SPIE

RMIT UNIVERSITY

2013 Micro+Nano Materials, Devices, and Applications

Technical Program

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Conference
8–11 December 2013

Location
RMIT University
Emily McPherson Building
Melbourne, Victoria, Australia

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Contents

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Welcome

On behalf of SPIE and the symposium organizers, we welcome you to the international symposium on Micro + Nano Materials, Devices, and Applications 2013 in Melbourne, Australia. The symposium is an interdisciplinary forum for collaboration and learning among top researchers in all fields related to nano- and microscale materials and technologies. This event will include both oral and poster presentations with a focus on biomaterials and biological microdevices, micro and nanofluidics, photonics, fabrication, metrology, solar cell technologies, plasmonics, MEMS/NEMS, and nanomaterials.

The symposium is held in the Emily McPherson Building on the RMIT University campus. RMIT University is one of Australia's original and leading educational institutions. As an innovative, global university of technology, with its heart in the city of Melbourne, RMIT has an international reputation for excellence in work-relevant education and high quality research, and engagement with the needs of industry and community. Research at RMIT is particularly focused on solving the critical global problems affecting communities and the environment.

We hope you have a productive week and enjoy our Melbourne summer.

Conference Chair
James Friend
RMIT Univ.

RMIT Conference Manager
Lorraine Valladares
RMIT Univ.

Program Chair
Hoe Tan
Australian National Univ.

SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, programme committees, and session chairs who have so generously given of their time and advice to make this symposium possible. The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members.

This Programme is based on commitments received up to the time of publication and is subject to change without notice.

Special Events

Enjoy networking time with your colleagues at the Welcome Reception, Poster Session, Conference Dinner, and Plenary Presentations.

Welcome Reception and Registration

Room: Storey Hall Building 16: Street Level Room 8

Sunday 8 December . . . . . 17:00 to 19:00

Registration will be open from 17:00 to 19:00 on Sunday in conjunction with the Welcome Reception. Registered attendees are invited to relax, socialize, and enjoy light refreshments. Please remember to wear your conference badge. Dress is casual.

Plenary Session - Monday

Room: Swanston Academic Building 80: Street Level Room 7

Monday 9 December. . . . . 8:30 to 9:15

Semiconductor nanostructures in energy devices

P. Daniel Dapkus
Univ. of California (United States)

ABSTRACT: Semiconducting nanostructures offer potentially revolutionary advancements in the cost and performance of light emitting diodes for solid state lighting and photovoltaic energy converters. GaN based LEDs are usually fabricated on expensive substrates and suffer from a high density of threading dislocations. In addition, the high current performance of the devices is degraded by efficiency decreases (efficiency droop) that seem to be inherent to current designs. GaN nanorods have been grown that are free of dislocations and serve as templates for the growth of InGaN active emitting regions on nonpolar facets of the nanostructures that may eliminate the causes of the high current efficiency droop. Dense arrays of dislocation free nanorods with InGaN quantum well active regions and LEDs made from them will be described.

High efficiency multijunction solar cells are among the most promising structures to increase the efficiency of solar cells to 50%. Achieving cells with efficiencies that high is impeded by the lack of appropriate sets of lattice matched materials to create multicomponent current matched monolithic structures. Nanorods of semiconductors to form the cell components of such structures are promising because the dislocations that typically form in lattice matched epitaxy can be avoided with the nanorod geometry to yield low defect-free, lattice mismatched structures. As an example, dense, uniform arrays of GaAs nanorods on Si have been developed that promise to enable a new paradigm for the generation of efficient solar cells. We will describe the properties of these materials and discuss our progress towards realizing efficient solar cells.

BIOGRAPHY: P. Daniel (Dan) Dapkus is the W. M. Keck Distinguished Professor of Engineering at the University of Southern California where he has been a faculty member since 1982. He received his BS, MS and PhD in Physics at the University of Illinois at Urbana Champaign in 1966, 1967, and 1970, respectively. He is currently a faculty member of the Ming Hsieh Department of Electrical Engineering, the Mork Family Department of Chemical Engineering and Materials Science and the Department of Physics at USC. He also is the Director of the Center for Energy Nanoscience and Technology and a DoE Energy Frontier Research Center, The Center for Energy Nanoscience, in Emerging Materials for Solar Energy Conversion and Solid State Lighting. His current research involves the study of semiconductor nanostructures for application to energy devices, photonic materials and devices, and optoelectronic integration. Prior to coming to USC, Dapkus led the group at Rockwell International that demonstrated the device utility of metalorganic chemical vapor deposition (MOCVD), demonstrated the first practical quantum well lasers, and demonstrated the first application of MOCVD to the fabrication of solar cells, heterojunction bipolar transistors and HEMT devices. Prior to his tenure at Rockwell he was a member of technical staff at Bell Laboratories from 1970 to 1976, where he studied the physics of operation and the technology of GaP red and green emitting LEDs. He has received recognition for his work by being awarded the IEEE LEOS Distinguished Lecturer(1993 – 1994), the IEEE LEOS Engineering Achievement Award (1995), the IEEE David Sarnoff Technical Field Award in electronics (2001), the Optical Society of America Nick Holonyak, Jr. Award (2005), the Heinrich Welker Award of the International Symposium on Compound Semiconductors (2009), and the USC Associates Award for Creativity in Research (2009). He is a member of the US National Academy of Engineering (2004). He is also a Fellow of IEEE, OSA, APS and AAAS.

Plenary Session - Tuesday

Room: Swanston Academic Building 80: Street Level Room 7

Tuesday 10 December . . . . . 8:30 to 9:15

Nanophotonics for biology

Tanya M. Monro
The Univ. of Adelaide (Australia)

ABSTRACT: Recent developments in optical materials and optical fibre fabrication mean that it is now possible to produce glasses and fibres imbued with the properties of nanomaterials, and optical fibres with features spanning from 20 microns – 20 nm. When such materials are brought together with surface chemistries that offer molecular recognition, it is possible to develop sensors capable of detecting specific small molecules or proteins. Advances in the development of optical materials, structures and surfaces will be presented, along with a review of a range of fluorescent and label-free sensing architectures that offer the opportunity of making measurements in previously inaccessible environments. Recent highlights that will be presented include novel dip sensors that operate on fluid volumes comparable to a single cell, the detection of single nanocrystals from a distance and fibre-tip sensors.

BIOGRAPHY: Professor Tanya Monro is an ARC Federation Fellow and Director of the Institute for Photonics and Advanced Sensing (IPAS) at the University of Adelaide. IPAS pursues a transdisciplinary research agenda, bringing together physics, chemistry and biology to create knowledge and disruptive new technologies, and solve problems for health, defence, the environment, food and wine. Tanya is a Fellow of the Australian Academy of Science (AAS) and the Australian Academy of Technological Sciences and Engineering (ATSE) and the Australian Institute of Physics (AIP). She is a member of the AAS National Committee for Physics, a member of the SA Premier's Science & Industry Council (PSIC) and an inaugural Bragg Fellow of the Royal Institution of Australia. Tanya was awarded the Australian Academy of Sciences Pawsey Medal for 2012. Tanya was South Australia's "Australian of the Year" for 2011 and in September 2011 Tanya won the Scopus Young Researcher of the Year in Physical Science award. In 2010 she was named South Australian Scientist of the Year, and was named Telstra Business Women of the Year at both National and State levels (in the Community & Government category). In 2009 Tanya was named the Emerging Leader in the Science category in The Weekend Australian Magazine's Emerging Leader awards. In 2008 she won the Prime Minister's Malcolm McIntosh Prize for Physical Scientist of the Year, in 2007-2008, she was the 'Women in Physics Lecturer' for the Australian Institute of Physics. In 2006 Cosmos Magazine presented Tanya with a Bright Spark Award. Tanya obtained her PhD in physics in 1998 from The University of Sydney, for which she was awarded the Bragg Gold Medal for the best Physics PhD in Australia in that year. In 2000, she received a Royal Society University Research Fellowship at the Optoelectronics Research Centre at the University of Southampton in the UK. She came to the University of Adelaide in 2005 as inaugural Chair of Photonics. She has published over 500 papers in refereed journals and conference proceedings, and has raised over $86M for research. As well as being active in research and research leadership, she serves on international, national and state committees and boards on matters of science and research policy and science evaluation and assessment.

Plenary Session - Wednesday

Room: Swanston Academic Building 80: Street Level Room 7

Wednesday 11 December . . . . . 8:30 to 9:15

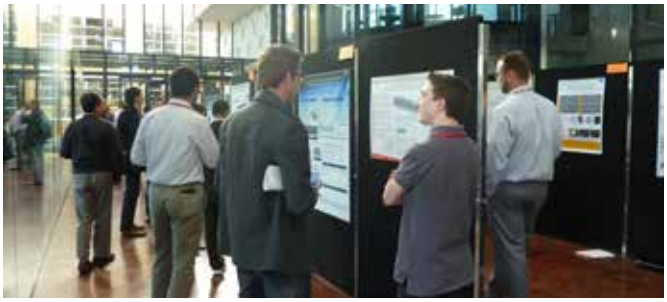
Hydrodynamic challenges in inkjet printing

Detlef Lohse
Univ. of Twente (The Netherlands)

ABSTRACT: Piezo-acoustic inkjet printing has become a mature technique for high performance printing. Nevertheless, there are still various scientific challenges. In this talk I will cover some of them: (i) Coupling between the fluid dynamics and the acoustics, in particular when a disturbing bubble has been entrained in the ink channel. (ii) Optical and acoustical monitoring of the bubble. (iii) Mechanisms of the bubble entrainment. (iv) Droplet formation and pinch-off of droplets. (v) Droplet impact on substrates.

The work has been done in close collaboration with Oce and various PhD students and colleagues in Twente.

BIOGRAPHY: Detlef Lohse received his PhD on the theory of turbulence in Marburg/Germany in 1992. As a postdoc in Chicago and later in Marburg and Munich he worked on single bubble sonoluminescence. In 1998 he was appointed as Chair of Physics of Fluids at the University of Twente, The Netherlands, where he still is. Lohse's present research subjects are turbulence and multiphase flow, granular matter, and micro- and nanofluidics. Both experimental, theoretical, and numerical methods are used in his group.



Poster Session

Room: Emily McPherson Building 13: Level 3 Room 5

Tuesday 10 December 2013 . . . . . 15:30 to 17:30

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 Tuesday morning. 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. Posters must be removed from the boards following the poster session. Posters that remain on the boards will be discarded.

Conference Dinner

Tuesday 10 December . . . . . 18:30 to 22:00

Rydges on Swanston
701 Swanston Street, Carlton, Melbourne

Welcome Drinks . . . . . 18:30 to 19:00

Dinner . . . . . 19:00 to 22:00

All registered attendees are invited to attend. A dinner ticket is included in your registration packet. Additional guest tickets can be purchased at the registration desk before noon on Monday for a cost of US$90.

(About a 10–15 minute walk north from the RMIT campus; can also take a tram up Swanston St.)

Daily Schedule of Events

Sunday 8 December			
17:00 to 19:00	WELCOME RECEPTION AND REGISTRATION—STOREY HALL BUILDING 16: LEVEL 7 ROOM 8		
Monday 9 December			
7:30 to 16:00	REGISTRATION—EMILY MCPHERSON BUILDING 13: LEVEL 3 (CORRIDOR)		
8:10 to 8:30	OPENING REMARKS—SWANSTON ACADEMIC BUILDING 80: LEVEL 2 ROOM 7		
	PROF. JAMES FRIEND (RMIT) - 8:10 to 8:15		
	PROF. PETER COLOE - PRO VICE CHANCELLOR AND VICE-PRESIDENT SCIENCE, ENGINEERING AND HEALTH (RMIT)- 8:15 to 8:22		
	DR. PHILIP STAHL - NASA AND SPIE PRESIDENT ELECT - 8:22 to 8:30		
8:30 to 9:15	PLENARY SESSION: **Semiconductor nanostructures in energy devices,** P. Daniel Dapkus, Univ. of California (United States) SWANSTON ACADEMIC BUILDING 80: LEVEL 2 ROOM 7		
Daily Venue Change: Move to Emily McPherson Building 13			
9:30 to 10:30	**SESSIONS 1, 2, and 3 run concurrently**		
	SESSION 1: Fabrication I	**SESSION 2: Solar I**	**SESSION 3: Nanomaterials I**
11:00 to 12:30	**SESSIONS 4, 5, and 6 run concurrently**		
	SESSION 4: Bio I	**SESSION 5: Photonics I**	**SESSION 6: Materials I**
13:30 to 15:00	**SESSIONS 7, 8, and 9 run concurrently**		
	SESSION 7: Microfluidics I	**SESSION 8: Plasmonics I**	**SESSION 9: Nanomaterials II**
15:30 to 17:00	**SESSIONS 10, 11, and 12 run concurrently**		
	SESSION 10: Bio II	**SESSION 11: Photonics II**	**SESSION 12: Solar II**
Tuesday 10 December			
7:30 to 16:00	REGISTRATION—EMILY MCPHERSON BUILDING 13: LEVEL 3 (CORRIDOR)		
8:30 to 9:15	PLENARY SESSION: **Nanophotonics for biology,** Tanya M. Monro, The Univ. of Adelaide (Australia) SWANSTON ACADEMIC BUILDING 80: LEVEL 2 ROOM 7		
Daily Venue Change: Move to Emily McPherson Building 13			
9:30 to 10:30	**SESSIONS 13, 14, and 15 run concurrently**		
	SESSION 13: Fabrication II	**SESSION 14: Plasmonics II**	**SESSION 15: MEMS I**
11:00 to 12:30	**SESSIONS 16, 17, and 18 run concurrently**		
	SESSION 16: Bio III	**SESSION 17: Photonics III**	**SESSION 18: Metrology/ Characterisation**
13:30 to 15:00	**SESSIONS 19, 20, and 21 run concurrently**		
	SESSION 19: Microfludics II	**SESSION 20: Solar III**	**SESSION 21: Nanomaterials III**
15:30 to 17:30	**POSTERS TUESDAY**		
18:30 to 22:00	CONFERENCE WELCOME DRINKS AND DINNER (RYDGES ON SWANSTON) 701 SWANSTON ST.		
Wednesday 11 December			
8:00 to 12:00 noon	REGISTRATION—EMILY MCPHERSON BUILDING 13: LEVEL 3 (CORRIDOR)		
8:30 to 9:15	PLENARY SESSION: **Hydrodynamic challenges in inkjet printing,** Detlef Lohse, Univ. of Twente (The Netherlands) SWANSTON ACADEMIC BUILDING 80: LEVEL 2 ROOM 7		
Daily Venue Change: Move to Emily McPherson Building 13			
9:30 to 10:30	**SESSIONS 22, 23, and 24 run concurrently**		
	SESSION 22: Electronics	**SESSION 23: Plasmonics III**	**SESSION 24: MEMS II**
11:00 to 12:30	**SESSIONS 25, 26, and 27 run concurrently**		
	SESSION 25: Microfludics III	**SESSION 26: Solar IV**	**SESSION 27: Nanomaterials IV**
13:30 to 15:00	**SESSIONS 28, 29, and 30 run concurrently**		
	SESSION 28: Bio IV	**SESSION 29: Photonics IV**	**SESSION 30: Materials II**
15:30 to 16:30	**SESSIONS 31, 32, and 33 run concurrently**		
	SESSION 31: Fabrication III	**SESSION 32: Photonics V**	**SESSION 33: Nanomaterials V**
16:30 to 17:00	**Closing Remarks**		

SPIE Micro+Nano Materials, Devices, and Systems

Conference Chair: **James Friend,** RMIT Univ. (Australia)

Program Chair: **Hark Hoe Tan,** The Australian National Univ. (Australia)

Organising Committee: **Brian Abbey,** La Trobe Univ. (Australia); **Peggy Chan,** RMIT Univ. (Australia); **Wenlong Cheng,** Monash Univ. (Australia); **Christina Cortez-Jugo,** Monash Univ. (Australia); **Timothy Davis,** CSIRO (Australia); **Daniel Gomez,** The Univ. of Melbourne (Australia); **Stefan Harrer,** IBM Research (Australia); **Dwayne Kirk,** Melbourne Ctr. for Nanofabrication (Australia); **Mainak Majumder,** Monash Univ. (Australia); **Gareth Moorhead,** CSIRO (Australia); **Paul Mulvaney,** The Univ. of Melbourne (Australia); **Yonggang Zhu,** CSIRO (Australia)

Special Committee Members: **Saulius Juodkazis** and **Min Gu,** Swinburne Univ. of Technology

Program Committee: **Fumihito Arai,** Tohoku Univ. (Japan); **Andrea Armani,** The Univ. of Southern California (United States); **Zhanghai Chen,** Fudan Univ. (China); **Anna Fontcuberta i Morral,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Sajeev John,** Univ. of Toronto (Canada); **Adrian Keating,** The Univ. of Western Australia; **Alexander Korsunsky,** Univ. of Oxford (United Kingdom); **Sanjay Krishna,** The Univ. of New Mexico (United States); **Sebastian Lourdudoss,** Royal Institute of Technology (Sweden); **Scott Manalis,** MIT Media Lab. (United States); **Dragomir Neshev,** The Australian National Univ.; **Matteo Pasquali,** Rice Univ. (United States); **Zuzanna Siwy,** Univ. of California, Irvine (United States); **Leigh Smith,** Univ. of Cincinnati (United States)

Sponsored by:

Monday 9 December

Opening Remarks

Room: Swanston Academic Building 80: Level 2 Room 7 8:10 to 8:30

Session Chair: **James Friend,** Australian National Fabrication Facility (Australia)

Plenary Session

Room: Swanston Academic Building 80: Level 2 Room 7 . . . Mon 8:30 to 9:15

Semiconductor nanostructures in energy devices

P. Daniel Dapkus, Univ. of California (United States)
(See page 4 for description)

Daily Venue Change: Move to Emily McPherson Building 13

Sessions 1, 2, and 3 run concurrently.

Session 1

Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Mon 9:30 to 10:00

Fabrication I

Session Chair: **Adam Mechler,** La Trobe Univ. (Australia)

9:30: **Black-Si as a platform for sensing**, Pierrette Michaux, Gediminas Gervinskas, Gediminas Seniutinas, Jennifer S. Hartley, Paul R. Stoddart, Dru Morrish, Narges F. Fahim, Md. Sohrab Hossain, Saulius Juodkazis, Swinburne Univ. of Technology (Australia). . . . . [8923-1]

9:45: **Development of silicon optics for an integrated micro-optical system-on-a-chip**, David C. Ng, National ICT Australia (Australia); Sasikaran Kandasamy, Melbourne Ctr. for Nanofabrication (Australia); Efstratios S. Skafidas, The Univ. of Melbourne (Australia). . . . . [8923-4]

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

Session 2

Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Mon 9:30 to 10:30

Solar I

Session Chair: **Sudha Mokkapati,** The Australian National Univ. (Australia)

9:30: **Enhanced photovoltaic performance of dye-sensitized solar cell using composite photoanode on 3D electrode**, Chiew Keat Lim, Nanyang Technological Univ. (Singapore); Hui Huang, A*STAR Singapore Institute of Manufacturing Technology (Singapore); Man Siu Tse, Ooi Kiang Tan, Nanyang Technological Univ. (Singapore) . . . . . [8923-5]

9:45: **Mixed metal oxides for dye-sensitized solar cell using zinc titanium layered double hydroxide as precursor**, Jianqiang Liu, Yaowei Qin, Liangji Zhang, Hongdi Xiao, Jianye Song, Dehe Liu, Mingzhe Leng, wanguo hou, Na Du, Shandong Univ. (China) . . [8923-6]

10:00: **Heat transfer simulation of vacuum-packaged micro solar thermal collector**, Yusnira Husaini, Arnan Mitchell, Gary Rosengarten, Vijay Prasad Sivan, RMIT Univ. (Australia) . . . . . [8923-7]

10:15: **Direct transfer of solar radiation to high temperature applications**, Maryam Rahou, John Andrews, Gary Rosengarten, RMIT Univ. (Australia). . . . . [8923-8]

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

Session 3

Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Mon 9:30 to 10:30

Nanomaterials I

Session Chair: **Brian Abbey,** La Trobe Univ. (Australia)

9:30: **Fluorescent single defects in different silicon carbide polytypes**, Stefania Castelletto, RMIT Univ. (Australia); Brett C. Johnson, The Univ. of Melbourne (Australia); Alberto Boretti, RMIT Univ. (Australia). . . . . [8923-9]

9:45: **Graphene-polymer multilayer heterostructure for THz metamaterials**, Zaiquan Xu, Monash Univ. (Australia); Caiyun Chen, Soochow Univ. (China); Steve Qing Yang Wu, Bing Wang, Jinghua Teng, A*STAR Institute of Materials Research and Engineering (Singapore); Qiaoliang Bao, Monash Univ. (Australia). . . . . [8923-214]

10:00: **Density functional theory calculations of phenol-modified monolayer silicon nanosheets**, Michelle J. Spencer, RMIT Univ. (Australia); Tetsuya Morishita, National Institute of Advanced Industrial Science and Technology (Japan); Michael R. Bassett, La Trobe Univ. (Australia). . . . . [8923-11]

10:15: **Tamm plasmon polariton enhancement of the photoluminescence signal from silicon nanocrystals**, Sergey A. Dyakov, KTH Royal Institute of Technology (Sweden) . . . . . [8923-12]

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

Sessions 4, 5, and 6 run concurrently.

Session 4
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Mon 11:00 to 12:15

Bio I

Session Chair: **Christina Cortez-Jugo,** Monash Univ. (Australia)

11:00: **Challenges in specificity and collection efficiency for integrated optical biosensors** *(Invited Paper)*, Andrea M. Armani, Simin Mehrabani, Ashley J. Maker, Cecilia Lopez, Mark C. Harrison, The Univ. of Southern California (United States). . . . . [8923-13]

11:30: **Laser nanostructured surface for biomedical sensing using surface-enhanced Raman spectroscopic mapping**, Ricardas Buividas, Swinburne Univ. of Technology (Australia); Nerijus Dzingelevicius, Vilnius Univ. (Lithuania) and Swinburne Univ. of Technology (Australia); Reda Kubiliute, Kaunas Univ. of Technology (Lithuania) and Swinburne Univ. of Technology (Australia); Paul R. Stoddart, Vi K. Truong, Elena P. Ivanova, Saulius Juodkazis, Swinburne Univ. of Technology (Australia) . . . . . [8923-14]

11:45: **Nanostructured diamond microelectrodes for medical applications**, Kumaravelu Ganesan, David J. Garrett, The Univ. of Melbourne (Australia) and Bionic Vision Australia (Australia); Kate Fox, The Univ. of Melbourne (Australia); Hamish Meffin, National ICT Australia (Australia) and The Univ. of Melbourne (Australia) and Bionic Vision Australia (Australia); Steven Prawer, The Univ. of Melbourne (Australia) . . . [8923-15]

12:00: **Nanosensors for next generation drug screening**, Sridhar Kannam, Matthew T. Downton, Natalie Gunn, Sung Cheol Kim, Priscilla Rogers, Christine Schieber, John Wagner, IBM Research Collaboratory for Life Sciences-Melbourne (Australia); Daniel Scott, Ross Bathgate, Efstratios S. Skafidas, The Univ. of Melbourne (Australia); Stefan Harrer, IBM Research Collaboratory for Life Sciences-Melbourne (Australia). . . . . [8923-16]

Lunch/Exhibition Break . . . . . Mon 12:30 to 13:30

Session 5
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Mon 11:00 to 12:30

Photonics I

Session Chair: **Lei Zhou,** Fudan Univ. (China)

11:00: **Trapping and mapping: what optical tweezers can tell us about semiconductor nanowires and nanoparticles** *(Invited Paper)*, Peter J. Reece, The Univ. of New South Wales (Australia) . . . . . [8923-18]

11:30: **Third-order optical nonlinearity in BDN dye encapsulated polymer matrix induced by nanosecond laser pulses**, Devendra Mohan, Purnima Arya, Guru Jambheshwar Univ. of Science and Technology (India); Anil Kumar, Instruments Research & Development Establishment (India). . . . . [8923-19]

11:45: **Multi-photon absorption and third-order nonlinearity in silicon at mid-infrared wavelengths**, Ting Wang, Dawn Tan, Singapore Univ. of Technology & Design (Singapore) . . . . . [8923-20]

12:00: **Translation interference pattern in nano-scale precision by phase control based on spatial light modulator**, Jie Ma, Yongchun Zhong, Zhe Chen, Jinan Univ. (China); Kam Sing Wong, Hong Kong Univ. of Science and Technology (China) . . . . . [8923-21]

12:15: **Constructing microstructures using the optical trapping map of dielectric spheres**, Murat S. Muradoglu, Tuch W. Ng, Monash Univ. (Australia). . . . . [8923-22]

Lunch/Exhibition Break . . . . . Mon 12:30 to 13:30

Session 6
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Mon 11:00 to 12:30

Materials I

Session Chair: **Dan Li,** Monash Univ. (Australia)

11:00: **Hydride Vapor Phase Epitaxy: the unexpected process for the fast growth of GaAs and GaN nanowires with record aspect ratio and polytypism-free crystalline structure** *(Invited Paper)*, Evelyne Gil, Universite Blaise Pascal - CNRS (France). . . . [8923-23]

11:30: **In situ monitoring of resistivity and carrier concentration during molecular beam epitaxy of topological insulator Bi2Se3**, Jack Hellerstedt, Monash Univ. (Australia) and Univ. of Maryland, College Park (United States); Jianhao Chen, Dohun Kim, William Cullen, Univ. of Maryland, College Park (United States); ChangXi Zhang, Monash Univ. (Australia); Michael S. Fuhrer, Univ. of Maryland, College Park (United States) and Monash Univ. (Australia). . . . . [8923-24]

11:45: **Effect of compositional gradient on mechanical properties in aluminum/ duralumin multi-layered clad structures**, Hideaki Tsukamoto, Nagoya Institute of Technology (Japan) . . . . . [8923-25]

12:00: **Electron spin resonance spectroscopy of high purity crystals at millikelvin temperatures**, Warrick G. Farr, Daniel L. Creedon, Maxim Goryachev, The Univ. of Western Australia (Australia); Karim Benmessai, The Univ. of Western Australia (Australia) and Ctr. de Développement des Téchnologies Avancées (Algeria); Michael E. Tobar, The Univ. of Western Australia (Australia). . . . . [8923-26]

12:15: **Composite anode LSM impregnated with cobalt oxide for steam electrolysis**, Shisong Li, Jigui Cheng, Kui Xie, Yucheng Wu, Hefei Univ. of Technology (China) . . . . . [8923-27]

Lunch/Exhibition Break . . . . . Mon 12:30 to 13:30

Sessions 7, 8, and 9 run concurrently.

Session 7
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Mon 13:30 to 15:00

Microfluidics I

Session Chair: **Michel Versluis,** Univ. Twente (Netherlands)

13:30: **Spreading of liquids at small scales on structured and patterned surfaces** *(Invited Paper)*, Craig Priest, Pontus S.H. Forsberg, Zhantao Wang, Ciro Semprebon, Martin Brinkmann, Rossen Sedev, John Ralston, Univ. of South Australia (Australia) . [8923-213]

14:00: **Small volume particulate and non-particulate sample collection for fluidic systems**, Brandon H. Cheong, Tuck W. Ng, Monash Univ. (Australia); Oi Wah Liew, National Univ. of Singapore (Singapore) [8923-29]

14:15: **Characterization of magnetic force driven microflow**, Karolina Petkovic-Duran, Anthony Swallow, Yuan Gao, Timothy J. Davis, Judy Scoble, Greg Coia, Yonggang Zhu, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-30]

14:30: **Acoustowetting: film spreading, fingering instabilities and soliton-like wave propagation**, Amgad Rezk, Ofer Manor, James Friend, Leslie Y. Yeo, RMIT Univ. (Australia) . . . . . [8923-31]

14:45: **Mapping the effect of pulsed surface acoustic waves on a sessile drop**, Sean A. Collignon, Leslie Y. Yeo, James Friend, RMIT Univ. (Australia). . . . [8923-32]

Coffee Break . . . . . Mon 15:00 to 15:30

Session 8
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Mon 13:30 to 15:00

Plasmonics I

13:30: **Metamaterials: an ideal platform to manipulate electromagnetic waves** *(Invited Paper)*, Lei Zhou, Fudan Univ (China) . . . . . [8923-33]

14:00: **Simulation of the gap plasmon coupling with a quantum dot**, Chamanei Perera, Kristy C. Vernon, Queensland Univ. of Technology (Australia) . . [8923-34]

14:15: **Angular alignment of gold nanorods by photothermal depletion**, Adam B. Taylor, Timothy T. Y. Chow, James W. M. Chon, Swinburne Univ. of Technology (Australia) . . . . . [8923-35]

14:30: **Localized surface plasmon resonance study of a plasmonic structure using spectroscopic ellipsometry**, Mohammad T. Yaseen, Academia Sinica (Taiwan) . . . . . [8923-36]

14:45: **Polarization effect and emission control in asymmetric cross-shaped slot antennas surrounded with periodic corrugations**, Amir H. Djalalian-Assl, Jasper J. Cadusch, The Univ. of Melbourne (Australia); Timothy D. James, The Univ. of Melbourne (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Timothy J. Davis, Commonwealth Scientific and Industrial Research Organisation (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Ann Roberts, The Univ. of Melbourne (Australia) . . [8923-37]

Coffee Break . . . . . Mon 15:00 to 15:30

Session 9
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Mon 13:30 to 15:00

Nanomaterials II

Session Chair: **Wenlong Cheng,** Monash Univ. (Australia)

13:30: **Graphene-based functional soft materials** *(Invited Paper)*, Dan Li, Monash University (Australia). . . . . [8923-38]

14:00: **Examination of Au nanopore formation mechanism on nano-membrane using FESEM electron beam irradiation**, Seong Soo Choi, Myoung Jin Park, Sun Moon Univ. (Korea, Republic of); Nam Kyou Park, Seoul National Univ. (Korea, Republic of); Tokutaro Yamaguchi, Sun Moon Univ. (Korea, Republic of) . . . . . [8923-39]

14:15: **Aspect ratio dependent photothermal reshaping of single gold nanorods**, Adam B Taylor, James W. M. Chon, Swinburne Univ. of Technology (Australia). . . . . [8923-40]

14:30: **MUA and MPA capped CdSeZnS quantum dot fluorescent sensors**, Adrian Trinchi, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [8923-41]

14:45: **Development and utilization of nanophosphors in medical, security and energy devices**, Padmanabha R. Ravilisetty, Specialty Phosphors Inc. (United States) . . . . . [8923-42]

Coffee Break . . . . . Mon 15:00 to 15:30

Sessions 10, 11, and 12 run concurrently.

Session 10
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Mon 15:30 to 17:00

Bio II

Session Chair: **Andrea M. Armani,** The Univ. of Southern California (United States)

15:30: **Surface acoustic wave (SAW) atomization of therapeutic antibodies for pulmonary delivery** *(Invited Paper)*, Christina Cortez-Jugo, Monash Univ. (Australia); Aisha Qi, RMIT Univ. (Australia); Anushi Rajapaksa, Monash Univ. (Australia); James Friend, Leslie Y. Yeo, RMIT Univ. (Australia) . . . . . [8923-43]

16:00: **Water-soluble bis(arylidene)cycloalkanone dyes for two-photon excited photodynamic therapy**, Qianli Zou, Technical Institute of Physics and Chemistry (China); Hongyou Zhao, Chinese PLA General Hospital (China); Yuxia Zhao, Technical Institute of Physics and Chemistry (China); Ying Gu, Chinese PLA General Hospital (China); feipeng Wu, Technical Institute of Physics and Chemistry (China) . . . . . [8923-44]

16:15: **Effects of laser-exposed gold nanorods on biochemical pathways of neuronal cells**, Chiara Paviolo, Swinburne Univ. of Technology (Australia); John W. Haycock, The University of Sheffield (United Kingdom); Paul R. Stoddart, Sally L. McArthur, Swinburne Univ. of Technology (Australia) . . . [8923-45]

16:30: **Influence of surface acoustic wave induced acoustic streaming on the kinetics of electrochemical reactions**, Sabrina Tietze, Josefine Schlemmer, Gerhard Lindner, Hochschule für angewandte Wissenschaften und Künste (Germany) . . . . . [8923-46]

16:45: **Laser measurements of bacterial endospore destruction from shock waves**, Petros Lappas, RMIT Univ. (Australia); Daniel McCartt, Sean Gates, Jay Jeffries, Ronald Hanson, Stanford Univ. (United States) . . . . . [8923-47]

Session 11
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Mon 15:30 to 17:00

Photonics II

Session Chair: **Peter J. Reece,** The Univ. of New South Wales (Australia)

15:30: **Mechanically reconfigurable metamaterials: bendable, stretchable and inflatable platforms at GHz, THz and optical frequencies** *(Invited Paper)*, Arnan Mitchell, RMIT Univ. (Australia) . . . . . [8923-48]

16:00: **Characterization of optical polarization converters made by femtosecond laser writing,** Chris J. de Jong, Swinburne Univ. of Technology (Australia) and Eindhoven Univ. of Technology (Netherlands); Alireza Lajevardipour, Swinburne Univ. of Technology (Australia); Mindaugas Gecevicius, Martynas Beresna, Univ. of Southampton (United Kingdom); Gediminas Seniutinas, Gediminas Gervinskas, Ricardas Buividas, Swinburne Univ. of Technology (Australia); Peter G. Kazansky, Univ. of Southampton (United Kingdom); Yves Bellouard, Technische Univ. Eindhoven (Netherlands); Andrew H. A. Clayton, Saulius Juodkazis, Swinburne Univ. of Technology (Australia) . . . . . [8923-198]

16:15: **The application of carbon nanotubes in mode locked fiber laser**, Zhenhua Yu, Yanrong Song, Beijing Univ of Technology (China); Yonggang Wang, Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences (China) . . . . . [8923-50]

16:30: **Comparison of Al2O3 nano-overlays deposited with atomic layer deposition and magnetron sputtering on optical fibers for sensing purposes**, Mateusz J. Smietana, Piotr Firek, Warsaw Univ. of Technology (Poland); Predrag Mikulic, Wojtek J. Bock, Univ. du Québec en Outaouais (Canada) . . . . . [8923-51]

16:45: **Evaluation of optical fibres for surface-enhanced Raman scattering probes**, Jennifer S. Hartley, Saulius Juodkazis, Paul R. Stoddart, Swinburne Univ. of Technology (Australia) . . . . . [8923-52]

Session 12
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Mon 15:30 to 16:45

Solar II

Session Chair: **Evelyne Gil,** Univ. Blaise Pascal (France)

15:30: **III-V compound semiconductor quantum dot solar cells** *(Invited Paper)*, Lan Fu, Haofeng Lu, Australian National University (Australia); Greg Jolley, University of Western Australia (Australia); Samuel Turner, Sudha Mokkapati, Hoe Tan, Chennupati Jagadish, Australian National University (Australia). . . . . [8923-53]

16:00: **Heterogeneous nano-particle array for the realization of the hot carrier solar cell**, Yu Feng, Shu Lin, The Univ. of New South Wales (Australia); Xiaoming Wen, Pengfei Zhang, Univ of New South Wales (Australia); Shujuan Huang, Santosh Shrestha, Gavin Conibeer, The Univ. of New South Wales (Australia). . . . . [8923-55]

16:15: **Solution processing of next-generation nanocrystal solar cells**, Jacek J. Jasieniak, Joel van Embden, Anthony Chesman, Enrico Della Gaspera, Noel Duffy, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-56]

16:30: **Optical properties and electron dynamics in carbon nanodots**, Xiaoming Wen, Shujuan Huang, Gavin Conibeer, Santosh Shrestha, The Univ. of New South Wales (Australia); Pyng Yu, Yon-Rui Toh, Jau Tang, Academia Sinica (Taiwan) . . . . . [8923-57]

Tuesday 10 December

Plenary Session

Room: Swanston Academic Building 80: Level 2 Room 7 . . . .Tue 8:30 to 9:15

Nanophotonics for biology

Tanya M. Monro, The Univ. of Adelaide (Australia)
(See page 4 for description)

Daily Venue Change: Move to Emily McPherson Building 13

Sessions 13, 14, and 15 run concurrently.

Session 13

Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Tue 9:30 to 10:30

Fabrication II

Session Chair: **Dwayne D Kirk,** Melbourne Ctr. for Nanofabrication (Australia)

9:30: **Nano-architecture: creating complex surface structures using supramolecular self-assembly of tripeptides** *(Invited Paper)*, Adam Mechler, Rania Seoudi, La Trobe Univ. (Australia); Mark P. Del Borgo, Mibel Aguilar, Patrick Perlmutter, Monash Univ. (Australia). . . . . [8923-58]

10:00: **A novel transfer process for high temperature oxides stretchable electronics**, Philipp Gutruf, Charan M. Shah, Sumeet Walia, Hussein Nili Ahmadabadi, Ahmad S. Zoolfakar, RMIT Univ. (Australia); Christian Karnutsch, Fachhochschule Karlsruhe Technik und Wirtschaft (Germany); Kourosh Kalantar-Zadeh, Sharath Sriram, Madhu Bhaskaran, RMIT Univ. (Australia). . . . . [8923-59]

10:15: **Patterning of monolithic diamond films by inductively coupled plasma reactive ion etching**, Wei Tong, Kumaravelu Ganesan, Kate Fox, Olga Shimoni, Steven Prawer, The Univ. of Melbourne (Australia). . . . . [8923-60]

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

Session 14

Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Tue 9:30 to 10:30

Plasmonics II

Session Chair: **Arnan Mitchell,** RMIT Univ. (Australia)

9:30: **Plasmonics for high quantum efficiency III-V semiconductor nanowires** *(Invited Paper)*, Sudha Mokkapati, The Australian National Univ. (Australia). . . . . [8923-61]

10:00: **Hybridization in 3D: optical and plasmonic elements**, Lorenzo Rosa, Gediminas Gervinskas, Albertas ?ukauskas, Swinburne Univ. of Technology (Australia); Mangirdas Malinauskas, Vilnius Univ. (Lithuania); Etienne Brasselet, Univ. Bordeaux 1 (France); Saulius Juodkazis, Swinburne Univ. of Technology (Australia) . . . . . [8923-62]

10:15: **Ultra-compact plasmonic nanoring laser**, Chee-Wei Lee, Qian Wang, Gurpreet Singh, A*STAR - Data Storage Institute (Singapore); Seng-Tiong Ho, Northwestern Univ. (United States) . . . . . [8923-63]

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

Session 15

Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Tue 9:30 to 10:30

MEMS I

Session Chair: **Adrian Keating,** The Univ. of Western Australia (Australia)

9:30: **High resolution, large range, position sensing technique for MEMS cantilevers**, Gino Putrino, Adrian Keating, Mariusz Martyniuk, Lorenzo Faraone, John M. Dell, The Univ. of Western Australia (Australia) [8923-64]

9:45: **PiezoMEMS autofocus lens for next-generation smart devices**, John Phair, poLight AS (Norway) . . . . . [8923-65]

10:00: **Effect of surfaces on thermoelastic damping of a rectangular nanobeam**, Saurabh Dixit, Mandar M. Inamdar, Dnyanesh N. Pawaskar, Indian Institute of Technology Bombay (India) . . . . . [8923-66]

10:15: **Silicon bi-layer films for low temperature MEMS**, Kirsten L. Brookshire, Ramin Rafiei, Dhirendra K. Tripathi, Dilusha K. K. M. B. Silva, John Bumgarner, Robert W. Basedow, Yinong Liu, Lorenzo Faraone, The Univ. of Western Australia (Australia). . . . . [8923-67]

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

Sessions 16, 17, and 18 run concurrently.

Session 16

Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Tue 11:00 to 12:30

Bio III

Session Chair: **Dan V. Nicolau,** McGill Univ. (Canada)

11:00: **Building plasmonic nanoparticle superlattices with soft ligands** *(Invited Paper)*, Wenlong Chen, Monash Univ. (Australia) . . . . . [8923-212]

11:30: **Towards capture and time resolved analysis of PCR amplification products using PDMS microfluidic devices**, Dmitriy Khodakov, Renzo Fenati, Adrian Linacre, Flinders Univ. (Australia); Amanda V. Ellis, Flinders Univ. (Australia) and Flinders Ctr. for Nanoscale Science and Technology (Australia). . . . . [8923-69]

11:45: **Development of glucose microsensors integrated with bio-functionalized zinc oxide nanorods**, Archana Komirisetty, Frances Williams, Aswini K. Pradhan, Norfolk State Univ. (United States) . . . . . [8923-70]

12:00: **Speech assistance devices controlled by neck myoelectric signal -compact pump system for regeneration of laryngeal tone**, Katsutoshi Ooe, Takayuki Yamamoto, Daiichi Institute of Technology (Japan). . . . . [8923-71]

12:15: **Gen silencing using siRNA**, Sarah Masoumi, James Friend, Leslie Y. Yeo, RMIT Univ. (Australia); Christina Cortez-Jugo, Monash Univ. (Australia). . . . . [8923-72]

Lunch/Exhibition Break . . . . . Tue 12:30 to 13:30

Session 17

Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Tue 11:00 to 12:15

Photonics III

Session Chair: **Eunjoo Jang,** Samsung Advanced Institute of Technology (Korea, Republic of)

11:00: **Measuring the electrical properties of semiconductor nanowires using terahertz conductivity spectroscopy** *(Invited Paper)*, Hannah J. Joyce, Univ of Oxford (United Kingdom) and Univ. of Cambridge (United Kingdom); C. J. Docherty, Univ of Oxford (United Kingdom); Chaw Keong Yong, Univ. of Oxford (United Kingdom); Jennifer Wong-Leung, Qiang Gao, The Australian National Univ. (Australia); Suriati Paiman, The Australian National University (Australia); Hark Hoe Tan, Chennupati Jagadish, The Australian National Univ. (Australia); James Lloyd-Hughes, Laura M. Herz, Michael B. Johnston, Univ. of Oxford (United Kingdom). . . . . [8923-73]

11:30: **THz photomixer with a sub-50 nm nanoelectrode gap on low temperature grown GaAs**, Gediminas Seniutinas, Gediminas Gervinskas, Swinburne Univ. of Technology (Australia); Ar?nas Krotkus, Ctr. for Physical Sciences and Technology (Lithuania); Gediminas Molis, TeraVil Ltd. (Lithuania); Gintaras Valu?is, Ctr. for Physical Sciences and Technology (Lithuania); Saulius Juodkazis, Swinburne Univ. of Technology (Australia) . . . . . [8923-75]

11:45: **Appearance of localized excitons in narrow GaAs/AlGaAs core-multi shell quantum well tubes**, Leigh M. Smith, Teng Shi, Howard E. Jackson, Univ. of Cincinnati (United States); Jan M. Yarrison-Rice, Miami Univ. (United States); Bryan M. Wong, Sandia National Labs., California (United States); Nian Jiang, Qiang Gao, Hark Hoe Tan, Chennupati Jagadish, The Australian National Univ. (Australia); Joanne Etheridge, Monash Univ. (Australia) . . . . . [8923-76]

12:00: **Extending device performance in photonic devices using piezoelectric properties**, Gregory E. Triplett, Univ. of Missouri-Columbia (United States) . . . . . [8923-77]

Lunch/Exhibition Break . . . . . Tue 12:30 to 13:30

Session 18

Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Tue 11:00 to 12:30

Metrology/Characterisation

Session Chair: **Gareth F. Moorhead,** Commonwealth Scientific and Industrial Research Organisation (Australia)

11:00: **The sound of nano**, Matthew Clark, Richard J. Smith, Fernando Perez-Cota, Leonel Marques, Kevin F. Webb, Jon Aylott, The Univ. of Nottingham (United Kingdom). . . . . [8923-78]

11:15: **Ultra-stable atomic force microscope with integrated laser inteferometry**, Jan Herrmann, Bakir Babic, Christopher H. Freund, Malcolm A. Lawn, Magnus T. L. Hsu, Terry G. McRae, Malcolm B. Gray, Victoria A. Coleman, National Measurement Institute of Australia (Australia) . . . . . [8923-79]

11:30: **Measuring nanobubble properties using a novel method**, Morteza Yousefi, James Friend, Leslie Y. Yeo, RMIT Univ. (Australia) . . . . . [8923-80]

11:45: **Quantitative measurements of two photon action and scattering cross sections of single gold nanorods**, Arif M. Siddiquee, Adam B. Taylor, James W. M. Chon, Swinburne Univ. of Technology (Australia). . . . . [8923-81]

12:00: **Characterisation of individual crystallographic defects using coherent x-ray diffractive imaging**, Brian Abbey, La Trobe Univ. (Australia) . . . . . [8923-82]

12:15: **X-ray diffraction microscopy of magnetic microstructure**, Grant A. van Riessen, Ashish Tripathi, Mark Junker, La Trobe Univ. (Australia) . . . . . [8923-83]

Lunch/Exhibition Break . . . . . Tue 12:30 to 13:30

Sessions 19, 20, and 21 run concurrently.

Session 19
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Tue 13:30 to 14:45

Microfluidics II

Session Chair: **Lydia L Sohn,** UC Berkeley (United States)

13:30: **Ultrafast vaporization dynamics of laser-activated polymeric microcapsules** *(Invited Paper)*, Michel Versluis, Univ. Twente (Netherlands) . . [8923-84]

14:00: **Microfluidic devices using thiol-ene polymers**, Simon J. Bou, Amanda V. Ellis, Flinders Univ. (Australia). . . . . .[8923-85

14:15: **A microfluidic platform to study the mechano sensational properties of ion channels**, Sara Baratchi, Francisco J. Tovar-Lopez, Khashayar Khoshmanesh, Megan Grace, William Darby, Peter McIntyre, Arnan Mitchell, RMIT Univ. (Australia). . . . . [8923-86]

14:30: **Flow through a microfluidic chip induced by a distal surface acoustic wave atomizing suction pump**, Jessica K. Underwood, Peggy P. Y. Chan, Leslie Y. Yeo, James Friend, RMIT Univ. (Australia). . [8923-87]

Coffee Break . . . . . Tue 15:00 to 15:30

Session 20
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Tue 13:30 to 15:00

Solar III

Session Chair: **Lan Fu,** The Australian National Univ. (Australia)

13:30: **Light trapping and solar energy harvesting in thin film photonic crystals** *(Invited Paper)*, Sajeev John, Univ. of Toronto (Canada) . . . . . [8923-89]

14:00: **Nano inverted pyramid texturing by laser interference lithography for silicon solar cells**, Senthuran Sivasubramaniam, Maan M. Alkaisi, Univ. of Canterbury (New Zealand) and The MacDiarmid Institute for Advanced Materials and Nanotechnology (New Zealand) . . . . . [8923-90]

14:15: **Ion-beam and plasma etching of a conical-pores photonic crystal for thin-film solar cell**, Gediminas Gervinskas, Lorenzo Rosa, Saulius Juodkazis, Swinburne Univ. of Technology (Australia). . . . . [8923-91]

14:30: **Growth of CZTS by co-sputtering of metallic & sulfide targets and sulfurization for solar cell applications**, Nadarajah Muhunthan, Vidya N. Singh, National Physical Lab. (India) . . . . . [8923-92]

14:45: **Potential of hafnium nitride for the hot carrier solar cell**, Simon Chung, Santosh Shrestha, Hongze Xia, Neeti Gupta, Gavin Conibeer, The Univ. of New South Wales (Australia) . . . . . [8923-93]

Coffee Break . . . . . Tue 15:00 to 15:30

Session 21
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Tue 13:30 to 15:00

Nanomaterials III

Session Chair: **Matteo Pasquali,** Rice Univ. (United States)

13:30: **Terahertz detection with graphene devices** *(Invited Paper)*, Michael S Fuhrer, Monash University (Australia) and University of Maryland (United States) . . . . . [8923-94]

14:00: **Influence of different reduction processes on the chemical nature, electrical conductivity and electrochemical double layer capacitance of reduced graphene oxide**, Parama Chakraborty Banerjee, Mainak Majumder, Monash Univ. (Australia). . . . . [8923-95]

14:15: **Simultaneous Raman and electrical transport measurements of disordered graphene in situ in ultra-high vacuum**, Jacob A. Tosado, Monash Univ. (Australia) and Univ. of Maryland (United States); Michael S. Fuhrer, Monash Univ. (Australia) . . [8923-96]

14:30: **Synthesis of patched or stacked graphene and hBN flakes: an emerging route to hybrid structure discovery**, Soo Min Kim, Korea Institute of Science and Technology (Korea, Republic of). [8923-97]

14:45: **Synthesis of hexagonal boron nitride and its applications**, Ki Kang Kim, Dongguk Univ. (Korea, Republic of); Soo Min Kim, Korea Institute of Science and Technology (Korea, Republic of); Young Hee Lee, Sungkyunkwan Univ. (Korea, Republic of) . . . [8923-98]

Coffee Break . . . . . Tue 15:00 to 15:30

Posters
Room: Emily McPherson Building 13: Level 3 Room 5 . . . . . Tue 15:30 to 17:30

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 Tuesday morning. 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. Posters must be removed from the boards following the poster session. Posters that remain on the boards will be discarded.

Fabrication of Fresnel zone plate lens in fused silica glass using femtosecond laser lithography technology, Ik-Bu Sohn, Gwangju Institute of Science and Technology (Korea, Republic of); Md. Shamim Ahsan, Gwangju Institute of Science and Technology (Korea, Republic of) and Khulna Univ. (Bangladesh); Young-Chul Noh, Gwangju Institute of Science and Technology (Korea, Republic of); Hun-Kook Choi, Jin-Tae Kim, Chosun Univ. (Korea, Republic of); Myeong-Jin Ko, Korea Institute of Industrial Technology (Korea, Republic of) . . . . . [8923-3]

On-chip optical nano-scale displacement sensor, Peng Wang, Aron W. Michael, Chee Yee Kwok, The Univ. of New South Wales (Australia). [8923-107]

Analysis of deep submicron device parameters using t-sizing through circuit simulator, Senthilrani Shanmugavelu, Velammal College of Engineering and Technology (India); M. Suganthi, Thiagarajar College of Engineering (India). . . . . [8923-148]

What happens when we slowly touch a water surface?, Gea O. F. Parikesit, Univ. Gadjah Mada (Indonesia) . . . . . [8923-149]

Design and analysis of low power nanoscale DRAM cell, Abhishek S. Tomar, Indian Institute of Information Technology and Management (India). . . . . [8923-151]

Immobilization of lipase and keratinase on functionalized SBA-15 nanostructured materials, Hy G. Le, Phuong T. Dang, Tuan A. Vu, Hoa T. K. Tran, Vietnamese Academy of Science and Technology (Viet Nam) . [8923-152]

Additive manufacturing of lab-on-a-chip devices, Feng Zhu, RMIT Univ. (Australia); Niall MacDonald, RMIT Univ. (Australia) and Univ. of Glasgow (United Kingdom); Jonathan M. Cooper, Univ. of Glasgow (United Kingdom); Donald Wlodkowic, RMIT Univ. (Australia) . . . . . [8923-153]

A high-throughput lab-on-a-chip interface for zebrafish embryo tests in drug discovery and ecotoxicology, Feng Zhu, RMIT Univ. (Australia); Jin Akagi, Chris J. Hall, Kathryn Crosier, Philip Crosier, The Univ. of Auckland (New Zealand); Donald Wlodkowic, RMIT Univ. (Australia). . . . . [8923-154]

Immobilization of zebrafish larvae on a chip-based device for environmental scanning electron microscopy (ESEM) imaging, Jin Akagi, RMIT Univ. (Australia); Chris J. Hall, Kathryn Crosier, Philip Crosier, The Univ. of Auckland (New Zealand); Donald Wlodkowic, RMIT Univ. (Australia). . . . . [8923-155]

Microfluidic EmbryoSort technology: towards in flow analysis, sorting and dispensing of individual vertebrate embryos, Nurul M. Fuad, Donald Wlodkowic, RMIT Univ. (Australia) . . . . . [8923-156]

Preparation and evaluation of transmission-mode AlGaN photocathode, Guanghui Hao, Mingzhu Yang, XinLong Chen, Benkang Chang, Nanjing Univ. of Science and Technology (China). . . . . [8923-157]

Transmission-mode Ga1-xAlxAs photocathode made for detecting 532nm light, XinLong Chen, Jing Zhao, Benkang Chang, Yuan Xu, Guanghui Hao, Nanjing Univ. of Science and Technology (China) . . . . . [8923-158]

Infrared eye tracker in an oculary clinical setting, Mizhanim Mohamad Shahimin, Univ. Kebangsaan Malaysia (Malaysia); Mukhzeer Mohamad Shahimin, Univ. Malaysia Perlis (Malaysia) . . . . . [8923-159]

Optimization of MEMS based micropump for drug delivery application, Hayati Sabani, Mukhzeer Mohamad Shahimin, Bibi Nadia Taib, Mohd. Azarulsani Md. Azidin, Aida Fatehah Mohd Shukur, Univ. Malaysia Perlis (Malaysia). . . . . [8923-160]

The application and quantitative testing of 150 million pixel CMOS image sensor, Xueyi Gong, Shanghai Institute of Technical Physics (China)[8923-161]

A simplified approach for integrating capacitively coupled contactless conductivity detection with lab-on-chip devices using injected gallium electrodes, Leigh D. Thredgold, Dmitriy Khodakov, Amanda V. Ellis, Claire E. Lenehan, Flinders Univ. (Australia) . . . . . [8923-162]

Effect of mesh element type of finite element model on unimorph cantilever vibration, Hasnizah Aris, La Trobe Univ. (Australia) and Univ. Malaysia Perlis (Malaysia); David Fitrio, Jugdutt J. Singh, La Trobe Univ. (Australia). . . . . [8923-163]

Metal-oxide-semiconductor field-effect transistors operated by surface plasmon polaritons, Takuma Aihara, Ayumi Takeda, Masashi Fukuhara, Yuya Ishii, Mitsuo Fukuda, Toyohashi Univ. of Technology (Japan) . . . . . [8923-164]

Sensitivity improvement of Schottky-type plasmonic detector, Ayumi Takeda, Takuma Aihara, Masashi Fukuhara, Yuya Ishii, Mitsuo Fukuda, Toyohashi Univ. of Technology (Japan) . . . . . [8923-165]

Standard microelectronic processes compatible porous silicon gratings with high extinction of 0th order mode transmission, Xiao Sun, Adrian Keating, Giacinta Parish, The Univ. of Western Australia (Australia). . [8923-166]

Method for evaporating silicon to form low dimensional Si lattice structures, David C. Ng, National ICT Australia (Australia); Kumaravelu Ganesan, Efstratios S. Skafidas, The Univ. of Melbourne (Australia) . [8923-167]

Catalytic pyrolysis of biomass by novel nanostructured catalysts, Phuong T. Dang, Hy G. Le, Giang T. Pham, Hong T. Vu, Kien T. Nguyen, Quang K. Nguyen, Canh D. Dao, Giang H. Le, Thuy T. Hoang, Hoa T. K. Tran, Tuan A. Vu, Vietnamese Academy of Science and Technology (Viet Nam) . . . [8923-168]

High-speed camera observation of multi-component droplet coagulation in an ultrasonic standing wave field, Marina Reissenweber, Gerhard Lindner, Hochschule für angewandte Wissenschaften und Künste (Germany); Sandro Krempel, Coburg University of Applied Sciences and Arts (Germany)[8923-169]

Fabrication and replication of micro-optical structures for growth of GaN-based light emitting diodes, Gediminas Gervinskas, Gediminas Seniutinas, Swinburne Univ. of Technology (Australia); Anand Vijayakumar, Shanti Bhattacharya, Indian Institute of Technology Madras (India); Edgaras Jelmakas, Arunas Kadys, Rolandas Tomasiunas, Vilnius Univ. (Lithuania); Saulius Juodkazis, Swinburne Univ. of Technology (Australia). . . . . [8923-170]

NUC and blind pixel eliminating in the DTDI application, Su Xiaofeng, Shanghai Institute of Technical Physics (China) . . . . . [8923-171]

Characterization of single nanoantennas with various configurations, Shiuan-Yeh Chen, Chua-Zu Huang, Ting-Hao Wang, National Cheng Kung Univ. (Taiwan) . . . . . [8923-172]

A waveguide based microfluidic application, Nooshin S. Taheri, RMIT Univ. (Australia); James Friend, Australian National Fabrication Facility (Australia); Peggy P. Y. Chan, RMIT Univ. (Australia); Leslie Y. Yeo, Monash Univ. (Australia). . . . . [8923-174]

Long-wavelength infrared Fabry-Perot etalon for multi-spectral thermal imaging, Haifeng Mao, Adrian Keating, Dilusha K. K. M. B. Silva, The Univ. of Western Australia (Australia); John Dell, The University of Western Australia (Australia); Lorenzo Faraone, The Univ. of Western Australia (Australia). . . . . [8923-175]

Targeted sacrificial layer etching for MEMS release using microfluidic channels, Ben C. Cheah, John M. Dell, Adrian Keating, The Univ. of Western Australia (Australia) . . . . . [8923-176]

Darkfield microspectroscopic analysis of gold nanorods in spiral ganglion neurons, Jiawey Yong, William G. A. Brown, Swinburne Univ. of Technology (Australia); Karina Needham, The Univ. of Melbourne (Australia); Aimin Yu, Swinburne Univ. of Technology (Australia); Bryony A. Nayagam, The Univ. of Melbourne (Australia); Sally L. McArthur, Paul R. Stoddart, Swinburne Univ. of Technology (Australia) . . . . . [8923-177]

Nanocrystallic thin films statistical structural analysis by the automatic image processing, Maciej Wielgus, Warsaw Univ. of Technology (Poland) and Institute of Electron Technology (Poland); Zofia Sunderland, Warsaw Univ. of Technology (Poland) . . . . . [8923-178]

Formation of cylindrical micro-lens array in fused silica glass using laser irradiations, Hun-Kook Choi, Gwangju Institute of Science and Technology (Korea, Republic of); Md. Shamim Ahsan, Gwangju Institute of Science and Technology (Korea, Republic of) and Khulna Univ. (Bangladesh); Dongyoon Yoo, Ik-Bu Sohn, Young-Chul Noh, Gwangju Institute of Science and Technology (Korea, Republic of); Jin-Tae Kim, Chosun Univ. (Korea, Republic of); Deok Jung, Jin Hyeok Kim, Chonnam National Univ. (Korea, Republic of) . . . . . [8923-179]

Micro flexible robot hand using electro-conjugate fluid, Shohei Ueno, Kenjiro Takemura, Keio Univ. (Japan); Shinichi Yokota, P&I Lab., Tokyo Institute of Technology (Japan); Kazuya Edamura, New Technology Management Co., Ltd (Japan). . . . . [8923-180]

Probe beam current effect of the subsidiary electrode in a newly developed source lens structure of the microcolumn, Won-Kweon Jang, Hanseo Univ. (Korea, Republic of); Ho-Seob Kim, Tae-Sik Oh, Sun Moon Univ. (Korea, Republic of). . . . . [8923-181]

Shape optimization of electrostatically driven microcantilevers using simulated annealing to enhance static travel range, Reena R. Trivedi, Indian Institute of Technology Bombay (India); Manish M. Joglekar, Indian Institute of Technology Roorkee (India); Rameshachandra P. Shimpi, Dnyanesh N. Pawaskar, Indian Institute of Technology Bombay (India) . . . . . [8923-182]

Optical and thermal characterization on micro-optical elements made by femtosecond laser writing, Ricardas Buividas, Swinburne Univ. of Technology (Australia) and Australian National Fabrication Facility (Australia); Vygantas Mizeikis, Shizuoka Univ. (Japan); Albertas ?ukauskas, Mangirdas Malinauskas, Vilnius Univ. (Lithuania); Junko Morikawa, Tokyo Institute of Technology (Japan); Saulius Juodkazis, Swinburne Univ. of Technology (Australia). . . . . [8923-183]

Single-step passivation (SSP) and antireflection coating for radiation resistant mono-crystalline silicon solar cell, Khuram Ali, Sohail A. Khan, Mohd Zubir Mat Jafri, Univ. Sains Malaysia (Malaysia). . . . . [8923-184]

Governing equations for electro-conjugate fluid flow, Kyohei Hosoda, Kenjiro Takemura, Keio Univ. (Japan); Koji Fukagata, Keio Univ (Japan); Sinichi Yokota, Tokyo Tech (Japan); Kazuya Edamura, New Technology Management Co., Ltd (Japan) . . . . . [8923-185]

Adapting semiconductor device fabrication processes to make micro-structured surfaces for algal biofilm studies, Suthamathy Sathananthan, Scott N. Genin, James S. Aitchison, Grant Allen, Univ. of Toronto (Canada) . . . . . [8923-186]

Anti-reflection properties of spherical top nanowire arrays for solar cell applications, Fei Tao, Jiacheng Chen, Feng He, Hang Zhou, Peking Univ. Shenzhen Graduate School (China) . . . . . [8923-187]

Development of a multi-electrode system for non-destructive and contactless wafer evaluation, Justin Ndagijmana, Kumamoto Univ. (Japan). . . . . [8923-190]

Development of a multi-flash lamp in pulse photo conductivity method, Junpei Fukashi, Kumamoto Univ. (Japan). . . . . [8923-191]

Probing the electronic structure in GaAs nanowire rotational twin superlattices, Leigh M. Smith, Teng Shi, Howard E. Jackson, Univ. of Cincinnati (United States); Jan M. Yarrison-Rice, Miami Univ. (United States); Tim Burgess, Qiang Gao, Hark Hoe Tan, Chennupati Jagadish, The Australian National Univ. (Australia) . . . . . [8923-192]

Particle separation with travelling surface acoustic waves, Jan M. Behrens, RMIT Univ. (Australia) . . . . . [8923-193]

Investigating extremely low resistance ohmic contacts to silicon carbide using a novel test structure, Yue Pan, Fahid Algahtani, Patrick W. Leech, Geoffrey K. Reeves, RMIT Univ. (Australia); Philip G. Tanner, Griffith Univ. (Australia); Anthony S. Holland, RMIT Univ. (Australia) . . . . . [8923-194]

Non-thermal effects of microwaves on biological activity of Collagenase enzyme and growth rate of yeast cells, Hamad S. Alsuhaim, Elena Pirogova, Vuk Vojisavljevic, RMIT Univ. (Australia) . . . . . [8923-195]

Influence of technique on the measured particle size distribution of complex nanoparticle systems, Åsa K. Jämting, Maitreyee Roy, Heather J. Catchpoole, Malcolm A. Lawn, Bakir Babic, Victoria A. Coleman, Jan Herrmann, National Measurement Institute of Australia (Australia). . . [8923-196]

Improved geometrical design of the circular transmission line model ohmic contact test structure, Aaron M. Collins, RMIT Univ. (Australia) . . . [8923-197]

Optimising the thermal budget for forming of nickel germanide on crystalline germanium, Fahid Algahtani, Anthony S. Holland, Elena Pirogova, RMIT Univ. (Australia) . . . . . [8923-200]

Detection of harmful algal bloom causing microalgae using covalently immobilised capture oligonucleotide probes on glass and PDMS surfaces, Karen L. Bruce, Amanda V. Ellis, Sophie C. Leterme, Dmitriy Khodakov, Claire E. Lenehan, Flinders Univ. (Australia) . . . . . [8923-201]

Rapid formation of controlled size and morphology spheroids by surface acoustic wave microfluidic device (SAW) versus liquid overlay method, Layla M. Alhasan, RMIT Univ. (Australia); Peggy P. Y. Chan, RMIT Univ. (Australia) and Melbourne Ctr. for Nanofabrication (Australia) . . . . . [8923-202]

Four point probe geometry modified correction factor for determining resistivity, Fahid Algahtani, Karthikram B. Thulasiram, RMIT Univ. (Australia); Nashrul M. Nasir, Univ. Malaysia Perlis (Malaysia); Anthony S. Holland, RMIT Univ. (Australia) . . . . . [8923-203]

Modelling and fabrication of thermally actuated micropores for biological sensing, Hui Liam Lee, Boyin Liu, Jing Fu, Monash Univ. (Australia) [8923-204]

Assessment of GeB doped silica optical fiber for the application of remote radiation sensing system, Alawiah Ariffin, M. M. Fadhli, Multimedia Univ. (Malaysia); Sabar Bauk, Univ. Sains Malaysia (Malaysia); Hairul Azhar Abdul Rashid, Multimedia Univ. (Malaysia); Mohd Jamil Maah, Univ. of Malaya (Malaysia). . . . . [8923-205]

Hydrophobicity studies of polymer thin films with varied CNT concentration, Mukhzeer Mohamad Shahimin, Nurul Husna Mohd Rodzi, Prabakaran Poopalan, Bahari Man, Mohammad Nuzaihan Md Nor, Univ. Malaysia Perlis (Malaysia) . . . . . [8923-206]

Investigation of amorphisation of germanium using modelling and experimental processes, Saeed Almalki, Fahid Algahtani, RMIT Univ. (Australia); Mohammad S. N. Alnassar, RMIT Univ. (Australia) and Qassim Univ. (Saudi Arabia); Anthony S. Holland, RMIT Univ. (Australia). . . . . [8923-207]

Preparation of Cu_2O/TiO_2 nanotube heterojunction arrays with enhanced photoelectrocatalysis performance, Jianfang Zhang, Xia Shu, Tiankuo Shen, Haidong Bian, Yan Wang, Hefei Univ. of Technology (China); Zhong Chen, Nanyang Technological Univ. (Singapore); Yucheng Wu, Hefei Univ. of Technology (China) . . . . . [8923-208]

Green synthesis of silver nanoparticles as antibacterial agent using Rhodomyrtus tomentosa acetone extract, Supayang P Voravuthikunchai, Shiv Shankar, Prince of Songkla University (Thailand) . . . . . [8923-209]

Spectroscopic modeling of water molecule, Rostyslav Danylo, Boris A. Okhrimenko, National Taras Shevchenko Univ. of Kyiv (Ukraine). . . . [8923-210]

Measurement of the temperature distribution inside a chemical vapor deposition reactor during carbon nanotube synthesis, Kochandra Raji, National Institute of Technology Calicut (India); O. Sehmus, Jaime Taha-Tijerina, Rice Univ. (United States); C. B. Sobhan, National Institute of Technology Calicut (India); Pulickel M. Ajayan, Rice Univ. (United States) . . . . . [8923-218]

Wednesday 11 December

Plenary Session

Room: Swanston Academic Building 80: Level 2 Room 7 . . . Wed 8:30 to 9:15

Hydrodynamic challenges in inkjet printing

Detlef Lohse, Univ. of Twente (The Netherlands)
(See page 5 for description)

Daily Venue Change: Move to Emily McPherson Building 13

Sessions 22, 23, and 24 run concurrently.

Session 22
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Wed 9:30 to 10:30

Electronics

Session Chair: **Hannah J. Joyce,** Univ of Oxford (Australia)

9:30: **Electrically stable, solution-processed amorphous oxide thin-film transistors through UV-Ozone assisted sol-gel approach**, Laurence Deam, The Univ. of Melbourne (Australia); Leonardo D. Tozi, Jacek J. Jasieniak, Commonwealth Scientific and Industrial Research Organisation (Australia); Kin K. Lee, Jeffrey C. McCallum, The Univ. of Melbourne (Australia); Mark Bown, Thokchom B. Singh, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [8923-99]

9:45: **Controlling polarity of organic bulk heterojunction field effect transistors via solvent additives**, Jung Hwa Seo, Dong-A Univ. (Korea, Republic of); Bright Walker, Ulsan National Institute of Science and Technology (Korea, Republic of) [8923-100]

10:00: **Conduction mechanisms and resistive switching in RF magnetron sputtered SrTiO3 epitaxial ultra-thin films and multilayer structures**, Hussein Nili Ahmadabadi, Philipp Gutruf, Kourosh Kalantar-Zadeh, Madhu Bhaskaran, Sharath Sriram, RMIT Univ. (Australia) . . . . . [8923-101]

10:15: **Novel single dot test structure for determining specific contact resistivity**, Yue Pan, Anthony S. Holland, RMIT Univ. (Australia) . . [8923-102]

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

Session 23
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Wed 9:30 to 10:30

Plasmonics III

Session Chair: **Kylie R. Catchpole,** The Australian National Univ. (Australia)

9:30: **Plasmonics: the convergence between optics and electronics** *(Invited Paper)*, Timothy J. Davis, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-103]

10:00: **Vanadium dioxide thickness effects on tunable optical antennas**, Stuart K. Earl, Timothy D. James, The Univ. of Melbourne (Australia); Robert E. Marvel, Vanderbilt Univ. (United States); Daniel E. Gomez, Commonwealth Scientific and Industrial Research Organisation (Australia) and The Univ. of Melbourne (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Timothy J. Davis, Commonwealth Scientific and Industrial Research Organisation (Australia) and Melbourne Ctr. for Nanofabrication (Australia); Jason G. Valentine, Richard F. Haglund Jr., Vanderbilt Univ. (United States); Ann Roberts, The Univ. of Melbourne (Australia) . [8923-104]

10:15: **Electron-beam lithography of plasmonic nanorod arrays for multilayered optical storage**, Adam B. Taylor, Pierrette Michaux, James W. M. Chon, Swinburne Univ. of Technology (Australia) . . [8923-105]

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

Session 24
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Wed 9:30 to 10:15

MEMS II

Session Chair: **Weidong Zhou,** The Univ. of Texas at Arlington (United States)

9:30: **Micromachined sensors operating in the infrared** *(Invited Paper)*, Adrian Keating, Univ of Western Australia (Australia) . . . . . [8923-106]

10:00: **A Versatile Instrumentation System for MEMS-Based Device Optical Characterization**, Ramin Rafiei, Robert W. Basedow, Dilusha K. K. M. B. Silva, Jega T. Gurusamy, Jorge R. Silva Castillo, The Univ. of Western Australia (Australia); Dhirendra K Tripathi, The University of Western Australia (Australia); John M. Dell, Lorenzo Faraone, The Univ. of Western Australia (Australia) . . . . . [8923-108]

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

Sessions 25, 26, and 27 run concurrently.

Session 25
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Wed 11:00 to 12:30

Microfludics III

Session Chair: **Craig Priest,** Univ. of South Australia (Australia)

11:00: **Label-free single-cell analysis** *(Invited Paper)*, Lydia L Sohn, UC Berkeley (United States). . [8923-109]

11:30: **Buried picolitre fluidic channels in single-crystal diamond**, Michelle A. Strack, Barbara A. Fairchild, Andrew D. C. Alves, The Univ. of Melbourne (Australia); Philipp Senn, The Univ. of Melbourne (Australia) and Bionics Institute (Australia); Brant C. Gibson, RMIT Univ. (Australia) and The Univ. of Melbourne (Australia); Steven Prawer, The Univ. of Melbourne (Australia); Andrew D. Greentree, RMIT Univ. (Australia). . . . . [8923-110]

11:45: **How to fabricate robust microfluidic systems for a dollar**, Florian Lapierre, Commonwealth Scientific and Industrial Research Organisation (Australia); Neil Cameron, Department of Chemistry & Biophysical Sciences Institute (United Kingdom); John Oakeshott, Tom Peat, CSIRO (Australia); Yonggang Zhu, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-111]

12:00: **Fabrication of scale-like microcantilevers for cell capturing**, Boyin Liu, Jing Fu, Monash Univ. (Australia); Anthony Somers, Deakin Univ. (Australia); Murat S. Muradoglu, Tuch W. Ng, Monash Univ. (Australia). . . . . [8923-112]

12:15: **Nanoimprint Lithography for Microfluidics Manufacturing**, Gerald Kreindl, EV Group (Austria) . . . . . [8923-113]

Lunch/Exhibition Break . . . . . Wed 12:30 to 13:30

Session 26
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Wed 11:00 to 12:30

Solar IV

Session Chair: **Timothy J. Davis,** Commonwealth Scientific and Industrial Research Organisation (Australia)

11:00: **Nanophotonic light trapping for high efficiency solar cells** *(Invited Paper)*, Kylie R Catchpole, Australian National University (Australia). . . . . [8923-114]

11:30: **Light trapping for >30% tandem solar cells built on c-Si**, Niraj N. Lal, Thomas P. White, Kylie R. Catchpole, The Australian National Univ. (Australia). . . . . [8923-115]

11:45: **Improved metal nanoparticle fabrication for solar cell applications**, Tristan L. Temple, Macquarie Univ. (Australia) and CSIRO (Australia); Svetlana Dligatch, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-116]

12:00: **Plasmonic nanoparticles enhanced dye sensitized solar cells**, Qi Xu, Fang Liu, Yuxiang Liu, Weisi Meng, Yidong Huang, Tsinghua Univ. (China) . . . . . [8923-117]

12:15: **Ageing effects on plasmonic properties for solar cell applications**, Supriya Pillai, Yang Yang, Yajie Jiang, Martin A. Green, The Univ. of New South Wales (Australia). . . . . [8923-118]

Lunch/Exhibition Break . . . . . Wed 12:30 to 13:30

Session 27
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Wed 11:00 to 12:30

Nanomaterials IV

Session Chair: **Takeshi Morita,** The Univ. of Tokyo (Japan)

11:00: **Carbon nanotube and graphene: from fluid phases to multifunctional materials** *(Invited Paper)*, Matteo Pasquali, Rice Univ. (United States) . [8923-119]

11:30: **Tunable reduction and amorphisation of graphene oxide films by focused ion beam irradiation**, Derrek E. Lobo, Jing Fu, Mainak Majumder, Monash Univ. (Australia) . . . . . [8923-120]

11:45: **New efficient p-n heterojunction of BiOI/TiO_2 nanotube arrays with enhanced visible-light photoelectrocatalytic activities**, Jiaqin Liu, Lili Ruan, Jiajia Hu, Yan Wang, Hefei Univ. of Technology (China); Xinyi Zhang, Monash Univ. (Australia); Yucheng Wu, Hefei Univ. of Technology (China) . . . . . [8923-121]

12:00: **Surface acoustic waves-assisted technique for generation of individual carbon nanotubes and their shear-induced alignment**, Morteza Miansarigavzan, Monash Univ. (Australia); Aisha Qi, RMIT Univ. (Australia); Mainak Majumder, Monash Univ. (Australia); James Friend, RMIT Univ. (Australia). . . . . [8923-122]

12:15: **Porous CNTs/chitosan composite with lamellar structure prepared by ice-templating**, Tianhao Wu, Dalian Univ. of Technology (China); Jia Yan, Dalian Univ of Technology (China); Minjing Liu, Dalian Univ. of Technology (China) . . . . . [8923-123]

Lunch/Exhibition Break . . . . . Wed 12:30 to 13:30

Sessions 28, 29, and 30 run concurrently.

Session 28
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Wed 13:30 to 15:00

Bio IV

Session Chair: **Stefan Harrer,** IBM Research Collaboratory for Life Sciences-Melbourne (Australia)

13:30: **Molecular motors-powered devices: twenty years after** *(Invited Paper)*, Dan V. Nicolau, McGill Univ. (Canada) . . . . . [8923-124]

14:00: **Integrated microdroplet-based system for enzyme synthesis and sampling**, Florian Lapierre, Robert Stewart, Commonwealth Scientific and Industrial Research Organisation (Australia); Michel Best, CSIRO (Australia); John Oakeshott, Thomas Peat, Yonggang Zhu, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-125]

14:15: **A microfluidic device for studying cell signalling with multiple inputs and adjustable amplitudes and frequencies**, Zubaidah Ningsih, Andrew H. A. Clayton, James W. M. Chon, Swinburne Univ. of Technology (Australia) . . . . . [8923-126]

14:30: **Micro pore arrays in free standing cyclic olefin copolymer membranes: fabrication and surface functionalization strategies for in-vitro barrier tissue models**, Murat Gel, Commonwealth Scientific and Industrial Research Organisation (Australia); Sasi Kandasamy, Melbourne Ctr. for Nanofabrication (Australia); Kellie Cartledge, David Haylock, Commonwealth Scientific and Industrial Research Organisation (Australia) . . . . . [8923-127]

14:45: **Modeling of the blood-brain barrier under flow: a microfluidic approach**, Vijay P. Sivan, RMIT Univ. (Australia); Be'Eri Niego, Robert L. Medcalf, Arnan Mitchell, Monash Univ. (Australia) . . . . . [8923-128]

Coffee Break . . . . . Wed 15:00 to 15:30

Session 29
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Wed 13:30 to 15:00

Photonics IV

Session Chair: **Masaya Notomi,** NTT Basic Research Labs. (Japan)

13:30: **Bright and stable quantum dots and their application to display** *(Invited Paper)*, Eunjoo Jang, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [8923-129]

14:00: **Proposal of a Si based device for multiplexing conversion between PDM and MDM**, Mengyuan Ye, Yu Yu, Lei Xiang, Bingrong Zou, Xinliang Zhang, Dexiu Huang, Huazhong Univ. of Science and Technology (China) . . . . . [8923-130]

14:15: **Planar optofluidic sensing platform exploiting the transition between trapping and discrete diffraction in waveguide arrays**, Eike Zeller, Geethaka C. Devendra, Thach G. Nguyen, Arnan Mitchell, RMIT Univ. (Australia) . . . . . [8923-131]

14:30: **Chiral elements and dual systems: towards the design of an omnidirectional optical active media**, Xavier Vidal, Macquarie Univ. (Australia); Xavier Zambrana Puyalto, Macquarie Univ. (Australia) and ARC Ctr. for Engineered Quantum Systems (Australia); Alex F. Barbara, Macquarie Univ. (Australia); Ivan Fernandez-Corbaton, Gabriel Molina-Terriza, Macquarie Univ. (Australia) and ARC Ctr. for Engineered Quantum Systems (Australia) . . . . . [8923-132]

14:45: **Steady state design of photonic transistor to achieve a switching gain>=3 dB**, Vivek Krishnamurthy, Data Storage Institute (Singapore); Yijing Chen, National University of Singapore (Singapore); Seng Tiong Ho, Northwestern University (United States) . . . . [8923-133]

Coffee Break . . . . . Wed 15:00 to 15:30

Session 30
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Wed 13:30 to 15:00

Materials II

Session Chair: **Michael S. Fuhrer,** Monash Univ. (Australia)

13:30: **Hydrothermal method for piezoelectric materials and their applications** *(Invited Paper)*, Takeshi Morita, The Univ. of Tokyo (Japan) . . [8923-134]

14:00: **Investigation of periodically poled 128° YX-cut LiNbO3 achieved with UV direct-written technique for SAW generation**, Andreas Boes, Didit Yudistira, Amgad Rezk, RMIT Univ. (Australia); Elisabeth Soergel, Rheinische Friedrich-Wilhelms-Univ. Bonn (Germany); Scott A. Wade, Swinburne Univ. of Technology (Australia); James Friend, Arnan Mitchell, RMIT Univ. (Australia). . . . . [8923-135]

14:15: **SAW generation in acoustic superlattice lithium niobate: methods of converting bound acoustic resonances to propagating waves**, Didit Yudistira, Andreas Boes, James Friend, Arnan Mitchell, RMIT Univ. (Australia) . . . . . [8923-136]

14:30: **Characterization and modeling of nitrogen-vacancy color center patterning in diamond by scanning focused helium ion beam**, Wen-Di Li, Zhouyang Zhu, The Univ. of Hong Kong (Hong Kong, China); Zhihong Hung, Victor A. Acosta, Charles Santori, Hewlett-Packard Labs. (United States) . . . . . [8923-137]

14:45: **Non-intrusive tuneable resonant microwave cavity for optically detected magnetic resonance of NV centres in nanodiamonds**, Jean-Michel G LE FLOCH, The University of Western Australia (Australia) and ARC Centre of Excellence for Engineered Quantum Systems, (EQuS) (Australia); Carlo Bradac, Thomas Volz, Macquarie University (Australia) and ARC Centre of Excellence for Engineered Quantum Systems, (EQuS) (Australia); Michael E Tobar, The University of Western Australia (Australia) and ARC Centre of Excellence for Engineered Quantum Systems, (EQuS) (Australia); Stefania Castelletto, Royal Melbourne Institute of Technology (RMIT) University (Australia) . . . . [8923-138]

Coffee Break . . . . . Wed 15:00 to 15:30

Sessions 31, 32, and 33 run concurrently.

Session 31
Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . Wed 15:30 to 16:00

Fabrication III

Session Chair: **Rosie Hicks,** Australian National Fabrication Facility (Australia)

15:30: **A fabrication method of out-of-plane stretchable electrodes based on PDMS**, Namsun Chou, Sohee Kim, Gwangju Institute of Science and Technology (Korea, Republic of) . . . . . [8923-140]

15:45: **Three-dimensional cell patterning in hydrogel by ultrasound standing waves**, Kai Wei Cheng, Amgad Rezk, Peggy P. Y. Chan, James Friend, Leslie Y. Yeo, RMIT Univ. (Australia) . . . . . [8923-141]

Session 32
Room: Emily McPherson Building 13: Level 3 Room 15 . . . . . Wed 15:30 to 16:30

Photonics V

Session Chair: **Leigh M. Smith,** Univ. of Cincinnati (United States)

15:30: **Enhanced spontaneous emission from nanocavities, nanowires, and nano-emitters** *(Invited Paper)*, Masaya Notomi, NTT Basic Research Labs (Japan). . . . . [8923-142]

16:00: **Group theory of chiral photonic crystals with 4-fold symmetry: S-parameters of eight-fold intergrown Gyroid nets**, Matthias Saba, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Mark D. Turner, Min Gu, Swinburne Univ. of Technology (Australia) and CUDOS (Australia); Gerd E. Schröder-Turk, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [8923-143]

16:15: **Silver nanowire on a dielectric substrate as an optical nano polariser**, Priyamvada Venugopalan, Qiming Zhang, Xiangping Li, Min Gu, Swinburne Univ of Technology (Australia) . . . . . [8923-144]

Session 33
Room: Emily McPherson Building 13: Level 3 Room 13 . . . . . Wed 15:30 to 16:30

Nanomaterials V

Session Chair: **Mainak Majumder,** Monash Univ. (Australia)

15:30: **Transfer printed nanomembranes for silicon photonics, flexible electronics and optoelectronics** *(Invited Paper)*, Weidong Zhou, Univ of Texas at Arlington (United States); Zhenqiang Ma, University of Wisconsin-Madison (United States) . . . . . [8923-145]

16:00: **Photoluminescence emitted from dendritic ZnO with hierarchical nanostructures**, Shih-Yung Chen, Academia Sinica (Taiwan); Wei-Liang Chen, Chung-Ting Ko, National Taiwan Univ. (Taiwan); Ming-Yu Lai, Academia Sinica (Taiwan); Feng-Chieh Li, Yu-Yang Lee, Miin-Jang Chen, Yu-Ming Chang, National Taiwan Univ. (Taiwan); Yuh-Lin Wang, Academia Sinica (Taiwan) . . . . . [8923-146]

16:15: **Electrodeposition and characterization of Sb-doped ZnO nanostructures**, Jinkun Liang, Hailin Su, Yucheng Wu, Hefei Univ. of Technology (China); Shihping Kao, Chunliang Kuo, National Cheng Kung Univ. (Taiwan); Junchun-Andrew Huang, Hefei Univ. of Technology (China) and National Cheng Kung Univ. (Taiwan) . . . . . [8923-147]

Closing Ceremony

Room: Emily McPherson Building 13: Level 3 Room 9 . . . . . 16:30 to 17:00

The closing ceremony will be followed by refreshments in Room 7.

Index of Authors, Chairs, and Committee Members

Names shown in bold are **SPIE Members**

Index of Authors, Chairs, and Committee Members

Names shown in bold are **SPIE Members**

Index of Authors, Chairs, and Committee Members

Names shown in bold are **SPIE Members**

Registration

Onsite Registration and Badge Pick-Up Hours

Outside Room 8 of Storey Hall Building 16, Level 7
Sunday 8 December . . . . . 17:00 to 19:00

Corridor, Emily McPherson Building 13, Level 3
Monday 9 December. . . . . 07:30 to 16:00
Tuesday 10 December . . . . . 07:30 to 16.00
Wednesday 11 December. . . . . 08:00 to 12:00

Conference Registration

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

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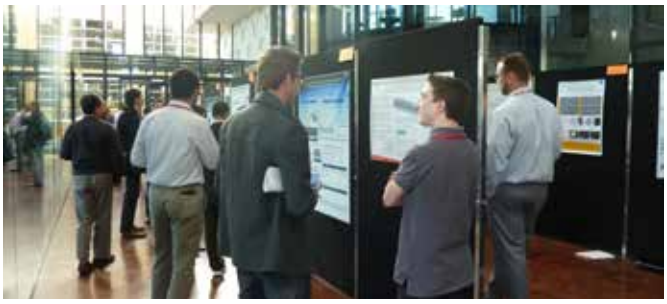


Poster Session

Room: Emily McPherson Building 13: Level 3 Room 5

Tuesday 10 December 2013 . . . . . 15:30 to 17:30
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 Tuesday morning. 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. Posters must be removed from the boards following the poster session. Posters that remain on the boards will be discarded.

General Information

Food and Beverage Services

Refreshment Breaks

Emily McPherson Building 13: Level 3 Room 7

Hours 10:30 to 11:00 and 15:00 to 15:30

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

Daily Lunches

Boxed lunches will be provided during the lunch break from 12:30 to 13:30.

Conference Dinner

Tuesday 10 December . . . . . .18:30 to 22:00

Rydges on Swanston

701 Swanston Street, Carlton, Melbourne

(See page 5 for further details.)

Onsite Services

Internet Access

RMIT Buildings

Complimentary WiFi Internet access is available; instructions will be posted onsite.

SPIE Conference App

http://spie.org/spieapp

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

Urgent Message Line

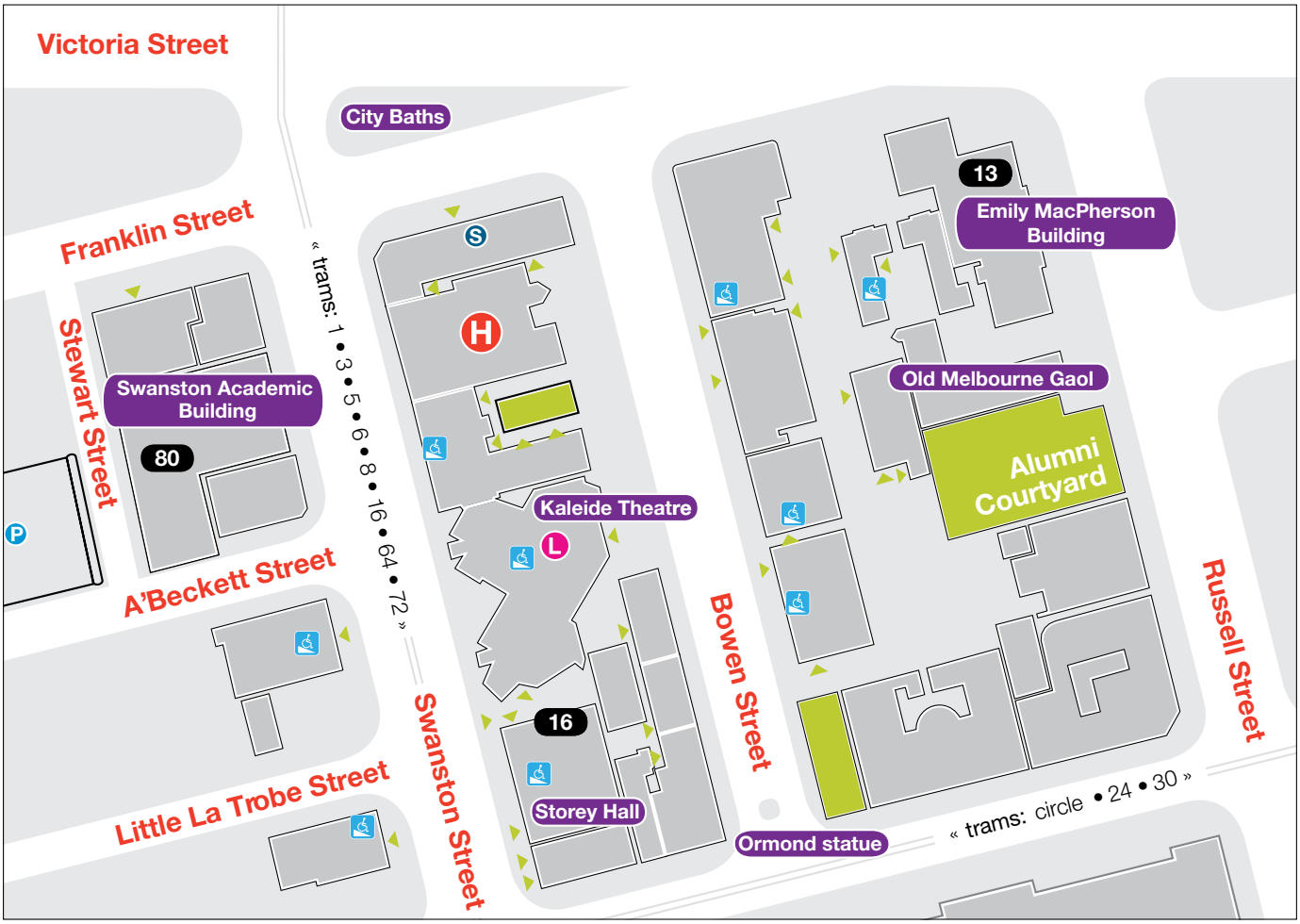
An urgent message line is available during registration hours:

+ 61 407 190 338

Lost and Found

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

Conference Dinner: Rydges on Swanston
701 Swanston Street Carlton, Melbourne (Tuesday)



Swanston Academic Building 80:
Opening Remarks & Plenaries
(Mon, Tue, Wed)

Storey Hall Building 16:
Welcome Reception & Registration
(Sunday)

Emily MacPherson Building 13:
Conference Sessions & Posters Registration
(Mon, Tue, Wed)

Travel

Welcome to Melbourne

With elegant tree-lined boulevards and a raging cafe culture, Victoria's capital maintains a distinctly European feel. Expect wonderful architecture both old and new and green spaces like the Royal Botanic Gardens. This cosmopolitan city is also Australia's culture capital, with vibrant dining, shopping, and nightlife scenes.

Whether you're visiting Victoria to work, play or study you will find what you're looking for "down under".

Visit this page for detailed information about Melbourne and applicable links including transit options, rates, restaurants, and things to do while there. http://spie.org/travelmelbourne

Transportation Options

Flying to Melbourne

The Melbourne Airport is located 15 kilometers from RMIT.

Sky Bus

SkyBus offers an express bus service from the airport to the city centre. Buses run every 10 minutes throughout the day. One way adult fare is $17, roundtrip $28 (subject to change).

Taxi

Melbourne's taxis are located on the ground floor outside Terminals 1 and 3. Taxi fares are calculated according to distance and duration and will vary based on the number of passengers and time of travel.

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 the SPIE Micro+Nano Materials, Devices and Applications. Reservations can also be made online Book Hertz Online. You will receive 15% off qualifying affordable rates at participating locations in Melbourne.

Be sure to identify yourself as an SPIE attendee. Please print the Hertz Discount Coupon, on the web page, 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- 31 December 2013.

Local Hertz Bureau: Phone: 011-61-3-9338-4044. Hours of operation M-SU 0330-0230.

Public Transportation

Getting to RMIT Campus by Public transport Train: Most RMIT City campus buildings are located close to Melbourne Central train station, which is serviced by all Connex Melbourne's Train City Loop services. For services that run directly to Flinders Street, visitors to the RMIT City campus can catch a connecting City Loop train service from Flinders Street Station or catch any of the Yarra Tram Swanston Street services (see below).

Tram: Most north-south Melbourne city tram services run along Swanston Street (including routes 1, 3, 5, 6, 8, 16, 64, 67 and 72). For those services that run along Elizabeth Street (routes 19, 57, 59) get off at Melbourne Central and walk one block to Swanston Street.

Commuters traveling east-west on services along Flinders Street (routes 48, 70 and 75), Collins Street (routes 109 and 112) or Bourke Street (routes 86 and 96) can catch a connecting Swanston Street service.

Bus: Many bus lines offer services connecting to train and tram services listed above. Check Metlink for details of connecting services in your area.

Parking

There is no on-campus parking available for visitors to the University. However, there are a number of commercial car parks within a very short walk. Metered street parking is also available around the City campus. Please note, time limits and clearway restrictions apply.

NEW

SPIE Micro+Nano Materials, Devices, and Applications Proceedings

Get Conference proceedings papers online during the meeting.

Beginning the first day of the conference, SPIE Micro+Nano Materials, Devices, and Applications pre-registered attendees will have online access to all proceedings papers related to this event as they are published. Papers can be accessed online through the SPIE Digital Library and all downloaded PDFs of papers are yours to keep. Event attendees who register after the pre-registration cutoff, or onsite, will receive access after the meeting.

To access the proceedings (beginning 9 December):

- **If you already have an SPIE account,** sign in at https://spiedigitallibrary.org (click SIGN IN, upper right corner) to gain access to the conference papers. If you do not have an account, create one using the email address you used to register for the SPIE Micro+Nano Materials, Devices, and Applications conference.
- **Once you have signed in,** you may access the event proceedings via the "My Conference Proceedings" tab in the left column on your My Account page, or use the Browse Proceedings By Conference link and scroll to Micro/Nano Materials, Devices, and Systems.

Note: If your organization subscribes to the SPIE Digital Library, you can also access this content via your organization's account when logging on through your institution's network.

Should you need any assistance, please contact us at:
Email: SPIEDLsupport@spie.org
Phone (North America): 1 888 902 0894
Phone (Rest of World): +1 360 685 5580
Authors—submit your paper by 4 November to ensure that it is available online at the conference.

Policies

Granting Attendee Registration and Admission

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, 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, 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.

Misconduct Policy

SPIE is a professional, not-for-profit society committed to providing valuable conference and exhibition experiences. SPIE is dedicated to equal opportunity and treatment for all its members and meeting attendees. Attendees are expected to be respectful to other attendees, SPIE staff, and contractors. Harassment and other misconduct will not be tolerated; violators will be asked to leave the event.

Identification

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued Photo ID at registration to collect registration materials.

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 this event, I grant full permission to 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 SPIE media now known or later developed, for any legitimate SPIE marketing or promotional purpose.

By registering for this 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. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks and wire transfers. Onsite registrations can also pay with Cash.

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 full-length manuscript (4-page minimum) for any accepted oral or poster presentation will be submitted for publication in the SPIE Digital Library, printed conference Proceedings, and CD. (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 conference Proceedings and 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 for material presented in meeting rooms 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 SPIE in the course of normal business. Such photos and video may be used in SPIE marketing materials or other SPIE promotional items.

Laser Pointer Safety Information/Policy

SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, 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-SPIE-supplied laser pointer. If you choose to use your own laser pointer, it must be tested to ensure <5 mW power output. Laser pointers in Class II and IIIa (<5 mW) are eye safe if power output is correct, but output must be verified because manufacturer labeling may not match actual output. Come to Speaker Check-In and test your laser pointer on our power meter. You are required to sign a waiver releasing SPIE of any liability for use of potentially non-safe, personal laser pointers. Misuse of any laser pointer can lead to eye damage.

Access to Technical and Networking Events

Persons under the age of 18 including babies, carried or in strollers, and toddlers are not allowed in technical or networking events. Anyone 18 or older must register as an attendee. All technical and networking events require a valid conference badge for admission.

Underage Persons on Exhibition Floor Policy

For safety and insurance reasons:

- No persons under the age of 18 will be allowed in the exhibition area during move-in and move-out.
- Children 14 and older, accompanied by an adult, will be allowed in the exhibition area during open exhibition hours only
- All children younger than 14, including babies in strollers and toddlers, are not allowed in the exhibition area at any time.

Policies (continued)

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. SPIE is not responsible for items left unattended.

Wireless Internet Service Policy
At SPIE events where wireless is included with your registration, 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.

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. 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 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 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 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 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.

Confidential Reporting of Unethical or Inappropriate Behavior
SPIE is an organization with strong values of responsibility and integrity. Our Ethics Statement and Code of Professional Conduct contain general guidelines for conducting business with the highest standards of ethics. SPIE has established a confidential reporting system for staff & other stakeholders to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by phone or through the website, and, if preferred, may be made anonymously. The web address is www.SPIE.ethicspoint.com and the toll free hotline number is 1-888-818-6898.

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