
ICMAT 2011
INTERNATIONAL CONFERENCE ON MATERIALS FOR ADVANCED TECHNOLOGIES
26 JUNE - 1 JULY, SINGAPORE
www.mrs.org.sg
Organised by
MRS
Materials Research Society
SINGAPORE
In association with
NUS
National University of Singapore
Institute of Materials Research and Engineering
NANYANG TECHNOLOGICAL UNIVERSITY

Study of Properties of Indium Mixed Zno Nanowires Synthesized by Using a Double Quartz Tube Method

Ismardi ABRAR[1+], Chang Fu DEE[1#], Ille GEBESHUBER[1], Muhamad MAT SALLEH[1], Burhanuddin YEOP MAJLIS[1]
[1]Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia
[#]Corresponding author: deechangfu@gmail.com [+]Presenter

Indium (In) mixed ZnO nanowires (NWs) have been synthesized by vapour transport evaporation (VTD) method using double quartz tube method. In this method, a smaller quartz tube was coaxially placed into another bigger quartz tube for the growth process. Multiple types of NWs as the result of synthesis process have been formed. A great majority of In doped ZnO NWs were found in the sample. The samples have been characterised for morphological structures by field emission scanning electron microscopy (FESEM). The existences of all the elements have been investigated by energy dispersive X-ray (EDX) spectroscopy. X-ray diffraction (XRD) provided information for the crystallinity of these In mixed ZnO NWs. Trace of In was found in the spectra for X-ray photoelectron spectroscopy (XPS). Optical property has also been analyzed by photoluminescence (Pl). As a comparison, the same growth process and material was repeated by employing a conventional single quartz tube method. By undergoing the same characterization process, the different properties of the synthesized NWs were compared. Generally, the first process (double tube method) has provided better In incorporation into the ZnO NWs. This improvement may have led to an opportunity of better controlling for the doping in ZnO NWs which may help in producing a better build block or device for future electronic applications.

Ismardi Abrar I., Dee C.F., Gebeshuber I.C. and Majlis B.Y. *"Study of properties of Indium mixed ZnO nanowires synthesized by using a double quartz tube method"*, Book of Abstracts ICMAT-11 (International Conference on Materials for Advanced Technologies) Symposium I: Semiconductor Nanowires and Heterostructures: Synthesis, Properties and Multifunctions, I-PO2-59, p. 88, Singapore, Jun. 26 - Jul. 1, 2011.

Investigation of Simple Process Technology for the Fabrication of Valveless Micropumps

Jumril YUNAS[1#+], Juliana JOHARI[1], Ali Reza BAHADORIMEHR[1], Burhanuddin YEOP MAJLIS[1], Ille GEBESHUBER[1]
[1]*Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*
[#]*Corresponding author: jumrilyunas@yahoo.com* [+]*Presenter*

Micropumps are essential components of the miniaturization of fluidic systems to enable liquid injection from the storage to a fluidic system and to control fluidic flow in a variety of applications, such as integrated fluidic channel arrangements in chemical analysis systems or electronics cooling, as well as for drug delivery systems. Micropumps offer important advantages because they are compact and small in size. They can operate using small sample volumes and provide rapid respond time. In this paper we discuss a simple and rapid process technique for the fabrication of valveless micro-pumps. The technique utilizes standard MEMS technique by using a double sided wet etching technique with an additional adhesive bonding technique. Anisotropic wet etching at both sides of silicon substrate is implemented at the same time which reduce the processing steps up to 50%. The diffuser and a nozzle element of the pump, as well as a 150 μm thick silicon membrane are designed and fabricated using only 3 pattern process steps. An actuator-chamber and a pump-chamber with a depth of 250 μm respectively is formed after 250 minutes KOH etching, while the diffuser/nozzle element with a depth of 50 μm are sequentially formed after chambers forming. A piezoelectric disc working at the frequency 1.5 kHz is bonded on to the back side of the silicon membrane using conductive epoxy material. Finally, the use of a standard thick photoresist as the adhesive material for the bonding will also be discussed in detail. The flow rate was measured and the process reproducibility was proven which show a good prospect for the future development of miniaturized pump for biomedical application.

Yunas J., Suasana, Bahadorimehr A., Majlis B.Y. and Gebeshuber I.C. (2011) *"Investigation of simple process technology for the fabrication of valveless micropumps"*, Book of Abstracts ICMAT-11 (International Conference on Materials for Advanced Technologies) Symposium G: NEMS/MEMS and microTAS, G11-7, p. 61, Singapore, Jun. 26 - Jul. 1, 2011.

On the Way to the Bionic Man - A Novel Approach to MEMS Based on Biological Sensory Systems

Salmah B. KARMAN[1], Mark O. MACQUEEN[2], Tina R. MATIN[1], S. Zaleha M. DIAH[3], Jeanette MUELLER[4], Jumril YUNAS[1], Teresa MAKARCZUK[5], Ille C. GEBESHUBER[1,5#+]

[1]Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia, [2]Aramis Technologies Sdn. Bhd., Malaysia, [3]Zoology Museum, University of Malaya, Malaysia, [4]Trustroom, Austria, [5]Institute of Applied Physics, Vienna University of Technology, Austria

[#]Corresponding author: gebeshuber@iap.tuwien.ac.at [+]Presenter

The human senses are of extraordinary value, but we cannot change them, even if this proves to be a disadvantage in our modern times. However, we can assist, enhance and expand these senses via MEMS. A push-pull analysis was performed to investigate market needs in relation to biological senses reported in the literature. Some animals and even humans (with artificial lenses after cataract surgery) can see in the infrared and ultraviolet range; related MEMS with IR/UV sensitivity might assist to determine the status of organisms. The hearing capabilities of bats (ultrasound) can inspire echolocation. Butterflies have exquisite thermoregulation; this might lead to MEMS that are better protected from overheating and undesirable convection. Mice can smell important information about another mouse's immune system and mosquitoes detect minuscule amounts of carbon dioxide and lactic acid; such bio-inspired MEMS could serve as medical or environmental scanners. The senses for magnetism, vibrations and electroreception that are used by animals might satisfy the need for MEMS for navigation and orientation.
MEMS that are skillfully added to the human body can provide additional perceptory data. The challenge here will be to process the MEMS generated data into readily understandable information and provide them to the user as an add-on within an already existing sensory bandwidth. This can happen in three ways: the expensive method adds information to the upper or lower end of the (compressed) sensory bandwidth; the additive method enhances the original information by transforming it and in the mutative method completely reformats the available information. The extraordinary plasticity of the human brain will allow the user to adapt to the amended sensory environment relatively fast, providing unparalleled novel abilities. Future research will identify where already available MEMS excel and which outstanding properties of sensory systems can easily be replicated by 'off the shelf' systems.

Karman S.B., Macqueen M.O., Matin T.R., Diah S.Z.M., Mueller J., Yunas J., Makarczuk T. and Gebeshuber I.C. (2011) *"On the way to the bionic man - A novel approach to MEMS based on biological sensory systems"*, Book of Abstracts ICMAT-11 (International Conference on Materials for Advanced Technologies) Symposium G: NEMS/MEMS and microTAS, G-PO3-47, p. 90, Singapore, Jun. 26 - Jul. 1, 2011.

NEMS-based Innervation of Materials

Ille C. GEBESHUBER[1,2#+], Jeanette MUELLER[3], Mark O. MACQUEEN[4]

[1]Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia, [2]Institute of Applied Physics, Vienna University of Technology, Austria, [3]Trustroom, Austria, [4]Aramis Technologies Sdn. Bhd., Malaysia

[#]Corresponding author: gebeshuber@iap.tuwien.ac.at [+]Presenter

We propose a concept for a novel "homogenous" material that is assembled by billions of coupled reactive NEMS. This new approach shall enable the material to show specific reactions to external inputs. Since the NEMS can communicate with each other, the reaction to the external input can be local (indicator) or general (reactive). By implementing this material into buildings, clothing or even food, it would be possible to create a virtual neural system in objects. The presentation will give an outlook on the potential of such an approach in art, science and technology and the possible impact on the life of future generations.
We propose a concept for a novel "homogenous" material that is assembled by billions of coupled reactive NEMS. This new approach shall enable the material to show specific reactions to external inputs. Since the NEMS can communicate with each other, the reaction to the external input can be local (indicator) or general (reactive). By implementing this material into buildings, clothing or even food, it would be possible to create a virtual neural system in objects. The presentation will give an outlook on the potential of such an approach in art, science and technology and the possible impact on the life of future generations.

Gebeshuber I.C., Mueller J. and Macqueen M.O. (2011) *"NEMS-based innervation of materials"*, Book of Abstracts ICMAT-11 (International Conference on Materials for Advanced Technologies) Symposium G: NEMS/MEMS and microTAS, G-PO3-47, p. 91-92, Singapore, Jun. 26 - Jul. 1, 2011.

Symposium G Abstracts

G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | Posters (PO3)

G1 Nano-Photonics

Symposia List > Symposium G > G1

G1-1 Invited
Blinking of the Hot Spots of Plasmonic Optical Disk for Photocatalytic Reactors
Din Ping TSAI[1,2#+]
[1]*Department of Physics, National Taiwan University, Taiwan*, [2]*National Instrument Technology Research Center, Taiwan*

G1-2 Invited
Recent Rrogress in Riezoelectric MEMS
Chengkuo LEE[1#+]
[1]*Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

G1-3
A Nano Optical Actuator Based on Radiation Force
Xin ZHAO[1+], Hong CAI[2], Ming Lin Julius TSAI[3], Xin-ming JI[4], Jia ZHOU[4], Min-Hang BAO[4], Yi-Ping HUANG[4], Ai-Qun LIU[1#]
[1]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [2]*Institute of Microelectronics, Singapore*, [3]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [4]*Fudan University, China*

G1-4
MEMS Controlled EIT Coupling in Metamaterial
Wu ZHANG[1+], Weiming ZHU[1], Ji Fang TAO[1], Yuan Hsing FU[2], Dim-Lee KWONG[3], Patrick G.Q LO[3], Ai-Qun LIU[4#]
[1]*Nanyang Technological University, Singapore*, [2]*Data Storage Institute, Singapore*, [3]*Institute of Microelectronics, Singapore*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G1-5
A Nano-Opto-Mechanical Switch Using EIT-Like Effects
Min REN[1+], Ye Feng YU[1], Hong CAI[2], Weiming ZHU[1], Ai-Qun LIU[3#]
[1]*Nanyang Technological University, Singapore*, [2]*Institute of Microelectronics, Singapore*, [3]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G1-6
Particle Rotation by Using Ring Resonator Based Pure Angular Momentum Generator
Ye Feng YU[1+], Hong CAI[2], Jifang TAO[1], Xin ZHAO[3], Tarik BOUROUINA[4], Ai-Qun LIU[3#]
[1]*Nanyang Technological University, Singapore*, [2]*Institute of Microelectronics, Singapore*, [3]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [4]*ESIEE-Paris, University of Paris-Est , France*

G2 Kynote Talks on Nanophotonics

Symposia List > Symposium G > G2

G2-1 Invited
Reconfigurable Photonic Metamaterials
Nikolay I. ZHELUDEV[1#+], Jun-Yu OU[1], Eric PLUM[1]
[1]*Optoelectronics Research Centre, University of Southampton, United Kingdom*

G2-2 Invited
Single Crystal Tio2 Nanoswords for Energy and Mems Applications
Liwei LIN[1#+]
[1]*Berkeley Sensor & Actuator Center, University of California at Berkeley, United States*

G3 Nano Technology

Symposia List > Symposium G > G3

G3-1 Invited
Randomly Distributed Nanostructured Semiconductor Lasers
Siu Fung YU[1#+]
[1]*Engineering Product Design Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong SAR, China*

G3-2 Invited
Surface Modification of Metallic Nanoparticles and Its Applications to Localized Electromagnetic Field Enhancement
Jing Bo ZHANG[1#+], Lifang NIU[1], Yuan Hsing FU[2], Hongyu CHEN[3], Lanry Lin Yue YUNG[4], Michelle Yanyan FANG[5], Shu Min CHIN[6], Boris LUKYANCHUK[7]
[1]*Optical Materials and System Division, Data Storage Institute, Singapore*, [2]*Data Storage Institute, Singapore*, [3]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [4]*Chemical and Biomolecular Engineering, National University Singapore, Singapore*, [5]*CHBM, National University Singapore, Singapore*, [6]*Division of BIE, National University Singapore, Singapore*, [7]*Advanced Concepts Group, Data Storage Institute, Singapore*

G3-3 Invited
More Than Moore with Nano- Electronics and Photonics Integrated Circuits
Selin Hwee Gee TEO[1#+]
[1]*IME, Singapore*

G3-4
Piezoresistance Effects in Junctionless Nanowire Transistors

Pushpapraj SINGH[1+], Jianmin MIAO[1#], Woo-Tae PARK[2], Li Shiah LIM[3], Dim-Lee KWONG[4]
[1]*Mechanical and Aeroscape Engineering, Institute of Microelectronics, Nanyang Technological University, Singapore*,
[2]*Minituarized Medical Device, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*,
[3]*Minituarized Medical Device, Institute of Microelectronics, Singapore*, [4]*Institute of Microelectronics, Singapore*

G3-5 **Characterization of the Nanowire Design Current Uniformity for Bio-sensing**
Jun An Jason ANG[1#+], Eu-Jin LIM ANDY[2], Guang Kai Ignatius TAY[3], Guo Jun ZHANG[1]
[1]*Agency for Science, Technology and Research, Singapore*, [2]*Fab, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3]*Minituarized Medical Device,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G3-6 **Crystal Plasticity of Nano-twinned Copper**
Hamidreza MIRKHANI[1#+], Shailendra P. JOSHI[2]
[1]*Mechanical Eng., National University of Singapore, Singapore*, [2]*Mechanical Engineering, National University of Singapore, Singapore*

G3-7 **The Effects of Structural Defects on Elastic Properties of Carbon Nanotubes**
Yumin CHENG[1#+]
[1]*Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, China*

G4 Microfluidics (I)

Symposia List > Symposium G > G4

G4-1 Invited **Microfluidics on the Fast Lane**
Claus Dieter OHL[1#+]
[1]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*

G4-2 **Experimental Investigation of Homogeneous Nucleation of Water Under Microfluidic Confinement**
Keita ANDO[1#+], Ai-Qun LIU[1], Claus Dieter OHL[2]
[1]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [2]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*

G4-3 **On-chip Immersion Refractometer for Protozoon Classification**
Lip Ket CHIN[1+], Teck Choon AYI[2], Peng Huat YAP[2], Ai-Qun LIU[3#]
[1]*Nanyang Technological University, Singapore*, [2]*Dso National Laboratories, Singapore*, [3]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G4-4 **A Static Micromixer Inspired from Fractal-Like Natural Flow Systems**
Ali Reza BAHADORIMEHR[1], Mitra DAMGHANIAN[2], Burhanuddin YEOP MAJLIS[1#+]
[1]*Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*, [2]*Institute of Microengineering and Nanoelectronics, Malaysia*

G4-5 **Development of a Portable Lab-on-a-Chip Capacitively Coupled Contactless Conductivity (C4D) Sensor**
Kambiz ANSARI[1#+], Shu Ying Jasmine YUEN[1], Edwin Sze Lun KHOO[1], Isabel RODRIGUEZ[2]
[1]*Institute of Materials Research and Engineering, Singapore*, [2]*Patterning and Fabrication, Institute of Materials Research and Engineering, Singapore*

G4-6 **A Tunable Optofluidic Prism via Two Flow Streams**
Sha XIONG[1+], Lip Ket CHIN[1], Yi YANG[1], Ai-Qun LIU[2#]
[1]*Nanyang Technological University, Singapore*, [2]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G4-7 **An Absorptive Filter Using Microfluidic Switchable Metamaterials**
Bin DONG[1+], Weiming ZHU[1], Yuan Hsing FU[2], Jifang TAO[1], Din Ping TSAI[3,4], Patrick G.Q LO[5], Dim-Lee KWONG[5], Ai-Qun LIU[6#]
[1]*Nanyang Technological University, Singapore*, [2]*Data Storage Institute, Singapore*, [3]*Department of Physics, National Taiwan University, Taiwan*, [4]*National Instrument Technology Research Center, Taiwan*, [5]*Institute of Microelectronics, Singapore*, [6]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G5 Microfluidics (II)

Symposia List > Symposium G > G5

G5-1 Invited **Acoustofluidics: Manipulating Fluids at the Microscale and Nanoscale**
Leslie YEO[1#+]
[1]*Department of Mechanical & Aerospace Engineering, Monash University, Australia*

G5-2 Invited **Chip-scale Microscopy**
Changhuei YANG[1#+]
[1]*Electrical Engineering and Bioengineering, California Institute of Technology, United States*

G5-3 **Improvement of Accuracy and Reliability of Electrophoretic Coulter Method**

Kazuhei OGATA[1#+]
[1]Bio-nano Electronics Research Center, Japan

G5-4 **Discrete 3D T-shaped Electrode Arrays for Moving Liquid by AC Electro-osmosis**
Xin GUO[1], Kongying XIE[1], Robert CAMPBELL[2], Yong Jun LAI[3#+]
[1]Mechanical and Materials Engineering, Queen's University, Canada, [2]Hotel Dieu Hospital, Kingston, ON, Canada, Queen's University, Canada, [3]Dept. of Mechanical and Materials Eng.,, Queen's University, Canada

G5-5 **A Tunable Three-dimensional Optofluidic Dye Laser Using Dean Flows**
Yi YANG[1+], Ai-Qun LIU[1#], Lei LEI[1]
[1]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G5-6 **DC-biased AC-electrokinetics: A Conductivity Gradient Driven Fluid Flow**
Wee Yang NG[1+], Antonio RAMOS[2], Yee Cheong LAM[3], Isabel RODRIGUEZ[4#]
[1]Patterning and Fabrication, Institute of Materials Research & Engineering, Singapore, [2]Department of Electronics and Electromagnetism, Faculty of Physics, University of Seville, Spain, [3]Division of Manufacturing Engineering, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore, [4]Patterning and Fabrication, Institute of Materials Research and Engineering, Singapore

G6 Materials & Mechanics

Symposia List > Symposium G > G6

G6-1 Invited **Analytical Solutions of Slender and Thin Polymeric Gel Structures under Buckling**
Zishun LIU[1#+], Somsak SWADDIWUDHIPONG[2], Fangsen CUI[1], Yong Wei ZHANG[3]
[1]Engineering Mechanics, Institute of High Performance Computing, Singapore, [2]Department of Civil & Environmental Engineering, National University of Singapore, Singapore, [3]Institute of High Performance Computing, Singapore

G6-2 Invited **Biomechanics of Hydrated Soft Tissues: Effect of Geometrical and Constitutive Parameters in Harmonic Nano-indentation Tests**
Pasquale VENA[1#], Roberto CONTRO[2+], Roberto RAITERI[3], Riccardo GOTTARDI[3], Matteo TAFFETANI[4], Emanuele BERTARELLI[4]
[1]Dipartimento Ingegneria Strutturale, Politecnico di Milano, Italy, [2]Ingegneria Strutturale, Politecnico di Milano, Italy, [3]Biophysics and Electronic bioengineering, Università degli studi di Genova, Italy, [4]Politecnico di Milano, Italy

G6-3 **Grain Size-Inclusion Size Interaction in Metal Matrix Composites at Moderate Strains**
Ramin AGHABABAEI[1#+], Shailendra P. JOSHI[1]
[1]Mechanical Engineering, National University of Singapore, Singapore

G6-4 **Direct Evaluation of Dislocation Density Tensors from Atomistic Data**
Jun HUA[1#+], Christoph BEGAU[2], Alexander HARTMAIER[2]
[1]Department of Mechanics, Xi'an University of Architecture and Technology, China, [2]Interdisciplinary Centre for Advanced Materials Simulation, Ruhr-University Bochum, Germany

G6-5 **Drug Packaging and Release Devices Made of Ph Sensitive Gel: A Proof-of-concept Study by Computer Modeling and Simulation**
Fangsen CUI[1#+], Zishun LIU[1], Yong Wei ZHANG[2]
[1]Engineering Mechanics, Institute of High Performance Computing, Singapore, [2]Institute of High Performance Computing, Singapore

G6-6 **Numerical and Analytical Solutions of Buckling Behaviors of Biological Multi-Walled Cylindrical Shells**
Qianhua CHENG[1#+], Bin LIU[2], Yong Wei ZHANG[3]
[1]Engineering Mechanics, Institute of High Performance Computing, Singapore, [2]Department of Engineering Mechanics, Tsinghua University, China, [3]Institute of High Performance Computing, Singapore

G6-7 **Designs Optimization of Serpentine Connection in Stretchable Electronics**
Zhuangjian LIU[1#+], Yong Wei ZHANG[2]
[1]Engineering Mechanics, Institute of High Performance Computing, Singapore, [2]Institute of High Performance Computing, Singapore

G6-8 **Surface-adsorption-induced Bending Behaviors of Graphene Nano-ribbons**
Zuoqi ZHANG[1#+], Bin LIU[2], Kehchih HWANG[2], Huajian GAO[3]
[1]Department of Engineering Mechanics, Institute of High Performance Computing, Singapore, [2]Department of Engineering Mechanics, Tsinghua University, China, [3]Brown University, United States

G7 RF MEMS

Symposia List > Symposium G > G7

G7-1 Invited **MEMS Activities in IME**
Min TANG[1#+]
[1]Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

G7-2 Invited **AlN Resonator for RF Communication and Bio-sensing Applications**
Ming Lin Julius TSAI[1#+]

[1] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G7-3 **FBAR Resonators with Sufficient High Q for RF Filter Implementation**

Lynn KHINE[1#+], Bo Woon Jeffrey SOON[1], You Liang Lionel WONG[1], Ming Lin Julius TSAI[1]
[1] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G7-4 **Aln Actuator for Tunable RFMEMS Capacitor**

Sanchitha FERNANDO[1#+], Min TANG[2], Lynn KHINE[2], Rahul AGARWAL[1], Kia Hian LAU[1], Bo Woon Jeffrey SOON[2], Ming Lin Julius TSAI[2]
[1] *Institute of Microelectronics, Singapore*, [2] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G7-5 **Performance and Design Optimization Algorithms for RF MEMS Switches**

Krupashankara SETHURAM[1#+], Vijay G[2], Sujeet SINGH[2], Parasappa KADADI[2], Tilak K N[2]
[1] *Mechanical Engineering, Rashtreeya Vidyalaya College of Engineering, India*, [2] *Rashtreeya Vidyalaya College of Engineering, India*

G7-6 **A Novel Rf Mems Distributed Phase Shifter for Phased Array Antenna Applications**

Kanthamani SUNDHARAJAN[1#+]
[1] *Thiagarajar college of Engineering, India*

G8 MEMS for Bio-Applications (I)

Symposia List > Symposium G > G8

G8-1 Invited **Microfluidic Devices for Sorting and Characterising Biological Cells**

Kian-Meng LIM[1#+]
[1] *Mechanical Engineering, National University of Singapore, Singapore*

G8-2 **Label-Free Detection of Single Protozoan Parasites in Water by Micro-Photonic-Fluidic System (MPFS)**

Lei LEI[1+], Wei HUANG[1], Yi YANG[1], Ye Feng YU[2], Ai-Qun LIU[1#]
[1] *School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [2] *Nanyang Technological University, Singapore*

G8-3 **On-Chip trapping and characterization of Cryptosporidium using surface coated ITO - PDMS bonded chips**

Harikrishnan NARAYANAN UNNI[1#+], Deny HARTONO[2], Kian-Meng LIM[1]
[1] *Mechanical Engineering, National University of Singapore, Singapore*, [2] *National University of Singapore, Singapore*

G8-4 **Electrical Characterization of Insulin Secreting Beta-cells by 1536 Well Formatted Silicon Patch Clamp Chip**

KokBoon FANG[1+], Xiandi GONG[1], Tushar BANSAL[1#]
[1] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G8-5 **Pulsatile Shear Stress and High Glucose Concentrations Induced Reactive Oxigen Species Production in Endothelial Cells**

Jiaqing YU[1+], Lip Ket CHIN[1], Yi FU[1], Ting YU[1], Kathy Qian LUO[2], Ai-Qun LIU[3#]
[1] *Nanyang Technological University, Singapore*, [2] *Division of Bioengineering, Nanyang Technological University, Singapore*, [3] *School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G8-6 **Measurements of Compressibility of Biological Cells using Acoustic Radiation**

Deny HARTONO[1+], Yang LIU[2], Kian-Meng LIM[3], Lanry Lin Yue YUNG[4#]
[1] *National University of Singapore, Singapore*, [2] *Computational Engineering, Singapore-Massachusetts Institute of Technology Alliance, Singapore*, [3] *Mechanical Engineering, National University of Singapore, Singapore*, [4] *Chemical and Biomolecular Engineering, National University Singapore, Singapore*

G9 MEMS for Bio-Applications (II)

Symposia List > Symposium G > G9

G9-1 Invited **In Vivo Drug Testing in Microfluidics on Zebrafish Embryo**

Danny VAN NOORT[1#+], Deepak CHOUDHURY[2], Ciprian ILIESCU[2], Hanry YU[3]
[1] *Mechanobiology Institute, Singapore*, [2] *Cell and Tissue Engineering, Institute of Bioengineering and Nanotechnology, Singapore*, [3] *Department of Physiology, National University of Singapore, Singapore*

G9-2 **Single Cell Transfer Between Two Droplets Using Bubble Driven Microfluidic System**

Zhenguo LI[1+], Keita ANDO[1], Jing Bo ZHANG[2], Ai-Qun LIU[1#], Claus Dieter OHL[3]
[1] *School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [2] *Optical Materials and System Division, Data Storage Institute, Singapore*, [3] *Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*

G9-3 **Microfluidics-based Compound Droplets: New Platform for Analytical Applications**

Zahra BARIKBIN[1+], Md. Taifur RAHMAN[2], Saif A. KHAN[3#]
[1] *Singapore-MIT Alliance, National University of Singapore, Singapore*, [2] *Chemical and Pharmaceutical Engineering, Singapore-*

MIT Alliance, Singapore, [3]*Department of Chemical and Biomolecular Engineering, National University of Singapore, Singapore*

G9-4 **"Liquid Biopsy" for Cancer Diagnostics: Magnetophoretic Capture of Circulating Tumor Cells**

Abdur Rub Abdur RAHMAN[1], Daniel DANIEL[2#+], Zach CHUA[3], Dhiya'uddin BIN DAH'ALAN[4], Kok Chuan LEE[5]
[1]*Bio-Electronics Program, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Institute of Microelectronics, Singapore*, [3]*Biomedical Engineering, Ngee Ann Polytechnic, Singapore*, [4]*Temasek Polytechnic, Singapore*, [5]*Bio-Electronics Program,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G9-5 **Investigation of Rhabdomyosarcoma Cell Electrofusion**

Chong Xian YEO[1#+], Kian Hwa TAN[2], Eng Lee TAN[2], Chu Sing Daniel LIM[1]
[1]*School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore*, [2]*Centre for Biomedical and Life Sciences, Singapore Polytechnic, Singapore*

G9-6 **Developing High Sensitivity Biomass Sensor Using Lamé Mode Square Resonator**

Amir HEIDARI[1,2#+], Yong Jin YOON[3], Woo-Tae PARK[4], Ming Lin Julius TSAI[1]
[1]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*School of Mechanical and Aerospace Engineering, Department of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore*, [3]*Department of Mechanical and Aerospace, Nanyang Technological University, Singapore*, [4]*Minituarized Medical Device, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G10 Optical MEMS

Symposia List > Symposium G > G10

G10-1 Invited **Application of MEMS Technologies in the Packaging of Silicon Photonics for Enhanced System Performance**

Qingxin ZHANG[1#+]
[1]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G10-2 Invited **Photonic Micromachined Tunable Lasers**

Hong CAI[1#+]
[1]*Institute of Microelectronics, Singapore*

G10-3 **A MEMS Littrow Tunable Laser with Ultra High Coupling Efficiency and Large Tuning Range**

Ji Fang TAO[1+], Aibin YU[2], Jian WU[3], Ai-Qun LIU[4#]
[1]*Nanyang Technological University, Singapore*, [2]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3]*Beijing University of Posts and Telecommunications, China*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G10-4 **Wireless Imaging Module Assembly and Integration for Capsule Endoscopic Applications**

Riyas KATAYAN[1#+], Ruiqi LIM[2], Sin Win SHWE[1], Kripesh VAIDYANATHAN[3]
[1]*Minituarized Medical Device,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Minituarized Medical Device, Institute of Microelectronics, Singapore*, [3]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G10-5 **Tagging for Capsule Endoscopy Localization**

Ruiqi LIM[1#], Riyas KATAYAN[2+], Sin Win SHWE[2], Kripesh VAIDYANATHAN[3]
[1]*Minituarized Medical Device, Institute of Microelectronics, Singapore*, [2]*Minituarized Medical Device,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G10-6 **A Tunable External Cavity Laser Using A Micromachined Silicon Flexure For Atomic Spectroscopy**

Ho-Chiao CHUANG[1#+], Kuo-Yuan HUANG[1]
[1]*Mechanical Engineering, National Taipei University of Technology, Taiwan*

G11 Fabrication

Symposia List > Symposium G > G11

G11-1 Invited **Fabrication of High-aspect Ratio Micro/nano Structures with X-ray Lithography/LIGA Technique**

Linke JIAN[1#+]
[1]*Singapore Synchrotron Light Source, National University of Singapore, Singapore*

G11-2 Invited **Ambient Energy Harvesting: from Macro to Nano Devices**

Philippe BASSET[1#+]
[1]*ESYCOM-ESIEE Paris, Université Paris-Est, France*

G11-3 **Microfluidics for Solar-powered Photocatalysis**

Ning WANG[1], Yu-Peng ZHANG[2], Lei LEI[3], H.L.W. CHAN[1], Xu-Ming ZHANG[2#+]
[1]*The Hong Kong Polytechnic University, Hong Kong SAR, China*, [2]*Hong Kong Polytechnic University, Hong Kong SAR, China*, [3]*Nanyang Technological University, Singapore*

G11-4 **Fabrication of Microactuator based on Low Cost and High Resolution X-ray Lithography**

Pongsak KERDLAPEE[1+], Anurat WISITSORAAT[2], komgrit LEKSAKUL[1#], Adisorn TUANTRANONT[2]
[1]*Industrail Engineering, Chiangmai University, Thailand*, [2]*Nanoelectronics and Micro-Electro-Mechanical Systems Laboratory, National Electronics and Computer Technology, Thailand*

G11-5 **Characterization of local stress in doped poly silicon film by poly silicon cantilever structures**
Kai Yeow TAN[1#+], Qingxin ZHANG[1], Kim Bock CHUA[2], Xiang Zheng TAY[1], Guang De GAN[3]
[1]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Fabs, Institute of microelectronics, Singapore*, [3]*Fabs, Institute of microelectronics, Agency for Science, Technology and Research, Singapore*

G11-6 **Fabrication and Performance Characterization of a Disposable Micropump Actuated by Piezoelectric-disc**
Ling Ling SUN[1#+], Lingna LI[2], Jin Lan GUO[2], Siti FATIMATUZZAHRA BTE R[2], Shanzhong WANG[1]
[1]*Temasek Microelectronics Center, Temasek Polytechnic, Singapore*, [2]*Temasek Polytechnic, Singapore*

G11-7 **Investigation of Simple Process Technology for the Fabrication of Valveless Micropumps**
Jumril YUNAS[1#+], Juliana JOHARI[1], Ali Reza BAHADORIMEHR[1], Burhanuddin YEOP MAJLIS[1], Ille GEBESHUBER[1]
[1]*Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*

G11-8 **Hydridosilane Modification of Metals: An Exploratory Study**
Janis MATISONS[1#+], Barry ARKLES[1], Yun Mi KIM[1], Youlin PAN[1], Eric EISENBRAUN[2], Alain KALOYEROS[2]
[1]*Research and Development, Gelest Inc, United States*, [2]*College of Nanoscale Science and Engineering, State University of New York, United States*

G12 MEMS Sensors

Symposia List > Symposium G > G12

G12-1 Invited **Micro- and Nanofibers: a Platform for making Optical Microdevices**
Guillaume VIENNE[1#+]
[1]*Advanced Concepts Group, Data Storage Institute, Singapore*

G12-2 **Challenges and Solutions for Fabricating Isolation Trenches for High Aspect Ratio Sensors**
Rahul AGARWAL[1#+], Jin XIE[2], Kia Hian LAU[1], Praveen KUMAR SAMPATH[1], Nagarajan RANGANATHAN[1], Janak SINGH[1], Ming Lin Julius TSAI[3], Kai Yeow TAN[3]
[1]*Institute of Microelectronics, Singapore*, [2]*Sensors and Actuators Microsystems, Institute of Microelectronics, Singapore*, [3]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G12-3 **Large-area Pulsed Laser Deposition and Assembly Processes for Piezoelectric MEMS Devices Based on All-oxide LaNiO3/Pb(Zr,Ti)O3/LaNiO3 Thin-films**
Minh NGUYEN[1#+], Matthijn DEKKERS[1], Maarten VAN JALK[1], Joska BROEKMAAT[1], Arjen JANSSENS[1], Hammad NAZEER[2], Dave BLANK[3], Guus RIJNDERS[3]
[1]*SolMateS B.V., Netherlands*, [2]*Transducers Science and Technology, MESA Institute for Nanotechnology, University of Twente, Netherlands*, [3]*Inorganic Materials Science, MESA Institute for Nanotechnology, University of Twente, Netherlands*

G12-4 **Development of Ultra-Sensitive Pressure Sensing Device Using CNT/Polymer Composites**
Cheong Ming LAM[1], Zuruzi ABU SAMAH[2#+]
[1]*Biomedical Devices and Systems Section,School of Engineering (Manufacturing), Nanyang Polytechnic, Singapore*, [2]*BioMems and Nanotechnology Section,School of Engineering (Manufacturing), Nanyang Polytechnic, Singapore*

G12-5 **Fiber-optic Biochemical Gas Sensor (Bio-sniffer) for Real-Time Monitoring of Environmental Formaldehyde with High Sensitivity and Selectivity**
Hiroyuki KUDO[1+], Gen ITABASHI[1], Toshifumi YAMASHITA[1], Tomoko GESSEI[2], Mika HAYASHI[1], Kumiko MIYAJIMA[1], Daishi TAKAHASHI[1], Takahiro ARAKAWA[1], Kohji MITSUBAYASHI[1#]
[1]*Tokyo Medical and Dental University, Japan*, [2]*Tokyo Metropolitan Industrial Technology Research Institute, Japan*

G12-6 **Performance Improvement on MEMS Micropropulsion System through a Novel Two-depth Micronozzle Design**
Kean How CHEAH[1], Jitkai CHIN[2#+]
[1]*University Nottingham Malaysia, Malaysia*, [2]*Department of Chemical and Environmental Engineering, University Nottingham Malaysia, Malaysia*

G12-7 **Design, Fabrication and Characterization of Zno Based Thin Film Bulk Acoustic Resonators**
Somsing RATHOD[1#+], Atul VIR SINGH[2], Sudhir CHANDRA[2]
[1]*Electronics and Radar Development Establishment, Defence Research and Development Organisation, Bangalore, India*, [2]*Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, India*

Symposia List > Symposium G > Posters (PO3)

G-PO3-1 **Mechanical Stopper Material Evaluation and Assembly Process Improvement of MEMS Tri-axial Force Sensor for Sensorised Guidewires Application**
Muhammad HAMIDULLAH[1#], Liang LOU[2+], Li Shiah LIM[3], Woo-tae PARK[1], Hanhua FENG[1]
[1]*Miniaturized Medical Devices, Institute of Microelectronics, Singapore*, [2]*National University of Singapore, Singapore*, [3]*Minituarized Medical Device, Institute of Microelectronics, Singapore*

G-PO3-2 **Fabrication of a New Peltier Device with a Coaxial Thermocouple**
Yosuke MURAYAMA[1#+], Shigeo YAMAGUCHI[1]
[1]*Electrical, Electronic and Information Engineering, Kanagawa University, Japan*

G-PO3-3 **Proposal and Fabrication of a Precisely Temperature-controlled NN-type Peltier Device with a T-shaped Stage**
Nobuyuki SUZUKI[1#+], Shigeo YAMAGUCHI[2]
[1]*Electrical, Electronic, and Information Engineering, Kanagawa University, Japan*, [2]*Electrical, Electronic and Information Engineering, Kanagawa University, Japan*

G-PO3-4 **Fabrication of a Thin-film Peltier Device Based on InSb**
Tatsuya ISHII[1#+], Hideyuki HOMMA[1], Shigeo YAMAGUCHI[2]
[1]*Electrical,Electronic and Information Engineering, Kanagawa University, Japan*, [2]*Electrical, Electronic and Information Engineering, Kanagawa University, Japan*

G-PO3-5 **Oscillating Micromixers on a Compact Disc**
Chih-Hsin SHIH[1#+], Daniel YEN[1]
[1]*Chemical Engineering, Feng Chia University, Taiwan*

G-PO3-6 **Robust Sequential Flow Controls on the Centrifugal Platform**
Chih-Hsin SHIH[1#+], Hou-Jin WU[1], Wen-Hao CHEN[1]
[1]*Chemical Engineering, Feng Chia University, Taiwan*

G-PO3-7 **Design and Modeling of Platinum Thin Film Microheater for High Temperature Microtensile Test Application**
Wan Chia ANG[1#+], Man I LEI[2], Ming Lin Julius TSAI[2], Kam Chew LEONG[3], Chuan Seng TAN[4]
[1]*School of Electrical and Electronics Engineering, Nanyang Technological University, Singapore*, [2]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3]*Global Foundries Singapore Private Limited, Singapore*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G-PO3-8 **FFabrication of a Portable Thermal Cycler Using a PN Sandwich-structure Peltier Device**
Yoko OKUWAKI[1#+], Shigeo YAMAGUCHI[1]
[1]*Electrical, Electronic and Information Engineering, Kanagawa University, Japan*

G-PO3-9 **Label-free Direct Detection of Herbicides Using Micro-gravimetric Platforms**
Palaniappan ALAGAPPAN[1#+], Yanli YANG[2], Priyanka SHARMA[3], Raman SURI[3], Bo LIEDBERG[4], Subodh MHAISALKAR[5,6]
[1]*Nanyang Technological University, Singapore*, [2]*Centre for Biomimetic Sensor Science, School of Materials Science and Engineering, Nanyang Technological University, Singapore*, [3]*Institute of Microbial Technology, India*, [4]*Department of Physics and Measurement Technology, Linköping University, Sweden*, [5]*School of Materials Science and Engineering, Nanyang Technological University, Singapore*, [6]*Energy Research Institute, Nanyang Technological University, Singapore*

G-PO3-10 **Microfabrication of a Planar Helix with Straight-Edge Connections Slow-wave Structure**
Ciersiang CHUA[1#+], Ming Lin Julius TSAI[2], Min TANG[2], Sheel ADITYA[1], Zhongxiang SHEN[1]
[1]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [2]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G-PO3-11 **Ultrasonic Transducer Fabricated Using Lead-free BSZT/Epoxy 1-3 Composites**
Siu To Felix LEE[1#+], K.H. LAM[1], X.M. ZHANG[1], H.L.W. CHAN[1]
[1]*The Hong Kong Polytechnic University, Hong Kong SAR, China*

G-PO3-12 **Lead-free BSZT/P(VDF-TrFE) 0-3 Composites for Infrared Sensor Applications**
Siu To Felix LEE[1#+], K.H. LAM[1], X.M. ZHANG[1], H.L.W. CHAN[1]
[1]*The Hong Kong Polytechnic University, Hong Kong SAR, China*

G-PO3-13 **Rapid Microfluidic Capture of Rare Endothelial Progenitor Cells from Whole Blood**
Shi Yun NG[1#+], Janice LIAW[1], Karen Yanping WANG[1], Kum Cheong TANG[1], Tzu-Hsiang Linus KAO[1]
[1]*Bio-Electronics Program, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G-PO3-14 **Detection of Endothelial Progenitor Cells on Microelectrode Array Via Electrochemical Impedance Spectroscopy**
Janice LIAW[1#+], Shi Yun NG[1], Karen Yanping WANG[1], Kum Cheong TANG[1], Abdur Rub Abdur RAHMAN[1], Tzu-Hsiang Linus KAO[1]
[1]*Bio-Electronics Program, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G-PO3-15 **Fabrication of Micro-cantilevers Using Rf Magnetron Sputtered Sic Films**
Atul VIR SINGH[1+], Sudhir CHANDRA[1#], Gouranga BOSE[2]
[1]*Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, India*, [2]*Institute of Technical Education and Research, Bhubneswar, India*

G-PO3-16 **Uniformity Investigation of the Imprinted Patterns with Fabricated 4'' Mould**
Ten It WONG[1+], Chenggen QUAN[2], Man Siu TSE[3], Xiaodong ZHOU[4#]
[1]*Design and Growth, Institute of Materials Research and Engineering, Singapore*, [2]*Department of Mechanical Engineering, National University of Singapore, Singapore*, [3]*Division of Microelectronics, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [4]*Materials Analysis and Characterisation, Institute of Materials Research and Engineering, Singapore*

G-PO3-17 **Probing Structures and Defects of Graphene by a Capped Carbon Nanotube**
Ping LIU[1#+], Yong Wei ZHANG[1]

[1] *Institute of High Performance Computing, Singapore*

G-PO3-18 **Effect of Substrate Temperature on Properties of Silicon Nitride Films Deposited by Rf Magnetron Sputtering**

Ruchi TIWARI[1+], Sudhir CHANDRA[1#]

[1] *Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, India*

G-PO3-19 **Separation Gap Estimation in Dynamic Systems Actuated by Casimir Force**

Song CUI[1+], Yeng Chai SOH[2#]

[1] *Materials Analysis and Characterization, Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore*, [2] *School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

G-PO3-20 **Design, Fabrication and Characterization of Ultra Miniature Piezoresistive Pressure Sensors for Medical Implants**

Li Shiah LIM[1#], Woo-Tae PARK[2], Liang LOU[3], Hanhua FENG[1], Pushpapraj SINGH[4+]

[1] *Minituarized Medical Device, Institute of Microelectronics, Singapore*, [2] *Minituarized Medical Device, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3] *National University of Singapore, Singapore*, [4] *Mechanical and Aeroscape Engineering, Institute of Microelectronics, Nanyang Technological University, Singapore*

G-PO3-21 **Multi Degree-of-freedom Micromotor Utilizing an Electrothermal Actuator Array and a Spherical Rotor**

Xiaojing MU[1,2#+], Winston SUN[3], Hanhua FENG[3], Guangya ZHOU[4], Fook Siong CHAU[4]

[1] *Miniature Medical Device, Institute of Microelectronics, Singapore*, [2] *Mechanical Engineering, Institute of Microelectronics /National University of Singapore, Singapore*, [3] *Miniaturized Medical Devices, Institute of Microelectronics, Singapore*, [4] *Mechanical Engineering, National University of Singapore, Singapore*

G-PO3-22 **A Novel Micromechanical Resonator Using Two-dimensional Phononic Crystal Slab**

Nan WANG[1,2#+], Fu-Li HSIAO[3], Moorthi PALANIAPAN[2], Ming Lin Julius TSAI[1], Bo Woon Jeffrey SOON[1], Dim-Lee KWONG[4], Chengkuo LEE[2]

[1] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2] *Department of Electrical and Computer Engineering, National University of Singapore, Singapore*, [3] *Graduate Institute of Photonics, National Changhua University of Education, Taiwan*, [4] *Institute of Microelectronics, Singapore*

G-PO3-23 **Focused Ion Beam Fabricated Polystyrene-platinum Thermal Microactuator**

Cheng Choo LEE[1#+], Gursel ALICI[2], Geoff SPINKS[2], Gwenaelle PROUST[1], Julie CAIRNEY[1]

[1] *Australian Centre for Microscopy and Microanalysis, University of Sydney, Australia*, [2] *School of Mechanical, Materials and Mechatronic Engineering, University of Wollongong, Australia*

G-PO3-24 **Two Steps Plasma Etching for Sio2 Microcantilever Release**

Rosminazuin AB RAHIM[1], Badariah BAIS[1+], Burhanuddin YEOP MAJLIS[1]

[1] *Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*

G-PO3-25 **Simulation Study of Side-by-side Spiral Coil Structure Design for Micromagnetometer**

Nadzril SULAIMAN[1+], Burhanuddin YEOP MAJLIS[1]

[1] *Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*

G-PO3-26 **Micro-engineered Structures and Optimized Automated System for Rapid Parallel Production of Nano-imprint Patterned Optical Fibre Probes**

Miguel COMBARIZA[1#+], Charan Manish SHAH[2], Sharath SRIRAM[2], Madhu BHASKARAN[2], Gorgi KOSTOVSKI[2], Mahyar NASABI[2], Arnan MITCHELL[2]

[1] *Electrical and Computer Engineering, Royal Melbourne Institute of Technology University, Australia*, [2] *Microplatforms Research Group, Royal Melbourne Institute of Technology University, Australia*

G-PO3-27 **Fabrication of MEMS Based Microspeaker Using Bulk Micromachining Technique**

Gandi SUGANDI[1+], Burhanuddin YEOP MAJLIS[1]

[1] *Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*

G-PO3-28 **Design Consideration of Membrane Structure for Thermal Actuated Micropump**

Norihan ABDUL HAMID[1#+], Jumril YUNAS[2], Burhanuddin YEOP MAJLIS[2]

[1] *Institute of Microengineering and Nanoelectronics, Malaysia*, [2] *Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*

G-PO3-29 **Microfluidic Manipulation Using Continuous-wave Laser**

Aoqun JIAN[1+], Ning WANG[2], Xu-Ming ZHANG[3#]

[1] *Department of Applied Physics, Hong Kong Polytechnic University, Hong Kong SAR, China*, [2] *The Hong Kong Polytechnic University, Hong Kong SAR, China*, [3] *Hong Kong Polytechnic University, Hong Kong SAR, China*

G-PO3-30 **High Throughput Anisotropic Plasma Etching of Organic Materials for MEMS**

Anbumalar MANICKAM[1#+], Nagarajan RANGANATHAN[2], Junwei CHEN[3], Vladimir BLIZNETSOV[1]

[1] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2] *Institute of Microelectronics, Singapore*, [3] *School of Materials Science and Engineering, Nanyang Technological University, Singapore*

G-PO3-31 **Fabrication of Narrow Microfluidic Channels in Dielectric Stacks with PDMS**

Anbumalar MANICKAM[1#+], Nagarajan RANGANATHAN[2], Vladimir BLIZNETSOV[1]

[1] *Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2] *Institute of Microelectronics, Singapore*

G-PO3-32 **Three-Axis Capacitive SOI Accelerometer Using Combination of In-Plane and Vertical Comb**

Electrodes

Jin XIE[1#+], Rahul AGARWAL[2], Kia Hian LAU[2], Youhe LIU[1], Ming Lin Julius TSAI[3]
[1]*Sensors and Actuators Microsystems, Institute of Microelectronics, Singapore*, [2]*Institute of Microelectronics, Singapore*, [3]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G-PO3-33 **A New Robust Four Degree-of-Freedom Gyroscope Design**

Kean Lee KANG[1], Jin XIE[2#+], Ming Lin Julius TSAI[3], Sanchitha FERNANDO[4]
[1]*School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore*, [2]*Sensors and Actuators Microsystems, Institute of Microelectronics, Singapore*, [3]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [4]*Institute of Microelectronics, Singapore*

G-PO3-34 **Fabrication of Porous Silicon Neural Recording Probes**

Guang Kai Ignatius TAY[1#+], Poh Giao TEH[1], Woo-Tae PARK[2], Ming-Yuan CHENG[1], Praveen KUMAR SAMPATH[3], W.S. Vincent LEE[3], Ramana MURTHY[4], Nagarajan RANGANATHAN[3], Minkyu JE[5]
[1]*Minituarized Medical Device,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Minituarized Medical Device, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3]*Institute of Microelectronics, Singapore*, [4]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [5]*Integrated Circuits and Systems, Institute of Microelectronics, Singapore*

G-PO3-35 **Spray Coating & Large-gap Proximity Lithography for MEMS Application**

Huey Wen LIM[1#+], Ao CHEN[1], Qingxin ZHANG[1], Yong Hean LEE[1], Zulkiflee ABDULLAH[1], Lawson KOR[1], Nagarajan RANGANATHAN[2]
[1]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Institute of Microelectronics, Singapore*

G-PO3-36 **Pinball Microfluidics: A Novel Approach for Continuous Generation of Layer-by-Layer Polymer Microcapsules**

Chaitanya KANTAK[1,2+], Sebastian BEYER[3], Levent YOBAS[4], Tushar BANSAL[1], Dieter TRAU[3#]
[1]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Division of Bioengineering, National University of Singapore, Singapore*, [3]*National University of Singapore, Singapore*, [4]*Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Hong Kong SAR, China*

G-PO3-37 **Evaluation of Piezoelectric Properties of AlN using MEMS Resonators**

Lynn KHINE[1#+], You Liang Lionel WONG[1], Bo Woon Jeffrey SOON[1], Ming Lin Julius TSAI[1]
[1]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*

G-PO3-38 **Thermal Characterization of a PCR Device with a Temperature Gradient Over a Radial Design**

Steven SIM[1#+], Tae Goo KANG[2], Yu CHEN[3], Andrew DEMELLO[4]
[1]*Bioelectronics,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [2]*Institute of Microelectronics, Agency for Science, Technology and Research, Singapore*, [3]*National University of Singapore, Singapore*, [4]*Chemistry, Imperial College London, United Kingdom*

G-PO3-39 **Soft Contact-lens Biosensor based on MEMS Techniques for in-situ Monitoring of Tear Glucose**

Hiroyuki KUDO[1+], MingXing CHU[1], Yoshitaka HIRANUMA[2], Daishi TAKAHASHI[1], Kumiko MIYAJIMA[1], Takahiro ARAKAWA[1], Kohji MITSUBAYASHI[1#]
[1]*Tokyo Medical and Dental University, Japan*, [2]*Nihon University, Japan*

G-PO3-40 **Area-Selective Polymer Deposition on Micro-Area Framed by Trenches with Falling Liquid Film**

Sunao MURAKAMI[1#+], Tsuyoshi IKEHARA[1], Mitsuo KONNO[1], Ryutaro MAEDA[1], Takashi MIHARA[2]
[1]*Research Center for Ubiquitous MEMS and Micro Engineering, National Institute of Advanced Industrial Science and Technology, Japan*, [2]*Future Creation Laboratory, Olympus Corporation, Japan*

G-PO3-41 **Direct Writing of Closed Channels in Silica by MeV Ion Beam Lithography**

Nitipon PUTTARAKSA[1,2#+], Mari NAPARI[1], Orapin CHIENTHAVORN[3], Rattanaporn NORARAT[1], Timo SAJAVAARA[1], Mikko LAITINEN[1], Somsorn SINGKARAT[2,4], Harry J. WHITLOW[1]
[1]*Department of Physics, University of Jyväskylä, Finland*, [2]*Plasma and Beam Physics Research Facility, Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Thailand*, [3]*Department of Chemistry, Kasetsart University, Thailand*, [4]*Thailand Center of Excellence in Physics, CHE, Thailand*

G-PO3-42 **Dynamic Field Responsive Nanoparticle Aggregates for Continuous Microfluidic Protein Separations**

S.H. Sophia LEE[1+], Saif A. KHAN[2#], T. Alan HATTON[3]
[1]*Singapore-MIT Alliance, National University of Singapore, Singapore*, [2]*Department of Chemical and Biomolecular Engineering, National University of Singapore, Singapore*, [3]*Department of Chemical Engineering, Massachusetts Institute of Technology, United States*

G-PO3-43 **Hydrogel Microstructure for Single Cell Analysis in a Microfluidic Device**

Jitkai CHIN[1#+], Kean How CHEAH[2], kai Seng KOH[2]
[1]*Department of Chemical and Environmental Engineering, University Nottingham Malaysia, Malaysia*, [2]*University Nottingham Malaysia, Malaysia*

G-PO3-44 **Development of Multiple-step SOI DRIE Process for Superior Notch Reduction at Buried Oxide.**

Praveen KUMAR SAMPATH[1#+]

[1] Institute of Microelectronics, Singapore

G-PO3-45 **Thick-film Deposition of High-viscous Liquid Photopolymer**

Jafar ALVANKARIAN[1], Mitra DAMGHANIAN[1], Burhanuddin YEOP MAJLIS[1#+]
[1] Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia

G-PO3-46 **Effect of Temperature on the Electrical and Gas Sensing Properties of Polyaniline and Multiwall Carbon Nanotube Doped Polyaniline Composite Thin Films**

Subodh SRIVASTAV[1#+], Sumit KUMAR[1], Vipin Kumar JAIN[1], YK VIJAY[1]
[1] Department of Physics, University of Rajasthan, India

G-PO3-47 **On the Way to the Bionic Man - A Novel Approach to MEMS Based on Biological Sensory Systems**

Salmah B. KARMAN[1], Mark O. MACQUEEN[2], Tina R. MATIN[1], S. Zaleha M. DIAH[3], Jeanette MUELLER[4], Jumril YUNAS[1], Teresa MAKARCZUK[5], Ille C. GEBESHUBER[1,5#+]
[1] Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia, [2] Aramis Technologies Sdn. Bhd., Malaysia, [3] Zoology Museum, University of Malaya, Malaysia, [4] Trustroom, Austria, [5] Institute of Applied Physics, Vienna University of Technology, Austria

G-PO3-48 **Biomolecule Separation Using Electrophoresis Enhanced Deterministic Lateral Displacement**

Kerwin Zeming KWEK[1#+], Yong ZHANG[2], Hong Yee LOW[3]
[1] Bioengineering, National University of Singapore, Singapore, [2] National University of Singapore, Singapore, [3] Institute of Materials Research and Engineering, Singapore

G-PO3-49 **Silicon Probes for Cochlear Auditory Nerve Stimulation and Measurement.**

Nishant LAWAND[1,2#+], Paddy FRENCH[1], Jeroen BRIAIRE[3], Johan H.M. FRIJNS[3]
[1] Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, Netherlands, [2] Electronic Instrumentation Laboratory, Delft University of Technology, Netherlands, [3] Ear, Nose and Throat Department., Leiden University Medical Center., Netherlands

G-PO3-50 **NEMS-based Innervation of Materials**

Ille C. GEBESHUBER[1,2#+], Jeanette MUELLER[3], Mark O. MACQUEEN[4]
[1] Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia, [2] Institute of Applied Physics, Vienna University of Technology, Austria, [3] Trustroom, Austria, [4] Aramis Technologies Sdn. Bhd., Malaysia

G-PO3-51 **Nano-scaled Optical Powermeter Development on Silicon Platform**

Ji Fang TAO[1#+], Aibin YU[2], Hong CAI[3], Jian WU[4], Ai-Qun LIU[5]
[1] Nanyang Technological University, Singapore, [2] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [3] Institute of Microelectronics, Singapore, [4] Beijing University of Posts and Telecommunications, China, [5] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-52 **A Ring Resonator Pressure Sensor Based on Optical Force**

Xin ZHAO[1+], Hong CAI[2], Ming Lin Julius TSAI[3], Xin-ming JI[4], Jia ZHOU[4], Min-Hang BAO[4], Yi-Ping HUANG[4], Ai-Qun LIU[1#]
[1] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, [2] Institute of Microelectronics, Singapore, [3] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [4] Fudan University, China

G-PO3-53 **Controllable Optical Activity in Metamaterial through MEMS**

Wu ZHANG[1+], Weiming ZHU[1], Yuan Hsing FU[2], Ji Fang TAO[1], Dim-Lee KWONG[3], Patrick G.Q LO[3], Ai-Qun LIU[4#]
[1] Nanyang Technological University, Singapore, [2] Data Storage Institute, Singapore, [3] Institute of Microelectronics, Singapore, [4] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-54 **Stopping Micro-Particle on the Ring/Waveguide by Using Double Coupled Ring Resonator**

Ye Feng YU[1+], Hong CAI[2], Jifang TAO[1], Min REN[1], Tarik BOUROUINA[3], Ai-Qun LIU[4#]
[1] Nanyang Technological University, Singapore, [2] Institute of Microelectronics, Singapore, [3] ESIEE-Paris, University of Paris-Est , France, [4] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-55 **Material Characterization and Gapfill Study of Polyimides and PDMS' for MEMS Applications**

Steven LEE HOU JANG[1#+], Yingjun MAO[1], Wee Ming TAN[1], Ramana MURTHY[2], Nagarajan RANGANATHAN[3], Huey Wen LIM[2]
[1] FAB, Institute of Microelectronics, Singapore, [2] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [3] Institute of Microelectronics, Singapore

G-PO3-56 **High Topography Polyimide CMP Process**

Yingjun MAO[1#+], Gim Guan CHEN[2], Ramana MURTHY[3], Swee Kiat Eugene TAN[4]
[1] FAB, Institute of Microelectronics, Singapore, [2] FAB, Singapore, [3] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [4] FAB,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

G-PO3-57 **A Simple Method for Quantification of Beta-amyloid Using the Photo-sensitive Thin Film Transistor**

Kwan-Su KIM[1], Jongil JU[1], Chang-Beom KIM[1+], Jung-Min CHO[1], Hee-Kyung SUNG[1], Ki-bong SONG[1#]
[1] Electronics and Telecommunications Research Institute, South Korea

G-PO3-58 **Double-Ring Resonator External Cavity Tunable Laser**

Min REN[1+], Hong CAI[2], Ji Fang TAO[1], Ye Feng YU[1], Weiming ZHU[1], Ai-Qun LIU[3#]
[1] Nanyang Technological University, Singapore, [2] Institute of Microelectronics, Singapore, [3] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-59 **Droplet-based Microfluidic Chemical Reactors**

Zhenguo LI[1+], Keita ANDO[1], Jing Bo ZHANG[2], Ai-Qun LIU[1#]

[1] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, [2] Optical Materials and System Division, Data Storage Institute, Singapore

G-PO3-60 **An Optofluidic Waveguide Splitter by Centrigual Effect**

Yi YANG[1+], Ai-Qun LIU[1#]
[1] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-61 **Laser Intra-cavity Spectroscopy based microfluidic cytometer**

Lei LEI[1+], Yong CHEN[2], Ai-Qun LIU[1#]
[1] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, [2] Ecole Normale Supérieure, CNRS-ENS-UMPC UMR8640, France

G-PO3-62 **Cell Culture using Droplet Microfluidics**

Lip Ket CHIN[1+], Ai-Qun LIU[2#]
[1] Nanyang Technological University, Singapore, [2] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-63 **The Negative Π/2 Phase Shift of Totle Reflect Light**

Bing LIU[1#+]
[1] Physics, Qingdao University, China

G-PO3-64 **Microfluidic Droplet-based Liquid-liquid Extraction for Fluorescence-indicated Mass Transfer**

Jiaqing YU[1+], Lip Ket CHIN[1], Ai-Qun LIU[2#]
[1] Nanyang Technological University, Singapore, [2] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-65 **An improved thermal characteristic of white LED using LTCC-COB package**

Jae-kwan SIM[1+], San KANG[1], Yong-ho RA[1], Byung Joon BAEK[2], K ASHOK[1,3], Cheul-Ro LEE[1#]
[1] School of Advanced Materials Engineering, Chonbuk National University, South Korea, [2] Division of Mechanical system engineering, Chonbuk National University, South Korea, [3] Physics and nanotechnology, Sri Ramaswamy Memorial University, India

G-PO3-66 **Wafer Level Packaging With TSV for MEMS Devices**

Kia Hian LAU[1#+], Bangtao CHEN[1], YingYing LIM[1], Rahul AGARWAL[1], Praveen KUMAR SAMPATH[1]
[1] Institute of Microelectronics, Singapore

G-PO3-67 **Studies on Quasi-static Au-to-Au Ohmic Contact for MEMS Switches**

Haodong QIU[1#+], Hong WANG[1]
[1] Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-68 **Optimization of On-chip Interface Circuit for Mems Sensor Based on Micro-cantilever**

Badariah BAIS[1#+], Liang Wen LOH[2], Rosminazuin AB RAHIM[1], Burhanuddin YEOP MAJLIS[3]
[1] Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia, [2] Universiti Kebangsaan Malaysia, Malaysia, [3] Institute of Microengineering and Nanoelectronic, University kebangsaan malaysia, Malaysia

G-PO3-69 **Paper Based Electrochemical Sensor for Detection of Ascorbic Acid by Inkjet Printed-nanoPolyaniline Modified Screen Printed Carbon Paste Electrode**

Worrapong KIT-ANAN[1#+], Aricha OLARNWANICH[1], Chakrit SRIPRACHUABWONG[2], Chanpen KARUWAN[2], Anurat WISITSORAAT[2], Werayut SRITURAVANICH[3], Alongkorn PIMPIN[3], Adisorn TUANTRANONT[2]
[1] International School of Engineering, Chulalongkorn University, Thailand, [2] Nanoelectronics and Micro-Electro-Mechanical Systems Laboratory, National Electronics and Computer Technology, Thailand, [3] Mechanical Engineering, Chulalongkorn University, Thailand

G-PO3-70 **Nonlocal Theory for Micro-beams by Adapting a New First-Order Shear Deformation Plate Theory**

Rameshchandra P. SHIMPI[1#+]
[1] Aerospace Engineering Department, Indian Institute of Technology Bombay, India

G-PO3-71 **Single Chip Integrated Microsystem for Viral RNA Extraction and Real-time RT-PCR**

Ming Yi Daniel ANG[1+], Hong Miao JI[2], Guang Kai Ignatius TAY[3], Kum Cheong TANG[4], Tae Goo KANG[2#]
[1] Institute of Microelectronics, Singapore, [2] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [3] Minituarized Medical Device,Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [4] Bio-Electronics Program, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore

G-PO3-72 **Study of Dry and Wet Oxide Etching for Mosfet-based Mems/nems Devices**

Vikas SHARMA[1#+]
[1] Physics, Birla Institute of Technology and Science, India

G-PO3-73 **Development of Nano-opto-mechanical System (noms) Accelerometer Using Cmos Compatible Process Technology**

Bin DONG[1+], Hong CAI[2], Ming Lin Julius TSAI[3], Ai-Qun LIU[4#]
[1] Nanyang Technological University, Singapore, [2] Institute of Microelectronics, Singapore, [3] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [4] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

G-PO3-74 **Low-voltage-driven Silicon NEMS Torsion Switch with Pre-tilted Angle**

Liang LOU[1#+], Ming Lin Julius TSAI[2], Woo-Tae PARK[3], Hanhua FENG[4], Dim-Lee KWONG[5], Chengkuo LEE[6]
[1] IME, Singapore, [2] Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [3] Minituarized Medical Device, Institute of Microelectronics, Agency for Science, Technology and Research, Singapore, [4] Minituarized Medical Device,

Institute of Microelectronics, Singapore, [5]*Institute of Microelectronics, Singapore*, [6]*Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

G-PO3-75 **Compact Circumferential Scan 3-arm Suspended Micromirror for OCT Applications**

Winston SUN[1#+], Xiaojing MU[2,3], Hanhua FENG[1]

[1]*Miniaturized Medical Devices, Institute of Microelectronics, Singapore*, [2]*Miniature Medical Device, Institute of Microelectronics, Singapore*, [3]*Mechanical Engineering, Institute of Microelectronics /National University of Singapore, Singapore*

Symposium I Abstracts

I1 | I2.1 | I2.2 | I3 | I4 | I5 | I6 | I7 | I8 | I9 | I10 | I11 | I12 | Posters (PO2)

I1 Emergent Nanowire Growth Process

Symposia List > Symposium I > I1

I1-1 Invited
Aluminum-catalyzed Silicon Nanowire Growth for Photovoltaic Applications
Joan REDWING[1#+], Yue KE[2], Xiaojun WENG[3], Yuwen YU[4], Heayoung YOON[4], Sarah EICHFELD[1], Theresa MAYER[4]
[1]Material Science and Engineering, Penn State University, United States, [2]Material Science and Engineering, Penn State Univ, United States, [3]Materials Research Institute, Penn State University, United States, [4]Electrical Engineering, Penn State University, United States

I1-2
General Synthesis of Compound Semiconductor Nanowire Arrays by Van Der Waals Epitaxy
Muhammad Iqbal Bakti UTAMA[1+], Yanyuan ZHAO[1], Zeping PENG[1], Rui CHEN[1], Handong SUN[1], Qihua XIONG[2,3#]
[1]Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, [2]School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, [3]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

I1-3 Invited
Plasma Effects in Inorganic Nanowire Growth
Kostya OSTRIKOV[1#+]
[1]Commonwealth Scientific and Industrial Research Organisation, Australia

I1-4
Al-catalyzed Growth of Silicon Nanowires and Microwires, Combined with an In-situ Dry Catalyst Etching Technique
David KOHEN[1#+], Vasiliki TILELI[1], Christine MORIN[1], Pascal FAUCHERAND[1], Joël DUFOURCQ[1], Sebastien NOËL[1], Michel LEVIS[1], Arnaud BRIOUDE[2], Simon PERRAUD[1]
[1]CEA, LITEN, France, [2]CNRS, Université Claude Bernard Lyon 1, LMI, France

I2.1 Nanowire Heterojunctions and Alloys

Symposia List > Symposium I > I2.1

I2.1-1 Invited
Realization of Lateral Electrodes on Semiconductor Nanowires and Applications in UV Photodetectors
Yi SHI[1#+], Yun SHENG[1], Huabin SUN[1], Jianyu WANG[1], Fan GAO[1], Lijia PAN[1], Rong ZHANG[1], Youdou ZHENG[1]
[1]School of Electronic Science and Engineering, Nanjing University, China

I2.1-2
Heterojunction Semiconductor Nanowire Diodes
Ionut ENCULESCU[1#+], Elena MATEI[1], Jean-Philippe ANSERMET[2], Maria Eugenia TOIMIL MOLARES[3], Lucian ION[4], Stefan ANTOHE[4]
[1]Multifunctional Materials and Structures, National Institute of Materials Physics, Romania, [2]Ecole Polytechnique Federale de Lausanne, Switzerland, [3]Gesellschaft für Schwerionenforschung mbH, Darmstadt, Germany, [4]University of Bucharest, Romania

I2.1-3
Electron-Hole Overlap Dictates the Hole Spin Relaxation Rate in Nanocrystal Heterostructures
Jun HE[1+], Haizheng ZHONG[2], Gregory SCHOLES[3#]
[1]School of Physics Science and Technology, Central South University, China, [2]School of Material Science and Engineering, Beijing Institute of Technology, China, [3]Department of Chemistry, Institute for Optical Sciences, Centre for Quantum Information and Quantum Control, University of Toronto, Canada

I2.1-4 Invited
Bandgap Engineering of Semiconductor Nanowires
Anlian PAN[1#+]
[1]Hunan University, China

I2.1-5
Synthesis, Optical and Field Emission Properties of Zno (core)/graphite (shell) Nanowires
Sameera IVATURI[1#+], Ravi BHATIA[2], Prasad VISHNUBHOTLA[1]
[1]Department of Physics, Indian Institute of Science, India, [2]Department Physics, Indian Institute of Science, India

I2.1-6
Zno and Tio2-based Nanostructures for Efficient Photoelectrochemical Water Splitting
Chuanwei CHENG[1], Hongxing LI[1], Hongjin FAN[1#+]
[1]Division of Physics and Applied Physics, Nanyang Technological University, Singapore

I2.2 Nanowires for Energy I

Symposia List > Symposium I > I2.2

I2.2-1 Invited
Nanowires for Energy, Environment and Neurobiology
Yi CUI[1#+]
[1]Department Materials Science and Engineering, Stanford University, United States

I2.2-2
Wet Chemically Etched Silicon Nanowires: A Key Component in New Generation of Photovoltaic Devices
Vladimir SIVAKOV[1#+], Björn HOFFMANN[2], Matthias PIETSCH[3], Martin SCHREIVOGEL[2], Felix VOIGT[2], Gerald BRÖNSTRUP[2], Florian TALKENBERG[2], Arne BOCHMANN[2], Thomas STELZNER[2], Silke CHRISTIANSEN[3]
[1]Semiconductor Nanostructures, Institute of Photonic Technology, Germany, [2]Institute of Photonic Technology, Germany, [3]Max Planck Institute for the Science of Light, Germany

I2.2-3 **Si/PEDOT:PSS Nanowire Radial Heterojunction Solar Cells**
Wenhui LU[1+], Qi CHEN[1], Liwei CHEN[1#]
[1]*Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, China*

I2.2-4 Invited **Semiconductor Nanowire Photovoltaic and Lighting Devices**
Deli WANG[1#+]
[1]*Electrical and Computer Engineering, University of California San Diego, United States*

I2.2-5 **Surface Passivation of Silicon Nitride for Silicon Nanowire Solar Cell**
Eman ASHOUR[1#+], Yusof SULAIMAN[2], Nowshad AMIN[3], Kamaruzzaman SOPIAN[4]
[1]*Solar Energy Research Institute, Universiti Kebangsaaan Malaysia, Malaysia*, [2]*Solar Energy Research Institute, University Kebangsaan Malaysia, Malaysia*, [3]*Electrical Electronic and Systems Engineering, Universiti Kebangsaan Malaysia, Malaysia*, [4]*Solar Energy Research Institute, Universiti Kebangsaan Malaysia, Malaysia*

I2.2-6 **In situ Formation of Large-scale AgCl Nanoparticles/honeycomb Titanate Nanowires Heterostructure for Enhanced Visible Light Photocatalytic Application**
Yuxin TANG[1+], Han Teng TAY[1], Teck Hua LAU[1], Peixin WEE[1], Qiong ZHOU[1], Zhili DONG[1], Zhong CHEN[1#]
[1]*School of Materials Science and Engineering, Nanyang Technological University, Singapore*

I3 Nanowire Electronic Devices

Symposia List > Symposium I > I3

I3-1 Invited **Semiconductor Nanowires for Future Field Effect Transistors**
Mikael BJOERK[1], Heinz SCHMID[1], Kirsten MOSELUND[1], Cedric BESSIRE[1], Hesham GHONEIM[1], Siegfried KARG[1], Emanuel LÖRTSCHER[1], Heike RIEL[1#+]
[1]*IBM Research - Zurich, Switzerland*

I3-2 **Time-dependent Transport in Nanowire-based Electronic Devices**
Chi-Shung TANG[1#+]
[1]*Department of Mechanical Engineering, National United University, Taiwan*

I3-3 **Demonstration of Vertical Silicon Nanowire Tunnel Field Effect Transistor with Low Subthreshold Slope < 50mv/decade**
Ramanathan GANDHI[1+], Zhixian CHEN[2], Navab SINGH[3], Kaustav BANERJEE[4], Sung Joo LEE[1#]
[1]*National University of Singapore, Singapore*, [2]*NanoElectronics, Institute Of Microelectronics, Singapore*, [3]*Institute of Microelectronics, Singapore*, [4]*Electrical and Computer Engineering, University of California Santa Barbara, United States*

I3-4 **The Detection of K+ with a G-rich DNA Aptamer-Based Silicon Nanowire Field-Effect Transistor**
Yi-Cheng LIN[1+], Ko-Shing CHANG[2], Chi-An DAI[1], Yit-Tsong CHEN[2#]
[1]*Department of Chemical Engineering, National Taiwan University, Taiwan*, [2]*Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan*

I3-5 **First Demonstration of Independently Controlled Stacked Gate MOSFET on a Single Si Nanowire**
Xiang LI[1#], Zhixian CHEN[2+], Navab SINGH[1], Patrick G.Q LO[1], Dim-Lee KWONG[1]
[1]*Institute of Microelectronics, Singapore*, [2]*NanoElectronics, Institute Of Microelectronics, Singapore*

I4 Nanowires for Energy II

Symposia List > Symposium I > I4

I4-1 Invited **Enhanced Power Conversion Efficiency in Hybrid and Dye-sensitized Solar Cells with Oriented TiO2 and ZnO Nanotubes and Nanorods**
Guozhong CAO[1#+]
[1]*Materials Science and Engineering, University of Washington, United States*

I4-2 **Aligned Semiconductor Oxide Nanostructures for Dye Sensitized Solar Cells**
Irene GONZALEZ-VALLS[1], Lola GONZALEZ-GARCIA[2], Belen BALLESTEROS[1], Frank GÜELL[3], Angel BARRANCO[2], Yu YOUHAI[1], Agustin GONZALEZ-ELIPE[2], Monica LIRA-CANTU[4#+]
[1]*CIN2 (CSIC), Spain*, [2]*Instituto de Ciencia de Materiales de Sevilla (CSIC-Univ. Sevilla),, Spain*, [3]*M-2E, IN2UB, Departament d'Electrònica, Universitat de Barcelona, Spain*, [4]*Laboratory of Nanostructured Materials for Photovltaic Energy, Centre d'Investigaciò en Nanociéncia i Nanotecnologia (CIN2, CSIC), Spain*

I4-3 Invited **Metal Oxide Nanowire Arrays for Photoelectrochemical Hydrogen Generation**
Yat LI[1#+]
[1]*University of California, Santa Cruz, United States*

I4-4 **Hierarchical Anatase-phase TiO2 Nanostructures: Fabrication and Function for Photoelectrochemical Water Splitting**
Fabio DI FONZO[1#+], Chuanwei CHENG[2], Andrea LI BASSI[3], Cesare SOCI[2,4], Hongjin FAN[2]
[1]*Center for Nano Science and Technology of the Italian Institute of Technology, Politecnico di Milano, Italy*, [2]*Division of Physics and Applied Physics, Nanyang Technological University, Singapore*, [3]*Department of Energy, Politecnico di Milano, Italy*, [4]*Electrical and Electronic Engineering, CNRS International Nanyang Technological University Thales Research Alliance, Singapore*

I4-5 Invited **Single Nanowire Electrochemical Devices**
Liqiang MAI[1,2#+]
[1]*State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, China*, [2]*Department of Chemistry and Chemical Biology, Harvard University, United States*

I5 Nanowire Growth Phenomena

Symposia List > Symposium I > I5

I5-1 Invited
Periodic Nanowire Structures
Erik P. A. M. BAKKERS[1,2#+]
[1]Eindhoven University of Technology, Delft University of Technology, Netherlands, [2]Philips Research Laboratories Eindhoven, Netherlands

I5-2
Y-junction GaAs Nanowires by a Novel VLS Growth Mechanism
Vaithianathan VEERAMUTHU[1+], Cesare SOCI[1,2#]
[1]Division of Physics and Applied Physics, Nanyang Technological University, Singapore, [2]Electrical and Electronic Engineering, CNRS International Nanyang Technological University Thales Research Alliance, Singapore

I5-3 Invited
Dislocation-driven Nanowire Growth: Nanowire Trees, Nanotubes, and Nanoplates
Jin SONG[1#+]
[1]Chemistry, University of Wisconsin-Madison, United States

I5-4
Atomically Thin BN Nanoribbons: Fabrication and Insulator-semiconductor Transition
Haibo ZENG[1#+]
[1]International Center for Materials Nanoarchitectonics, National Institute for Materials Science, Japan

I5-5
New Insight into Growth Mechanism of ZnO Nanowires Electrodeposited from Nitrate-based Solutions
Mohammad Reza KHAJAVI[1+], Ramon TENA-ZAERA[2#], Daniel John BLACKWOOD[1], German CABANERO[3]
[1]Materials Science and Engineering, National University of Singapore, Singapore, [2]New Materials, Centre for Electrochemical Technologies, Spain, [3]Centre for Electrochemical Technologies, Spain

I5-6
Lateral Growth of Sno2 Nanowires on R-cut Sapphire Substrate
Won-Sik KIM[1+], Daihong KIM[1], Seong-Hyeon HONG[1#]
[1]Department of Materials Science and Engineering, Seoul National University, South Korea

I6 Nanowires for Energy III

Symposia List > Symposium I > I6

I6-1 Invited
Nanogenerators for Self-powered Sensors and Piezotronics for Smart Systems
Z. L WANG[1#+]
[1]Georgia Institute of Technology, United States

I6-2
Why Putting Strain on Nanowires
Alois LUGSTEIN[1#+], Johannes GREIL[2], Matthias STEINMAIER[2], Andreas STEIGER-THIERSFELD[2], Emmerich BERTAGNOLLI[2]
[1]Solid State Electronics, Vienna University of Technology, Austria, [2]Vienna University of Technology, Austria

I6-3
Effect of Electrical Interfacial Resistances on Performances of Silicon Nanowire Based Thermoelectric Device
Yida LI[1#+], Kavitha BUDDHARAJU[1], Navab SINGH[1], Patrick G.Q LO[1], Sung Joo LEE[2]
[1]Institute Of Microelectronics, Singapore, [2]National University of Singapore, Singapore

I6-4 Invited
Approaching an Ideal Photocatalyst with Multi-hetero-nanostructures
Xiangfeng DUAN[1#+]
[1]University of California Los Angeles, United States

I6-5
Carrier Separation in Infrared Type-II Nanostructures: Case of Nanocrystals and Nanotetrapods
Doh Chang LEE[1#+], Istvan ROBEL[2], Jeffrey PIETRYGA[2], Victor KLIMOV[2]
[1]Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology, South Korea, [2]Los Alamos National Laboratory, United States

I6-6
Growth of Ge Nanowires for Nanoscale Memory Applications
Siddheswar MAIKAP[1#], Writam BANERJEE[1+], Ziaur Rahaman SK[1], S. MANNA[2], Samit K. RAY[2]
[1]Electronic Engineering, Chang Gung University, Taiwan, [2]Physics and Meteorology, Indian Institute of Technology Kharagpur, India

I7 High Resolution and In-situ Characterizations

Symposia List > Symposium I > I7

I7-1 Invited
Nanowire Imaging: Form and Function
Lincoln J. LAUHON[1#+]
[1]Materials Science and Engineering, Northwestern University, United States

I7-2
Nanoscale Free-carrier Profiling of Individual Semiconductor Nanowires by Infrared Near-Field Spectroscopy
Johannes STIEGLER[1#+], Andreas HUBER[2], Silke DIEDENHOFEN[3], Jaime GOMEZ RIVAS[3], Rienk ALGRA[4,5], Erik P. A. M. BAKKERS[4,6], Rainer HILLENBRAND[7]
[1]CIC nanoGUNE Consolider, Spain, [2]Neaspec GmbH, Germany, [3]FOM Institute AMOLF, c/o Philips Research Laboratories, Netherlands, [4]Eindhoven University of Technology, Delft University of Technology, Netherlands, [5]Philips Research Laboratories, Eindhoven, Netherlands, [6]Philips Research Laboratories Eindhoven, Netherlands, [7]Nanogune San Sebastian, Spain

I7-3 Invited
Nanoscale Silicide/silicon Interface and Device Engineering
Yu HUANG[1#+]
[1]Materials Science and Engineering, University of California, Los Angeles, United States

I7-4 **Semiconductor Surface Passivation by Direct Atomic Source Nitridation**
Shi Jie WANG[1#+]
[1]*Institute of Materials Research and Engineering, Singapore*

I8 III-V Nanowires

Symposia List > Symposium I > I8

I8-1 Invited **Ga-assisted MBE Grown GaAs Nanowires and Related Quantum Heterostructures for Solar Applications**
Anna FONTCUBERTA I MORRAL[1#+]
[1]*Ecole Polytechnique Fédérale de Lausanne, Switzerland*

I8-2 **Controlled Axial Polytypism in Single Binary and Ternary III-V Nanowires**
Philippe CAROFF[1#+], Jessica BOLINSSON[2], Sebastien PLISSARD[3], Xavier WALLART[1], Kimberly A. DICK[4]
[1]*Institute of Electronics, Microelectronics and Nanotechnology, France*, [2]*Solid State Physics, Lund University, Sweden*, [3]*TN / PSN, Eindhoven University of Technology, Netherlands*, [4]*Solid State Physics, Polymer and Materials Chemistry, Lund University, Sweden*

I8-3 **Growth Processes of InP with Wurtzite and Zinc Blende Structures on (111)A Surface**
Tomoki YAMASHITA[1#+], Toru AKIYAMA[1], Kohji NAKAMURA[1], Tomonori ITO[1]
[1]*Mie University, Japan*

I8-4 Invited **III-V nanowires: Growth, Properties and Applications**
Silvija GRADECAK[1#+]
[1]*Massachusetts Institute of Technology, United States*

I8-5 **Properties of Self-catalysed GaAs Nanowires Grown by Metal-organic Chemical Vapor Deposition**
S. Z. YU[1#+], J.R. DONG[1], Y.M. ZHAO[1], K. L. LI[1]
[1]*Suzhou Institute of Nanotech and Nano-bionics, Chinese Academy of Sciences, China*

I8-6 **InSb Nanowire Arrays and Growth Mechanisms**
Sebastien PLISSARD[1#+], George IMMINK[2], Marcel VERHEIJEN[2], Dorris SLAPAK[1], Tilman ZEHENDER[1], Erik P. A. M. BAKKERS[2,3]
[1]*TN / PSN, Eindhoven University of Technology, Netherlands*, [2]*Philips Research Laboratories Eindhoven, Netherlands*, [3]*Eindhoven University of Technology, Delft University of Technology, Netherlands*

I9 Nanowire Growth Control

Symposia List > Symposium I > I9

I9-1 Invited **Spatial Arranged ZnO Nanowires: Developing Technologies for Future Applications**
Margit ZACHARIAS[1#+]
[1]*Faculty of Engineering, IMTEK, Albert Ludwigs University of Freiburg, Germany*

I9-2 **Various Shaped ZnO Nanostructures and Their Applications to Optoelectronics**
Kiseok KIM[1], Jinju KIM[1], Mun Seok JEONG[1], Gun Young JUNG[2#+]
[1]*Gwangju Institute of Science and Technology, South Korea*, [2]*School of Materials Science and Engineering, Gwangju Institute of Science and Technology, South Korea*

I9-3 **SnO2 Nanorod Arrays: Low Temperature Growth, Surface Modification and Field Emission Properties**
Hui HUANG[1#+], Chiew Keat LIM[2], Man Siu TSE[1], Ooi Kiang TAN[1]
[1]*Division of Microelectronics, School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [2]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

I9-4 Invited **Semiconductor Nanowire Fabric**
Brian A. KORGEL[1#+]
[1]*Chemical Engineering, University of Texas at Austin, United States*

I9-5 **Growth and Manipulation of Low Temperature Grown Zinc Oxide Rods**
Alexandra SANTOS[1#+], Bess SINGIDAS[2], Roland SARMAGO[2]
[1]*University of the Philippines, Philippines*, [2]*National Institute of Physics, University of the Philippines, Philippines*

I9-6 **Tailoring of Electro-optical Properties Via Catalyst Doping in the Vls Grown ZnS Nanowires**
Shania REHMAN[1], Muhammad HAFEEZ[1], Umair MANZOOR[1], Arshad BHATTI[1#+]
[1]*Physics, COMSATS Institute of Information Technology, Pakistan*

I10 Photonic Applications of Nanowires

Symposia List > Symposium I > I10

I10-1 **Antireflective Nanostructures for Maximizing Optical Collection Efficiency of Photodetector and Photovoltaic Devices**
Jr-Hau HE[1#+]
[1]*Department of Electrical Engineering, National Taiwan University, Taiwan*

I10-2 **Modulating Resonance Modes and Q Value of a CdS Nanowire Cavity by Single Ag Nanoparticles**
Qing ZHANG[1#+], Xinyan SHAN[1], Chunxiao WANG[1], Ququan WANG[2], Jinfeng JIA[3], Qikun XUE[1]

[1]Department of Physics, Tsinghua University, China, [2]Department of Physics, Wuhan University, China, [3]Department of Physics, Shanghai Jiaotong University, China

I10-3 **Whispering Gallery Mode Lasing from Hexagonal ZnO Microdisks**

Rui CHEN[1+], Bo LING[2], Xiaowei SUN[2], Handong SUN[1#]
[1]Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, [2]Division of Microelectronics, School of Electrical and Electronics Engineering, Nanyang Technological University, Singapore

I10-4 **Nano Arrays of GaN/InGaN Heterostructures for High Efficiency Light-Emitting Diode**

Keyan ZANG[1#+], Ah Bian CHEW[1], Anna Marie YONG[1], Rayson TAN[2], Soo Jin CHUA[2]
[1]Institute of Material Research and Engineering, Singapore, [2]Design and Growth, Institute of Materials Research and Engineering, Singapore

I10-5 **Nanoscale n-ZnO/p-GaN Heterojunction Led Arrays Showing Wave-guided Emission**

Shrawan JHA[1#+], Oleksandr KUTSAY[1], Igor BELLO[1]
[1]City University of Hong Kong, Hong Kong SAR, China

I11 Optical Properties of Nanowires

Symposia List > Symposium I > I11

I11-1 **Ultrafast Charge Carrier Dynamics and Optical Properties in Zno Nanowire Arrays: Role of Native Defects and Surface States**

Mingjie LI[1+], Guichuan XING[1], Guozhong XING[1], Xinghai ZHANG[2], Tze Chien SUM[1#]
[1]Division of Physics and Applied Physics, Nanyang Technological University, Singapore, [2]Institute of Materials Research and Engineering, Singapore

I11-2 **Vertically Aligned ZnO-ZnGa2O4 Core-shell Nanowire Arrays: From Synthesis to Otical Properties**

Miao ZHONG[1#+]
[1]Mechanical Engineering, The University of Tokyo, Japan

I11-3 **ZnO Nanowire Arrays: Controllable Preparation and Effect of Annealing Temperature on Optical Properties**

Guoan TAI[1,2+], Kai WANG[1], Shu Ping LAU[1#], Wanlin GUO[2]
[1]Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong SAR, China, [2]Institute of Nanoscience, Nanjing University of Aeronautics and Astronautics, China

I11-4 **Phonons in Bi2S3 Nanowires: A Raman Scattering Study**

Yanyuan ZHAO[1+], Jun ZHANG[1], Zeping PENG[1], Chee Kwan GAN[2], Kun Ting Eddie CHUA[2], Qihua XIONG[3,4#]
[1]Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, [2]Materials Science and Engineering, Institute of High Performance Computing, Singapore, [3]School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, [4]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

I11-5 **Ultrafast Optical Spectroscopy of Semiconducting Nanowires and Heterostructures**

Tze Chien SUM[1#+], Guichuan XING[1], Guozhong XING[1], Mingjie LI[1], Sabyasachi CHAKRABORTTY[2], Song Wee NGIAM[1], Tom WU[1], Yin Thai CHAN[2]
[1]Division of Physics and Applied Physics, Nanyang Technological University, Singapore, [2]Department of Chemistry, National University of Singapore, Singapore

I11-6 **Temperature-dependent Photoluminescence Spectroscopy of Gallium Arsenide-Aluminum Gallium Arsenide Core-shell Nanowires on Si(100) and Si(111) Substrates**

Jasher John IBANES[1#+], Kaye Ann DE LAS ALAS[1], John Daniel VASQUEZ[1], Maria Herminia BALGOS[2], Rafael JACULBIA[1], Michael DEFENSOR[3], Regine LOBERTERNOS[3], Arnel SALVADOR[3], Armando SOMINTAC[2]
[1]Condensed Matter Physics Laboratory, Philippines, [2]National Insitute of Physics, Condensed Matter Physics Laboratory, Philippines, [3]National Institute of Physics, Condensed Matter Physics Laboratory, Philippines

I11-7 **Structure and Photoluminescence Properties of InGaN/GaN Multiple Quantum Wells Embedded in Nanorods**

Peng CHEN[1#+], Zhiguo YU[1], Guofeng YANG[1], Yuan GUO[1], QingFang MENG[1], Zi Li XIE[1], Bin LIU[1], Xiangqian XIU[1], Xuemei HUA[1], Hong ZHAO[1], Ping HAN[1], Yi SHI[1], Rong ZHANG[1], Youdou ZHENG[1]
[1]School of Electronic Science and Engineering, Nanjing University, China

I12 Nanowire for Sensors

Symposia List > Symposium I > I12

I12-1 Invited **Pushing the Detection Limit of Nanowire FET Biosensors**

Gengfeng ZHENG[1,2#+]
[1]Laboratory of Advanced Materials, Fudan University, China, [2]Department of Chemistry, Fudan University, China

I12-2 **Miniaturized Ionization Gas Sensors from Single Metal Oxide Nanowires**

Francisco HERNANDEZ-RAMIREZ[1#+], Juan Daniel PRADES[2], Angelika HACKNER[3], Thomas FISCHER[4], Gerhard MÜLLER[3], Sanjay MATHUR[5], Joan Ramon MORANTE[1]
[1]Advanced Materials, Catalonia Institute for Energy Research, Spain, [2]University of Barcelona, Spain, [3]EADS Innovation Works, Germany, [4]University of Cologne, Germany, [5]Institute of Inorganic and Materials, University of Cologne, Germany

I12-3 **Synthesis, Alignment and Fabrication of Metal Oxide Nanostructures on Non Conventional Substrates for Multifunctional Room Temperature Sensors**

Ghim Wei HO[1#+], Wei Li ONG[1], Zhihan LIM[2], Moe KEVIN[2], Shweta AGARWALA[2], Zhihan LEE[2], Gah Hung LEE[2]

[1]*Electrical and Computer Engineering, National University of Singapore, Singapore*, [2]*National University of Singapore, Singapore*

I12-4 **CMOS-compatible Silicon Nanowire-array Platform for Bio-marker Sensing and Stem-cell Differentiation**

Guosheng CHENG[1#+]
[1]*Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, China*

I12-5 **Nanoelectronic Detection of Triggered Secretion of Pro-inflammatory Cytokines Using CMOS Compatible Silicon Nanowires**

Tze Sian PUI[1#+], Ajay AGARWAL[1], Feng YE[2], Yinxi HUANG[2], Peng CHEN[2]
[1]*Bioelecronics Program, Institute of Microelectronics, Singapore*, [2]*Division of Bioengineering, Nanyang Technological University, Singapore*

I12-6 **Functionalized In2O3 Nanowires and Its Enhanced CO Sensing Responses**

Raju Kumar GUPTA[1+], Nandan SINGH[1], Pooi See LEE[1#]
[1]*School of Materials Science and Engineering, Nanyang Technological University, Singapore*

Symposia List > Symposium I > Posters (PO2)

I-PO2-1 **Half Metallic Spintronic Switch of Bimetallic Sandwich Molecular Wire Via the Control of External Electrical Field**

Shuo-Wang YANG[1#+], Haixia DA[2], Hongmei JIN[3], Kok Hwa LIM[1]
[1]*Computational Material Science and Engineering, Institute of High Performance Compating, Singapore*, [2]*School of Chemical and Biomedical Engineering,, Nanyang Technological University,, Singapore*, [3]*Computational Material Science and Engineering, Institute of High Performance Computing, Singapore*

I-PO2-2 **Cu4Bi4S9 Nanoribbons for Potential Low-cost Aboundant Energy Materials**

Hongxing LI[1+], Hongjin FAN[1#]
[1]*Division of Physics and Applied Physics, Nanyang Technological University, Singapore*

I-PO2-3 **White Light Emitting Single Compound Nanophosphors**

Karunakar NANDA[1#+], S. C. VANITHAKUMARI[2], Sanjaya BRAHMA[2], S. A. SHIVASHANKAR[2]
[1]*Materials Research Centre, Indian Institute of Science, India*, [2]*Indian Institute of Science, India*

I-PO2-4 **High-performance NiCo2O4 Nanofilm Photodetectors Fabricated by an Interfacial Assembly Strategy**

Linfeng HU[1+], Limin WU[1], Xiaosheng FANG[1#]
[1]*Department of Materials Science, Fudan University, China*

I-PO2-5 **Study of the ZnO Nanowire Arrays Growth Via Chemical Methods**

Yamin LEPRINCE-WANG[1#+], Tayeb BROURI[1], Salah BOUCHAIB[1], Martine CAPO-CHICHI[1], Kevin LAURENT[2], Julien LEOPOLDES[1], Dapeng YU[2]
[1]*LPMDI-CNRS FRE3300, Université Paris-Est, France*, [2]*Physics, Peking University, China*

I-PO2-6 **Synthesis of Indium-catalyzed Silicon Nanowires by Using Hot-wire Chemical Vapor Deposition Technique: The Role of Filament Temperature**

Su Kong CHONG[1#+], Boon Tong GOH[1], Zarina ASPANUT[1], Muhamad RASAT MUHAMAD[1], Chang Fu DEE[2], Saadah ABDUL RAHMAN[1]
[1]*Low Dimensional Materials Research Centre, Department of Physics, University of Malaya, Malaysia*, [2]*Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*

I-PO2-7 **Carbon Nanotube Thin-Film Field-Effect Transistors Fabricated with Pure Semiconducting Carbon Nanotubes**

Jingqi LI[1#+], Zhihong WANG[2], Xianbin WANG[2], Xixiang ZHANG[3]
[1]*Thin Film Center, Core Lab, King Abdullah University of Science and Technology, Saudi Arabia*, [2]*Nanofabrication Center, Core Lab, King Abdullah University of Science and Technology, Saudi Arabia*, [3]*King Abdullah University of Science and Technology, Saudi Arabia*

I-PO2-8 **From Vapor-liquid-solid to Wet Chemically Etched Silicon Nanowires**

Vladimir SIVAKOV[1#+], Felix VOIGT[2], Florian TALKENBERG[2], Björn HOFFMANN[2], Gerald BRÖNSTRUP[2], Matthias PIETSCH[3], Martin SCHREIVOGEL[2], Marina KULMAS[2], Arne BOCHMANN[2], Gottfried BAUER[4], Silke CHRISTIANSEN[3]
[1]*Semiconductor Nanostructures, Institute of Photonic Technology, Germany*, [2]*Institute of Photonic Technology, Germany*, [3]*Max Planck Institute for the Science of Light, Germany*, [4]*Institute of Physics, Carl-von-Ossietzky University, Germany*

I-PO2-9 **Optical Properties of Mbe-grown Gaas-algaas Core-shell Nanowires (nws) Grown on Si (111) Substrate with Pre-patterned Au Nanoparticles Using Anodized-aluminum-oxide (aao) Template**

Michelle SOMINTAC[1#+], Jasher IBANEZ[1], Rafael JACULBIA[2], Regine LOBERTERNOS[2], Michael DEFENSOR[2], Elmer ESTACIO[3], Arnel SALVADOR[2], Armando SOMINTAC[2]
[1]*National Institute of Physics, Condensed Matter Physics Laboratory, Philippines*, [2]*Condensed Matter Physics Laboratory, Philippines*, [3]*Research Center for Development of Far-Infrared Region, University of Fukui, Japan*

I-PO2-10 **Synthesis of Silicon Nanocoils by Post Annealing of Silicon Nanowire in Reducing Atmosphere**

Bhabani Sankar SWAIN[1+], Sung-Soo LEE[1], Sang-Hoon LEE[1], Bibhu Prasad SWAIN[2], Nong-Moon HWANG[1#]
[1]*Materials Science and Engineering, Seoul National University, South Korea*, [2]*Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, Japan*

I-PO2-11 **Epitaxial CdS Tripod Crystals on (001) Muscovite Mica: Synthesis, Characterization, and Device Application**

Muhammad Iqbal Bakti UTAMA[1+], Jun ZHANG[1], Shuangfeng JIA[2], Dehui LI[1], Rui CHEN[1], Handong SUN[1], Jianbo WANG[2], Qihua XIONG[3,4#]
[1]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University,*

Singapore, [2]*School of Physics and Technology, Center for Electron Microscopy and MOE Key Laboratory of Artificial Micro- and Nano-Structures, Wuhan University, China*, [3]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

I-PO2-12 **Time-resolved Photoluminescence Properties of GaN Nanotubes**

Galia POZINA[1#+], Sergey KHROMOV[1], Carl HEMMINGSSON[1]
[1]*Department of Physics, Chemistry and Biology, Linköping University, Sweden*

I-PO2-13 **Comparative Study of the One- and Two-photon Excited Photoluminescence from ZnO Single Crystal**

Tingchao HE[1+], Rui CHEN[1], Wenwen LIN[2], Tao CHEN[3], Feng HUANG[2], Handong SUN[1#]
[1]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [2]*Laboratory of Materials Chemistry and Physics, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, China*, [3]*Singapore Institute of Manufacturing Technology, Singapore*

I-PO2-14 **Synthesis, Characterization and Properties of Cnt-ZnO Hybrids**

Sameera IVATURI[1#+], Ravi BHATIA[2], Prasad VISHNUBHOTLA[1]
[1]*Department of Physics, Indian Institute of Science, India*, [2]*Department Physics, Indian Institute of Science, India*

I-PO2-15 **Exciton Dynamics in CdS Nanobelts**

Xinlong XU[1+], Yanyuan ZHAO[1], Handong SUN[1], Tze Chien SUM[2], Alfred Cheng Hon HUAN[2], Qihua XIONG[3,4#]
[1]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [2]*Division of Physics and Applied Physics, Nanyang Technological University, Singapore*, [3]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

I-PO2-16 **Junction Less Stackable SONOS Memory Realized on Vertical Si Nanowire**

Yuan SUN[1#+], Hong Yu YU[2], Navab SINGH[3], Kam Chew LEONG[4], Patrick G.Q LO[3], Dim-Lee KWONG[3]
[1]*Microelectronics, Institute of Microelectronics, Singapore*, [2]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [3]*Institute of Microelectronics, Singapore*, [4]*Global Foundries Singapore Private Limited, Singapore*

I-PO2-17 **Observation of Spin-orbit Splitting Band Transition by Photoconductivity Measurement of Single CdS Nanobelts**

Dehui LI[1+], Jun ZHANG[1], Qihua XIONG[2,3#]
[1]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [2]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [3]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

I-PO2-18 **Metallic Nanoparticle-Si Nanowire Heterostructures: Synthesis and Optical Properties**

Renjie CHEN[1+], Zeping PENG[1], Hailong HU[2], Muhammad Iqbal Bakti UTAMA[1], Kaushik GHOSH[3], Zexiang SHEN[2], Qihua XIONG[2,4#]
[1]*Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [2]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [3]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, Singapore*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

I-PO2-19 **Three-photon Absorption in Seeded CdSe/CdS Nanorod Heterostructures**

Guichuan XING[1+], Sabyasachi CHAKRABORTTY[2], Song Wee NGIAM[1], Yin Thai CHAN[2], Tze Chien SUM[1#]
[1]*Division of Physics and Applied Physics, Nanyang Technological University, Singapore*, [2]*Department of Chemistry, National University of Singapore, Singapore*

I-PO2-20 **Synthesis and Characterization of Copper Oxide Nanowires by Oxidation of Copper Films on Oxidized Silicon and Their Application in Alcohol Sensor**

Hardik PANDYA[1#+], Sudhir CHANDRA[2], Anoop Lal VYAS[1]
[1]*Instrument Design Development Centre, Indian Institute of Technology Delhi, India*, [2]*Centre for Applied Research in Electronics, Indian Institute of Technology Delhi, India*

I-PO2-21 **Characterization of Ordered Arrays of Low Dimensional Nanostructures Synthesized by Catalytic Etching**

Lay Theng TAN[1#+], Ming Hui HUANG[1], Ting Sheng CHONG[1], Chih Soon ONG[1], Thet Sun MYO[1], Qixun WEE[2], Chew Beng SOH[3], Soo Jin CHUA[4]
[1]*School of Engineering, Republic Polytechnic, Singapore*, [2]*Advanced Materials for Micro- and Nano-Systems, Singapore-Massachusetts Institute of Technology Alliance, Singapore*, [3]*Design and Growth, Institute of Materials Research and Engineering, Singapore*, [4]*Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

I-PO2-22 **Current-Voltage (I-V) Characteristic of Porous Silicon Nanostructures (PSiN) with Different Etching Time**

Ain Zubaidah MASLIHAN[1#+], Mohd Husairi FADZILAH SUHAIMI[2], N.I IKHSAN[3], M. RUSOP[4], S. ABDULLAH[3]
[1]*Faculty of Applied Science, Universiti Teknologi MARA Malaysia, Malaysia*, [2]*Faculty of Applied Sciences, Universiti Teknologi MARA, Malaysia*, [3]*School of Physics and Material Study, Faculty of Applied Sciences, Universiti Teknologi MARA, Malaysia*, [4]*NANO-ElecTronic Centre, Faculty of Electrical Engineering, Universiti Teknologi MARA, Malaysia*

I-PO2-23 **Vertical Silicon Nanowire Schottky Barrier Diodes with Dopant Segregation**

Wei Jie LU[1,2#+], Kin Leong PEY[3,4], Navab SINGH[5], Kam Chew LEONG[6], Patrick G.Q LO[5], Dim-Lee KWONG[5]
[1]*Institute of Microelectronics, Nanyang Technological University, Singapore*, [2]*Global Foundries Singapore Pte Ltd, Singapore*, [3]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [4]*Singapore University of Technology and Design, Singapore*, [5]*Institute of Microelectronics, Singapore*, [6]*Global Foundries Singapore Private Limited, Singapore*

I-PO2-24 **Temperature Dependence of the Electronic Structures and Optical Gain of GaNAsP/GaPN Quantum Well Grown on Si Substrate**

Przemyslaw BRZYKCY[1#+], WJ FAN[2]
[1]*Microelectronics, Nanyang Technological University, Singapore*, [2]*Nanyang Technological University, Singapore*

I-PO2-25 **Excitonic Staircase in One-dimensional Cds@tio2 and Cds@anatase@rutile Tio2 Heterostructures: Band-gap Alignment for Enhanced Photoelectrochemical Activity**

Jiangtian LI[1], Martin HOFFMANN[2], Hao SHEN[2], Cristian FÀBREGA[3], Juan Daniel PRADES[4], Teresa ANDREU[3], Francisco HERNANDEZ-RAMIREZ[3#+], Sanjay MATHUR[1]

[1]Institute of Inorganic and Materials, University of Cologne, Germany, [2]University of Cologne, Germany, [3]Advanced Materials, Catalonia Institute for Energy Research, Spain, [4]University of Barcelona, Spain

I-PO2-26 **In Situ Observation of the Single Crystalline Al2o3 Nanotube from Zno-al2o3 Core-shell Nanowire Heterostructure**

Chun-Wei HUANG[1+], Chun-Wen WANG[1], Cheng-Lun HSIN[1], Shih-Ying YU[1], Fu-Hsuan CHU[1], Wen-Wei WU[1#], Ping-Hung YEH[2]

[1]Department of Materials Science and Engineering, National Chiao Tung University, Taiwan, [2]Department of Physics, Tamkang University, Taiwan

I-PO2-27 **Electroluminescence from the Solution Grown Ga Doped ZnO Nanorods/P-Gan Heterojunction Light Emitting Diode**

Hong Quang LE[1#+], Laura Lynn LIEW[1], Soo Jin CHUA[2]

[1]Design and Growth, Institute of Materials Research and Engineering, Singapore, [2]Department of Electrical and Computer Engineering, National University of Singapore, Singapore

I-PO2-28 **Current-voltage Characteristic of Porous Silicon Nanostructures with Different Current Density**

Mohd Husairi FADZILAH SUHAIMI[1#+], Ain Zubaidah MASLIHAN[2], M. RUSOP[3], S ABDULLAH[4]

[1]Faculty of Applied Sciences, Universiti Teknologi MARA, Malaysia, [2]Faculty of Applied Science, Universiti Teknologi MARA Malaysia, Malaysia, [3]NANO-ElecTronic Centre, Faculty of Electrical Engineering, Universiti Teknologi MARA, Malaysia, [4]NANO-SciTech Centre (NST), Universiti Teknologi MARA, Malaysia

I-PO2-29 **Time-resolved Photoluminescence Spectroscopy of Core-shell Gaas/Algaas Nanowires Grown on Si(100) and Si(111) Substrates**

Maria Herminia BALGOS[1#+], Michael DEFENSOR[2], Rafael JACULBIA[3], Jasher John IBANES[3], Regine LOBERTERNOS[2], Fritz Christian AWITAN[1], Mae Agatha TUMANGUIL[1], Rhenish SIMON[1], Arnel SALVADOR[2], Armando SOMINTAC[1]

[1]National Insitute of Physics, Condensed Matter Physics Laboratory, Philippines, [2]National Institute of Physics, Condensed Matter Physics Laboratory, Philippines, [3]Condensed Matter Physics Laboratory, Philippines

I-PO2-30 **Analysis of Mbe Grown GaAs Nanowires on Si Substrates Via Raman Spectroscopy**

Rafael JACULBIA[1#+], Ramon DELOS SANTOS[1], Michael DEFENSOR[2], Arnel SALVADOR[2], Armando SOMINTAC[3]

[1]Condensed Matter Physics Laboratory, Philippines, [2]National Institute of Physics, Condensed Matter Physics Laboratory, Philippines, [3]National Insitute of Physics, Condensed Matter Physics Laboratory, Philippines

I-PO2-31 **A 2D Analytical Surface Potential Model of Multigate Silicon Nanowire Transistors For Biosensor Applications**

M.Karthigai PANDIAN[1#+], N.B. BALAMURUGAN[2]

[1]Electrical and Electronics Engineering, Velammal College of Engineering and Technology, India, [2]Electronics and Communication Engineering, Thiagarajar College of Engineering, India

I-PO2-32 **Growth of Ge Nanowires and Radial Heterojunctions for Optoelectronic Devices**

Samit K RAY[1#+], Sanatnu MANNA[2], Samaresh DAS[2], Rajkumar SINGHA[2], Suvraprakash MONDAL[2]

[1]Physics and Meteorology, Indian Institute of Technology Kharagpur, India, [2]Indian Institute of Technology Kharagpur, India

I-PO2-33 **In-situ Template Synthesis of ZnO Nanowires in Poly(3-hexylthiophene)**

Yi-Huan LEE[1#], Fan-Kai WEI[1+], Chi-An DAI[1]

[1]Department of Chemical Engineering, National Taiwan University, Taiwan

I-PO2-34 **Enhanced Ultraviolet Photocurrent Response from Rapid Thermal Annealed ZnO Nanowires**

Soumen DHARA[1+], P K GIRI[1#]

[1]Department of Physics, Indian Institute of Technology Guwahati, India

I-PO2-35 **Directed Assembly of Fluorescent Au-tipped CdSe Seeded CdS Nanorods**

Sabyasachi CHAKRABORTTY[1+], Guichuan XING[2], Yang XU[1], Song Wee NGIAM[2], Nimai MISHRA[1], Tze Chien SUM[2], Yin Thai CHAN[1#]

[1]Department of Chemistry, National University of Singapore, Singapore, [2]Division of Physics and Applied Physics, Nanyang Technological University, Singapore

I-PO2-36 **Short Circuit Diffusion and Quantum Confinement Study of a Single Ti-assisted ZnO Nanowire**

Hsuan -Jung HUNG[1], Chia-Liang CHENG[1], Yuan-Ron MA[1], Sheng Yun WU[1#+]

[1]Physics, National Dong Hwa University, Taiwan

I-PO2-37 **Light-induced Selective Deposition of Metals on Gold-Tipped CdSe Seeded CdS Nanorods**

Jie LIAN[1+], Xinheng LI[1], Ming LIN[2], Yin Thai CHAN[1#]

[1]Department of Chemistry, National University of Singapore, Singapore, [2]Materials Analysis and Characterisation, Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore

I-PO2-38 **Vertically Aligned Zn2SnO4/ZnO Heterojunction Nanowire Arrays for Dye-Sensitized Solar Cells**

Dong Wook KIM[1+], In-Sun CHO[2], Chin Moo CHO[3], Seong Sik SHIN[3], Hyun Soo HAN[3], Ju Sung KIM[3], Jun Hong NOH[3], Sangwook LEE[3], Kug Sun HONG[3#]

[1]Department of Materials Science and Engineering, Seoul National University, South Korea, [2]Stanford University, United States, [3]Seoul National University, South Korea

I-PO2-39 **Hot-wire Hydrogen Pre-treatment for the Passivation of c-Si Surface for Hit Solar Cells Applications**

Shahaji MORE[1#], Rajeev DUSANE[1+]

[1]Metallurgical Engineering and Material Science, Indian Institute of Technology Bomaby, India

I-PO2-40 **Synthesis of Free-standing ZnO Microribbons on Si Substrate with Au Clusters as Catalys**

Ray VARGAS[1#+], Roland SARMAGO[1]
[1]*National Institute of Physics, University of the Philippines, Philippines*

I-PO2-41 **MOCVD of GaSb and AlGaSb using a Horizontal Reactor**
Ari RAMELAN[1#+], Krystyna TOMSIA[2], Ewa GOLDYS[2]
[1]*Physics, Sebelas Maret University, Indonesia*, [2]*Physics, Macquarie University, Australia*

I-PO2-42 **Vacancy-induced d0 Ferromagnetism in Non-magnetic Potassium Substituted ZnO Nanowires**
Shyamsundar GHOSH[1#+], Gobinda Gopal KHAN[1], Kalyan MANDAL[2]
[1]*Material Sciences, S. N. Bose National Centre for Basic Sciences, India*, [2]*Materials Science, S. N. Bose National Centre for Basic Sciences, India*

I-PO2-43 **Vapor-liquid-solid Growth of Silicon Nanowires Fabricated by Electron Beam Evaporation**
Kai WANG[1#+], Kin Hung WONG[1]
[1]*Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong SAR, China*

I-PO2-44 **ZnO Nanostructure Growth by Two Step Aqueous Solution Method**
R. SIVAKUMAR[1#+], Punitha KULANDAISAMY[2], C. MUTHALVAN[1], C. SANJEEVIRAJA[2]
[1]*Directorate of Distance Education, Alagappa University, India*, [2]*Department of Physics, Alagappa University, India*

I-PO2-45 **Current Conduction Mechanism in p-CdTe/n-Si Hetero-structures**
Mahesha M G[1#+], Kasturi V BANGERA[2], Shivakumar G K[2]
[1]*Physics, Manipal University, India*, [2]*Physics, National Institute of Technology Karnataka Surathkal, India*

I-PO2-46 **Growth, Optical Properties, and Energy Applications of p-CuO/n-ZnO Heterostructure Nanowires**
Xinhong ZHAO[1], Peng WANG[1], Baojun LI[1#+]
[1]*Sun Yat-Sen University, China*

I-PO2-47 **Hybrid Light-emitting Diodes Based on Low-temperature Grown ZnO Nanorods and Organic Semiconductor**
Chi Man LUK[1#+], Yeung Yu HUI[1], Shu Ping LAU[1]
[1]*Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong SAR, China*

I-PO2-48 **Selective Area Growth of GaN Nanowires Using MOCVD on Nano-patterned Si(111) Formed by the Etching of Nano-sized Au Droplets**
BoRa YEOM[1+], Yong-ho RA[1], Min-Hee KIM[1], Rangaswamy NAVAMATHAVAN[1], Ji-Hyeon PARK[1], Jin-Soo KIM[1], Cheul-Ro LEE[1#]
[1]*School of Advanced Materials Engineering, Chonbuk National University, South Korea*

I-PO2-49 **Mechanism and Orientation Evolution of Tin Oxide Nanowire Arrays Growth**
Jun PAN[1#+], Hao SHEN[1], Qing ZHANG[2], Qihua XIONG[3,4], Sanjay MATHUR[5]
[1]*University of Cologne, Germany*, [2]*Department of Physics, Tsinghua University, China*, [3]*School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore*, [4]*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*, [5]*Institute of Inorganic and Materials, University of Cologne, Germany*

I-PO2-50 **Efficient Carrier Transfer in InAs/ Al0.9Ga0.1As QDs Structures Grown by Droplet Epitaxy**
Dmitry GULYAEV[1], Anna LYAMKINA[1#], Sergey MOSHCHENKO[1], Konstantin ZHURAVLEV[2+]
[1]*Rzhanov Institute of Semiconductor Physics Siberian Branch of Russian Academy of Sciences, Russian Federation*, [2]*Laboratory of Molecular Beam Epitaxy Growth of III-V Semiconductor, A.V. Rzhanov Institute of Semiconductor Physics, Russian Federation*

I-PO2-51 **Broad Surface State Lasing of Whispering-gallery Modes in Tin-doped Cadmium Sulfide Whiskers**
Ruibing LIU[1], Jinyou XU[2+], Xiujuan ZHUANG[1], Debing LI[3], Cun-Zheng NING[3], Anlian PAN[4#]
[1]*College of Physics and Microelectronics Science, Key Laboratory for Micro-Nano Physics and Technology of Hunan Province, Hunan University College of Physics and Microelectronics Science, China*, [2]*College of Physics and Microelectronics Science, Key Laboratory for Micro-Nano Physics and Technology of Hunan Province, Hunan University, China*, [3]*School of Electrical, Computer and Engergy Engineering, Arizona State University, United States*, [4]*Hunan University, China*

I-PO2-52 **Well-aligned ZnO Nanowires: Synthesis, Structure, Optical, and Electrical Transport Properties**
Fu-Hsuan CHU[1+], Chun-Wei HUANG[1], Chun-Wen WANG[1], Wen-Wei WU[1#], Ping-Hung YEH[2]
[1]*Department of Materials Science and Engineering, National Chiao Tung University, Taiwan*, [2]*Department of Physics,Tamkang University, Taiwan*

I-PO2-53 **Synthesis of Various ZnO Nanostructures for UV Detectors**
Chen-Yen KAO[1+], Chun-Wen WANG[1], Chun-Wei HUANG[1], Shih-Ying YU[1], Wen-Wei WU[1#]
[1]*Department of Materials Science and Engineering, National Chiao Tung University, Taiwan*

I-PO2-54 **The Dielectric Properties of SnO2 Nano-wires by THz Time-domain Spectroscopy**
Dongwook LEE[1#+], Chuanwei CHENG[1], Xingquan ZOU[2], Saritha Krishnankutty NAIR[1], Hongjin FAN[1], Elbert CHIA[1]
[1]*Division of Physics and Applied Physics, Nanyang Technological University, Singapore*, [2]*Division of Physics and Applied Physics, Nanyang Technologcial Universtiy, Singapore*

I-PO2-55 **Synthesis and Characterization of Tin Oxide Nanostructures**
Anima JOHARI[1], Vikas RANA[1#+], Mukesh CHANDRA[2]
[1]*Centre for Applied Research in Electronics, Indian Institute of Technology, India*, [2]*Department of Physics, Indian Institute of Technology Delhi, India*

I-PO2-56 **Fabrication of Efficient Light Scattering Functionalized Photoanode Using Well-aligned Zno Hemisphere Crystals for Dye-sensitized Solar Cells**
Ki Seok KIM[1+], Jinju KIM[1], Yusin PAK[1], Hui SONG[1], Gun Young JUNG[2#]
[1]*Gwangju Institute of Science and Technology, South Korea*, [2]*School of Materials Science and Engineering, Gwangju Institute of Science and Technology, South Korea*

I-PO2-57 **Suppressing the Lateral Growth of Gallium Nitride Nanowires by Introducing Hydrogen Plasma**

Tung-Hsien WU[1+], Franklin Chau-Nan HONG[1#], Chi-Jen WANG[2]
[1]*Department of Chemical Engineering, National Cheng Kung University, Taiwan*, [2]*EFUN Technology Co. Ltd, Taiwan*

I-PO2-58 **Vertically-aligned Gallium Nitride Nanowires Grown on Conductive Titanium Nitride Films**

Chih-Jui NI[1+], Tung-Hsien WU[1], Franklin Chau-Nan HONG[1#]
[1]*Department of Chemical Engineering, National Cheng Kung University, Taiwan*

I-PO2-59 **Study of Properties of Indium Mixed Zno Nanowires Synthesized by Using a Double Quartz Tube Method**

Ismardi ABRAR[1+], Chang Fu DEE[1#], Ille GEBESHUBER[1], Muhamad MAT SALLEH[1], Burhanuddin YEOP MAJLIS[1]
[1]*Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, Malaysia*