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Table of Contents

Schedule of Events N/A

Session I. PLENARY 29-34

8:30 AM **Introduction and Awards**

I.-1 **Silicon Carbide Power Devices: A 35 Year Journey from Conception to Commercialization** 31
8:50 AM B. Jayant Baliga¹
¹North Carolina State University, 2410 Campus Shore Drive, Raleigh, NC 27606, USA

9:50 AM **Break**

I.-2 **The End of the Road for 2D Scaling of Silicon CMOS and the Future of Device Technology** 33
10:10 AM H.-S. Philip Wong
Dep. of Electrical Engineering and Stanford SystemX Alliance, Stanford University, Stanford, CA 94305, USA

Session II-A. MEMORY AND SWITCH DEVICES 35-42

II-A.-1 **Energy-Efficient Phase Change Memory Programming by Nanosecond Pulses** 37
11:30 AM Eilam Yalon, Kye Okabe, Christopher M. Neumann, H.-S. Philip Wong, Eric Pop
Electrical Engineering, Stanford University, Stanford, California 94305, USA

II-A.-2 **A Three-Terminal Edge-Triggered Mott Switch** 39
11:50 AM Ahmedullah Aziz¹, Roman Engel-Herbert², Sumeet Kumar Gupta^{1,2}, Nikhil Shukla³
¹Purdue University, West Lafayette, Indiana, 47907, USA; ²Pennsylvania State University, State College, Pennsylvania 16802, USA; ³University of Virginia, Charlottesville, Virginia 22903, USA

II-A.-3 **On the Possibility of Dynamically Tuning and Collapsing the Ferroelectric Hysteresis/Memory Window in an Asymmetric DG MOS Device: A Path to A Reconfigurable Logic-Memory Device** 41
12:10 PM Nujhat Tasneem, Asif I Khan
School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, 30332, USA

Session II-B. GaN DEVICES 43-50

II-B.-1 **A homogeneous and reproducible large-area, low dispersion GaN-on-Si normally-off 600 V transistor technology using selective GaN etching** 45
11:30 AM Patrick Waltereit¹, Marina Preschle¹, Stefan Müller¹, Lutz Kirste¹, Heiko Czap¹, Joachim Rüster¹, Michael Dammann¹, and Richard Reiner¹
Fraunhofer Institute for Applied Solid State Physics IAF, Tullastrasse 72, 79108 Freiburg, Germany

II-B.-2 **Thermal Performance Improvement of GaN-on-Diamond High Electron Mobility Transistors** 47
11:50 AM Marko J. Tadjer¹, Travis J. Anderson¹, James C. Gallagher², Peter E. Raad³, Pavel Komarov³, Andrew D. Koehler¹, Karl D. Hobart¹, and Fritz J. Kub¹
¹U.S. Naval Research Laboratory, 4555 Overlook Ave. SW, Washington, DC 20375, USA;
²American Society for Engineering Education Postdoctoral Fellow, 1818 N St. NW, Washington, DC 20036, USA; ³TMX Scientific, Richardson, TX, USA and Southern Methodist University, Dallas, TX, USA

II-B.-3 **Realization of the First GaN Based Tunnel Field-Effect Transistor** 49
12:10 PM Alexander Chaney¹, Henryk Turski¹, Kazuki Nomoto¹, Qingxiao Wang², Zongyang Hu¹, Moon Kim²,
Huili Grace Xing¹, Debdeep Jena¹
¹Cornell University, Ithaca, NY 14850, USA; ²University of Texas Dallas, Richardson, TX 75080

Session III-A. STEEP-SLOPE AND NC 2D DEVICES **51-58**

III-A.-1 **Steep-Slope Hysteresis-Free Negative-Capacitance 2D Transistors** 53
2:00 PM Peide D. Ye
INVITED School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47906

III-A.-2 **Sub-Thermionic Steep Switching in Hole-Doped WSe₂ Transistors** 54
2:40 PM Connor J. McClellan¹, Eilam Yalon¹, Lili Cai², Saurabh Suryavanshi¹, Xiaolin Zheng² and Eric Pop¹
¹Electrical Engineering, Stanford University, Stanford, CA 94305, USA; ²Mechanical Engineering,
Stanford University, Stanford, CA 94305, USA

III-A.-3 **High Performance, Sub-thermionic MoS₂ Transistors using Tunable Schottky**
3:00 PM **Contacts** 56
INVITED S. Bhattacharjee, K.L. Ganapathi, S. Mohan and N. Bhat
Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore, 560014, India

Session III-B. GaN AND III-V DEVICES **59-70**

III-B.-1 **1.1 kV vertical p-i-n GaN-on-sapphire diodes** 61
2:00 PM Sara E. Harrison¹, Qinghui Shao¹, Clint D. Frye¹, Lars F. Voss¹, and Rebecca J. Nikolić¹
¹Lawrence Livermore National Laboratory, 7000 East Ave, Livermore, CA 94550, USA

III-B.-2 **Vertical GaN-on-GaN p-n Diodes with 10-A Forward Current and 1.6 kV Breakdown Voltage** 63
2:20 PM J. Wang¹, L. Cao¹, J. Xie², E. Beam², C. Youtsey³, R. McCarthy³, L. Guido⁴, and Patrick Fay¹
¹University of Notre Dame, 275 Fitzpatrick Hall, Notre Dame, IN 46556, USA; ²Qorvo, 500 W.
Renner Rd., Richardson, TX 75080, USA; ³MicroLink Devices, 6457 W. Howard St, Niles, IL
60714, USA; ⁴Virginia Tech, 302 Whittemore, Blacksburg, VA 24061, USA

III-B.-3 **Novel approach for a monolithically integrated GaN cascode with minimized conduction and**
2:40 PM **switching losses** 65
H. Hahn¹, H. Yacoub¹, T. Zweipfennig¹, G. Lükens¹, S. Kotzea¹, A. Debald¹, A. Noculak², R.
Negra², H. Kalisch¹ and A. Vescan¹
¹Compound Semiconductor Technology, RWTH Aachen University, Sommerfeldstr. 18, 52074
Aachen, Germany; ²Chair of High Frequency Electronics, RWTH Aachen University, Kopernikusstr.
16, 52074 Aachen, Germany

III-B.-4 **All MOCVD grown 250 nm gate length Al_{0.70}Ga_{0.30}N MESFETs** 67
3:00 PM Hao Xue¹, Towhidur Razzak¹, Seongmo Hwang², Antwon Coleman², Sanyam Bajaj¹, Yuewei
Zhang¹, Zane Jamal-Eddin¹, Shahadat Hasan Sohel¹, Asif Khan², Siddharth Rajan¹, Wu Lu¹
¹Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio,
43210, USA; ²College of Engineering and Computing, University of South Carolina, 301 Main
Street Columbia, SC 29208

III-B.-5 **High Aspect Ratio Junctionless InGaAs FinFETs Fabricated Using a Top-Down Approach** 69
3:20 PM D. A. J. Millar¹, X. Li¹, U. Peralagu¹, M. J. Steer¹, I. M. Povey², G. Gaspar², M. Schmidt², P. K.
Hurley² and I. G. Thayne¹
¹School of Engineering, University of Glasgow, Glasgow, United Kingdom; ²Tyndall National Institute,
University College Cork, Lee Maltings, Dyke Parade, Cork, Ireland

- IV-A.-1**
4:00 PM **Tunable Random Number Generation Using Single Superparamagnet with Perpendicular Magnetic Anisotropy** 73
Punyashloka Debashis and Zhihong Chen
School of Electrical and Computer Engineering and Birck Nanotechnology Center Purdue University, West Lafayette, IN 47906, USA
- IV-A.-2**
4:20 PM **Large Room Temperature Charge-to-Spin Conversion Efficiency in Topological Insulator/CoFeB bilayers** 75
Qiming Shao¹, Guoqiang Yu¹, Lei Pan¹, Xiaoyu Che¹, Yabin Fan¹, Koichi Murata¹, Qing-Lin He¹, Tianxiao Nie¹, Xufeng Kou¹ and Kang L. Wang¹
¹Department of Electrical and Computer Engineering, University of California, Los Angeles, CA 90095, USA
- IV-A.-3**
4:40 PM
INVITED **Spin-based majority gates for logic applications** 77
Iuliana P. Radu
Imec, Leuven, B-3001, Belgium
- IV-A.-4**
5:20 PM **Domain Formation in Ferroelectric Negative Capacitance Devices** 79
M. Hoffmann¹, S. Slesazek¹ and T. Mikolajick^{1,2}
¹NaMLab gGmbH, Noethnitzer Str. 64, Dresden, D-01187, Germany; ²Chair of Nanoelectronic Materials, TU Dresden, Dresden, D-01069, Germany
- IV-A.-5**
5:40 PM **Insights on the DC Characterization of Ferroelectric Field-Effect-Transistors** 81
Matthew Jerry¹, Jeffrey A. Smith¹, Kai Ni¹, Atanu Saha², Sumeet Gupta², and Suman Datta¹
¹University of Notre Dame, Notre Dame, IN 46556, USA; ²Purdue University, West Lafayette, IN 47906, USA

- IV-B.-1**
4:00 PM
INVITED **Monolithic Integration of III-V on silicon for photonic and electronic applications** 85
S. Mauthe, H. Schmid, B. Mayer, S. Wirths, C. Convertino, Y. Baumgartner, L. Czornomaz, M. Sousa, P. Staudinger, H. Riel and K. E. Moselund
IBM Research Zurich, Säumerstrasse 4, 8803 Rüschlikon, Switzerland
- IV-B.-2**
4:40 PM **9 GHz passively mode locked quantum dot lasers directly grown on Si** 87
Songtao Liu¹, Justin C. Norman², Daehwan Jung³, MJ Kennedy¹, Arthur C. Gossard^{1,2,3} and John E. Bowers^{1,2,3}
¹Department of Electrical and Computer Engineering, University of California, Santa Barbara, California 93106, USA; ²Materials Department, University of California, Santa Barbara, California 93106, USA; ³Institute for Energy Efficiency, University of California, Santa Barbara, California 93106, USA
- IV-B.-3**
5:00 PM **Optical Gain and Loss Measurements of Semipolar III-nitride Laser Diodes with ITO/thin-p-GaN Cladding Layers** 89
Shlomo Mehari¹, Daniel A. Cohen¹, Daniel L. Becerrea¹, Claude Weisbuch^{1,2}, Shuji Nakamura^{1,3} and Steven P. DenBaars^{1,3}
¹Materials Department, University of California, Santa Barbara, California 93106, USA; ²Laboratoire de Physique de la Matière Condensée, CNRS, Ecole Polytechnique, 91128 Palaiseau, France; ³Electrical and Computer Engineering Department, University of California, Santa Barbara, California 93106, USA
- IV-B.-4**
5:20 PM **Efficient Metal-Halide Perovskite Micro Disc Lasers Integrated in a Silicon Nitride Photonic Platform** 91
P. J. Cegielski¹, S. Neutzner², C. Porschatis¹, M. Gandini², D. Schall¹, C. A. R. Perini², J. Bolten¹, S. Suckow¹, B. Chmielak¹, A. Petrozza², T. Wahlbrink¹, M. C. Lemme^{1,3}, A. L. Giesecke¹
¹AMO GmbH, Otto-Blumenthal-Straße 25, 52074 Aachen, Germany; ²CNST @Polimi, Istituto Italiano di Tecnologia, via Giovanni Pascoli 70/3, Milan, 20133, Italy; ³Chair, 52074 Aachen, Germany

5:40 PM

3 Gbps Free Space Optical Link Based on Integrated Indium Phosphide Transmitter 93
Hongwei Zhao, Sergio Pinna, Bowen Song, Ludovico Megalini, Simone Tommaso Suran Brunelli, Larry Coldren and Jonathan Klamkin
Electrical and Computer Engineering Department, University of California Santa Barbara, Santa Barbara, CA 93106 USA

Session V. POSTER SESSION

95-222

- P-1** **2D Ferroelectric CuInP_2S_6 : Synthesis, ReRAM, and FeRAM** 103
Pai-Ying Liao, Mengwei Si, Gang Qiu, Peide D. Ye
School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47906
- P-2** **CMOS Technology with Integrated Carbon-Nanotube Contact Plugs** 105
Clarissa Prawoto, Suwen Li and Mansun Chan
The Hong Kong University of Science and Technology, Kowloon, Hong Kong
- P-3** **Reliable High-Quality Metal-Embedded h-BN Contacts to p-type WSe₂** 107
Younghun Jung¹, Min Sup Choi², Abhinandan Borah¹, Ankur Nipane¹, Won Jong Yoo², James Hone¹, and James T. Teherani¹
¹Columbia University, New York, NY 10027, United States; ²Sungkyunkwan University, Suwon, Gyeonggi-do 16419, Republic of Korea
- P-4** **Quantifying the thermal boundary conductance of 2D-substrate interfaces** 109
Cameron J. Foss and Zlatan Aksamija
University of Massachusetts Amherst, 100 Natural Resources Way, Amherst, MA 01002
- P-5** **Ferroelectric Aluminum-Doped Hafnium Oxide for Memory Applications** 111
Hojoon Ryu, Kai Xu, Ji Guo, and Wenjuan Zhu
University Illinois at Urbana-Champaign, 208 North Wright Street, Urbana, IL 61801, USA
- P-6** **Self-powered Flexible Strain Sensor with Graphene/P(VDF-TrFE) Heterojunction** 113
Soaram Kim¹, Sean Gorman¹, Yongchang Dong², Apparao M. Rao², and Goutam Koley¹
¹Holcombe Department of Electrical and Computer Engineering, Clemson University, Clemson, SC 29634, USA; ²Department of Physics and Astronomy and Clemson Nanomaterials Institute, Clemson University, Clemson, SC 29634, USA
- P-7** **Annealing and Encapsulation of CVD-MoS₂ FETs with 10¹⁰ On/Off Current Ratio** 115
Yu.Yu. Illarionov^{1,2}, K.K.H. Smithe³, M. Walt¹, R.W. Grady³, S. Deshmukh³, E. Pop³, and T. Grasser¹
¹Institute for Microelectronics (TU Wien), Gusshausstrasse 27–29, 1040 Vienna, Austria; ²Ioffe Physical-Technical Institute, Polytechnicheskaya 26, 194021 St-Petersburg, Russia; ³Department of Electrical Engineering, Stanford University, Stanford, CA 94305, USA
- P-8** **All CVD Boron Nitride Encapsulated Graphene FETs** 117
H. Pandey¹, M. Shaygan², S. Sawallich³, S. Kataria¹, M. Otto², Z. Wang², M. Nagel³, D. Neumaier², M.C. Lemme^{1,2}
¹Chair of Electronic Devices, RWTH Aachen University, Otto-Blumenthal-Str. 2, 52074 Aachen, Germany ²AMO GmbH, Advanced Microelectronics Center Aachen, Otto-Blumenthal-Str. 25, 52074 Aachen, Germany; ³Protemics GmbH, Otto-Blumenthal-Str. 25, 52074 Aachen, Germany
- P-9** **Cockcroft-Walton Multiplier based on Unipolar Ag/HfO₂/Pt Threshold Switch** 119
Ahmedullah Aziz¹, Nikhil Shukla³, Alan Seabaugh⁴, Suman Datta⁴ and Sumeet Gupta^{1,2}
¹Purdue University, West Lafayette, IN, USA; ²Pennsylvania State University, University Park, PA, USA; ³University of Virginia, Charlottesville, VA, USA; ⁴University of Notre Dame, Notre Dame, IN, USA

- P-10 Low Power Nanoscale Switching of VO₂ using Carbon Nanotube Heaters 121**
Stephanie Bohaichuk,¹ Miguel Muñoz Rojo,¹ Gregory Pitner,¹ Connor McClellan,¹ Feifei Lian,¹ Jason Li,² Jaewoo Jeong,³ Mahesh Samant,³ Stuart Parkin,³ H.-S. Philip Wong,¹ Eric Pop¹
¹Stanford University, Stanford, CA 94305, USA; ²Asylum Research, Santa Barbara, CA 93117, USA; ³IBM Almaden Research Center, San Jose, CA 95120, USA
- P-11 Localized Heating in MoTe₂-Based Resistive Memory Devices 123**
Isha M. Datye, Miguel Muñoz Rojo, Eilam Yalon, Michal J. Mleczko, and Eric Pop
Electrical Engineering, Stanford University, Stanford, CA 94305, USA
- P-12 Unique Features of Electron Transport and Low-Frequency Noise in Quasi-One-Dimensional ZrTe₃ van der Waals Nanoribbons 125**
Adane K. Geremew¹, Matthew A. Bloodgood², Tina T. Salguero², Sergey Rumyantsev^{1,3} and Alexander A. Balandin¹
¹University of California at Riverside, 900 University Ave., Riverside, CA 92521 USA; ²University of Georgia, 140 Cedar Street, Athens, Georgia 30602 USA; ³Ioffe Physical-Technical Institute, St. Petersburg, 194021 Russia
- P-13 Epitaxial Gd₂O₃ on Si (111) Substrate by Sputtering to Enable Low Cost SOI 127**
Amita, K. R. Khiangte, A. Laha, S. Mahapatra and U. Ganguly
Indian Institute of Technology Bombay, India
- P-14 Modeling and Comparative Analysis of Hysteretic Ferroelectric and Anti-ferroelectric FETs 129**
K. Saha¹ and Sumeet K. G^{1,2}
¹Purdue Univ., W. Lafayette, IN, ²Penn State Univ., Univ. Park, PA, USA
- P-15 Thickness Tunable Transport Properties in MoTe₂ Field Effect Transistors 131**
Yuqi Zhu^{1,2}, Feng Zhang^{1,2}, and Joerg Appenzeller^{1,2}
¹Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana 47907, USA;
²Department of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana 47907, USA
- P-16 Modeling of electron transport in nanoribbon devices using Bloch waves 133**
Akash A. Laturia, Maarten L. Van de Put, Massimo V. Fischetti, and William G. Vandenberghe
The University of Texas at Dallas, 800 W. Campbell Rd., Dallas, Texas 75080, USA
- P-17 Effect of Gate Oxide Defects on Tunnel Transistor RF Performance 135**
M. Hellenbrand, E. Memisevic, J. Svensson, A. Krishnaraja, E. Lind, and L.-E. Wernersson
Lund University, Department of Electrical and Information Technology Ole Römers väg 3, 22363 Lund, Sweden
- P-18 A Vacuum Multi-Finger Transistor in CMOS Technology 137**
Shabnam Ghotbi, Hossein Pajouhi and Saeed Mohammadi
School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, 47907, USA
- P-19 Time Response of Polarization Switching in Ge Hafnium Zirconium Oxide Nanowire Ferroelectric Field-effect Transistors 139**
Sami Alghamdi, Wonil Chung, Mengwei Si, and Peide D. Ye
School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47906
- P-20 An Ultra Energy Efficient Neuron enabled by Tunneling in Sub-threshold Regime on a Highly Manufacturable 32 nm SOI CMOS Technology 141**
T. Chavan¹, S. Dutta¹, N.R. Mohapatra² and U. Ganguly¹
¹Indian Institute of Technology Bombay, Mumbai, India; ²Indian Institute of Technology Gandhinagar, Gujarat, India
- P-21 Investigation of Threshold Switch OFF-State Resistance on Performance Enhancement in 2D MoS₂ Phase-FETs 143**
Benjamin Grisafe and Suman Datta
University of Notre Dame, Notre Dame, IN 46545, USA

- P-22** **A wired-AND transistor: Polarity controllable FET with multiple inputs** 145
M. Simon^{1,2}, J. Trommer^{1,2}, B. Liang¹, D. Fischer³, T. Baldauf^{2,4}, M. B. Khan^{2,5}, A. Heinzig^{2,3},
M. Knaut^{2,3}, Y. M. Georgiev^{2,5}, A. Erbe^{2,5}, J. W. Bartha^{2,3}, T. Mikolajick^{1,2,3} and W. M. Weber^{1,2}
All Dresden, Germany: ¹NaMLab gGmbH, ²Center for Advancing Electronics Dresden (CfAED),
³Institute of Semiconductor and Microsystems Technology (IHM), TU Dresden, ⁴Faculty of
Electrical Engineering, University of Applied Sciences Dresden, ⁵Helmholtz-Zentrum Dresden-
Rossendorf (HZDR)
- P-23** **Nonlinearity Enhancement by Positive Pulse Stress in Multilevel Cell Selectorless RRAM Applications** 147
Ying-Chen Chen¹, Xiaohan Wu¹, Yao-Feng Chang², and Jack C. Lee¹
¹Department of Electrical and Computer Engineering, The University of Texas at Austin,
Austin, Texas, USA; ²Micron Technology, Inc., Boise, Idaho, USA
- P-24** **Fabrication and Characterization of a Fully Si Compatible Forming-Free GeOx Resistive Switching Random-Access Memory** 149
Jae Yoon Lee¹, Youngmin Kim¹, Ikhyeon Kwon², Il Hwan Cho², Jae Yeon Lee³, Soo Gil Kim³,
and Seongjae Cho¹
¹Department of Electronics Engineering, Gachon University, Seongnam-si, Gyeonggi-do 13120,
Republic of Korea; ²Department of Electronic Engineering, Myongji University, Yongin-si,
Gyeonggi-do 17058, Republic of Korea; ³R&D Division, SK hynix, Inc., Icheon-si, Gyeonggi-do
17336, Republic of Korea
- P-25** **An Improved 1T-DRAM Cell Using TiO₂ as the Source and Drain of an n-Channel PD-SOI MOSFET** 151
Dibyendu Chhatterjee and Anil Kottantharayil
Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai,
Maharashtra/400076, India
- P-26** **Multi-level 2-bit/cell operation utilizing Hf-based MONOS nonvolatile memory** 153
Sohya Kudoh¹ and Shun-ichiro Ohmi²
^{1,2}Department of Electrical and Electronic Engineering, Tokyo Institute of Technology J2-72, 4259
Nagatsuta, Midori-ku, Yokohama 226-8502, Japan
- P-27** **A FeFET Based Processing-In-Memory Architecture for Solving Distributed Least-Square Optimizations** 155
Insik Yoon¹, Muya Chang¹, Kai Ni², Matthew Jerry², Samantak Gangopadhyay¹, Gus Smith³,
Tomer Hamam¹, Vijaykrishnan Narayanan³, Justin Romberg¹, Shih-Lien Lu⁴, Suman Datta² and
Arijit Raychowdhury¹
¹Georgia Institute of Technology, Atlanta, GA 30318, USA; ²University of Notre Dame, Notre Dame,
IN 46556 USA; ³Pennsylvania State University, State College, PA 16801 USA; ⁴TSMC, Taiwan
- P-28** **Energy-Efficient, Two-Dimensional Analog Memory for Neuromorphic Computing** 157
Mohammad T. Sharbati, Yanhao Du and Feng Xiong
Dept. of ECE, University of Pittsburgh, 3700 O'Hara St., Pittsburgh, PA 15261 USA
- P-29** **Surface Passivated InN Nanowire and Graphene Heterojunction Based Memtransistor** 159
Ifat Jahangir^{1,2}, Md. A. Uddin³, A. K. Singh¹, A. Franken⁴, MVS Chandrashekar² and G. Koley⁵
¹Intel Corporation, Hillsboro, OR 97124, USA; ²Department of Electrical Engineering, University of
South Carolina, Columbia, SC 29208, USA; ³Micron Technology, Boise, ID 83716, USA; ⁴Midlands
Technical College, Columbia, SC 29203, USA; ⁵Nanoscale Electronics and Sensor Laboratory,
Clemson University, Anderson, SC, 29625, USA
- P-30** **Probing Self-Heating in RRAM Devices by Sub-100 nm Spatially Resolved Thermometry** 161
Sanchit Deshmukh, Miguel Muñoz Rojo, Eilam Yalon, Sam Vaziri, Eric Pop
Electrical Engineering, Stanford University, Stanford, CA 94305, U.S.A.
- P-31** **Gate Leakage in Non-Volatile Ferroelectric Transistors: Device-Circuit Implications** 163
Sandeep Krishna Thirumala¹ and Sumeet Kumar Gupta^{1,2}
¹Purdue Univ., W. Lafayette, IN; ²Penn State Univ., Univ. Park, PA, USA

- P-32 Development of hierarchical simulation framework for design and optimization of molecular based flash cell** 165
Vihar P. Georgiev
Device Modelling Group, School of Engineering, University of Glasgow, Glasgow, UK
- P-33 Mechanistic Analysis of Oxygen Vacancy Driven Conductive Filament Formation in Resistive Random Access Memory Metal/NiO/Metal Structures** 167
Handan Yildirim and Ruth Pachter
Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright-Patterson Air Force Base, Ohio 45433, USA
- P-34 Gate Controlled Majorana modes on 2D Quantum anomalous Hall Heterostructures** N/A
Nima Djavid¹, Gen Yin², Yafis Barlas¹, and Roger K. Lake¹
¹Department of Electrical engineering, University of California Riverside, Riverside 91521, USA;
²Department of Electrical engineering, University of California at Los Angeles, Los Angeles 90095, USA
- P-35 Room temperature resonant tunneling in metal-insulator-insulator-insulator-semiconductor devices** 171
J. Molina-Reyes and H. Uribe-Vargas
National Institute of Astrophysics, Optics and Electronics, Electronics Department. Luis Enrique Erro No.1, Santa Maria Tonantzintla, Puebla. C.P. 72840. Mexico
- P-36 Design of InP Segmented-collector DHBTs with Reduced Collector Transit Time τ_c for Large Power Bandwidth Power Amplifiers** 173
Yihao Fang¹, Jonathan P. Sculley², Miguel E Urteaga³, Andy D Carter³, Paul D. Yoder², and Mark J. W. Rodwell¹
¹Department of Electrical and Computer Engineering, University of California, Santa Barbara, 93106, USA; ²School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, 30332, USA; ³Teledyne Scientific and Imaging, 1049 Camino Dos Rios, Thousand Oaks, CA, 91360, USA
- P-37 High performance black phosphorus field-effect transistors with vacuum-annealed low-resistance Ohmic contact** 175
Hyunik Park, Jinho Bae, and Jihyun Kim
Department of Chemical and Biological Engineering, Korea University, Seoul 02841, South Korea
- P-38 Thermally Aided Nonvolatile Memory Using ReS₂ Transistors** 177
Natasha Goyal¹, David M. A. Mackenzie², Himani Jawa¹, Dirch H. Petersen² and Saurabh Lodha¹
¹Dept. of Electrical Engineering, IIT Bombay, Powai, Mumbai, India; ²Department of Micro- and Nanotechnology, DTU, 2800 Kongens Lyngby, Denmark
- P-39 Evaluating Performance of Dual-Gate InSe FETs** N/A
Himani Jawa, Sushovan Dhara, Kartikey Thakar, Sayantan Ghosh, and Saurabh Lodha
Department of Electrical Engineering, IIT Bombay, Mumbai, India
- P-40 Impact of calibrated band-tails on the subthreshold swing of pocketed TFETs** 181
Jasper Bizindavyi^{1,2}, Anne S. Verhulst², Bart Sorée^{1,2,3}, and Guido Groeseneken^{1,2}
¹Department of Electrical Engineering, KU Leuven, Kasteelpark Arenberg 10, 3001 Leuven, Belgium; ²imec, Kapeldreef 75, 3001 Leuven, Belgium; ³Department of Physics, Universiteit Antwerpen, Groenenborgerlaan 171, 2020 Antwerpen, Belgium
- P-41 Experimental Investigation of N-Channel Oxygen-Inserted (OI) Silicon Channel MOSFETs with High-K/Metal Gate Stack** 183
J.A. Smith¹, H. Takeuchi², R. Stephenson², Y.A. Chen², M. Hytha², R. J. Mears², and S. Datta¹
¹University of Notre Dame, Notre Dame, IN, USA; ²Atomera, Inc., Los Gatos, CA, USA;

- P-42** **2-Transistor Schmitt Trigger based on 2D Electrostrictive Field Effect Transistors** 185
Niharika Thakuria¹, Daniel Schulman², Saptarshi Das² and Sumeet Kumar Gupta^{1,2}
¹Purdue University, West Lafayette, IN; ²Penn State University, University Park, PA, USA
- P-43** **Three-Dimensionally Structured Betavoltaics** 187
John W. Murphy, Clint D. Frye, Fang Qian, John D. Despotopoulos, Roger A. Henderson, Qinghui Shao, Kareem Kazkaz, Lars F. Voss, and Rebecca J. Nikolic
Lawrence Livermore National Laboratory, 7000 East Ave., Livermore, CA 94550, USA
- P-44** **Flexible Thin-Film PZT Ultrasonic Transducers** 189
Tianning Liu¹, Jeong Nyeon Kim², Susan E. Trolrier-McKinstry¹, and Thomas N. Jackson¹
¹Center for Thin Film Devices and Materials Research Institute; ²Department of Engineering Science and Mechanics Penn State University, University Park 16802, USA
- P-45** **High-Sensitive and Selective Detection of Human-Infectious Influenza Virus Using Biomimetic Graphene Field-Effect Transistor** 191
T. Ono¹, T. Kawata¹, Y. Kanai¹, Y. Ohno^{1,2}, K. Maehashi^{1,3}, K. Inoue¹, Y. Watanabe⁴, S. Nakakita⁵, Y. Suzuki⁶, T. Kawahara⁶, and K. Matsumoto¹
¹Osaka University, 8-1 Mihogaoka, Ibaraki, Osaka 567-0047, Japan; ²Tokushima University, 2-1 Minamijosanjima, Tokushima, Tokushima 770-8506, Japan; ³Tokyo University of Agriculture and Technology, 2-24-16 Nakacho, Koganei, Tokyo 184-8588, Japan; ⁴Kyoto Prefectural University of Medicine, 465 Kajicho, Kawaramachi-Hirokoji, Kamigyo, Kyoto 602-8566 Japan; ⁵Kagawa University, 1750-1 Ikenobe, Mikicho, Kita-gun, Kagawa 761-0701 Japan; ⁶Chubu University, 1200 Matsumotocho, Kasugai, Aichi 487-8501, Japan
- P-46** **Color-Filtered Si Photodiode Array for On-Chip Calcium Imaging in Living Cells** 193
Z. Xiong¹, F.-J. Hwang², D. Mao¹, G.-L. Li¹ and G. Xu¹
¹Department of Electrical and Computer Engineering, ²Department of Biology, University of Massachusetts, Amherst, MA, 01003, USA
- P-47** **Optoelectronics based on Vertical Transport in Multi-layer MoS₂** 195
Shubhadeep Bhattacharjee, Pranandita Biswas, Swanand Solanke, Rangarajan Muralidharan, Digbijoy Nath, Navakanta Bhat
Centre For Nano Science and Engineering, Indian Institute of Science, Bangalore
- P-48** **Tunnel junctions for two-color nitride light emitting diodes and laser diodes grown by plasma assisted molecular beam epitaxy** 197
C. Skierbiszewski^{1,2}, H. Turski¹, M. Zak¹, K. Nowakowski-Szkudlarek¹, G. Muziol¹, M. Siekacz¹, A. Feduniewicz-Zmuda¹, M. Sawicka¹
¹Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland; ²Top-GaN Ltd., Sokolowska 29/37, 01-142 Warsaw, Poland
- P-49** **Redefining Responsivity in Graphene-based Schottky Diodes** 199
S. Riazimeher¹, S. Kataria¹, J. M. González², M. Shaygan³, S. Suckow³, O. Engström³, F. J. G. Ruiz², A. Godoy², M. C. Lemme^{1,3}
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- P-50** **First demonstration of vacuum-sealed fully integrated BEOL-compatible field emission devices for Si integrated high voltage applications** 201
Nishita Deka, Vivek Subramanian
Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, CA 94720, USA

- P-51 High Voltage Vertical Gallium Nitride Pseudo-Junction-Barrier-Schottky Diode with Ion Implantation 203**
Sizhen Wang¹, Alex Q. Huang²
¹North Carolina State University, Raleigh, NC 27606, USA; ²The University of Texas at Austin, Austin, TX 78712, USA
- P-52 Fast Recovery Performance of β -Ga₂O₃ Trench MOS Schottky Barrier Diodes 205**
Akio Takatsuka¹, Kohei Sasaki^{1,2}, Daiki Wakimoto^{1,2}, Quang Tu Thieu¹, Yuki Koishikawa^{1,2}, Jun Arima³, Jun Hirabayashi³, Daisuke Inokuchi³, Yoshiaki Fukumitsu³, Akito Kuramata^{1,2}, and Shigenobu Yamakoshi^{1,2}
¹Novel Crystal Technology, Inc., 2-3-1 Hirosedai, Sayama-shi, Saitama, 350-1328 Japan; ²Tamura Corporation, 2-3-1 Hirosedai, Sayama-shi, Saitama, 350-1328 Japan; ³TDK Corporation, 2-15-7, Higashi-Ohwada, Ichikawa-shi, Chiba, 272-8558 Japan
- P-53 Theory and Design of Electron Blocking Layers for III-N Based Laser Diodes by Numerical Simulation 207**
Karan Mehta, Yuh-Shiuan Liu, Jialin Wang, Hoon Jeong, Theeradetch Detchprohm, Young Jae Park, Shyh-Chiang Shen, Russell D. Dupuis, and P. Douglas Yoder
Georgia Institute of Technology, Atlanta, GA 30332 USA
- P-54 A unified current-voltage and charge-voltage model of quasi-ballistic III-nitride HEMTs for RF applications 209**
Kexin Li and Shaloo Rakheja
Department of Electrical and Computer Engineering, New York University, Brooklyn, NY 11201, USA
- P-55 GaN Lateral Schottky Diodes with High Baliga's Figure-of-Merit Utilizing Self-Terminated, Low Damage Anode Recessing Technology 211**
J. Gao^{1,2}, Y. Jin^{1,2}, B. Xie², C. P. Wen², Y. Hao² and M. Wang²
¹School of Electronic and Computer Engineering, Peking University Shenzhen Graduate School, Shenzhen 518055, China; ²Institute of Microelectronics, Peking University, Beijing 100871, China
- P-56 The Impact of Substrates on the Performance of Top-Gate β -Ga₂O₃ Field-Effect Transistors: Record High Drain Current of 980 mA/mm on Diamond 213**
Jinhyun Noh, Mengwei Si, Hong Zhou, Marko J. Tadjer, and Peide D. Ye
¹School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, 47907, USA; ²U.S. Naval Research Laboratory, Washington, D.C., 20375, USA
- P-57 Enhancement-mode Al_{0.45}Ga_{0.55}N/Al_{0.3}Ga_{0.7}N High Electron Mobility Transistor with p-Al_{0.3}Ga_{0.7}N Gate 215**
E. A. Douglas, B. Klein, A. Allerman, A. G. Baca, T. Fortune, and A. M. Armstrong
Sandia National Laboratories, PO Box 5800 Albuquerque, NM 87185, USA
- P-58 710 V Breakdown Voltage in Field Plated Ga₂O₃ MOSFET 217**
Ke Zeng, Abhishek Vaidya, and Uttam Singiseti
Electrical Engineering Department, University at Buffalo (SUNY), Buffalo, NY, 14260, USA
- P-59 Nanoscale Scanning Probe Thermometry of TaO_x-based selector devices 219**
Dasheng Li¹, Georg Ramer², Phoebe Yeoh¹, Brian Hoskins², Yuanzhi Ma¹, James A. Bain¹, Andrea Centrone² and Marek Skowronski¹
¹Carnegie Mellon University, 5000 Forbes Ave, Pittsburgh, PA 15213, USA; ²Center for Nanoscale Science and Technology, National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899, USA

- P-60** **(Late News) Enhanced P-type Behavior in 2D WSe₂ via Chemical Defect Engineering** 221
 Amrutesh Rai^{1*}, Jun Hong Park^{2,3,4*}, Chenxi Zhang⁵, Iljo Kwak⁴, Steven Wolf⁴, Suresh Vishwanath⁶, Xinyu Lin⁷, Jacek Furdyna⁷, Huili Grace Xing⁶, Kyeongjae Cho⁵, Andrew C. Kummel^{4,8}, and Sanjay K. Banerjee¹
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Session VI PLENARY

223-226

- VI.-1** **Recent Progress in Spintronics and Devices** 225
8:00 AM Kang L. Wang
 Departments of Electrical and Computer Engineering, Materials Science and Engineering, Physics and Astronomy, University of California, Los Angeles, CA 90095, USA
- VI.-2** **Frontiers of Information Technology**
9:00 AM Heike Riel
 IBM

Session VII-A. 2D ELECTRONIC DEVICES I

227-236

- VII-A.-1** **Doping-free complementary inverter enabled by 2D WSe₂ electrostatically-doped reconfigurable transistors** 229
10:30 AM Giovanni V. Resta¹, Yashwanth Balaji^{2,3}, Dennis Lin², Iuliana P. Radu², Francky Catthoor^{2,3}, Pierre-Emmanuel Gaillardon⁴ and Giovanni De Micheli¹
¹Integrated System Laboratory (LSI) EPFL, Switzerland; IMEC, Belgium; KU Leuven, Belgium; ²Laboratory of NanoIntegrated Systems (LNIS), ³University of Utah, USA
- VII-A.-2** **First Demonstration of WSe₂ CMOS Inverter with Modulable Noise Margin by Electrostatic Doping** 231
10:50 AM Chin-Sheng Pang and Zhihong Chen
 ECE Dept & Birck Nanotechnology Center, Purdue University, W. Lafayette, IN
- VII-A.-3** **Variability in synthetic MoS₂ devices: Effect of the growth substrate** 233
11:10 AM Abdullah Alharbi¹, Davood Shahrjerdi^{1,2}
¹Electrical and Computer Engineering Department, New York University, Brooklyn, NY, 11201, ²Center for Quantum Phenomena, Physics Department, New York University, New York, NY
- VII-A.-4** **2D RF Electronics: from devices to circuits – challenges and applications** 235
11:30 AM D. Fadil¹, W. Wei¹, E. Pallecchi¹, M. Anderson², J. Stake², M. Deng³, S. Fregonese³, T. Zimmer³,
INVITED H. Happy¹
¹University of Lille, IEMN, CNRS UMR8520, Avenue Poincaré – CS 60069, 59652 Villeneuve d'Ascq, France; ²Department of Microtechnology and Nanoscience, Chalmers University of Technology, SE-412 96 Gothenburg, Sweden University of Bordeaux, IMS, CNRS UMR 5218, Bât. A31, 351 Cours de la Libération, 33400 Talence, France

Session VII-B. NEUROMORPHIC AND QUANTUM DEVICES

237-243

- VII-B.-1** **Drift-enhanced Unsupervised Learning with PCM Synapses** 239
10:30 AM Yuhan Shi¹, Sangheon Oh¹, Xin Liu¹, and Duygu Kuzum¹
INVITED ¹Department of Electrical and Computer Engineering, University of California, San Diego, USA

VII-B.-2 **Artificial Neuron using MoS₂/Graphene Threshold Switching Memristors** 241
11:10 AM
Hirokijyoti Kalita¹, Adithi Krishnaprasad¹, Nitin Choudhary¹, Sonali Das¹, Hee-Suk Chung²,
Yeonwoong Jung¹, and Tania Roy¹
¹University of Central Florida, 4000 Central Florida Blvd, Orlando, FL 32826, USA; ²Korea Basic
Science Institute, Jeonju 54907, South Korea

VII-B.-3 **Towards scalable silicon quantum computing** 243
11:30 AM
INVITED
M. Vinet¹, L. Hutin¹, B. Bertrand¹, H. Bohuslavskyi^{1,2}, A. Corna², A. Amisse^{1,2}, A. Crippa², L.
Bourdet², R. Maurand², S. Barraud¹, M. Urdampilleta³, C. Bäuerle³, M. Sanquer², X. Jehl², Y.-M.
Niquet², S. De Franceschi², T. Meunier³
¹CEA, LETI, Minatec Campus, F-38054 Grenoble, France; ²CEA, INAC, F-38054 Grenoble, France
³CNRS, Institut Néel, F-38042 Grenoble, France

Session VIII-A. 2D ELECTRONIC DEVICES II **245-256**

VIII-A.-1 **High Performance Complementary Black Phosphorus FETs and Inverter**
1:30 PM **Circuits Operating at Record-Low VDD down to 0.2V** 247
Peng Wu, Joerg Appenzeller
School of Electrical and Computer Engineering & Birck Nanotechnology Center, Purdue University
West Lafayette, IN 47907, USA

VIII-A.-2 **High-Performance Few-Layer Tellurium CMOS Devices Enabled by Atomic Layer Deposited**
1:50 PM **Dielectric Doping Technique** 249
Gang Qiu^{1,2}, Mengwei Si^{1,2}, Yixiu Wang³, Xiao Lyu^{1,2}, Wenzhuo Wu³, Peide D. Ye^{1,2}
¹School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana 47907,
USA; ²Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana 47907, USA;
³School of Industrial Engineering, Purdue University, West Lafayette, Indiana 47907, USA

VIII-A.-3 **Challenges and opportunities in integration of 2D materials on 3D substrates:**
2:10 PM **Materials and device perspectives** 251
INVITED
Mahesh R. Neupane, Dmitry Ruzmetov, Robert Burke, A. Glen Birdwell, Decarlos Taylor, Matthew
Chin, Terrance O'Regan, Frank Crowne, Barbara Nichols, Pankaj Shah, Edward Byrd, and Tony
Ivanov
US Army Research Laboratory, Maryland, USA

VIII-A.-4 **Three-Dimensional Integration of Multi-Channel MoS₂ Devices for High Drive Current FETs** 253
2:50 PM
Ruiping Zhou and Joerg Appenzeller
Birck Nanotechnology Center, Purdue University, West Lafayette, IN 47906, USA

VIII-A.-5 **Effects of single vacancy defects on 1/f noise in graphene/h-BN FETs** 255
3:10 PM
Ting Wu¹, Abdullah Alharbi¹, Takashi Taniguchi², Kenji Watanabe², Davood Shahrjrdi^{1,3}
¹Electrical and Computer Engineering Department, New York University, Brooklyn, NY, 11201;
²National Institute of Materials Science, 1-1 Namiki Tsukuba, Ibaraki 305-0044, Japan; ³Center for
Quantum Phenomena, Physics Department, New York University, New York, NY 10003

Session VIII-B. OPTICAL AND THz DEVICES **257-268**

VIII-B.-1 **Approaches for Dynamic IR Nano-Optics using 2D Materials** 259
1:30 PM
INVITED
Joshua D. Caldwell
Department of Mechanical Engineering, Vanderbilt University, 334 Olin Hall, 2400 Highland Ave,
Nashville, TN, 37205, USA

VIII-B.-2 **WSe₂/ReS₂ vdW Heterostructure for Versatile Optoelectronic Applications** 261
2:10 PM
Abin Varghese^{1,2,3}, Denis Joseph¹, Sayantan Ghosh¹, Kartikey Thakar¹, Nikhil Medhekar² and
Saurabh Lodha¹
¹Department of Electrical Engineering, IIT Bombay, Mumbai, 400076, India; ²Department of
Materials Science and Engineering, Monash University, Clayton, Victoria 3800, Australia; ³IITB-
Monash Research Academy, Powai, Mumbai, 400076, India

- VIII-B.-3** **Photo-oxidized HfS₂ – An embeddable and writable high-k dielectric for flexible Van der Waals nano-electronics** 263
2:30 PM
 Namphung Peimyoo¹, Jake mehew¹, Matt D. Barnes¹, Adolfo De Sanctis¹, Iddo Amit¹, Janire Escolar¹, Konstantinos Anastasiou¹, Ali Gholina², Aidan P Rooney², Sarah Haigh², Saverio Russo¹, Monica F. Craciun¹ and Freddie Withers¹
¹Centre for Graphene Science, College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter EX4 4QF, United Kingdom; ²School of Materials, University of Manchester, Oxford Road, Manchester M13 9PL, United Kingdom
- VIII-B.-4** **Electrically Switchable Infrared Nanophotonic Devices with VO₂** 265
2:50 PM
 Nikita A. Butakov¹, Mark Knight², Tomer Lewi¹, Prasad P. Iyer¹, Hamid Chorsi¹, Javier Del Valle Granda³, Yoav Kalchheim³, Phillip Hon², Ivan K. Schuller³, Jon A. Schuller¹
¹University of California, Santa Barbara, CA, USA; ²Northrop Grumman, Torrance, CA, USA; ³University of California, San Diego, CA, USA
- VIII-B.-5** **Graphene-Channel-Transistor Terahertz Amplifier** 267
3:10 PM
 Stephane Boubanga-Tombet¹, Deepika Yadav¹, Wojciech Knap², Vyacheslav V. Popov³ and Taiichi Otsuji¹
¹Research Institute of Electrical Communication, Tohoku University, Sendai 980-8577, Japan; ²Laboratory Charles Coulomb, University of Montpellier and CNRS, Place Eugene Bataillon, F-34095 Montpellier, France; ³Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch), RAS, Saratov 410019, Russia

Session IX-A. ADVANCED DEVICES

269-280

- IX-A.-1** **Manufacturable Heterogeneous Integration for Flexible CMOS Electronics** 271
3:50 PM
INVITED
 Muhammad M. Hussain¹, Sohail F. Shaikh¹, Galo A. Torres Sevilla^{1,2}, Joanna M. Nassar^{1,3}, Aftab M. Hussain^{1,4}, Rabab R. Bahabry^{1,5}, Sherjeel M. Khan¹, Arwa T. Kutbee^{1,6}, Jhonathan P. Rojas^{1,7}, Mohamed T. Ghoneim^{1,8} and Melvin Cruz¹
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- IX.-A.-2** **Effective Drive Current in Scaled FinFET and NSFET CMOS Inverters** 273
4:30 PM
 A. Razavieh¹, Y. Deng¹, P. Zeitzoff¹, M.H. Na², J. Frougier¹, G. Karve², D.E. Brown¹, T. Yamashita² and E.J. Nowak¹
¹GLOBALFOUNDRIES, 257 Fuller Rd., Albany, NY 12203, USA; ²IBM, 257 Fuller Rd., Albany, NY 12203, USA
- IX-A.-3** **Novel 2-D Materials for Tunneling FETs: an Ab-initio Study** 275
4:50 PM
 C. Klinkert¹, A. Szabo¹, D. Campi², C. Stieger¹, N. Marzari², and M. Luisier¹
¹Integrated Systems Laboratory, ETH Zurich, CH-8092 Zurich, Switzerland; ²Theory and Simulation of Materials, EPF Lausanne, CH-1015 Lausanne, Switzerland
- IX-A.-4** **Alleviation of Short Channel Effects in Ge Negative Capacitance pFinFETs** 277
5:10 PM
 Wonil Chung, Mengwei Si and Peide D. Ye
 School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47907
- IX-A.-5** **Bias Stress Stability of Carbon Nanotube Transistors with Implications for Sensors** 279
5:30 PM
 Steven G. Noyce¹, James L. Doherty¹, Aaron D. Franklin^{1,2}
¹Duke University, Department of Electrical & Computer Engineering, Durham, North Carolina 27708, USA; ²Duke University, Department of Chemistry, Durham, North Carolina 27708, USA

- IX-B.-1**
3:50 PM
INVITED **Recent Advances in Ga₂O₃ MOSFET Technologies** 283
Masataka Higashiwaki¹, Man Hoi Wong¹, Takafumi Kamimura¹, Yoshiaki Nakata¹, Chia-Hung Lin¹, Ravikiran Lingaparathi¹, Akinori Takeyama², Takahiro Makino², Takeshi Ohshima², Naoki Hatta³, Kuniaki Yagi³, Ken Goto^{4,5}, Kohei Sasaki⁴, Shinya Watanabe⁴, Akito Kuramata⁴, Shigenobu Yamakoshi⁴, Keita Konishi⁵, Hisashi Murakami⁵, and Yoshinao Kumagai⁵
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- IX-B.-2**
4:30 PM **Design and Demonstration of (Al_xGa_{1-x})₂O₃/Ga₂O₃ Double Heterostructure Field Effect Transistor (DHFET)** 284
Yuewei Zhang, Zhanbo Xia, Chandan Joishi, and Siddharth Rajan
Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, 43210, USA
- IX-B.-3**
4:50 PM **1.5 kV Vertical Ga₂O₃ Trench-MIS Schottky Barrier Diodes** 286
Wenshen Li¹, Kazuki Nomoto¹, Zongyang Hu¹, Nicholas Tanen³, Kohei Sasaki², Akito Kuramata², Debdeep Jena^{1,3} and Huili Grace Xing^{1,3}
¹School of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853, USA; ²Novel Crystal Technology, Inc., Sayama 350-1328, Japan; ³Department of Material Science and Engineering, Cornell University, Ithaca, NY 14853, USA
- IX-B.-4**
5:10 PM **2.3 kV Field-Plated Vertical Ga₂O₃ Schottky Rectifiers and 1 A Forward Current with 650 Reverse Breakdown Ga₂O₃ Field-Plated Schottky Barrier Diodes** 288
Jiancheng Yang¹, Fan Ren¹, Marko Tadjer², Steve J. Pearton³, and Akito Kuramata⁴
¹Department of Chemical Engineering, University of Florida, Gainesville, FL 32611; ²Naval Research Laboratory, Washington DC 20375; ³Department of Materials Science Engineering, University of Florida, Gainesville FL 32611; ⁴Tamura Corporation and Novel Crystal Technology, Inc., Syama Saitama 350-1328, Japan
- IX-B.05**
5:30 PM **(Late News) High-Speed 1310 nm Hybrid Silicon Quantum Dot Photodiodes with Ultra-low Dark Current** 290
Bassem Tossoun, Géza Kurczveil, Chong Zhang, Di Liang, and Raymond G. Beausoleil
Hewlett Packard labs, Hewlett Parkard Enterprise, 1501 Page Mill Road, Palo Alto, California 94304, USA

RUMP SESSIONS

293-294

- R.1**
8:30 PM **Negative capacitance devices—Viable for integration now, soon, or never?** 293
Session Moderators: Aaron Franklin (Duke), Mathieu Luisier (ETH)
- R.2**
8:30 PM **Ultrawide-band gap semiconductors (Ga₂O₃, Diamond, AlN)...Do we need them beyond GaN/SiC?** 293
Session Moderators: Uttam Singiseti (Univ. of Buffalo), Grace Xing (Cornell)

JOINT EMC/DRC PLENARY SESSION

N/A

- 8:20 am** **Electronics Anywhere or Will We Ever Have Flexible Electronics?** N/A
Thomas Jackson
The Pennsylvania State University, State College, Pennsylvania, USA

- X.-1** **Cancelled**
- 9:50 AM**
INVITED
- X.-2** **Paper-electronics: a sustainable multifunctional platform** 299
10:30 AM
INVITED
Elvira Fortunato, Diana Gaspar, Inês Cunha, Manuel Mendes, António Vicente, Hugo Águas, Ana Carolina Marques, Ana Pimentel, Daniela Nunes, Luís Pereira and Rodrigo Martins
i3N/CENIMAT, Department of Materials Science, Faculty of Science and Technology, Universidade NOVA de Lisboa and CEMOP/UNINOVA, Campus de Caparica 2829-516 Caparica, Portugal
- X.-3** **Exploring Silver Contact Morphologies in Printed Carbon Nanotube Thin-Film Transistors** 301
11:10 AM
Jorge A. Cardenas¹, Sophia Upshaw¹, Matthew J. Catenacci², Benjamin J. Wiley², Aaron D. Franklin^{1,2}
Department of Electrical and Computer Engineering, Duke University, Durham NC 27708, USA
- X.-4** **CMOS 3D-Extended Metal Gate ISFETs with Near Nernstian Ion Sensitivity** 303
11:30 AM
Jun-Rui Zhang¹, F. Bellando¹, M. Rupakula¹, E. Garcia Cordero¹, N. Ebejer², J. Longo², F. Wildhaber², H. Guérin², A.M. Ionescu¹
¹Nanolab, Ecole Polytechnique Fédérale de Lausanne, Switzerland; ²Xsensio S.A., EPFL Innovation Park, 1024 Ecublens, Switzerland
- X.-5** **(Late News) Supercapacity (>1000 $\mu\text{F}/\text{cm}^2$) charge release in a CVD-grown WSe_2 FET incorporating a $\text{PEO}:\text{CSClO}_4$ side gate** 305
M. Asghari Heidarlou¹, B. Jariwala², P. Paletti¹, S. Rouvimov¹, J. A. Robinson², S. K. Fullerton-Shirey³, and A. Seabaugh¹
¹University of Notre Dame, Notre Dame, IN, 46556, USA; ²The Pennsylvania State University, University Park, Pennsylvania 16802, USA; ³University of Pittsburgh, Pittsburgh, Pennsylvania, 15213, USA

60th ELECTRONIC MATERIALS CONFERENCE
WEDNESDAY PM SESSIONS

N/A

Session G: GALLIUM OXIDE DEVICES

N/A

- G01 1:30 PM** **(Student) High Electron Mobility in Modulation-Doped $\beta\text{-(Al}_x\text{Ga}_{1-x})_2\text{O}_3/\text{Ga}_2\text{O}_3$ Heterostructures** N/A
Yuwei Zhang¹, Adam T. Neal², Zhanbo Xia¹, Chandan Joishi¹, Yuanhua Zheng³, Sanyam Bajaj¹, Mark Brenner¹, Shin Mou², Donald Dorsey², Kelson Chabak⁴, Gregg Jessen⁴, Jinwoo Hwang⁵, Joseph Heremans³ and Siddharth Rajan^{1,5}
¹The Ohio State University, United States; ²Air Force Research Laboratory, Materials and Manufacturing Directorate, United States; ³The Ohio State University, United States; ⁴Air Force Research Laboratory, Sensors Directorate, United States; ⁵The Ohio State University, United States.
- 1:50 PM G02** **(Student) MBE Growth and Doping of Ga_2O_3 Heterostructures** N/A
Nicholas Tanen¹, Vladimir Protasenko², Celesta Chang³, Hanjong Paik¹, Vasanth Balakrishnan¹, Jonathan P. McCandless², David Muller³, Darrell Schlom¹, HuiLi Xing², ¹ and Debdeep Jena^{2,1}
¹Cornell University, United States; ²Cornell University, United States; ³Cornell University, United States.
- 2:10 PM G03** **Strain Engineering and Two-Dimensional Electron Gas in Polar $\epsilon\text{-Ga}_2\text{O}_3$** N/A
Sung Beom Cho^{1,2} and Rohan Mishra^{1,2}
¹Washington University in St. Louis, United States; ²Washington University in St. Louis, United States.

- 2:30 PM G04 (Student) DC and RF Characteristics of Submicron Delta-Doped β -Ga₂O₃ Field Effect Transistors** N/A
 Zhanbo Xia¹, Chandan Joishi^{1,4}, Sriram Krishnamoorthy², Sanyam Bajaj¹, Yuewei Zhang¹, Mark Brenner¹, Saurabh Lodha⁴ and Siddharth Rajan^{1,3}
¹The Ohio State University, United States; ²The University of Utah, United States; ³The Ohio State University, United States; ⁴Indian Institute of Technology Bombay, India.
- 2:50 PM G05 (Student) Pulse and Large Signal RF Performance of β -Ga₂O₃ MOSFETs** N/A
 Manikant Singh¹, Michael A. Casbon², Michael J. Uren¹, James W. Pomeroy¹, Paul Tasker², Man Hoi Wong³, Kohei Sasaki⁴, Akito Kuramata⁴, Shigenobu Yamakoshi⁴, Masataka Higashiwaki³ and Martin Kuball¹
¹University of Bristol, United Kingdom; ²University of Cardiff, United Kingdom; ³National Institute of Information and Communications Technology, Japan; ⁴Tamura Corporation, Japan.
- 3:10 PM BREAK**
- 3:30 PM G06 (Student) Analytical Electron Microscopy of Annealed Ga₂O₃/SiO₂ and Ga₂O₃/Al₂O₃ Interface Structures in MOS Devices** N/A
 Christopher J. Klingshirn¹, Joshua A. Taillon¹, Asanka Jayawardena², Sarit Dhar², Tsvetanka Zheleva³, Aivars Lelis³ and Lourdes G. Salamanca-Riba¹
¹University of Maryland, United States; ²Auburn University, United States; ³U.S. Army Research Laboratory, United States.
- 3:50 PM G07 (Student) Ternary Alloy Rare Earth Scandate as Dielectric for β -Ga₂O₃ MOS Structures** N/A
 Hannah N. Masten, Jamie Phillips and Rebecca L. Peterson
 University of Michigan, United States.
- 4:10 PM G08 Evaluation of Constant Voltage Stress on Al₂O₃/ β -Ga₂O₃ MOSCAPs** N/A
 Chadwin D. Young¹, M.S. Lakshmi Narayanan¹, Xioye Qin¹, Andrea Padovani², Peng Zhao¹, Pavel Bolshakov¹, Akito Kuramata³, Luca Larcher⁴ and Robert Wallace¹
¹University of Texas at Dallas, United States; ²MDLsoft, Inc., United States; ³Novel Crystal Technology, Inc., Japan; ⁴Universita di Modena e Reggio Emilia, Italy.
- 4:30 PM G09 Combined XPS-UPS Study of Conduction Band Offsets for High-*k* Dielectric Nanolaminates Grown on Single-Crystal GaN and Ga₂O₃(010) by Atomic Layer Deposition** N/A
 David J. Mandia¹, Angel Yanguas-Gil¹, Jian Liu³, Jacob H. Leach², Keith R. Evans² and Jeffrey W. Elam¹
¹Argonne National Laboratory, United States; ²Kyma Technologies, Inc., United States; ³Northwestern University, United States.
- 4:50 PM G10 (Student) MBE-Grown Self-Powered β -Ga₂O₃ MSM Deep-UV Photodetector** N/A
 Anamika S. Pratiyush¹, Sriram Krishnamoorthy^{3,2}, Sandeep Kumar¹, Zhanbo Xia², Rangarajan Muralidharan¹, Siddharth Rajan² and Digbijoy N. Nath¹
¹Indian Institute of Science, Bangalore, India; ²The Ohio State University, United States; ³The University of Utah, United States.

Session H: NITRIDES–LEDs AND LASERS

N/A

- 1:30 PM H01 Stimulated Emission at 375nm from Optically Pumped Vertical-Cavity Surface-Emitting Lasers with Air-Gap/Al_{0.05}Ga_{0.95}N Distributed Bragg Reflectors** N/A
 Youngjae Park¹, Theeradetch Detchprohm¹, Karan Mehta¹, Oliver Moreno¹, Yuh-Shiuan Liu¹, Shuo Wang², Shyh-Chiang Shen¹, P. Douglas Yoder¹, Fernando Ponce² and Russell Dupuis¹
¹Georgia Institute of Technology, United States; ²Arizona State University, United States.
- 1:50 PM H02 (Student) Waveguide Design for AlGaN-Based Deep-Ultraviolet (DUV) Laser** N/A
 Qiang Guo¹, Ronny Kirste², Shun Washiyama¹, Seiji Mita², Will Mecouch², Pramod Reddy², Ramón Collazo¹ and Zlatko Sitar^{1,2}
¹North Carolina State University, United States; ²Adroit Materials, United States.
- 2:10 PM H03 Material Growth and Device Fabrication of GaN-Based Laser Diodes in Ultraviolet Region from 390 nm Towards 370 nm** N/A

Ping Chen^{1,2}, Yuh-Shiuan Liu², Youngjae Park², Detchprohm Theeradetch², Shyh-Chiang Shen² and Russell Dupuis²

¹Institute of Semiconductors, Chinese Academy of Sciences, China; ²Georgia Institute of Technology, United States.

2:30 PM H04 (Student) Reducing Forward Voltage Through AlGaIn Layer Optimization in c-Plane InGaIn-Based Green Light-Emitting Diodes N/A

Cheyenne Lynsky, Abdullah I. Alhassan, James S. Speck, Steven P. DenBaars and Shuji Nakamura
University of California, Santa Barbara, United States.

2:50 PM H05 (Student) Carrier Dynamics in High-Speed III-Nitride Light-Emitting Diodes for Visible-Light Communication N/A

Arman Rashidi, Morteza Monavarian, Andrew Aragon, Ashwin Rishinaramangalam and Daniel Feezell
University of New Mexico, United States.

3:10 PM BREAK

Session I: III-NITRIDES–PHOTODETECTORS

N/A

3:30 PM I01 (Student) Demonstration of GaN p-i-p-i-n Separate-Absorption and Multiplication Ultraviolet Avalanche Photodiodes Arrays with Large Detection Area N/A

Mi-Hee Ji¹, Jeomoh Kim², Hoon Jeong¹, Marzieh Bakhtiary Noodeh¹, Theeradetch Detchprohm¹ and Russell Dupuis¹
¹Georgia Institute of Technology, United States; ²LG Electronics, Korea (the Republic of).

3:50 PM I02 (Student) Billion-Fold Reduction in Screw Dislocation Related Dark Current in Al_{0.50}Ga_{0.50}N Solar-Blind Metal-Semiconductor-Metal Photodetectors N/A

Shashwat Rathkanthiwar, Anisha Kalra, Rangarajan Muralidharan, Digbijoy N. Nath and Srinivasan Raghavan
Indian Institute of Science, Bangalore, India, India.

4:10 PM I03 (Student) Impact of Interface Properties in N-Polar Heterostructure GaN Photocathodes N/A

Emma Rocco¹, Isra Mahaboob¹, Kasey Hogan¹, Vincent Meyers¹, Sean A. Tozier¹, L. Doug Bell² and Fatemeh (Shadi) Shahedipour-Sandvik¹

¹SUNY Polytechnic Institute, Colleges of Nanoscale Science and Engineering, United States;

²California Institute of Technology, United States.

4:30 PM I04 (Student) High Efficiency, Monolithically Integrated (In)GaIn/Si Photocathode for Stable Generation of Solar Fuels N/A

Srinivas Vanka^{1,2}, Sheng Chu², Yichen Wang², Ishiang Shih² and Zetian Mi^{1,2}
¹University of Michigan, United States; ²McGill University, Canada.

4:50 PM I05 (Student) Back-Illuminated Al_{0.4}Ga_{0.6}N p-i-n UV Detector with 67% Zero-Bias External Quantum Efficiency N/A

Anisha Kalra, Shashwat Rathkanthiwar, Rangarajan Muralidharan, Srinivasan Raghavan and Digbijoy N. Nath
Indian Institute of Science, India.

Session J: PROCESSING AND CHARACTERIZATION OF ORGANIC MATERIALS AND DEVICES

N/A

1:30 PM J01 Operation of High-Frequency Vertical Organic Transistors N/A

Hans Kleemann¹, Markus P. Klinger¹, Axel Fischer¹, Bahman Kheradmand-Boroujeni^{2,3}, Frank Ellinger^{2,3} and Karl Leo^{1,3}

¹Technische Universität Dresden, Germany; ²Technische Universität Dresden, Germany; ³Center for Advancing Electronics Dresden (cfaed), Germany.

- 1:50 PM J02** (Student) Enhancing Crystalline Conformation in Polyfluorene Films Deposited by Resonant Infrared Matrix Assisted Pulsed Laser Evaporation N/A
Spencer Ferguson and Adrienne Stiff-Roberts
 Duke University, United States.
- 2:10 PM J03** Thermoelectric Response of Conducting Polymers Doped by Solid-State Diffusion and Their Electronic Applications N/A
Keehoon Kang¹, Deepak Venkateshvaran², Katharina Broch³, Guillaume Schweicher², Youngrok Kim¹, Cameron Jellett⁴, Christian B. Nielsen⁵, Iain McCulloch^{4, 6}, Takhee Lee¹ and Henning Sirringhaus²
¹Seoul National University, Korea (the Republic of); ²Cavendish Laboratory, University of Cambridge, United Kingdom; ³University of Tuebingen, Germany; ⁴Imperial College, London, United Kingdom; ⁵Queen Mary University, United Kingdom; ⁶King Abdullah University of Science and Technology, Saudi Arabia.
- 2:30 PM J04** (Student) A Programmable Molecular-Scale Rectifier Driven by the Interface-Engineered Molecular Junction Consisting of the 2D Semiconducting Layer and the Self-Assembled Monolayers N/A
Jaeho Shin, Seunghoon Yang, Chul-Ho Lee and Gunuk Wang
 Korea University, Korea (the Republic of).
- 2:50 PM J05** High Piezoelectric Coefficient PVDF-TrFE Films for Flexible Electronics N/A
Deepak^{1, 2}, Karishma Jain^{1, 2} and Anshu Gaur^{1, 2}
¹Indian Institute of Technology Kanpur, India; ²Indian Institute of Technology Kanpur, India.
- 3:10 PM BREAK**

Session K: MATERIALS INTEGRATION

N/A

- 3:30 PM K01** (Student) Characterization of Wafer-Bonded Silicon with Surfaces Treated with an Ion-Bombardment Procedure to Form Oxide-Free Interfaces N/A
Michael E. Liao¹, Chao Li¹, Christoph Floetgen² and Mark Goorsky¹
¹University of California, Los Angeles, United States; ²EV Group, Austria.
- 3:50 PM K02** The Effect of In-Plane Rotational Misalignment on Electrical Conductivity of Wafer-Bonded n-InP/n-InP Structures N/A
Michael E. Liao, Victor Tran, Matthew Yee and Mark Goorsky
 University of California, Los Angeles, United States.
- 4:10 PM K03** (Student) Wafer-Scale Lift-Off of Epitaxial GaN Transistors from Silicon to Glass Substrate and Their JDEC Reliability Tests N/A
Pavani Vamsi Krishna Nittala, Nayana Remesh, Nagaboopathy K. Mohan, Rangarajan Muralidharan, Srinivasan Raghavan, Digbijoy N. Nath and Prosenjit Sen
 Indian Institute of Science, India.
- 4:30 PM K04** A New Relaxation Mechanism Enabling High-Quality, Laterally Grown Ge Films on Si N/A
Nate Quitoriano
 McGill University, Canada.
- 4:50 PM K05** (Student) Formation of Si/SiGe Nanowires and Quantum Dots via Ge Diffusion During Oxidation of Si/SiGe Heterostructures N/A
Emily Turner¹, William Brewer¹, Yan Xin³, Christopher Hatem⁴, Van Truong¹, Kevin Jones¹, Keshab R. Sapkota² and George T. Wang²
¹University of Florida, United States; ²Sandia National Laboratories, United States; ³National High Magnetic Field Laboratory, United States; ⁴Applied Materials, United States.

- 1:30 PM L01 (Student) Diffusion-Controlled Epitaxy of Large Area Coalesced WSe₂ Monolayers on Sapphire** N/A
Xiaotian Zhang¹, Tanushree H. Choudhury², Mikhail Chubarov², Yu Xiang^{3,4}, Bhakti Jariwala¹, Fu Zhang¹, Nasim Alem^{1,2}, Gwo-Ching Wang^{3,4}, Joshua A. Robinson^{1,2} and Joan M. Redwing^{1,2}
¹The Pennsylvania State University, United States; ²The Pennsylvania State University, United States; ³Rensselaer Polytechnic Institute, United States; ⁴Rensselaer Polytechnic Institute, United States.
- 1:50 PM L02 (Student) Wafer-Scale Synthesis of Monolayer WSe₂—A Multi-Functional Photocatalyst for Efficient Overall Pure Water Splitting** N/A
Yongjie Wang, Yuanpeng Wu and Zetian Mi
 University of Michigan, United States.
- 2:10 PM L03 (Student) Tailoring Material Properties of Nanostructured WS₂ During Plasma-Enhanced Atomic Layer Deposition for Enhanced Electrochemical Performance** N/A
Shashank Balasubramanyam¹, Longfei Wu², Vincent Vandalon¹, Marcel Verheijen^{1,3}, W.M.M (Erwin) Kessels¹, Jan Philipp Hofmann² and Ageeth Bol¹
¹Eindhoven University of Technology, Netherlands; ²Eindhoven University of Technology, Netherlands; ³Phillips Innovation Laboratories, Netherlands.
- 2:30 PM L04 Wafer Scale Epitaxial Growth of Monolayer and Few-Layer WS₂ by Gas Source Chemical Vapor Deposition** N/A
Mikhail Chubarov¹, Tanushree H. Choudhury¹ and Joan M. Redwing^{1,2}
¹The Pennsylvania State University, United States; ²The Pennsylvania State University, United States.
- 2:50 PM L05 (Student) Two-Dimensional Tantalum Disulfide—Controlling Structure and Properties via Synthesis** N/A
Rui Zhao¹, Benjamin Grisafe², Ram Krishna Ghosh², Suman Datta² and Joshua A. Robinson¹
¹Pennsylvania State University, United States; ²University of Notre Dame, United States.
- 3:10 PM BREAK**
- 3:30 PM L06 (Student) Two-Dimensional Elemental Materials via Intercalation Through Epitaxial Graphene** N/A
Natalie C. Briggs^{1,2,3}, Brian M. Bersch^{1,2}, Ana De La Fuente Duran¹, Yuanxi Wang³, Shruti Subramanian^{1,2}, Chengye Dong^{1,2}, Ke Wang⁴, Vincent Crespi^{5,2,3} and Joshua A. Robinson^{1,2,3}
¹Pennsylvania State University, United States; ²The Pennsylvania State University, United States; ³Pennsylvania State University, United States; ⁴Pennsylvania State University, United States; ⁵Pennsylvania State University, United States.
- 3:50 PM L07 (Student) Epitaxial Growth and Characterization of 2-D Bi_{1-x}Sb_x Alloys on Si(111)** N/A
Sarah E. Muschinske¹, Emily S. Walker¹, Christopher J. Brennan¹, Yukun Sun², Alice Yau¹, Tanuj Trivedi¹, Anupam Roy¹, Stephen D. March¹, Andrew F. Briggs¹, Erica M. Krivoy¹, Deji Akinwande¹, Minjoo L. Lee², Edward T. Yu¹ and Seth Bank¹
¹The University of Texas at Austin, United States; ²The University of Illinois at Urbana-Champaign, United States.
- 4:10 PM L08 Chemical Vapor Deposition of Black Phosphorus** N/A
Michael Snure, Gene Siegel, Shivashankar Vangala, Timothy A. Prusnick and Stefan C. Badescu
 Air Force Research Lab, United States.
- 4:30 PM L09 (Student) Properties of MBE-Grown GaN on MoS₂ Heterojunctions** N/A
Choong Hee Lee¹, Yuwei Zhang¹, Jared Johnson¹, Rachel Koltun², Vincent Gambin², Jinwoo Hwang¹ and Siddharth Rajan¹
¹Ohio State University, United States; ²Northrop Grumman Aerospace Systems, United States.
- 4:50 PM LATE NEWS**

Session M: COMPUTATIONAL ELECTRONIC MATERIALS

N/A

- 1:30 PM M01 (Student) Refractive Indices of BAlN and BGaN Alloys from First-Principle Calculations** N/A
Feras S. Alqatari¹, Kuang-Hui Li¹, Kaikai Liu^{2,1} and Xiaohang Li¹
¹King Abdullah University of Science and Technology, Saudi Arabia; ²Huazhong University of Science and Technology, China.
- 1:50 PM M02 Band Structures and Direct-to-Indirect Bandgap Transition in BGaN Alloys** N/A
Che-Hao Liao
King Abdullah University of Science and Technology (KAUST), Saudi Arabia.
- 2:10 PM M03 Wurtzite B_xAl_{1-x}N and B_xGa_{1-x}N Heterointerface for Optical and Power Electronics** N/A
Haiding Sun, Kaikai Liu, Muwei Zhang, Feras S. Alqatari and Xiaohang Li
King Abdullah University of Science and Technology (KAUST), Saudi Arabia.
- 2:30 PM M04 (Student) Towards Automating High-Throughput Calculations of Intrinsic Point Defect Properties with Semi-Local DFT** N/A
Daniel Broberg and Mark Asta
University of California, Berkeley, United States.
- 2:50 PM M05 Ab Initio Design of Two-Dimensional Electron Gas at Perovskite Oxide Interface** N/A
Kesong Yang
University of California San Diego, United States.
- 3:10 PM BREAK**
- 3:30 PM M06 Stability, Novel Materials and Physics of Perovskite Semiconductors for Solar Cells** N/A
Chao Zheng and Oleg Rubel
McMaster University, Canada.
- 3:50 PM M07 Identification of Intrinsic Defects in BiI₃ for Photovoltaic Applications** N/A
Sung Beom Cho¹, Jaume Gazquez³, Yoon Myung², Parag Banerjee¹ and Rohan Mishra¹
¹Washington University in St. Louis, United States; ²Sejong University, Korea (the Republic of);
³Institut de Ciència de Materials de Barcelona, Spain.
- 4:10 PM M08 Phase Transitions and Self-Assembled Nanostructure in Chalcopyrite Semiconductors and Similar Compounds** N/A
Paul Quayle
Kyma Technologies, Inc., United States.
- 4:30 PM M09 First-Principial Predictions of Integer Anomalous Quantum Hall Effect in 2D Chern Insulator and Transition to Weyl Semimetal in Bulk—Bi₂MnX₄ (X= Se, Te)** N/A
Sugata Chowdhury¹, Kevin Garrity², Joseph A. Haggmann¹, Curt Richter¹, Carelyn Campbell² and Francesca Tavazza²
¹National Institute of Standards and Technology, United States; ²National Institute of Standards and Technology, United States.
- 4:50 PM M10 (Student) Design of a Simulation Framework for ZnO QD-Graphene Channel UV Photodetector** N/A
Amelia Peterson and Shayla Sawyer
Rensselaer Polytechnic Institute, United States.

Session N: NANOSCALE CHARACTERIZATION

N/A

- 1:30 PM N01 (Student) Electron Microscopy Characterization of 2D Indium/Indium Nitride Layer Synthesized by Confinement Heteroepitaxy (CHet) Technique** N/A
Hesham M. ElSherif¹, Brian M. Bersch², Natalie C. Briggs², Nabil D. Bassim¹ and Joshua A. Robinson²
¹McMaster University, Canada; ²The Pennsylvania State University, United States.

- 1:50 PM N02** **(Student) Optical Bandgaps Measured by STEM-EELS—A ZnO Study** N/A
Cecilie Granerød, Wei Zhan, Lasse Vines, Klaus Magnus Johansen and Øystein Prytz
 University of Oslo, Norway.
- 2:10 PM N03** **Structural-Chemical Characterization and Bandgap Measurements at the Nanoscale of (ZnO)_{1-x}(GaN)_x Thin Films Using (S)TEM Methods** N/A
Calliope Bazioti, Cecilie Granerød, Vegard S. Olsen, Lasse Vines, Bengt G. Svensson and Øystein Prytz
 University of Oslo, Norway.
- 2:30 PM N04** **(Student) Direct Observation of Recombination Enhanced Dislocation Glide in GaAs/Si Thin Films Using Electron Channeling Contrast Imaging** N/A
Brian B. Haidet¹, Patrick Callahan¹, Gareth Seward², Daehwan Jung³, John Bowers^{1,3,4} and Kunal Mukherjee¹
¹University of California Santa Barbara, United States; ²University of California Santa Barbara, United States; ³Institute for Energy Efficiency, University of California Santa Barbara, United States; ⁴University of California, Santa Barbara, United States.
- 2:50 PM N05** **TiN/HZO/Si Examined by Atom Probe Tomography and STEM/EDX** N/A
Norman Sanford¹, Paul Blanchard¹, Alexana Roshko¹, Andrew Kummel², Michael Katz¹ and Albert Davydov¹
¹National Institute of Standards and Technology, United States; ²University of California, San Diego, United States.
- 3:10 PM BREAK**
- 3:30 PM N06** **Laser-Assisted Atom Probe Studies of AlOx Tunnel Junctions on Silicon** N/A
Norman Sanford, Paul Blanchard, Russell Lake, Xian Wu and David Pappas
 National Institute of Standards and Technology, United States.
- 3:50 PM N07** **Non-Destructive Piezoresponse Force Microscopy (PFM) for Nanoscale Materials Characterization** N/A
Yonatan Calahorra
 University of Cambridge, United Kingdom.
- 4:10 PM N08** **Optimization and Limitations of Scanning Spreading Resistance Microscopy** N/A
Jay Mody and Jochonia Nxumalo
 GLOBALFOUNDRIES, United States.
- 4:30 PM N09** **Nanoscale Surface Characterization by Correlated Multimodal Scanning Probe Microscopy** N/A
Nathan D. Kirchhofer, Marta Kocun, Jason Li and Roger Proksch
 Asylum Research, an Oxford Instruments Company, United States.
- 4:50 PM N10** **Simultaneous Topographical and Electrochemical Mapping Using Scanning Ion Conductance Microscopy—Scanning Electrochemical Microscopy (SICM-SECM)** N/A
Wenqing Shi, Gerald Pascual, Byong Kim and Keibock Lee
 Park Systems, United States.

Session O: MATERIAL FOR ENERGY STORAGE AND CATALYSIS

N/A

1:30 PM LATE NEWS

- 1:50 PM O02** **Li₄Ti₅O₁₂/Li Hybrid Solid-State/Ionic Liquid Electrolyte Batteries** N/A
 Isaiah O. Oladeji² and Robert E. Peale¹
¹University of Central Florida, United States; ²Sisom Thin Films LLC, United States.
- 2:10 PM O03** **Large-Scale First-Principles Molecular Dynamics Simulation of Organic Molecules@SWCNT for Novel Cathode Material of Li-Ion Battery** N/A
Shuji Ogata, Takahiro Tsuzuki and Masahiro Uranagase
 Nagoya Institute of Technology, Japan.

2:30 PM O04 **Investigating the Electrochemical Performance of One Pot Synthesized MnO₂ Nanorods** N/A
Neha Kanaujiya¹, Nagesh Kumar², Yogesh Sharma^{1,2} and Ghanshyam D. Varma^{1,2}
¹I.I.T. Roorkee, India; ²I.I.T. Roorkee, India.

2:50 PM LATE NEWS

3:10 PM BREAK

3:30 PM O06 **Engineering Monolayer MoS₂ Films to be Better Hydrogen Evolution Catalyst than Pt** N/A
Guoqing Li and Linyou Cao
North Carolina State University, United States.

3:50 PM O07 **(Student) Optimization and Tunability of 3D Graphene Structures for Catalytic Applications** N/A
Chen Wang, Adrian E. Garcia, Robert Sanderson, Regina Ragan, Kyle Mcdevitt and Ali Mohraz;
University of California, Irvine, United States.

4:10 PM O08 **Graphene and Carbon Nanotube Based Electrocatalysts for PEM Fuel Cell Application** N/A
Marie Heitzmann^{1,3}, Seydou Hebie^{1,4}, Stephane Louisa^{1,3,2}, Emeline Remy^{1,3}, Pierre-André Jacques^{1,3}, Lionel Dubois^{1,4} and Philippe Serp²
¹CEA, France; ²LCC ENSIACET, France; ³LITEN, France; ⁴INAC, France.

4:30 PM O09 **On-Chip Signaling Approaches for Chemical Sensing and Fundamental Investigation of Electrochemical Processes** N/A
Mengning Ding
Nanjing University, China.

4:50 PM LATE NEWS

AUTHOR INDEX

317-320

