SPIE. MICRO+NANO MATERIALS, DEVICES, AND APPLICATIONS

2015

MICRO+NANO MATERIALS, DEVICES, AND APPLICATIONS.

TECHNICAL PROGRAM

Conferences:
6–9 December 2015

The University of Sydney
Sydney, New South Wales
Australia

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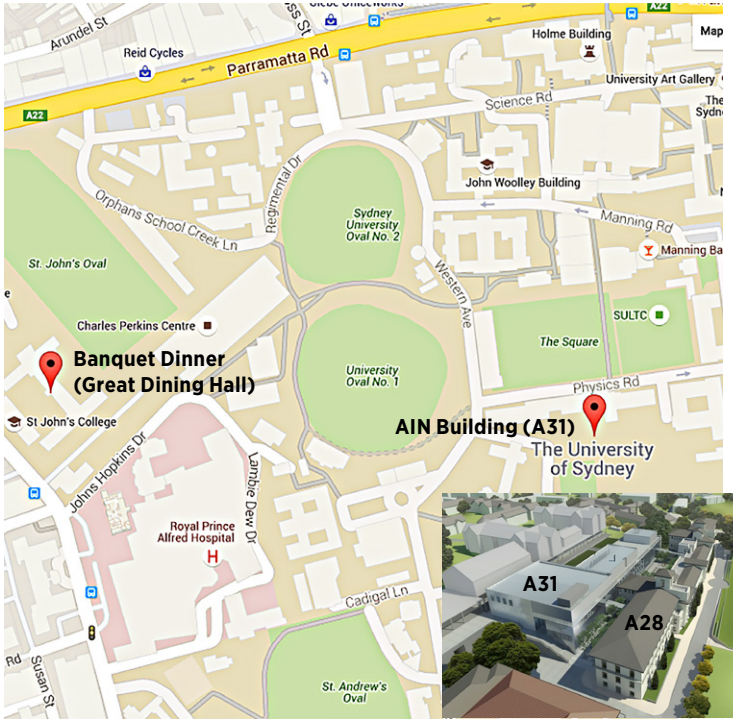
THE UNIVERSITY OF SYDNEY, CAMPERDOWN CAMPUS

SPIE Micro+Nano Materials, Devices and Applications 2015 will be held in the **AIN Building (A31)**, behind the Physics Building (A28), Camperdown Campus, University of Sydney. Conference Banquet Dinner: Location: St John's College, Quad and **Great Dining Hall**



SPIE. MICRO+NANO MATERIALS, DEVICES, AND APPLICATIONS

Conferences: 6–9 December 2015
The University of Sydney
Sydney, New South Wales, Australia

Contents

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David Moss, RMIT Univ. (Australia)

Dragomir N. Neshev, The Australian National Univ. (Australia)

Fiorenzo Gabriele Omenetto, Tufts Univ. (USA)

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DAILY SCHEDULE OF EVENTS

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09:45: Silk Biomaterials: A Life on the Edge, Fiorenzo Omenetto, Tufts Univ. (USA)</td><td></td></tr>
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	TUESDAY 8 DECEMBER			WEDNESDAY 9 DECEMBER		
	PLENARY PRESENTATION: 08:30: **3D Fabrication Nano to Macroscopic: Why We Need That!** Gordon G. Wallace, Univ. of Wollongong (Australia)			PLENARY PRESENTATION: 08:30: **Photonics Beyond Diffraction Limit: Plasmon Waveguide, Cavities, and Integrated Laser Circuits,** Xiang Zhang, Univ. of California, Berkeley (USA)		
	9:25 to 12:35			9:25 to 12:35		
	SESSION 3A	**SESSION 3B**	**SESSION 3C**	**SESSION 5A**	**SESSION 5B**	**SESSION 5C**
	INDUSTRY SHOWCASE During coffee and lunch breaks, 10:00 to 16:00					
	Lunch Break • 12:35 to 13:35			Lunch Break • 12:35 to 14:05		
	13:35 to 17:05			14:05 to 18:45		
	SESSION 4A	**SESSION 4B**	**SESSION 4C**	**SESSION 6A** **SESSION 7A**	**SESSION 6B**	**SESSION 6C**
	INTERNATIONAL YEAR OF LIGHT PUBLIC LECTURE 17:30 to 19:00					
	CONFERENCE BANQUET DINNER 19:30 to 22:00					

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ANDROID APP ON Google play

Monday 7 December 2015

09:00 to 10:30 • Location: SNH 4002 Lecture Theatre

09:00

Strong Interaction Between Photons, Phonons, and Electrons Enabled by Silicon Photonics

Michal Lipson
Columbia Univ. (USA)

Abstract: Recent advances in silicon photonics led the demonstration of unique high-quality structures that support photonic, phononic and electronic modes. For example, suspended ultra-high Q structures act as high confinement for both optical modes in the NIR and vibrational modes in the RF, and specially designed structures act as traveling waves for both optical and electrical modes in the microwave. The strong interaction between these different modes across the electromagnetic spectrum lead to novel fundamental phenomena. We have recently demonstrated that strong interaction between light and optical phonons in suspended structures can lead to near-field radiative cooling of a thermally isolated nanostructure. Strong interaction between light and acoustic phonons can lead to synchronization of mechanical structures. Finally, strong interaction of light and electrical fields can lead to optical non-reciprocity.

Biography: **Prof. Michal Lipson** is an Electrical Engineering Professor at Columbia University. She is one of the pioneers of the field of silicon photonics and holds over 20 patents and is the author of over 200 technical papers. Professor Lipson's honors and awards include Macarthur fellow, Blavatkink Award, IBM Faculty Award, and NSF Early Career Award OSA and IEEE fellow.

09:45

Silk Biomaterials: A Life on the Edge

Fiorenzo Omenetto
Tufts Univ. (USA)

Abstract: Biomaterials offer opportunities for devices that operate seamlessly at the interface of the biological and technological worlds. Stringent requirements on material form and function are imposed when operating at the nanoscale or when interfacing such materials with microelectronic circuitry. Silk fibroin is a very attractive biopolymer for use as the starting point for nanostructured optical materials and thin-film electronics. Devices such as silk-based photonic crystals, lasers, wireless antennas and resorbable electronics will be described as some examples of the possibilities that this water-processed, biocompatible material offers.

Biography: **Fiorenzo Omenetto** is the Frank C. Doble Professor of Engineering, a Professor of Biomedical Engineering, and a Professor of Physics at Tufts University. His research interests cover optics, nanostructured materials (such as photonic crystals and photonic crystal fibers), nanofabrication, and biopolymer-based photonics. He has proposed and pioneered (with David Kaplan) the use of silk as a material platform for photonics, optoelectronics and high-technology applications with applications such as edible sensors, resorbable electronics, or implantable photonics. He was named one of the top 50 people in tech by *Fortune* magazine in a class of 50 featuring Steve Jobs, Jeff Bezos, and Shigeru Miyamoto among others. Prof. Omenetto was formerly a J. Robert Oppenheimer Fellow at Los Alamos National Laboratory National a Guggenheim Fellow for 2011 and is a Fellow of the Optical Society of America and the American Physical Society.

PLENARY EVENTS

Tuesday 8 December 2015

08:30 to 09:15 • Location: SNH 4002 Lecture Theatre

08:30

3D Fabrication Nano to Macroscopic: Why We Need That!

Gordon G. Wallace
Univ. of Wollongong
(Australia)

Abstract: It is time to celebrate the demise of the conventional approach to making stuff wherein the realisation of practical devices was in many ways restricted to the use of materials amenable to mass production using capital intensive facilities. Over the past three decades we have amassed a stock pile of new materials not amenable to this approach. These new materials have properties that can help us tackle big issues in areas such as energy and health. Particularly in the latter area the need for customised structures is critical. In both areas nature suggests that hierarchical structures wherein nano and microscopic features are distributed throughout a macroscopic structure are required for optimal performance. Here we will use the example of the discovery of new organic conductors to highlight the opportunities and the challenges. We will show how advances in 3D printing as well as knitting and braiding of fibers have enabled the fabrication of new devices. We will report on progress towards the development of protocols that enable 3D assembly across the nano to macroscopic domains. Please raise your glasses!

Biography: **Prof. Gordon Wallace** is the Executive Research Director at the ARC Centre of Excellence for Electromaterials Science and Director of the Intelligent Polymer Research Institute and Director of the ANFF Materials node. He previously held an ARC Federation Fellowship and currently holds an ARC Laureate Fellowship. His research includes organic conductors, nanomaterials and electrochemical probe methods of analysis, and the use of these in the development of Intelligent Polymer Systems, as well as the use of these tools and materials in developing bio-communications from the molecular to skeletal domains in order to improve human performance via medical Bionics and the use of 3D printing to achieve this. Prof. Wallace is an elected Fellow at the Australian Academy of Science, the Australian Academy of Technological Sciences and Engineering, the Institute of Physics (UK) and the Royal Australian Chemical Institute. He was named NSW Scientist of the Year in the chemistry category in 2008, was appointed to the Korean World Class University System, and received the Royal Australian Chemical Institute HG Smith Prize.

Wednesday 9 December 2015

08:30 to 09:15 • Location: SNH 4002 Lecture Theatre

08:30

Photonics Beyond Diffraction Limit: Plasmon Waveguide, Cavities, and Integrated Laser Circuits

Xiang Zhang
Univ. of California,
Berkeley (USA)

Abstract: I will discuss recent development in scaling down of photonics. First I will present theoretical and experimental investigation of passive low loss waveguide using hybrid plasmon design. We propose a new optical cavity design approach using indefinite medium that has a drastically different scaling law than conventional microcavities, and discuss its experimental demonstrations. Finally, we will show an active plasmonic laser circuit that integrated with five tiny cavities that multiplexed into a single waveguide-an effort towards integrated photonics at nano-scale.

Biography: **Xiang Zhang** is the Ernest S. Kuh Chaired Professor at the University of California, Berkeley and the Director of the NSF Nano-scale Science and Engineering Center (SINAM). He is a member of the US National Academy of Engineering (NAE), Academia Sinica (Republic of China) and fellow of APS, OSA, AAAS and SPIE. His group's research in optical metamaterials was selected by *Time* magazine as "Top 10 Scientific Discoveries in 2008". Xiang Zhang was a recipient of the NSF CAREER Award, Rohsenow Lecturer at MIT, William C. Reynolds Lecturer at Stanford University, Fred Kavli Distinguished Lecturer at Materials Research Society (MRS), SME Dell K. Allen Outstanding Young Engineer Award and ONR Young Investigator Award. He received his BS/MS in physics in Nanjing University, China, and Ph.D from UC Berkeley in 1996 and was on faculty at Pennsylvania State University and UCLA prior returning Berkeley in 2004.

SPECIAL EVENTS

Badge Pick-up and Welcome Mixer

Sunday 6 December • 17:00 to 19:00
Location: SNH Level 3 Foyer

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

Poster Session

Monday 7 December • 18:30 to 20:00
Location: SNH Level 2 Research Foyer

All registered symposium attendees are invited to attend the Monday poster session provided as an opportunity to enjoy networking and refreshments 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.

INTERNATIONAL YEAR OF LIGHT PUBLIC LECTURE

A Century of Nobel Prizes in Light: Research that Changed the World!

Tuesday 8 December • 17:30 to 19:00
Location: SNH 4002 Lecture Theatre • Entry is free

The ARC Centre of Excellence CUDOS has sponsored a series of presentations in celebration of the 2015 International Year of Light. The presentations in this series have described how scientific breakthroughs in the understanding of light have changed and improved our lives. These range from the most basic level where light is necessary to the existence of life through photosynthesis, to the applications of light that have revolutionised transport and processing of information through the invention of the laser, optical fibres, lighting through the invention of LED's, the remarkable use of light microscopy in medicine and biology, astronomy, where optical telescopes have shown us our place in the universe, and the tantalizing prospects of the quantum nature of light.

But what about the future? What role can light play in promoting sustainable development and providing solutions to global challenges?

Data centres are the backbone of the modern economy, but by 2020 they will consume more than 250 megawatts of electricity in the US alone. Driving power consumption down is a major engineering, industrial and political concern. Light as a means for transmitting large amounts of computing data is recognised today as the most promising direction for solving this problem. In contrast to electronics, light does not burn power as it transmits data. The challenge with this approach is that until recently silicon - the basic material used in microelectronics and computing today - has been considered unsuitable for many optical applications.

Professor Michal Lipson will give a talk titled, 'What's Next – Computing At The Speed Of Light' which will discuss how this challenge is being addressed by her ground-breaking research in silicon photonics. Her research has harnessed the ability to control the flow of light at GHz frequencies and thereby enhance the natural optoelectronic properties of silicon. This ability to create active optical devices on silicon is the basis for the burgeoning field referred to 'light on a silicon chip' and opens the way for future opportunities for computing at the speed of light!

Michal Lipson is Professor of Electrical Engineering at Columbia University (USA). She is one of the main pioneers in the field of silicon photonics and is the inventor of several critical building blocks including the GHz silicon modulator. Professor Lipson holds over 20 patents and is the author of over 200 technical papers. She is co-founder of PicoLuz a company specialising in nonlinear silicon photonic components.

Following Professor Lipson's presentation light refreshments will be served. We invite you to join us for a glass of champagne to toast the 2015 International Year of Light.

SPECIAL EVENTS

Conference Banquet Dinner

Tuesday 8 December
19:30 to 22:00
Location: St John's College, Quad and Great Dinning Hall

All registered attendees are invited to attend. A dinner ticket will be included in your registration packet. Additional guest tickets can be purchased onsite.

Industry Showcase

Tuesday 8 December

During coffee and lunch breaks
10:00 to 16:00
Location: SNH Level 3 Foyer

Visit our industry partners on display during coffee and lunch breaks. Companies will showcase photonics technology where an increasing number of industrial and research applications are addressed.

Join us in celebrating the International Year of Light

The International Year of Light is a global initiative highlighting to the citizens of the world the importance of light and light-based technologies in their lives, for their futures, and for the development of society.

We hope that the International Year of Light will increase global awareness of the central role of light in human activities and that the brightest young minds continue to be attracted to careers in this field.

For more information on how you and your organization can participate, visit **www.spie.org/IYL**

INTERNATIONAL YEAR OF LIGHT 2015

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CONFERENCE 9668

Monday–Wednesday 7–9 December 2015
Proceedings of SPIE Vol. 9668

SPIE Micro+Nano Materials, Devices, and Systems

Conference Chair: **Benjamin J. Eggleton,** The Univ. of Sydney (Australia)

Conference Co-Chair: **Stefano Palomba,** The Univ. of Sydney (Australia)

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(Australia); **Rupert F. Oulton,** Imperial College London (United Kingdom); **Min Qiu,** Zhejiang Univ. (China); **David D. Sampson,** The Univ. of Western Australia (Australia); **Cather M. Simpson,** The Univ. of Auckland (New Zealand); **Volker J. Sorger,** The George Washington Univ. (USA); **Din Ping Tsai,** Academia Sinica (Taiwan); **Niek F. Van Hulst,** ICFO - Institut de Ciències Fotòniques (Spain); **Frédérique Vanholsbeeck,** The Univ. of Auckland (New Zealand); **Seok-Hyun Yun,** Harvard Medical School (USA); **Yonggang Zhu,** Commonwealth Scientific and Industrial Research Organisation (Australia)

MONDAY 7 DECEMBER

MONDAY PLENARY SESSION

Room: 4002 Lecture Theatre . . . . . Mon 9:00 to 10:30

9:00: 

Strong interaction between photons, phonons, and electrons enabled by silicon photonics *(Plenary)*, Michal Lipson, Columbia Univ. (USA)

9:45: 

Silk biomaterials: a life on the edge *(Plenary)*, Fiorenzo G. Omenetto, Tufts Univ. (USA)

Coffee Break . . . . . Mon 10:30 to 11:00

CONFERENCE 9668

Sessions 1A, 1B, and 1C run concurrently.

SESSION 1A

Room: 4001 Seminar Room . . . . . Mon 11:00 to 12:30

Nanostructured Materials I

Session Chair: **Ann Roberts,** The Univ. of Melbourne (Australia)

Sessions 1A, 1B, and 1C run concurrently.

11:00: **Recent progress in the physics of hyperbolic, all-dielectric and nonlinear metamaterials** *(Invited Paper)*, Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-1]

11:30: **Nonlinear torsional metamaterials**, Mingkai Liu, David A. Powell, Ilya V. Shadrivov, The Australian National Univ. (Australia); Mikhail Lapine, Univ. of Technology, Sydney (Australia) and Univ. of Sydney (Australia); Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-22]

11:50: **Magnetic hyperbolic metamaterials**, Sergey S. Kruk, The Australian National Univ. (Australia); Zi Jing Wong, Univ. of California, Berkeley (USA); Ekaterina Pshenay-Severin, Friedrich-Schiller-Univ. Jena (Germany); Kevin O'Brien, Univ. of California, Berkeley (USA); Dragomir N. Neshev, Yuri S. Kivshar, The Australian National Univ. (Australia); Xiang Zhang, Univ. of California, Berkeley (USA) . . . . . [9668-3]

12:10: **Dynamic tuning and switching of all-dielectric metasurfaces with liquid crystals**, Juergen Sautter, The Australian National Univ. (Australia); Isabelle Staude, The Australian National Univ. (Australia) and Friedrich-Schiller-Univ. Jena (Germany); Manuel Decker, Evgenia Rusak, Dragomir N. Neshev, The Australian National Univ. (Australia); Igal Brener, Sandia National Labs. (USA); Yuri S. Kivshar, The Australian National Univ. (Australia). . . . . [9668-5]

Lunch Break . . . . . Mon 12:30 to 13:50

SESSION 1B

Room: 3003 Lecture Theatre . . . . . Mon 11:00 to 12:50

Micro/Nanofluidics and Optofluidics I

Session Chair: **Warwick P. Bowen,** The Univ. of Queensland (Australia)

Sessions 1A, 1B, and 1C run concurrently.

11:00: **From smartphones to diagnostics: programmable droplet microfluidics** *(Invited Paper)*, Hywel Morgan, Univ. of Southampton (United Kingdom) . . . . . [9668-6]

11:30: **Investigation of convective heat transfer in microchannels with superhydrophobic surfaces and nanofluids**, Chia-Yang Chung, Robert A. Taylor, Majid E. Warkiani, The Univ. of New South Wales (Australia); Gary Rosengarten, RMIT Univ. (Australia) . . . . . [9668-10]

11:50: **Micro vortex flows induced by thermoplasmonic Marangoni effect**, Kyoko Namura, Kaoru Nakajima, Kenji Kimura, Motofumi Suzuki, Kyoto Univ. (Japan) . . . . . [9668-8]

12:10: **Carbon nanohorn and carbon nanotube nanofluids for solar thermal collectors**, Sara Mesgari Hagh, Natasha E. Hjerrild, Rory Clifford, Felipe Crisostomo, Robert A. Taylor, The Univ. of New South Wales (Australia). . . . . [9668-9]

12:30: **Computation and simulation with microorganisms in microfluidics**, Dan V. Nicolau, McGill Univ. (Canada) . . . . . [9668-7]

Lunch Break . . . . . Mon 12:50 to 13:50

SESSION 1C

Room: 3001 Seminar Room . . . . . Mon 11:00 to 12:50

Photonics I

Session Chair: **Justin J. Cooper-White,** The Univ. of Queensland (Australia)

Sessions 1A, 1B, and 1C run concurrently.

11:00: **Functional photonic nanostructures based on resonant dielectric nanoparticles** *(Invited Paper)*, Isabelle Staude, Friedrich-Schiller-Univ. Jena (Germany) and The Australian National Univ. (Australia); Manuel Decker, Katie E. Chong, Dragomir N. Neshev, The Australian National Univ. (Australia); Igal Brener, Sandia National Labs. (USA); Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-11]

11:30: **Fabrication and depth- and time-resolved fluorescence mapping of InGaN/GaN nanorod arrays**, Xi Dai, The Univ. of New South Wales (Australia) and Max-Planck-Institut für die Physik des Lichts (Germany); Xiaoming Wen, The Univ. of New South Wales (Australia); Michael Latzel, Max-Planck-Institut für die Physik des Lichts (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Martin Heilmann, Max-Planck-Institut für die Physik des Lichts (Germany); Christian Appelt, Max-Planck-Institut für die Physik des Lichts (Germany) and Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Yu Feng, Jianfeng Yang, Weijian Chen, Shujuan Huang, Santosh Shrestha, The Univ. of New South Wales (Australia); Silke H. Christiansen, Max-Planck-Institut für die Physik des Lichts (Germany) and Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (Germany); Gavin Conibeer, The Univ. of New South Wales (Australia) . . . . . [9668-12]

11:50: **Photonics of two-dimensional materials beyond graphene**, Qiaoliang Bao, Monash Univ. (Australia) and Soochow Univ. (China); Yupeng Zhang, Monash Univ. (Australia); Yunzhou Xue, Monash Univ. (Australia) and Soochow Univ. (China); Shaojuan Li, Soochow Univ. (China) . . . . . [9668-13]

12:10: **Low loss and single mode hybrid-clad waveguides for Terahertz radiation**, Haisu Li, The Univ. of Australia (Australia); Shaghik Atakaramians, Boris T. Kuhlmey, The Univ. of Sydney (Australia) . . . . . [9668-14]

12:30: **Mid-IR silicon pillar waveguides**, Neetesh Singh, Darren D. Hudson, Benjamin J. Eggleton, The Univ. of Sydney (Australia). . . [9668-15]

Lunch Break . . . . . Mon 12:50 to 13:50

Sessions 2A, 2B, and 2C run concurrently.

SESSION 2A

Room: 4001 Seminar Room . . . . . Mon 13:50 to 18:30

Nanostructured Materials II

Session Chairs: **Yuri S. Kivshar,** The Australian National Univ. (Australia); **Mikhail Lapine,** Univ. of Technology, Sydney (Australia)

Sessions 2A, 2B, and 2C run concurrently

13:50: **Polarisation and phase sensitive metasurfaces for imaging and information processing** *(Invited Paper)*, Ann Roberts, Jasper J. Cadusch, Evgeniy Panchenko, Timothy D. James, The Univ. of Melbourne (Australia); Kevin J. Webb, Purdue Univ. (USA); Daniel E. Gómez, Commonwealth Scientific and Industrial Research Organisation (Australia); Tim Davis, The Univ. of Melbourne (Australia) . . . . . [9668-16]

14:20: **Colloidal metamaterials**, Mingkai Liu, The Australian National Univ. (Australia); Kebin Fan, Boston Univ. (USA); Willie Padilla, Duke Univ. (USA); David A. Powell, The Australian National Univ. (Australia); Xin Zhang, Boston Univ. (USA); Ilya V. Shadrivov, The Australian National Univ. (Australia). . . . . [9668-17]

14:40: **Mesoscopic effects in discretised metamaterial spheres**, Mikhail Lapine, Christopher G. Poulton, Univ. of Technology, Sydney (Australia); Ross C. McPhedran, The Univ. of Sydney (Australia) . . . . . [9668-18]

15:00: **Nanostructuring for enhanced light absorption**, Ali Mirzaei, Ilya V. Shadrivov, Andrey E. Miroshnichenko, Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-19]

15:20: **Artificial electrostriction in metamaterials**, Michael J. A. Smith, Boris T. Kuhlmey, C. Martijn de Sterke, The Univ. of Sydney (Australia); Christian Wolff, Mikhail Lapine, Christopher G. Poulton, Univ. of Technology, Sydney (Australia) . . . . . [9668-20]

Coffee Break . . . . . Mon 15:40 to 16:10

16:10: **Dynamic control of THz waves through thin-film transistor metamaterials**, Fangfang Ren, The Australian National Univ. (Australia); Weizong Xu, Hai Lu, Nanjing Univ. (China); Jiandong Ye, The Australian National Univ. (Australia) and Nanjing Univ. (China); Hark Hoe Tan, Chennupati Jagadish, The Australian National Univ. (Australia) . . . [9668-21]

16:30: **All-dielectric Huygens' metasurfaces of different symmetries**, Sergey S. Kruk, The Australian National Univ. (Australia); Ivan I. Kravchenko, Oak Ridge National Lab. (USA); Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-2]

16:50: **Perfect Terahertz absorber through resonance impedance matching of all dielectric cylinders**, Michael Cole, David A. Powell, Ilya V. Shadrivov, The Australian National Univ. (Australia). . . . . [9668-23]

17:10: **Optical properties of InAs/GaInSb superlattices**, Mikhail A. Patrashin, Norihiko Sekine, Kouichi Akahane, Iwao Hosako, National Institute of Information and Communications Technology (Japan) [9668-24]

17:30: **Photophysics of point defects in zinc oxide nanoparticles**, Sumin Choi, Matthew R. Phillips, Igor Aharonovich, Cuong Ton-That, Univ. of Technology, Sydney (Australia) . . . . . [9668-25]

17:50: **Perovskite-based photodetectors: fabrication and optimisation**, Yupeng Zhang, Monash Univ. (Australia); Yusheng Wang, Soochow Univ. (China); Jingying Liu, Liangcong Jiang, Yi-Bing Cheng, Monash Univ. (Australia); Qiaoliang Bao, Monash Univ. (Australia) and Soochow Univ. (China) . . . . . [9668-26]

18:10: **Humidity sensing using resonance-enhanced absorption in dye-doped polymer thin-film on metal substrates**, Madhuri Kumari, Boyang Ding, Richard J. Blaikie, Univ. of Otago (New Zealand) . . . . . [9668-27]

SESSION 2B

Room: 3003 Lecture Theatre . . . . . Mon 13:50 to 18:20

Micro/Nanofluidics and Optofluidics II

Session Chairs: **Hywel Morgan,** Univ. of Southampton (United Kingdom); **Neetesh Singh,** The Univ. of Sydney (Australia)

Sessions 2A, 2B, and 2C run concurrently

13:50: **Photo-convective forces for micro- and nano-photonics** *(Invited Paper)*, David L. McAuslan, Glen I. Harris, Y. Sachkou, C. Baker, E. Hexin, Eoin E. Sheridan, Warwick P. Bowen, The Univ. of Queensland (Australia). . . . . [9668-40]

14:20: **Enhanced water vapour flow in silica microtubes explained by Maxwell's tangential momentum accommodation and Langmuir's adsorption**, Wenwen Lei, David R. McKenzie, The Univ. of Sydney (Australia). . . . . [9668-29]

14:40: **Low-temperature bonded glass-membrane microfluidic device for in vitro organ-on-a-chip cell culture models**, Kyall Pocock, Ian Wark Research Institute (Australia) and Univ. of South Australia (Australia); Craig Priest, Clive A. Prestidge, Ian Wark Research Institute (Australia); Chenxi Wang, Kazuma Mawatari, Takehiko Kitamori, The Univ. of Tokyo (Japan); Benjamin Thierry, Ian Wark Research Institute (Australia) and Univ. of South Australia (Australia) . . . . . [9668-30]

15:00: **Printed circuit boards as platform for disposable lab-on-a-chip applications**, Christian Leiterer, Macquarie Univ. (Australia); Matthias Urban, Wolfgang Fritzsche, Leibniz-Institut für Photonische Technologien e.V. (Germany); Ewa M. Goldys, David Inglis, Macquarie Univ. (Australia). . . . . [9668-31]

15:20: **Enabling rapid behavioral ecotoxicity studies using an integrated lab-on-a-chip systems**, Yushi Huang, Dayanthi Nugegoda, Donald Wlodkowic, RMIT Univ. (Australia) . . . . . [9668-32]

Coffee Break . . . . . Mon 15:40 to 16:10

16:10: **Induction of human iPSC-derived cardiomyocyte proliferation revealed by combinatorial screening in high density microbioreactor arrays** *(Invited Paper)*, Drew M. Titmarsh, Nick R. Glass, Richard J. Mills, Alejandro Hidalgo, Ernst J. Wolvetang, Enzo R. Porrello, James E. Hudson, Justin J. Cooper-White, The Univ. of Queensland (Australia) . . . . [9668-220]

16:40: **3D printed polymers toxicity profiling: a caution for biodevice applications**, Feng Zhu, RMIT Univ. (Australia); Joanna Skommer, Deakin Univ. (Australia); Timo Friedrich, Jan Kaslin, Monash Univ. (Australia); Donald Wlodkowic, RMIT Univ. (Australia) . . . . . [9668-33]

17:00: **Lab-on-chip platform for circulating tumor cells isolation**, Devendra K. Maurya, Edith Cowan Univ. (Australia) . . . . . [9668-34]

17:20: **Microfluidic device with integrated optical interfaces for miniaturized point-of-care blood analysis**, Markus Knoerzer, Hochschule Karlsruhe Technik und Wirtschaft (Germany) and RMIT Univ. (Australia); Khashayar Khoshmanesh, RMIT Univ. (Australia); Thomas Hahn, Bürkert Fluid Control Systems (Germany); Arnan Mitchell, RMIT Univ. (Australia); Dominik G. Rabus, RMIT Univ. (Australia) and Bürkert Fluid Control Systems (Germany); Christian Karnutsch, Hochschule Karlsruhe Technik und Wirtschaft (Germany) and RMIT Univ. (Australia) . . . . . [9668-35]

17:40: **Bubble-induced acoustic mixing in a microfluidic device**, Huaying Chen, Karolina Petkovic-Duran, Commonwealth Scientific and Industrial Research Organisation (Australia); Yonggang Zhu, Commonwealth Scientific and Industrial Research Organisation (Australia) and Melbourne Ctr. for Nanofabrication (Australia) . . . . . [9668-36]

18:00: **Automation of daphtoxkit-F biotest using a microfluidic lab-on-a-chip technology**, Yushi Huang, Dayanthi Nugegoda, Donald Wlodkowic, RMIT Univ. (Australia) . . . . . [9668-37]

SESSION 2C

Room: 3001 Seminar Room . . . . . Mon 13:50 to 18:30

Photonics II

Session Chairs: **Isabelle Staude,** Friedrich-Schiller Univ. (Germany); **Anthony Orth,** RMIT Univ. (Australia)

Sessions 2A, 2B, and 2C run concurrently

13:50: **Chip-based optical frequency combs** *(Invited Paper)*, Alexander L. Gaeta, Cornell Univ. (USA) . . . . . [9668-28]

14:20: **Damage monitoring using fiber optic sensors and by analysing electro-mechanical admittance signatures obtained from piezo sensor**, Muneesh Maheshwari, Venu Gopal M. Annamdas, John Hock Lye Pang, Swee Chuan Tjin, Anand K. Asundi, Nanyang Technological Univ. (Singapore) . . . . . [9668-41]

14:40: **Optimisation of nanostructured metallic optical filters and prevention of performance degradation due to oxidative stress and aging**, Eugeniu Balaur, Catherine Sadatnajafi, Guido Cadenazzi, Brian Abbey, La Trobe Univ. (Australia) . . . . . [9668-42]

15:00: **The Raman scattering in optical sensor**, Amira Zrelli, Ecole Nationale d'Ingenieurs de Tunis (Tunisia); Mohamed Bouyahi, Univ. Tunisia El Manar (Tunisia); Tahar Ezzedine, Univ. Tunis El Manar (Tunisia) [9668-43]

15:20: **Tunable microwave notch filter created by stimulated Brillouin scattering in a silicon chip**, Alvaro Casas Bedoya, Blair Morrison, Mattia Pagani, David A. I. Marpaung, Benjamin J. Eggleton, The Univ. of Sydney (Australia) . . . . . [9668-44]

Coffee Break . . . . . Mon 15:40 to 16:10

16:10: **Integration of upconversion nanocrystals into monolithic glass for high-performance photonic composites**, Jiangbo Zhao, Hong Ji, The Univ. of Adelaide (Australia); Xianlin Zheng, Run Zhang, Macquarie Univ. (Australia); Paul Ionescu, The Univ. of Melbourne (Australia); Erik P. Schartner, Herbert Foo, Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia). . . . . [9668-45]

16:30: **Multipolar third harmonic generation in magnetic fishnet metamaterials**, Lei Wang, The Australian National Univ. (Australia); Alexander S. Shorokhov, Lomonosov Moscow State Univ. (Russian Federation) and The Australian National Univ. (Australia); Pavel N. Melentiev, Institute for Spectroscopy (Russian Federation); Manuel Decker, Christian Helgert, Frank Setzpfandt, Rui Guo, The Australian National Univ. (Australia); Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russian Federation); Dragomir N. Neshev, Yuri S S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-46]

16:50: **Complete one-to-two coherent photon conversion in dispersion-engineered nonlinear waveguides**, Alexander S. Solntsev, Andrey A. Sukhorukov, The Australian National Univ. (Australia) . . . . . [9668-47]

17:10: **Nonlinear adiabatic couplers for tunable photon-pair Bell-state generation with spatial pump filtering**, Che Wen Wu, Alexander S. Solntsev, Tong Liu, The Australian National Univ. (Australia); Frank Setzpfandt, Australian National Univ. (Australia); Andreas Boes, Christian Will, Arnan Mitchell, RMIT Univ. (Australia); Dragomir N. Neshev, Andrey A. Sukhorukov, The Australian National Univ. (Australia) . . . . . [9668-48]

17:30: **Tunable entangled photon-pair generation in a quadratically nonlinear directional coupler**, Frank Setzpfandt, Australian National Univ. (Australia) and Friedrich-Schiller-Univ. Jena (Germany); Alexander S. Solntsev, James G. Titchener, Che Wen Wu, The Australian National Univ. (Australia); Chunle Xiong, The Univ. of Sydney (Australia); Roland Schiek, Ostbayerische Technische Hochschule Regensburg (Germany); Thomas Pertsch, Friedrich-Schiller-Univ. Jena (Germany); Dragomir N. Neshev, Andrey A. Sukhorukov, The Australian National Univ. (Australia) . . [9668-49]

17:50: **All-optically reconfigurable arbitrary two-qubit state generation in inhomogeneously poled nonlinear waveguides**, James G. Titchener, Alexander S. Solntsev, Andrey A. Sukhorukov, The Australian National Univ. (Australia). . . . . [9668-50]

18:10: **Quantum-classical correspondence of spontaneous down-conversion and sum-frequency generation in waveguide arrays**, Diana Antonosyan, James G. Titchener, Alexander S. Solntsev, Andrey A. Sukhorukov, The Australian National Univ. (Australia) . . . . . [9668-51]

POSTER SESSION

Room: Level 2 Research Foyer . . . . . Mon 18:30 to 20:00

All registered symposium attendees are invited to attend the Monday poster session provided as an opportunity to enjoy networking and refreshments 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. An interactive poster session and reception with authors present will be held on Monday 18:30 to 20:00. Light refreshments will be served.

Structural, linear, and nonlinear optical studies on annealed Mn doped ZnO thin film investigated using z-scan technique under cw regime, Poornesh P., Manipal Univ. (India) . . . . . [9668-156]

Slow light in aperiodic photonic superlattices and waveguides, Volodymyr I. Fesenko, Institute of Radio Astronomy (Ukraine). . . [9668-157]

Effect of BMITFSI to the electrical properties of methycelloluse/chitosan/NH4TF-based polymer electrolytes, Azwani Sofia Ahmad Khiar, Nur Arifah Arifin, Univ. Sains Islam Malaysia (Malaysia) . . . . . [9668-158]

Gate dielectric prepared from the regenerated silk fibroin for organic thin film transistor, Hyoung-Joon Jin, Inha Univ. (Korea, Republic of) . . . . . [9668-159]

Fabrication of translucent nanoceramics and its behavior in cell response, Yixiao Cai, Wei Xia, Uppsala Univ. (Sweden) . . . . . [9668-160]

Nano TiO_2-activated carbon composite electrodes for supercapacitor, M. Selvakumar, Manipal Institute of Technology (India); Krishna Bhat, National Institute of Technology, Karnataka (India). . . . . [9668-161]

Studies on structure, thermal, and mechanical properties of nano-composites of organically modified monmorillonite clay with some polymer, Ashok Rao, Manipal Institute of Technology (India) . . . [9668-162]

Enhanced emission in Dy doped Ge28.125Ga6.25S65.625 glass ceramics, Rongping Wang, Zhiyong Yang, The Australian National Univ. (Australia); Xiang Shen, Ningbo Univ. (China); Kunlun Yan, The Australian National Univ. (Australia); Anping Yang, Bin Zhang, Jiangsu Normal Univ. (China); Barry Luther-Davies, The Australian National Univ. (Australia). . . . . [9668-164]

Synthesis of graphene oxide/sodium silicate nanocomposite using sodium silicate solution, Sung Jin An, Kumoh National Institute of Technology (Korea, Republic of) . . . . . [9668-165]

Fabrication and optical characterization of a 2D metal periodic grating structure for cold filter application, Atsushi Motogaito, Masanori Kito, Hideto Miyake, Kazumasa Hiramatsu, Mie Univ. (Japan) . . . . . [9668-166]

Density dependence of carrier dynamics in $CH_3NH_3PbBr_3$ perovskite, Sheng Chen, Xiaoming Wen, Rui Sheng, Anita Ho-Baillie, Shujuan Huang, Martin A. Green, The Univ. of New South Wales (Australia) . . . . . [9668-168]

High efficiecy quantum-dot light-emitting diodes with polyaniline-poly-(p-styrenesulfonic acid) interlayer, Young Ran Park, Koo Shin, Young Joon Hong, Sejong Univ. (Korea, Republic of) . . . . . [9668-169]

Emission-color-tuned light-emitting diode microarrays with InGaN-based multishell nanotube heterostructures, Young Joon Hong, Sejong Univ. (Korea, Republic of) . . . . . [9668-170]

Dynamic evaluation and control of blood clotting using a microfluidic platform for high-throughput diagnostics, Miguel E. Combariza, Markus Knoerzer, Xinghuo Yu, RMIT Univ. (Australia); Jamie Cox, Phillip Nguyen, RMIT Univ. (Australia); Warwick Nesbitt, Monash Univ. (Australia); Francisco J. Tovar-Lopez, RMIT Univ. (Australia); Dominik G. Rabus, Bürkert Fluid Control Systems (Germany) and RMIT Univ. (Australia); Arnan Mitchell, RMIT Univ. (Australia). . . . . [9668-171]

Enhancement of the melting threshold of nanoparticles in Young's modulus-enhanced hybrid ceramic composites, Qiming Zhang, Swinburne Univ. of Technology (Australia); Zhilin Xia, Wuhan Univ. of Technology (China); Xiangping Li, Swinburne Univ. of Technology (Australia); Yi-Bing Cheng, Monash Univ. (Australia); Min Gu, Swinburne Univ. of Technology (Australia) . . . . . [9668-172]

A homeostatic, chip-based platform for zebrafish larvae immobilization and long-term imaging, Timo Friedrich, Monash Univ. (Australia); Feng Zhu, Donald Wlodkowic, RMIT Univ. (Australia); Jan Kaslin, Monash Univ. (Australia) . . . . . [9668-174]

Testing organic toxicants on biomicrofluidic devices: why polymeric substrata can lead you into trouble, Yushi Huang, Rhys Cartlidge, Feng Zhu, Dayanthi Nugegoda, Donald Wlodkowic, RMIT Univ. (Australia). . . . . [9668-175]

Multiphoton life time imaging microscopy reveals alteration in free to bound NADH ratio associated with Inhibition of metabolic enzymes activities in pancreatic cancer cells, Ayad G. Anwer, Krystyna Drozdowicz-Tomsia, Macquarie Univ. (Australia); Guozhen Liu, Macquarie Univ. (Australia) and Central China Normal Univ. (China); Ewa M. Goldys, Macquarie Univ. (Australia) . . . . . [9668-176]

CONFERENCE 9668

Optomechanically induced chirality in metamaterials, Mingkai Liu, David A. Powell, Ilya V. Shadrivov, The Australian National Univ. (Australia). . . . . [9668-186]

Pulsatile flow generated by thermoplasmonic Marangoni effect, Toshiki Sono, Kyoto Univ. Graduate School of Engineering (Japan); Kyoko Namura, Kaoru Nakajima, Kenji Kimura, Motofumi Suzuki, Kyoto Univ. (Japan) . . . . . [9668-187]

Development of functional nano-particle layer for highly efficient OLED, Yoonseuk Choi, Jae-Hyun Lee, Min-Hoi Kim, Haechul Choi, Hanbat National Univ. (Korea, Republic of); Chang-Jae Yu, Hanyang Univ. (Korea, Republic of); Eun-Uk Park, Hanbat National Univ. (Korea, Republic of). . . . . .[9668-188]

Plasmonic nano-emitter using four-wave mixing (FWM), Po-Wen Tang, Chao-Yi Tai, National Central Univ. (Taiwan) . . . . . [9668-189]

Robust high-coupling efficiency inverse taper coupler for silicon waveguide, Peng Wang, Aron W. Michael, Chee Yee Kwok, Ssu-Han Chen, The Univ. of New South Wales (Australia). . . . . [9668-190]

Design and simulation of piezoelectric PZT micro-actuators with integrated piezoresistive displacement sensors for micro-optics applications, Ssu-Han Chen, Aron W. Michael, Chee Yee Kwok, Peng Wang, The Univ. of New South Wales (Australia) . . . . . [9668-191]

Surface plasmon interference lithography using Al grating structure on glass, Yong Min Kim, Kyung Cheol Choi, KAIST (Korea, Republic of).[9668-192]

Effect of photonic structures on the optical properties of nano-phosphor, Arvind Kumar, Shashi Thakur, National Institute of Technology, Hamirpur (India); Naresh Dhiman, Sri Sai Univ. (India) . . . . . [9668-193]

Performance limits of stimulated Brillouin scattering due to nonlinear loss, Christian Wolff, Philipp Gutsche, Univ. of Technology, Sydney (Australia); Michael J. Steel, Macquarie Univ. (Australia); Benjamin J. Eggleton, The Univ. of Sydney (Australia); Christopher G. Poulton, Univ. of Technology, Sydney (Australia). . . . . [9668-194]

Effect of CNT addition on the energy release during the thermite reaction, Vimal Sharma, National Institute of Technology, Hamirpur (India). . . . . [9668-195]

Preparation and imaging performance of nanoparticulated $LuPO_4$:Eu semitransparent films under x-ray radiation, Ioannis E. Seferis, Justyna Zeler, Univ. of Wroclaw (Poland); Christos M. Michail, Ioannis G. Valais, George P. Fountos, Nektarios I. Kalyvas, Athanasios Bakas, Ioannis S. Kandarakis, Technological Educational Institute of Athens (Greece); Eugeniusz Zych, Univ. of Wroclaw (Poland) and Wroclaw Research Centre EIT+ (Poland). . . . . [9668-196]

CONFERENCE 9668

Micromotility measurements of breast cancer cells in a 3D environment with digital holographic microscopy, Chia-Chi Chien, Univ. of South Australia (Australia); Pierre Baganinchi, The Univ. of Edinburgh (United Kingdom); Tianqing Liu, QIMR Berghofer Medical Research Institute (Australia); Benjamin Thierry, Univ. of South Australia (Australia) . [9668-197]

Comparison of sensor structures for the signal amplification of surface plasmon resonance immunoassay using enzyme precipitation, Chih-Tsung Yang, Benjamin Thierry, Ian Wark Research Institute (Australia) and Univ. of South Australia (Australia) . . . . . [9668-198]

Wideband photonic RF Hilbert transformer using a frequency comb source based on a microring resonator, Thach Nguyen, Mehrdad Shoeiby, RMIT Univ. (Australia); Sai Tak Chu, City Univ. of Hong Kong (Hong Kong, China); Roberto Morandotti, Institut National de la Recherche Scientifique (Canada); Arnan Mitchell, David J. Moss, RMIT Univ. (Australia). . . . . [9668-199]

Polarization-dependent optical switching based on waveguide-coupled electron-phonon dynamics, Yimeng Wang, Xinping Zhang, Beijing Univ. of Technology (China) . . . . . [9668-200]

High-throughput poration of mammalian cells using femtosecond laser-activated plasmonic substrates, Nabiha Saklayen, Marinna Madrid, Marinus Huber, Daryl I. Vulis, Alexander Raun, Harvard Univ. (USA); Valeria Nuzzo, ECE Paris (France); Eric Mazur, Harvard Univ. (USA) . . . . . [9668-202]

Development of myoelectric control type speaking valve with low flow resistance, Katsutoshi Ooe, Kohei Sakurai, Shinya Mimaki, Daiichi Institute of Technology (Japan). . . . . [9668-203]

Assessment of bacterial concentrations using an all-fibre fluorometer, Cushla McGoverin, Rachel Guo, The Univ. of Auckland (New Zealand); Scott Choi, Craig Tuffnell, Veritide Ltd. (New Zealand); Simon Swift, Frédérique Vanholsbeeck, The Univ. of Auckland (New Zealand) [9668-204]

Extraordinary optical transmission sensor for measuring LDL cholesterol concentration, Hyerin Song, Kyujung Kim, Pusan National Univ. (Korea, Republic of) . . . . . [9668-205]

Intermediate band dye sensitised solar cells, Andrew Nattestad, Univ. of Wollongong (Australia). . . . . [9668-206]

Localized surface plasmon resonance biosensor using gold-silver alloy, Heesang Ahn, Kyujung Kim, Pusan National Univ. (Korea, Republic of) . . . . . [9668-207]

Luminescent solar concentrator improvement by stimulated emission, Md Rejvi Kaysir, Simon Fleming, The Univ. of Sydney (Australia); Rowan W. MacQueen, Timothy W. Schmidt, The Univ. of New South Wales (Australia); Alexander Argyros, The Univ. of Sydney (Australia) . . . . . [9668-208]

Investigation of emission properties of vacuum diodes with nanodiamond-graphite emitters, Sergey N. Orlov, JSC Molecular Electronics Research Institute (MERI) (Russian Federation); Sergey P. Timoshenkov, Valery Timoshenkov, National Research Univ. of Electronic Technology (Russian Federation); Evgeny S. Gornev, JSC Molecular Electronics Research Institute (MERI) (Russian Federation); Ravil Yafarov, Institute of Radio Engineering and Electronics (Russian Federation) . . . . . [9668-209]

Near-field optical microscopy technique for visualising the evanescent fields of silicon photonic and hybrid integrated photonic waveguides using a standard atomic force microscope, Steffen Schoenhardt, RMIT University (Australia); Jonas Dalke, Karlsruhe University of Applied Sciences (Germany); Thach Nguyen, Arnan Mitchell, RMIT University (Australia). . . . . [9668-213]

Hollow silicon microneedle array based trans-epidermal antiemetic patch for efficient management of chemotherapy induced nausea and vomiting, Bhushan N Kharbikar, Harish Kumar S, Sindhu K R, Rohit Srivastava, Indian Institute of Technology Bombay (India) . [9668-214]

Ultrafast generation, transport and relaxation of non-equilibrium carriers in plasmonic nanostructures, Prineha Narang, California Institute of Technology (USA) and Northrop Grumman (USA); Ravishankar Sundararaman, William A. Goddard III, Harry A. Atwater, California Institute of Technology (USA) . . . . . [9668-215]

Quantum plasmonics for next-generation optical and sensing technologies, Modjtaba Moaied, The Univ. of Sydney (Australia) and Commonwealth Scientific and Industrial Research Organization (CSIRO) (Australia); Kostya Ostrikov, The Univ. of Sydney (Australia) and Commonwealth Scientific and Industrial Research Organisation (Australia) and Queensland Univ. of Technology (Australia); Mario Silverinha, Univ. de Coimbra (Portugal) . . . . . [9668-216]

Measurement of nonlinear properties for PEI tetra sulfonated indium phthalocyanine compounds self-assembly film using improved Tophat z-scan technique, Qing Chang, Heilongjiang Univ. (China); Da-jun Liu, Changchun Univ. of Science and Technology (China); Xinzhi Wu, Junyi Yang, Yinglin Song, Suzhou Univ. of Science and Technology (China) . . . . . [9668-218]

TUESDAY 8 DECEMBER

TUESDAY PLENARY SESSION

Room: 4002 Lecture Theatre . . . . . Tue 8:30 to 9:15

8:30: 

3D fabrication nano to macroscopic: why we need that! *(Plenary)*, Gordon G. Wallace, Univ. of Wollongong (Australia)

Sessions 3A, 3B, and 3C run concurrently.

SESSION 3A

Room: 4001 Seminar Room . . . . . Tue 9:25 to 12:25

Nanostructured Materials III

Session Chairs: **Frank Vollmer,** Max-Planck-Institut für die Physik des Lichts (Germany); **Volker J. Sorger,** The George Washington Univ. (USA)

Sessions 3A, 3B, and 3C run concurrently.

9:25: **Recent progress in semiconductor nanowire photodetectors for multispectral imaging and in nanoscale sensing using surface-enhanced Raman spectroscopy** *(Invited Paper)*, Kenneth B. Crozier, Harvard School of Engineering and Applied Sciences (Australia). . [9668-52]

9:55: **Nitrogen acceptors in ZnO nanowires**, Cuong Ton-That, Liangchen Zhu, Matthew R. Phillips, Univ. of Technology, Sydney (Australia); Bruce C. C. Cowie, Australian Synchrotron (Australia); Sevak Khachadorian, Sarah Schlichting, Nadja Jankowski, Axel Hoffmann, Technische Univ. Berlin (Germany) . . . . . [9668-53]

10:15: **Evaluation of zinc oxide tetrapods for biosensor application**, Wei Zhao, KTH Royal Institute of Technology (Sweden) and Acreo Swedish ICT AB (Sweden); Yichen Zhao, KTH Royal Institute of Technology (Sweden); Mikael Karlsson, Qin Wang, Acreo Swedish ICT AB (Sweden); Muhammet S. Toprak, KTH Royal Institute of Technology (Sweden) . . . . . [9668-55]

10:35: **Toroidal response due to strong near-field coupling in planar metamaterials**, Alexey Basharin, Foundation for Research and Technology-Hellas (Greece) . . . . . [9668-221]

Coffee Break . . . . . Tue 10:55 to 11:15

11:15: **2D materials for nano-photonic devices** *(Invited Paper)*, Yuerui Lu, The Australian National Univ. (Australia) . . . . . [9668-56]

11:45: **Investigations on the influence of laser wavelength to generate micro texture on ITO coacted polyethylene terephthalate using liquid assisted laser processing for the development of multi-reflective solar cell**, Ashish K. Shukla, Iyamperumal A. Palani, M. Anbarasu, Indian Institute of Technology Indore (India) . . . . . [9668-57]

12:05: **Using light to control the optical, plasmonic, and mechanical properties of stacked azo-containing hybrid micro/nanosystems**, Filippo Fabbri, Univ. Paris-Sud 11 (France); Luca Sorelli, Univ. Laval (Canada); Anh-Duc Vu, Ecole Polytechnique (France); Jessy F. Baronet, Univ. Laval (Canada); Khalid Lahlil, Lucio Martinelli, Thierry Gacoin, Yves Lassailly, Jacques Peretti, Ecole Polytechnique (France) . . . . . [9668-58]

Lunch Break . . . . . .Tue 12:25 to 13:35

SESSION 3B

Room: 3003 Lecture Theatre . . . . . .Tue 9:25 to 12:35

Nanophotonics for Biology and Medical Applications I

Session Chairs: **Krasimir Vasilev,** Univ. of South Australia (Australia); **Prineha Narang,** California Institute of Technology (USA)

Sessions 3A, 3B, and 3C run concurrently.

9:25: **Flexible and highly efficient far-field three-dimensional nonlinear nanofocusing** *(Invited Paper)*, Baohua Jia, Swinburne Univ of Technology (Australia). . . . . [9668-59]

9:55: **Scintillating nanoparticle-photosensitizer conjugates towards x-ray activated photo dynamic therapy (PDT)**, Sandhya Clement, Elizabeth Camilleri, Wei Deng, Ewa M. Goldys, Macquarie Univ. (Australia). . . . . [9668-60]

10:15: **Some minding about the creation of multi-spectrum passive Terahertz imaging system**, Alexander Denisov, Jing hui Qiu, Shengchang Lan, Liu Hao, Harbin Institute of Technology (China) . . . . . [9668-61]

10:35: **Creation of reduced graphene oxide film along core surface of the microstructured fibres for hybrid optoelectronic devices**, Yinlan Ruan, The Univ. of Adelaide (Australia); Liyun Ding, Wuhan Univ. of Technology (China); Jingjing Duan, Shizhang Qiao, Heike Ebendorff-Heidepriem, Tanya M. Monro, The Univ. of Adelaide (Australia). . . [9668-62]

Coffee Break . . . . . .Tue 10:55 to 11:25

11:25: **All optically driven nano and micromachines** *(Invited Paper)*, Halina Rubinsztein-Dunlop, The Univ. of Queensland (Australia) . [9668-110]

11:55: **Study of ellipticity effect on LP11 modes field distribution in a step index fiber**, Hong Ji, Yinlan Ruan, Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia); Tanya M. Monro, Univ. of South Australia (Australia). . . . . [9668-64]

12:15: **Gigapixel hyperspectral microscopy for high content analysis**, Antony Orth, RMIT Univ. (Australia) and The Rowland Institute (USA); Monica J. Tomaszewski, Richik N. Ghosh, Thermo Fisher Scientific Inc. (USA); Ethan F. Schonbrun, The Rowland Institute at Harvard (USA) . . . . . [9668-65]

Lunch Break . . . . . .Tue 12:35 to 13:35

SESSION 3C

Room: 3001 Seminar Room . . . . . .Tue 9:25 to 12:35

Photonics III

Session Chairs: **Igal Brener,** Sandia National Labs. (USA); **Christian Wolff,** Univ. of Technology, Sydney (Australia)

Sessions 3A, 3B, and 3C run concurrently

9:25: **Bringing nanoscale matter to life: electrically tunable metamaterials and metasurfaces for control of absorption, emission and scattering** *(Invited Paper)*, Harry A. Atwater, Ruzan Sokhoyan, Yao Wei Huang, Howard Lee, Ragip Pala, Seunghoon Han, Krishnan Thyagarajan, Victor W. Brar, Michelle Sherrott, Laura Kim, Seyoon Kim, California Institute of Technology (USA) . . . . . [9668-66]

9:55: **Experimental observation of magnetic Fano resonances in all-dielectric quadrumers**, Alexander S. Shorokhov, Lomonosov Moscow State Univ. (Russian Federation); Benjamin Hopkins, Katie E. Chong, Dragomir N. Neshev, Duk Yong Choi, The Australian National Univ. (Australia); Maxim R. Shcherbakov, Lomonosov Moscow State Univ. (Russian Federation); Andrey E. Miroshnichenko, The Australian National Univ. (Australia); Andrey A. Fedyanin, Lomonosov Moscow State Univ. (Russian Federation); Yuri S. Kivshar, The Australian National Univ. (Australia). . . . . [9668-67]

10:15: **Fano resonance in waveguide photonic crystals**, Jian Zhang, Xinping Zhang, Beijing Univ. of Technology (China) . . . . . [9668-68]

10:35: **Polarization-independent wavefront control with silicon Huygens' metadevices**, Katie E. Chong, The Australian National Univ. (Australia); Isabelle Staude, The Australian National Univ. (Australia) and Friedrich-Schiller-Univ. Jena (Germany); Anthony James, Jason Dominguez, Sheng Liu, Salvatore Campione, Ganapathi S. Subramania, Ting S. Luk, Sandia National Labs. (USA); Manuel Decker, Dragomir N. Neshev, The Australian National Univ. (Australia); Igal Brener, Sandia National Labs. (USA); Yuri S. Kivshar, The Australian National Univ. (Australia). . . [9668-69]

Coffee Break . . . . . .Tue 10:55 to 11:25

11:25: **Dipole-fiber systems: radiation field patterns, effective magnetic response, and two-dimensional effective cavities** *(Invited Paper)*, Shaghik Atakaramians, The Univ. of Sydney (Australia); Andrey E. Miroshnichenko, Ilya V. Shadrivov, The Australian National Univ. (Australia); Tanya M. Monro, Univ. of South Australia (Australia); Yuri S. Kivshar, The Australian National Univ. (Australia); Shahraam V. Afshar, Univ. of South Australia (Australia) . . . . . [9668-70]

11:55: **Persistent flows of exciton-polariton quantum fluid in semiconductor microcavities**, Guangyao Li, The Australian National Univ. (Australia). . . . . [9668-71]

12:15: **Reflectionless propagation and interaction of whispering gallery modes in fiber resonators**, Sergey V. Suchkov, Australian National Univ. (Australia); Andrey A. Sukhorukov, The Australian National Univ. (Australia); Misha Sumetsky, Aston Univ. (United Kingdom) . . . . . [9668-72]

Lunch Break . . . . . .Tue 12:35 to 13:35

Sessions 4A, 4B, and 4C run concurrently.

SESSION 4A

Room: 4001 Seminar Room . . . . . .Tue 13:35 to 17:05

Nanostructured Materials IV

Session Chairs: **Kenneth B. Crozier,** Harvard School of Engineering and Applied Sciences (Australia); **Haisu Li,** The Univ. of Sydney (Australia)

Sessions 4A, 4B, and 4C run concurrently

13:35: **Electrodeposited p-type Co_3O_4 with high photoelectrochemical performance in aqueous medium**, Mohd Asri Mat Teridi, Mehdi Ebadi, Yusof Sulaiman, Mohd Adib Ibrahim, Norasikin Ahmad Ludin, Kamaruzzaman Sopian, National Univ. of Malaysia (Malaysia). . . . [9668-73]

CONFERENCE 9668

13:55: **Designing small molecule polyaromatic p- and n-type semiconductor materials for organic electronics**, Gavin Collis, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [9668-74]

14:15: **Theoretical and experimental investigation of a nanofluid receiver employed in a low profile concentration solar thermal collector**, Qiyuan Li, Cheng Zheng, Sara Mesgari Hagh, Yasitha Hewakuruppu, Natasha E. Hjerrild, Felipe Crisostomo, Karl Morrison, Albert Woffenden, Chia-Yang Chung, The Univ. of New South Wales (Australia); Gary Rosengarten, RMIT Univ. (Australia); Jason A. Scott, Robert A. Taylor, The Univ. of New South Wales (Australia). . . . . [9668-75]

14:35: **The design of the Fano resonances in oligomer-like structures**, Ben Hopkins, Andrey E. Miroshnichenko, The Australian National Univ. (Australia); Dmitry S. Filonov, ITMO Univ. (Russian Federation); Francesco Monticone, The Univ. of Texas at Austin (USA); Stanislav B. Glybovski, National Research Univ. of Information Technologies, Mechanics and Optics (Russian Federation); Andrea Alù, The Univ. of Texas at Austin (USA); Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-76]

14:55: **Optical properties of arrays of five-pointed nano-stars**, Shaoli L. Zhu, Michael B. Cortie, Univ. of Technology, Sydney (Australia) . . [9668-77]

Coffee Break . . . . . .Tue 15:15 to 15:45

15:45: **Plasmonic response in nanoporous metal: dependence on network topology**, Marc A. Gali, Matt Tai, Matthew D. Arnold, Michael B. Cortie, Angus R. Gentle, Geoffrey B. Smith, Univ. of Technology, Sydney (Australia). . . . . [9668-78]

16:05: **Optimization of effective absorption enhancement of paired-strips gold nanoantennas arrays in organic thin-films**, Zih-Ying Yang, Kuo-Ping Chen, Chen-Wei Su, National Chiao Tung Univ. (Taiwan). . . . . [9668-79]

16:25: **Graphene nano-ribbon with nano-breaks as efficient thermoelectric device**, Md Sharafat Hossain, Feras Al-Dirini, Faruque M. Hossain, Efstratios S. Skafidas, The Univ. of Melbourne (Australia) [9668-80]

16:45: **Modeling of graphene nanoscroll conductance with quantum capacitance effect**, Razali Ismail, Mohsen Khaledian, Univ. Teknologi Malaysia (Malaysia) . . . . . [9668-81]

SESSION 4B

Room: 3003 Lecture Theatre . . . . . .Tue 13:35 to 16:25

Nanophotonics for Biology and Medical Applications II

Session Chair: **Baohua Jia,** Swinburne Univ. of Technology (Australia)

Sessions 4A, 4B, and 4C run concurrently.

13:35: **Label-free hyperspectral unmixing for differentiate the different treatments with 'stem cell over cartilage' system for regenerative medicine applications**, Saabah B. Mahbub, Macquarie Univ. (Australia). . . . . [9668-82]

13:55: **Nanoparticle-based strategy for ultrasensitive cytokine detection**, Guzohen Liu, Ayad G. Anwer, Kai Zhang, Azizul U. Rehman, Ewa M. Goldys, Macquarie Univ. (Australia) . . . . . [9668-83]

14:15: **Systematic assessment of biodistribution and blood circulation time of functionalized upconversion nanoparticles in chick embryo**, Annemarie Nadort, Liuen Liang, Anna Guller, Ekaterina A. Grebenik, Yiqing Lu, Yi Qian, Ewa M. Goldys, Andrei V. Zvyagin, Macquarie Univ. (Australia). . . . . [9668-84]

14:35: **A wirelessly powered micro-spectrometer for neural probe-pin devices**, Sang H. Choi, NASA Langley Research Ctr. (USA); Kyo D. Song, Hargsoon Yoon, Norfolk State Univ. (USA); Uhn Lee M.D., Gacheon Univ. of Medicine and Science (Korea, Republic of) . . . . . [9668-85]

14:55: **Multimode fibres: a pathway towards deep-tissue fluorescence microscopy**, Martin Ploschner, Tomáš Cižmár, Univ. of Dundee (United Kingdom) . . . . . [9668-86]

Coffee Break . . . . . .Tue 15:15 to 15:45

15:45: **In-vivo and In-vitro fluorescence quenching of NADH by FCCP**, Azizul U. Rehman, Macquarie Univ. (Australia) and National Institute of Lasers & Optronics (Pakistan); Ayad G. Anwer, Macquarie Univ. (Australia); Martin E. Gosnell, Macquarie Univ. (Australia) and Quantitative Pty. Ltd. (Australia); Saabah B. Mahbub, Macquarie Univ. (Australia); Guozhen Liu, Macquarie Univ. (Australia) and Central China Normal Univ. (China); Krystyna Drozdowicz-Tomsia, Ewa M. Goldys, Macquarie Univ. (Australia). . . . . [9668-87]

16:05: **Optical parameter measurement of highly diffusive tissue body phantoms with specially designed sample holder for photo diagnostic and PDT applications**, Azizul U. Rehman, Macquarie Univ. (Australia) and National Institute of Lasers & Optronics (Pakistan); Iftikhar Ahmad, Pakistan Institute of Engineering and Applied Sciences (Pakistan); K. Rehman, Govt. School (Pakistan); S. Anwar, Shamaraz Firdous Sr., M. Nawaz, National Institute of Lasers & Optronics (Pakistan) . . . . . [9668-88]

SESSION 4C

Room: 3001 Seminar Room . . . . . .Tue 13:35 to 17:05

Solar Cell Technologies

Session Chairs: **Diana Antonosyan,** The Australian National Univ. (Australia); **Alexander L. Gaeta,** Columbia Univ. (USA)

Sessions 4A, 4B, and 4C run concurrently.

13:35: **Improved properties of phosphor-filled luminescent down-shifting layers: reduced scattering, optical model, and optimization for PV application**, Anastasiia Solodovnyk, Bayerisches Zentrum für Angewandte Energieforschung e.V. (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Benjamin Lipovšek, Univ. of Ljubljana (Slovenia); Karen K. Forberich, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Edda Stern, Bayerisches Zentrum für Angewandte Energieforschung e.V. (Germany); Janez Krc, Univ. of Ljubljana (Slovenia); Miroslaw Batentschuk, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Marko Topic, Univ. of Ljubljana (Slovenia); Christoph J. Brabec, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and Bayerisches Zentrum für Angewandte Energieforschung e.V. (Germany). . . . . [9668-90]

13:55: **Improved-performance polymer solar cells employing nano-patterned electrodes**, Baofu Ding, Kamal E. Alameh, Edith Cowan Univ. (Australia). . . . . [9668-91]

14:15: **Fiber energy devices: from micro/nano-structured electrodes to wearable-energy applications**, Dechun Zou, Peking Univ. (China)[9668-92]

14:35: **Nanostructured metallic rear reflectors for thin solar cells: balancing parasitic absorption in metal and large-angle scattering**, Claire E. R. Disney, Supriya Pillai, Martin A. Green, The Univ. of New South Wales (Australia) . . . . . [9668-93]

14:55: **Novel plasmonics materials to improve thin film solar cells efficiency**, Nithya Saiprasad, Royal Melbourne Institute of Technology (Australia); Alberto Boretti, West Virginia Univ. (USA); Stefania Castellato, Swinburne Univ. of Technology (Australia) . . . . . [9668-94]

Coffee Break . . . . . .Tue 15:15 to 15:45

15:45: **Ultrafast charge generation and relaxation dynamics in methylammonium lead bromide perovskites**, Xiaofan Deng, Xiaoming Wen, Rui Sheng, Anita Ho-Baillie, Shujuan Huang, The Univ. of New South Wales (Australia); Takaaki Harada, Tak W. Kee, The Univ. of Adelaide (Australia); Martin A. Green, The Univ. of New South Wales (Australia). . . . . [9668-95]

16:25: **Nanosphere lithography for improved absorption in thin crystalline silicon solar cells**, Yuan-Chih Chang, David N. Payne, Michael E. Pollard, Darren M. Bagnall, The Univ. of New South Wales (Australia). . . . . [9668-97]

16:45: **To improve moisture stability of perovskite solar cells by hydrophobic hole transporting system without lithium salt additive**, Lixin Xiao, Peking Univ. (China). . . . . [9668-98]

PANEL DISCUSSION

Room: 4002 Lecture Theatre . . . . . 17:30 to 19:00

International Year of Light Public Lecture

Technical attendees and the general public are invited to join the discussion about the future perspective of light. Facilitated by a panel of experts and special guests, audience members are encouraged to ask questions and engage with the global optics community. Entry is free.

CONFERENCE BANQUET DINNER

Room: The Quad and Great Dining Hall . . . . 19:30 to 22:00

All registered attendees are invited to attend. A dinner ticket will be included in your registration packet. Additional guest tickets can be purchased onsite.

WEDNESDAY 9 DECEMBER

WEDNESDAY PLENARY SESSION

Room: 4002 Lecture Theatre . . . . . Wed 8:30 to 9:15

8:30: 

Photonics beyond diffraction limit: plasmon waveguide, cavities, and integrated laser circuits *(Plenary)*, **Xiang Zhang,** Univ. of California, Berkeley (USA)

Sessions 5A, 5B, and 5C run concurrently.

SESSION 5A

Room: 4001 Seminar Room . . . . . Wed 9:25 to 12:35

Biocompatible Materials I

Session Chairs: **Yuerui Lu,** The Australian National Univ. (Australia); **Sergey S. Kruk,** The Australian National Univ. (Australia)

Sessions 5A, 5B, and 5C run concurrently.

9:25: **Nanoengineered plasma polymer films for biomedical applications** *(Invited Paper)*, Krasimir Vasilev, Univ. of South Australia (Australia). . . . . [9668-99]

9:55: **First principle study on biocompatible lead-free piezoelectric materials**, Tomoya Kai, Yasutomo Uetsuji, Osaka Institute of Technology (Japan); Kazuyoshi Tsuchiya, Tokai Univ. (Japan) . . . . . [9668-100]

10:15: **Multiscale simulation of polycrystalline ferroelectric materials**, Tatsuya Oka, Yasutomo Uetsuji, Hiroyuki Kuramae, Osaka Institute of Technology (Japan); Kazuyoshi Tsuchiya, Tokai Univ. (Japan). . . [9668-101]

10:35: **Acellular organ scaffolds for tumor tissue engineering**, Anna Guller, Macquarie Univ. (Australia) and I.M. Sechenov Moscow Medical Academy (Russian Federation); Inna Trusova, Elena Petersen, Moscow Institute of Physics and Technology (Russian Federation); Anatoly B. Shekhter, I.M. Sechenov Moscow Medical Academy (Russian Federation); Yi Qian, Andrei V. Zvyagin, Macquarie Univ. (Australia). . . . . [9668-102]

Coffee Break . . . . . Wed 10:55 to 11:25

11:25: **Exploring the nanoscale dynamics of molecular systems with optical microcavities** *(Invited Paper)*, Frank Vollmer, Max-Planck-Institut für die Physik des Lichts (Germany) . . . . . [9668-103]

11:55: **Complementary all-graphene planar self-switching devices**, Feras Al-Dirini, Md Sharafat Hossain, Mahmood A. Mohammed, Faruque M. Hossain, Ampalavanapillai T. Nirmalathas, Efstratios S. Skafidas, The Univ. of Melbourne (Australia) . . . . . [9668-152]

12:15: **Rapid assessment of live to dead bacterial cell ratios**, Fang Ou, Rachel Guo, Cushla McGoverin, Simon Swift, Frédérique Vanholsbeeck, The Univ. of Auckland (New Zealand) . . . . . [9668-153]

Lunch Break . . . . . Wed 12:35 to 14:05

SESSION 5B

Room: 3003 Lecture Theatre . . . . . Wed 9:25 to 12:35

Plasmonics I

Session Chairs: **Nikolai Strohfeldt,** Univ. Stuttgart (Germany); **Stefan A. Maier,** Imperial College London (United Kingdom)

Sessions 5A, 5B, and 5C run concurrently.

9:25: **Plasmonic, dielectric, and hyperbolic platforms for surface-enhanced spectroscopies** *(Invited Paper)*, Stefan A. Maier, Imperial College London (United Kingdom) . . . . . [9668-106]

9:55: **Sub-wavelength Si-based plasmonic light emitting tunnel junction**, Volker J. Sorger, Hasan Goktas, The George Washington Univ. (USA) . . . . . [9668-107]

10:15: **Ultrafast generation and relaxation of non-equilibrium carriers in plasmonic nanostructures**, Prineha Narang, Ravishankar Sundararaman, William A. Goddard III, Harry A. Atwater Jr., California Institute of Technology (USA) . . . . . [9668-108]

10:35: **Bright second harmonic generation of individual optical antennas by non-linear polarization phase engineering**, Mohsen Rahmani, Imperial College London (United Kingdom) and Australian National Univ. (Australia); Sylvain Gennaro, Vincenzo Giannini, Heykel Aouani, Miguel Navarro-Cía, Themistoklis P. H. Sidiropoulos, Stefan A. Maier, Rupert F. Oulton, Imperial College London (United Kingdom) . . . . . [9668-109]

Coffee Break . . . . . Wed 10:55 to 11:25

11:25: **Nonlinear optics with metasurfaces** *(Invited Paper)*, Igal Brener, Sandia National Labs. (USA) . . . . . [9668-222]

11:55: **Polarization-independent interference in inhomogeneous plasmonic nano-discs and nano-apertures**, Gabriel Geraci, Imperial College London (United Kingdom); Ben Hopkins, Andrey E. Miroshnichenko, The Australian National Univ. (Australia); Biniyam Erkihun, Imperial College London (United Kingdom); Dragomir N. Neshev, Yuri S. Kivshar, The Australian National Univ. (Australia); Stefan A. Maier, Mohsen Rahmani, Imperial College London (United Kingdom) . . . . . [9668-132]

12:15: **Fano coupling between Rayleigh anomaly and localized surface plasmon resonance and the sensor applications**, Feifei Liu, Xinping Zhang, Beijing Univ. of Technology (China) . . . . . [9668-112]

Lunch Break . . . . . Wed 12:35 to 14:05

SESSION 5C

Room: 3001 Seminar Room . . . . . Wed 9:25 to 12:25

Fabrication I

Session Chairs: **Mingkai Liu,** The Australian National Univ. (Australia); **Arnan Mitchell,** RMIT Univ. (Australia)

Sessions 5A, 5B, and 5C run concurrently

9:25: **Micro-imaging cancer by parametric and multimodal extensions of optical coherence tomography** *(Invited Paper)*, David D. Sampson, The Univ. of Western Australia (Australia) . . . . . [9668-113]

9:55: **Investigation on surface enhanced Raman spectroscopy for ultrasensitive diagnosis of malaria infection**, Quan Liu, Keren Chen, Nanyang Technological Univ. (Singapore) . . . . . [9668-223]

10:15: **Customization of BCP Lo for directed self assembly**, Mary Ann J. Hockey, Brewer Science, Inc. (USA) . . . . . [9668-148]

10:35: **Nano-engineered flexible pH sensor for point-of-care urease detection**, Ali Sardarinejad, Devendra K. Maurya, Edith Cowan Univ. (Australia); Alfred Chin Yen Tay, Barry J. Marshall, The Univ. of Western Australia (Australia); Kamal E. Alameh, Edith Cowan Univ. (Australia) . . . . . [9668-210]

Coffee Break . . . . . Wed 10:55 to 11:25

11:25: **Structuring and domain engineering ferroelectric crystals at the nanoscale: new platforms for integrated photonics and phononics** *(Invited Paper)*, Arnan Mitchell, RMIT Univ. (Australia) . . . . . [9668-225]

11:55: **Development of the magnetic force-induced dual vibration energy hervester using a unimorph cantilever**, Motomitsu Umaba, Yusuke Morita, Eiji Nakamachi, Doshisha Univ. (Japan) . . . . . [9668-115]

12:15: **CMOS compatible fabrication process of MEMS resonator for timing reference and sensing application**, Duc Hau Huynh, The Univ. of Melbourne (Australia) and National ICT Australia (Australia); Phuong D. Nguyen, Thanh C. Nguyen, Efstratios S. Skafidas, Robin Evans, The Univ. of Melbourne (Australia) . . . . . [9668-143]

12:25: **Laser scribed graphene oxide film with fractal structures**, Litty V. Thekkekara, Swinburne Univ. of Technology (Australia) . . [9668-114]

Lunch Break . . . . . Wed 12:55 to 14:05

Sessions 6A, 6B, 6C, and 7A run concurrently.

SESSION 6A

Room: 4001 Seminar Room . . . . . Wed 14:05 to 15:55

Medical and Biological Micro/Nanodevices

Session Chair: **Halina Rubinsztein-Dunlop,** The Univ. of Queensland (Australia)

Sessions 6A, 6B, 6C, and 7A run concurrently

14:05: **Rethinking microscopy along the cost and efficiency axis** *(Invited Paper)*, Changhuei Yang, Xiaoze Ou, California Institute of Technology (USA) . . . . . [9668-120]

14:35: **A temperature-compensated optical fiber force sensor for minimally invasive surgeries**, Zonglai Mo, Peter Xu, Neil G. R. Broderick, The Univ. of Auckland (New Zealand); Hao Chen, The University of Auckland (New Zealand) . . . . . [9668-154]

14:55: **Self-assembled laser-activated plasmonic substrates for high-throughput, high-efficiency intracellular delivery**, Marinna Madrid, Harvard School of Engineering and Applied Sciences (USA); Nabiha Saklayen, Harvard Univ. (USA); Marinus Huber, Max-Planck-Institut (Germany); Nicolas Vogel, Univ. of Erlangen (Germany); Christos Boutopoulos, Michel Meunier, Ecole Polytechnique de Montréal (Canada); Eric Mazur, Harvard Univ. (USA) . . . . . [9668-155]

15:15: **Liquid marble as microbioreactor for bioengineering applications**, Peggy P. Chan, Swinburne Univ. of Technology (Australia) . . . . . [9668-149]

15:35: **Sub-bandage sensing system for remote monitoring of chronic wounds in healthcare**, Alex J. Hariz, Nasir Mehmood, Nico Voelcker, Univ. of South Australia (Australia) . . . . . [9668-219]

Coffee Break . . . . . Wed 15:55 to 16:25

SESSION 6B

Room: 3003 Lecture Theatre . . . . . Wed 14:05 to 18:45

Plasmonics II

Session Chairs: **Shaghik Atakaramians,** The Univ. of Sydney (Australia); **Timothy D. James,** The Univ. of Melbourne (Australia)

Sessions 6A, 6B, 6C, and 7A run concurrently.

14:05: **Hybrid thermodynamics for hydrogen in palladium nanocubes and nanoparticles for active plasmonics** *(Invited Paper)*, Nikolai Strohfeldt, Univ. Stuttgart (Germany); Ronald Griessen, VU Univ. (Netherlands); Harald Giessen, Univ. Stuttgart (Germany) . . . . . [9668-125]

14:35: **Waveguide-plasmon-polariton enhanced photochemistry**, Daniel E. Gomez, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [9668-126]

14:55: **Plasmonic nanorod antennae for enhanced photo-acoustic interaction**, Ivan S. Maksymov, Andrew D. Greentree, RMIT Univ. (Australia). . . . . [9668-127]

15:15: **Transforming polarisation to wavelength via two-colour quantum dot plasmonic enhancement**, Timothy D. James, The Univ. of Melbourne (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Paul Mulvaney, The Univ. of Melbourne (Australia); Timothy J. Davis, Commonwealth Scientific and Industrial Research Organisation (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Ann Roberts, The Univ. of Melbourne (Australia) . . . . . [9668-128]

15:35: **Electrostatically assembled gold nanolens arrays for enhanced nearfield focusing**, Julian A. Lloyd, Soon Hock Ng, Monash Univ. (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Daniel E. Gómez, Commonwealth Scientific and Industrial Research Organisation (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Udo Bach, Monash Univ. (Australia) and Commonwealth Scientific and Industrial Research Organisation (Australia) and Melbourne Ctr. for Nanofabrication (Australia). . . . . [9668-129]

Coffee Break . . . . . Wed 15:55 to 16:25

16:25: **Plasmonic nanoparticle-based SERS immunosensor-on-a-chip**, Lim Wei Yap, Wenlong Cheng, Monash Univ. (Australia); Yonggang Zhu, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [9668-38]

16:45: **Tunable Tamm plasmon modes as high sensitivity bioensors**, Kuo-Ping Chen, Che-Yuan Chang, National Chiao Tung Univ. (Taiwan) . . . . . [9668-131]

17:05: **Opto-mechanical interactions in split ball resonators**, Yue Sun, Sergey V. Suchkov, Andrey E. Miroshnichenko, Andrey A. Sukhorukov, The Australian National Univ. (Australia) . . . . . [9668-135]

17:25: **Plasmonic nano-resonator enhanced one-photon luminescence from single gold nanorods**, Keyu Xia, Macquarie Univ. (Australia); Yingbo He, Hongming Shen, Yuqing Cheng, Qihuang Gong, Guowei Lu, Peking Univ. (China) . . . . . [9668-133]

17:45: **Multipolar plasmon resonances on opto-capacitive nano-structures**, nikta Shahcheraghi, Univ. of Technology, Sydney (Australia). . . . . [9668-134]

18:05: **Tunable photoluminescence of two-dimensional $MoSe_2$ by gold nanoantennas**, Haitao Chen, Jiong Yang, The Australian National Univ. (Australia); Evgenia Rusak, Karlsruher Institut für Technologie (Germany); Rui Guo, Manuel Decker, Isabelle Staude, The Australian National Univ. (Australia); Carsten Rockstuhl, Karlsruher Institut für Technologie (Germany); Yuerui Lu, Yuri S. Kivshar, Dragomir N. Neshev, The Australian National Univ. (Australia) . . . . . [9668-111]

18:25: **Integrate plasmonic nanoantennas for polarisation sensitive directional waveguide coupling**, Rui Guo, Manuel Decker, The Australian National Univ. (Australia); Frank Setzpfandt, Friedrich-Schiller-Univ. Jena (Germany); Xin Gai, Duk-Yong Choi, The Australian National Univ. (Australia); Roman Kiselev, Leibniz-Institut für Photonische Technologien e.V. (Germany); Arkadi Chipouline, Technische Univ. Darmstadt (Germany); Isabelle Staude, The Australian National Univ. (Australia) and Friedrich-Schiller-Univ. Jena (Germany); Thomas Pertsch, Friedrich-Schiller-Univ. Jena (Germany); Dragomir N. Neshev, Yuri S. Kivshar, The Australian National Univ. (Australia) . . . . . [9668-136]

SESSION 6C

Room: 3001 Seminar Room . . . . . Wed 14:05 to 17:35

Fabrication II

Session Chairs: **David D. Sampson,** The Univ. of Western Australia (Australia); **Alexander S. Solntsev,** The Australian National Univ. (Australia)

Sessions 6A, 6B, 6C, and 7A run concurrently

14:05: **Fabrication of plasmonic photonic crystals using photo-reduction of metallic ions in patterned polymer film**, Yuanhai Lin, Xinping Zhang, Beijing Univ. of Technology (China) . . . . . [9668-116]

14:25: **Tunable focusing by elastic metasurface**, Yair D. Zarate, The Australian National Univ. (Australia) . . . . . [9668-138]

14:45: **Spectroscopic behavior in whispering-gallery modes by edge formation of printed microdisk lasers**, Cong Chen, Jifeng Li, Soichiro Ryu, Kyushu Univ. (Japan); Kei Yasui, Nissan Chemical Industries, Ltd. (Japan); Hiroaki Yoshioka, Yuji Oki, Kyushu Univ. (Japan) . . . . . [9668-119]

15:05: **Freestanding metal nanomembranes with nanohole arrays patterned by a template transfer method**, Peipei Jia, The Univ. of Adelaide (Australia); Jun Yang, Western Univ. (Canada); Heike Ebendorff-Heidepriem, The Univ. of Adelaide (Australia) . . . . . [9668-118]

15:25: **Gyroid based nanostructures with cubic symmetry for on-chip photonic applications**, Yanlei Hu, Benjamin P. Cumming, Min Gu, Swinburne Univ. of Technology (Australia) . . . . . [9668-145]

Coffee Break . . . . . Wed 15:45 to 16:15

16:15: **Investigations on the influence of laser fluence and wavelength in the inclusion of zinc dust in Cu-Al for the development of Cu-Zn-Al shape memory alloy using laser assisted alloying**, Akash K. Kumar, Iyamperumal A. Palani, Indian Institute of Technology Indore (India) . . . . . [9668-139]

16:35: **Influence of laser fluence and substrate temperature on the laser induced forward transfer (LIFT) of ZnO and Sb doped ZnO nanostructures to the flexible PET to realize P-N junction for the flexible UV LED device development**, Iyamperumal A. Palani, Tejendra Dixit, Anubha Bilgayan, Rajagopalan P., Vipul Singh, Indian Institute of Technology Indore (India); Okada Tatsuo, Daisuke Nakamura, Kyushu Univ. (Japan). . . . . [9668-140]

16:55: **Optical properties of refractory TiN, AlN and (Ti,Al)N coatings**, Maryna Bilokur, Shaoli L. Zhu, Angus R. Gentle, Matthew D. Arnold, Michael B. Cortie, Geoffrey B. Smith, Univ. of Technology, Sydney (Australia) . . . . . [9668-144]

17:15: **Optimisation for Schottky electrode**, Stanley Luong, RMIT Univ. (Australia). . . . . [9668-141]

SESSION 7A

Room: 4001 Seminar Room . . . . . Wed 16:25 to 18:45

Biocompatible Materials II

Session Chair: **Peggy P. Chan,** Swinburne Univ. of Technology (Australia)

Sessions 6A, 6B, 6C, and 7A run concurrently

16:25: **Application of novel iron core/iron oxide shell nanoparticles to sentinel lymph node identification**, Aidan Cousins, Douglas Howard, Univ. of South Australia (Australia); Anna Henning, Boutiq Nanoparticle Solutions (New Zealand); Bruce A. Wedding, Benjamin Thierry, Univ. of South Australia (Australia) . . . . . [9668-151]

16:45: **Bio-functionalisation of polyether ether ketone using plasma immersion ion implantation**, Edgar Wakelin, The Univ. of Sydney (Australia); Giselle Yeo, The Univ. of Sydney (Australia) and Charles Perkins Ctr. (Australia) and Bosch Institute (Australia); Alexey Kondyurin, The Univ. of Sydney (Australia); Michael Davies, Univ. of Copenhagen (Denmark) and Heart Research Institute (Australia); David R. McKenzie, The Univ. of Sydney (Australia); Anthony Weiss, The Univ. of Sydney (Australia) and Charles Perkins Ctr. (Australia) and Bosch Institute (Australia); Marcela M. M. Bilek, The Univ. of Sydney (Australia) . . . . . [9668-104]

17:05: **Micro-scale resolved mechanical property variation of the yttria partially stabilised zirconia-porcelain interface in dental prostheses**, Alexander J. G. Lunt, Univ. of Oxford (United Kingdom); Gaurav Mohanty, EMPA (Switzerland); Tee K. Neo, Specialist Dental Group (Singapore); Johann Michler, EMPA Materials Science & Technology (Switzerland); Alexander M. Korsunsky, Univ. of Oxford (United Kingdom) . . . . [9668-105]

17:25: **Wafer-scale epitaxial graphene on SiC for sensing applications**, Mikael Karlsson, Qin Wang, Acreo Swedish ICT AB (Sweden); Yichen Zhao, Wei Zhao, Muhammet S. Toprak, KTH Royal Institute of Technology (Sweden); Amer Ali, Mikael Syväjärvi, Graphensic AB (Sweden) . [9668-122]

17:45: **Conductivity and electrical studies of plasticized carboxymethyl cellulose based proton conducting solid biopolymer electrolytes**, Mohd Ikmar Nizam Bin Mohamad Isa, Noor Azniza Mohd Noor, Univ. Malaysia Terengganu (Malaysia) . . . . . [9668-123]

CONFERENCE 9668

18:05: **Tuning the surface chemistry of plasma activated coatings deposited on zirconium substrates**, Behnam Akhavan, Marcela M. M. Bilek, The Univ. of Sydney (Australia) . . . . . [9668-124]

18:25: **Determination of effect factor for effective parameter on saccharification of lignocellulosic material by concentrated acid**, Ali Arasteh Nodeh, Islamic Azad Univ. of Najafabad (Iran, Islamic Republic of); Sina Aghili, Islamic Azad Univ. (Iran, Islamic Republic of). . . . . [9668-224]

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ONLINE PROCEEDINGS INCLUDED WITH PAID REGISTRATION

SPIE Micro + Nano Materials, Devices, and Systems 2015
Product Code: **DL9668**
Included Volume: 9668

PRINTED PROCEEDINGS

You can purchase printed proceedings for an additional fee. Printed proceedings will be available 8-10 weeks after the conference. Shipping is additional.

VOL#	TITLE (EDITOR)	PRICE
9668	**Micro+Nano Materials, Devices, and Systems** *(Benjamin J. Eggleton, Stefano Palomba)*	**$230**

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GENERAL INFORMATION

Registration

Onsite Registration and Badge Pick-up Hours

Sunday . . . . . 17:00 to 19:00
Monday . . . . . 07:30 to 16:00
Tuesday . . . . . 07:30 to 16:00
Wednesday . . . . . 08:00 to 12:00

CONFERENCE REGISTRATION

Includes admission to all conference sessions, plenaries, and poster session, welcome reception, banquet dinner, lunches, coffee breaks, and Digital Library access for Conference Proceedings.

- SPIE Members receive conference and course 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.

SPIE Cashier

Registration Area • Open during registration hours

If you are paying by cash or cheque as part of your onsite registration, or have questions regarding your registration, visit the SPIE Cashier.

RECEIPTS AND CERTIFICATE OF ATTENDANCE

Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those from the SPIE Cashier.

BADGE CORRECTIONS

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

REFUND INFORMATION

There is a US$50 service charge for processing refunds. Requests for refunds must be received by 25 NOVEMBER 2015; 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

All conference rooms have a computer workstation, projector, screen, lapel microphone, and laser pointer. All presenters are requested to download your presentation on the day of your talk, prior to conference starting or at the coffee/lunch break.

POSTER SETUP INSTRUCTIONS

Setup: Monday 7 December . . . . . 12:00 to 17:30

Poster Session: Monday 7 December . . . . . 18:30 to 20:00

All registered attendees are invited to attend the poster session. This event will provide an opportunity to meet with colleagues, network, and view the poster papers. Authors will be present at their posters to answer questions and provide in-depth discussions regarding their work.

Attendees are required to wear their conference registration badges.

POSTER AUTHORS: Poster boards will be available on Monday morning at 08:00. Please set up your poster during the morning coffee break or the lunch break, and plan to stand by your poster during the poster session from 18:30 to 20:00. Posters must be removed from the boards following the poster session. Posters that remain on the boards will be discarded.

Food and Beverage Services

REFRESHMENT BREAKS

Located near conference rooms

Monday . . . . . 10:30 to 11:00 and 15:40 to 16:10

Tuesday . . . . . 10:55 to 11:25 and 15:15 to 15:45

Wednesday . . . . . 10:55 to 11:25 and 15:45 to 16:25

Complimentary coffee/tea will be served twice daily. Check individual conference listings for exact times and locations.

DAILY LUNCHES

Monday and Tuesday lunches will be provided during the daily scheduled lunch breaks. Wednesday lunch is not included; the scheduled lunch break time is open for attendees to explore some of the local restaurants and area.

SPECIAL EVENTS

Onsite Services

INTERNET ACCESS

AIN Buildings

Complimentary WiFi Internet access is available. Instructions will be posted onsite.

SPIE CONFERENCE APP

Search and browse the programme, special events, participants, exhibitors, courses, and more. Free Conference Apps available for iPhone and Android phones.

URGENT MESSAGE LINE

An urgent message line is available during registration hours: +1 360-510-9886

LOST AND FOUND

Found items will be kept at Registration during the registration hours each day and then turned over to the facility security.

CAR RENTAL

Hertz

Call your local Hertz Reservation Centre or, in the USA, the Hertz International Reservation Centre at 1-800-654-3001 to receive a special discount for SPIE Micro + Nano Materials, Devices and Applications. Reservations can also be made online. You will receive 10% off qualifying affordable rates at participating locations in Sydney.

Be sure to identify yourself as an SPIE attendee. Please print this Hertz Discount Coupon and present it at time of rental in order to receive this discount. The PC reference given must be on your advance reservation to receive this special offer.

This special offer is available for rentals from 1–15 December 2015.