

## **Session Program**

**11-16 Dec 2022**



# **24th Australian Institute of Physics Congress** ***Australian and New Zealand Conference on Optics and Photonics***

# Monday 12 December

11:00

## Australian and New Zealand Conference on Optics and Photonics: ANZCOP 1 - Optical Sensors 1

**Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Shahraam Afshar Vahid

11:00-11:30

### New frontiers in smart sensor technology for a healthier, safer and sustainable future

#### Speaker

Prof. Benjamin Eggleton

11:30-11:45

### Robust Optical Fibre Sensors for Harsh Wastewater Environments

#### Speaker

Martin Ams

11:45-12:00

### Laser Written Carbonised Porous Silicon Waveguides for Optical Sensor Applications

#### Speaker

Jesse Fletcher

12:00-12:15

### Towards a sub-attometer fibre wavemeter based on Speckle interference patterns

#### Speaker

Chris Perrella

12:30

11:00

## Australian and New Zealand Conference on Optics and Photonics: ANZCOP 2 - Astrophotonics

**Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Simon Gross

11:00-11:30

### Astrophotonics: when astronomy meets photonics

#### Speaker

Prof. Sergio Leon-Saval

11:30-11:45

### A Focal Plane All-fibre Wavefront Sensor

#### Speaker

Fiona Wei

11:45-12:00

### Development of Western Australia's Optical Space Communications Capabilities

#### Speaker

Benjamin Dix-Matthews

12:00-12:15

### Developing Optical Phased Array sensing for the Breakthrough Starshot propulsion system

#### Speaker

Paul Sibley

12:15-12:30

**Development of an mid-infrared integrated optics 4-telescope beam combiner for the Hi-5 instrument****Speaker**

Mr Ahmed Sanny

12:30

14:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 3 - Optical Sensors 2****Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Jiawen Li

14:00-14:30

**Light interacting with the vacuum****Speaker**

Prof. Gerd Leuchs

14:30-14:45

**Measuring Magnetic Fields at Arbitrary Frequencies with an Atomic Magnetometer****Speaker**

Mr Kyle Netz

14:45-15:00

**Diamond-glass nanoparticles for nanoscale quantum sensing****Speaker**

Qiang Sun

15:00-15:15

**Wearable Optical Fibre Sensors for Physiological Measurements****Speaker**

Simon Fleming

15:15-15:30

**Optimisation of a Fibre Laser Hydrophone for Marine Traffic Monitoring****Speaker**

Alexei Tikhomirov

15:30

14:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 4 - Biophotonics 1****Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Judith Dawes

14:00-14:15

**Calibration Methods for in vivo Microrheology with Rotational Optical Tweezers****Speaker**

Mark Watson

14:15-14:30

**Optical Tweezers for IVF: an in vitro study of reproductive cells and their environment****Speaker**

Carl Adrian Campugan

14:30-15:00

**Clinical translation of optical imaging for surgical guidance - from bench to bedside**

**Speaker**

Prof. Anita Mahadevan-Jansen

**15:00–15:30 Diagnosing Skin Lesions - Malignant & Benign - with Light****Speaker**

Prof. Cather Simpson

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 5 - Atom Optics****Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Halina Rubinsztein-Dunlop**16:00–16:30 From Atom Mirrors to Atom Chips to Time Crystals****Speaker**

Prof. Peter Hannaford

**16:30–16:45 Spin entanglement of a thermal atomic pair in an optical tweezer****Speaker**

Lucile Sanchez

**16:45–17:15****Statistics of Light Emitted from Ultra-Strongly Coupled Quantum Systems****Speaker**

Mikolaj Schmidt

**17:15–17:30 Development of a Compact Clock for Small Satellite Applications****Speaker**

Emily Ahern

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 6 - Biophotonics 2****Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Irina Kabakova**16:00–16:30****Hyper-spectral imaging methodology for classification of embryo metabolism****Speaker**

Dr Denitza Denkova

**16:30–16:45****Towards pH Sensing in Hybrid Silk Materials for Wound Healing Applications****Speaker**

Laura Hung

**16:45–17:00****A wireless camera based optical elastography probe towards intraoperative breast cancer detection****Speaker**

QI FANG

**17:00–17:15****Real-Time Imaging of Nanoparticle Transcytosis in a Microfluidic Blood-Brain Barrier Model**

**Speaker**  
Yueying Cao

17:15–17:30

**Smart silk membrane: Hybrid optical platform for wound sensing applications**

**Speaker**  
Dr Asma Khalid

17:30

## Tuesday 13 December

11:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 7 - Fibre and Communications

**Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Simon Fleming

11:00–11:30

#### Dispersion-diversity optical fibers

##### Speaker

Prof. Ivana Gasulla

11:30–11:45

#### Spatial and Spectral High-Speed Optical Fibre Characterization

##### Speaker

Marcos Maestre Morote

11:45–12:00

#### Lunar Communications with the ANU Optical Ground Station

##### Speaker

Michael Copeland

12:00–12:15

#### An Ultra-sensitive Fibre Frequency Reference for Short-term Laser Stabilisation

##### Speaker

Dr Chathura Bandutunga

12:15–12:30

#### Annealing effects in femtosecond laser-inscribed mid-infrared fibre Bragg gratings

##### Speaker

Alex Fuerbach

12:30

11:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 8 - Quantum Optics 1

**Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Sejeong Kim

11:00–11:30

#### Towards room temperature quantum squeezing of a mechanical resonator

##### Speaker

Prof. Warwick Bowen

11:30–11:45

#### Silicon photonics with T centre spin-photon devices

##### Speaker

Daniel Higginbottom

11:45–12:00

#### Optically detected spin transitions in an Er-doped whispering-gallery resonator

##### Speaker

Luke Trainor

12:00–12:15

#### The Hanbury Brown and Twiss experiment as a tool for emitter localization

12:30

14:00

**Speaker**

Mr Jaret Vasquez-Lozano

12:15–12:30

**Correction of quantum phase errors with integrated photonic circuits**

**Speaker**

Jinyong Ma

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 10 - Quantum Optics 2**

**Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Mikolaj Schmidt

14:00–14:30

**Towards the simplest quantum computation**

**Speaker**

Prof. Kae Nemoto

14:30–14:45

**Resonant Spectroscopy of Blue Quantum Emitters in Hexagonal Boron Nitride**

**Speaker**

Jake Horder

14:45–15:00

**Superresolution measurements and the quantum Gouy phase in transverse-spatial N00N states**

**Speaker**

Mr Markus Hiekkamäki

15:00–15:15

**Generation of quantum entangled photons from lithium niobate nonlocal metasurfaces**

**Speaker**

Jinyong Ma

15:15–15:30

**A scalable, high-bandwidth warm atom quantum memory using hollow-core photonic crystal fibers**

**Speaker**

Dr Ben Sparkes

15:30

14:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 9 - THz Photonics**

**Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Alessandro Tuniz

14:00–14:30

**Terahertz waveguides: the fundamental component for next generation of communication**

**Speaker**

Shaghik Atakaramians

14:30–14:45

**Terahertz Vector Beam Generation Enabled by Photonic Topological Metasurfaces**

**Speaker**

Elizaveta Melik-Gaykazyan

15:30

16:00

17:30

16:00

**14:45-15:00 Integratable 3D Printed Terahertz Horn Coupler**

**Speaker**

Mr Qigejian Wang

**15:00-15:15**

**Automation and measurement geometry of stimulated-polariton-scattering based THz spectrometric systems**

**Speaker**

Ondrej Kitzler

**15:15-15:30**

**Temperature-dependent synchrotron absorption measurements of MgO:LiNbO3**

**Speaker**

Ameera Jose

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 11 - Optoacoustics**

**Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Michael Steel

**16:00-16:30**

**Confining sound in superfluids via optomechanics**

**Speaker**

Mr Raymond Harrison

**16:30-16:45**

**Inducing guided long-wavelength acoustic waves in a non-suspended waveguide**

**Speaker**

Choon Kong Lai

**16:45-17:00**

**Superfluid Optomechanical Dissipative Solitons**

**Speaker**

Walter Wasserman

**17:00-17:15**

**How to Engineer Optomechanical Coupling Using NV Defects**

**Speaker**

Mikolaj Schmidt

**17:15-17:30**

**Modelling of noise in Brillouin-based storage and retrieval**

**Speaker**

Prof. Christopher Poulton

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 12 - Lasers**

**Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Helen Pask

**16:00-16:30**

**The mechanisms and limitations to ultrashort pulse emission from mid-infrared fibre lasers**

**Speaker**

Prof. Stuart Jackson

**16:30-16:45**

**Reverse-wave suppression in ring-resonator lasers**



**Speaker**

David Ottaway

16:45–17:00

**Lasing and amplification in titanium doped sapphire whispering gallery mode resonator**

**Speaker**

Luke Trainor

17:00–17:15

**Multi-Spatial Mode Readout Of Optical Cavities For Reduced Brownian Coating Thermal Noise**

**Speaker**

Andrew Wade

17:15–17:30

**Mode-locked Fibre Lasers in the Mid-Infrared Region**

**Speaker**

Claude Aguegaray

17:30

## Wednesday 14 December

11:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 13 - Nanophotonics 1

**Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Alexander Solntsev

11:00–11:30

#### Tunable Optical Metasurfaces with Amplitude and Phase Reconfigurability

**Speaker**

Dragomir Neshev

11:30–12:00

#### 3D Dynamic Tuning of Metasurfaces

**Speaker**

Yana Izdebskaya

12:00–12:15

#### Complete Conversion of Unpolarised to Polarised Light with Metasurfaces

**Speaker**

Neuton Li

12:30

11:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 14 - Microscopy and Imaging 1

**Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Dr Frédérique Vanholsbeeck

11:00–11:30

#### Quantitative imaging of nuclear architecture and DNA target search in a living cell

**Speaker**

Prof. Elizabeth Hinde

11:30–11:45

#### Raman Spectroscopy detection of clinically significant prostate cancer: unraveling new trends within a clinical trial

**Speaker**

Ms Suse J. van Breugel

11:45–12:00

#### Multimodal fibre-optic imaging probe for detection of atherosclerotic plaques using fluorescent nanoparticles

**Speaker**

Ms Rouyan Chen

12:00–12:15

#### Establishing the Bio-interface for Neural Electrophysiology with a Diamond Voltage Imaging Microscope

**Speaker**

Dr Daniel McCloskey

12:15–12:30

#### Phase contrast imaging with thin film notch filters

12:30

**Speaker**

Shaban Sulejman

14:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 15 - Nanophotonics 2****Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Igor Aharonovich

14:00–14:30

**Metasurface sorting of Orbital Angular Momentum Modes****Speaker**

judith dawes

14:30–14:45

**Photoswitching upconversion emission with high-energy irradiation****Speaker**

Simone Lamon

14:45–15:00

**Dielectric-plasmonic waveguide couplers: an explorer's map****Speaker**

Alessandro Tuniz

15:00–15:15

**Correlation between Crystal Size and Photo Luminescence Intensity of SiV Centres in HTHP Nanodiamonds****Speaker**

Taras Plakhotnik

15:15–15:30

**Asymmetric and nonreciprocal control of light with dielectric metasurfaces****Speaker**

Sergey Kruk

15:30

14:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 16 - Microscopy and Imaging 2****Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Brendan Kennedy

14:00–14:30

**All in a spin: rotational levitated optomechanics****Speaker**

Kishan Dholakia

14:30–14:45

**Spatial tomography of light resolved in time, spectrum and polarisation****Speaker**

Dr Martin Ploschner

14:45–15:00

**On-The-Fly Calculation of Holographic Masks to Generate Arbitrary Spatiotemporal Beams****Speaker**

Andrew Komonen

15:00–15:15

**Spatial reorganization of F-actin in respiratory cells as measured by Brillouin microscopy**

15:30

**Speaker**

Irina Kabakova

15:15–15:30

**Three-dimensional characterisation of cellular elasticity using quantitative micro elastography**

**Speaker**

Dr Matt Hepburn

16:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 17 - Nanophotonics 3**

**Session** | **Location:** Adelaide Convention Centre, Hall C | **Convener:** Lukas Wesemann

16:00–16:30

**Topological plasmonics: Ultrafast vector movies of plasmonic skyrmions on the nanoscale**

**Speaker**

Prof. Harald Giessen

16:30–16:45

**Electrical Control of Single Photon Emitters in Hexagonal Boron Nitride**

**Speaker**

Mr Simon White

16:45–17:00

**Probing Photon Correlation in Spontaneous Emission of Lanthanide Nanocrystals**

**Speaker**

Peng Ren

17:00–17:15

**Levitodynamics with optically active nanocrystals**

**Speaker**

Cyril Laplane

17:15–17:30

**Spectrally tunable metasurface filters for long-wavelength infrared range**

**Speaker**

Fedor Kovalev

17:30

## Thursday 15 December

11:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 18 - Fabrication and Integration 1

**Session** | **Location:** Adelaide Convention Centre, Room E2 | **Convener:** Baohua Jia

11:00-11:30

#### Semiconductor Nanowire Arrays for Photonic Integration

**Speaker**

Lan Fu

11:30-12:00

#### Photonic chip frequency combs - new technologies to measure almost anything

**Speaker**

Prof. Arnan Mitchell

12:00-12:15

#### Miniature Zero-index Metamaterial based on Steiner Tree Topological Photonic Crystal

**Speaker**

Dr Haoyi Yu

12:15-12:30

#### Optical bonding fibers to ZBLAN glass chip waveguides using a CO2 laser

**Speaker**

Dr Yongsop Hwang

12:30

11:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 19 - Nonlinear Optics 1

**Session** | **Location:** Adelaide Convention Centre, Room E3 | **Convener:** Martijn De Sterke

11:00-11:30

#### 3D meta-optics: a new platform for wavefront shaping and optical sensing

**Speaker**

Haoran Ren

11:30-11:45

#### Soliton linear-wave scattering and soliton multiplexing via bichromatic driving of a Kerr microresonator

**Speaker**

Pierce Qureshi

11:45-12:00

#### Nonlinear frequency up-conversion in high-Q GaP metasurfaces

**Speaker**

Rocio Camacho

12:00-12:15

#### Resonant harmonic generation from nonlinear dielectric metasurfaces

**Speaker**

Kirill Koshelev

12:15-12:30

**Silicon-Germanium Ring Resonator on-Chip with High Q-Factor in the Mid-Infrared****Speaker**

Marko Perestjuk

12:30

14:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 20 - Nonlinear Optics 2****Session** | **Location:** Adelaide Convention Centre, Hall C | **Convener:** Yana Izdebskaya

14:00-14:15

**Linear propagation of optical pulses with high-order dispersion****Speaker**

Martijn De Sterke

14:15-14:30

**Dispersion Engineering for Complete Coherent Conversion****Speaker**

Alexander Solntsev

14:30-14:45

**Exploring higher order dispersion: Families of exact soliton solutions****Speaker**

Yun Long Qiang

14:45-15:00

**Periodic Poling of Thin-Film Lithium Niobate for Quasi-Phase Matching****Speaker**

Aditya Dubey

15:00-15:15

**Characterising Solitons with Tuneable Multi-peak Spectra****Speaker**

Justin Widjaja

15:15-15:30

**Broadband Frequency Combs in Photonic-Belt Resonators****Speaker**

Vincent Ng

15:30

16:00

**Australian and New Zealand Conference on Optics and Photonics: ANZCOP 21 - Fabrication and Integration 2****Session** | **Location:** Adelaide Convention Centre, Hall C | **Convener:** Lan Fu

16:00-16:30

**New Approaches to Hybrid Fibers with Novel Functionalities for Sensing and Nonlinear Photonics Applications****Speaker**

Heike Ebendorff-Heidepriem

16:30-17:00

**2D materials for quantum integrated photonics****Speaker**

Sejeong Kim

17:00-17:15

**Optical Design, Simulation and Applications of 3d-printed Microoptics****Speaker**

Prof. Alois Herkommer

17:30

17:15-17:30

## Mid infrared optical waveguide couplers

### Speaker

TONEY teddy fernandez

## Friday 16 December

09:00

### Australian and New Zealand Conference on Optics and Photonics: ANZCOP 22 - Novel Materials

**Session** | **Location:** Adelaide Convention Centre, Hall C | **Convener:** Sejeong Kim

09:15–09:30

#### Development of a Fast-Scanning LiDAR System with High Spatial Resolution

**Speaker**

Mr Liam Sutton

09:30–09:45

#### Designer glasses for ultra-low loss optical waveguides for lightwave circuits

**Speaker**

TONEY teddy fernandez

09:45–10:00

#### Development of upconversion glass for true-3D tabletop display

**Speaker**

Yunle Wei

10:00–10:15

#### First Observation of Fluorescence above 1200 nm from a Silicon-Related Colour Centre in Diamond

**Speaker**

Mitchell de Vries

10:15–10:30

#### Deactivation of NV- color centers in glass-sandwiched diamond particles

**Speaker**

Wen Qi Zhang

10:30