# 2017 IEEE 12th Nanotechnology Materials and Devices Conference (NMDC 2017)

Singapore 2 – 4 October 2017



IEEE Catalog Number: CFP17NMD-POD ISBN: 978-1-5386-2773-0

# Copyright $\odot$ 2017 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number: CFP17NMD-POD ISBN (Print-On-Demand): 978-1-5386-2773-0 ISBN (Online): 978-1-5386-2772-3

ISSN: 2378-377X

# **Additional Copies of This Publication Are Available From:**

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



**Session Mo2A** 

Date Monday, 2 October 2017

Time 11:00 - 12:30 Venue Changi Room 1

2D Materials I

Session Chair Takafumi UEMURA

Osaka University

Mo2A-1 P0329

11:00 - 11:30

Triboelectric Behavior in 2D Materials for Energy Harvesting and Sensor Applications...N/A

Sang-Woo KIM

Sungkyunkwan University (SKKU)

Mo2A-2 P0125 11:30 - 11:45

Conductivity Improvement of CVD Graphene through ITO Nanoparticles and Raman Characteristics...1

Naveen Harindu Hemasiri BASTIAN WADUGE, Jae-Kwan KIM and Ji-Myon LEE Sunchon National University

Mo2A-3 P0126 11:45 - 12:00

Structural and Electronic Properties of Ir-doped Zigzag Silicene Nanoribbons...3

Varun SHARMA and Pankaj SRIVASTAVA ABV-Indian Institute of Information Technology and Management

Mo2A-4 P0135 12:00 - 12:15

Sub-20nm All Two-dimensional Reconfigurable Transistors for Multi-valued Logic at Quantum Limits...N/A

Jinseong HEO, \*Seongjun PARK and \*\*Philip KIM Harvard University and Samsung Electronics \*Samsung Electronics

\*\*Harvard University

Mo2A-5 P0152 12:15 - 12:30

Bandgap Engineered Phosphorene based DG TFET...7

Md. Abdullah-Al- KAISER, Dip Joti PAUL and Quazi Deen Mohd KHOSRU

Bangladesh University of Engineering and Technology

**Session Mo2B** 

Date Monday, 2 October 2017

Time 11:00 - 12:30 Venue Changi Room 2

Energy Harvesting and Storage I

Session Wen J. LI

Chair City University of Hong Kong

Mo2B-1 P0333

11:00 - 11:30

Carbon Nanostructures on Silicon for High-Capacity and Long-Life Anode of Lithium Ion Battery...N/A Yonhua TZENG, Waileong CHEN, Yen-Ting PAN and Jiun-Chi LAI National Cheng Kung University

Mo2B-2 P0139

11:30 - 11:45

Polarization Charges in High Performance GaN/InGaN/GaN Core/Shell/Shell Nanowire for Solar Energy Harvesting...11

Soumya Ranjan ROUTRAY and Trupti Ranjan I FNKA

National Institute of Technology Silchar

Mo2B-3 P0191

11:45 - 12:00

Optimization of Piezoelectric Energy Harvesting Structure by Segmenting the Piezoelectric Layer(s)...13 Debarun BORTHAKUR, Srimanta BAISHYA, \*Sweta CHANDER and Koushik GUHA National Institute of Technology Silchar \*Indian Institute of Technology (Banaras Hindu University)

Mo2B-4 P0205

12:00 - 12:15

Systematic Study of Piezogenerators based on Vertical GaN Nanowires...N/A

Lu LU, Nicolas JAMOND, Elie LEFEUVRE, Lorenzo MANCINI, Francois JULIEN, Ali MADOURI, Noelle GOGNEAU and Maria TCHERNYCHEVA University Paris-Sud/Saclay

Mo2B-5 P0209

12:15 - 12:30

Design and Simulation of GaN/InGaN Core/Shell/Shell Radial Nanowires for Solar Energy Harvesting...17

Soumya Ranjan ROUTRAY and Trupti Ranjan LENKA

National Institute of Technology Silchar

**Session Mo2C** 

Date Monday, 2 October 2017

Time 11:00 - 12:30 Venue Changi Room 3

Nanoelectroncis I

Session Antonio Di BARTOLOMEO Chair University of Salerno

\_\_\_\_\_

Mo2C-1 P0260 11:00 - 11:30

Probing an Axial pn Junction in a Single GaN Nanowire at a Nanoscale\*...N/A

Zhihua FANG, \*Fabrice DONATINI, \*\*Bruno DAUDIN and \*Julien PERNOT

CEA/CNRS \*UGA/CNRS

\*\*CEA

Mo2C-2 P0145 11:30 - 11:45

Local Joule Heating in Electromigrated Au Nanowires Imaged by In Situ Atomic Force Microscopy...21

Mamiko YAGI and Jun-ichi SHIRAKASHI Tokyo University of Agriculture & Technology

Mo2C-3 P0124 11:45 - 12:00

Rapid Synthesis of mMonolayer Graphene and Its Use for Ultra-transparent Electrodes with Patterned Silver Nanowire Network...23

Maddumage Don Sandeepa Lakshad WIMALANANDA, Jae-Kwan KIM and Ji-Myon LEE Sunchon National University

Mo2C-4 P0140 12:00 - 12:15

High Frequency Characteristics of Printed Silver Nanowire Transmission Line...N/A

Yuuji KAKUYA, \*Dawei HU, \*Hirotaka KOGA and \*Katsuaki SUGANUMA Reserch Division 2 Soken Inc.

\*Osaka university

Mo2C-5 P0287 12:15 - 12:30

Optimization of Piezoresponse in ALD Al Doped ZnO Thin Films on Flexible Substrates for IoT Related Sensing Applications...27

Ayman REZK and Irfan SAADAT Masdar Institute

**Session Mo3A** 

Date Monday, 2 October 2017

Time **14:00 - 16:00**Venue **Changi Room 1** 

Photonics and Metamaterials

Session Sang-Woo KIM

Chair Sungkyunkwan University (SKKU)

Mo3A-1 P0308 14:00 - 14:30

Decision Making by Photonics...N/A

Makoto NARUSE, \*Atsushi UCHIDA and \*\*Song-Ju

KIM

National Institute of Information and Communications Technology

\*Saitama University

\*\*National Institute for Materials Science

Mo3A-2 P0306 14:30 - 15:00

Probing Light-Matter Interactions in Perovskite Crystals...N/A

Qihua XIONG

Nanyang Technological University

Mo3A-3 P0219

15:00 - 15:15

Photoluminescence and Structural Analysis of Samarium Doped TiO2 Thin Films and their Applications to Visible LEDs...31

Xinwei ZHAO, Mariko MURAYAMA, Sujun GUAN, Kensaku YODA, Keita SHIRAISHI, Takahiro ISHII and \*Shuji KOMURO Tokyo University of Science

\*Toyo University

Mo3A-4 P0291 15:15 - 15:30

Band Gap Engineering of Zinc substituted Cobalt Ferrite for Optoelectronic Applications...33

Sweety SUPRIYA, Sunil KUMAR and Manoranjan KAR

Indian Institute of Technology Patna

Mo3A-5 P0230

15:30 - 15:45

MoS2-based Imaging Sensor for Visible and Near Infrared...35

Yi XU and Lay-Kee ANG

Singapore University of Technology and Design

Mo3A-6 P0179 15:45 - 16:00

Poly (3, 3'''- dialkylquaterthiophene) Based Organic Thin Film Transistor Under Green Light Illumination...37

Chandan KUMAR, Gopal RAWAT, Hemant KUMAR, Yogesh KUMAR, Rajiv PRAKASH and Satyabrata JIT

Indian Institute of Technology (BHU) Varanasi

#### **Session Mo3B**

Monday, 2 October 2017 Date

Time 14:00 - 16:00 Changi Room 2 Venue

#### Biomedical I

Session Yee Sin ANG

Chair Singapore University of Technology and

Design

P0352 Mo3B-1

14:00 - 14:30

Micro-Volt Signal Amplification Circuits Based on Organic Thin-Film Transistors for Wireless Biosignal Monitoring Systems...N/A

Takafumi UEMURA, Shusuke YOSHIMOTO, Teppei ARAKI and Tsuyoshi SEKITANI Osaka University

Mo3B-2 P0351

14:30 - 15:00

Giving Optical Vision to Nanorobots: Scanning Microlenses for Super-resolution Imaging...N/A

City University of Hong Kong

Mo3B-3 P0116

15:00 - 15:15

Microfluidic Separation of Circulating Tumor Cells (CTCs) From Whole Blood...39

Daniel POENAR, \*Bhuvanendran Nair Gourikutty SAJAY and \*Chia-Pin CHANG Nanyang Technological University \*Institute of Microelectronics

Mo3B-4 P0136

15:15 - 15:30

Shrinking-Induced Silica Lamella For High-Molecular Weight DNA Extraction...N/A

Yi ZHANG, \*Ye ZHANG, \*\*Jeffrey M. BURKE, \*\*\*Kristin GLEITSMAN, \*Sarah M. FRIEDRICH,

\*\*Kelvin LIU and \*Tza-Huei WANG Nanyang Technological University

\*Johns Hopkins University, \*\*Circulomics Inc.

\*\*\*Pacific Biosciences Inc.

Mo3B-5 P0184

15:30 - 15:45

Silica Nanoparticle Based Label Free Impedance Immunosensor: Role of Particle Size in Sensitivity Enhancement...43

Naren DAS, Vasundhara DAMODARAN and Chirasree ROYCHAUDHURI Indian Institute of Engineering Science and

Technology

Mo3B-6 P0188

15:45 - 16:00

Effect of pH on the environmental-friendly fabrication of silver nanoparticles using rambutan peel extract...N/A

Siriporn PHONGTONGPASUK, Titika NORASINGSATORN and Niti YONGVANICH Silpakorn University

#### **Session Mo3C**

Monday, 2 October 2017 Date

Time 14:00 - 15:45 Venue Changi Room 3

#### Nanoelectronics II

Session James E. MORRIS Chair Portland State University

Mo3C-1 P0350

14:00 - 14:30

Graphene/Silicon Schottky Diodes for

Photodetection...45

Antonio Di BARTOLOMEO, Giuseppe LUONGO, Laura IEMMO, \*Filippo GIUBILEO, \*\*Gang NIU, \*\*\*Gregorz LUPINA and \*\*\*Thomas SCHROEDER University of Salerno

\*CNR-SPIN

\*\*Xi'an Jiaotong University

\*\*\*IHP Microelectronics

Mo3C-2 P0198

14:30 - 15:00

High Throughput Methods for Evaluating the Homogeneity of Nanomaterials for Nanoelectronics...47 Wei ZHAO, Donggi LI, Wenyun WU, Jin ZHANG, Bingyu XIA, Peng LIU, Yang WEI and Kaili JIANG Tsinghua University

Mo3C-3 P0147

15:00 - 15:15

Pattern Fabrication on Graphene via Dual Probe Local Anodic Oxidation...49

Sergio Alfredo GARNICA BARRAGAN, Soeren ZIMMERMANN and Sergei FATIKOW University of Oldenburg

Mo3C-4 P0160

15:15 - 15:30

Pt Nanogap Electode Fabricated by Two Layer Liftoff UV-NIL and Nanowire-breakdown Process...51

Kyouhei HASHIGUCHI, \*Kenta SUZUKI, \*Hiroshi HIROSHIMA and Hiroshi SUGA Chiba Institute of Technology (CIT) \*National Institute of Advanced Industrial Science

Mo3C-5 P0167

and Technology

15:30 - 15:45

Field Emission Properties of Ex-situ and In-situ Iron Catalyst-Grown Carbon Nanotubes...53

Yu Dian LIM, \*Dmitry GRAPOV, Shaomeng WANG, Beng Kang TAY, Sheel ADITYA and \*Vladimir **LABUNOV** 

Nanyang Technological University

\*Belarusian State University of Informatics and Radioelectronics

**Session Mo4A** 

Date Monday, 2 October 2017

Time 16:30 - 18:00 Venue Changi Room 1

Nanostructures I

Session Kaili JIANG

Chair Tsinghua University

Mo4A-1 P0309

16:30 - 17:00

Carbon Nanotube Based Optoelectronic Devices and Integrated Systems...N/A

Lian-Mao PENG, Yang LIU and Sheng WANG Peking University

Mo4A-2 P0164

17:00 - 17:15

Effects of nano-SiO2 doping on Tracking Growth and Thermal Accumulation in Silicone Rubber Insulation...56

Muhammad Tariq NAZIR, B. Toan PHUNG and \*Shengtao LI

University of New South Wales

\*Xi'an Jiaotong University

Mo4A-3 P0271

17:15 - 17:30

Graphene-based Al-Bi2O3 Nanoenergetic Films by Electrophoretic Deposition...58

Jordan GEESON, Clay STALEY, Sangho BOK, \*Rajagopalan THIRUVENGADATHAN, Keshab GANGOPADHYAY and Shubhra GANGOPADHYAY University of Missouri \*Amrita University

Mo4A-4 P0280

17:30 - 17:45

Improvement of the Electrical Properties of Polyimide Films with Silicon Nitride Nanoparticles...60 Sombel DIAHAM, François SAYSOUK and Marie-Laure LOCATELLI University of Toulouse, LAPLACE

Mo4A-5 P0285

17:45 - 18:00

Micro-, Nanostructure of Fine Crystalline Spots in Thin Amorphous Films Formed by Electron Beam in TEM...N/A

Vladimir KOLOSOV Ural Federal University **Session Mo4B** 

Date Monday, 2 October 2017

Time 16:30 - 18:00 Venue Changi Room 2

Modelling I

Session Ken Tye YONG

Chair Nanyang Technological University

Mo4B-1 P0346

16:30 - 17:00

Electron Emission, Andreev Transport and Valleytronics in 2D Dirac Materials...N/A

Yee Sin ANG

Singapore University of Technology and Design

Mo4B-2 P0119

17:00 - 17:15

Performance limits of monolayer 1TËŠ-ReS2 nanoscale MOSFETs...62

Amretashis SENGUPTA

Indian Institute of Engineering Science and

Technology, Shibpur

Mo4B-3 P0133

17:15 - 17:30

Physical Design and CAD Challenges for 3D ICs...N/A Khaled SALAH

Mentor

Mo4B-4 P0148

17:30 - 17:45

Molecular based Flash Cell for Low Power Flash Application: Optimization and Variability Evaluation...64 Vihar GEORGIEV, Laia VILA-NADAL, Leroy CRONIN and Asen ASENOV University of Glasgow

Mo4B-5 P0149

17:45 - 18:00

Effect of the Quantum Mechanical Tunneling on the Leakage Current in Ultra-scaled Si Nanowire Transistors...N/A

Salim BERRADA, Jaehyun LEE, Vihar GEORGIEV and Asen ASENOV University of Glasgow **Session Mo4C** 

Date Monday, 2 October 2017

Time 16:30 - 18:00 Venue Changi Room 3

Reliability and Safety

Session Chair Julien PERNOT

UGA/CNRS

Mo4C-1 P0353 16:30 - 17:00

Nanopackaging and EHS...N/A

James E. MORRIS
Portland State University

Mo4C-2 P0163 17:00 - 17:15

Atomistic to Circuit Level Modeling of Defective Doped SWCNTs with Contacts for On-Chip Interconnect Application...66

Jie LIANG, \*Jaehyun LEE, \*Salim BERRADA, \*Vihar GEORGIEV, \*Asen ASENOV, Nadine AZEMARD-CRESTANI and Aida TODRI-SANIAL CNRS-LIRMM/University of Montpellier \*University of Glasgow

Mo4C-3 P0168 17:15 - 17:30

Healing Pinhole Shorts for Applications using Intermetal Dielectric Films...68

Huafeng LIU, Xiaoxiao SONG, Qiu WANG, Wenjie WU, Ji FAN, Jinquan LIU and Liangcheng TU Huazhong University of Science and Technology

Mo4C-4 P0212 17:30 - 17:45

Stress-coupled Contact Resistance of Individual Metal Coated Polymer Spheres for Conductive Adhesive...70

Molly BAZILCHUK, Helge KRISTIANSEN, \*Zhiliang ZHANG and \*Jianying HE Conpart AS, NTNU

\*Norwegian University of Science and Technology

Mo4C-5 P0165 17:45 - 18:00

The NanoDefiner E-Tool - A Decision Support Framework for Recommendation of suitable Measurement Techniques for the Assessment of potential Nanomaterials...71

Raphael BRUNGEL, Johannes RUCKERT, \*Wendel WOHLLEBEN, \*\*Frank BABICK, \*\*\*Antoine GHANEM, \*\*\*\* Hubert RAUSCHER, Christoph M. FRIEDRICH and Stefan WEIGEL

University of Applied Sciences and Arts Dortmund (FH Dortmund)

BASF SE

\*\*Technical University Dresden (TU Dresden)

\*\*\*Solvay S.A.

\*\*\*\*European Commission, Joint Research Centre (JRC)

**Session Tu1A** 

Date Tuesday, 3 October 2017

Time **09:30 - 10:30**Venue **Changi Room 1** 

Oxide
Session Hong WANG

Chair Nanyang Tehnological University

Tu1A-1 P0117 09:30 - 09:45

Synthesis and Characterization of Metal Oxide Semiconductor Materials by a Facile Growth Method

for Photovoltaic Applications...73

Sunay TURKDOGAN and Bayram KILIC University of Yalova

-

Tu1A-2 P0120 09:45 - 10:00

Fully Transparent Indium-Free Oxide Electronics Entirely Deposited by Atomic Layer Deposition...N/A Husam ALSHAREEF and Zhenwei WANG KAUST

Tu1A-3 P0193

10:00 - 10:15

High Pressure-Induced Cleavage and Recrystallization of CH3NH3PbBr3 Perovskite Nanoparticles into Large Nanoplates...77 *Tingting YIN, Jiaxu YAN and Ze Xiang SHEN* Nanyang Technological University

Tu1A-4 P0214

10:15 - 10:30

Investigation on BOX and Its Effects on Electrical Characteristics of Tri-gate FinFET...N/A

Rajashree DAS, Rajesh SAHA and Srimanta BAISHYA

National Institute of Technology Silchar

#### **Session Tu1B**

Date Tuesday, 3 October 2017

Time **09:30 - 10:30**Venue **Changi Room 2** 

#### Nanoelectronics III

Session Ken OKANO

Chair International Christian University

Tu1B-1 P0178

09:30 - 09:45

Demonstration of a-InGaZnO TFT Nonvolatile Memory Using TiAlO Charge Trapping Layer...N/A Renrong LIANG, Wei ZHANG, Libin LIU, Jing WANG, Jun XU and Tian-Ling REN Tsinghua University

Tu1B-2 P0185

09:45 - 10:00

Lateral Conduction within CNT-based Planar Microcoils on Silicon Substrate...83

Zishan Ali SYED MOHAMMED, \*Kaushik GHOSH, Daniel POENAR and Sheel ADITYA Nanyang Technological University \*Institute of Nano Science & Technology

Tu1B-3 P0194

10:00 - 10:15

Modeling Graphene FET Frequency Doubler With Integrated Quantum Capacitance Effects Using Quartic Equation Technique...85

Hariharan S and Bala Tripura Sundari B Amrita UNiversity

Tu1B-4 P0206

10:15 - 10:30

Variability Study of High Current Junctionless Silicon Nanowire Transistors...87

Vihar GEORGIEV, Alexandru-Iustin DOCHIOIU, Fikru ADAMU LEMA, Salim BERADA, Muhammad MIRZA, Douglas PAUL and Asen ASENOV University of Glasgow **Session Tu2A** 

Date Tuesday, 3 October 2017

Time 11:00 - 12:30 Venue Changi Room 1

2D Materials II

Session Martin FOLDYNA

Chair CNRS, Ecole Polytechnique

Tu2A-1 P0207

11:00 - 11:30

Tuning Two-Dimensional Material Properties via Electrochemical Intercalation...N/A

Feng XIONG, \*Eilam YALON, \*Connor MCCLELLAN, \*Aditya SOOD, \*Jinsong ZHANG, \*Kenneth GOODSON, \*Eric POP and \*Yi CUI University of Pittsburgh \*Stanford University

Tu2A-2 P0195

11:30 - 11:45

Tuning the Electro and Optical Properties in 2D Materials by Layer Thickness and Stacking Configuration...N/A

Juan XIA, Jiaxu YAN and Ze Xiang SHEN Nanyang Technological University

Tu2A-3 P0227

11:45 - 12:00

Promoting the Yield and Crystallinity of Synthetic WS2 via Precursor Pretreatment...91

Mei Er PAM, \*Yumeng SHI, Hui Ying YANG and Lay Kee ANG

Singapore University of Technology and Design \*Shenzhen University

Tu2A-4 P0272

12:00 - 12:15

CVD Graphene Materials Integration: Pressure and Argon Sensor...93

Lina TIZANI and Irfan SAADAT Masdar Institute

Tu2A-5 P0282

12:15 - 12:30

Ionic Polymer Gated van der Waals Heterostructure Photodetectors...N/A

Jake D. MEHEW, Selim UNAL, Elias TORRES ALONSO, Gareth F. JONES, Saad FADHIL RAMADHAN, Monica F. CRACIUN and Saverio RUSSO

University of Exeter

**Session Tu2B** 

Date Tuesday, 3 October 2017

Time 11:00 - 12:30 Venue Changi Room 2

Energy and Storage II

Session Chair Masaki TANEMURA

Nagoya Institute of Technology

Tu2B-1 P0355 11:00 - 11:30

Plasmonics of Nanostructures, Graphene and Beyond...N/A

Kelvin J. A. OOI and Dawn T. H. TAN

Singapore University of Technology and Design

Tu2B-2 P0238 11:30 - 11:45

Surface Modification of LiCoO2 with Nano Li2SO4 for All-solid-state Lithium Ion Batteries using Li2S-P2S5 Glass-ceramics...95

Moonju CHO, Sungwoo NOH, Jinoh SON, Jongyeob PARK and Dongwook SHIN Hanyang University

Tu2B-3 P0239 11:45 - 12:00

Electrochemical Performance of All-solid-state Lithium-sulfur Batteries (ASSLSBs) with Sulfurbased Cathodes Prepared between Li2S-P2S5 Amorphous Solid Electrolytes using Mechanical Milling...N/A

Jong Yeob PARK, Jin Oh SON, \*Moonju CHO, \*Sunho CHOI and \*Dongwook SHIN University of Hanyang \*Hanyang University

Tu2B-4 P0263 12:00 - 12:15

PVDF, Barium Hexaferrites and rGO Nanocomposite for High Energy Density Capacitor...99

Sunil KUMAR, Sweety SUPRIYA and Manoranjan

Indian Institute of Technology Patna

Tu2B-5 P0307 12:15 - 12:30

Super Hydrophilic Nanotubular Surfaces for Enhanced Heat Flux...N/A

Prasanth RAVINDRAN and Jothi Prakash C G

Pondicherry Central University

**Session Tu3A** 

Date Tuesday, 3 October 2017

Time **14:00 - 16:00**Venue **Changi Room 1** 

MEMS/NEMS

Session Wei Lin LEONG

Chair Nanyang Technological University

Tu3A-1 P0357

Synthesis and Electronic Devices of Atom-thin Transition Metal Dichalcogenides...N/A

Zheng LIU

Nanyang Tehnological University

Tu3A-2 P0297 14:30 - 15:00

14:00 - 14:30

15:15 - 15:30

Radial Junction Solar Cells based on Silicon Nanowires...N/A

Mutaz AL-GHZAIWAT, Zuzana MRAZKOVA, Wanghua CHEN, \*Jean-Luc MAURICE, Ileana FLOREA, \*\* RUSLI, \*Pere ROCA I CABARROCAS and \*Martin FOLDYNA

Ecole Polytechnique
\*CNRS. Ecole Polytechnique

\*\*CINTRA, Nanyang Technological University

Tu3A-3 P0118 15:00 - 15:15

Closed Form Model for Switching Time of a Meander Hinged MEMS Switch with Beam Perforation Effect...103

Koushik GUHA, Krishna Lal BAISHNAB, \*Himangshu Jyoti GOGOI, Ananta Kumar BORAH and Naushad Manjoor LASKAR National Institute of Technology Silchar \*Indian Institute of Technology Guwahati

Tu3A-4 P0131

Low Resonant Frequency MEMS Mechanism based on Nonlinear Stiffness Beam...105

Shihao TANG, Ji FAN, Jinquan LIU, Wenjie WU and Liangcheng TU

Huazhong University of Science and Technology

Tu3A-5 P0240 15:30 - 15:45

New Analytical Model of Switching Capacitance for MEMS Shunt Perforated Switch...107

Koushik GUHA, Srimanta BAISHYA, Ananta

BORAH and \*Srinivasa Rao K
National Institute of Technology Silchar

\*KL University

Tu3A-6 P0276 15:45 - 16:00

Membranes of Organically Cross-Linked Gold Nanoparticles: Novel Materials for MEMS/NEMS Sensors and Actuators...109

Hendrik SCHLICKE, Clemens J. SCHROTER, Gregor T. DAHL, Matthias REBBER, Malte BEHRENS and Tobias VOSSMEYER University of Hamburg **Session Tu3B** 

Date Tuesday, 3 October 2017

Time **14:00 - 16:00**Venue **Changi Room 2** 

Modelling II

Session Lay-Kee ANG

Chair Singapore University of Technology and

Design

Tu3B-1 P0338

14:00 - 14:30

Low Temperature Growth of Transfer Free Graphene using a Novel Catalyst...N/A Riteshkumar VISHWAKARMA, Kazunari TAKAHASHI, Mona Ibrahim ARABY, Yuji WAKAMATSU, Golap KALITA, \*Mohamad Saufi ROSMI, \*\*Masashi KITAZAWA and Masaki TANEMURA

Nagoya Institute of Technology \*Universiti Pendidikan Sultan Idris

\*\*Olympus Co. Ltd.

Tu3B-2 P0347

14:30 - 15:00

Characterisation and Device Fabrication of Ultra-High Sensitive Photoconductors Using Nano-Layer A-Se and N-Doped Diamond...N/A

Joshua D. JOHN, Ichitaro SAITO, \*Tomoaki MASUZAWA, \*\*Daniel H.C. CHUA, \*\*\*Takatoshi YAMADA and Ken OKANO International Christian University

\*Shizuoka University

\*\*National University of Singapore

\*\*\*National Institute of Advanced Industrial Science and Technology

Tu3B-3 P0186

15:00 - 15:15

A Theoretical Study of Si Impacts on Novel Silicon-Carbon Cyclacenes...N/A

Behrooz MIRZA, Somayeh SOLEIMANI-AMIRI and Maziar MIRZA

Karaj Branch, Islamic Azad University

Tu3B-4 P0259

15:15 - 15:30

Vertically Stacked Lateral Nanowire Transistors: Optimisation for 5nm CMOS Technology...N/A Talib AL-AMERI

Glasgow University

Tu3B-5 P0200

15:30 - 15:45

Statistical Variability in 5 nm Vertically Stacked Lateral Si Nanowire Transistors...N/A

Talib AL-AMERI
Glasgow University

Tu3B-6 P0210

15:45 - 16:00

VOCs Monitoring using Microwave Capacitive Resonator and Conductive Polymer – MWCNTs Nanocomposites for Environmental Applications...115

Prince BAHOUMINA, Hamida HALLIL, Jean-Luc LACHAUD, \*Stephane BILA, \*\*Qing ZHANG, \*\*\*Emmanuelle PICHONAT, Corinne DEJOUS and

University of Bordeaux, Bordeaux INP, CNRS, IMS

\*University of Limoges

\*\*Nanyang Technological University

\*\*\*University Lille, CNRS, IEMN

#### **Session TuPS**

Date Tuesday, 3 October 2017

Time 16:30 - 18:30 Venue Changi Room 3

#### Poster Session

#### TuPS-1 P0226

Low-energy Transmission Electron Diffraction and Imaging of Large-area Graphene...N/A

Wei ZHAO, Bingyu XIA, \*Li LIN, Xiaoyang XIAO,
Peng LIU, Kaili JIANG and Shoushan FAN
Tsinghua University
\*Peking University

#### TuPS-2 P0201

Growth and Crystal Structure Investigation of Selfcatalyst InAs/GaSb Heterostructure Nanowires on Si Substrate...133

Ramesh Kumar KAKKERLA, \*Chih-Jen HSIAO, Deepak ANANDAN, Sankalp Kumar SINGH and Edward Yi CHANG National Chiao Tung University \*National Cheng Kung University

#### TuPS-3 P0340

Synthesis and Characterization of Zinc Oxide Nanoparticles for Application in the Detection of Fingerprints...N/A

Maribel GUZMAN, Betty FLORES, \*Loic MALET and \*Stephane GODET PUCP \*ULB

#### TuPS-4 P0182

LiCuVO4 as an Anode for Lithium-ion Batteries...N/A

Mudit MISHRA, Raghav RAJENDRAN NAIR and

\*M. V. REDDY

Anglo-Chinese School (Independent)

\*National University of Singapore

#### TuPS-5 P0237

Enhanced Electrochemical Properties of Sulfide based Glass-ceramics electrolyte for All Solid State Lithium Secondary Batteries by Oxide Substitution...N/A Jin Oh SON, Jong Yeob PARK, \*Moonju CHO, Chanhwi PARK and \*Dongwook SHIN University of Hanyang \*Hanyang University

#### TuPS-6 P0242

Role of Conductive Carbon in Composite Cathodes for All-solid-state Batteries using Sulfide Solid Electrolyte...N/A

Sungwoo NOH, William NICHOLS, Moonju CHO and Dongwook SHIN Hanyang University

#### TuPS-7 P0103

Self-Powered Fully-Flexible Light-Emitting System
Enabled by Flexible Piezoelectric Energy Harvester...N/A
Han Eol LEE, \*Chang Kyu JEONG, Dae Yong
PARK and Keon Jae LEE
Korea Advanced Institute of Science and
Technology
\*The Pennsylvania State University

#### TuPS-8 P0153

Quantum Mechanical Self Consistent Simulation and Analytical Modeling for C-V Characterization of High-K Gate AllnN/AlN/GaN MOS-HEMT Structure Featuring Negative Capacitance In AllnN Layer...163 Shoaib MAHMUD, Tyafur Rahman PATHAN and Quazi Deen Mohd KHOSRU Bangladesh University of Engineering and Technology

#### TuPS-9 P0262

Grain Size and Grain Boundary Effect on Dielectric Behavior of Nanocrystalline Cobalt ferrite...165 Sweety SUPRIYA, Sunil KUMAR and Manoranjan KAR Indian Institute of Technology Patna

#### TuPS-10 P0301

Measurements of Polyimide/Silicon Nitride Nanocomposite Interphase...117

Mohammed HOUSSAT, Nadine LAHOUD-DIGNAT, Jean-Pascal CAMBRONNE and Sombel DIAHAM University of Toulouse, LAPLACE

# TuPS-11 P0345

Spectroscopic Study of Cu Substituted Ni-Mg Nanoferrites Synthesized by Solution Combustion Route...N/A

Pradeep CHAVAN and L R NAIK Karnatak University Dharwad

# TuPS-12 P0129

Time Response Analysis of a Continuous Blood Glucose Monitoring System...119

Rajeeb TALUKDAR, Shreshtha BOHRA, Dip Jyoti BANIA, Krishna Lal BAISHNAB, Koushik GUHA and \*Srinivasa Rao K

National Institute of Technology Silchar \*KL University

# TuPS-13 P0141

One-step Silicon Substrate Through-wafer Etching Process for High Precision MEMS Application...121 Xiaochao XU, Wenjie WU, Huafeng LIU, Ji FAN, Jinquan LIU and Liangcheng TU Huazhong University of Science and Technology

#### TuPS-14 P0303

Nonlinear Broadband Piezo-Magneto-Elastic Energy Harvester in Bistable and Monostable Configurations...N/A

Krishnasamy M and Trupti Ranjan LENKA National Institute of Technology Silchar

# TuPS-15 P0326

Novel CMOS-MEMS Accelerometer with Fingered Differential LMGFET Architecture with Linear Response...125

Tony C THOMAS, V Susmitha REDDY and V SEENA

Indian Institute of Space Science and Technology

# TuPS-16 P0331

Polymer Piezoresistive MEMS Accelerometer with Integrated ITO...127

Saranya B T, Anjana C, Tina B S and V SEENA Indian Institute of Space Science and Technology

#### TuPS-17 P0166

Simulated Behavior of Planar-Helix Slow-Wave Structure Traveling-Wave Tube at Various Electron Beam Current...129

Yu Dian LIM, Shaomeng WANG, Beng Kang TAY and Sheel ADITYA
Nanyang Technological University

# TuPS-18 P0181

A Holistic Approach to Evaluate EMI Shielding Characteristics of Carbon Nanotube-based Polymer Composites....131

Sidhaarth MAHADEVAN, Suriyanarayanan RAMESH, Srigovindan GIRI and Rajagopalan THIRUVENGADATHAN Amrita University

### TuPS-19 P0302

Investigation of Barrier Dependent Absorption in InAs QDs for Ultra-high Efficiency Solar Cells...N/A

Srimurugan V, Clement Raj C and \*Prasanth RAVINDRAN

Pondicherry University

\*Pondicherry Central University

### TuPS-20 P0295

SPR Enhanced AC Magnetic Induction Magnetics Nanoparticles based Bio-chip...N/A

Chiu-Hsien WU and Zu-Yin DENG National Chung Hsing University

# TuPS-21 P0115

Morphology, Structural and Optical Analysis of Au Nanoparticle Assisted TiO2 Nanowires for Opto-Nanoelectronic Applications...137 Biraj SHOUGAIJAM, \*Chitralekha NGANGBAM and Trupti Ranjan LENKA

National Institute of Technology Silchar \*National Institute of Technology Manipur

#### TuPS-22 P0146

Influence of Copper Doping in Nanostructured ZnO Thin Films by Spin Coating...139

Niti YONGVANICH, Krittayot THONGKAEW,
Nongnapat YUANLAE, Supansa SAE-UNG and
Cheewita SUWANCHAWALIT
Silpakorn University

#### TuPS-23 P0248

Fabrication of ZnO Nanostructured Electrode on Seedless Substrate...N/A Md Faruk HOSSAIN, Hiroyuki OKADA and Shigeki NAKA University of Toyama

# TuPS-24 P0334

TNTs Formation in Aged Electrolyte and their Applications as Photocatalysts for Cr (VI) Reduction Under Visible Light...N/A

Muhammad Afiq ZULKIFLI, Mustaffa Ali Azhar TAIB, Nyein NYEIN, Nurulhuda BASHIROM, \*Tan Wai KIAN, \*Go KAWAMURA, \*Atsunori MATSUDA and Zainovia LOCKMAN Universiti Sains Malaysia \*Toyohashi University of Technology

# TuPS-25 P0233

A Study on the Electrically Controllable Terahertz Asymmetric Split Loop Resonator with an Outer Square Loop based on VO2...N/A Dae Jun PARK and Han Cheol RYU Sahmyook University

## TuPS-26 P0264

Solvent Annealing Process for Wide Bandgap Perovskite Solar Cells...143

SiSi CHU, Chenggan CHEN, \*Xingzhi DU and Hang ZHOU

**Peking University** 

\*Peking University Shenzhen Graduate School

# TuPS-27 P0231

Effect of Zirconium Addition on Phase Evolution of Chromium Zirconium Nitride Prepared by Magnetron Sputtering...N/A

Kumpon LEELARUEDEE, Patama VISUTTIPITUKUL, Hideyuki KUWAHARA and \*Niti YONGVANICH Chulalongkorn University

\*Silpakorn University

TuPS-28 P0104

A Porous Compound Substrate in SERS

Application...N/A

Tieli ZHOU and \*Weidong RUAN

Changchun University

\*Jilin University

#### TuPS-29 P0130

Template-free Synthesis of Cu Nanowires by a Low Temperature Decomposition-reduction

Process...N/A

Li DU, Guanglan LIAO and Tielin SHI Huazhong University of Science and Technology

#### TuPS-30 P0161

Crystal Structures and Magnetic Properties of Silica and Polyethylene Glycol (PEG-4000) – Encapsulated Zn0.5Ni0.5Fe2O4 Magnetic Nanoparticles...149

Januar WIDAKDO, Novita ISTIKHOMAH, Ande RIFIANTO, Edi SUHARYADI, \*Takeshi KATO and \*Satoshi IWATA

Universitas Gadjah Mada

\*Nagoya University

#### TuPS-31 P0162

Effect of Zn concentration on Crystal Structure and Magnetic Properties of ZnxNi1-xFe2O4 Nanoparticles Fabricated by Co-precipitation Method...151

Novita ISTIKHOMAH, Januar WIDAKDO, Ande RIFIANTO, Edi SUHARYADI, \*Takeshi KATO and \*Satoshi IWATA Universitas Gadjah Mada

\*Nagoya University

# TuPS-32 P0171

High Performance CO Oxidation Catalyst Based on Gas-phase Pd Nanoclusters Deposited on Alumina Powder...N/A

Anupam YADAV, \*Giuseppe SANZONE, Ting-Wei LIAO, Kuo-Juei HU, Saleh AGHAKHANI, Didier GRANDJEAN, \*Jinlong YIN and \*Kevin COOKE KU Leuven

\*Teer Coatings Ltd.

# TuPS-33 P0128

Irreversible n to p Transition and Corresponding Performance Improvement of RGO/TiO2NT Hybrid Gas Sensor Devices by Varying the Electrophoretic Deposition Time...155

Sanghamitra GHOSAL and Partha BHATTACHARYYA Indian Institute of Engineering Science & Technology

#### **Session We1A**

Date Wednesday, 4 October 2017

Time **09:30 - 10:30**Venue **Changi Room 1** 

#### Nanostructures II

Session Ze Xiang SHEN

Chair Nanyang Technological University

#### We1A-1 P0183

09:30 - 09:45

Filling Behavior and Mold Release Force in UV Nanoimprinting using PDMS Mold in Different Atmosphere...167

Kenta SUZUKI, Sung-Won YOUN and Hiroshi HIROSHIMA

National Institute of Advanced Industrial Science and Technology

# We1A-2 P0189

09:45 - 10:00

Microstructure Mapping by Fast Scanning Laue X-ray Nanodiffraction of TPS...N/A

Shang-Jui CHIU, Ching-Shun KU, Hsin-Yi LEE, Ching-Yu CHIANG and Chia-Hsien LIN National Synchrotron Radiation Research Center

#### We1A-3 P0199

10:00 - 10:15

Development of Zn-Al-Cr-O Spinel Ceramic Color Pigment Nanopowders by Pechini Method...169 Niti YONGVANICH, Jakkapop PHASTHASRI, Parimas MANOMAIPERMPOON and Krissana NOITHAI Silpakorn University

#### We1A-4 P0204

10:15 - 10:30

Effect of Sequential Addition of Precursor in Synthesis of Ag-Cu Nanoparticles...171

Krishna VADIRAJ KINHAL. Nirav BHATT and

Subramaniam PUSHPAVANAM Indian Institute of Technology Madras **Session We1B** 

Date Wednesday, 4 October 2017

Time **09:30 - 10:30**Venue **Changi Room 2** 

Nanoelectronics IV

Session Shunri ODA

Chair Tokyo Institute of Technology

We1B-1 P0213

09:30 - 09:45

Bi-layer Resistive Switching Memory Using Aligned SWCNTs as Electrodes...173

Chee Khing TAN, Kang ZHANG, \*Lugli PAOLO and Qing ZHANG

Nanyang Technological University \*Technical University of Munich

We1B-2 P0304

09:45 - 10:00

Ex-situ Plasma Doping of MoS2 Thin Films Synthesised by Thermally Assisted Conversion Process: Simulations and Experiment...175

Farzan GITY, \*Lida ANSARI, \*Scott MONAGHAN, \*Gioele MIRABELLI, \*Pasqualino TORCHIA, \*Alan HYDES and \*Michael SCHMIDT Tyndall National Institute \*University College Cork

We1B-3 P0180

10:00 - 10:15

SiGe Oxidation Kinetics and Oxide Density Measured by Resonant Soft X-Ray Reflectivity...177 Fabien ROZE, \*Patrice GERGAUD, \*\*Nicolas JAOUEN, Olivier GOURHANT, \*\*\*Elisabeth BLANQUET and \*Franħois BERTIN

\*CEA-LETI

\*\*Synchrotron Soleil

**STMicroelectronics** 

\*\*\*ŚIMaP

We1B-4 P0342

10:15 - 10:30

Reconfigurable NAND-NOR Circuits Fabricated by a CMOS Printing Technique...179

Andre HEINZIG, \*Sebastian PREGL, \*Jens TROMMER, Thomas MIKOLAJICK and \*Walter WEBER

Technische UniversitAxt Dresden (TUD)

\*Namlab gGmbH

**Session We2A** 

Date Wednesday, 4 October 2017

Time 11:00 - 12:30 Venue Changi Room 1

Special Session

Session Qing ZHANG

Chair Nanyang Technological University

We2A-1 P0270

11:00 - 11:30

Recent Advances in the Wireless Reading of

Passive Sensors...N/A

Herve AUBERT, Dominique HENRY and Patrick PONS

LAAS-CNRS

We2A-2 P0224

11:30 - 12:00

Carbon and Microwave-based Ultrasensitive Gas Sensors (CAMUS)...N/A

Hamida HALLIL, Corinne DEJOUS, Jean-Luc LACHAUD, Dominique REBIERE, \*Qing ZHANG, \*\*Philippe. COQUET, \*\*\*Stéphane BILA and et al. University of Bordeaux, Bordeaux INP, CNRS, IMS \*Nanyang Technological University \*\*CINTRA

\*\*\*XLIM

We2A-3 P0339

12:00 - 12:30

LIA LICS Active Nanostructures and MEMS for RF Micro-transducer Devices...N/A

Philippe PERNOD, \*Vladimir PREOBRAZHENSKY, Nicolas TIERCELIN, Abdelkrim TALBI, Olivier BOU MATAR, Yannick DUSCH, Stefano GIORDANO and et al.

LIA LICS, Institute of Electronics, Microelectronics and Nanotechnology (IEMN UMR 8520)
\*LIA LICS, Wave Research Center, A.M.Prokhorov GPI, RAS

**Session We2B** 

Date Wednesday, 4 October 2017

Time 11:00 - 12:30 Venue Changi Room 2

Modelling III

Session Rajagopalan THIRUVENGADATHAN

Chair Amrita University

We2B-1 P0305 11:00 - 11:30

Low Dimensional (0D, 1D, 2D) Devices for Future

Electronics...182 Shunri ODA

Tokyo Institute of Technology

We2B-2 P0192

11:30 - 11:45

Hydrogen-Bonding Evolution during the Polymorphic Transformations in CH3NH3PbBr3: Experiment and Theory...184

Jiaxu YAN, Tingting YIN and Ze Xiang SHEN Nanyang Technological University

We2B-3 P0266

11:45 - 12:00

Modelling of Perovskite/InGaAs Tandem Solar Cells...186

Xingzhi DU, \*Tao TANG, \*\*Yiming LIU and \*Hang ZHOU

Peking University Shenzhen Graduate School \*Peking University

\*\*University of Southern Denmark

We2B-4 P0286

12:00 - 12:15

k-p Transport Analysis of a Graphene Ribbon with Antidots in the Presence of Magnetic Field...188

Paolo MARCONCINI Universita' di Pisa

We2B-5 P0298

12:15 - 12:30

TCAD Assisted Analysis of Silicon Carbide based Fast Neutron Detector for Nuclear Applications...190 Shivang TRIPATHI, \*Chandrakant UPADHYAY, \*C.P. NAGARAJ, \*K. DEVAN, \*A. VENKATESAN and \*B.K. PANIGRAHI

Homi Bhabha National Institute

\*Indira Gandhi Centre for Atomic Research

**Session We3A** 

Date Wednesday, 4 October 2017

Time **14:00 - 16:00**Venue **Changi Room 1** 

**Organics** 

Session Daniel H.C. CHUA

Chair National University of Singapore

We3A-1 P0354

14:00 - 14:30

Stacking-Induced Novel Electro/Optoelectronic Properties In 2D Materials and Its Applications in Solar Cells...N/A

Solai Celis...IVA

Jiaxu YAN, Juan XIA and Ze Xiang SHEN Nanyang Technological University

We3A-2 P0218

14:30 - 14:45

Effect of Thermal Annealing on Electrical Stability of TIPS-Pentacene Flexible OFETs...192

Vivek RAGHUWANSHI, Deepak BHARTI, Ajay Kumar MAHATO, Ishan VARUN and Shree Prakash TIWARI

Indian Institute of Technology Jodhpur

We3A-3 P0278

14:45 - 15:00

Comprehensive Analysis of TIPS-Pentacene: Polymer Blend Organic Field-Effect Transistor for Device and Circuit Simulation...194

Ajay Kumar MAHATO, Deepak BHARTI, Vipin JOSHI, Vivek RAGHUWANSHI and Shree Prakash TIWARI

Indian Institute of Technology Jodhpur

We3A-4 P0245

15:00 - 15:15

The Effect of PC61BM Electrode Interlayer on Bandgap Tunable Perovskite Photodetectors...196 Wen LUO, Xiaote XU, Mei YUAN, \*Chuan LIU and Hang ZHOU
Peking University

We3A-5 P0250

\*Sun Yat-sen University

15:15 - 15:30

Electron-Transport Layer Free Perovskite Solar Cells with Anodized ITO Electrode...198

Zhujing ZHAN, \*Yang SHAO, \*Rong LIU, \*Xingzhi DU, \*Renzheng QIU, Shengdong ZHANG and Hang ZHOU

**Peking University** 

\*Peking University Shenzhen Graduate School

We3A-6 P0265 15:30 - 15:45

Optimizing Multiwall Carbon Nanotube Weight Ratio for Efficient Charge Transport in Hybrid TiO2 / Polymer Solar Cells...200

Thivakarasarma THURAISAMYKURUKKAL, Sumanthiran PRAISOODY, Prashanthan KARUNANANTHARAJAH and Ravirajan PUNNIAMOORTHY University of Jaffna

We3A-7 P0274

15:45 - 16:00

Capping IGZO Transistor with MAPbI3 Perovskite Light Absorber...202

Xiaote XU, Wen LUO, Mei YUAN, Songnan DU, \*Chuan LIU and Hang ZHOU
Peking University
\*Sun Yat-sen University

#### **Session We3B**

Date Wednesday, 4 October 2017

Time **14:00 - 15:45**Venue **Changi Room 2** 

#### Biomedical II

Session Hamida HALLIL

Chair University of Bordeaux, Bordeaux INP,

CNRS. IMS

We3B-1 P0356

14:00 - 14:30

Semiconductor Nanocrystals for Biophotonics...N/A

Ken Tye YONG

Nanyang Technological University

We3B-2 P0203

14:30 - 14:45

Surface Functionalization of Nanoporous PLGA Microparticles...204

Mohammad G. ABDALLAH, \*Muhammad YOUSUFUDDIN, Serkan YAMAN, Rayan KHAN, Young-Tae KIM and Samir M. IQBAL University of Texas at Arlington \*University of North Texas

We3B-3 P0290

14:45 - 15:00

Magnetic Controlled Gold Nanoparticle based SERS Bio-chip...N/A

Zu-Yin DENG and Chiu-Hsien WU National Chung Hsing University

We3B-4 P0220

15:00 - 15:15

Noise Spectroscopy Analysis for Estimation of Specific Biomolecule in Complex Mixture Using Solid State Nanopore...208

Naren DAS, \*A.M. JOSEPH and Chirasree ROYCHAUDHURI Indian Institute of Engineering Science and Technology

\*IIT Mumbai

We3B-5 P0232

15:15 - 15:30

Near-Infrared Metal-Enhanced Fluorescence Platforms based on Gold Nanostars...N/A

Ioannis THEODOROU, Zaynab JAWAD, Qianfan JIANG, Eric ABOAGYE, Alexandra PORTER, Mary RYAN and Fang XIE Imperial College London

We3B-6 P0267

15:30 - 15:45

Faraday Magneto-Optical Characteristics of Streptavidin Coated Fe3O4@Au Core-Shell Nanoparticles for Biomedical Assay...N/A

Kuen-Lin CHEN, Jian-Ming CHEN, Chiu-Hsien WU and Chien-Chung JENG National Chung Hsing University