for following the solution path. Our homotop algorithm is much more efficient than the conventional iterations type algorithms. Some numerical examples are given in order to demonstrate the effectiveness

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18 **Mr Daniel Angley**

University of Melbourne VIC AUSTRALIA

Landauer's Principle and Stochastic Control

We apply Landauer's principle to stochastic control problems, yielding a new cost of performing computation in a control system, the thermodynamic cost. This is compared to the quadratic actuation cost from optimal control theory.

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19 **Dr Allan Ernest**

Charles Sturt University NSW AUSTRALIA

The Unbound Quantum States of Atomic Hydrogen

The often-ignored unbound quantum states of systems have application in modeling processes like bremsstrahlung and particle interactions in gravitational wells. ýWe consider the use of positive energy solutions of the hydrogen atom in this context.

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20 **Dr Allan Ernest**

Charles Sturt University NSW AUSTRALIA

The Effect of Spatial Oscillation Frequency on Quantum Overlap Integrals

In the eigenstate theory of dark matter calculations of transition rates involve quantum overlap integrals with unmanageably large numbers of terms. We present procedures and approximations for dealing with these types of integrals.

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21 **Mr Nicholas Miller**

RMIT University VIC AUSTRALIA

Temperature Profile for Nanofluidic Flow of Colloids

We show how to include the thermal diffusivity to improve the prediction of temperature profiles for molecular dynamics simulations of two component colloidal fluids undergoing Poiseuille flow.

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22 **Mr Bahaaudin Raffah**

University of Westren Australia WA AUSTRALIA

Simulation of Quantum Nanowires

We present a way to extend the R-matrix approach for arbitrary potentials in general nanowires. In addition, a comparison between the analytical approach (R-matrix method) and the direct numerical simulation approach is presented.

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23 **Prof Alexander Sukov**

Moscow State Technological University RUSSIA

Scattering of Waves by Coated Fractally Corrugated Periodic Surface: Analytical-Numerical Investigation

Scattering of a monochromatic plane electromagnetic E[H] - polarized wave by an electrically perfectly conducting fractally corrugated periodic (in one direction) surface is investigated. It is assumed that this surface is coated plane layer of medium consisting from electromagnetic metamaterial. The original problem is reduced to the solution of a system of singular integral equations.

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24 **Prof Jingbo Wang**
University of Western Australia WA AUSTRALIA
Quantum Walks and Centrality on Trees
We study discrete time quantum walk-based search on trees and present numerical results to show that the frequency of the search success probability is related to the centrality of the target.

25 **Prof Jingbo Wang**
University of Western Australia WA AUSTRALIA
Quantum Billiard and Its Dynamics
In this work, the dynamics of a single charged particle confined by a nano elliptical stadium and under the influence of external magnetic field is studied in both quantum and classical domain.

Wednesday 8 December
1700 - 1830

Poster Session 2: Education & History of Physics (PEG & HOP)

Room: Banquet Room 201, Level 2

Poster Board No

26 **Mr Neil Champion**
Williamstown High School VIC AUSTRALIA
Beyond Physics as Fact: Preparing Rich Curriculum Units
International Baccalaureate Middle Years Program units for two Areas of interaction are presented. Optics is contextualised via blindness across the globe (Health and social education). The context for thermodynamics is steam and industrialization (Human ingenuity).

27 **Mr Nigel Kuan**
University of Sydney NSW AUSTRALIA
Integrating 'Link-Mapping' into Multimedia, in the Teaching of High-School Physics
An investigation into the effects of multimedia-based link-mapping (similar to concept-mapping) on the learning of high school physics

29 **Dr Timo Nieminen**
University of Queensland QLD AUSTRALIA
Do International Research Students Really Need Different Supervision?
Research on international students often focuses on difficulty in academic writing. Due to the importance of performing research, rather than producing a thesis, this is of marginal relevance. We investigate supervision of international research students.

28 **Dr Timo Nieminen**
University of Queensland QLD AUSTRALIA
The Asian War Bow
The bow is one of the earliest complex machines, a prime example of the storage and transfer of energy. The physics of the bow illuminates compromises and design choices made in Asian military archery.

30 **Dr Geoff Swan**
Edith Cowan University WA AUSTRALIA
Evolution of an Experiment: Introduction to the Oscilloscope and Resonance in Pipes
Changes in the teaching and learning environment have resulted in a rethinking of the physics laboratory. The evolution of an experiment where students learn to use an oscilloscope and investigate resonance in pipes is explored.

31 **Dr Graham Wild**
Edith Cowan University WA AUSTRALIA
AC Electricity Experiments for Off-Campus Teaching and Learning
We show the implementation of a computer based Digital Storage Oscilloscope and Function Generator, using the computers sound card for the off-campus teaching and learning of AC electronics experiments.

Wednesday 8 December

1700 - 1830

Poster Session 2: Plasma Science (PP)

Room: Banquet Room 201, Level 2

Poster Board No

32 **Dr Neil Cramer**
University of Sydney NSW AUSTRALIA
The Alfven Resonance in Pair Plasmas
The absorption of wave energy in a magnetized cold pair plasma at the analogue of the Alfvén resonance is considered. This mechanism may affect electromagnetic wave emission from the electron-positron plasma of pulsars.

33 **Dr Tony Murphy**
CSIRO Materials Science and Engineering NSW AUSTRALIA
Development of a Predictive Three-Dimensional Computational Model of Gas–Metal Arc Welding
A self-consistent model of the electrode, arc and weld pool in arc welding is described. Arc motion, weld-pool surface deformation, and droplets are all considered. Predictions of the model are compared with measured weld cross-sections.

35 **Dr Yuriy Tyshetskiy**
University of Sydney NSW AUSTRALIA
Screening of Absorbing Particles in Plasma with a Flow
Shielding of absorbing body (dust grain) immersed in collisionless plasma with a flow is studied analytically using kinetic model with point-sink approximation of ion absorption by the body, both for sub- and super-thermal ion flows.

34 **Dr Yuriy Tyshetskiy**
University of Sydney NSW AUSTRALIA
Towards Kinetic Theory of Modulational Interactions in Quantum Plasmas
We present first results in adopting the universal formalism for modulational interactions for quantum plasmas, in the framework of Wigner-Poisson model. As an example, a kinetic derivation of quantum-corrected Zakharov's equations is presented and discussed.

Wednesday 8 December

1700 - 1830

Poster Session 2: Synchrotron Science (SynSci)

Room: Banquet Room 201, Level 2

Poster Board No

37 **Dr Eugeniu Balaur**
La Trobe University VIC AUSTRALIA
Fabrication of Zone Plate Optics with 15 nm Resolution Using Focused Ion Beams
Focused Ion Beam was used to fabricate zone plates for X-ray applications. 90um diameter zone plates with 15nm outermost zone width were successfully produced on a 150nm thick gold film.

38 **Mr Paul Bennetto**
Australian Synchrotron VIC AUSTRALIA
Simulating the Storage Ring of the Australian Synchrotron
Computer models have been developed to predict the behavior of electron scattering in the 3 GeV storage ring of the Australian Synchrotron. Applications for these models include beam energy measurements and top-up injection studies.

39 **Ms Tessa Charles**
Monash University VIC AUSTRALIA
CLIC Accelerating Structure Cooling Analysis
A mathematical model is presented describing the cooling of the CLIC accelerating structures, justifying constraints placed on flow parameters and the time required to switch between the different operation modes has been calculated.

40 **Ms Chandni Doshi**
La Trobe University VIC AUSTRALIA
Simulation of the Effects of an Indirect Imaging Detector Used for Imaging of Corrosion in Aluminium Alloys
This work presents a simulation system that simulates the imaging process in an x-ray tomography experiment measuring intergranular corrosion in aluminum alloys. In particular the effects of an indirect imaging detector are investigated.

41 **Mr Mahommed Islam**
University of Melbourne VIC AUSTRALIA
Measurement of the X-Ray Mass Attenuation Coefficients of Gold in the 38 keV - 50 keV Energy Range
We present new experimental data on X-ray coefficients for attenuation and absorption in gold using the latest implementation of the X-ray Extended Range Technique, XERT, as shown in recent Phys. Rev. papers

43 **Mr Mac Luu**
La Trobe University VIC AUSTRALIA
Multi-Wavelength Elemetal Contrast Full-Field Imaging
We will discuss a technique to obtain elemental distribution of an individual element of interest from a compound sample using X-ray
contrast full- field phase imaging.

44 **Mr Nicholas Rae**
University of Melbourne VIC AUSTRALIA
Measurements of X-Ray Mass Attenuation Coefficients and Determination of the Imaginary Components of the Atomic Form-Factor of Zinc over the Energy Range of 7.2 keV-15.2 keV
We study the interaction of X-rays at synchrotrons with zinc to determine the interaction coefficient of photons with matter, as represented by the recent Phys. Rev, publication. Our accuracy reveals new physics and can attain accuracies some 100 times that of previous literature.

Wednesday 8 December
1700 - 1830

Poster Session 2: Women in Physics (WIP)

Room: Banquet Room 201, Level 2

Poster Board No

45 **Dr Susan Feteris**
Monash University VIC AUSTRALIA
Women Studying Tertiary Physics: Selected Data
A review of thirty years of Monash University records provides data on enrolments and academic performance. Patterns are evident for the retention of women and men and some features can be attributed to specific interventions.

46 **Dr Galina Gramotnev**
University of Queensland QLD AUSTRALIA
Women in Physics: Is this an Opportunity or a Nightmare?
This presentation analyses the situation where a potential non-specific conflict of interests in dual-career couples is inappropriately used as a reason or vehicle to directly impede the careers and research of women in physics.

47 **Dr Timo Nieminen**
University of Queensland QLD AUSTRALIA
International Research Work Experience of Young Females in Physics
International research work for young people is common in physics. However, work experience and career plan of female workers in physics are little studied. We explore them by interviewing three international female workers in physics.

Wednesday 8 December
1700 - 1830

Poster Session 2: Optics, Photonics & Lasers (AOS)

Room: Banquet Room 201, Level 2

Poster Board No

48 **Dr Andrew Lee**
Macquarie University NSW AUSTRALIA
A Continuous-Wave, Second-Stokes Self-Raman Laser Generating Near-Infrared and Orange-Red Visible Emission
We report the first demonstration of a continuous wave (CW) self-Raman, Nd:GdVO4 laser operating at the cascaded second-Stokes wavelength of 1308 nm. By utilizing intracavity sum-frequency generation, we also generate orange-red emission at 620 nm.

49 **Dr Xiangping Li**
Swinburne University of Technology VIC AUSTRALIA
Optimised Photorefractive Formula for Enhanced Quantum-Dot-Sensitized Photorefractivity
This paper reports on the enhanced photorefractive behavior of a CdSe quantum-dot-dispersed poly(styrene-co-acrylonitrile). The photorefractive performance per CdSe quantum dot is three orders of magnitude higher than that in the sample sensitized by trinitrofluorenone.

50 **Miss Xiaoli Li**
Macquarie University NSW AUSTRALIA
High Efficiency CW Yellow Emission from Miniature Nd:GdVO4 self-Raman Laser
We report continuous-wave yellow emission from a Nd:GdVO4 self-Raman laser with intracavity frequency doubling in LBO. A pump-limited, 586.5nm output of 280mW was obtained with an intracavity mirror in 28mm-long resonator, pumped by 3.2W diode laser.

51 **Dr Philip Light**
University of Western Australia WA AUSTRALIA
Guidance of Cold Rubidium Atoms through Hollow-Core Fibre using a Hollow Beam
We propose the use of blue-detuned hollow laser beams for the transport of cold rubidium atoms through hollow-core photonic crystal fibre, allowing guidance over arbitrary paths without heating or Stark shifting of the atoms energy levels.

52 **Mr Han Lin**
Swinburne University of Technology VIC AUSTRALIA
Polarisation Dependent Light Localisation in Chalcogenide Glass Nanogratings
Polarisation dependent light localisation in chalcogenide glass nanogratings is investigated using the FDTD method. It is shown that the modes coupled into the nanogratings have polarisation sensitivity with respect to the grating vector.

53 **Mr Jipeng Lin**
Macquarie University NSW AUSTRALIA
Study of Relaxation Oscillations in Continuous-Wave Intracavity Raman Lasers
The relaxation oscillation frequency (ROF) in a CW intracavity Raman laser is studied theoretically and validated experimentally. We show that some important experimental parameters can be determined simply by measuring ROF vs. pump power.

54 **Mr Liam McGuinness**
University of Melbourne VIC AUSTRALIA
Extending Coherence of Nitrogen-Vacancy Centres in Diamond Through Dynamical Decoupling
New methods for extending the coherence time of NV centres through optimal dynamic decoupling and spin bath modification are presented. The consequences for quantum information and magnetometry are discussed

55 **Mr Christopher Miese**
Macquarie University NSW AUSTRALIA
Fast Direct Fabrication of Waveguide Bragg Gratings
We investigated micro-damage effects to fabricate waveguides that incorporate Bragg gratings in a single process step. We utilized a 5.1 MHz femtosecond oscillator combined with a Pockels cell to modulate the pulse energy.

56 **Mr Andrew Morgan**
University of Melbourne VIC AUSTRALIA
A Direct Method for Exit Surface Wave Reconstruction from a Single Diffracted Image
We present a method to solve directly for the exit-surface-wave of an object. Starting from a single resnel/Fraunhofer diffracted image, we proceed via a set of linear equations obtained from this image and
the known illumination.

57 **Mr Milos Rancic**
Australian National University ACT AUSTRALIA
Synthesising Programmable Photonic Structures in Rare Earth Ion Doped Hosts
The use of coherent optical techniques and spectral hole-burning are investigated to produce sub-wavelength photonic structures in rare earth crystals. These photonic structures have lifetime of several minutes and can be re-written in milliseconds.

58 **Mr Ben Sparkes**
Australian National Univerisity ACT AUSTRALIA
A Scalable, Self-Analysing Digital Locking System for use of Quantum Optics Experiments
We present a scalable digital locking system developed for quantum optics experiments, including automatic re-locking and lock analysis functions.

59 **Mr Shiaw Juen Tan**
Queensland University of Technology QLD AUSTRALIA
Plasmon Nanofocusing by a Dielectric Layer on a Metal Surface – Adiabatic Approach
We investigate the nanofocusing capability of a tapered high-index dielectric layer on a metal surface. A surface plasmon, propagating in the direction opposite to the taper, experiences back-reflection from a caustic,strong field enhancement and localisation.

60 **Mr Jeremy Waller**
Defence Science Technology Organisation SA AUSTRALIA
On the Passage of the Sun Across a Laser Communication System Field of View
We present a method to compute the times that the Sun will be within the field-of-view of the receiver of a laser communications system given its pointing azimuth and elevation.

61 **Mr Stephen Weber**
Swinburne University of Technology VIC AUSTRALIA
Manipulation of Microparticles in a Microfluidic Device via Surface Plasmon Resonance on Patterned and Non-Patterned Surfaces
In a microfluidic device the manipulation of different sized microparticles via surface plasmon resonance induced optical effects is investigated. This manipulation is investigated for patterned and non-patterned gold surfaces.

Wednesday 8 December
1700 - 1830

Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)

Room: Banquet Room 201, Level 2

Poster Board No

62 **Ms Arwen Pagon**
RMIT University VIC AUSTRALIA
Development of Functionally Graded Coatings for Cutting Tool Applications
This study investigates the development of functionally graded coatings for cutting tools (eg. drills) with the ultimate goal of enhancing performance. Energetic physical vapour deposition was investigated to optimise film microstructure and the coating/tool interface.

63 **Mr Jarryd Pla**
University of New South Wales NSW AUSTRALIA
Microwave Control of a Single Electron Spin in Silicon
We demonstrate microwave control of a single electron spin in silicon, detected via single shot projective measurements of the spin state. Two resonance peaks are observed with a splitting of 2.8 mT at a frequency of 50 GHz.

64 **Ms Ewa Rej**
University of Sydney NSW AUSTRALIA
Diamond Nanoparticles for Magnetic Resonance Imaging
We report magnetic resonance experiments on diamond nanoparticles towards the development of MRI contrast agents based on 13C. Our purpose-built spectrometer allows for spin dynamics to be examined at ambient and milli-Kelvin temperatures.

65 **Dr Matias Rodriguez**
Australian National University ACT AUSTRALIA
Small Angle X-Ray Scattering Studies on Swift Heavy Ion Irradiated Metallic Glasses
Ion tracks in amorphous metals were successfully characterized using synchrotron based small angle x-ray scattering. Damage recovery and recrystallization of the material was studied upon annealing, showing interesting differences between the unirradiated and irradiated material.

66 **Dr Simon Ruffell**
Australian National University ACT AUSTRALIA
Impurity-Free Seeded Crystallization of Amorphous Silicon by Nanoindentation
Using nanoindentation-induced phase transformations we demonstrate seeded solid phase crystallization of amorphous Si films. The seeded films have an improved microstructure with greatly improved electrical properties achievable with a lower thermal budget.

67 **Mr Peter Ryan**
University of Melbourne VIC AUSTRALIA
Photoluminescense of Boron and Phosphorous Doped Silicon Nanocrystals Fabricated By Ion Implantation
The effect of boron and phosphorous doping and co-doping on the optical properties of s ilicon nanocrystals formed in fused-silica by ion implantation is being studied. This is of interest for possible applications in optical quantum computing.

68 **A/Prof Robert Scholten**
University of Melbourne VIC AUSTRALIA
Partially Coherent Electron Diffraction
We simulate diffraction for partially coherent electron sources, in particular for electron bunches extracted from an ultracold plasma, using a Gaussian-Schell coherence model.

69 **Ms Abby Scott**
University of Wollongong NSW AUSTRALIA
Absorption Characteristics of Filter Paper in the Terahertz Region at Varying Humidities
Various Terahertz (THz) techniques have been used to examine the effects of relative humidities on the absorption characteristics of filter paper. Data has been collected from 0.1 to 5 THz, and results have proven consistent across all THz systems.

70 **Dr Andrew Smith**
Monash University VIC AUSTRALIA
Ab Initio Calculations of Stacking Fault Energies for Magnesium and Titanium
Properties of magnesium and titanium are calculated for bulk, surface and stacking faults, regarded as homogeneous interfaces, using density functional theory. Supercells enable stacking fault energies to be determined for intrinsic, extrinsic and twin-like structures.

72 **Dr Paul Spizzirri**
University of Melbourne VIC AUSTRALIA
Laser Induced Activation of Donors in Nano-MOSFET Devices
Preliminary work towards the use of lasers to anneal low energy, phosphorus ions implanted into nano-MOSFETs is described. Spectroscopic (optical), in-situ micro-thermometry is employed to estimate the temperature of the implanted channel while maintaining a low thermal budget. Lattice recovery and phosphorus donor activation are probed using (electrical) transport measurements.

71 **Dr Paul Spizzirri**
University of Melbourne VIC AUSTRALIA
The Second-Order Stark Effect from Phosphorus Donor Ensembles in Silicon
Thermally ionized donor ensembles are used to establish inhomogeneous electric fields in silicon. Electronic Raman spectroscopy is used to observe the quadratic Stark shift/split of the neutral (P) donor 1s states in the presence of these fields.

73 **Dr Manoj Sridhar**
Melbourne Centre For Nanofabrication VIC AUSTRALIA
Focused Ion Beam Micromachining of Lithium Niobate for Microfluidics
We present experimental and SRIM simulation results for Focused Ion Beam (FIB) milling of microchannels in lithium niobate, and show that the experimental milling rate is a function of the aspect ratio of milled structures.

74 **Mr Jibu Stephen**
Victoria University of Wellington WELINGTON NEW ZEALAND
The Effect of Antisite Disorder on the Magneto-Transport and Optical Properties of Co2MnSi
Magneto-transport and optical measurements have been done on ordered and disordered Co2MnSi thin films. The optical results are compared with band structure calculations and the anomalous Hall resistivity does not fit the expected field dependence.

75 **A/Prof Glen Stewart**
University of New South Wales ACT AUSTRALIA
A Mössbauer Study of the Fe Oxidation State in a Basalt-like Silicate Melt
57Fe-Mossbauer spectroscopy is employed to determine the Fe valence mix as a function of oxygen fugacity for a basalt-like silicate melt.

76 **Ms Michelle Strack**
University of Melbourne VIC AUSTRALIA
Three Dimensions of Diamond: Towards Microscale Sensing using Single-crystal Diamond
High energy ion implantation and subsequent annealing enables 3D structures to be created in single-crystal diamond. We have fabricated microscale measurement devices, such as high-frequency cantilevers and microfluidic channels, using these methods.

77 **Mr Samuel Thompson**
University of Melbourne VIC AUSTRALIA
In-Situ Observations of Ion-Impact-Induced Effects in Nano-MOSFETs for Deterministic Doping
We present an improved measurement system for detection of single ion impacts by MOSFET drain current modulation. This new system gives a lower noise floor and the increased functionality of in-situ current-voltage (IV) characterization.

78 **Dr Heiko Timmers**
University of New South Wales ACT AUSTRALIA
Characterisation of a Palladium Defect Complex in Germanium
The formation and disassociation of a lattice defect in germanium involving Pd-dopant atoms has been studied with perturbed angular correlation spectroscopy in order to inform the understanding of defect dynamics in this lattice.

79 **Prof Jingbo Wang**
University of Western Australia WA AUSTRALIA
Electron Transport in Surface Acoustic Wave
We present a detailed study of electron transport via surface acoustic waves (SAW) through a semiconductor hetero-structure. The effects of many experimental parameters are analyzed, such as temperature, SAW frequency and amplitude, and hetero-structure profile.

80 **Dr Changyi Yang**
Universtiy of Melbourne VIC AUSTRALIA
The Ionization Energy Distribution of Sub-20 keV Single Ions in Semiconductor Substrates Measured by On-Chip Detectors
On-line detection of the ionization energy of single keV ions in semiconductors paves a new way for deterministic doping single atoms in a shallow depth for nanofabrication of electronic/optoelectronic devices. In the single ion implantation operation, we measured ionization energy of sub-20 keV heavy ions (P+ and N+) and sub-10 keV light ions (He+ and H+) in Si. We also explore Ge and diamond detectors.

81 **Dr Changyi Yang**
Universtiy of Melbourne VIC AUSTRALIA
On-Chip Avalanche Detectors for Deterministic Doping of Silicon Nano-Devices with sub-10 keV single ion implantation
We investigated silicon diode avalanche multiplication operation both linear and Geiger modes for deterministic doping nano-devices by single ion implantation at a very shallow depth. We apply this technique for the nanofabrication of single donor nano electronic devices.

82 **Mr Chih-Hwan Henry Yang**
Centre For Quantum Computer Technology NSW AUSTRALIA
Dynamically Controlled Charge Sensing in a Few-Electron Silicon Quantum Dot
We report on a silicon MOS quantum dot, integrated with a dynamic-feedback- controlled SET charge sensor. The sensor provides robust and sensitive detection in charge movement in the quantum dot even in the presence of nearby unintentional

traps.

83 **Mr Changxi Zheng**
Monash University VIC AUSTRALIA
Design and Application of a III-V Surface Electron Microscope
We have developed a III-V low energy electron microscope which combines surface electron microscopy with III-V molecular beam epitaxy. Applications to the study of Langmuir evaporation, surface phase transformations and droplet epitaxy are described.

Wednesday 8 December
1700 - 1830

Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)

Room: Banquet Room 201, Level 2

Poster Board No

84 **Mr Charles Meaney**
University of Queensland QLD AUSTRALIA
Nonlinear Phenomena in a Quantum Many-Body Nano-Electromechanical System
We consider a superconducting microwave resonator containing N nano-mechanical resonators coupled to the microwave field. Classically, we show this system has a rich bifurcation structure. We comment on the quantum signatures of these bifurcations.

85 **Mr Benjamin Norton**
Griffith University QLD AUSTRALIA
Phase Fresnel Lenses for Large Scale Trapped Ion Quantum Computing
Using phase Fresnel lenses with large working distances and high numerical apertures, we can couple a large fraction of the fluorescence from ions within an ion trap, into easily manipulated optical modes.

86 **Mr James Owens**
University of Queensland QLD AUSTRALIA
Continuous-Time Quantum Walk on an Ellipse in Integrated Optics
We experimentally implement a continuous-time quantum walk with periodic boundary conditions using a 3-dimensional evanescently coupled waveguide array in an integrated optical circuit. The walk contains six sites, with elliptical symmetry.

87 **Mr Matthew Palmer**
University of Sydney NSW AUSTRALIA
Photon Quantum State Transport in Curved Spacetime
We derive a description of a photon's polarisation quantum state for each point along its null geodesic in curved spacetime. We obtain a complete, unitary, and relativistic description that features a straightforward qubit interpretation.

88 **Dr Marcelo Pereira De Almeida**
University of Queensland QLD AUSTRALIA
Violation of the Leggett-Garg Inequality with Weak Measurements of Photons
By weakly measuring the polarisation of a photon we violate the Leggett-Garg inequalities (LGI). In addition, our results show that there is a correlation between achieving strange weak values and violating the LGI.

89 **Mr Jacques Pienaar**
University of Queensland QLD AUSTRALIA
Single Photons in the Heisenberg Picture
We propose a theoretical model for the deterministic production of single-photons in the Heisenberg picture. The model provides a basis for field-theoretic approaches to optical quantum computation.

90 **Mr Ressa Said**
Macquarie University NSW AUSTRALIA
Three-qubit Quantum Error Correction Code in Diamond
We report a proposal and numerical simulations of multiple rounds of quantum error correction in a three-qubit system of spins associated with a single nitrogen-vacancy centre in diamond.

91 **Mr Dylan Saunders**
Griffith University QLD AUSTRALIA
Maximally Parsimonious Demonstrations of Quantum Nonlocality
Bell-nonlocality, EPR-Steering, and Nonseparability are different nonlocal features of quantum mechanics. We show, theoretically and experimentally, that the most parsimonious demonstrations of these effects (in terms of the number of distinct outcomes) requires generalized measurements.

92 **Dr Matthew Sellars**
Australian National University ACT AUSTRALIA
Rephased Amplified Spontaneous Emission in a Rareearth Ion Doped Crystal
This work describes progress towards demonstating “rephased amplified spontaneous emission”(RASE) in a rare-earth ion doped crystal; potentially a source of on-demand single photon states. Key experimental components include a novel 4-level photon echo sequence, and a dynamic, narrowband frequency filter.

93 **Mr Alexandr Sergeevich**
University of Sydney NSW AUSTRALIA
Quantum Dot Hamiltonian Adaptive Parameter Estimation Using Exchange Energy Control
We present a parameter estimation algorithm with control over time between measurements and exchange energy of a double quantum dot. An adaptive Bayesian updating approach is used. The optimal adaptive algorithm is compared with various nonadaptive schemes.

94 **Dr David Simpson**
University of Melbourne VIC AUSTRALIA
Preservation of Quantum Coherence in Biologically Relevant Solutions at Room Temperature
In this paper we report the results of the first immersion and quantum measurement of a diamond nanocrystal containing a single NV centre in aqueous solutions at room temperature.

95 **Mr William Soo**
University of Sydney NSW AUSTRALIA
Switching Phenomena in Bifurcation Amplifiers
We use a quantum trajectory approach to study switching events in optical bistabity. Recent single-shot qubit state measurement devices in circuit QED depend on these processes and we will study the accuracy, efficiency and backaction of such measurement devices.

96 **Dr Erik Streed**
Griffith University QLD AUSTRALIA
Imaging Trapped Ions with A Microfabricated Lens for Quantum Information Processing
We report the first imaging trapped ions with a microfabricated phase Fresnel lens. The demonstrated collection efficiency and image contrast are comparable to the current state of the art for quantum information processing.

97 **Mr Alex Szorkovszky**
University of Queensland QLD AUSTRALIA
Resonant Actuation of Cavity Optomechanical Systems
We experimentally develop a technique to enhance the driving of an optomechanical system using a resonant electric circuit. This opens up the possibility of observing nonlinear mechanics and, in turn, nonlinear optical effects.

98 **Mr Maki Takahashi**
University of Sydney NSW AUSTRALIA
Transport of Massive Fermion Qubits in Curved Space-Time
We develop a unitary and relativistic formalism describing the effect of space-time curvature on the quantum spin degree of freedom of fermions. This fermionic model of qubits can be used to investigate quantum information phenomena in curved space-times.

99 **Mr Nathan Walk**
University of Queensland QLD AUSTRALIA
Security of Post-selection based Continuous Variable Quantum Key Distribution against Arbitrary Attacks
We analyse the security and performance of a continuous variable quantum key distribution protocol using post selection, deriving results that are unconditionally secure in the sense of no longer restricting the eavesdroppers attack.

100 **Mr Joel Wallman**
University of Sydney NSW AUSTRALIA
Deterministic Observation of Quantum Nonlocality with Random Measurements
We demonstrate that spatially separated observers can always violate a Bell inequality for any random choice of measurements if the observers share a single reference direction.

101 **Prof Jingbo Wang**
University of Western Australia WA AUSTRALIA
Optimized Quantum Circuit Simulator
In this poster, we present an optimized decomposition scheme, which reduces the evaluation of multiple unitary gate operations with many conditionals to just two matrix additions, regardless of the number of conditionals or gate dimensions.

102 **Mr Matthew Wardrop**
University of Sydney NSW AUSTRALIA
Magnetic Controlled-Phase Gate Implementation on Singlet-Triplet Qubits
We describe a quantum gate for singlet-triplet gallium arsenide qubits that is based entirely on exchange interaction. We investigate the most significant decoherence processes and compare its performance to other proposals involving capacitative coupling of quantum dots.

103 **Mr Graham White**
University of Sydney NSW AUSTRALIA
Concatenation Methods for Topological Codes
We provide bounds on the efficiency of topological quantum error-correcting codes, discussing various Kitaev-type toric codes, and examine different ways of approximating toric codes as concatenated codes comprised of small planar codes.

PRESENTING AUTHOR INDEX

Last Name, First Name	Date	Session Start Time	Session End Time	Meeting Room / Banquet Room Level 2	Session Description
Abdul Aziz, Nor Azah	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Late Submission
Abeyrathne, Chathurika	Wed 8 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 8E: Biophysics / Biomedical Physics 2
Ables, Sean	Tues 7 Dec	1545	1700	MR 209, Lvl 2	Concurrent Session 6F: Solar, Terrestrial & Space Physics 6
Afra, Boshra	Thurs 9 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 11F: Synchrotron Science 2
Aguergaray, Claude	Tues 7 Dec	1115	1230	MR 207, Lvl 2	Concurrent Session 4D: ACOFT - Nonlinear Pulse Propagation in Fibers and Waveguides
Aharonovich, Igor	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Late Submission
Ahlefeldt, Rose	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Ahmad, Mushtaq	Wed 8 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 8F: Plasma Science 2
Akanda, Rezaul Hoque	Thurs 9 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 11G: AOS - Applications of Nonlinear Optics
Akulshin, Alexander	Tues 7 Dec	1545	1700	MR 203, Lvl 2	Concurrent Session 6B: AMP/AOS - Atom Light Interactions
Allen, Bruce	Wed 8 Dec	900	945	BR 202, Lvl 2	Plenary Session 6
Allen, Leslie	Tues 7 Dec	1545	1700	MR 206, Lvl 2	Concurrent Session 6H: CMMSP - Nanoscience
Allwood, Gary	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Allwood, Gary	Thurs 9 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 10H: AOS - Devices and Systems
Almasoodi, Talib Hashim Hasan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Al-Shabib, Wamid	Mon 6 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 3B: AOS - Optics and Interferometry
Alvares, Darren	Wed 8 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 7E: Biophysics / Biomedical Physics 1
Alves, Andrew	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Ams, Martin	Thurs 9 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 10C: AOS - Fabrication
Angley, Daniel	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Ankiewicz, Adrian	Thurs 9 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 10B: AOS - Nonlinear Optics
Aoki, Kanna	Wed 8 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 9G: AOS - Photonic Crystals
Arhatari, Benedicta	Tues 7 Dec	1115	1230	MR 203, Lvl 2	Concurrent Session 4B: AOS - X-Ray/XUV
Arkwright, John	Tues 7 Dec	830	1000	MR 203, Lvl 2	ACOFT - Bragg Gratings and Novel Fibers
Arkwright, John	Tues 7 Dec	830	1000	MR 203, Lvl 2	ACOFT - Bragg Gratings and Novel Fibers
Armstrong, Seiji	Tues 7 Dec	1115	1230	MR 208, Lvl 2	Concurrent Session 4E: Quantum Information, Concepts & Coherence Group 2
Artlett, Christopher	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Asavei, Theodor	Wed 8 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 7G: AOS - Optical Trapping
Åslund, Mattias	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Åslund, Mattias	Wed 8 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 8D: ACOFT - Novel Devices II
Babinec, Thomas	Mon 6 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 1G: AOS - Diamond Photonics
Babourina, Ekaterina	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Bachor, Hans	Wed 8 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 7B: AOS - Quantum Optics
Bal, Harpreet Kaur	Tues 7 Dec	1545	1700	MR 207, Lvl 2	Concurrent Session 6D: ACOFT - Sensors
Balaur, Eugeniu	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Baldwin, Ken	Wed 8 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 9B: AOS/AMP - BEC I: Correlations
Bao, Hongchun	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Barry, Alex	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Renewable Energy (RE)
Barry, Richard	Wed 8 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 8H: Relativity & Gravitation 2
Bartholomew, John	Thurs 9 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 10E: Quantum Information, Concepts & Coherence Group 5

Bartkowiak, Maciej	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Baynes, Fred	Mon 6 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 3B: AOS - Optics and Interferometry
Bell, Nicole	Tues 7 Dec	1115	1230	MR 204, Lvl 2	Concurrent Session 4C: Nuclear & Particle Physics 4
Bell Burnell, Jocelyn	Wed 8 Dec	1900	2030	BR 202, Lvl 2	Public Lecture
Bellido-Caceres, Jose	Tues 7 Dec	1400	1515	MR 204, Lvl 2	Concurrent Session 5C: Nuclear & Particle Physics 5
Bennet, Francis	Thurs 9 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 10B: AOS - Nonlinear Optics
Bennetto, Paul	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Biggerstaff, Devon	Wed 8 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 9C: Education 3
Black, Curtis	Wed 8 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 9D: Nuclear & Particle Physics 7
Bland-Hawthorn, Joss	Tues 7 Dec	830	1000	MR 204, Lvl 2	ACOFT - Fibres for Novel Applications
Boland, Mark	Mon 6 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 1C: Nuclear & Particle Physics 1
Bolejko, Krzysztof	Mon 6 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 1B: Astronomy & Astrophysics
Bolejko, Krzysztof	Wed 8 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 8H: Relativity & Gravitation 2
Boswell, Rod	Wed 8 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 7F: Plasma Science 1
Boucher, Neil	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Acoustics, Music & Ultrasonics (AAS)
Boucher, Neil	Thurs 9 Dec	1530	1630	MR 206, Lvl 2	Concurrent Session 12H: History of Physics
Bourke, Jay	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Bouya, Zahra	Tues 7 Dec	1545	1700	MR 209, Lvl 2	Concurrent Session 6F: Solar, Terrestrial & Space Physics 6
Bowen, Warwick	Tues 7 Dec	1545	1700	MR 208, Lvl 2	Concurrent Session 6E: Quantum Information, Concepts & Coherence Group 4
Boyd, Keiron	Wed 8 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 8D: ACOFT - Novel Devices II
Bradby, Jodie	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Branciard, Cyril	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Brasier, Owen	Tues 7 Dec	1400	1515	BR 202, Lvl 2	Concurrent Session 5A: ACOFT - High Speed Signal Processing and Devices
Brede, Markus	Thurs 9 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 10G: Complex Systems, Computational & Mathematical Physics
Brell, Courtney	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Brodzeli, Zourab	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Brodzeli, Zourab	Wed 8 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 7D: ACOFT - Novel Devices I
Broome, Matthew	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Brown, Anthony	Mon 6 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 3C: Nuclear & Particle Physics 3
Brown, Michael	Mon 6 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 1B: Astronomy & Astrophysics
Brown, Richard	Mon 6 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 2E: Special Session - Industry Forum
Brown, Will	Mon 6 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 2B: AOS - Optics in Astronomy
Brown, Will	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Brownless, John Scott	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Bucur, Voichita	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Acoustics, Music & Ultrasonics (AAS)
Bui, Lam	Wed 8 Dec	900	1030	MR 203, Lvl 2	ACOFT - Radio over Fiber
Buividas, Ricardas	Mon 6 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 3G: AOS - Plasmonics: Devices
Burgess, Jack	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Burke, Jan	Mon 6 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 3B: AOS - Optics and Interferometry
Byrne, Keal	Mon 6 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 1H: CMMSP - Surface & Materials
Cairns, Iver	Mon 6 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 3F: Solar, Terrestrial & Space Physics 3
Cairns, Iver	Tues 7 Dec	1115	1230	MR 209, Lvl 2	Concurrent Session 4F: Solar, Terrestrial & Space Physics 4
Callen, Benjamin	Tues 7 Dec	1545	1700	MR 204, Lvl 2	Concurrent Session 6C: Nuclear & Particle Physics 6
Campbell, Geoff	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)

Campbell, Laurence	Tues 7 Dec	1545	1700	MR 203, Lvl 2	Concurrent Session 6B: AMP/AOS - Atom Light Interactions
Canning, John	Tues 7 Dec	830	1000	MR 203, Lvl 2	ACOFT - Bragg Gratings and Novel Fibers
Cao, Yaoyu	Thurs 9 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 10C: AOS - Fabrication
Carvalho, Andre	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Carvalho, Andre	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Casas Bedoya, Alvaro	Wed 8 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 9G: AOS - Photonic Crystals
Cavalcanti, Eric	Thurs 9 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 11E: Quantum Information, Concepts & Coherence Group 6
Cervera, Manuel	Mon 6 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 3F: Solar, Terrestrial & Space Physics 3
Champion, Neil	Wed 8 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 7C: Education 1
Champion, Neil	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Education & History of Physics (PEG & HOP)
Champion, Neil	Wed 8 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 7C: Education 1
Chang, Nick	Mon 6 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 1E: AOS - Sensing/Lasers
Chantler, Christopher	Thurs 9 Dec	1530	1630	MR 209, Lvl 2	Concurrent Session 12F: Synchrotron Science 3
Chantler, Christopher	Thurs 9 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 11H: CMMSP - Condensed Matter
Chantler, Christopher	Wed 8 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 8B: AOS/AMP - Spectroscopy
Chapman, Robert	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Charbonneau, Sylvain	Mon 6 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 2A: ACOFT Keynote Session 2
Charles, Christine	Tues 7 Dec	1115	1230	MR 209, Lvl 2	Concurrent Session 4F: Solar, Terrestrial & Space Physics 4
Charles, Tessa	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Chattaraj, Pratim Kumar	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Atomic & Molecular Physics (AMP)
Chen, Bo	Tues 7 Dec	1115	1230	MR 203, Lvl 2	Concurrent Session 4B: AOS - X-Ray/XUV
Chen, Parry	Tues 7 Dec	1400	1515	MR 205, Lvl 2	Concurrent Session 5G: AOS - Metamaterials
Chia, Andy	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Chia, Ching K	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Choi, Duk-Yong	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Chong, Shen	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Chrzanowski, Helen	Tues 7 Dec	1115	1230	MR 208, Lvl 2	Concurrent Session 4E: Quantum Information, Concepts & Coherence Group 2
Chua, Sheon	Wed 8 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 7H: Relativity & Gravitation 1
Cirio, Mauro	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Colless, James	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Collins, Matthew	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Collins, Stephen	Wed 8 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 8D: ACOFT - Novel Devices II
Coogan, Anthony	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Coogan, Anthony	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Astronomy & Astrophysics (ASA)
Cook, Kevin	Tues 7 Dec	1545	1700	MR 207, Lvl 2	Concurrent Session 6D: ACOFT - Sensors
Cook, Kevin	Tues 7 Dec	830	1000	MR 203, Lvl 2	ACOFT - Bragg Gratings and Novel Fibers
Cook, Kevin	Tues 7 Dec	830	1000	MR 203, Lvl 2	ACOFT - Bragg Gratings and Novel Fibers
Cooper, Shaun	Mon 6 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 2F: Solar, Terrestrial & Space Physics 2
Coopersmith, Jennifer	Thurs 9 Dec	1530	1630	MR 206, Lvl 2	Concurrent Session 12H: History of Physics
Coopersmith, Jennifer	Wed 8 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 9C: Education 3
Corcoran, Bill	Wed 8 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 8A: ACOFT - Silicon Photonics
Corney, Joel	Tues 7 Dec	1400	1515	MR 203, Lvl 2	Concurrent Session 5B: AOS/AMP - Fermi Gases
Cousland, Geoffrey	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Coutts, David	Mon 6 Dec	1530	1700	BR 202, Lvl 2	Concurrent Session 3A: ACOFT/AOS Laserfest Symposium 1

Cramer, Neil	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Plasma Science (PP)
Cumming, Benjamin P.	Thurs 9 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 10C: AOS - Fabrication
Cunningham, Thomas	Thurs 9 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 11A: Nuclear & Particle Physics 9
Curwood, Evan	Wed 8 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 7E: Biophysics / Biomedical Physics 1
Cuthbert, Cameron	Tues 7 Dec	1400	1515	MR 204, Lvl 2	Concurrent Session 5C: Nuclear & Particle Physics 5
Cvetojevic, Nick	Mon 6 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 2B: AOS - Optics in Astronomy
Dainty, Chris	Mon 6 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 2B: AOS - Optics in Astronomy
D'Alfonso, Adrian	Thurs 9 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 11H: CMMSP - Condensed Matter
Dalton, Bryan	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Late Submission
Danilkin, Sergey	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Danilovich, Taissa	Mon 6 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 1B: Astronomy & Astrophysics
Dao, Lap Van	Tues 7 Dec	1115	1230	MR 203, Lvl 2	Concurrent Session 4B: AOS - X-Ray/XUV
Darmawan, Andrew	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Dasgupta, Mahananda	Thurs 9 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 10A: Nuclear & Particle Physics 8
Davis, Jeffrey	Wed 8 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 7E: Biophysics / Biomedical Physics 1
Davis, Matthew	Thurs 9 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 11D: AOS/AMP BEC II: Excitations
Davis, Tim	Mon 6 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 2G: AOS - Plasmonics: Fundamentals
Davis, Tim	Mon 6 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 3G: AOS - Plasmonics: Devices
Davoyan, Artur	Tues 7 Dec	1115	1230	MR 205, Lvl 2	Concurrent Session 4G: AOS - Plasmonics: Optics
Dawes, Judith	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Dawes, Judith	Mon 6 Dec	1530	1700	BR 202, Lvl 2	Concurrent Session 3A: ACOFT/AOS Laserfest Symposium 1
de Jonge, Martin	Thurs 9 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 11F: Synchrotron Science 2
Deam, Laurence	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Delides, Claire	Mon 6 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 3F: Solar, Terrestrial & Space Physics 3
Deller, Christine	Mon 6 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 2E: Special Session - Industry Forum
Deshmukh, Sarita	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Desyatnikov, Anton	Wed 8 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 7B: AOS - Quantum Optics
Dewar, Robert	Thurs 9 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 10G: Complex Systems, Computational & Mathematical Physics
Doherty, Marcus	Thurs 9 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 10E: Quantum Information, Concepts & Coherence Group 5
Dolman, Bronwyn	Mon 6 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 1D: Meteorology, Oceanography, Environmental Physics & Climate Change 1
Dolman, Bronwyn	Mon 6 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 3D: Meteorology, Oceanography, Environmental Physics & Climate Change 3
Domachuk, Peter	Mon 6 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 1E: AOS - Sensing/Lasers
Dooley, Philip	Wed 8 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 7C: Education 1
Doshi, Chandni	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Dowd, Rohan	Mon 6 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 3C: Nuclear & Particle Physics 3
Downes, Tony	Thurs 9 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 11E: Quantum Information, Concepts & Coherence Group 6
Dragomir, Nicoleta	Tues 7 Dec	1400	1515	MR 207, Lvl 2	Concurrent Session 5D: ACOFT - Biomedical and Sensing
Drumm, Daniel	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Drumm, Daniel	Tues 7 Dec	1115	1230	MR 206, Lvl 2	Concurrent Session 4H: CMMSP - Modelling & Simulations
Duering, Malte	Thurs 9 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 10C: AOS - Fabrication
Duldig, Marcus	Mon 6 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 3F: Solar, Terrestrial & Space Physics 3
Duldig, Marcus	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Duldig, Marcus	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Dyke, Paul	Tues 7 Dec	1400	1515	MR 203, Lvl 2	Concurrent Session 5B: AOS/AMP - Fermi Gases
Dyson, Peter	Mon 6 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 1F: Solar, Terrestrial & Space Physics 1
Dyson, Peter	Tues 7 Dec	1400	1515	MR 209, Lvl 2	Concurrent Session 5F: Solar, Terrestrial & Space Physics 5

Egami, Chikara	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Egorov, Mikhail	Thurs 9 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 11D: AOS/AMP BEC II: Excitations
Elliman, Robert	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Elliman, Robert	Tues 7 Dec	1545	1700	MR 206, Lvl 2	Concurrent Session 6H: CMMSP - Nanoscience
Ellis, Simon	Mon 6 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 1B: Astronomy & Astrophysics
Emami, Farzin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Englich, Florian	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Ernest, Allan	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Astronomy & Astrophysics (ASA)
Ernest, Allan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Ernest, Allan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Essiambre, Rene-Jean	Mon 6 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 1A: ACOFT Keynote Session 1
Evans, David	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Evers, Maurits	Thurs 9 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 10A: Nuclear & Particle Physics 8
Fairchild, Barbara	Mon 6 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 1H: CMMSP - Surface & Materials
Fang, Jinghua	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Fedrizzi, Alessandro	Tues 7 Dec	1545	1700	MR 208, Lvl 2	Concurrent Session 6E: Quantum Information, Concepts & Coherence Group 4
Feigl, Christopher	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Feng, Chao	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Feng, Yuan Ping	Tues 7 Dec	1115	1230	MR 206, Lvl 2	Concurrent Session 4H: CMMSP - Modelling & Simulations
Feteris, Susan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Women in Physics (WIP)
Finlayson, Trevor	Thurs 9 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 11H: CMMSP - Condensed Matter
Flambaum, Victor	Mon 6 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 2C: Nuclear & Particle Physics 2
Flambaum, Victor	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Nuclear & Particle Physics (NUPP)
Flambaum, Victor	Mon 6 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 1B: Astronomy & Astrophysics
Flambaum, Victor	Tues 7 Dec	1545	1700	MR 203, Lvl 2	Concurrent Session 6B: AMP/AOS - Atom Light Interactions
Flambaum, Victor	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Fleming, Simon	Tues 7 Dec	830	1000	MR 204, Lvl 2	ACOFT - Fibres for Novel Applications
Foran, Garry	Thurs 9 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 11F: Synchrotron Science 2
Forbes, Benjamin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Frederiksen, Jorgen	Mon 6 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 1D: Meteorology, Oceanography, Environmental Physics & Climate Change 1
Frederiksen, Jorgen	Mon 6 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 2D: Meteorology, Oceanography, Environmental Physics & Climate Change 2
Fuller-Rowell, Tim	Tues 7 Dec	830	915	BR 202, Lvl 2	Plenary Session 3
Fung, Park	Wed 8 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 9E: Biophysics / Biomedical Physics 3
Fung, Park	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)
Gai, Xin	Tues 7 Dec	1545	1700	BR 202, Lvl 2	Concurrent Session 6A: ACOFT - Nonlinear Waveguides
Galea, Ahmad	Mon 6 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 1C: Nuclear & Particle Physics 1
Galloway, Duncan	Mon 6 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 1B: Astronomy & Astrophysics
Gan, Zongsong	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Ganesan, Kumar	Wed 8 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 8E: Biophysics / Biomedical Physics 2
Gangat, Adil	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Ganija, Miftar	Wed 8 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 8G: AOS - Lasers
Garanovich, Ivan	Wed 8 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 9G: AOS - Photonic Crystals
Garrett, Michael	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Garrett, Richard	Mon 6 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 2E: Special Session - Industry Forum
Georgiou, Helen	Wed 8 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 9C: Education 3

Ghimire, Navin Prakash	Tues 7 Dec	1400	1515	MR 207, Lvl 2	Concurrent Session 5D: ACOFT - Biomedical and Sensing
Gibson, Brant	Mon 6 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 1G: AOS - Diamond Photonics
Gibson, Brant	Mon 6 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 1G: AOS - Diamond Photonics
Goh, Xiao Ming	Tues 7 Dec	1115	1230	MR 205, Lvl 2	Concurrent Session 4G: AOS - Plasmonics: Optics
Gol, Berrak	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)
Gomez, Daniel	Mon 6 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 3G: AOS - Plasmonics: Devices
Gossel, Graeme	Wed 8 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 9H: Relativity & Gravitation 3
Goto, Ryuichiro	Tues 7 Dec	1115	1230	BR 202, Lvl 2	Concurrent Session 4A: ACOFT - Direct Writing and Novel Gratings
Graham, Daniel	Wed 8 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 7F: Plasma Science 1
Gramotnev, Dmitri	Mon 6 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 2G: AOS - Plasmonics: Fundamentals
Gramotnev, Dmitri	Tues 7 Dec	1115	1230	MR 205, Lvl 2	Concurrent Session 4G: AOS - Plasmonics: Optics
Gramotnev, Galina	Mon 6 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 2D: Meteorology, Oceanography, Environmental Physics & Climate Change 2
Gramotnev, Galina	Mon 6 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 2D: Meteorology, Oceanography, Environmental Physics & Climate Change 2
Gramotnev, Galina	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Women in Physics (WIP)
Green, Martin	Mon 6 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 2D: Meteorology, Oceanography, Environmental Physics & Climate Change 2
Greenwood, Robert	Mon 6 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 1F: Solar, Terrestrial & Space Physics 1
Gross, Simon	Thurs 9 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 10C: AOS - Fabrication
Guo, Haibo	Tues 7 Dec	1115	1230	MR 206, Lvl 2	Concurrent Session 4H: CMMSP - Modelling & Simulations
Hage, Boris	Mon 6 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 3E: Quantum Information, Concepts & Coherence Group 1
Haine, Simon	Wed 8 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 9B: AOS/AMP - BEC I: Correlations
Halima, Ahmed	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Hall, Christopher	Thurs 9 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 10F: Synchrotron Science 1
Hall, Christopher	Wed 8 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 9F: CMMSP - Semiconductors II
Hall, Liam	Mon 6 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 3H: CMMSP - Theory
Hall, Michael	Thurs 9 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 11E: Quantum Information, Concepts & Coherence Group 6
Han, Ting	Tues 7 Dec	1545	1700	BR 202, Lvl 2	Concurrent Session 6A: ACOFT - Nonlinear Waveguides
Hannam, Kirsty	Tues 7 Dec	1400	1515	MR 205, Lvl 2	Concurrent Session 5G: AOS - Metamaterials
Harmer, Sarah	Thurs 9 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 11F: Synchrotron Science 2
Harris, Glen	Tues 7 Dec	1545	1700	MR 208, Lvl 2	Concurrent Session 6E: Quantum Information, Concepts & Coherence Group 4
Harris, Trevor	Tues 7 Dec	1545	1700	MR 209, Lvl 2	Concurrent Session 6F: Solar, Terrestrial & Space Physics 6
Hayward, Andrew	Tues 7 Dec	1545	1700	MR 203, Lvl 2	Concurrent Session 6B: AMP/AOS - Atom Light Interactions
He, Qiongyi	Wed 8 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 9B: AOS/AMP - BEC I: Correlations
Heckenberg, Norman	Thurs 9 Dec	1530	1630	MR 206, Lvl 2	Concurrent Session 12H: History of Physics
Henderson, Clare	Tues 7 Dec	1115	1230	MR 203, Lvl 2	Concurrent Session 4B: AOS - X-Ray/XUV
Henderson, Matthew	Mon 6 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 1G: AOS - Diamond Photonics
Herman, Peter R	Tues 7 Dec	1115	1230	BR 202, Lvl 2	Concurrent Session 4A: ACOFT - Direct Writing and Novel Gratings
Heuer, Rolf-Dieter	Tues 7 Dec	1030	1115	BR 202, Lvl 2	Plenary Session 5
Hinton, Kerry	Wed 8 Dec	900	1030	MR 203, Lvl 2	ACOFT - Radio over Fiber
Hnatovsky, Cyril	Thurs 9 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 10C: AOS - Fabrication
Hope, Anthony	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Hornibrook, John	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Horsley, Andrew	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Nuclear & Particle Physics (NUPP)
Hossain, Md Muntasir	Mon 6 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 3G: AOS - Plasmonics: Devices
Hosseini, Mahdi	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Howard, Katie	Wed 8 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 9H: Relativity & Gravitation 3
Hu, Hui	Tues 7 Dec	1400	1515	MR 203, Lvl 2	Concurrent Session 5B: AOS/AMP - Fermi Gases

Humble, John	Mon 6 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 3F: Solar, Terrestrial & Space Physics 3
Humble, John	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Huntula, Jiradawan	Wed 8 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 9C: Education 3
Hush, Michael	Tues 7 Dec	1545	1700	MR 208, Lvl 2	Concurrent Session 6E: Quantum Information, Concepts & Coherence Group 4
Hutchison, Wayne	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Inta, Ra	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Astronomy & Astrophysics (ASA)
Inta, Ra	Wed 8 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 9H: Relativity & Gravitation 3
Islam, Mahommed	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Ivannikov, Valentin	Tues 7 Dec	1545	1700	MR 203, Lvl 2	Concurrent Session 6B: AMP/AOS - Atom Light Interactions
Izdebskaya, Yana	Thurs 9 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 11G: AOS - Applications of Nonlinear Optics
Jackson, Stuart	Mon 6 Dec	1530	1700	BR 202, Lvl 2	Concurrent Session 3A: ACOFT/AOS Laserfest Symposium 1
Jacques, Thomas	Mon 6 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 3C: Nuclear & Particle Physics 3
Jakutis Neto, Jonas	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
James, Brian	Thurs 9 Dec	1530	1630	MR 206, Lvl 2	Concurrent Session 12H: History of Physics
Jennens, David	Mon 6 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 1C: Nuclear & Particle Physics 1
Jia, Baohua	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Jones, Michael	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Jones, Scott	Wed 8 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 7D: ACOFT - Novel Devices I
Jose, Smitha	Thurs 9 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 10D: AOS/AMP - Control and Trapping of (ultra) Cold Gases
Jovanovic, Nemanja	Mon 6 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 2B: AOS - Optics in Astronomy
Julius, T'Mir	Thurs 9 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 11A: Nuclear & Particle Physics 9
Juodkazis, Saulius	Thurs 9 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 11H: CMMSP - Condensed Matter
Kabakova, Irina	Thurs 9 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 11G: AOS - Applications of Nonlinear Optics
Kalinowski, Ksawery	Thurs 9 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 10B: AOS - Nonlinear Optics
Kane, Thomas	Tues 7 Dec	1400	1515	MR 209, Lvl 2	Concurrent Session 5F: Solar, Terrestrial & Space Physics 5
Kang, Jung-Hyun	Mon 6 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 2H: CMMSP - Semiconductors I
Karasik, Raisa	Mon 6 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 3E: Quantum Information, Concepts & Coherence Group 1
Karoly, David	Wed 8 Dec	945	1030	BR 202, Lvl 2	Plenary Session 7
Kashyap, Pawan	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Keane, Zachary	Mon 6 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 2H: CMMSP - Semiconductors I
Kennedy, Brendan	Wed 8 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 9E: Biophysics / Biomedical Physics 3
Kennedy, Shane	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Kent, Ben	Wed 8 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 9E: Biophysics / Biomedical Physics 3
Kheruntsyan, Karen	Wed 8 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 9B: AOS/AMP - BEC I: Correlations
Khodasevych, Iryna	Tues 7 Dec	1400	1515	MR 205, Lvl 2	Concurrent Session 5G: AOS - Metamaterials
Kibedi, Tibor	Tues 7 Dec	1400	1515	MR 204, Lvl 2	Concurrent Session 5C: Nuclear & Particle Physics 5
Kippenberg, Tobias	Thurs 9 Dec	945	1030	BR 202, Lvl 2	Plenary Session 9
Klochan, Oleh	Wed 8 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 9F: CMMSP - Semiconductors II
Knott, Jon	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Kobakhidze, Archil	Mon 6 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 2C: Nuclear & Particle Physics 2
Kocsis, Sacha	Mon 6 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 3E: Quantum Information, Concepts & Coherence Group 1
Kompaneets, Roman	Wed 8 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 8F: Plasma Science 2
Kompaneets, Roman	Wed 8 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 7F: Plasma Science 1
Kompaneets, Roman	Wed 8 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 7F: Plasma Science 1
Kong, Qian	Thurs 9 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 10B: AOS - Nonlinear Optics
Krofcheck, David	Tues 7 Dec	1115	1230	MR 204, Lvl 2	Concurrent Session 4C: Nuclear & Particle Physics 4
Kuan, Nigel	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Education & History of Physics (PEG & HOP)

Kumar, Vickal	Mon 6 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 2F: Solar, Terrestrial & Space Physics 2
Kumar, Vickal	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Kurth, Martin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Kurth, Martin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Optics, Photonics & Lasers (AOS)
Kutuvantavida, Yasar	Thurs 9 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 10H: AOS - Devices and Systems
Kwiat, Paul	Mon 6 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 3E: Quantum Information, Concepts & Coherence Group 1
Lai, Nai Shyan	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Lam, Timothy	Tues 7 Dec	1545	1700	MR 207, Lvl 2	Concurrent Session 6D: ACOFT - Sensors
Lancaster, David	Wed 8 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 8G: AOS - Lasers
Lancaster, David	Wed 8 Dec	1530	1710	BR 202, Lvl 2	Concurrent Session 9A: ACOFT/AOS - Laserfest Symposium 2
Lane, Gregory	Wed 8 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 9D: Nuclear & Particle Physics 7
Larkins, Michael	Tues 7 Dec	1115	1230	MR 205, Lvl 2	Concurrent Session 4G: AOS - Plasmonics: Optics
Lautenbach, Jens	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Lawrence, Felix	Wed 8 Dec	900	1030	MR 204, Lvl 2	ACOFT - Photonic Crystals
Lee, Albert	Mon 6 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 2C: Nuclear & Particle Physics 2
Lee, Andrew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Leong, Mark	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Lewis, Benjamin	Wed 8 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 9H: Relativity & Gravitation 3
Li, Fangxin	Wed 8 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 8A: ACOFT - Silicon Photonics
Li, Fangxin	Wed 8 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 8A: ACOFT - Silicon Photonics
Li, Xiangping	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Li, Xiaoli	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Lichter, Samantha	Wed 8 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 7E: Biophysics / Biomedical Physics 1
Liew, Yih Miin	Tues 7 Dec	1400	1515	MR 207, Lvl 2	Concurrent Session 5D: ACOFT - Biomedical and Sensing
Light, Philip	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Lim, Christina	Wed 8 Dec	900	1030	MR 203, Lvl 2	ACOFT - Radio over Fiber
Lim, Wee Han	Mon 6 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 2H: CMMSP - Semiconductors I
Limosani, Antonio	Mon 6 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 3C: Nuclear & Particle Physics 3
Lin, Han	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Lin, Jipeng	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Litvinyuk, Igor	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Liu, Wei	Tues 7 Dec	830	1000	MR 204, Lvl 2	ACOFT - Fibres for Novel Applications
Livingstone, Jayde	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Lorenser, Dirk	Wed 8 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 8E: Biophysics / Biomedical Physics 2
Lowe, John	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Lowery, Arthur	Mon 6 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 1A: ACOFT Keynote Session 1
Lugg, Nathan	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Lukic, Vesna	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Lund, Austin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Luong, Duc Huy	Thurs 9 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 10A: Nuclear & Particle Physics 8
Lurie, Anna	Thurs 9 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 10H: AOS - Devices and Systems
Luther-Davies, Barry	Tues 7 Dec	1545	1700	BR 202, Lvl 2	Concurrent Session 6A: ACOFT - Nonlinear Waveguides
Luther-Davies, Barry	Wed 8 Dec	1530	1710	BR 202, Lvl 2	Concurrent Session 9A: ACOFT/AOS - Laserfest Symposium 2
Luu, Mac	Thurs 9 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 10F: Synchrotron Science 1
Luu, Mac	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Lynn, Kenneth	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
MacKinnon, Andrew	Mon 6 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 3D: Meteorology, Oceanography, Environmental Physics & Climate Change 3

MacKinnon, Andrew	Mon 6 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 3D: Meteorology, Oceanography, Environmental Physics & Climate Change 3
Makin, Melissa	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Mallett, Benjamin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Marien, Geraldine	Wed 8 Dec	1100	1230	BR 201, Lvl 2	Concurrent Session 7A: ACOFT - Microstructured Fibers and Novel Devices
Martin, Andy	Mon 6 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 3H: CMMSP - Theory
Martin, Andy	Thurs 9 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 10E: Quantum Information, Concepts & Coherence Group 5
Martin, Andy	Thurs 9 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 11D: AOS/AMP BEC II: Excitations
Martin, Andy	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Marvian, Iman	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Matthys, Justin	Wed 8 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 9D: Nuclear & Particle Physics 7
Maucort, Guillaume	Wed 8 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 7G: AOS - Optical Trapping
Maucort, Guillaume	Wed 8 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 9E: Biophysics / Biomedical Physics 3
McArthur, Sally L	Wed 8 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 8F: Plasma Science 2
McCosker, Ravi	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
McCulloch, Dougal	Mon 6 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 1H: CMMSP - Surface & Materials
McGlynn, Peter	Mon 6 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 1E: AOS - Sensing/Lasers
McGuinness, Liam	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
McKemmish, Laura	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
McKenzie, Warren	Wed 8 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 7D: ACOFT - Novel Devices I
McRae, Terry	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Quantum Information, Concepts & Coherence Group (QUICC)
Meaney, Charles	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Meehan, Dan	Tues 7 Dec	1400	1515	MR 209, Lvl 2	Concurrent Session 5F: Solar, Terrestrial & Space Physics 5
Melatos, Andrew	Tues 7 Dec	1545	1700	MR 204, Lvl 2	Concurrent Session 6C: Nuclear & Particle Physics 6
Menk, Fred	Tues 7 Dec	1115	1230	MR 209, Lvl 2	Concurrent Session 4F: Solar, Terrestrial & Space Physics 4
Metcalfe, Guy	Mon 6 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 3D: Meteorology, Oceanography, Environmental Physics & Climate Change 3
Miese, Christopher	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Milburn, Gerard	Mon 6 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 3H: CMMSP - Theory
Mildren, Rich	Wed 8 Dec	1530	1710	BR 202, Lvl 2	Concurrent Session 9A: ACOFT/AOS - Laserfest Symposium 2
Miller, Gerald	Tues 7 Dec	1545	1700	MR 204, Lvl 2	Concurrent Session 6C: Nuclear & Particle Physics 6
Miller, Nicholas	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Mills, David	Wed 8 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 8C: Education 2
Min, Eun Hee	Tues 7 Dec	830	1000	MR 204, Lvl 2	ACOFT - Fibres for Novel Applications
Minasian, Robert	Wed 8 Dec	900	1030	MR 203, Lvl 2	ACOFT - Radio over Fiber
Minovich, Alexander	Tues 7 Dec	1400	1515	MR 205, Lvl 2	Concurrent Session 5G: AOS - Metamaterials
Monro, Tanya	Wed 8 Dec	1100	1230	BR 201, Lvl 2	Concurrent Session 7A: ACOFT - Microstructured Fibers and Novel Devices
Morandotti, Roberto	Tues 7 Dec	1400	1515	BR 202, Lvl 2	Concurrent Session 5A: ACOFT - High Speed Signal Processing and Devices
Morandotti, Roberto	Tues 7 Dec	1115	1230	MR 207, Lvl 2	Concurrent Session 4D: ACOFT - Nonlinear Pulse Propagation in Fibers and Waveguides
Morello, Andrea	Mon 6 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 2H: CMMSP - Semiconductors I
Morfa, Anthony	Mon 6 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 2D: Meteorology, Oceanography, Environmental Physics & Climate Change 2
Morgan, Andrew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Moss, David	Wed 8 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 8A: ACOFT - Silicon Photonics
Mould, Jeremy	Thurs 9 Dec	900	945	BR 202, Lvl 2	Plenary Session 8
Mullavey, Adam	Thurs 9 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 10H: AOS - Devices and Systems

Mullavey, Adam	Wed 8 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 7H: Relativity & Gravitation 1
Munasinghe, Tilanka	Wed 8 Dec	1100	1230	BR 201, Lvl 2	Concurrent Session 7A: ACOFT - Microstructured Fibers and Novel Devices
Munch, Jesper	Mon 6 Dec	1530	1700	BR 202, Lvl 2	Concurrent Session 3A: ACOFT/AOS Laserfest Symposium 1
Murnane, Margaret	Mon 6 Dec	900	945	BR 202, Lvl 2	Plenary Session 1
Murphy, Tony	Wed 8 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 7F: Plasma Science 1
Murphy, Tony	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Plasma Science (PP)
Myers, Casey	Tues 7 Dec	1400	1515	MR 208, Lvl 2	Concurrent Session 5E: Quantum Information, Concepts & Coherence Group 3
Naseri, Pourandokht	Wed 8 Dec	1100	1230	BR 201, Lvl 2	Concurrent Session 7A: ACOFT - Microstructured Fibers and Novel Devices
Neilson, David	Mon 6 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 3H: CMMSP - Theory
Neshev, Dragomir	Thurs 9 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 11B: AOS - Applications of Nonlinear Optics
Neudegg, Dave	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Newnham, Jonathan	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Condensed Matter, Materials & Surface Physics (CMMSP)
Nguyen, Huy	Tues 7 Dec	1400	1515	MR 207, Lvl 2	Concurrent Session 5D: ACOFT - Biomedical and Sensing
Nguyen, Thach	Wed 8 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 8A: ACOFT - Silicon Photonics
Nguyen, Thanh	Wed 8 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 7H: Relativity & Gravitation 1
Nicholls, Neville	Mon 6 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 1D: Meteorology, Oceanography, Environmental Physics & Climate Change 1
Nieminen, Timo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Education & History of Physics (PEG & HOP)
Nieminen, Timo	Wed 8 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 7G: AOS - Optical Trapping
Nieminen, Timo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Women in Physics (WIP)
Nieminen, Timo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Education & History of Physics (PEG & HOP)
Nolan, Christopher	Tues 7 Dec	1400	1515	MR 209, Lvl 2	Concurrent Session 5F: Solar, Terrestrial & Space Physics 5
Norman, Michael	Tues 7 Dec	915	1000	BR 202, Lvl 2	Plenary Session 4
Norman, Peter	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Astronomy & Astrophysics (ASA)
Norton, Benjamin	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Olds, William	Mon 6 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 1E: AOS - Sensing/Lasers
Olsen, Murray	Wed 8 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 7B: AOS - Quantum Optics
Ong, Lucas	Wed 8 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 9D: Nuclear & Particle Physics 7
Opanchuk, Bogdan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Orr, Brian	Wed 8 Dec	1530	1710	BR 202, Lvl 2	Concurrent Session 9A: ACOFT/AOS - Laserfest Symposium 2
O'Sullivan, Maurice	Mon 6 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 2A: ACOFT Keynote Session 2
Ottaway, David	Wed 8 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 8G: AOS - Lasers
Owens, James	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Paganin, David	Thurs 9 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 10F: Synchrotron Science 1
Pagon, Arwen	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Palmer, Matthew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Palsson, Matthew	Tues 7 Dec	1115	1230	MR 208, Lvl 2	Concurrent Session 4E: Quantum Information, Concepts & Coherence Group 2
Panopoulos, Harris	Thurs 9 Dec	1530	1630	MR 209, Lvl 2	Concurrent Session 12F: Synchrotron Science 3
Parappilly, Maria B	Wed 8 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 7C: Education 1
Parkinson, Murray	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Pask, Helen	Wed 8 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 8G: AOS - Lasers
Pask, Helen	Wed 8 Dec	1530	1710	BR 202, Lvl 2	Concurrent Session 9A: ACOFT/AOS - Laserfest Symposium 2
Patel, Nikhul	Thurs 9 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 11A: Nuclear & Particle Physics 9
Paterson, Adi	Tues 7 Dec	1115	1230	MR 204, Lvl 2	Concurrent Session 4C: Nuclear & Particle Physics 4
Paterson, David	Thurs 9 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 11F: Synchrotron Science 2
Paviolo, Chiara	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)

Payne, Andrew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Payne, David	Mon 6 Dec	945	1030	BR 202, Lvl 2	Plenary Session 2
Pelusi, Mark	Tues 7 Dec	1400	1515	BR 202, Lvl 2	Concurrent Session 5A: ACOFT - High Speed Signal Processing and Devices
Peng, Shi-Guo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Pereira De Almeida, Marcelo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Perrella, Christopher	Wed 8 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 8B: AOS/AMP - Spectroscopy
Pesor, Nadine	Mon 6 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 2C: Nuclear & Particle Physics 2
Petelina, Svetlana	Mon 6 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 1F: Solar, Terrestrial & Space Physics 1
Petrasiunas, Matthew	Wed 8 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 8G: AOS - Lasers
Phan, Anna	Mon 6 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 1C: Nuclear & Particle Physics 1
Pienaar, Jacques	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Piper, Jim	Mon 6 Dec	1530	1700	BR 202, Lvl 2	Concurrent Session 3A: ACOFT/AOS Laserfest Symposium 1
Pla, Jarryd	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Plakhotnik, Taras	Mon 6 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 1G: AOS - Diamond Photonics
Plakhotnik, Taras	Tues 7 Dec	1545	1700	MR 206, Lvl 2	Concurrent Session 6H: CMMSP - Nanoscience
Pogson, Elise	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)
Pollard, Judith	Wed 8 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 7C: Education 1
Preece, Daryl	Wed 8 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 7G: AOS - Optical Trapping
Prezens, Jude	Wed 8 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 8H: Relativity & Gravitation 2
Princep, Andrew	Thurs 9 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 11H: CMMSP - Condensed Matter
Pryde, Geoff	Mon 6 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 3E: Quantum Information, Concepts & Coherence Group 1
Pun, Edwin	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Putkunz, Corey	Thurs 9 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 10F: Synchrotron Science 1
Quach, James	Mon 6 Dec	1530	1700	MR 206, Lvl 2	Concurrent Session 3H: CMMSP - Theory
Quilty, James	Thurs 9 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 10H: AOS - Devices and Systems
Radic, Stojan	Mon 6 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 2A: ACOFT Keynote Session 2
Rae, Nicholas	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Synchrotron Science (SynSci)
Raffah, Bahaaudin	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Rancic, Milos	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Rayner, Anton	Wed 8 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 8C: Education 2
Reid, Iain	Mon 6 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 1F: Solar, Terrestrial & Space Physics 1
Reid, Margaret	Thurs 9 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 11E: Quantum Information, Concepts & Coherence Group 6
Rej, Ewa	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Richards, Phil	Tues 7 Dec	1115	1230	MR 209, Lvl 2	Concurrent Session 4F: Solar, Terrestrial & Space Physics 4
Riesen, Nicolas	Wed 8 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 7D: ACOFT - Novel Devices I
Ringsmuth, Andrew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)
Rizk, Anthony	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Roberts, Ann	Mon 6 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 2G: AOS - Plasmonics: Fundamentals
Robertson, Kalman	Thurs 9 Dec	1530	1630	BR 202, Lvl 2	Concurrent Session 12A: Nuclear & Particle Physics 10
Robinson, Peter	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Acoustics, Music & Ultrasonics (AAS)
Robson, Robert	Tues 7 Dec	1400	1515	MR 206, Lvl 2	Concurrent Session 5H: CMMSP - Soft Matter
Rodriguez, Brian	Tues 7 Dec	1545	1700	MR 206, Lvl 2	Concurrent Session 6H: CMMSP - Nanoscience
Rodriguez, Matias	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Roe, Gerry	Mon 6 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 2E: Special Session - Industry Forum
Rosa, Lorenzo	Mon 6 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 2G: AOS - Plasmonics: Fundamentals

Ruffell, Simon	Wed 8 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 9F: CMMSP - Semiconductors II
Ruffell, Simon	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Ryan, Peter	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Ryan, Rebecca	Wed 8 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 7E: Biophysics / Biomedical Physics 1
Saavedra, Aldo	Wed 8 Dec	1530	1700	MR 207, Lvl 2	Concurrent Session 9D: Nuclear & Particle Physics 7
Sabbatin, Jacopo	Thurs 9 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 11D: AOS/AMP BEC II: Excitations
Sabella, Alexander	Wed 8 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 8G: AOS - Lasers
Said, Ressa	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Saitoh, Kunimasa	Wed 8 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 7D: ACOFT - Novel Devices I
Salby, Murry	Mon 6 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 2F: Solar, Terrestrial & Space Physics 2
Saunders, Dylan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Savory, Seb	Mon 6 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 1A: ACOFT Keynote Session 1
Schnelle, Sebastian	Thurs 9 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 10D: AOS/AMP - Control and Trapping of (ultra) Cold Gases
Scholten, Robert	Thurs 9 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 10D: AOS/AMP - Control and Trapping of (ultra) Cold Gases
Scholten, Robert	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Schöpe, Hans Joachim	Tues 7 Dec	1400	1515	MR 206, Lvl 2	Concurrent Session 5H: CMMSP - Soft Matter
Schroeder, Jochen	Tues 7 Dec	1400	1515	BR 202, Lvl 2	Concurrent Session 5A: ACOFT - High Speed Signal Processing and Devices
Sciffer, Murray	Mon 6 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 2F: Solar, Terrestrial & Space Physics 2
Scott, Abby	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Sellars, Matthew	Thurs 9 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 10E: Quantum Information, Concepts & Coherence Group 5
Sellars, Matthew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Sergeevich, Alexandr	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Sevior, Martin	Thurs 9 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 11A: Nuclear & Particle Physics 9
Shao, Tony	Mon 6 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 3C: Nuclear & Particle Physics 3
Sharafutdinova, Galiya	Mon 6 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 3B: AOS - Optics and Interferometry
Sheng, Yan	Thurs 9 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 10B: AOS - Nonlinear Optics
Siam, Esther	Wed 8 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 9C: Education 3
Siddaway, Jason	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Siddaway, Jason	Mon 6 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 2F: Solar, Terrestrial & Space Physics 2
Sidiroglou, Fotios	Wed 8 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 8D: ACOFT - Novel Devices II
Sigle, Daniel	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Atomic & Molecular Physics (AMP)
Simakov, Nikita	Mon 6 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 2B: AOS - Optics in Astronomy
Simakov, Nikita	Wed 8 Dec	1710	1830	BR 202, Lvl 2	ACOFT - Postdeadline Session & Student Awards
Simenel, Cedric	Thurs 9 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 10A: Nuclear & Particle Physics 8
Simpson, David	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Singh, Kunwar	Wed 8 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 8F: Plasma Science 2
Skawronski, Tristan	Thurs 9 Dec	1530	1630	BR 202, Lvl 2	Concurrent Session 12A: Nuclear & Particle Physics 10
Slagmolen, Bram	Wed 8 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 7H: Relativity & Gravitation 1
Smale, Lucas	Wed 8 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 8B: AOS/AMP - Spectroscopy
Smith, Andrew	Tues 7 Dec	1115	1230	MR 206, Lvl 2	Concurrent Session 4H: CMMSP - Modelling & Simulations
Smith, Andrew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Smith, Devin	Tues 7 Dec	1545	1700	MR 208, Lvl 2	Concurrent Session 6E: Quantum Information, Concepts & Coherence Group 4
Sokolov, Andrey	Thurs 9 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 10G: Complex Systems, Computational & Mathematical Physics

Solntsev, Alexander	Thurs 9 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 11G: AOS - Applications of Nonlinear Optics
Soo, William	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Sparkes, Ben	Thurs 9 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 10E: Quantum Information, Concepts & Coherence Group 5
Sparkes, Ben	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Spekkens, Robert	Tues 7 Dec	1400	1515	MR 208, Lvl 2	Concurrent Session 5E: Quantum Information, Concepts & Coherence Group 3
Spencer, Michelle	Thurs 9 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 11H: CMMSP - Condensed Matter
Spizzirri, Paul	Mon 6 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 2H: CMMSP - Semiconductors I
Spizzirri, Paul	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Spizzirri, Paul	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Sridhar, Manoj	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Stace, Tom	Tues 7 Dec	1400	1515	MR 208, Lvl 2	Concurrent Session 5E: Quantum Information, Concepts & Coherence Group 3
Stacey, Alastair	Mon 6 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 1H: CMMSP - Surface & Materials
Stefani, Alessio	Tues 7 Dec	1545	1700	MR 207, Lvl 2	Concurrent Session 6D: ACOFT - Sensors
Stefszky, Michael	Wed 8 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 7B: AOS - Quantum Optics
Steinhauer, Christian	Wed 8 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 8E: Biophysics / Biomedical Physics 2
Stephen, Jibu	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Stevenson, Michael	Wed 8 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 8D: ACOFT - Novel Devices II
Stewart, Glen	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Steyn-Ross, Alistair	Wed 8 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 9E: Biophysics / Biomedical Physics 3
Stilgoe, Alexander	Wed 8 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 7G: AOS - Optical Trapping
Stoddart, Paul	Tues 7 Dec	1400	1515	MR 207, Lvl 2	Concurrent Session 5D: ACOFT - Biomedical and Sensing
Strack, Michelle	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Streed, Erik	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Stuchbery, Andrew	Thurs 9 Dec	1100	1230	BR 202, Lvl 2	Concurrent Session 10A: Nuclear & Particle Physics 8
Sukhorukov, Andrey	Wed 8 Dec	900	1030	MR 204, Lvl 2	ACOFT - Photonic Crystals
Sukhorukov, Andrey	Wed 8 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 9G: AOS - Photonic Crystals
Sukov, Alexander	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Svanberg, Katarina	Mon 6 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 1E: AOS - Sensing/Lasers
Swaim, Jon	Wed 8 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 8E: Biophysics / Biomedical Physics 2
Swan, Geoff	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Education & History of Physics (PEG & HOP)
Szigeti, Stuart	Thurs 9 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 10D: AOS/AMP - Control and Trapping of (ultra) Cold Gases
Szorkovszky, Alex	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Takahashi, Maki	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Tan, Kong Guan	Tues 7 Dec	1400	1515	MR 204, Lvl 2	Concurrent Session 5C: Nuclear & Particle Physics 5
Tan, Shiaw Juen	Mon 6 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 3G: AOS - Plasmonics: Devices
Tan, Shiaw Juen	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Tang, Wenxin	Wed 8 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 9F: CMMSP - Semiconductors II
Taylor, Adam	Tues 7 Dec	1115	1230	MR 205, Lvl 2	Concurrent Session 4G: AOS - Plasmonics: Optics
Taylor, Michael	Wed 8 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 7G: AOS - Optical Trapping
Thomas, Juna	Thurs 9 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 11G: AOS - Applications of Nonlinear Optics
Thompson, Jayne	Mon 6 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 2C: Nuclear & Particle Physics 2
Thompson, Samuel	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Threlfall, Phil	Wed 8 Dec	1330	1500	MR 206, Lvl 2	Concurrent Session 8H: Relativity & Gravitation 2

Tikka, Ajay	Wed 8 Dec	1100	1230	MR 208, Lvl 2	Concurrent Session 7E: Biophysics / Biomedical Physics 1
Timmers, Heiko	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)
Timmers, Heiko	Wed 8 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 9F: CMMSP - Semiconductors II
Timmers, Heiko	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Timmers, Heiko	Wed 8 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 8E: Biophysics / Biomedical Physics 2
Tiwary, Shailendra Kumar	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Tomljenovic-Hanic, Snjezana	Wed 8 Dec	900	1030	MR 204, Lvl 2	ACOFT - Photonic Crystals
Toomey, Joshua	Thurs 9 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 10H: AOS - Devices and Systems
Torrance, Angela	Tues 7 Dec	1115	1230	MR 203, Lvl 2	Concurrent Session 4B: AOS - X-Ray/XUV
Town, Graham	Tues 7 Dec	1115	1230	MR 207, Lvl 2	Concurrent Session 4D: ACOFT - Nonlinear Pulse Propagation in Fibers and Waveguides
Traine, Sarah	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Astronomy & Astrophysics (ASA)
Truong, Gar-Wing	Wed 8 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 8B: AOS/AMP - Spectroscopy
Tuck, Gary	Wed 8 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 8C: Education 2
Tuniz, Alessandro	Wed 8 Dec	1100	1230	BR 201, Lvl 2	Concurrent Session 7A: ACOFT - Microstructured Fibers and Novel Devices
Turner, Joanna	Mon 6 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 1D: Meteorology, Oceanography, Environmental Physics & Climate Change 1
Turner, Joanna	Wed 8 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 8C: Education 2
Turner, Mark	Wed 8 Dec	1530	1700	MR 205, Lvl 2	Concurrent Session 9G: AOS - Photonic Crystals
Tyshetskiy, Yuriy	Wed 8 Dec	1330	1500	MR 209, Lvl 2	Concurrent Session 8F: Plasma Science 2
Tyshetskiy, Yuriy	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Plasma Science (PP)
Tyshetskiy, Yuriy	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Plasma Science (PP)
Vale, Chris	Tues 7 Dec	1400	1515	MR 203, Lvl 2	Concurrent Session 5B: AOS/AMP - Fermi Gases
Van Donkelaar, Jessica	Wed 8 Dec	1530	1700	MR 209, Lvl 2	Concurrent Session 9F: CMMSP - Semiconductors II
Van Megen, William	Tues 7 Dec	1400	1515	MR 206, Lvl 2	Concurrent Session 5H: CMMSP - Soft Matter
Varvell, Kevin	Thurs 9 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 11A: Nuclear & Particle Physics 9
Vernon, Kristy	Mon 6 Dec	1330	1500	MR 205, Lvl 2	Concurrent Session 2G: AOS - Plasmonics: Fundamentals
Vo, Trung Duc	Wed 8 Dec	1330	1500	BR 202, Lvl 2	Concurrent Session 8A: ACOFT - Silicon Photonics
Vu, Khu	Tues 7 Dec	1545	1700	BR 202, Lvl 2	Concurrent Session 6A: ACOFT - Nonlinear Waveguides
Wade, Andrew	Wed 8 Dec	1100	1230	MR 206, Lvl 2	Concurrent Session 7H: Relativity & Gravitation 1
Wade, Scott	Wed 8 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 8D: ACOFT - Novel Devices II
Wakhle, Aditya	Tues 7 Dec	1545	1700	MR 204, Lvl 2	Concurrent Session 6C: Nuclear & Particle Physics 6
Walk, Nathan	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Waller, Jeremy	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)
Wallman, Joel	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Wang, Feng	Wed 8 Dec	1330	1500	MR 203, Lvl 2	Concurrent Session 8B: AOS/AMP - Spectroscopy
Wang, Jingbo	Tues 7 Dec	1400	1515	MR 208, Lvl 2	Concurrent Session 5E: Quantum Information, Concepts & Coherence Group 3
Wang, Jingbo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Wang, Jingbo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Wang, Jingbo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Wang, Jingbo	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Complex Systems, Computational & Mathematical Physics (CSCMO)
Wardill, Paul	Mon 6 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 2E: Special Session - Industry Forum
Wardrop, Matthew	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
Warszawski, Lila	Thurs 9 Dec	1330	1500	MR 207, Lvl 2	Concurrent Session 11D: AOS/AMP BEC II: Excitations
Waters, Colin	Tues 7 Dec	1545	1700	MR 209, Lvl 2	Concurrent Session 6F: Solar, Terrestrial & Space Physics 6
Weber, Stephen	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Optics, Photonics & Lasers (AOS)

Wegener, Margaret	Wed 8 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 8C: Education 2
Westman, Hans	Tues 7 Dec	1400	1515	MR 208, Lvl 2	Concurrent Session 5E: Quantum Information, Concepts & Coherence Group 3
White, Andrew	Tues 7 Dec	1115	1230	MR 208, Lvl 2	Concurrent Session 4E: Quantum Information, Concepts & Coherence Group 2
White, Graham	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Quantum Information, Concepts & Coherence Group (QUICC)
White, Martin	Mon 6 Dec	1100	1230	MR 204, Lvl 2	Concurrent Session 1C: Nuclear & Particle Physics 1
White, Thomas	Wed 8 Dec	900	1030	MR 204, Lvl 2	ACOFT - Photonic Crystals
White, Thomas	Wed 8 Dec	900	1030	MR 204, Lvl 2	ACOFT - Photonic Crystals
Wild, Graham	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Wild, Graham	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Education & History of Physics (PEG & HOP)
Wilson, Brendan	Wed 8 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 7B: AOS - Quantum Optics
Wilson, Marcus	Wed 8 Dec	1530	1700	MR 208, Lvl 2	Concurrent Session 9E: Biophysics / Biomedical Physics 3
Wilson, Marcus	Wed 8 Dec	1530	1700	MR 204, Lvl 2	Concurrent Session 9C: Education 3
Wiseman, Howard	Thurs 9 Dec	1330	1500	MR 208, Lvl 2	Concurrent Session 11E: Quantum Information, Concepts & Coherence Group 6
Withford, Michael	Tues 7 Dec	1115	1230	BR 202, Lvl 2	Concurrent Session 4A: ACOFT - Direct Writing and Novel Gratings
Wolfe, Joe	Wed 8 Dec	1330	1500	MR 204, Lvl 2	Concurrent Session 8C: Education 2
Wong, Kok Hou	Wed 8 Dec	1100	1230	MR 207, Lvl 2	Concurrent Session 7D: ACOFT - Novel Devices I
Wright, Tod	Wed 8 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 9B: AOS/AMP - BEC I: Correlations
Wuchenich, Danielle	Mon 6 Dec	1530	1700	MR 203, Lvl 2	Concurrent Session 3B: AOS - Optics and Interferometry
Wylie, Jonathan	Thurs 9 Dec	1100	1230	MR 205, Lvl 2	Concurrent Session 10G: Complex Systems, Computational & Mathematical Physics
Xu, Zhiyong	Thurs 9 Dec	1100	1230	MR 203, Lvl 2	Concurrent Session 10B: AOS - Nonlinear Optics
Yang, Changyi	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Yang, Changyi	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Yang, Chih-Hwan Henry	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)
Yang, Hongang	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Yeo, Boon (Teddy)	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Biophysics / Biomedical Physics (BP/BMP)
Young, Ross	Thurs 9 Dec	1530	1630	BR 202, Lvl 2	Concurrent Session 12A: Nuclear & Particle Physics 10
Younger, Joel	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Younger, Joel	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Solar, Terrestrial & Space Physics (STSP)
Younger, Joel	Mon 6 Dec	1100	1230	MR 209, Lvl 2	Concurrent Session 1F: Solar, Terrestrial & Space Physics 1
Zeller, Eike	Mon 6 Dec	1700	1830	BR 201, Lvl 2	Poster Session 1: Australian Conference on Optical Fibre Technology (ACOFT)
Zhang, Wenqi	Tues 7 Dec	1115	1230	MR 207, Lvl 2	Concurrent Session 4D: ACOFT - Nonlinear Pulse Propagation in Fibers and Waveguides
Zheng, Changxi	Wed 8 Dec	1700	1830	BR 201, Lvl 2	Poster Session 2: Condensed Matter, Materials & Surface Physics (CMMSP)

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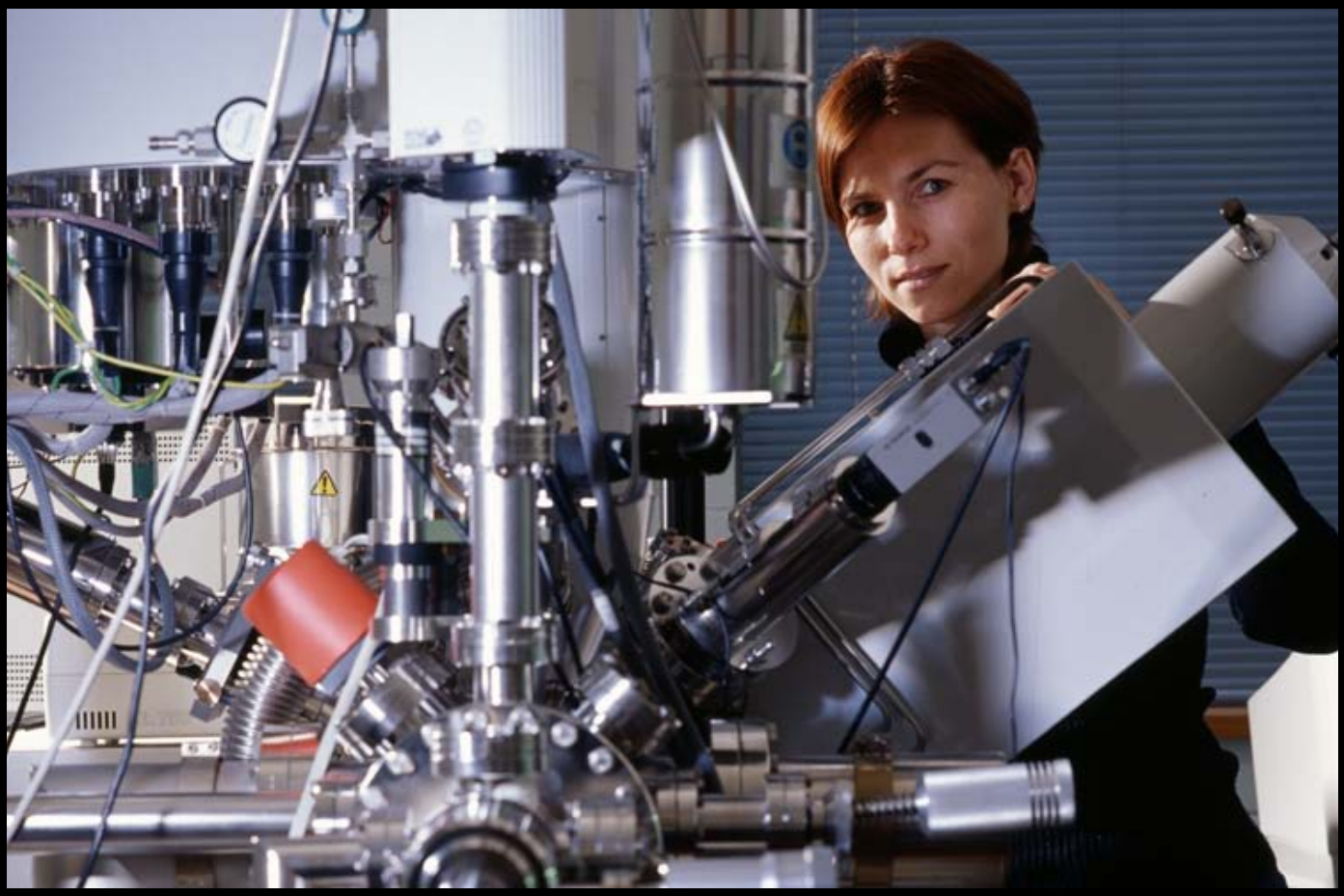

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