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SPIE.

2016 BIOPHOTONICS AUSTRALASIA

TECHNICAL PROGRAMME

Conferences:
16–19 October 2016

Adelaide Convention Centre,
North Terrace
Adelaide, Australia

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SPIE. BIOPHOTONICS AUSTRALASIA

16–19 October 2016
Adelaide Convention Centre, North Terrace
Adelaide, Australia

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Welcome

SPIE BioPhotonics Australasia will provide an opportunity for a broad-ranging exploration of the use of interactions between light and biological systems, and applications of these approaches to provide advances in biomedicine and imaging.

SPIE BioPhotonics Australasia will connect people across scientific disciplines. The meeting will incorporate presentation and discussion of science in plenaries, themed sessions, speed science discussions, and industry engagement forums. The meeting will engage trainees to researcher leaders, chemists to biologists to clinicians to physicists, and academics, industry, and policy makers. A goal of this meeting is for every attendee to have had the opportunity to engage one-on-one with someone outside their science discipline and outside their respective industry (academia/industry/policy).

We have planned 3.5 days of information, networking, and enjoyment. We welcome you to Adelaide!



SYMPOSIUM CHAIRS



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The University
of Adelaide
(Australia)



Ewa M. Goldys
Macquarie
University
(Australia), Ctr.
for Nanoscale
BioPhotonics
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PLENARY PRESENTATIONS

Don't miss these world-class speakers presenting on the latest research.

Monday 17 October

Location: Adelaide Conv. Ctr., Hall M

09:00 to 10:30

Session Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia);
Ewa M. Goldys, Macquarie Univ. (Australia), Ctr. for Nanoscale BioPhotonics (Australia)

09:00 to 09:45

Neurophotonics Challenges: From Decoding Molecular Interactions at Synapses to Controlling Behaviour



Yves De Koninck,
Univ. Laval (Canada)

Abstract: One of the greatest challenges of modern science is to decipher how the brain processes information. The “neural code” defines how information about the outside world is represented in the electrical activity of neurons, which connect to form circuits of staggering complexity. These circuits have evolved to solve tasks far beyond the

reach of today's most powerful computers while using only the energy budget of a light bulb. To crack the neural code, the true enabling technologies will be those that bridge single cell molecular studies with whole animal physiology and behaviour. Light-based tools represent the disruptive enabling technologies in this endeavour. Yet, harnessing their full potential remains limited by properties of light such as diffraction, absorption, and scattering, which restrict resolution and depth of observation/intervention. Our ability to probe and control cellular and molecular events across the length and time scales that characterize brain function (from synapses to neuronal networks; from milliseconds to days) thus hinges on the development of novel techniques to deliver light and measure events with extreme sensitivity and precision. I will describe recent approaches we developed to undertake these challenges. At one end of the spectrum, to conduct quantitative analysis of molecular interactions in situ, we developed fluorescence fluctuation analysis techniques that yield measurements of densities and oligomerization states from tissue samples with previously unachieved precision. At the other end of the spectrum, we developed multimodal fibre optics-based tools with applications ranging from single cells optogenetics to accessing hard-to-reach areas of the nervous system.

MONDAY PLENARY PRESENTATIONS

Biography: **Yves De Koninck** is Professor of Psychiatry and Neuroscience at Laval University in Canada, Adjunct Professor of Pharmacology and Therapeutics at McGill University and Scientific Director of the Quebec Mental Health Institute and of the Sentinel North Initiative (sentinelnorth.ulaval.ca). He is also Director of Research of the Quebec Integrated Health and Social Services Centre. He founded the Quebec Pain Research Network (qprn.ca) and is a former President of the Canadian Association for Neuroscience (can-acn.org). He holds a Canada Research Chair in chronic pain and related brain disorders. He founded the Neurophysics training program (neurophysics.ca) and the Neurophotonics Centre (neurophotonics.ca) where physicists and neuroscientists converge to design novel, transformative technologies to probe and manipulate the brain. He also created the Neurophotonics Summer School and the Frontiers in Neurophotonics Symposium series (frontiersneurophotonics.org). For these transdisciplinary efforts he received the Jacques-Rousseau Prize from Association francophone pour le savoir. Fellow of the Canadian Academy of Health Sciences and of the Royal Society of Canada, he is recognized for his research on sensory mechanisms, especially as they pertain to pain, and for the design of novel technologies to probe the brain. He has participated in the transfer of several technologies to industry, trained over 70 students and post-docs, many of whom now holding academic and industrial positions in Canada and abroad, and served on multiple evaluation and advisory boards across the world.

The Brain of Humans and Experimental Animals



George Paxinos, Neuroscience Research Australia (Australia)

Abstract: Pre-Socratic philosophers rejected supernatural explanations for the existence of the physical world and the nature of the soul. These philosophers rejected gods and magic. Later Hippocrates said that men ought to know that from the brain, and only from it, derive our pleasures, happiness, laughter as well as pain and sorrow.

After the long battle to find the seat of the soul, psychology lost its soul in the 1930s. According to Hebb (1958), the mind is the integration of the activity of the neurons of the brain. That is, there is no ghost in the machine. If the relation between brain and behavior is 1 to 1, then there is no need to hypothesize the presence of the soul to understand behavior and modify it.

We have constructed two types of brain atlases: histological and MRI. Standard atlases using identical nomenclature enable scientists to navigate seamlessly between the brain of humans and experimental animals to test hypotheses inspired by human considerations and relate data from experimental animals to humans.

In the histological atlases, we make use of genes that are responsible for the segmentation of the brain in development (hox genes). Using evidence from transgenic mice and birds we are proposing a new plan for the organization and function of certain brain regions of mammals. The brainstem, for instance, can no longer be considered as a container of haphazardly arranged nuclei (as potatoes in a sac), but instead as regions which co-vary (start and end) with their neighbours.

The human brain features many more homologies with the brain of monkey (eg, virtually all areas of the cortex are homologous), of the rat and of the bird than previously thought. Areas which are shown to be homologous are likely to have similar function as for example are 9/46 of the prefrontal cortex which is homologous in human and monkey and is involved in executive processing in working memory in both species.

Using MR images in mice and non-human primates we are providing 3D volumes of canonical brains against which transgenic varieties with clinical significance can be compared.

Finally, the human brain contains homologous parts to brains of reptiles and conflicts between human societies and the extinctions caused by humans may be in part attributable to this heredity.

Biography: **George Paxinos** was borne on Ithaca Greece and studied at the University of California at Berkeley, McGill and Yale. He is currently an NHMRC Senior Principal Research Fellow at Neuroscience Research Australia. He published 46 scientific books and a novel. His *Rat Brain in Stereotaxic Coordinates* is the third most cited book in science. He served as president of the Australian Neuroscience Society and of the IBRO World Congress of Neuroscience.

TUESDAY PLENARY PRESENTATIONS

Tuesday 18 October

Location: Adelaide Conv. Ctr., Hall M

09:00 to 10:30

Session Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia);
Ewa M. Goldys, Macquarie Univ. (Australia), Ctr. for Nanoscale BioPhotonics (Australia)

09:00 to 09:45

Light-sheet Based Raman Imaging



Rainer Heintzmann,

Leibniz-Institut für Photonische Technologien e.V.
(Germany)

Abstract: Two recently developed modes of lightsheet imaging will be presented. Lightwedge microscopy aims at mesoscopic imaging of fixed and optically cleared samples at $1\ \mu\text{m}$ isotropic resolution without the need for sample rotation. The key-idea is to focus a lightsheet at an unusually high NA (thus the name “lightwedge”) and still obtain a large field of view due to refocusing of the lightwedge and stitching the multiple small regions of thin illumination back together. This has been simplified by electrical tunable lens technology which has become available recently.

The second mode is hyperspectral Raman imaging in a lightsheet illumination configuration^[1]. To recover the spectral information a full-field Fourier-spectroscopic approach has been chosen. The difficulty here is that in a Michelson approach, it would be technically very hard to maintain the angular stability and common path approaches usually tolerate a relatively low product of étendue and maximal optical path difference. We thus developed an optically stable Mach-Zehnder like scheme based on the use of retro-reflecting corner cubes, which is inherently stable. This enabled us to obtain full spectrally-resolved Raman images consisting of over four million spectra in about 10 minutes. Advantages over the conventional Raman imaging are the reduced maximum power on the sample and out of focus heating, the lightsheet-inherent good suppression of crosstalk from the illumination side and the avoidance of glass close to the sample mounting.

Light sheet illumination for Raman imaging at few specific wavelengths was previously reported ^[2].

With a total laser power of 2 W at an illumination wavelength of 577 nm, we obtained images (2048×2048 pixels) of polystyrene beads, zebrafish and a root cap of a snowdrop at a spectral resolution of $4.4\ \text{cm}^{-1}$ with only few

minutes of exposure. The olefinic and aliphatic C-H stretching modes, as well as the fingerprint region are clearly visible along with the broad water peak of the embedding medium.

Spectrally resolved spontaneous Raman microscopy therefore promises high-throughput imaging for biomedical research and on-the-fly clinical diagnostics.

The work on hyperspectral Raman imaging was supported by a grant of the Carl-Zeiss-Stiftung.

References:

- [1] W. Müller, M. Kielhorn, M. Schmitt, J. Popp, R. Heintzmann, Light sheet Raman micro-spectroscopy, *Optica* 3, 452-457, 2016.
- [2] Ishan Barman, Khay Ming Tan, Gajendra Pratap Singh, "Optical sectioning using single-plane-illumination Raman imaging", *J. Raman Spectrosc.*, 41, 1099-1101 (2010)

Biography: **Rainer Heintzmann** did his doctoral thesis at the University of Heidelberg and worked as a PostDoc at the Max Planck Institute of Biophysical Chemistry in Göttingen. He is currently professor of physical chemistry at the Friedrich-Schiller University Jena, and heads a research unit at the Leibniz Institute of Photonic Technology in Jena, Germany. His research focuses on imaging cellular function at high resolution and developing techniques to measure multidimensional information in small biological objects such as cells, cellular organelles or other small structures of interest. A further interest is in computer-based reconstruction methods. He published >80 articles in peer-reviewed scientific journals.

09:45 to 10:30

In vivo Multiphoton Imaging of Mouse Brain



Chris Xu,
Cornell Univ. (USA)

Abstract: Over the last two decades, multiphoton microscopy has created a renaissance in the brain imaging community. It has changed how we visualize neurons by providing high-resolution, non-invasive imaging capability deep within intact brain tissue. Multiphoton imaging will likely play an essential role in understanding how the brain works at the level of neural circuits, which will provide a bridge between microscopic interactions at the neuronal level and the complex computations performed at larger scales. In this talk, the fundamental challenges of deep tissue, high-resolution optical imaging are discussed. New technologies for in vivo structural and functional imaging of mouse brain using long wavelength excitation and three-photon microscopy will be presented. We will discuss the requirements for imaging the dynamic

TUESDAY PLENARY PRESENTATIONS

neuronal activity at the cellular level over a large area and depth in awake and behaving animals. We will speculate on the possible future directions to further improve the imaging depth and speed in biological tissues.

Biography: **Chris Xu** is a Professor at the School of Applied and Engineering Physics, Cornell University, and the Mong Family Foundation Director, Cornell Neurotech. Prior to Cornell, he was a Member of Technical Staff at Bell Laboratories. He received his Ph.D. in Applied Physics from Cornell University. His current research areas are biomedical imaging and fiber optics. His research is supported by major grants from NIH, NSF, DARPA, and IARPA. Dr. Xu has chaired or served on numerous conference organization committees and NSF/NIH review panels. He has published more than 100 journal papers (including 7 invited review articles) and 8 book chapters. He has 28 patents granted or pending. He has won the NSF CAREER award, Bell Labs team research award, and the Tau Beta Pi and two other teaching awards from Cornell Engineering College. He is a fellow of the Optical Society of America, and a fellow of the National Academy of Inventors.

WEDNESDAY PLENARY PRESENTATIONS

Wednesday 19 October

Location: Adelaide Conv. Ctr., Hall M

09:00 to 10:30

Session Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia);
Ewa M. Goldys, Macquarie Univ. (Australia), Ctr. for Nanoscale BioPhotonics (Australia)

09:00 to 09:45

Advances for Imaging Tissue Composition and Microstructures with Endoscopic OCT



Brett E. Bouma,
Harvard Medical School (USA) and Massachusetts General Hospital (USA)

Biography: **Brett E. Bouma, PhD**, is a Professor of Dermatology and Health Sciences and Technology at Harvard Medical School and an Physicist in the Wellman Center for Photomedicine at the Massachusetts General Hospital. His doctoral dissertation research, in the physics department of the University of Illinois, Chicago, focused on understanding

the interaction of ultrafast laser pulses with optical materials and plasmas.

Following the completion of his graduate work, he entered a post-doctoral fellowship in the EECS department at MIT where he continued his work with ultrafast lasers and began to explore applications in medicine and biology. Since starting a lab at MGH in 1998, he has focused his research on the development and clinical application of novel optical technologies for diagnosis and therapy. Professor Bouma is a Fellow of the Optical Society of America.

09:45 to 10:30

Path, Present, and Future



Richard M. Levenson,
Univ. of California, David (USA)

Abstract: How microscopes work in actual clinical pathology has not changed materially in well over a century. Recently, however, a number of new approaches that combine the utility, affordability and ease of use are beginning to emerge, and some may eventually find their way into the mainstream. One will be described in detail: Microscopy with Ultraviolet

WEDNESDAY PLENARY PRESENTATIONS

Surface Excitation. MUSE is a rapid approach for obtaining high-resolution, diagnostic-quality histological images from unsectioned thick tissue specimens. Although conventional histology requires extensive tissue processing and thin physical sectioning, this requirement can be circumvented if optically sectioned images can be acquired free from the blur contributed by out-of-focus regions. Other methods for obtaining high-quality images from thick tissue are certainly available. MUSE is notable for its optical and mechanical simplicity. Micron-deep images of the specimen surface are generated with 280-nm UV excitation provided by off-axis light-emitting diodes (LEDs). Excitation with such short-wavelength UV light excites a wide range of exogenous dyes with very large Stokes shifts, and the resulting visible-band fluorescence images can be captured using ordinary microscopic optics and standard CMOS or CCD cameras. These fluorescence images can then be converted computationally to resemble conventional hematoxylin- and eosin-staining. Preparing a sample for MUSE imaging can be performed in around a minute. With appropriate stage travel, extended fields of view can be captured from whole organs with microscopic detail. This non-destructive process leaves the sample intact for subsequent downstream molecular or genetic analysis. In addition, images can include shading and depth cues that reveal surface profiles important in understanding the three-dimensional organization of complex specimens. This inexpensive, rapid and slide-free, sample-sparing method has potential to replace frozen sections, and may have other applications in both high- and low-resource settings.

Biography: **Richard Levenson**, MD is Professor and Vice Chair for Strategic Technologies in the Department of Pathology and Laboratory Medicine at the University of California, Davis. He received his BA in History and Literature at Harvard College, and MD at the University of Michigan. After anatomic pathology training at Washington University, St. Louis and a Cancer Research fellowship at the University of Rochester, he became Asst. Professor in Pathology at Duke University and Board-certified in anatomic pathology. He then moved to the NSF Center for Light Microscope Imaging and Biotechnology at Carnegie Mellon University, with a focus on applications of optics in pathology. Dr. Levenson joined Cambridge Research and Instrumentation, Inc. (CRI—now part of PerkinElmer) in Boston, eventually becoming Vice President for Research before taking his current position at UC Davis in 2012. His research interests include highly multiplexed imaging of molecular markers using secondary ion mass spectrometry, machine-learning software, novel optical designs for high-speed characterization of surgical biopsies, cancer immunotherapy, and technologies for performing digital autopsies. He is also directs a health informatics graduate seminar series. He is an inventor with a number of issued patents in optical imaging and machine learning, and is co-founder and CEO of a start-up company commercializing a novel microscopy system. He serves on journal editorial boards, is a frequent grant reviewer for the NIH and NSF, and organizes conferences and symposia. His recent published work on pigeons as trainable medical image observers garnered world-wide and somewhat bemused publicity.

SPECIAL EVENTS

Join your peers and colleagues at these special events: Conference dinner and cocktail receptions. Enjoy group discussions around focused technical topics at the interactive poster sessions.

Welcome Reception

Sunday 16 October 2016 · 17:30 to 19:30

Location: Adelaide Conv. Ctr., Foyer M and Room N

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Pre-registered attendees are welcome to pick up their badge and invited to relax, socialise, and enjoy light refreshments.

MONDAY POSTER SESSION:

BioPhotonics

Monday 17 October 2016 · 15:30 to 17:00

Location: Adelaide Conv. Ctr., Hall N

Posters will be required to be dropped at the Registration Desk by no later than 16:00 Sunday, 16 October.

All registered symposium attendees are invited to attend the Monday poster session provided as an opportunity to enjoy networking while reviewing poster papers. The interactive poster session is designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high quality papers that are presented in this alternate format and to interact with the poster authors.

Industry Cocktail Networking Event

Monday 17 October 2016 · 17:30 to 19:00

Location: The Univ. of Adelaide, Ingkarni Wardli Bldg., Level 7

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Dr. Paul Willis, Director of RiAus and CNBP Advisory Board member will engage with industry, government, and political key players with academics to raise the research and development collaboration discussion.

SPECIAL EVENTS



TUESDAY POSTER SESSION:

Fibre Sensing and Medical Imaging

Tuesday 18 October 2016 · 16:00 to 17:30

Location: Adelaide Conv. Ctr., Hall N

Posters will be required to be dropped at the Registration Desk by no later than 16:00 Sunday, 16 October

All registered symposium attendees are invited to attend the Monday poster session provided as an opportunity to enjoy networking while reviewing poster papers. The interactive poster session is designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high quality papers that are presented in this alternate format and to interact with the poster authors.

Conference Dinner

Tuesday 18 October 2016 · 19:00 to 22:00

Location: Adelaide Conv. Ctr., Panorama Ballroom, West Bldg.

All registered attendees are invited to attend. Tickets are \$120 and can be purchased during registration.

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DAILY EVENT SCHEDULE

SUNDAY 16 October		
Welcome Reception, 17:30 to 19:30, p. 13		
MONDAY 17 October		
PLENARY PRESENTATION: Neurophotonics Challenges: From Decoding Molecular Interactions at Synapses to Controlling Behaviour , Yves De Koninck, 09:00 to 9:45, p.5		
PLENARY PRESENTATION: The Brain of Humans and Experimental Animals , George Paxinos, 09:45 to 10:30, p.7		
SESSIONS 1A, 1B, AND 1C RUN CONCURRENTLY		
SESSION 1A: Advanced Imaging and Raman Sensing Session Chairs: Yves De Koninck, Univ. Laval (Canada); Steve Lee, The Australian National Univ. (Australia), 11:00 to 12:25, p. 19	Session 1B: Applications of Fibre Sensing I Session Chair: Tong Sun, City Univ. London (United Kingdom), 11:00 to 12:25, p. 20	Session 1C: Optical Coherence Tomography Session Chairs: Richard M. Levenson M.D., Univ. of California, Davis (USA); David D. Sampson, The Univ. of Western Australia (Australia), 11:00 to 12:25. p. 22
Lunch Break · 12:25 to 13:30		
SESSIONS 2A, 2B, AND 2C RUN CONCURRENTLY		
SESSION 2A: Nanostructures and Fluidics I Session Chairs: Kishan Dholakia, Univ. of St. Andrews (United Kingdom); Brant C. Gibson, RMIT Univ. (Australia), 13:30 to 15:00, p. 23	SESSION 2B: Applications of Fibre Sensing II Session Chairs: Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany); Tanya M. Monro, The Univ. of Adelaide (Australia), 13:30 to 15:00, p. 24	SESSION 2C: OCT and Related Technologies Session Chair: George Paxinos, Neuroscience Research Australia (Australia), 13:30 to 15:00, p. 25
MONDAY POSTER SESSION: BioPhotonics · 15:30 to 17:00, p. 26		
Industry Cocktail Networking Event · 17:30 to 19:00, p. 13		

DAILY EVENT SCHEDULE

TUESDAY 18 October		
PLENARY PRESENTATION: Light-sheet Based Raman Imaging , Rainer Heintzmann, 09:00 to 9:45, p. 8		
PLENARY PRESENTATION: In vivo Multiphoton Imaging of Mouse Brain , Chris Xu, 09:45 to 10:30, p. 9		
SESSION 3A: Industry and Research Talk BioPhotonics , 11:00 to 12:30, p. 30		
SESSIONS 4A, 4B, AND 4C RUN CONCURRENTLY		
SESSION 4A: Nanomaterials for BioPhotonics , Session Chair: Dayong Jin, Univ. of Technology, Sydney (Australia), 14:00 to 15:30, p. 31	SESSION 4B: Fibre Sensing Technologies , Session Chair: Andre N. Luiten, The Univ. of Adelaide (Australia), 14:00 to 15:30, p. 33	SESSION 4C: Advanced Microscopy in Medicine : Session Chairs: Rainer Heintzmann, Leibniz-Institut für Photonische Technologien e.V. (Germany); Marie-Claude Gregoire, Australian Nuclear Science and Technology Organisation (Australia), 14:00 to 15:30, p. 34
TUESDAY POSTER SESSION: Fibre Sensing and Medical Imaging · 16:00 to 17:30, p. 35		
Conference Dinner · 19:00 to 22:00, p. 14		

WEDNESDAY 19 October

PLENARY PRESENTATION: **Advances for Imaging Tissue Composition and Microstructures with Endoscopic OCT**,

Brett E. Bouma, 9:00 to 9:45, p. 11

PLENARY PRESENTATION: **Path, Present, and Future**, Richard M.

Levenson, 09:45 to 10:30, p. 11

SESSIONS 5A, 5B, AND 5C RUN CONCURRENTLY

SESSION 5A:

Nanostructures and Fluidics II, Session

Chairs: Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia); Anita Mahadevan-Jansen, Vanderbilt Univ. (USA), 11:30 to 13:00, p. 39

SESSION 5B:

Chemical Aspects of Fibre Sensing,

Session Chairs: Tomáš Cižmár, Univ. of Dundee (United Kingdom); Alexandre François, Univ. of South Australia (Australia), 11:30 to 13:00, p. 40

SESSION 5C:

Medically Relevant BioPhotonic Technologies,

Session Chair: Gary F. Egan, The Univ. of Melbourne (Australia), 11:30 to 13:00, p. 41

CONFERENCE 10013

Monday–Wednesday 17–19 October 2016
Proceedings of SPIE Vol. 10013

SPIE BioPhotonics Australasia

Conference Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia); **Ewa M. Goldys**, Macquarie Univ. (Australia), Ctr. for Nanoscale BioPhotonics (Australia)

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CONFERENCE 10013

MONDAY 17 OCTOBER

WELCOME

Location: Adelaide Convention Ctr. Hall M 8:50 to 9:00

Session Chair: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia)

MONDAY PLENARY SESSION

Room: Adelaide Convention Ctr. Hall M . Mon 9:00 to 10:30

Session Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia);
Ewa M. Goldys, Macquarie Univ. (Australia), Ctr. for Nanoscale
Biophotonics (Australia)

9:00: Neurophotonics challenges: from decoding molecular interactions at synapses to controlling behaviour (*Plenary*),
Yves De Koninck, Univ. Laval (Canada) [10013-500]

9:45: The brain of humans and experimental animals
(*Plenary*), George Paxinos, Neuroscience Research Australia
(Australia) [10013-501]

Morning Tea Mon 10:30 to 11:00

SESSIONS 1A, 1B, AND 1C RUN CONCURRENTLY.

SESSION 1A

Location: Adelaide Convention Ctr. Hall M Mon 11:00 to 12:25

Advanced Imaging and Raman Sensing

Session Chairs: **Yves De Koninck**, Univ. Laval (Canada);
Steve Lee, The Australian National Univ. (Australia)

11:00: Multimodal second harmonic generation and two photon fluorescence imaging of microdomain calcium contraction coupling in single cardiomyocytes (*Invited Paper*), James W. Chan, Univ. of California, Davis (United States) [10013-1]

11:25: Predicting embryo quality using label free-diagnostics of metabolism, Melanie L. Sutton-McDowall, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Martin E. Gosnell, Quantitative Pty. Ltd. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Ayad G. Anwer, Ewa M. Goldys, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Jeremy G. Thompson, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia) [10013-2]

CONFERENCE 10013

- 11:40: **Using hyperspectral imaging of endogenous fluorescent metabolic molecules to identify pain states in central nervous system tissue**, Vasiliki Staikopoulos, The Univ. of Adelaide (Australia); Martin E. Gosnell, Macquarie Univ. (Australia) and Quantitative Pty. Ltd. (Australia); Ayad G. Anwer, Macquarie Univ. (Australia); Sanam Mustafa, Mark R. Hutchinson, The Univ. of Adelaide (Australia); Ewa M. Goldys, Macquarie Univ. (Australia) [10013-3]
- 11:55: **Chemical quenching of NADH in HeLa cells revealed through hyperspectral imaging and unmixing of cell auto fluorescence**, Aziz ul Rehman, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and National Institute of Lasers and Optronics (Pakistan); Ayad G. Anwer, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Martin E. Gosnell, Macquarie Univ. (Australia) and Quantitative Pty. Ltd. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Saabah B. Mahbub, Guozhen Liu, Ewa M. Goldys, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) . . . [10013-4]
- 12:10: **Snapshot hyperspectral camera for functional biological imaging**, Tomasz S. Tkaczyk, Rice Univ. (United States). [10013-5]
- Lunch Break Mon 12:25 to 13:30

SESSIONS 1A, 1B, AND 1C RUN CONCURRENTLY.

SESSION 1B

Location: Adelaide Convention Ctr.

Riverview Room 7 Mon 11:00 to 12:25

Applications of Fibre Sensing I

Session Chair: **Tong Sun**, City Univ. London (United Kingdom)

- 11:00: **Optical medical imaging: from glass to man** (*Invited Paper*), Mark Bradley, The Univ. of Edinburgh (United Kingdom) [10013-6]
- 11:25: **Multimode fibre based endoscopy: current progress and challenges**, Martin Plöschner, Macquarie Univ. (Australia) and Univ. of Dundee (United Kingdom); Tomas Cizmar, Martin V. G. Kristensen, Univ. of Dundee (United Kingdom); Tomáš Tyc, Masaryk Univ. (Czech Republic); Denitza Denkova, Ewa M. Goldys, Macquarie Univ. (Australia) . . . [10013-7]

CONFERENCE 10013

11:40: Biosensors for detecting stress in developing embryos, Malcolm S. Purdey, The Univ. of Adelaide (Australia) and South Australian Health and Medical Research Institute (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Avishkar Saini, Hanna J McLennan, University of Adelaide (Australia) and ARC Centre for Nanoscale Biophotonics (CNBP) (Australia); Benjamin J. Pullen, South Australian Health & Medical Research Institute (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and The Univ. of Adelaide (Australia); Erik P. Schartner, Melanie L. Sutton-McDowall, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Tanya M. Monro, The Univ. of Adelaide (Australia) and The Univ. of South Australia (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Jeremy G. Thompson, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Stephen J. Nicholls, South Australian Health & Medical Research Institute (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and The Univ. of Adelaide (Australia); Andrew D. Abell, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia). [10013-8]

11:55: A spatial ELISA based on gold nanoparticle modified optic fiber for probing cytokine IL-6, Kaixin Zhang, Guozhen Liu, Annemarie Nadort, Ayad G. Anwer, Ewa M. Goldys, Macquarie Univ. (Australia). . . [10013-118]

Lunch Break Mon 12:25 to 13:30

12:10: Raman imaging of biofilms using gold sputtered fiber optic probes, Christina Grace Charlet Christopher, Hariharan Manoharan, Aryasomayajula Subrahmanyam, V. V. Raghavendra Sai, Indian Institute of Technology Madras (India) [10013-10]

CONFERENCE 10013

SESSIONS 1A, 1B, AND 1C RUN CONCURRENTLY.

SESSION 1C

Location: Adelaide Convention Ctr.

Riverview Room 8 Mon 11:00 to 12:25

Optical Coherence Tomography

Session Chairs: **Richard M. Levenson M.D.**,
Univ. of California, Davis (United States); **David D. Sampson**,
The Univ. of Western Australia (Australia)

11:00: **Parametric extensions of optical coherence tomography**
(Invited Paper), David D. Sampson, The Univ. of Western Australia
(Australia) [10013-11]

11:25: **Optical coherence tomography attenuation imaging for lipid
core detection: validation and serial clinical imaging**, Gijs van Soest,
Muthukaruppan Gnanadesigan, Antonios Karanasos M.D., Erasmus MC
(Netherlands); Steve White, Univ. of Bristol (United Kingdom); Antonius
F. W. van der Steen, Erasmus MC (Netherlands); Bu-Chun Zhang M.D.,
Erasmus MC (Netherlands) and Xuzhou Medical Univ. (China); Tom W.
Johnson M.D., Bristol Heart Institute (United Kingdom); Evelyn Regar M.D.,
Erasmus MC (Netherlands) [10013-12]

11:40: **Label-free imaging of cutaneous lymphatic vessels in human
burn scars using optical coherence tomography**, Peijun Gong,
Shaghayegh Es'haghian, The Univ. of Western Australia (Australia);
Karl-Anton Harms, Alexandra Murray, Royal Perth Hospital (Australia);
Suzanne Rea, Fiona M. Wood M.D., David D. Sampson, The Univ. of
Western Australia (Australia); Robert A. McLaughlin, The Univ. of Adelaide
(Australia) [10013-13]

11:55: **Full-range complex swept-source polarisation-sensitive optical
coherence tomography**, Qingyun Li, Karol Karnowski, The Univ. of
Western Australia (Australia); Martin Villiger, Harvard Medical School (United
States) and Massachusetts General Hospital (United States); Dirk Lorenser,
David D. Sampson, The Univ. of Western Australia (Australia) . . . [10013-14]

12:10: **Optical coherence micro-elastography for imaging breast
cancer on the micro-scale: towards intraoperative deployment**,
Brendan F. Kennedy, Wesley M. Allen, Lixin Chin, Philip Wijesinghe,
The Univ. of Western Australia (Australia); Bruce Latham, PathWest Lab.
Medicine WA (Australia); Christobel M. Saunders, David D. Sampson, The
Univ. of Western Australia (Australia) [10013-15]

Lunch Break Mon 12:25 to 13:30

SESSIONS 2A, 2B, AND 2C RUN CONCURRENTLY.

SESSION 2A

Location: Adelaide Convention Ctr. Hall M Mon 13:30 to 15:00

Nanostructures and Fluidics I

Session Chairs: **Kishan Dholakia**, Univ. of St. Andrews (United Kingdom);
Brant C. Gibson, RMIT Univ. (Australia)

13:30: Rapid detection of microbial pathogens based on time-gated luminescence bioprobes, Nima Sayadi, Russell Connally, Thomas Lawson, Macquarie Univ. (Australia); Jingli Yuan, Dalian Univ. of Technology (China); Nicolle H. Packer, James A. Piper, Macquarie Univ. (Australia) [10013-16]

13:45: High-speed multiphoton imaging, Woei Ming Lee, Yongxiao Li, A. Brustle, V. Gautam, Ian Cockburn, C. Gillespie, The Australian National Univ. (Australia); Katharina Gaus, The Univ. of New South Wales (Australia) [10013-17]

14:00: Using photobleaching to your advantage, Antony Orth, Timothy Doughney, Philipp Reineck, RMIT Univ. (Australia); Hannah Brown, Jeremy G. Thompson, The Univ. of Adelaide (Australia); Brant C. Gibson, RMIT Univ. (Australia) [10013-18]

14:15: Measurements of vitamin B12 in human blood serum using resonance Raman spectroscopy, Georgios Tsiminis, Erik P. Schartner, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia) and Institute for Photonics and Advanced Sensing (Australia); Joanna L. Brooks, The Univ. of Adelaide (Australia); Mark R. Hutchinson, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia) and Institute for Photonics and Advanced Sensing (Australia) [10013-19]

14:30: Raman optical activity (ROA) for the conformational analysis of biological molecules, Ewan W. Blanch, Saeideh Ostovar Pour, RMIT Univ. (Australia) [10013-20]

14:45: Does it ever pay to measure nothing?, Daniel W. Drumm, Andrew D. Greentree, RMIT Univ. (Australia) [10013-21]

Afternoon Tea Mon 15:00 to 15:30

CONFERENCE 10013

SESSIONS 2A, 2B, AND 2C RUN CONCURRENTLY.

SESSION 2B

Location: Adelaide Convention Ctr.

Riverview Room 7 Mon 13:30 to 15:00

Applications of Fibre Sensing II

Session Chairs: **Jürgen Popp**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Tanya M. Monro**, The Univ. of Adelaide (Australia)

13:30: **Remote nanodiamond magnetometry**, Yinlan Ruan, The Univ. of Adelaide (Australia); David A. Simpson, The Univ. of Melbourne (Australia); Jan Jeske, RMIT Univ. (Australia); Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia); Desmond M. W. Lau, RMIT Univ. (Australia); Hong Ji, The Univ. of Adelaide (Australia); Brett C. Johnson, The Univ. of Melbourne (Australia); Takeshi Ohshima, National Institutes for Quantum and Radiological Science and Technology (Japan); Shahraam Afshar Vahid, Univ. of South Australia (Australia); Lloyd C. L. Hollenberg, The Univ. of Melbourne (Australia); Tanya M. Monro, The Univ. of South Australia (Australia); Brant C. Gibson, RMIT Univ. (Australia) [10013-22]

13:45: **A portable optical fiber probe for in vivo brain temperature measurements**, Stefan Musolino, Erik P. Schartner, Georgios Tsiminis, Abdallah Salem, The Univ. of Adelaide (Australia); Tanya M. Monro, Univ. of South Australia (Australia); Mark R. Hutchinson, The Univ. of Adelaide (Australia) [10013-23]

14:00: **Imaging voltage activity across neuron networks**, Soroush Shahnia, Laser Physics and Photonic Devices Labs. (Australia); Roman Kostecky, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Junaiz Rehman, Sam Rudd, Peter J. Murphy, David Lancaster, Univ. of South Australia (Australia); Tanya M. Monro, The Univ. of Adelaide (Australia) and The Univ. of South Australia (Australia); Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Drew Evans, Shahraam Afshar Vahid, Univ. of South Australia (Australia) [10013-24]

14:15: **Computational modeling of a novel liquid crystal-based optrode**, Leonardo Silvestri, Amr Al Abed, Hrishikesh Srinivas, The Univ. of New South Wales (Australia); Han Wang, Univ. of New South Wales (Australia); Nigel H. Lovell, Francois J. Ladouceur, The Univ. of New South Wales (Australia) [10013-25]

CONFERENCE 10013

14:30: **Real-time dose monitoring of cyclotron produced 16 MeV proton beams using fibre optic systems**, Johan Asp, South Australian Health & Medical Research Institute (Australia) and The Univ. of South Australia (Australia); Alexandre Santos, The Univ. of Adelaide (Australia) and Royal Adelaide Hospital (Australia); Shahraam Afshar Vahid, Univ. of South Australia (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Eva Bezak, Univ. of South Australia (Australia) and The Univ. of Adelaide (Australia) [10013-26]

14:45: **Immunogold-silver staining (IGSS) based U-bent fiberoptic sandwich biosensor**, Ramakrishna Bandaru, V. V. Raghavendra Sai, Indian Institute of Technology Madras (India) [10013-27]

Afternoon Tea Mon 15:00 to 15:30

SESSIONS 2A, 2B, AND 2C RUN CONCURRENTLY.

SESSION 2C

Location: Adelaide Convention Ctr.

Riverview Room 8 Mon 13:30 to 15:00

OCT and Related Technologies

Session Chair: **George Paxinos**, Neuroscience Research Australia (Australia)

13:30: **Swept source OCT system for combined polarization sensitive and elastography measurements**, Karol Karnowski, Qingyun Li, Philip Wijesinghe, The Univ. of Western Australia (Australia); Fabio Feroldi, Vrije Univ. Amsterdam (Netherlands); Martin Villiger, Wellman Ctr. for Photomedicine (United States) and Harvard Medical School (United States) and Massachusetts General Hospital (Australia); Dirk Lorensen, Cylite Pty Ltd. (Australia) and The Univ. of Western Australia (Australia); Brendan F. Kennedy, David D. Sampson, The Univ. of Western Australia (Australia) [10013-28]

13:45: **Photoacoustic imaging of human atherosclerosis in the coronary and carotid arteries**, Gijs van Soest, Min Wu, Mirjam Visscher, Erasmus MC (Netherlands); Verva Daeichin, Erasmus MC (Netherlands) and Delft Univ. of Technology (Netherlands); Pieter Kruizinga, Heleen M. M. van Beusekom, Erasmus MC (Netherlands); Krista Jansen, Erasmus MC (Netherlands) and Vrije Univ. (Netherlands); Antonius F. W. van der Steen, Erasmus MC (Netherlands) and Delft Univ. of Technology (Netherlands) [10013-29]

CONFERENCE 10013

- 14:00: **Flexible needle probe for optically guided tissue aspiration**, Jiawen Li, Bryden C. Quirk, The Univ. of Adelaide (Australia); Peter B. Noble, The Univ. of Western Australia (Australia); Rodney W. Kirk, The Univ. of Adelaide (Australia); David D. Sampson, The Univ. of Western Australia (Australia); Robert A. McLaughlin, The Univ. of Adelaide (Australia) [10013-30]
- 14:15: **Cellular-scale elasticity imaging using ultrahigh-resolution optical coherence elastography**, Philip Wijesinghe, Andrea Curatolo, Qi Fang, Karol Karnowski, David D. Sampson, Brendan F. Kennedy, The Univ. of Western Australia (Australia) [10013-31]
- 14:30: **Plasmonic nanoantenna hydrophones**, Ivan S. Maksymov, Andrew D. Greentree, RMIT Univ. (Australia) [10013-32]
- 14:45: **From qualitative to quantitative blood flow imaging in laser speckle flowmetry**, Annemarie Nadort, Macquarie Univ. (Australia); Koen Kalkman, Ton G. van Leeuwen, Dirk J. Faber, Univ. of Amsterdam (Netherlands) [10013-33]
- Afternoon Tea Mon 15:00 to 15:30

MONDAY POSTER SESSION

Location: Adelaide Convention Ctr. Hall N Mon 15:30 to 17:00

BioPhotonics

- Evaluation on mitigative effect of ELF-PEF on maize seedling root under drought stress based on biophotonics technology**, Ruirui He, Gang Xi, Kai Liu, Yanyan Zhao, Cheng Liang, Xi'an Univ. of Technology (China) [10013-70]
- Towards controlled positioning of nanodiamond arrays for photonic applications**, Ashleigh H. Heffernan, Andrew D. Greentree, Brant C. Gibson, RMIT Univ. (Australia) [10013-73]
- Applications of stereolithography for rapid prototyping of biologically-compatible chip-based physiometers**, Nurul M. Fuad, Feng Zhu, RMIT Univ. (Australia); Jan Kaslin, Monash Univ. (Australia); Donald Wlodkowic, RMIT Univ. (Australia) [10013-74]
- Optical tracking of embryonic vertebrates behavioural responses using automated time-resolved video-microscopy system**, Milanga Walpitagama, RMIT Univ. (Australia); Jan Kaslin, Monash Univ. (Australia); Dayanthi Nugegoda, Donald Wlodkowic, RMIT Univ. (Australia) . [10013-75]
- Ultra-weak photon emission in germination process of sorghum seeds**, Kai Liu, Rui Rui He, Gang Xi, Ning Mei Yu, Xi'an Univ. of Technology (China) [10013-76]

Adaptive spatial filtering for off-axis digital holographic microscopy based on region-recognition approach with iterative thresholding, Xuefei He, Chuong V. Nguyen, Mrinalini Pratap, Yujie Zheng, Yi Wang, David Nisbet, Melanie Rug, Alexander Maier, Woei Ming Lee, The Australian National Univ. (Australia) [10013-77]

Spectrum-tuneable micro-LED array for biological fluorescence excitation, Hua Yang, Jing Li, Ran Yao, Institute of Semiconductors (China) and Beijing Engineering Research Ctr. for the 3rd Generation Semiconductor Materials and Application (China) and State Key Lab. of Solid State Lighting (China); Changbin Song, Institute of Semiconductors (China) and State Key Lab. of Solid State Lighting (China) and Beijing Engineering Research Ctr. (China); Xiaoyan Yi, Institute of Semiconductors (China) and Beijing Engineering Research Ctr. for the 3rd Generation Semiconductor Materials and Application (China) and State Key Lab. of Solid State Lighting (China). [10013-78]

Optofluidic technology for monitoring rotifer *Brachionus calyciflorus* responses to regular light pulses, Rhys Cartlidge, RMIT Univ. (Australia); Olivia Campana, University of York (United Kingdom); Dayanthi Nugegoda, Donald Wlodkowic, RMIT Univ. (Australia) [10013-79]

Integrated optofluidic system for highly sensitive detection of cancer biomarkers incorporating bimodal waveguide photonic biosensors interfaced to complex, active microfluidics, Crispin Szydzik, RMIT Univ. (Australia) and Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); Adrián Fernández Gavela, Sonia Herranz, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain); Arnan Mitchell, RMIT Univ. (Australia); Laura M. Lechuga, Institut Català de Nanociència i Nanotecnologia (ICN2) (Spain) [10013-80]

Preparation of Fe₃O₄-loaded fluorescent PLGA nanoparticles conjugated with anti-VEGF for chemotherapy and photothermal therapy towards tumour cells, Ke Ma, Guozhen Liu, Ewa M. Goldys, Macquarie Univ. (Australia) [10013-81]

Enhanced photoluminescence from single nitrogen-vacancy defects in nanodiamonds coated with phenol-ionic complexes, Kerem Bray, Rodolfo Previdi, Univ. of Technology, Sydney (Australia); Brant C. Gibson, ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Olga Shimoni, Igor Aharonovich, Univ. of Technology, Sydney (Australia). [10013-82]

Optimisation of polarization controlled colour tuning using nanoscale cross-shaped apertures in silver films, Eugeniu Balaur, Catherine Sadatnajafi, Daniel P. Langley, Brian Abbey, La Trobe Univ. (Australia). [10013-84]

CONFERENCE 10013

- Hybrid silicon photonic and plasmonic crystals as a platform for integrable biosensing**, Markus Knoerzer, Guanghui Ren, Steffen Schoenhardt, Sara Baratchi, Khashayar Khoshmanesh, Arnan Mitchell, RMIT Univ. (Australia) [10013-85]
- Cuprous oxide nanocubes for biological imaging applications**, Nafisa Zohora, Ahmad E. Kandjani, Brant C. Gibson, RMIT Univ. (Australia). [10013-86]
- Engineering of fluorescent nanodiamonds towards probing cytokines in live microglial cells**, Nicole M. Cordina, Guozhen Liu, Ewa M. Goldys, Nicolle H. Packer, Macquarie Univ. (Australia) [10013-87]
- Establishing population inversion in a single Yb/Tm co-doped upconversion nanocrystal**, Yiqing Lu, Fan Wang, Yujia Liu, Xianlin Zheng, Macquarie Univ. (Australia); Shihui Wen, Univ. of Technology, Sydney (Australia) and Macquarie Univ. (Australia); Deming Liu, Macquarie Univ. (Australia); Dayong Jin, Univ. of Technology, Sydney (Australia) and Macquarie Univ. (Australia); James A. Piper, Macquarie Univ. (Australia). [10013-88]
- Enhanced gene silencing mediated by photo-responsive liposomes**, Wenjie Chen, Wei Deng, Ewa M. Goldys, Macquarie Univ. (Australia). [10013-90]
- Fluorescence intensity based magnetic field sensing using diamond**, Marco Capelli, Philipp Reineck, Antony Orth, RMIT Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Jan Jeske, RMIT Univ. (Australia); Desmond M. W. Lau, Brant C. Gibson, Andrew D. Greentree, RMIT Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia) [10013-91]
- Impact of fixation, mounting media, and cells adhesives on cells metabolic fluorophores monitored by hyperspectral imaging**, Ayad G. Anwer, Martin E. Gosnell, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Aziz ul Rehman, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Pakistan); Saabah B. Mahbub, Guozhen Liu, Kashif Islam, Ewa M. Goldys, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia). [10013-92]
- High-resolution imaging of nanoparticles in bio-labelling applications**, Denitza Denkova, Martin Ploschner, Alfonso Garcia-Bennett, Yiqing Lu, James A. Piper, Macquarie Univ. (Australia) [10013-93]

CONFERENCE 10013

Towards high throughput cell barcoding using intracellular whispering gallery modes, Avinash Upadhy, The Australian National Univ. (Australia); Matjaž Humar, Harvard Univ. (United States) and Wellman Ctr. for Photomedicine (United States); Seok-Hyun Yun, Wellman Ctr. for Photomedicine (United States) and Harvard Medical School (United States) [10013-94]

Quantum imaging and emitter counting within diffraction-limited spots, Josef Worboys, Daniel W. Drumm, Andrew D. Greentree, RMIT Univ. (Australia) [10013-95]

Onion-like surface design of upconverting nanophosphors modified with polyethylenimine: shielding toxicity versus keeping brightness?, Anna Guller, Macquarie Univ. (Australia) and Sechenov First Moscow State Medical Univ. (Russian Federation); Annemarie Nadort, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Alla Nikonaeвна Generalova, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry (Russian Federation); Inna Kornienko, Elena Petersen, Moscow Institute of Physics and Technology (Russian Federation); Qian Yi, Macquarie Univ. (Australia); Anatoly Shekhter, I.M. Sechenov Moscow Medical Academy (Russian Federation); Ewa M. Goldys, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Andrei V. Zvyagin, Macquarie Univ. (Australia) and Lobachevsky Nizhny Novgorod State Univ. (Russian Federation) [10013-96]

The comparative study of singlet oxygen generation efficiency of Rose Bengal, Gold nanoparticles, and Gold-Rose Bengal conjugate in photodynamic therapy, Manoj B. Kale, Sandhya Clement, Ewa M. Goldys, Macquarie Univ. (Australia) [10013-97]

Resolving luminescence lifetimes in flow cytometry via displaced detection, Xianlin Zheng, Yiqing Lu, Macquarie Univ. (Australia); Dayong Jin, Univ. of Technology, Sydney (Australia) and Macquarie Univ. (Australia); James A. Piper, Macquarie Univ. (Australia) [10013-98]

LED-based design of NON-imaging optics in biological microscopic applications, Kashif Islam, Ewa M. Goldys, Macquarie Univ. (Australia); Martin E. Gosnell, Quantitative Biotechnology Pty. Ltd. (Australia); Martin Ploschner, Ayad G. Anwer, Macquarie Univ. (Australia) [10013-99]

Modeling the interaction of infrared laser irradiation with unmyelinated axons in infrared neural inhibition, Mohit Ganguly, Vanderbilt Univ. (United States) [10013-100]

CONFERENCE 10013

TUESDAY 18 OCTOBER

WELCOME

Location: Adelaide Convention Ctr. Hall M 8:50 to 9:00

Session Chair: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia)

TUESDAY PLENARY SESSION

Location: Adelaide Convention Ctr. Hall M Tue 9:00 to 10:30

Session Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia);
Ewa M. Goldys, Macquarie Univ. (Australia), Ctr. for Nanoscale
Biophotonics (Australia)

9:00: **Light-sheet based Raman imaging** (*Plenary*),
Rainer Heintzmann, Leibniz-Institut für Photonische Technologien e.V.
(Germany). [10013-502]

9:45: **In vivo multiphoton imaging of mouse brain** (*Plenary*),
Chris Xu, Cornell Univ. (United States). [10013-503]

Morning Tea Tue 10:30 to 11:00

SESSION 3A

Location: Adelaide Convention Ctr.

Hall M Tue 11:00 to 12:30

Industry and Research Talk BioPhotonics

*Come listen to industry representatives from Zeiss, Olympus, and Trajan
present new research.*

Lunch Break Tue 12:30 to 14:00

SESSIONS 4A, 4B, AND 4C RUN CONCURRENTLY.

SESSION 4A

Location: Adelaide Convention Ctr. Hall M . Tue 14:00 to 15:30

Nanomaterials for BioPhotonics

Session Chair: **Dayong Jin**, Univ. of Technology, Sydney (Australia)

14:00: Brightness and photostability of emerging red and near-IR fluorescent nanomaterials for bioimaging, Philipp Reineck, RMIT Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Adam Francis, RMIT Univ. (Australia); Antony Orth, Desmond W. Lau, RMIT Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Reece D. V. Nixon-Luke, RMIT Univ. (Australia); Ishan D. Rastogi, Macquarie Univ. (Australia); Wan A. W. Razali, RMIT Univ. (Australia) and Univ. Teknologi MARA (Malaysia); Nicole M. Cordina, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia) and Univ. Teknologi MARA (Malaysia); Lindsay M. Parker, Macquarie Univ. (Australia) and RMIT Univ. (Australia) and Univ. Teknologi MARA (Malaysia); Varun K. A. Sreenivasan, Macquarie Univ. (Australia) and RMIT Univ. (Australia); Louise J. Brown, Macquarie Univ. (Australia); Brant C. Gibson, RMIT Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia). [10013-34]

14:15: Ultra-bright emission from hexagonal boron nitride defects as a new platform for bio-imaging and bio-labelling, Christopher Elbadawi, Trong Toan Tran, Daniel Totonjian, Charlene J. Lobo, Univ. of Technology, Sydney (Australia); Gabriele Grosso, Hyowan Moon, Dirk R. Englund, Massachusetts Institute of Technology (United States); Michael J. Ford, Igor Aharonovich, Milos Toth, Univ. of Technology, Sydney (Australia); Olga Shimoni, University of Technology, Sydney (Australia) . . . [10013-35]

14:30: Seed mediated one-pot growth of versatile heterogeneous upconversion nanocrystals for multimodal tumor imaging, Shihui Wen, Univ. of Technology, Sydney (Australia) and Macquarie Univ. (Australia); Deming Liu, Macquarie Univ. (Australia); Du Li, Donghua Univ. (China); Bingyang Shi, Macquarie Univ. (Australia); Xiaoxue Xu, Macquarie Univ. (Australia) and Univ. of Technology, Sydney (Australia); Dayong Jin, Univ. of Technology, Sydney (Australia) and Macquarie Univ. (Australia); Xiangyang Shi, Donghua Univ. (China) [10013-36]

CONFERENCE 10013

14:45: **Novel ways to illuminate cells and biological tissues using nanoparticles and chemical conjugates**, Lindsay M. Parker, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Vasiliki Staikopoulos, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and Macquarie Univ. (Australia); Nicole M. Cordina, Nima Sayyadi, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Philipp Reineck, RMIT Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Yiqing Lu, Andrew Care, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Mark R. Hutchinson, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Nicolle H. Packer, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia). [10013-37]

15:00: **Using DNA nanostructures to harvest light and create energy transfer and harvesting systems**, Sebastián A. Díaz, Susan Buckhout-White, Carl W. Brown III, Anirban Samanta, U.S. Naval Research Lab. (United States); William P. Klein, Boise State Univ. (United States); Mario G Ancona, US Naval Research Lab (United States); Chris L Dwyer, Duke University (United States); Ellen R Goldman, Joseph S. Melinger, Paul D Cunningham, Chris M. Spillmann, US Naval Research Lab (United States); Igor L. Medintz, U.S. Naval Research Lab. (United States) [10013-38]

15:15: **Novel chiral biophotonic sensors**, Saeideh Ostovar Pour, RMIT Univ. (Australia) [10013-39]

Afternoon TeaTue 15:30 to 16:00

SESSIONS 4A, 4B, AND 4C RUN CONCURRENTLY.

SESSION 4B

Location: Adelaide Convention Ctr.

Riverview Room 7 Tue 14:00 to 15:30

Fibre Sensing Technologies

Session Chair: **Andre N. Luiten**, The Univ. of Adelaide (Australia)

- 14:00: Exploiting surface plasmon scattering on optical fibers**, Elizaveta Klantsataya, The Univ. of Adelaide (Australia); Alexandre François, Univ. of South Australia (Australia); Beniamino Sciacca, FOM Institute for Atomic and Molecular Physics (Netherlands); Agnieszka Zuber, Heike Ebendorff-Heidepriem, Peter Hoffmann, The Univ. of Adelaide (Australia); Tanya M. Monro, Univ. of South Australia (Australia) [10013-40]
- 14:15: Ultra-small Fabry-Perot cavities in tapered optical fibers**, Stephen C. Warren-Smith, Leibniz-Institut für Photonische Technologien e.V. (Germany); Ricardo M. André, Univ. do Porto (Portugal); Jan Dellith, Hartmut Bartelt, Leibniz-Institut für Photonische Technologien e.V. (Germany) [10013-41]
- 14:30: Functionalised microstructured optical fibres as a sensing platform for biology**, Roman Kostecki, Sabrina Heng, Melanie L. Sutton-McDowall, Daniel B. Stubing, Jeremy G. Thompson, Andrew D. Abell, Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia) [10013-42]
- 14:45: Modular Optofluidic Systems (MOPS)**, Tobias N. Ackermann, Xavier Munoz-Berbel, Erica Alvarez-Conde, Ctr. Nacional de Microelectrónica (Spain); Daniel Kopp, Hans Zappe, Univ. of Freiburg (Germany); Andreu Llobera, Ctr. Nacional de Microelectrónica (Spain) [10013-43]
- 15:00: Hollow core optical fibres made by glass billet extrusion as sensors for Raman spectroscopy**, Georgios Tsiminis, Erik P. Schartner, Mark R. Hutchinson, Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia) [10013-44]
- 15:15: Optofluidic whispering gallery mode microcapillary lasers for refractive index sensing**, Alexandre François, Nicolas Riesen, Univ. of South Australia (Australia); Kristy Gardner, Univ. of Alberta (Canada); Tanya M. Monro, Univ. of South Australia (Australia); Al Meldrum, Univ. of Alberta (Canada) [10013-45]
- Afternoon Tea Tue 15:30 to 16:00

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SESSIONS 4A, 4B, AND 4C RUN CONCURRENTLY.

SESSION 4C

Location: Adelaide Convention Ctr.

Riverview Room 8 Tue 14:00 to 15:30

Advanced Microscopy in Medicine

Session Chairs: **Rainer Heintzmann**, Leibniz-Institut für Photonische Technologien e.V. (Germany); **Marie-Claude Gregoire**, Australian Nuclear Science and Technology Organisation (Australia)

14:00: Multiphoton imaging for assessing renal disposition in acute kidney injury, Xin Liu, Xiaowen Liang, Haolu Wang, The Univ. of Queensland School of Medicine (Australia); Darren Roberts, The Australian National Univ. (Australia); Michael S. Roberts, The Univ. of Queensland School of Medicine (Australia) and The Univ. of South Australia (Australia) [10013-46]

14:15: In vivo quantitative visualization of hypochlorous acid in the liver using a novel selective two-photon fluorescent probe, Haolu Wang, The Univ. of Queensland School of Medicine (Australia); Aparna Jayachandran, The University of Queensland (Australia); Germain Gravot, Univ. de Rennes 1 (France); Xiaowen Liang, Camilla A. Thompson Thorling, The Univ. of Queensland School of Medicine (Australia); Run Zhang, The Univ. of Queensland (Australia); Xin Liu, The Univ. of Queensland School of Medicine (Australia); Michael S. Roberts, The Univ. of Queensland School of Medicine (Australia) and The Univ. of South Australia (Australia) . [10013-47]

14:30: Quantitative optical imaging of paracetamol-induced metabolism changes in the liver, Xiaowen Liang, Haolu Wang, Xin Liu, Michael S. Roberts, The Univ. of Queensland School of Medicine (Australia) [10013-48]

14:45: Label-free regenerative treatment monitoring of 'stem cell over cartilage' system by hyperspectral unmixing, Saabah B. Mahbub, Peter Succar, Martin E. Gosnell, Ayad G. Anwer, Ewa M. Goldys, Macquarie Univ. (Australia) [10013-49]

15:00: Non-invasive assessment of liver disease using infrared thermography, multiphoton, and fluorescence lifetime imaging, Camilla A. Thompson Thorling, The Univ. of Queensland School of Medicine (Australia); Hauke Studier, Univ. of South Australia (Australia); Darrell H. G. Crawford, Michael S. Roberts, The Univ. of Queensland School of Medicine (Australia) and The Univ. of South Australia (Australia) [10013-50]

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15:15: **High throughput time-gated luminescence detection of immune-labelled prostate cancer cells using automated scanning microscopy**, Nima Sayyadi, Xianlin Zheng, Irene Justiniano, Macquarie Univ. (Australia); Jingli Yuan, Dalian Univ. of Technology (China); Brad J. Walsh, Douglas Campbell, Minomic (Australia); Dayong Jin, Univ. of Technology, Sydney (Australia); Yiqing Lu, James A. Piper, Nicolle H. Packer, Macquarie Univ. (Australia). [10013-51]

Afternoon Tea Tue 15:30 to 16:00

TUESDAY POSTER SESSION

Location: Adelaide Convention Ctr. Hall N . Tue 16:00 to 17:30

Fibre Sensing and Medical Imaging

Compact multispectral fluorescence imaging system with spectral multiplexed volume holographic grating, Lv Yanlu, Chuangjian Cai, Jing Bai, Jianwen Luo, Tsinghua Univ. School of Medicine (China). . [10013-101]

Shapeshifting photoswitchable azobenzene compounds and their biological applications, Victoria Peddie, Sabrina Heng, Sanam Mustafa, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Jacob Thomas, Mark R. Hutchinson, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and The Univ. of Adelaide (Australia); Andrew D. Abell, The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia). [10013-103]

Using whispering gallery mode micro lasers for biosensing within undiluted aerum, Tess Reynolds, The Univ. of Adelaide (Australia); Alexandre François, Nicolas Riesen, Univ. of South Australia (Australia); Michelle E. Turvey, Stephen J. Nicholls, Peter Hoffmann, The Univ. of Adelaide (Australia); Tanya M. Monro, Univ. of South Australia (Australia). [10013-104]

Brain tumor classification of microscopy images using deep residual learning, Yota Ishikawa, Kiyotada Washiya, Kota Aoki, Hiroshi Nagahashi, Tokyo Institute of Technology (Japan) [10013-105]

Regulation of cellular marker modulated upon irradiation of low power laser light in burn injured mice, Bharath Rathnakar, Vijendra Prabhu, Bola Sadashiva Satish Rao, Subhas Chandra, Sharada Rai, Krishna Kishore Mahato, Manipal Univ. (India) [10013-106]

Region of interest extraction and coding based on saliency analysis and directional lifting wavelet for medical images, Libao Zhang, Shuang Wang, Jie Chen, Beijing Normal Univ. (China) [10013-107]

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- Optical ptychographic microscopy for quantitative anisotropic phase imaging**, Nicholas Anthony, Guido Cadenazzi, Keith A. Nugent, Brian Abbey, La Trobe Univ. (Australia). [10013-108]
- DHMI: Dynamic holographic microscopy interface**, Xuefei He, Yujie Zheng, Woei Ming Lee, The Australian National Univ. (Australia). [10013-109]
- Poly-Scan: flexible software framework for polygon based multiphoton microscopy**, Woei Ming Lee, Yongxiao Li, The Australian National Univ. (Australia). [10013-110]
- Measurement of cooperatively-enhanced atomic dipole forces in optically trapped nanodiamonds containing NV centres in liquid**, Carlo Bradac, Mathieu L. Juan, Macquarie Univ. (Australia); Benjamin Besga, Institut Néel (France); Mattias Johnsson, Gavin K. Brennen, Gabriel Molina-Terriza, Thomas Volz, Macquarie Univ. (Australia) [10013-111]
- Spin control method to localize blinking nitrogen vacancy centres in nanodiamonds**, Martina Barbiero, Swinburne Univ. of Technology (Australia); Xiangping Li, Jinan Univ. (China); Ye Chen, Swinburne Univ. of Technology (Australia); Stefania Castelletto, RMIT Univ. (Australia); Sarah Russell, Swinburne Univ. of Technology (Australia); Min Gu, RMIT Univ. (Australia) [10013-112]
- Direct fabrication of silicone lenses with 3D printed parts**, Tahseen Kamal, Rachel Watkins, Zijian Cen, Woei Ming Lee, The Australian National Univ. (Australia) [10013-113]
- A volume scanner for diffuse imaging**, Elham Vafa, Nicolas Roberts, Galiya Sharafutdinova, John L. Holdsworth, The Univ. of Newcastle (Australia). [10013-114]
- Dual pitch plasmonic devices for polarisation enhanced sensitivity**, Daniel P. Langley, La Trobe Univ. (Australia) Excellence for Advanced) and Australian Research Council Ctr. of Molecular Imaging (Australia); Eugeniu Balaur, Catherine Sadatnajafi, Brian Abbey, La Trobe Univ. (Australia) and Australian Research Council Ctr. of Excellence for Advanced Molecular Imaging (Australia). [10013-115]
- Elemental contrast imaging with a polychromatic laboratory x-ray source using energy-discriminating detectors**, Viona Yokhana, Bendicta D. Arhatari, La Trobe Univ. (Australia) and The ARC Ctr. of Excellence for Advanced Molecular Imaging (Australia); Timur E. Gureyev, The Univ. of Melbourne (Australia) and The ARC Ctr. of Excellence for Advanced Molecular Imaging (Australia); Brian Abbey, La Trobe Univ. (Australia) and The ARC Ctr. of Excellence for Advanced Molecular Imaging (Australia). [10013-116]

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3D printing of miniaturised lenses for endoscopic probes, Jiawen Li, The Univ. of Adelaide (Australia); Peter Fejes, The Univ. of Western Australia (Australia); Dirk Lorenser, Cylite Pty Ltd. (Australia); Bryden C. Quirk, The Univ. of Adelaide (Australia); Peter B. Noble, The Univ. of Western Australia (Australia); Rodney W. Kirk, The Univ. of Adelaide (Australia); Fiona M. Wood M.D., David D. Sampson, The Univ. of Western Australia (Australia); Robert A. McLaughlin, The Univ. of Adelaide (Australia). [10013-117]

Iron oxide based particles for dual-modal targeted cancer imaging, Fei Wang, Nicole M. Cordina, Kaixin Zhang, Guozhen Liu, Wei Deng, Ayad G. Anwer, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia); Alexander Engel, The Univ. of Sydney (Australia); Ewa M. Goldys, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale BioPhotonics (Australia). [10013-119]

Distinguish NADH/NADPH changes caused by oxidative stress in live cells using hyperspectral imaging, Meng He, Ayad G. Anwer, Macquarie Univ. (Australia); Saabah Mahbub, Macquarie University (Australia); Martin E. Gosnell, Quantitative Pty. Ltd. (Australia) and National Institute of Lasers and Optronics (Pakistan); Guozhen Liu, Macquarie Univ. (Australia) and Central China Normal Univ. (China); Ewa M. Goldys, Macquarie Univ. (Australia). [10013-120]

Hybrid nanodiamond-polycaprolatone scaffolds for tissue engineering, Desmond M. W. Lau, RMIT Univ. (Australia); Phong A. Tran, Queensland Univ. of Technology (Australia); Kate Fox, Brant C. Gibson, Andrew D. Greentree, RMIT Univ. (Australia). [10013-122]

Investigating protein N and O-glycosylation in diabetic mice ovaries using PGC-ESI-MS/MS, Abdulrahman M. Shathili II, Macquarie Univ. (Australia) and The Univ. of Adelaide (Australia); Hannah Brown, Arun Dass, The Univ. of Adelaide (Australia); Jeremy G. Thompson, The Univ. of Adelaide (Australia) and Macquarie Univ. (Australia); Nicollet H. Packer, Macquarie Univ. (Australia) and The Univ. of Adelaide (Australia). [10013-123]

Label-free assessment of endothelial cell metabolic state using autofluorescent microscopy, Benjamin J. Pullen, South Australian Health & Medical Research Institute (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and The Univ. of Adelaide (Australia); Martin E. Gosnell, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia); Ayad G. Anwer, Ewa M. Goldys, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and Macquarie Univ. (Australia); Stephen J. Nicholls, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and SAHMRI (Australia) and The Univ. of Adelaide (Australia); Peter J. Psaltis, South Australian Health & Medical Research Institute (Australia) and The Univ. of Adelaide (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia). [10013-124]

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- Imaging pain using peptides that selectively bind polysialic acid**, Sameera Iqbal, Macquarie Univ. (Australia) [10013-125]
- Early cancer detection using hyper spectral imaging**, Abbas Habibalahi, Ewa M. Goldys, Macquarie Univ. (Australia) [10013-126]
- Using upconversion nanoparticles as a model to study the transdermal penetration of nanoparticles**, Zahra Khabir, Xiaoxue Xu, Liuen Liang, Andrei V. Zvyagin, Macquarie Univ. (Australia) [10013-127]
- MALDI imaging mass spectrometry of sugar molecules from formalin fixed paraffin embedded tissues**, Arun V. Everest-Dass, Macquarie Univ. (Australia); Matthew T. Briggs, Peter Hoffmann, The Univ. of Adelaide (Australia); Nicolle H. Packer, Macquarie Univ. (Australia) [10013-128]
- Imaging of the nanoparticle protein corona**, Alfonso Garcia-Bennett, Denitza Denkova, Macquarie Univ. (Australia) [10013-129]
- Construction of polydopamine-coated gold nanostars for CT imaging and enhanced photothermal therapy of tumors: an innovative theranostic strategy**, Du Li, Univ. of Technology, Sydney (Australia); Yongxing Zhang, Shanghai Jiao Tong Univ. (China); Shihui Wen, Yang Song, Donghua Univ. (China); Yueqin Tang, Shanghai Jiao Tong Univ. (China); Xiaoyue Zhu, Mingwu Shen, Donghua Univ. (China); Serge M. Mignani, Univ. Paris Descartes (France); Jean-Pierre Majoral, Lab. de Chimie de Coordination (France); Qinghua Zhao, Shanghai Jiao Tong Univ. (China); Xiangyang Shi, Donghua Univ. (China) [10013-130]
- A simple optical fibre probe for differentiation between healthy and tumorous tissue**, Erik P. Schartner, Matthew R. Henderson, Malcolm S. Purdey, Tanya M. Monro, P. Grantley Gill, David F. Callen, The Univ. of Adelaide (Australia) [10013-132]
- Depth-dependent dispersion compensation for optical coherence tomography**, Lihua Pan, Xiangzhao Wang, Zhongliang Li, Shanghai Institute of Optics and Fine Mechanics (China) and Chinese Academy of Sciences (China) [10013-133]
- A simple smartphone based device towards biomedical colorimetric and fluorescent signal detection**, Piotr Wargocki, Guozhen Liu, Ayad G. Anwer, Wei Deng, Macquarie Univ. (Australia); Montarop Yamabhai, Macquarie Univ. (Australia) and Suranaree Univ. of Technology (Australia); Ewa M. Goldys, Macquarie Univ. (Australia) [10013-134]

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WEDNESDAY 19 OCTOBER

WELCOME

Location: Adelaide Convention Ctr. Hall M 8:50 to 9:00

Session Chair: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia)

WEDNESDAY PLENARY SESSION

Location: Adelaide Convention Ctr.

Hall M Wed 9:00 to 10:30

Session Chairs: **Mark R. Hutchinson**, The Univ. of Adelaide (Australia);
Ewa M. Goldys, Macquarie Univ. (Australia), Ctr. for Nanoscale
Biophotonics (Australia)

9:00: **Advances for imaging tissue composition and microstructures with endoscopic OCT (Plenary)**, Brett E. Bouma, Harvard Medical School (United States) and Massachusetts General Hospital (United States) [10013-504]

9:45: **Path, present, and future (Plenary)**, Richard M. Levenson M.D., Univ. of California, Davis (United States) [10013-505]

Morning Tea Wed 10:30 to 11:30

SESSIONS 5A, 5B, AND 5C RUN CONCURRENTLY.

SESSION 5A

Location: Adelaide Convention Ctr. Hall M Wed 11:30 to 13:00

Nanostructures and Fluidics II

Session Chairs: **Halina Rubinsztein-Dunlop**, The Univ. of Queensland (Australia); **Anita Mahadevan-Jansen**, Vanderbilt Univ. (United States)

11:30: **Laser-threshold magnetometry using nitrogen-vacancy colour centres in diamond**, Jan Jeske, Desmond M. W. Lau, RMIT Univ. (Australia); Liam P. McGuinness, Univ. Ulm (Germany); Philipp Reineck, RMIT Univ. (Australia); Brett C. Johnson, The Univ. of Melbourne (Australia); Jeffrey C. McCallum, The Univ. of Melbourne (Australia) and RMIT Univ. (Australia); Fedor Jelezko, Univ. Ulm (Germany); Thomas Volz, Macquarie Univ. (Australia); Brian C. Wilson, Univ. Health Network (Canada) and Univ. of Toronto (Canada) and Princess Margaret Cancer Ctr. (Canada); Jared H. Cole, The Univ. of Melbourne (Australia) and RMIT Univ. (Australia); Brant C. Gibson, Andrew D. Greentree, RMIT Univ. (Australia) [10013-52]

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- 11:45: **Enhanced singlet oxygen generation from PLGA loaded with verteporfin and gold nanoparticles**, Wei Deng, Zofia Kautzka, Ewa M. Goldys, Macquarie Univ. (Australia) [10013-53]
- 12:00: **A novel fusion protein mediating self-assembly of functional biomaterials and bioimaging agents**, Andrew Care, Peter L. Bergquist, Nicolle H. Packer, Anwar Sunna, Macquarie Univ. (Australia) . . . [10013-54]
- 12:15: **The graphene quantum dots (GQDs) based aptasensor toward intracellular cytokine monitoring**, Guozhen Liu, Macquarie Univ. (Australia) and Central China Normal Univ. (China); Kai Zhang, Ewa M. Goldys, Macquarie Univ. (Australia) [10013-89]
- 12:30: **Miniaturized video-microscopy system for near real-time water quality biomonitoring using microfluidic chip-based devices**, Yushi Huang, Abhimanyu Nigam, RMIT Univ. (Australia); Olivia Campana, University of York (United Kingdom); Dayanthi Nugegoda, Donald Wlodkowic, RMIT Univ. (Australia) [10013-56]
- 12:45: **Enzyme catalyzed optofluidic biosensors for ion concentration detection**, Chaoyang Gong, Yuan Gong, Univ. of Electronic Science and Technology of China (China); Maung Kyaw Khaing Oo, Department of Biomedical Engineering, University of Michigan, Ann Arbor (United States); Yu Wu, Yunjiang Rao, Univ. of Electronic Science and Technology of China (China); Xudong Fan, Department of Biomedical Engineering, University of Michigan, Ann Arbor (United States) [10013-57]

SESSIONS 5A, 5B, AND 5C RUN CONCURRENTLY.

SESSION 5B

Location: Adelaide Convention Ctr.

Riverview Room 7 Wed 11:30 to 13:00

Chemical Aspects of Fibre Sensing

Session Chairs: **Tomáš Cizmár**, Univ. of Dundee (United Kingdom);
Alexandre François, Univ. of South Australia (Australia)

- 11:30: **Fluorometric bio-sniffer (biochemical gas sensor) for breath acetone as a volatile indicator of lipid metabolism**, Kohji Mitsubayashi, Po-Jen Chien, Ming Ye, Takuma Suzuki, Koji Toma, Takahiro Arakawa, Tokyo Medical and Dental Univ. (Japan) [10013-58]
- 11:45: **Fluorescent optical fibre chemosensor for the detection of mercury**, Thu Hien Nguyen, Tong Sun, Kenneth T. V. Grattan, City Univ. London (United Kingdom) [10013-59]

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12:00: **Online remote monitoring of explosives by optical fibers**, Shuai Ruan, Peng Zhang, Xuanzhao Pan, Mengke Han, The Univ. of Adelaide (Australia) and Institute for Photonics and Advanced Sensing (Australia); Yizhao Chen, Anjun Qin, South China Univ. of Technology (China); Cheng Fang, The Univ. of Newcastle (Australia); Ben Zhong Tang, Hong Kong Univ. of Science and Technology (China); Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia) and Institute for Photonics and Advanced Sensing (Australia); Youhong Tang, Flinders Univ. (Australia); Yinlan Ruan, The Univ. of Adelaide (Australia) and Institute for Photonics and Advanced Sensing (Australia) [10013-60]

12:15: **Modulating molecular transport across peptide-modified nanoporous alumina membranes with light**, Jingxian Yu, The Univ. of Adelaide (Australia) [10013-71]

12:30: **Fluorescence enhancement of photo switchable metal ion sensors**, Georgina Sylvia, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and The Univ. of Adelaide (Australia); Sabrina Heng, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and Institute for Photonics and Advanced Sensing (Australia); Andrew D. Abell, ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) and Institute for Photonics and Advanced Sensing (Australia) and The Univ. of Adelaide (Australia) [10013-62]

12:45: **Photoswitchable nanoparticles for dual ion sensing**, Sabrina Heng, Andrew D. Abell, The Univ. of Adelaide (Australia) [10013-63]

SESSIONS 5A, 5B, AND 5C RUN CONCURRENTLY.

SESSION 5C

Location: Adelaide Convention Ctr.

Riverview Room 8 Wed 11:30 to 12:45

Medically Relevant BioPhotonic Technologies

Session Chair: **Gary F. Egan**, The Univ. of Melbourne (Australia)

11:30: **Bilateral connectivity in the somatosensory region using near-infrared spectroscopy (NIRS) by wavelet coherence**, Raul Fernandez Rojas, Xu Huang, Univ. of Canberra (Australia); Keng Liang Ou, Taipei Medical Univ. (Taiwan) [10013-64]

11:45: **Non-contact ECG for biomedical optics**, Vladimir L. Kodkin, Galina V. Yakovleva, South Ural State Univ. (Russian Federation) [10013-65]

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12:00: **Heart rate measurement and noise annihilation using the Takagi-Sugeno fuzzy model**, Guan-Jhong Lin, National Taiwan Univ. (Taiwan); Yen-Hsing Lin, Huai-Ping Song, National Taipei Univ. of Technology (Taiwan); Cheng-Yu Chi, Ying-Jay Yang, National Taiwan Univ. (Taiwan); Chung-Ping Chen, National Taipei Univ. of Technology (Taiwan) and National Taiwan Univ. (Taiwan) [10013-66]

12:15: **Thimble microscope system**, Tahseen Kamal, Jaden Rubinstein, Rachel Watkins, Zijian Cen, The Australian National Univ. (Australia); Gary Kong, Plant Biosecurity CRC (Australia); Woei Ming Lee, The Australian National Univ. (Australia) [10013-67]

12:30: **Background-free tumor cell isolation and detection using a novel microfluidic device**, Lianmei Jiang, Macquarie Univ. (Australia) and ARC Ctr. of Excellence for Nanoscale Biophotonics (Australia) [10013-68]

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Sunday.....17:00 to 19:30 hrs.

Monday.....08:00 to 11:30 hrs.

If you believe you will arrive after 11:00 on Monday 16th October please contact Brooke Bacon (brooke.b@rmit.edu.au) prior to the conference. During the conference please contact Brooke on mobile number +61408633888

CONFERENCE REGISTRATION

Includes admission to all conference sessions, plenaries, panels, poster sessions, welcome reception, morning and afternoon tea breaks, and online summary/poster collection.

EXHIBITION REGISTRATION

Exhibition-Only visitor registration is complimentary.

SPIE MEMBER, SPIE STUDENT MEMBER, AND STUDENT PRICING

- SPIE Members receive conference registration discounts. Discounts are applied at the time of registration.
- Student registration rates are available only to undergraduate and graduate students who are enrolled full time and have not yet received their Ph.D. Post-docs may not register as students. A student ID number or proof of student status is required with your registration.

ONSITE CASHIER

Registration Area · Open during registration hours

REGISTRATION PAYMENTS

Please note that no cash or cheque payments for registration will be available, this includes during the conference. Online registration will be available at all times until the conclusion of the conference.

RECEIPT AND CERTIFICATE OF ATTENDANCE

Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those by contacting Brooke Bacon (brooke.b@rmit.edu.au).

BADGE CORRECTIONS

Badge corrections can be made by the Onsite Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

REFUND INFORMATION

Requests for refunds must be received by 23rd September 2016; all registration fees will be forfeited after this date. Membership dues, SPIE Digital Library subscriptions, or Special Events purchased are not refundable.

AUTHOR / PRESENTER INFORMATION

SPEAKER CHECK-IN AND PREVIEW STATION

Please check your program for your allocated room for presenting.

All conference rooms will have a projector, screen, lapel microphone and laser pointer.

All presenters will be contacted by Brooke Bacon prior to the conference with details to email their presentations prior to the conference.

POSTER SETUP INSTRUCTIONS

All Poster Session contributors will be contacted by Brooke Bacon prior to the conference with further instructions.

ONSITE SERVICES

INTERNET ACCESS

Complimentary Internet will be available.

SPIE CONFERENCE AND EXHIBITION APP

Download the free SPIE Conference App, available for iPhone and Android phones. Search and browse the programme, special events, participants, exhibitors, and more.



SPIE EXHIBITOR DIRECTORY

Location: Hall O

Search exhibitors by name or booth numbers, browse products, and search technologies.

FOOD AND BEVERAGE SERVICES

COFFEE/TEA BREAKS

Location: Hall N · 10:30 to 17:00

Complimentary coffee and tea will be served twice daily, at 10:00 and 15:00 hrs. Check individual conference listings for exact times and locations.

GENERAL INFORMATION

TRAVEL TO ADELAIDE

Information listed on the BAU website:

**[http://spie.org/conferences-and-exhibitions/
bio-photonics-australasia/travel-to-australia](http://spie.org/conferences-and-exhibitions/bio-photonics-australasia/travel-to-australia)**

WELCOME TO ADELAIDE, SOUTH AUSTRALIA

Explore Adelaide

So much more than just the City of Churches!

Wherever you go in South Australia, you'll want to stop by Adelaide, Australia's most liveable city and one of Lonely Planet's must-visit destinations. The city centre is surrounded by parklands and is a blend of historic buildings, wide streets, parklands, vibrant cafes and restaurants. Adelaide rises from the middle of a vast, tree covered plain. It lies between rolling hills to the east and sandy beaches to the west. Adelaide's beauty is its accessibility. With a population of slightly more than one million, Adelaide is the "20 minute city". The airport is only seven kilometres from Adelaide city.

Please click for a detailed map of the City and Adelaide Convention Centre is listed as number 5 item at G13 on the map

<http://www.adelaidecitycouncil.com/assets/documents/MAP-city-at-tractions-gettingaround-adelaide.pdf>

For further details about Adelaide and the surrounding regions in South Australia, please click this link

<http://www.southaustralia.com/en>

ACCEPTANCE OF POLICIES AND REGISTRATION CONDITIONS

The following Policies and Conditions apply to all CNBP/SPIE Events. As a condition of registration, you will be required to acknowledge and accept these CNBP/SPIE Registration Policies and Conditions contained herein.

Granting Attendee Registration and Admission

CNBP/SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, CNBP/SPIE, or event management, reserves the right to prohibit entry or remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, who in their sole opinion are not, or whose conduct is not, in keeping with the character and purpose of the event. Without limiting the foregoing, CNBP/SPIE and event management reserve the right to remove or refuse entry to any attendee, exhibitor, representative, or vendor who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

SPIE Safe Meeting and Misconduct Policy

CNBP/SPIE is committed to providing a valuable and safe conference and exhibition experiences. CNBP/SPIE is dedicated to equal opportunity and treatment for all its members, meeting attendees, staff, and contractors. Attendees are expected to be respectful to other attendees, CNBP/SPIE staff, and contractors. Harassment and other misconduct will not be tolerated; violators will be addressed promptly and seriously. Consequences up to and including expulsion from the event as appropriate will be implemented immediately.

The SPIE anti-harassment policy can be found at <http://spie.org/policy>.

Reporting of Unethical or Inappropriate Behavior

CNBP and SPIE are organizations with strong values of responsibility and integrity. Our Harassment Policy, Ethics Statement, and Code of Professional Conduct contain general guidelines for behavior and for conducting business with the highest standards of ethics.

Onsite at a CNBP/SPIE meeting, contact any CNBP/SPIE Staff member with concerns or questions for thorough follow-up. If you feel in immediate danger, please dial 911 for police intervention.

SPIE has established a confidential reporting system for staff and all meetings participants to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by at www.SPIE.ethicspoint.com and, if preferred, may be made anonymously.

SPIE POLICIES

Identification

Individuals are not allowed to pick up badges for attendees other than themselves. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

Capture and Use of a Person's Image

By registering for an CNBP/SPIE event, I grant full permission to CNBP/SPIE to capture, store, use, and/or reproduce my image or likeness by any audio and/or visual recording technique (including electronic/digital photographs or videos), and create derivative works of these images and recordings in any CNBP/SPIE media now known or later developed, for any legitimate CNBP/SPIE marketing or promotional purpose.

By registering for an CNBP/SPIE event, I waive any right to inspect or approve the use of the images or recordings or of any written copy. I also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, I release, defend, indemnify and hold harmless SPIE from and against any claims, damages or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion or use in composite form that may occur or be produced in taking, processing, reduction or production of the finished product, its publication or distribution.

Payment Method

Registrants for paid elements of the event, who do not provide a method of payment, will not be able to complete their registration. Individuals with incomplete registrations will not be able to attend the conference until payment has been made. See Registration details online for payment methods and process, <https://spie.org/conferences-and-exhibitions/bio-photonics-australasia>.

Authors/Coauthors

By submitting an abstract, you agree to the following conditions:

- An author or coauthor (including keynote, invited, and solicited speakers) will register at the author registration rate, attend the meeting, and make the presentation as scheduled.
- A presentation summary or Poster for any accepted oral, invited, keynote, or poster presentation will be submitted for publication in the Proceedings of SPIE in the SPIE Digital Library. Some SPIE events have other requirements that the author is made aware of at the time of submission.
- Only papers presented at the conference and received according to publication guidelines and timelines will be published in the Proceedings of SPIE in the SPIE Digital Library (or via the requirements of that event).

Audio, Video, Digital Recording Policy

Conferences, courses, and poster sessions: For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use the materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at Speaker Check-In. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media.

EXHIBITION HALL: For security and courtesy reasons, recordings of any kind are prohibited unless one has explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their recording media and to leave the exhibition hall.

Your registration signifies your agreement to be photographed or videotaped by CNBP/ SPIE in the course of normal business. Such photos and video may be used in CNBP/SPIE marketing materials or other SPIE promotional items.

Laser Pointer Safety Information/Policy

CNBP/SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, CNBP/SPIE requests that presenters use provided laser pointers.

Use of a personal laser pointer represents user's acceptance of liability for use of a non-CNBP/SPIE-supplied laser pointer. If you choose to use your own laser pointer, it must be <5 mW power output. Laser pointers in Class II and IIIa (<5mW) are eye safe if power output is correct. You are required to sign a waiver releasing CNBP/SPIE of any liability for use of potentially non-safe, personal laser pointers. Misuse of any laser pointer can lead to eye damage.

Unauthorized Solicitation Policy

Unauthorized solicitation in the Exhibition Hall is prohibited. Any non-exhibiting manufacturer or supplier observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

Unsecured Items Policy

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. CNBP/SPIE is not responsible for items left unattended.

Wireless Internet Service Policy

At CNBP/SPIE events where wireless is included with your registration, CNBP/SPIE provides wireless access for attendees during the conference and exhibition but cannot guarantee full coverage in all locations, all of the time. Please be respectful of your time and usage so that all attendees are able to access the internet.

SPIE POLICIES

Excessive usage (e.g., streaming video, gaming, multiple devices) reduces bandwidth and increases cost for all attendees. No routers may be attached to the network. Properly secure your computer before accessing the public wireless network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and/or presentation. CNBP/SPIE is not responsible for computer viruses or other computer damage.

Mobile Phones and Related Devices Policy

Mobile phones, tablets, laptops, pagers, and any similar electronic devices should be silenced during conference sessions. Please exit the conference room before answering or beginning a phone conversation.

Smoking

For the health and consideration of all attendees, smoking, including e-cigarettes, is not permitted at any event elements, such as but not limited to: plenaries, conferences, workshops, courses, poster sessions, hosted meal functions, receptions, and in the exhibit hall. Most facilities also prohibit smoking and e-cigarettes in all or specific areas. Attendees should obey any signs preventing or authorizing smoking in specified locations.

Hold Harmless

Attendee agrees to release and hold harmless CNBP/SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

Event Cancellation

If for some unforeseen reason CNBP/SPIE should have to cancel the event, registration fees processed will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.

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NANOPHOTONICS AUSTRALASIA

A FORUM FOR DISCUSSING NANO- AND MICROSCALE
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www.spie.org/AU

Swinburne University of Technology
Melbourne, VIC Australia

Conference
10-13 December 2017

