59th Electronic Materials Conference

EMC Awards Ceremony and Plenary Session
Wednesday Morning, June 28, 2017
Mendoza College of Business, Jordan Auditorium

8:20 AM Awards Ceremony

8:30 AM *PL.1
First-Principles Theory of Wide Bandgap Materials Chris G. Van de Walle; Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States

9:20 AM BREAK

10:00 AM A1
(Student) Demonstration of a β-(AlGa)2O3 / Ga2O3 Heterojunction Field Effect Transistor Zhanbo Xia1, Sriram Krishnamoorthy1, Siddharth Rajan1, 2 and Mark Brenner1; 1Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; 2Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States

10:20 AM A2
Germanium Doped β-Ga2O3 MOSFETs with Mobility of 111 cm²/Vs Jonathan P. McCandless1, Neil A. Moser2, Kelson D. Chabak3, Kevin D. Leedy2, Andrew J. Green2, Antonio Crespo2, Elaheh Ahmadi2, James Speck2 and Gregg H. Jessen2; KBRWyle, Wright-Patterson AFB, Ohio, United States; 2Materials and Science Engineering, University of California, Santa Barbara, Santa Barbara, California, United States

10:40 AM A3
Investigation of Nitrogen Ion Implantation for Current Blocking in Vertical Ga2O3 Transistors Man Hoi Wong1, Chia-Hung Lin1, Akito Kuramata2, Shigenobu Yamakoshi2 and Masatake Higashitaki1; 1National Institute of Information and Communications Technology (NICT), Koganei, Tokyo, Japan; 2Electrical Engineering, Stony Brook University, Stony Brook, New York, United States

11:00 AM A4
(Student) Characterization of ZrO2 and HfO2 MOS Capacitors Deposited by ALD on (-201) β-Ga2O3 Substrates David I. Shahin1, Marko J. Tadjer2, Virginia D. Wheeler2, Travis J. Anderson2, Andrew D. Koehler2, Karl D. Hobart2, Charles R. Eddy2, Fritz J. Kub2 and Aris Christou1; 1Materials Science and Engineering Department, University of Maryland, College Park, Maryland, United States; 2U.S. Naval Research Laboratory, Washington, District of Columbia, United States

11:20 AM A5
(Student) Demonstration of Quasi-2-Dimensional β-Ga2O3 Solar-Blind Photodetectors with Metal-Semiconductor-Metal Structure Sooyeoun Oh, Gahyun Shin and Jihyun Kim; Korea University, Seoul, Korea (the Republic of)

11:40 AM A6
(Student) Very Thin Suspended β-Ga2O3 Nano Diaphragms for Mechanical Resonator and Ultraviolet Sensing Applications Xu-Qian Zheng, Jaesung Lee, Subrina Rafique, Lu Han, Christian A. Zorman, Hongping Zhao and Philip X. Feng; Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, Ohio, United States

B: Narrow Bandgap Materials and Devices

Session Chairs: Ganesh Balakrishnan and Daniel Wasserman
Wednesday Morning, June 28, 2017
DeBartolo Hall, Room 136

10:00 AM B1
(Student) Large-Area Deposition of Cadmium Arsenide Films Using Thermal Deposition Ashish Chana1, Joshua Winger1, Prashanth Gopalan2, Ajay Naha2, Michael Scarpulla1,2 and Berardi Sensale-Rodriguez2; 1Electrical and Computer Engineering, University of Utah, Salt Lake City, Utah, United States; 2Materials Science and Engineering, University of Utah, Salt Lake City, Utah, United States

10:20 AM B2
(Student) Carrier Transport Measurements on Low Doped HgCdTe Justin Easley1, Erdem Arkm1, Michael Carmody2 and Jamie Phillips2; 1University of Michigan, Ann Arbor, Michigan, United States; 2Teledyne Imaging Sensors, Camarillo, California, United States

10:40 AM B3
Tl3Si2, A Promising Semiconductor Compound for γ-Ray Detection at Room Temperature Wenwen Lin1, Zhifu Liu2, Constantinos C. Stoumpos1, Sanjib Das1, Yihui He2, Kyle M. Mccall1, Bruce W. Wessels2 and Mercouri G. Kanatzidis1; 1Chemistry, Northwestern University, Evanston, Illinois, United States; 2Northwestern University, Evanston, Illinois, United States

11:00 AM B4
(Student) Carrier Lifetime and Photoconductivity Measurements in Short-Period InAsSb-Based SLS Grown on Metamorphic Buffers Catherine Ye Xu1, Alex Frenkel1, Youxi Lin1, Dmitri Donetsky1, Leon Shterengas1, Sergey Suchalkin1, Gela Kipshidze1, Gregery Belenky1, Stefan P. Svensson2 and Wendy L. Sarney2; 1Department of Electrical and Computer Engineering, Stony Brook University, Stony Brook, New York, United States; 2U.S. Army Research Laboratory, Adelphi, Maryland, United States

11:20 AM B5
Integration of Thin Film Narrow-Bandgap Photodiodes to CVD Diamond Heat Spreaders—A Comparison between GaSb and InGaAs Emma J. Renger1, Sathvikas J. Addamane, Darryl M. Shima, Amy L. Soudacharang, Ahmad Mansoori and Ganesh Balakrishnan; Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, United States
C: Processing and Characterization of 2D and Thin-Film Devices
Session Chairs: Ioannis Kymisssis and William Wong
Wednesday Morning, June 28, 2017
DeBartolo Hall, Room 138

10:00 AM C1
(Student) Electrical Characterization of Benzenedithiolate Molecular Electronic Devices with Multilayer Graphene Electrodes
Yeonsik Jang, Hyunhak Jeong, Dongku Kim, Wang-Taek Hwang, Jun-Woo Kim and Takhee Lee; Seoul National University, Seoul, Korea (the Republic of)

10:20 AM C2
(Student) Epitaxial Bismuth Transfer to Arbitrary Substrates Using Thermal Release Tape
Sarah E. Muschinske1, Emily S. Walker1, Seung Ryul Na1, Stephen D. March1, Andrew F. Briggs1, Deji Akinwande1, Kenneth M. Liechti2 and Seth R. Bank1; 1Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; 2Department of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, Austin, Texas, United States

10:40 AM C3
(Student) Gate-Dependent Asymmetric Electrical Properties in Pentacene Barristors with Graphene Electrodes
Wang-Taek Hwang1, Hyunhak Jeong1, Dongku Kim1, Yeonsik Jang1, Jun-Woo Kim1, Seungjun Chung1, Gunuk Wang2 and Takhee Lee1; 1Seoul National University, Seoul, Korea (the Republic of); 2Korea University, Seoul, Korea (the Republic of)

11:00 AM C4
High Performance Short Wavelength Infrared Photosensor Based on Novel Conjugated Polymers
Zhenghui Wu1, Weichuan Yao1, Jason D. Azoulay2 and Tse Nga Tina Ng3; 1ECE, University of California, San Diego, San Diego, California, United States; 2School of Polymer and High Performance Materials, University of Southern Mississippi, Hattiesburg, Mississippi, United States

11:20 AM C5
Signature of Singlet Fission in Magnetoco nductance of Single Crystalline Tetracene Field-Effect Transistors
Hyuk-Jae Jang1,2, Emily G. Bittle1, Qin Zhang1,2, David J. Gundlach1 and Curt A. Richter1; 1National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 2Theiss Research, La Jolla, California, United States

D: Novel Nanostructured 2D Materials and Devices
Session Chairs: Siddharth Rajan and Huili Grace Xing
Wednesday Morning, June 28, 2017
DeBartolo Hall, Room 141

10:00 AM D1
(Student) Fabrication and Device Applications of Organic/MoS2 van der Waals Heterostructures
Itamar Balla1, Tejas A. Shastry1, Hadalia Bergeron1, Samuel H. Amsterdam1, Xiaolong Liu1, Gavin P. Campbell1, Michael J. Bedzyk1,4,3, Tobin J. Marks1,2 and Mark C. Hersam1,2,5; 1Department of Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; 2Department of Chemistry, Northwestern University, Evanston, Illinois, United States; 3Graduate Program in Applied Physics, Northwestern University, Evanston, Illinois, United States; 4Department of Physics, Northwestern University, Evanston, Illinois, United States; 5Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, Illinois, United States

10:20 AM D2
Building Wafer-Scale Films Layer-by-Layer by Stacking Three-Atom-Thick Semiconductors
Kibum Kang1, Kan-Heng Lee2, Yimo Han3, Hui Gao2, Saien Xie2, David Muller2 and Jiwoong Park1, 2; 1University of Chicago, Chicago, Illinois, United States; 2Cornell University, Ithaca, New York, United States

10:40 AM D3 WITHDRAWN
(Student) Three-Atom-Thick Epitaxial Superlattices with Coherent Lattice
Saien Xie1,2, Yimo Han3, Lijie Tu2, Robert DiStasio3, David Muller2 and Jiwoong Park1; 1University of Chicago, Chicago, Illinois, United States; 2Cornell University, Ithaca, New York, United States

11:00 AM D4
(Student) Tuning Electronic Properties of Directly Grown Lateral 2D Heterostructures Based on Graphene and Transition Metal Dichalcogenides
Shruti Subramanian; The Pennsylvania State University, State College, Pennsylvania, United States

11:20 AM D5
(Student) Lateral Superlattices of Monolayer Semiconducting Transition Metal Dichalcogenides (TMDCs) via Elastic Strain Engineering
Michael Cai Wang, Juyoung Leem, Satoshi Takekuma and SungWoo Nam; University of Illinois at Urbana-Champaign, Urbana, Illinois, United States

11:40 AM D6
Band Shifts and Localized States Arising from Moiré Patterns in MoS2-WSe2 Heterojunctions
Yi Pan1, Stefan Foelsch1, Yifan Nie1, Yu-Chuan Lin1, Bhakti Jariwala1, Kehao Zhang1, Kyeongjae Cho1, Joshua Robinson1 and Randall M. Feenstra2; 1Paul Drude Institute, Berlin, Germany; 2Materials Science and Engineering, The University of Texas at Dallas, Dallas, Texas, United States; 3Materials Science and Engineering, The Pennsylvania State University, University Park, Pennsylvania, United States; 4Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States
10:00 AM E1
**Polarization-Induced Electrical Conductivity in Ultra-Wide Band Gap AlGaN Alloys**
Andrew M. Armstrong and Andrew A. Allerman; Sandia National Laboratories, Albuquerque, New Mexico, United States

10:20 AM E2
**Vertical Al$_x$Ga$_{1-x}$N (x = 0.3 and x = 0.7) PIN Diodes for Power Electronics Applications**
Gregory W. Pickrell, Andrew A. Allerman, Mary H. Crawford, Andrew M. Armstrong, Jeramy R. Dickerson, Michael P. King, K. C. Cross, C. E. Glaser, Michael Van Heukelom and Robert J. Kaplar; Sandia National Laboratories, Albuquerque, New Mexico, United States

10:40 AM E3
**(Student) Vertical 19 μm Thick GaN Trench Gate MISFETs on Si**
Woojin Choi, Atsunori Tanaka, Renjie Chen and Shadi Dayeh; 1Electrical and Computer Engineering, University of California, San Diego, San Diego, California, United States; 2Material Science Program, University of California, San Diego, San Diego, California, United States

11:00 AM E4
**High P-Type Activation Efficiency in GaN via Multicycle Rapid Thermal Annealing—Implant Damage Recovery and Conductivity**
Mark Goorsky, Tingyu Bai, Chao Li, Marko Tadjer, Karl Hobart, Jennifer Hite, Travis Anderson and Boris Feigelson; 1MSE, University of California, Los Angeles, Los Angeles, California, United States; 2U.S. Naval Research Laboratory, Washington, District of Columbia, United States

11:20 AM E5
**In Operando Imaging of Field Spreading and Carrier Transport in GaN-Based Pin Diodes**
Kimberlee C. Collins, Francois Leonard, Jeramy R. Dickerson, Michael P. King, Mary H. Crawford, Andrew M. Armstrong, Andrew A. Allerman, Ozgur Aktas, Isik C. Kizilyalli, Robert J. Kaplar and A. A. Talin; 1Sandia National Laboratories, Livermore, California, United States; 2Sandia National Laboratories, Albuquerque, New Mexico, United States; 3Avogy, Inc., San Jose, California, United States

11:40 AM E6
**Stress Engineered AlN/AlGaN Superlattices as High-Voltage Current Blocking Layers on 200 mm Silicon**
Jie Su, Hu Liang, Niels Posthuma, Dirk Wellekens, Stefaan Decoutere, Soo Min Lee and Ajit Paranjpe; 1Veeco Instrument Inc, Somerset, New Jersey, United States; 2imec, Leuven, Belgium
F: Gallium Oxide—Epitaxial Growth and Characterization
Session Chairs: Rebecca Peterson and Marko Tadjer
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 102

1:30 PM F1
Highly Conductive Homeopitaxial Ga$_2$O$_3$:Si on (010)
β-Ga$_2$O$_3$ by Pulsed Laser Deposition
1 Air Force Research Laboratory, WPAFB, Ohio, United States; 2 Wright State University, Dayton, Ohio, United States; 3 KBRwyle, Beavercreek, Ohio, United States; 4 George Mason University, Fairfax, Virginia, United States

1:50 PM F2
(Student) N-Type β-Ga$_2$O$_3$, Thin Films Grown via Low Pressure Chemical Vapor Deposition
Subrina Rafique, Lu Han, Jonathon R. Grgat and Hongping Zhao; EECS, Case Western Reserve University, Cleveland, Ohio, United States

2:10 PM F3
(Student) Epitaxial Growth and Characterization of α-, β- and ε-Phases of Ga$_2$O$_3$, Grown Using MOCVD and HVPE Techniques
Yao Yao, Luke A. Lyle, Serdal Okur, Gary S. Tompa, Tom Salagaaj, Nick Shrockey, Robert F. Davis and Lisa M. Porter;
1 Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States; 2 Structured Materials Industries, Inc., Piscataway, New Jersey, United States

2:30 PM F4
Conductivity Control for Devices Based on Corundum-Structured α-Ga$_2$O$_3$ on Sapphire
Kentaro Kaneko, Takayuki Uchida, Shin-ichi Kan, Toshimi Hitora and Shizuo Fujita;
1 Kyoto University, Kyoto, Japan; 2 FLOSFI, Inc., Kyoto, Japan

2:50 PM F5
(LATE NEWS, Student) Gallium Oxide on Silicon Films Formed through Direct GaAs Thermal Oxidation and Wafer Bonding
Yuan Tian, Sergei Rouvimov, Jinyang Li and Doug Hall; Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States

3:10 PM BREAK

3:30 PM F6
Unintentional Shallow Donors in β-Ga$_2$O$_3$
Adam T.Neal, Jian V. Li and Shin Mou;
1 Materials and Manufacturing Directorate, Air Force Research Lab, Wright-Patterson AFB, Ohio, United States; 2 Universal Technology Corporation, Dayton, Ohio, United States; 3 Department of Physics, Texas State University, San Marcos, Texas, United States

5:00 PM F7
Structural Characteristics of HVPE-Grown Ga$_2$O$_3$ Films on Native Substrates with Different Crystallographic Orientations
Nadeemullah Mahdik, Marko J. Tadjer, Jennifer Hite and Karl D. Hobart; U.S. Naval Research Laboratory, Washington, District of Columbia, United States

4:30 PM F9
(Student) Phonon and Near-Edge Optical Properties of Ga$_2$O$_3$
Kelsey Mengle, Guangsha Shi, Dylan Bayerl and Emmanouil Kioupakis; Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

4:40 PM F8
Thermal Expansion Coefficients of Beta-Ga$_2$O$_3$ Wafers Determined Using High Resolution X-Ray Diffraction
Mark Goosney, Chao Li, Eva Rosker, Marko Tadjer and Karl Hobart; 1 MSE, University of California, Los Angeles, Los Angeles, California, United States; 2 U.S. Naval Research Laboratory, Washington, District of Columbia, United States

4:50 PM F10
Epitaxial Materials and Devices
Session Chairs: Rachel Goldman and Christine Wang
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 136

1:30 PM G1
(Student) Growth of AllnSb Metamorphic Buffers Using Digital Alloy Technique
Vinista Dahiga, Sadhvikas Addamane, Bed N. Pantha, Ben Mathews, Julia Deitz, Tyler J. Grassman, John A. Carlin, Nathaniel R. Miller, Ganesh Balakrishnan and Sanjay Krishna;
1 Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; 2 Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, New Mexico, United States; 3 Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, United States; 4 Department of Materials Science Engineering, The Ohio State University, Columbus, Ohio, United States; 5 Institute for Materials Research, The Ohio State University, Columbus, Ohio, United States

1:50 PM G2
(Student) The Effects of a Bismuth Flux on Strained-Layer III-V Optical Materials
Scott D. Sifferman, Ann K. Rockwell, Kyle M. McNicholas, Yukun Sun, Rodolfo Salas, Scott J. Maddox, Hari P. Nair, Minjoo Larry Lee and Seth R. Bank;
1 Microsystems Electronics Research Center and ECE Department, The University of Texas at Austin, Austin, Texas, United States; 2 Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States; 3 Department of EE, Yale University, New Haven, Connecticut, United States; 4 Materials Science and Engineering, Cornell University, Ithaca, New York, United States

2:10 PM G3
(Student) Surfactant-Mediated Epitaxy of III-V Digital Alloys
Ann K. Rockwell, Maddy Woodson, Min Ren, Scott Sifferman, Scott Maddox, Joe Campbell and Seth Bank;
1 Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; 2 Electrical and Computer Engineering, University of Virginia, Charlottesville, Virginia, United States

2:30 PM G4
Crystal Growth Mechanism of ZnTe Epilayers on Sapphire Substrate
Taizo Nakasu, Keisuke Oda, Masakazu Kobayashi, and Toshiaki Asahi;
1 Electrical Engineering and Bioscience, Waseda University, Tokyo, Japan; 2 Research Institute for Materials Science and Technology, Waseda University, Tokyo, Japan; 3 JX Nippon Mining & Metals Corporation, Tokyo, Japan
Density Enhancements in GeTe Films Using DI Water
Nadeemullah Mahadik, Laura Ruppalt and James Champlain; U.S. Naval Research Laboratory, Washington, District of Columbia, United States

Growth and Characterization of GePb Alloy Using Layer Inversion Method
Hakimah Alahmada2, Murtatha Alher3, Sattar AlKabi2, Seyed Amir Ghomtiri1, Aboozar Mosleh1, Shui-Qing Yu4 and Hameed Naseem1; 1Electrical Engineering, University of Arkansas, Fayetteville, Arkansas, United States; 2Microelectronics-Photonics Graduate Program, University of Arkansas, Fayetteville, Arkansas, United States; 3Department of Mechanical Engineering, University of Kerbala, Kerbala, Iraq; 4Electrical Engineering, University of Arkansas, Fayetteville, Arkansas, United States

Structural, Optical and Electrical Characterization of GeSn and SiGeSn Thin Films of Varying Composition Deposited by CVD Technique
Jignesh Vanjaria1, Tom Salagaj2, Nick Strockey2, Gary Tompa2 and Hongbin Yu1; 1Arizona State University, Tempe, Arizona, United States; 2Structured Materials Industries, Inc., Piscataway, New Jersey, United States

Investigation of High Voltage GaN Photoconductive Semiconductor Switches
Andrew D. Koehler1, Travis J. Anderson1, Anindya Nath1, Marko J. Tadjer1, Karl D. Hobart1 and Fritz J. Yu1; 1U.S. Naval Research Laboratory, Washington, District of Columbia, United States; 2George Mason University, Fairfax, Virginia, United States

Purification and Ligand Exchange Chemistry of Colloidal Quantum Dots for Fluorescence and Optoelectronic Applications
Andrew B. Gretyak, Megan Y. Gee, Adam Roberge, Yi Shen, John H. Dunlap and Matthew L. Kelley; Chemistry and Biochemistry, University of South Carolina, Columbia, South Carolina, United States
3:30 PM J1
Reaction of Viral Proteins and Sialoglycan on Biomimetic Graphene Surface Measured by Liquid Atomic Force Microscope and Graphene Field-Effect Transistor
Kaho Kamada1, Takao Ono1, Ryota Hayashi1, Yasushi Kanai2, Koichi Inoue1, Yasuhide Ohno1,2, Kenzo Maehashi1,3, Yohei Watanabe4, Shin-ichi Nakakita5, Yasuo Suzuki6, Toshio Kawahara7, Sonia A. Contera8 and Kazuhiro Matsumoto1; 1The Institute of Scientific and Industrial Research, Osaka University, Osaka, Japan; 2Graduate School of Science and Technology, Tokushima University, Tokushima, Japan; 3Institute of Engineering, Tokyo University of Agriculture and Technology, Tokyo, Japan; 4Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kyoto, Japan; 5Life Science Research Center, Kagawa University, Kagawa, Japan; 6College of Life and Health Sciences, Chubu University, Aichi, Japan; 7College of Engineering, Chubu University, Aichi, Japan; 8Department of Physics, University of Oxford, Oxford, United Kingdom

3:50 PM J2
Measurement of Enzymatic Reaction Using Graphene Field-Effect Transistor and Microwell for Detection of Helicobacter Pylori
Takao Ono1, Yasushi Kanai1, Yasuhide Ohno1,2, Kenzo Maehashi1,3, Koichi Inoue1 and Kazuhiro Matsumoto1; 1The Institute of Scientific and Industrial Research, Osaka University, Osaka, Japan; 2Graduate School of Science and Technology, Tokushima University, Tokushima, Japan; 3Institute of Engineering, Tokyo University of Agriculture and Technology, Tokyo, Japan

4:10 PM J3
(Student) Translation of PEDOT/Parylene C ECoG Microelectrode Arrays for Recording Auditory Cognitive Activity in Birds
Lorraine A. Hossain1, Eztequiel Arneodo2, Nick Rogers3, Mehran Ganji4, John Herriz5, Vikash Gilja6, Timothy Gentner7 and Shadi A. Dayeh4; 1Materials Science and Engineering, University of California, San Diego, La Jolla, California, United States; 2Biocircuits Institute, University of California, San Diego, La Jolla, California, United States; 3Department of Physics, University of California, San Diego, La Jolla, California, United States; 4Institute of Engineering, Tokyo University of Agriculture and Technology, Tokyo, Japan

4:30 PM J4
(Student) Size Effects in Scaling Electrocorticography Arrays of PEDOT:PSS/Au, PEDOT:PSS/Pt, Au and Pt
Mehran Ganji1, Atsunori Tanaka1, Ahmed Yousef, Vikash Gilja, Eric Halgren and Shadi Dayeh; ECE, University of California, San Diego, San Diego, California, United States

4:50 PM J5
(Student) Implications of Using High Reaction Rate Amperometric Micro-Electrode Array for Measurement of Local Concentration Variations of Bioanalytes
Jose F. Rivera1, David B. Janes1, Siddarth V. Sridharan2, Jenna L. Rickus2 and James Nolan3; 1Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States; 2Agricultural and Biological Engineering, Purdue University, West Lafayette, Indiana, United States

3:00 PM J1
Characteristics of Electronic Localization in Semiconductor Alloys—Design Principles
Oleg Rubel1 and Christopher Pashartis; Materials Science and Engineering, McMaster University, Hamilton, Canada

2:10 PM J3
(Student) Phase-Influenced Thermal Conductivity of Bulk VO2 from First-Principles Lattice Dynamics Calculations
Jorge O. Morales1,2, Francisco Herrera1, Donovan E. Diaz-Drogue1, Diego Celentano3,4, David B. Go5 and Tengfei Luo1,6; 1Aerospace and Mechanical Engineering, University of Notre Dame, South Bend, Indiana, United States; 2Mechanical Engineering, Pontificia Universidad Catolica de Chile, Santiago, Chile; 3Fisica, Pontificia Universidad Catolica de Chile, Santiago, Chile; 4Centro de Investigacion en Nanotecnologia y Materiales Avanzados (cSEND), University of Notre Dame, Notre Dame, Indiana, United States

2:30 PM J4
Electronic Properties of Two-Dimensional Bi-Layered Silicene on Various Substrates
Zhonghang Ji1, Lok C. Lew Yan Voon1 and Yan Zhuang1; 1Electrical Engineering, Wright State University, Dayton, Ohio, United States; 2University of West Georgia, Carrollton, Georgia, United States

3:10 PM BREAK

3:30 PM J6
(Student) Hybrid Functional Study of the Electronic Structure of Rare-Earth Pnictides
Shaiba Khalid1 and Anderson Janotti2; 1Department of Material Science and Engineering, University of Delaware, Newark, Delaware, United States; 2Department of Materials Science and Engineering, University of Delaware, Newark, Delaware, United States

3:50 PM J7
Electrical Properties of a Functionalized UiO-66 Metal-Organic Framework
Terence D. Musho1, Al Yasin and Nianqiang Wu; Mechanical and Aerospace Engineering, West Virginia University, Morgantown, West Virginia, United States
4:10 PM J8
Large-Scale DFT Simulation of Organic Molecules
Encapsulated in SWCNT as Electrode Material of
Rechargeable Battery Shuji Ogata, Takahiro Tsuzuki and Syota Oyayizu; Department of Physical Science and Engineering, Nagoya Institute of Technology, Nagoya, Japan

3:10 PM BREAK

3:30 PM J9
WITHDRAWN

3:30 PM K6
High-Sensitivity Optical Detection Using Charge-Coupled
Graphene-Based Sensors Stephen W. Howell1, Thomas E. Beechem2, Isaac Ruiz2, Paul Davids1, Richard K. Harrison1, Sean Smith1, Nicholas J. Martinez1 and Jeffrey B. Martin1;
1Applied Photonic Microsystems, Sandia National Laboratories, Albuquerque, New Mexico, United States; 2Nanoscale Sciences Department, Sandia National Laboratories, Albuquerque, New Mexico, United States; 3Nuclear Forensics Research and Development, Sandia National Laboratories, Albuquerque, New Mexico, United States; 4Electronic, Optical and Nano, Sandia National Laboratories, Albuquerque, New Mexico, United States

3:50 PM K7
Millisecond Pulse Dynamics of Electric Double Layers
Formed on Graphene Field-Effect Transistors Ke Xu1, Yu-Chuan Lin2, David Guzman2, Alejandro Strachan2, Joshua Robinson1, Alan Seabaugh1 and Susan K. Fullerton Shirley1;
1University of Pittsburgh, Pittsburgh, Pennsylvania, United States; 2University of Notre Dame, Notre Dame, Indiana, United States; 3The Pennsylvania State University, University Park, Pennsylvania, United States; 4Purdue University, West Lafayette, Indiana, United States

4:10 PM K8
Controlled Doping of Two-Dimensional (2D) Materials with
Molecular Reductants and Oxidants Siyuang Zhang1, Meng-Yen Tsai2, Steve Barlow2, Eric Vogel2, Seth Marder3, Christina A. Hacker1 and Sujitra Pookpanratana1; 1National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 2Georgia Tech, Atlanta, Georgia, United States

4:30 PM K9
(S)InterfAce Passivation and Trap Reduction in
Molybdenum Disulﬁde/ Silicon Oxide Back-Gate Transistors
by Hydrogen Fluoride Treatment Yaoqiao Hu, Pak San Yip, Chak Wah Tang, Kei May Lau and Qiang Li; Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

4:50 PM K10
Enhanced Carrier Mobility of Multilayer MoS2 and MoSe2
Thin-Film Transistors by Al2O3 Encapsulation Seong Yeoul Kim, Hyun Ah Lee and Woong Choi; Kookmin University, Seoul, Korea (the Republic of)

L: ALGaN/GaN HEMTs
Session Chairs: Andrew Koehler and Zlatko Sitar
Wednesday Afternoon, June 28, 2017
McKenna Hall, Auditorium

1:30 PM L1
(Student) N-Polar High-Electron-Mobility Transistors with
GaN/InGaN Composite Channels Haoran Li, Steven Wienceke, Brian Romanczyk, Elaheh Ahmadi, Matthew Guidry, Xun Zheng, Stacia Keller and Omesh K. Mishra; Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States
2:10 PM L3
Suppression of Self-Heating Effect in Flexible GaN-Based HFETs with Metal Substrates Seungkyu Oh1,2, Moon Uk Jo3, Tae Hong Jang1, Jei Chen1, Weijie Wang1, Shahab Shervin1, Sara Pouladi1, Joon Seop Kwak1 and Jae-Hyun Ryu1,2; 1Department of Mechanical Engineering and Materials Science, University of Houston, Houston, Texas, United States; 2Department of Printed Electronics Engineering, Sunchon National University, Sunchon-Si, Korea (the Republic of); 3Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; 1Department of Printed Electronics Engineering, Sunchon National University, Sunchon-Si, Korea (the Republic of); 2Texas Center for Superconductivity at the University of Houston (TcSUH), University of Houston, Houston, Texas, United States.

2:30 PM L4
(Student) GaN/AIN Quantum Well FETs on AIN/SiC Platform Using High Temperature MBE Growth Reet Chaudhuri1, S.M. Moududul Islam1, Samuel Bader2, Austin L. Hickman1, Shyam Bharadwaj1, Huili Grace Xing1, Debdeep Jena1, 3; 1Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; 2Department of Electrical Engineering, University of Houston, Houston, Texas, United States; 3Material Science and Engineering, Cornell University, Ithaca, New York, United States.

2:50 PM L5
(LATE NEWS, Student) Abrupt p-GaN: Mg/GaN Junctions via Flow Modulation MOCVD Anchal Agarwal1, Chirag Gupta1, Cory Lund1, Abdullah Allassan1, Tom Mates1 and Stacia Keller1; 1Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States.

3:10 PM BREAK

M: AlGaN Optoelectronics
Session Chairs: Andrew Koehler and Zlatko Sitar
Wednesday Afternoon, June 28, 2017
McKenna Hall, Auditorium

3:30 PM M1

3:50 PM M2
(Student) Molecular Beam Epitaxial Growth and Characterization of AlN Nanowall Deep UV Light Emitting Diodes Xianhe Liu, Songrui Zhao, Binh H. Le and Zetian Mi; Department of Electrical and Computer Engineering, McGill University, Montreal, Canada.

4:10 PM M3
(Student) Tunnel-Injected Sub-260 nm Ultraviolet Light Emitting Diodes Yuyei Zhang1, Srinan Krishnamoorthy1, Fatih Akyol1, Sanyam Bajaj1, Zane Jamal-Eddine1, Andrew A. Allerman1, Michael Moseley2, Andrew Armstrong2 and Siddharth Rajan1; 1Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; 2Sandia National Laboratories, Albuquerque, New Mexico, United States.

4:30 PM M4
(Student) Deep-UV Emission and Optical Gain Measurements in Optically-Pumped AlN/GaN Quantum Well Structures Galen Harden1, S. M. Moududul Islam1, Kevin Lee1, Vladimir Protsenko2, Huili Grace Xing2, Debdeep Jena1 and Anthony J. Hoffman1; 1University of Notre Dame, Notre Dame, Indiana, United States; 2Cornell University, Ithaca, New York, United States.

5:10 PM M6
(LATE NEWS) Impact-Ionization Induced UV-Vis Electroluminescence in Unipolar GaN/AIN Resonant Tunneling Diodes Jimmy Encomendero1, Faiza A. Faria2, S.M. Islam1, Vladimir Protsenko1, Sergei A. Rouvimov2, Patrick A. Fay2, Debdeep Jena1, Huili Grace Xing1; 1School of Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; 2Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States.

N: Silicon Carbide

Session Chairs: Nadeemullah Mahadik and MVS Chandrashekhar
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 155

1:30 PM N1
(Student) Mapping of Lattice Strain Variation in 4H-SiC Commercial Wafers by Synchrotron Double-Crystal X-Ray Topographic Contour Mapping Jimanju Guo, Yu Yang, Balaji Raghothamachar and Michael Dudley; Materials Science and Chemical Engineering Department, Stony Brook University, Stony Brook, New York, United States.

1:50 PM N2
Investigation of Shockley Stacking Fault Expansion in 4H-SiC Substrates Nadeemullah Mahadik1, Robert Stahlbush1 and Siddharth Sundaresan2; 1U.S. Naval Research Laboratory, Washington, District of Columbia, United States; 2GeneSiC Semiconductor Inc., Dulles, Virginia, United States.

2:10 PM N3
Lattice Parameter and Doping Concentration Measurement Inside Highly N-Doped Facet Region of 4H-SiC Commercial Wafers Using X-Ray Topographic Contour Mapping Yu Yang, Jimanju Guo, Balaji Raghothamachar and Michael Dudley; Material Science and Engineering, Stony Brook University, Stony Brook, New York, United States.
2:30 PM N4
(Student) A Comparison of High and Low Frequency Electrically Detected Magnetic Resonance and Near-Zero Field Magnetoresistance Phenomena in SiC pn Junctions
Ryan J. Waskiewicz1, Mark A. Anders1, Patrick M. Lenahan1 and Corey J. Cochrane1; 1Engineering Science and Mechanics, The Pennsylvania State University, State College, Pennsylvania, United States; 2NASA Jet Propulsion Laboratory, Pasadena, California, United States

2:50 PM N5
(Student) Sub-Bandgap Response of Graphene/SiC Schottky Emitter Bipolar Phototransistor Examined by Scanning Photocurrent Microscopy
Bobby G. Barker1, Venkata S.N. Chava1, MVS Chandrashekhar2 and Andrew B. Greytak2; 1Chemistry and Biochemistry, University of South Carolina, Columbia, South Carolina, United States; 2Electrical Engineering, University of South Carolina, Columbia, South Carolina, United States

3:10 PM BREAK

3:30 PM N6
(Student) CCDLTS Measurements of Silicon Carbide (4H-SiC) MOS Capacitors with Phosphoslicate Glass Dielectric Asanka Jayawardena1, Chunkun Jiao1, Patricia M. Mooney2 and Sarit Dhar1; 1Department of Physics, Auburn University, Auburn, Alabama, United States; 2Department of Physics, Simon Fraser University, Burnaby, Canada

3:50 PM N7
(Student) Performance Improvement of 10 kV 4H-SiC Rectifiers with High Schottky Barrier Height
Yifan Jiang1, Woongje Sung2, Jayant Baliga1, Sizhen Wang1, Bongmook Lee1 and Alex Huang2; 1Electrical and Computer Engineering, North Carolina State University, Raleigh, North Carolina, United States; 2State University of New York Polytechnic Institute, Albany, New York, United States

4:10 PM N8
(Student) Voltage Tunable Solar-Blindness in a UV Detector Using a TFS Grown Epitaxial Graphene (EG)/SiC Heterojunction Bipolar Phototransistor
Venkata S.N. Chava, Anusha Balachandran, Sakib M. Muhtadi, Asif Khan and MVS Chandrashekhar; Electrical Engineering, University of South Carolina Columbia, Columbia, South Carolina, United States

4:30 PM N9
(Student) TEM-EELS Investigation of B, P and Sb-Passivated 4H-SiC/SiO2 Interface Structures
Christopher J. Klingshirn1, Joshua A. Taillon2,1, Gang Liu2, Sarit Dhar2, Leonard C. Feldman1, Tsvetanka S. Zheleva2, Aivars J. Lelis1 and Lourdes G. Salamanca-Riba2; 1Materials Science and Engineering, University of Maryland, College Park, Maryland, United States; 2Materials Measurement Science Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 3Materials Science Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 4Institute for Advanced Materials, Rutgers University, New Brunswick, New Jersey, United States; 5Physics, Auburn University, Auburn, Alabama, United States; 6U.S. Army Research Laboratory, Adelphi, Maryland, United States

4:50 PM N10
Deep Reactive Ion Etching of 4H-SiC via Cyclic SF6/O2 Segments
Lunet E. Luna1, Marko J. Tadjer1, Travis J. Anderson2, Karl D. Hobart2 and Fritz J. Kub2; 1Postdoctoral Fellow residing at Naval Research Laboratory, Washington, District of Columbia, United States; 2U.S. Naval Research Laboratory, Washington, District of Columbia, United States
PS1 (Student) High Temperature Operation of n-Al_{1-x}GaN Channel Metal Semiconductor Field Effect Transistors on Low-Defect AlN Templates with Regrown Graded Contacts Sakib Muhtadi, S. Hwang, A. Coleman, F. Asif, A. Lunev, MVS Chandrashekharkin and Asif Khan; Electrical Engineering, University of South Carolina, Columbia, South Carolina, United States.

PS2 (Student) Solar Blind UV Detection Using High-Al Content AlGa_N Devices—Towards Responsivity >10^6 A/W Sakib Muhtadi, S. Hwang, A. Coleman, F. Asif, A. Lunev, Venkata S.N. Chava, MVS Chandrashekharkin and Asif Khan; Electrical Engineering, University of South Carolina, Columbia, South Carolina, United States.

PS3 (Student) Characterization of Dislocation Configurations in GaN Substrates by X-Ray Topography Shuang Wu1, Balaji Raghothamacharr1, Michael Dudley1, Jaime A. Freitas2, Tomasz Sochacki2 and Michal Bockowski3; 1Department of Materials Science and Chemical Engineering, Stony Brook University, Stony Brook, New York, United States; 2U.S. Naval Research Laboratory, Washington DC, District of Columbia, United States; 3Institute of High Pressure Physics, Polish Academy of Science, Warsaw, Poland.

PS4 (Student) Radiative and Auger Recombination in Indium Nitride from First-Principles Andrew McAllister1, Dylan Bayer2 and Emmanouil Kioupakis3; 1Applied Physics, University of Michigan, Ann Arbor, Michigan, United States; 2Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States.

PS5 Fast Hall—A High Speed Hall Measurement for Material Characterization Jeffrey Lindemuth1, Lake Shore Cryotronics, Westerville, Ohio, United States.

PS6 The Effect of the Undoped GaN/Buffer-Layer Interface on the Operation of Schottky Diodes and MESFET Devices Jian Xu; The Pennsylvania State University, State College, Pennsylvania, United States.

PS7 (Student) Enhanced Light Extraction Efficiency of AlGaN-Based Deep Ultraviolet Light-Emitting Diodes with Sidewall Roughed Sapphire Substrates Shuai Wang; Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China.

PS8 (Student) Beta-Gallium Arsenide Films Prepared by Anodization and Annealing of Gallium Arsenide Ryan J. Bank1, Jerry M. Woodall and Muhammad S. Islam; ECE, University of California, Davis, Davis, California, United States.

PS9 (Student) N-Type Quasi-2D β-Ga_{1-x}O_3 / p-Silicon Heterojunction P-N Diodes Gahyun Shin and Jihyun Kim; Korea University, Seoul, Korea (the Republic of).

PS10 (Student) A New Descriptor for High-Throughput Screening of P-Type Semiconductor Yongsung Youn, Kanghoon Yim, Misoo Lee and Seungwu Han; Seoul National University, Seoul, Korea (the Republic of).

PS11 (Student) Color Centers and Defect Complexes in Sn:ZnO Single Crystals Micah Haseman1, Pooneh Saadatkia1, Jack Warfield1, Joseph Lawrence2, Armando Hernandez2, Gerald Jellison1, Lynn Boatner3 and Farida Selim3; 1Physics, Bowling Green State University, Napoleon, Ohio, United States; 2Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; 3Center for Materials and Sensors Characterization, University of Toledo, Toledo, Ohio, United States; 4Materials Science and Technology Division, Oak Ridge National Lab, Oak Ridge, Tennessee, United States.

PS12 (Student) Developing Inexpensive and Easy Hole Conducting Transparent Electronics by Rusing Copper with Iodine Sebastian Howard, Matthew Wahila and Louis Piper; Physics, Binghamton University, State University of New York, Astoria, New York, United States.

PS13 Structural and Optical Properties of Hafnia-Based Thin Films with Embedded Si Nanoclusters and Rare-Earth Ions Larissa Khomenkova1, Christophe Labbe2, Xavier Portier1 and Fabrice Gourbilleau1; 1V.E. Lashkaryov Institute of Semiconductor Physics, Kyiv, Ukraine; 2CIMAP/Ensicaen, Caen, France.

PS14 (Student) Non-Thermal Plasma Based Surface Modification of ZnO-Epoxi-Graphene Flexible Nano-Composite Thin Films Sanjeev Kumar1,2, Walker Tuff2; 1Daniel R. Aman1,2 and Sankha Banerjee1,2; 1Mechanical Engineering, California State University, Fresno, Fresno, California, United States; 2Energy Engineering Research Group, California State University, Fresno, California, United States.

PS15 Exploring Sub-10[nm] Oxygen Clusters in Czochralski Silicon Phil Fraundorf, Jamie Roberts and David Osborn; Physics and Astronomy, University of Missouri Saint Louis, Saint Louis, Missouri, United States.

PS16 Structural and Optical Properties of Al-Doped ZnO Nanocrystals Prepared by Ultrasound Spray Pyrolysis Peter Tetyana Torchynska1, Brahim El Filali1 and Juan Antonio J. Gomez2; 1UPHITA, Instituto Politecnico Nacional, Ciudad de México, Mexico; 2ESFM, Instituto Politecnico Nacional, CDMX, Mexico.

PS17 (Student) Fundamental Bounds for the Resonance Strength in Graphene Plasmonic Structures Sara Arcezoonandan and Berardi Sensale-Rodriguez; Department of Electrical and Computer Engineering, The University of Utah, Salt Lake City, Utah, United States.
PS18 (Student) Novel Material Combinations for Narrowband Metamaterial Absorbers/Emitters Nicole A. Pfister, Dante DeMeo, John Chiwer, Emily Carlson and Thomas E. Vandervelde; Tufts University, Medford, Massachusetts, United States.

PS19 (Student) Metamaterial Bandpass Filters in Optical Frequencies Minsu Oh, Richard Liptak and Sergio Granieri; Physics and Optical Engineering, Rose-Hulman Institute of Technology, Terre Haute, Indiana, United States.

PS20 (Student) Thermoelectric Transport Properties of Single Layer 2D Chalcogenides and Dichalcogenides Jorge O. Morales1,2, Donovan E. Diaz-Droguett3 and Tengfei Luo1,2; 1Aerospace and Mechanical Engineering, University of Notre Dame, South Bend, Indiana, United States; 2Mechanical Engineering, Pontificia Universidad Catolica de Chile, Santiago, Chile; 3Centre de Investigació en Nanotecnologia y Materiales Avanzados (CIEN-UC), Pontificia Universidad Catolica de Chile, Santiago, Chile; 4Center for Sustainable Energy of Notre Dame (cSEND), University of Notre Dame, Notre Dame, Indiana, United States.

PS21 Seebeck Coefficient Measurements on Thin Films of ZnSnN2 and the States of Density Effective Mass Jeffrey S. Dyck1, John W. Cenker1, Robert A. Makin2, Nathaniel Feldberg3 and Steven Durbin4; 1Department of Physics, John Carroll University, University Heights, Ohio, United States; 2Department of Electrical and Computer Engineering, Western Michigan University, Kalamazoo, Michigan, United States; 3Department of Physics, State University of New York, Buffalo, New York, United States.

PS22 (Student) Thermal Oxidation of A-Oriented ZnO Thin Films—Exploring the Anisotropy of Optical and Electrical Properties Wan-Chen Hsieh1, Paritosh Wadkar1, Chiang-Wen Chang1, Chun-Fu Chang1, Hui-Chun Huang1, Sung-Wei Yeh1, Hye-Won Seo1, Wei-Kan Chu1 and Quark Y. Chen1,4; 1National Sun Yat-sen University, Kaohsiung, Taiwan; 2National Kaohsiung University, Kaohsiung, Taiwan; 3Jeju National University, Jeju-si, Korea (the Republic of); 4University of Houston, Houston, Texas, United States.

PS23 (Student) Dilute GeSn—A Study on the Effects of Adding Stannic Chloride to UHV-CVD Growth Perry Grant1,2, Wei Dou1, Joshua Grant2,3, Bader Alharthi1, Aboozar Moslehi1, Wei Du1, Baohua Li1, Mansour Mortazavi1, Hameed Naseem2 and Shui-Qing Yu1; 1Arktonics LLC, Fayetteville, Arkansas, United States; 2Arktonics LLC, Fayetteville, Arkansas, United States; 3National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 4Engineering Physics Division, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, United States.

PS24 Comparative Studies of Cu O Epitaxial Thin Films on MgO and s-AI O: Substrates Paritosh Wadkar1, Wan-Chen Hsieh1, Chiao-Wei Lin1, Chun-Fu Chang1, Hui-Chun Huang1, Sung-Wei Yeh1, Li-Wei Tu1, Hye-Won Seo1, Wei-Kan Chu1 and Quark Y. Chen1,4; 1National Sun Yat-sen University, Kaohsiung, Taiwan; 2National Kaohsiung University, Kaohsiung, Taiwan; 3Jeju National University, Jeju-si, Korea (the Republic of); 4University of Houston, Houston, Texas, United States.

PS25 Low Temperature Ge Growth Using Plasma Enhanced UHV-CVD Technique Bader Alharthi1, Joshua M. Grant1, Wei Dou1, Perry C. Grant2, Aboozar Moslehi1, Hameed Naseem3 and Shui-Qing Yu1; 1Electrical Engineering, University of Arkansas Fayetteville, Fayetteville, Arkansas, United States; 2Arktonics LLC, Fayetteville, Arkansas, United States.

PS26 (Student) Characterization of Contact Metallizations on SnS Nanoribbons Jenifer R. Haizus1, Adam J. Biacchi2, Son T. Le2, Curt A. Richter2, Angela R. Hight Walker2 and Lisa M. Porter2; 1Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States; 2Engineering Physics, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, United States.

PS27 (Student) Novel Photolithographic Techniques Using Polymethyl Methacrylate Daniel Carbaugh, Faiz Rahman, Sneha Pandya and Savas Kaya; Ohio University, Athens, Ohio, United States.

PS28 (Student) Effects of Forming Voltage and Oxide Microstructure on Conductive Filament Shape in p+Si/HfO2/Cu Filamentary Resistance Switches Heidi Clarke, Timothy Brown and Patrick Shamberger; Materials Science, Texas A&M University, College Station, Texas, United States.


PS30 WITHDRAWN Growth and Characterization of 3D Topological Insulator Bi2Se3 on Surface Passivated ZnO Hsin-Yen Lee1,2, Ying-Chen Lee1, Albert Davydov1 and Yuan-Hui Chang1; 1National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 2Theiss Research, La Jolla, California, United States; 3Department of Physics, National Taiwan University, Taipei, Taiwan.

PS31 (Student) Modeling Hexagonal Boron Nitride Based Thin Electroluminescence Devices for Deep Ultra Violet Light Generation Thushan Wickramasinghe; Electrical Engineering and Computer Science, Ohio University, Athens, Ohio, United States.
PS32  (Student) Electronic and Optical Properties of Two-Dimensional GaN from First-Principles Calculations
Nocona Sanders, Dylan Bayerl, Guangsha Shi and Emmanouil Kioupakis; Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States.

PS33  (Student) Graphene as Contact Electrode Material for CNTFET Applications
Phani Raghavendra Yasasvi Gangavarapu, Punith Chikkahalli Lokesh, K N Bhat and Akshay Naik; Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore, India.

PS34  (Student) Enhancement of QDs Size and Coupling Due to Ultrathin GaAs Barrier (4-4.5nm) of the Bilayer InAs QDs Heterostructure
Binita Tongbram and Subhananda Chakrabarti; Indian Institute of Technology, Powai, India.

PS35  (Student) Impact of Growth Pause on the Performance of InAs/GaAs Based Multi-Layer Quantum Dots Infra-Red Photodetectors
Binita Tongbram and Subhananda Chakrabarti; Indian Institute of Technology, Powai, India.

PS36  (Student) Probing the Origin of Magnetism in FeSb, BiSe, Ferromagnetic Semiconductors
Juan S. Lopez1, Pierre Ferdinand Poudou-Poudou1, Alexander Page2 and Citrad Uher2; 1Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States; 2Physics, University of Michigan, Ann Arbor, Michigan, United States.

PS37  (Student) Dye Sensitized Nanoparticles for Solar Driven Chemical Energy Storage
George Hargenrader; Chemistry, Bowling Green State University, Bowling Green, Ohio, United States.

PS38  (Student) Surface Functionalization Approaches for Quantitative Sensing of Bioanalytes Using Amperometric Micro-Electrode Arrays
Siddarth Sridharan1, Jose F. Rivera1, David B. Janes1 and Jenna L. Rickus2; 1ECE, Purdue University, West Lafayette, Indiana, United States; 2ABE, Purdue University, West Lafayette, Indiana, United States.

PS39  (Student) Enhanced Signal-to-Noise Ratio Using Nanomaterial-Based Passive Neural Electrodes
Sepideh Rastegar1, Justin Stadlbauer1, Kari McLaughlin2, Kiyo Fujimoto2, David Estrada2 and Kurtis D. Cantley1; 1Electrical and Computer Engineering, Boise State University, Boise, Idaho, United States; 2Micron School of Materials Science and Engineering, Boise State University, Boise, Idaho, United States.

PS40  Systematic Approach for Printing Solar Cells from Perovskite Precursors
Tara Holeman1, Jason Wright1, Jixin Chen2, Savas Kaya1 and Wojciech M. Jadwisienzak1; 1EECS, Ohio University, Athens, Ohio, United States; 2Department of Chemistry and Biochemistry, Ohio University, Athens, Ohio, United States.

PS41  WITHDRAWN
(Students) Artificial Photosynthesis—Utilizing NAD+/NADH Analogs for the Solar Fuel Forming Reductions
Stefan Ilic and Ksenija Glusac; Chemistry, Bowling Green State University, Bowling Green, Ohio, United States.

PS42  (Student) Novel Approach of Photolithography to Realize Patterned All-Solution Based Organic Thin-Film Transistors
Anuj Rajpoot and Soumya Dutta; Electrical Engineering, Indian Institute of Technology, Madras, Chennai, India.

PS43  TRANSFERRED TO W1

PS44  (Student) Synthesis and Electro-Optic Properties of Novel Polyimides Containing Dicyanovinylresorcinoxy Groups with Highly Enhanced Thermal Stability of Dipole Alignment
Jung-Eun Kim and Ju-Yeon Lee; Inje University, Gimhae, Korea (the Republic of).

PS45  (LATE NEWS, Student) Dependence of Internal Crystal Structures of InAs Nanowires on Electrical Characteristics of Field Effect Transistor
Sanmooon Han1, Kwanjae Lee1, Ilgyu Choi1, Cheul-Ro Lee1, Jin Soo Kim1, Seoung-Ki Lee2 and Jeongwoo Hwang2; 1Division of Advanced Materials Engineering & Research Center of Advanced Materials Development, Chonbuk National University, Jeonju, Korea (the Republic of); 2Korea Institute of Science and Technology Jeonbuk Branch, Wanju 55324, Republic of Korea; 3Korea Photonics Technology Institute, Gwangju 61007, Republic of Korea.

PS46  WITHDRAWN
(LATE NEWS) Low Bandgap Polymer/Polymer, Polymer/Fullerene Phase Diagrams—Effect of Phase Separation on Photovoltaic Performance
Getachew Muleta Fanta1; 1Polymer Engineering, Silesian University of Technology, Gliwice, Poland.

PS47  (LATE NEWS) Nanostructured AlGaN UV-LEDs with Reduced Surface Trap States Based on Polarity Control Scheme
Wei Guo, Zhenhai Yang, Junmei Li, Xi Yang, Feng Huang and Jichun Ye; Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo, China.
Effects of Substrate Type and Temperature Growth on the Microstructure and Characteristics of Pulsed Laser Deposited TiO₂ Films and their Role as Buffer Layers for Conductive Films

Sahil Agarwal¹, Micah Haseman², Pooneh Saadatkia¹, Dave Winarski¹, Eryn Doyle², Le Zhang²,³, Kevin Leedy⁴ and Farida A. Selim¹,²; ¹Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; ²Department of Physics and Astronomy, Bowling Green State University, Bowling Green, Ohio, United States; ³Jiangsu Key Laboratory of Advanced Laser Materials and Devices, School of Physics and Electronic Engineering, Jiangsu Normal University, Xuzhou, China; ⁴Air Force Research Laboratory Sensors Directorate, Wright-Patterson Air Force Base, Dayton, Ohio, United States.
Thursday Morning, June 29, 2017
DeBartolo Hall, Room 102

8:20 AM Q1
(Student) External Strain-Induced Energy Shifts in LaNiO3/Sr0.5Sr0.5MnO3/SrTiO3 Heterostructures
Hantian Gao1, Thaddeus J. Asel1, Molly Ball2, Jason Hoffman3, Anand Bhattacharya4, Wolfgang Windl2 and Leonard Brillson3; 1Department of Physics, The Ohio State University, Columbus, Ohio, United States; 2The Department of Science and Engineering, The Ohio State University, Columbus, Ohio, United States; 3Department of Physics, Harvard University, Boston, Massachusetts, United States; 4Materials Science Division, Argonne National Laboratory, Argonne, Illinois, United States; 5Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

8:40 AM Q2
(Student) Thickness Dependent Metal-Insulator Transition of a Correlated Oxide Heterostructure Integrated Directly on Si Kamyar Ahmadi-Majani1, Tongjie Chen1, Ricky Hensley1, Patrick Conlin1, Zheng Hui Lim1, Reza Moghadam1, Dong Su1, Divine P. Kumah2, Hanghui Chen4 and Joseph H. Ngai2; 1Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; 2Air Force Research Laboratory, Dayton, Ohio, United States; 4Institute of Physics, New York University Shanghai, Pudong, China

9:00 AM Q3
(Student) Optical Probe of Temperature Dependent Magnetization in La2/3Sr1/3MnO3 and Related Perovskite Heterostructures Matthew Sheffield1, Jason Hoffman1, Hantian Gao1, Michael Swartz2, Leonard Brillson1, Anand Bhattacharya2 and Ezekiel Johnston-Halperin1; 1Physics, The Ohio State University, Columbus, Ohio, United States; 2Argonne National Laboratory, Argonne, Illinois, United States

9:20 AM Q4
2 DEG at the Interface of SrTiO3 and Al2O3 Heterostructures Farida Selim1, David Winarski1, Pooneh Saadatkia1 and Kevin Leedy2; 1Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; 2Air Force Research Laboratory, Dayton, Ohio, United States

9:40 AM Q5
(Student) Ferroelectric Metal-Oxide-Semiconductor Capacitors Using Ultrathin Single Crystalline SrZrTiO3, Reza M. Moghadam1, Zhiyong Xiao1, Kamyar Ahmadi-Majani2, Everett D. Grimley3, Mark Bowden4, Phuong-Vu Ong5, James M. Lebeau6, Scott A. Chambers7, Xia Hong8, Peter V. Sushko9 and Joseph H. Ngai10; 1Electrical Engineering, The University of Texas at Arlington, Arlington, Texas, United States; 2Physics, University of Texas at Arlington, Arlington, Texas, United States; 3Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; 4Physics and Astronomy, University of Nebraska Lincoln, Lincoln, Nebraska, United States; 5Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, Washington, United States; 6Physical Sciences Division, Physical and Computational Sciences Directorate, Pacific Northwest National Laboratory, Richland, Washington, United States

10:00 AM BREAK

10:20 AM Q6
(Student) Diamond-Like Carbon and Amorphous Hydrogenated Carbon Thin Films Studied with Electrically Detected Magnetic Resonance and Near-Zero Field Magnetoresistance Charles McLemore1, Patrick M. Lenahan1 and Sean W. King2; 1Engineering Science and Mechanics, The Pennsylvania State University, University Park, Pennsylvania, United States; 2Logic Technology Development, Intel Corporation, Hillsboro, Oregon, United States

10:40 AM Q7
(Student) Tunable Traps in Solution Processed Spin–Coated Aluminium Oxide Phosphate Sandip Mondal and V Venkataraman; Department of Physics, Indian Institute of Science, Bengaluru, India

11:00 AM Q8
(Student) DLTS Analysis and Interface Engineering of Solution Route Fabricated Zirconia Based MIS Devices Using Plasma Treatment Arvind Kumar, Sandip Mondal and KSR Kotaewara Rao; Physics, Indian Institute of Science, Bangalore, India

11:20 AM Q9
(Student) Formation Mechanism of Atomically Flat Si(100) Surface by Annealing in Ar/H2 Ambient Sohya Kudoh and Shun-ichiro Ohmi; Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Yokohama, Japan

11:40 AM Q10
High-Dielectric Materials for Fabrication by Two-Photon Polymerization Eric M. Weis1, Kevin M. Hubbard1, Matthew J. Herman1, Reuben J. Peterson1, Ghanshyam Pilania2, Dmitry Shchegolkov2, Ting S. Luk3, Anatoly V. Efimov4 and Evgenya I. Simakov5; 1MST-7 Engineered Materials, Los Alamos National Laboratory, Los Alamos, New Mexico, United States; 2AOT-AE: Accelerators and Electrodyamics, Los Alamos National Laboratory, Los Alamos, New Mexico, United States; 3CINT, Sandia National Laboratories, Albuquerque, New Mexico, United States; 4MPA-CINT Center for Integrated Nanotechnologies, Los Alamos National Laboratory, Los Alamos, New Mexico, United States; 5MST-8: Materials Science in Radiation & Dynamics Extremes, Los Alamos National Laboratory, Los Alamos, New Mexico, United States

P: Low-Dimensional Structures
Session Chairs: Kris Bertness and Jian Xu
Thursday Morning, June 29, 2017
DeBartolo Hall, Room 136

8:20 AM P1
(Student) Semi-Empirical Growth Rate Modelling for Self-Assisted Growth of GaAs, GaAs/GaAsSb Core-Shell, GaAsSb Axial NW Using MBE Manish Sharma1, Md Rezaul Karim1, Pavan K. Kasanaboina1 and Shamli Iyer1; 1Nanoeengineering, North Carolina Agricultural and Technical State University, Greensboro, North Carolina, United States; 2Electrical and Computer Engineering, North Carolina Agricultural and Technical State University, Greensboro, North Carolina, United States
10:20 AM Q6
(Student) Probing Coupled Slow and Fast Charge Dynamics in Cesium Lead Halide Perovskite Using Scanning Kelvin Probe Microscopy
Ali Moed Trimizi1, Ryan P. Dwyer1, Tobias Hanrath1 and John Mannhart1; Chemistry and Chemical Biology, Cornell University, Ithaca, New York, United States; 2School of Chemical and Biomolecular Engineering, Cornell University, Ithaca, New York, United States

10:40 AM Q7
Enhanced Photocarrier Lifetime with Fullerenes in Polymer/MoS2 Heterojunctions
Chengmei Zhong1, 2; 1Department of Chemistry, The Ohio State University, Columbus, Ohio, United States; 2Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States

11:00 AM Q8
A Model for the Frenkel-Charge-Transfer Exciton Intermixing in Periodic Organic Chains—Application to Crystalline Copper Phthalocyanine
Adrian Popenescu1 and Igor Bondarev; North Carolina Central University, Durham, North Carolina, United States

11:20 AM Q9
Temperature and Light Intensity Dependent Current-Voltage Behavior in PBDDT-DPP Photovoltaic Cells—Effects of Side-Chain Architecture, Cathode Interlayer and Solvent Additive
Bryan Paulsen; Loyola University Chicago, Chicago, Illinois, United States

11:40 AM Q10
(Student) Investigation of Photoconductivity of Lead-Free Halide Perovskite Semiconductors
Emilio A. Codecido1, Eric T. McClure1, Patrick M. Woodward1 and Roberto C. Myers3; 1Department of Chemistry, The Ohio State University, Columbus, Ohio, United States; 2Department of Physics, The Ohio State University, Columbus, Ohio, United States; 3Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States

9:20 AM R4
(Student) Demonstration of GaAs Nanowire Photoanode for the Oxygen Evolution Reaction
Joy S. Zeng1, Xiaoping Xu1, Vijay Parameshwaran1, Jon Baker1, Stacey Bent1, H. S. P. Wong2 and Bruce Clemens1; 1Chemical Engineering, Stanford University, Silver Spring, Maryland, United States; 2Electrical Engineering, Stanford University, Stanford, California, United States; 3Stanford Nanofabrication Facility, Stanford University, Stanford, California, United States; 4U.S. Army Research Laboratory, Adelphi, Maryland, United States; 5Materials Science and Engineering, Stanford University, Stanford, California, United States

9:40 AM R5
(Student) What is the Role of Aluminum at the Electrode-Electrolyte Interfaces of Li1+Ni0.8Co0.15Al0.05O2?
Zachary Lebens-Higgins1, Nicholas Faenza2, Shawn Sallis2, Nathalie Pereira2, Glenn G. Amatucci1 and Louis F. Piper1, 3; 1Physics, Applied Physics, and Astronomy, Binghamton University, Binghamton, New York, United States; 2Energy Storage Research Group, Materials Science and Engineering, Rutgers University, North Brunswick, New Jersey, United States; 3Materials Science and Engineering, Binghamton University, Binghamton, New York, United States

10:00 AM BREAK

10:20 AM R6
(Student) AlN Thin-Film-Based Flexible Piezoelectric Generators
Jie Chen1, Shahab Shervin1, Seungkyu Oh1, 3, Sara Pouladi1, Weijie Wang2 and Jae-Hyun Ryu1, 2, 4; 1Materials Science and Engineering Program, University of Houston, Houston, Texas, United States; 2Department of Mechanical Engineering, University of Houston, Houston, Texas, United States; 3Department of Printed Electronics Engineering, Sunchon National University, Sunchon, Korea (the Republic of); 4Texas Center for Superconductivity at UH (TcSUH), University of Houston, Houston, Texas, United States

10:40 AM R7
Towards Infrared Rectennas for Use in Energy Harvesting
Applications
Dante F. DeMeo1, Nicole A. Pfiester, Corey M. Shemelya and Thomas E. Vandervelde; Electrical Engineering, Tufts University, Somerville, Massachusetts, United States

11:00 AM R8
Photovoltaic Infrared Energy Harvesting for Bio-Implantable Devices
Eunseong Moon, David Blaauw and Jamie Phillips; Electrical Engineering, University of Michigan, Ann Arbor, Michigan, United States

11:20 AM R9
Porous Carbon Cloth for Energy Storage and Conversion
Muhammad-Sadeeq A. Balogun, Hongbing Ji and Yexiang Tong; Physical Chemistry, Sun Yat-sen University, Guangzhou, China

11:40 AM R10
(LATE NEWS, Student) Outstanding High Temperature Performance of Nonpolar and Semipolar InGaN Solar Cells
Xiaokei Huang1, Houqiang Fu1, Hong Chen2, Zhijian Lu1, Jossue Montes1, Michael Iza1, Steven P. DenBaars1, Shi Ji Nakamura2, and Yuji Zhao1; 1School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, Arizona, United States; 2Materials Department, University of California, Santa Barbara, California, United States.
Thursday Morning, June 29, 2017
DeBartolo Hall, Room 141

8:20 AM S1
Probing Out-of-Plane Charge Transport in Black Phosphorus/Graphene Vertical Heterostructures

Jinmo Kang, Deep Jariwala, Christopher R. Ryder, Spencer A. Wells, Yongsuk Choi, Euyheon Hwang, Jeong Ho Choi, Tobin J. Marks, and Mark C. Hersam

Sungkyunkwan University, Suwon, Korea (the Republic of); Department of Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, Suwon, Korea (the Republic of); Department of Physics, Sungkyunkwan University, Suwon, Korea (the Republic of); Department of Chemistry, Northwestern University, Evanston, Illinois, United States; Department of Electrical and Computer Engineering and Computer Science, Northwestern University, Evanston, Illinois, United States

8:40 AM S2
Defects and Surface States in the 2D Semiconductor Germanane

Thaddeus J. Asel, Aldriel Barnum, Eric Yanchenko, Shiishi Jiang, Kevin Krymowski, Wolfgang Windl, Joshua E. Goldberger, and Leonard J. Brillson

Department of Physics, The Ohio State University, Columbus, Ohio, United States; Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; Department of Chemistry and Biochemistry, The Ohio State University, Columbus, Ohio, United States; Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States; Materials Science and Nanoengineering, Rice University, Houston, Texas, United States

9:00 AM S3
Large Area Growth and Characterization of Mo,W_,Te, for Phase Change Applications

Rachel Kolvin, Xiang Zhang, Claire Pettette-Hall, Teresa Ha, Pulickel M. Ajayan, and Vincent Pettiette-Hall

Sungkyunkwan University, Suwon, Korea (the Republic of); Department of Chemistry, Northwestern University, Evanston, Illinois, United States; Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

9:20 AM S4
Growth Optimization of Epitaxial Bismuth Thin Films towards the 2D Limit


Electrical and Computer Engineering, University of Texas at Austin, Austin, Texas, United States; Physics, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States

9:40 AM S5
Ohmic Contact between Mechanically Exfoliated Tungsten Diselenide and Epitaxial Graphene

Dachen Waters, Jun Li, Sergio C. de la Barrera and Randall M. Feenstra, Department of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

10:20 AM S6 WITHDRAWN

(Teacher) Chemical Vapor Deposition Growth of Large Single-Crystal Monolayer and Bilayer Boron Nitride

Yanxin Ji, Brian Calderon and Michael Spencer; Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States

10:40 AM S7
High Mobility CVD Grown Boron Nitride Devices

Brian R. Calderon, Yanxin Ji, Athith Krishna, Joon Young Kwak, Jeonghyun Hwang, Hussain Alsalman, Xian Xu and Michael G. Spencer; Engineering, Cornell University, Ithaca, New York, United States

11:00 AM S8
Effects of Temperature and Ammonia on Metal-Organic Chemical Vapor Deposition of Hexagonal Boron Nitride

Anthony Rice, Andrew A. Allerman, Mary H. Crawford, Thomas Beechem, Taisuke Ohta, Douglas Medlin, Catalin Sapataru, Jeffrey Figiel and Michael Smith; Sandia National Laboratories, Albuquerque, New Mexico, United States

11:20 AM S9
Substrate Impact on Charge Density Wave Phase Transitions in 1T Tantalum Disulphide

Jian Yi, Benjamin Grisafe, Donna Deng, Yi Wang, Long-Qing Chen, Zi-Kui Liu, Suman Datta, and Joshua Robinson

Materials Science and Engineering, The Pennsylvania State University, University Park, Pennsylvania, United States; Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States

11:40 AM S10
Molecular Beam Epitaxy of MoSe2 Directly on Si

Breton J. May and Roberto C. Myers

Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States; Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

8:20 AM T1
Characterizations of Kerr Refractive Index and Nonlinear Absorption on GaN Crystals in Polar, Nonpolar and Semipolar Orientations

Hong Chen, Xuanqi Huang, Houqiang Fu, Zhijian Lu, Jossue Montes and Yuji Zhao; Electrical Engineering, Arizona State University, Tempe, Arizona, United States

8:40 AM T2
Investigation of Polarization Field in AlGaN Multiple Quantum Wells

Dachen Guo, Ronny Kirste, Seiji Mitani, Pramod Reddy, Ramon Collazo, and Zlatko Sitar

Department of Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; Adroit Materials, Cary, North Carolina, United States

9:00 AM T3
Transient Hall Effect Characterization of Photogenerated Carriers in GaN/AlGaN 2DEGs

David R. Daughton, BoKuai Lai and Jeffrey Lindemuth; Lake Shore Cryotronics, Westerville, Ohio, United States
9:20 AM T4
(Student) Structural and Electronic Properties of BInGaN Alloys Lattice-Matched to GaN Logan D. Williams and Emmanouil Kioupakis; MSE, University of Michigan, Ann Arbor, Michigan, United States

9:40 AM T5
(Student) Terahertz Spectroscopy of Strained AlN/GaN/AIN Quantum Wells Hugo Condori1, Ashish Chanana1, S.M. Moududul Islam2, Ajay Nahata3, Debdeep Jena2 and Berardi Sensale-Rodriguez1; 1Department of Electrical and Computer Engineering, The University of Utah, Salt Lake City, Utah, United States; 2Department of Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States

10:00 AM BREAK

U: Nitride Wide Bandgap Characterization
Session Chairs: Andrew Armstrong and Brendan Gunning
Thursday Morning, June 29, 2017
McKenna Hall, Auditorium

10:20 AM U1
(Student) Observing EC-0.57 eV Trapping in Cross-Sectioned AlGaN/GaN Schottky Contacts Using Nanometer-Scale Scanning Kelvin-Deep Level Transient Spectroscopy with In Situ Biasing Darryl A. Gleason1, Kevin Galiano1, Jeff L. Brown1, Albert M. Hilton2, Eric R. Heller1, Donald L. Dorsey1 and Jonathan P. Pelz1; 1Department of Physics, The Ohio State University, Columbus, Ohio, United States; 2KBRwyle Aerospace Group, Dayton, Ohio, United States; 'Materials and Manufacturing Directorate, Air Force Research Laboratory, Dayton, Ohio, United States

10:40 AM U2
Comparison of the Experimental and Theoretical Recombination Dynamics in Deep UV Emitting AlGaN Quantum Wells Chelsea R. Haughn1, Gregory Rupper1, Sergey Rudin1, Thomas Wunderer2, Zhihong Yang2, Noble M. Johnson1, Michael Wraback1 and Gregory Garrett1; 1U.S. Army Research Laboratory, Adelphi, Maryland, United States; 2Palo Alto Research Center, Palo Alto, California, United States

11:00 AM U3
(Student) Impact of Al Composition of AlxGa1-xN Alloys and GaN Polarity on Thermoelectric Properties of III-Nitrides Sean Tozier, Matthew J. Rivera, Isra Mahaboob, Kasey Hogan, Emma Rocco, Jonathan Marini and F. Shadi Shahedipour-Sandvik; Nanoscale Engineering, Colleges of Nanoscale Science and Engineering, State University of New York Polytechnic Institute, Middletown, New York, United States

11:20 AM U4
(Student) Structural and Electrical Characterization of Ion Implanted n-AlN Mathew H. Breckenridge1, Biplab Sarkar1, Shun Washiyama1, Ronny Kiste1, William Mecouch1, James Tweedie1, Ramon Collazo2 and Zlatko Sitar1; 1Material Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; 2Adroit Materials, Inc., Apex, North Carolina, United States

11:40 AM U5
Improving the Output Power of Ultraviolet AlGaN-Based Light-Emitting Diode by Employing Ag Nanodots-Based Electrodes Jae-Seong Park1, Jin-Young Na2, Sun-Kyung Kim3 and Tae-Yeon Seong4; 1Korea University, Seoul, Korea (the Republic of); 4Kyunghee University, Yongin, Korea (the Republic of)
V: Oxide Semiconductors—Defects, Characterization and Devices
Session Chairs: Lisa Porter and Jamie Phillips
Thursday Afternoon, June 29, 2017
DeBartolo Hall, Room 102
1:30 PM V1
(LATE NEWS, Student) Solid Photoelectrochemical Cell Based on α-Hematite-Molybdenum Disulfide and Titanium Oxide Nanocomposite Films for Photoelectrochemical Applications Hussein Alrobei1,2, Manoj K. Ram1; 1Department of Mechanical Engineering, University of South Florida, Tampa, Florida, United States; 2Department of Mechanical Engineering, Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia; ‘Clean Energy Research Center, University of South Florida, Tampa, Florida, United States.

1:50 PM V2
(Students) Impact of Native Defects on Schottky Barriers at IrOx/ZnO Interfaces Geoffrey M. Foster1, Grace Mackessy2, Alana Hyland3, 4, Martin Allen4, Buguo Wang5 and Leonard J. Brillson1, 5; 1Department of Physics, The Ohio State University, Columbus, Ohio, United States; 2Columbia School for Girls, Columbus, Ohio, United States; 3Department of Electrical and Computer Engineering, University of Canterbury, Christchurch, New Zealand; 4The MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand; 5Semiconductor Research Center, Wright State University, Dayton, Ohio, United States; ‘Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

2:10 PM V3
(Students) Native Point Defect Formation, Thermal Runaway and Dielectric Breakdown in Flash Sintered ZnO Hantian Gao1, Thaddeus Asel2, Jon Cox2, Yuanyao Zhang1, Jian Luo1 and Leonard J. Brillson1, 3; 1Department of Physics, The Ohio State University, Columbus, Ohio, United States; 2Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; 3Department of NanoEngineering Program of Materials Science and Engineering, University of California at San Diego, San Diego, California, United States

2:30 PM V4
(Students) In Situ Oxidation, Reduction and Diffusion between Bottom Electrodes and Solution-Processed Amorphous Oxide Semiconductor Youngbae Son and Rebecca L. Peterson; Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, United States

2:50 PM V5
(Students) Luminescence of SrTiO3 During Phase Transition and the Role of Lattice Relaxation Poooneh Saadatkia1,2, David Winarski1, 2 and Farida Selim1, 2; 1Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; 2Physics and Astronomy, Bowling Green State University, Bowling Green, Ohio, United States

3:10 PM BREAK

W: Materials for Memory and Computation
Session Chair: Suzanne Mohney
Thursday Afternoon, June 29, 2017
DeBartolo Hall, Room 102
3:30 PM W1
(Student) Self-Healing Proteinaceous Materials for Reversible Thermal Switching John Tomko1, Abdon Pena-Francesch1, Melik Demirel1 and Patrick Hopkins1; 1Materials Science and Engineering, University of Virginia, Charlottesville, VA, United States; 2Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, VA, United States; 3Materials Science and Engineering, The Pennsylvania State University, University Park, PA, United States

3:50 PM W2
Stress Induced Resistive Switching in Pt/HfO2/Ti Devices Gilad Zeevi1, Alexander Katsman1 and Yuval Taisil1; 1Materials Science and Engineering, Technion–Israel Institute of Technology, Haifa, Israel; 2Department of Electrical Engineering, Technion–Israel Institute of Technology, Haifa, Israel

4:10 PM W3
Effects of RRAM Electroforming and Switching Methods on Device Performance Elucidated with Ultrafast Current Measurements Robin Jacobs-Gedrim, Stephen DiGregorio, Michael Van Heukelom, Conrad James and Matthew Marinella; Sandia National Laboratories, Albuquerque, New Mexico, United States

4:30 PM W4
Improving Phase Change Material-Based RF Switch Reliability via In-Depth Morphological Analysis Matthew King1, 2, Nabil El-Hinnawy1, 3, Pavel Borodulin1, Andy Ezis1, Carlos Padilla1, Vivien Liu1, Doyle Nichols1, Elizabeth Dickey2, Jon-Paul Maria1 and Robert Young1; 1Northrop Grumman, Linthicum, Maryland, United States; 2North Carolina State University, Raleigh, North Carolina, United States; 3Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

4:50 PM W5
Effects of Oxygen Vacancies on the Electronic Structure of Metal Insulator Metal (MIM) Systems and the Formation of a Conductive Filament Handan Yildirim and Ruth Pachter; Materials and Manufacturing Division, Air Force Research Laboratory, Wright-Patterson AFB, Ohio, United States

X: Rare Earth Nanocomposites and Films
Session Chair: Joshua Zide
Thursday Afternoon, June 29, 2017
DeBartolo Hall, Room 136
1:30 PM X1
(Student) Growth Rate Dependent Surface Morphology of Rare Earth Arsenide Films Kyle M. McNicholas1, Rodolfo Salas1, Scott D. Sifferman2, Daehwan Jung3, Minjoo Larry Lee1 and Seth R. Bank1; 1Microelectronics Research Center and Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; 2The Institute for Energy Efficiency, The University of California Santa Barbara, Santa Barbara, California, United States; 3Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States
2:10 PM X3
Surface Reconstruction Driven Dewetting of Thin GaAs Layers from Single Layer ErAs/GaAs Nanocomposites
Kurt Evink, Yuanchang Zhang, Brittany Urwin, Krishnamurthy Mahalingam, Madelyn J. Hill and Lawrence Grazulis; AFRL/RXAN, Air Force Research Laboratory, Wright-Patterson AFB, Ohio, United States

2:30 PM X4
Characterization of Heavily Doped GaAs:Er Devices for THz Generation Pumped with 1550nm Laser
A Mingardi, Elliott R. Brown, Buguo Wang, David Look, Ari Feldman, Todd Harvey and Richard Mirin; THz Sensors Lab, Wright State University, Dayton, Ohio, United States;
Quantum Electronics and Photonics Division, National Institute of Standards and Technology, Boulder, Colorado, United States;
Semiconductor Research Center, Wright State University, Dayton, Ohio, United States

2:50 PM X5
(Student) The Path to Growth of Metal/Semiconductor Nanocomposite Materials by Liquid Phase Epitaxy
Bo E. Tew, Matthew R. Lewis and Joshua Zide; Materials Science and Engineering, University of Delaware, Newark, Delaware, United States

3:10 PM BREAK

Y: Nano-Magnetic and Spintronic Materials
Session Chair: Ezekiel Johnston-Halperin and Patrick Lenahan
Thursday Afternoon, June 29, 2017
DeBartolo Hall, Room 136

3:30 PM Y1
(Student) Determining the Gilbert Damping Constant in Perpendicularly Magnetized W/CoFeB/MgO Films with High Thermal Stability
Dustin Lattery, Delin Zhang, Jie Zhu, Jian-Ping Wang and Xiaojia Wang; Mechanical Engineering, University of Minnesota Twin Cities, Minneapolis, Minnesota, United States;
Electrical Engineering, University of Minnesota Twin Cities, Minneapolis, Minnesota, United States

3:50 PM Y2
(Student) Dependence of Ferromagnetic Properties on Strain Profile of Ga Mn Asy P, with Various P Concentrations
Xiang Li, Xinyu Liu, Sining Dong, Jacke K. Furdyna and Malgorzata Dobrowolska-Furdyna; Department of Physics, University of Notre Dame, Notre Dame, Indiana, United States

4:10 PM Y3
Structural Evolution from 2D to 3D of Dilute Magnetic (Sn,Mn)Se Films Grown by Molecular Beam Epitaxy
Sining Dong; Department of Physics, University of Notre Dame, Notre Dame, Indiana, United States

4:30 PM Y4
Shape Anisotropy in Patterned Ferromagnetic GaMnAsP Films with Perpendicular Anisotropy
Xinyu Liu, Xiang Li, Sining Dong, Malgorzata Dobrowolska-Furdyna and Jacek Furdyna; Physics, University of Notre Dame, Notre Dame, Indiana, United States

1:50 PM Z1
Chalcopryte Interfaces Studied by Synchrotron Radiation
Christian Peetenkofer; EEIS, Helmholtz-Zentrum Berlin, Berlin, Germany

2:10 PM Z2
(Student) Plasma Assisted Molecular Beam Epitaxy Growth Space of ZnSnN3
Robert Makin, Krystal York, Steven Durbin, Nancy Senabulya, James Mathis, Roy Clarke, Nathaniel Feldberg and Patrice Miska;
Electrical and Computer Engineering, Western Michigan University, Kalamazoo, Michigan, United States;
University of Michigan, Ann Arbor, Michigan, United States;
Institut Jean Lamour, University of Lorraine, Vandoeuvre, France

2:30 PM Z3
(Student) Optical Characterization of Epitaxial ZnSnN3 Films
Roy Clarke, James P. Mathis, Nancy Senabulya, Robert A. Makin, Steven Durbin, Nathaniel Feldberg and Roger Reeves;
Department of Applied Physics, University of Michigan, Ann Arbor, Michigan, United States;
Department of Electrical and Computer Engineering, Western Michigan University, Kalamazoo, Michigan, United States;
Department of Physics, University at Buffalo, Buffalo, New York, United States;
Department of Physics, University of Canterbury, Christchurch, New Zealand

2:50 PM Z4
(Student) ALD Grown, Band-Tunable Indium Oxy sulfide (In(O-S)x)—A Nontoxic Electron Transport Layer for the Chalcogenide Absorbers SnS and CZTS-Se
Jayaraman, Sang B. Kim, Richard Haight, Oki Gunawan and Roy Gordon;
Department of Electrical and Applied Sciences, Harvard University, Cambridge, Massachusetts, United States;
Harvard University, Cambridge, Massachusetts, United States;
International Business Machines Corporation, Yorktown Heights, New York, United States

3:10 PM BREAK

3:30 PM Z5
Heterogeneous Sources of Misfit Dislocations in GaAs Wafers and Their Impact on Wide Bandgap Metamorphic AlInP Solar Cells
Kanai Mukherjee, Michelle Vaisman and Minjoo Larry Lee;
Department of Materials, University of California Santa Barbara, Santa Barbara, California, United States;
Department of Electrical Engineering, Yale University, New Haven, Connecticut, United States;
Department of Electrical and Computer Engineering, University of Illinois, Urbana, Illinois, United States
3:50 PM Z6  
(Student) Effect of Rapid Thermal Annealing on AlGaInP Solar Cells Grown by Molecular Beam Epitaxy  
Yukan Sun1,2, Joseph Faucher1, Shizhao Fan1, Ryan Hoo1 and Minjoo Larry Lee2; 1Department of Electrical Engineering, Yale University, New Haven, Connecticut, United States; 2Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States; 3Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States

2:10 PM AA3  
(Student) The Effects of Substrate Porosity on the Thermal Conductivity of PbSe/PbTe Superlattice Thin Films  
Mallory E. DeCoste1, Xin Chen1, Kai Zhang2, Helmut Baumgartner1 and Patrick E. Hopkins1; 1Mechanical and Aerospace Engineering, University of Virginia, Crozet, Virginia, United States; 2Applied Research Center, Old Dominion University, Newport News, Virginia, United States; 3Electrical and Computer Engineering, Old Dominion University, Newport News, Virginia, United States

4:10 PM Z7  
Flexible III-V Solar Cells Developed from Single-Crystal-Like Thin-Film Material Directly Grown on Hastelloy Tape  
Sara Pouladi, Mojtaba Asadirad, Monika Ratli, Seungkyu Oh, Devendra Katiwada, Pavel Dutta, Shahab Shervin, Yao Yao, Jie Chen, Venkat Selvamanickam and Jae-Hyun Ryu; Mechanical Engineering, University of Houston, Houston, Texas, United States

4:30 PM Z8  
(Student) High Temperature Characterization of InGaN/ GaN Multi-Quantum-Well Solar Cell  
Ehsan Yaldae1, Heather McFavilen1, Alec Fischer1, Joshua J. Williams1, Christiana Honsberg1 and Stephen Goodnick1; 1Electrical and Computer Engineering, Arizona State University, Tempe, Arizona, United States; 2Department of Physics, University of Michigan, Ann Arbor, Michigan, United States; 3State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China; 4College of Physics, Chongqing University, Chongqing, China

4:50 PM Z9  
(LATE NEWS, Student) Growth and Properties of Boron-III-As Alloys  
Kyle Marshall McNicholas, Rasha H. El-Jaroudi, Andrew Briggs, Stephen March, Scott Sifferman and Seth Bank; Microelectronics Research Center and Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States.

AA: Thermoelectric Materials  
Session Chairs: Mark Losego and Charles Lutz  
Thursday Afternoon, June 29, 2017  
DeBartolo Hall, Room 140

1:30 PM AA1  
Non-Equilibrium Processing Leads to Record High Thermoelectric Figure of Merit in PbTe-SrTe  
Gangjian Tan1, Fengyuan Shi1, Shiqiang Hao2, Li-Dong Zhao3, Hang Chi4, Xiaojun Zhang5, Citrad Uher4, Chris Wolverton1, Vinayak Dravid1 and Mercouri Kanatzidis1,5; 1Chemistry, Northwestern University, Evanston, Illinois, United States; 2Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; 3Materials Science and Engineering, University of Houston, Houston, Texas, United States; 4Department of Physics, University of Michigan, Ann Arbor, Michigan, United States; 5Department of Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States

1:50 PM AA2  
(Student) Thermoelectric Properties of the NaPb$_{2}$Sb$_{2}$ system  
Tyler Slade1, Jann Grovogui2, Shiqiang Hao3, Chris Wolverton4, Vinayak Dravid5 and Mercouri G. Kanatzidis1; 1Chemistry, Northwestern University, Evanston, Illinois, United States; 2Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; 3Materials Science and Engineering, University of Houston, Houston, Texas, United States; 4Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States

2:50 PM AA5  
Atomic Layer Deposited (ALD) AlO$_x$ Thin Films as an Efficient Environmental Barrier Coating for PbTe Based Thermoelectric Materials  
Sumanta Sarkar1, Duyen Cao2, Muhammad S. Islam1, Christos Malliakas3, Xiaoli Zhang1, Vinayak P. Dravid1 and Mercoury G. Kanatzidis1; 1Department of Chemistry, Northwestern University, Evanston, Illinois, United States; 2U.S. Department of Energy, Northwestern University, Evanston, Illinois, United States; 3U.S. Department of Energy, Northwestern University, Evanston, Illinois, United States

3:10 PM BREAK

3:30 PM AA6  
High Thermoelectric Performance in N-Type PbTe-Ge Alloys  
Zhongzhou Luo1,2; 1Department of Chemistry, Northwestern University, Singapore, Singapore; 2Nanyang Technological University, Singapore, Singapore

3:50 PM AA7  
High Thermoelectric Performance of PbSe-Ge$_x$Se Systems ($M$ = Mg, Hg)—New Insights into the Electronic and Thermal Transport Properties of Lead Chalcogenides  
James M. Hodges and Mercouri Kanatzidis; Chemistry, Northwestern University, Evanston, Illinois, United States

4:10 PM AA8  
A Chemical Understanding for the Band Convergence in Thermoelectric CoSb$_2$, Skutterudites—Influence of Electronic Population, Local Thermal Expansion and Bonding Interactions  
Riley Hands1, Xingyu Guo1, Yinglu Tang1, Guodong Li1, G. Jeff Snyder1 and Wolfgang Zeier1; 1Materials Science, Northwestern University, Chicago, Illinois, United States; 2Materials Science, Northwestern University, Evanston, Illinois, United States; 3EMPA Swiss Federal Laboratories, Dubendorf, Switzerland; 4Physikalisch-Chemisches Institut, Giessen, Germany

4:30 PM AA9  
Thermoelectric and Magnetic Properties of Nanostructured n-Type Ti$_{0.25}$Zr$_{0.25}$Hf$_{0.5}$N$_{x}$Fe$_{0.25}$Sn$_{0.75}$Sb$_{0.25}$ Half-Heusler Alloys  
Ruming Li and Pierre Ferdinand Poudel-Poudel; Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States
1:30 PM BB1
III-V Semiconductor Nanowires—An Exciting Toolbox for Heterostructure Design Studied by Scanning Tunneling Microscopy
Johan Knutsson1, Sarah McKibbin1, Martin Hjort1, Olof Persson1, Sebastian Lehmann1, Nate S. Wilson1, Christopher J. Brennan1, Rudresh Ghosh1,2, Force Microscopy
Santa Barbara, Santa Barbara, California, United States; 2Department of Physics and NanoLund, Lund University, Lund, Sweden; 3Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States; 4Department of Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States

1:50 PM BB2
Complete In Situ Surface Characterization of III-V Nanowire Devices
Sarah McKibbin, Jovana Colvin, Johan Knutsson, Andrea Troian, James Webb, Anders Mikkelsen and Rainer Timm; Department of Physics, Lund University, Lund, Sweden

2:10 PM BB3
Towards Single Dopant Devices for Quantum Information and Metrology—Weak Localization in Embedded Phosphorus Delta Layers in Silicon
Joseph A. Hagmann1, Xiqiao Wang1, Pradeep Namboodiri1, Jonathan Wyrick1, Roy Murray2, Michael D. Stewart2, Richard M. Silver2 and Curt A. Richter3; 1Engineering Physics Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 2Quantum Measurement Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States

2:30 PM BB4
(Student) Probing Out-of-Plane Electromechanical Response and Flexoelectricity of Monolayer MoS2 Using Piezoresponse Force Microscopy
Christopher J. Brennan1, Rudresh Ghosh2,3, Kalhan Koul1, Sanjay K. Banerjee1, Nanshu Lu1 and Edward T. Yu2; 1Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; 2NovaCentrix, Austin, Texas, United States; 3Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, Austin, Texas, United States

2:50 PM BB5
Non-Uniform Piezoelectricity in PVDF Thin Film
Zhonghang Ji, Robert Goldenberg and Yan Zhuang; Electrical Engineering, Wright State University, Dayton, Ohio, United States

3:10 PM BREAK

3:30 PM BB6
Scanning Capacitance Characterization of Vacuum-Channel Nanoelectronic Transistor
Gerald Pascual, Byong Kim and Keibock Lee; Technical Marketing, Park Systems, Inc., Santa Clara, California, United States

3:50 PM BB7
(Student) Tip-Enhanced Raman Spectroscopy of Monolayer and Bilayer MoS2
Zhongtian Zhang1, Christopher J. Brennan1, Rudresh Ghosh1,2, Sanjay K. Banerjee1 and Edward T. Yu2; 1Electrical and Computer Engineering, University of Texas at Austin, Austin, Texas, United States; 2NovaCentrix, Austin, Texas, United States

4:10 PM BB8
(Student) Heterojunction Electronic Properties and Compositional Differences of CdCl1, Post-Treated CdTe Solar Cells
Dean Collett, Jeffery A. Aguia1, Brian v. Deventer1, Yohan Yoon1,2, Paul Haney3, Nikolai Zhitenev4, Michael Scarpulla1,2, Prakash Koirala5, Robert W. Collins1 and Heayoung P. Yoon1; 1Electrical and Computer Engineering, University of Utah, Salt Lake City, Utah, United States; 2Fuel Design and Development Department, Idaho National Laboratory, Idaho Falls, Idaho, United States; 3Department of Materials Science and Engineering, University of Utah, Salt Lake City, Utah, United States; 4Utah Nanofab, University of Utah, Salt Lake City, Utah, United States; 5Maryland NanoCenter, University of Maryland, College Park, Maryland, United States; 6Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; 7Department of Physics and Astronomy, Center for Photonics Innovation and Commercialization, University of Toledo, Toledo, Ohio, United States

4:30 PM BB9
Laser-Assisted Atom Probe Tomography of AlN and AlGaN
Norman Sanford, Paul Blanchard and Albert Davydov; National Institute of Standards and Technology, Boulder, Colorado, United States

4:50 PM BB10
Atomic-Scale Characterization of Contaminants at the Nanowire/Substrate Regrowth Interface in GaN Grown by Selective Area Growth Molecular Beam Epitaxy
Paul T. Blanchard, Matthew D. Brubaker, Todd E. Harvey, Alexa Roshko, Norman A. Sanford, Joel C. Weber and Kris A. Bertness; National Institute of Standards and Technology (NIST), Boulder, Colorado, United States

CC: Nitride Wide Bandgap Epitaxy
Session Chairs: Theeradetch Detchprohm and Xiaohang Li
Thursday Afternoon, June 29, 2017
McKenna Hall, Auditorium

1:30 PM CC1
(Student) Selective Area Growth and Characterization of Over 15 μm Thick Vertical GaN Diodes on Si
Atsunori Tanaka1, Shadi A. Dayeh1,2 and Renjie Chen2; 1Materials Science and Engineering, University of California, San Diego, La Jolla, California, United States; 2Electrical and Computer Engineering, University of California, San Diego, San Diego, California, United States

1:50 PM CC2
(Student) Direct Growth of Single-Crystal-Like III-Nitride Thin Films on Copper Foil
Shahab Shervin1, Kamrul Alam1, Kaveh Shervin1, Je Chen1, Seung-Hwan Kim2, Tae Hoon Chung1, Sara Pouladi1, Ruiteng Li1, Rebecca Forrest1, Jiming Bao2 and Jae-Hyun Ryu1; 1University of Houston, Houston, Texas, United States; 2Hongik University, Seoul, Korea (the Republic of); 3Korea Photonics Technology Institute, Gwangju, Korea (the Republic of)
2:10 PM CC3
Nitrogen-Rich Growth of Smooth GaN Layers by Plasma-Assisted MBE
Henryk Turski1, 2, Anna Feduniewicz-Zmuda2, Debsheel Jena1, 3 and Czeslaw Skierbiszewski2, 4; 1Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; 2Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; 3Department of Material Science and Engineering, Cornell University, Ithaca, New York, United States; 4Top GaN Ltd., Warsaw, Poland

2:30 PM CC4
(Student) Strain Balancing in InGaN-Based Multiple Quantum Wells Using AlGaN Interlayers
Syed Ahmed Al Muyeed1, Wei Sun1, Xiongliang Wei1, Renbo Song1, Nelson Tansu1, Jonathan J. Wierer1 and Daniel Koleske2; 1Center for Photonics and Nanoelectronics, Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, Pennsylvania, United States; 2Sandia National Laboratories, Albuquerque, New Mexico, United States

2:50 PM CC5
Growth and Electrical Characterization of Scandium Nitride Thin Films on Magnesium Oxide
John S. Cetnar1, David C. Look1, 2, Amber N. Reed1, Bruce Claffin1, Vladimir Vasilyev1 and Shivashankar Vangala1, 2; 1Sensors Directorate, Air Force Research Laboratory, WPAFB, Ohio, United States; 2Wright State University, Dayton, Ohio, United States

3:10 PM BREAK

3:30 PM CC6
Design, Epitaxy Growth and Characterization of Highly Reflective AlGaN Based Distributed Bragg Reflectors
Theeradetch Detchprohm1, Karan Mehta1, Yuh-Shiuan Liu1, Young Jae Park1, Shuo Wang2, Oliver Moreno2, Shyh-Chiang Shen1, P. Douglas Yoder2, Fernando Ponce3 and Russell D. Dupuis1; 1Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; 2Physics, Arizona State University, Tempe, Arizona, United States

3:50 PM CC7
Structural Properties and Growth Modes of MOCVD-Grown AlN with TMAI Pretreatment of Sapphire Substrate
Haiding Sun1, Feng Wu1, Talal M. Altahtamouni2, Nasir Alfaraj2, Theeradetch Detchprohm3, Russell Dupuis3 and Xiaohang Li3; 1King Abdullah University of Science & Technology (KAUST), Thuwal, Saudi Arabia; 2Qatar University, Doha, Qatar; 3Georgia Institute of Technology, Atlanta, Georgia, United States

4:10 PM CC8 DISCUSSION TIME

4:30 PM CC9
Growth of BxAl1-xN Alloys by Metalorganic Vapor Phase Epitaxy—Towards a Lattice-Matched Ultra-Wide Bandgap Semiconductor
Brendan Gunning, Andrew A. Allerman, Daniel Koleske, Jeffrey Kempisty and Anthony Rice; Sandia National Laboratories, Albuquerque, New Mexico, United States
8:20 AM DD1
(Student) STM Studies of Individual Impurities in InSb
Jacob Repicky, Sara Mueller, Anne Benjamin and Jay Gupta; Physics, The Ohio State University, Columbus, Ohio, United States

8:40 AM DD2
Temperature Dependence Charge Transport and Persistent Conductivity in Tl,Se, Single Crystals Sanjib Das1, John A. Peters1, Wenwen Lin2, Svetlana S. Kostina1, Pice Chen1, Joon-II Kim1, Mercouri Kanatzidis1 and Bruce W. Wessels1; 1Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; 2Chemistry, Northwestern University, Evanston, Illinois, United States

9:00 AM DD3
(Student) Coloration and Defect Chemistry of Fe-Doped SrTiO3
Jonathan N. Baker, Preston C. Bowes, Daniel M. Long, Joshua S. Harris, Ali Mobellegh, Elizabeth C. Dickey and Douglas L. Irving; Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States

9:20 AM DD4
(Student) Modeling the Influence of Background Impurities on High Temperature Equilibrium Conductivity in SrTiO3, from First-Principles Preston C. Bowes, Jonathon N. Baker, Joshua S. Harris and Douglas L. Irving; Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States

9:40 AM DD5
(Student) Vacancy and Mass-Impurity Phonon Scattering in Self-Irradiated Silicon Ethan A. Scott1, Khalid Hattar2, John Gaskins1 and Patrick Hopkins1; 1Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, Virginia, United States; 2Sandia National Laboratories, Albuquerque, New Mexico, United States

10:00 AM DD BREAK

10:20 AM DD6
Point Defect Reduction in MOCVD GaN by Chemical Potential Control and Defect Quasi Fermi Level Control Pramod Reddy1,2, Shun Washiyama1, Felix Kaess1, Ronny Kirste2, Seiji Mita2, Michael Gerhold1, James Tweedie1, Ramon Collazo1 and Zlatko Sitar1; 1Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; 2Adroit Materials, Inc., Cary, North Carolina, United States; 3Army Research Office, Research Triangle Park, North Carolina, United States

10:40 AM DD7
(Student) Compensating Point Defect Reduction in High Al-Content Si Doped AlGaN Grown by Metalorganic Chemical Vapor Deposition Shun Washiyama1, Pramod Reddy1,2, Qiang Guo1, Andrew Klump1, Biplab Sarkar1, Ronny Kirste2, Seiji Mita2, Ramon Collazo1 and Zlatko Sitar1; 1Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; 2Adroit Materials, Cary, North Carolina, United States; 3Army Research Office, Research Triangle Park, North Carolina, United States

11:00 AM DD8
(Student) Suppression of Mg Migration in Non-Interrupted MOCVD Grown GaN Andrew J. Klump1, Felix Kaess1,2, Pramod Reddy1, Ramon Collazo1 and Zlatko Sitar1; 1Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; 2Technische Universität-Berlin, Berlin, Germany

11:20 AM DD9
(Student) First-Principles Study of Compensation in Si-Doped AIN Kelsey J. Mirrielees, Joshua S. Harris, Jonathon N. Baker, Dorian Alden, Ramon Collazo, Zlatko Sitar and Douglas L. Irving; Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States

11:40 AM DD10
Thermal Conductivity of Bulk GaN Robert Rounds1, Luis Hernandez-Balderrama1, Ronny Kirste2, Alexander Franke1, Tomasz Sochacki2, Michal Bockowski2, Ramon Collazo1 and Zlatko Sitar1; 1Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; 2Polish Academy of Sciences, Institute of High Pressure Physics, Warsaw, Poland

EE: Metamaterials and Materials for THz, Plasmonics and Polaritons
Session Chairs: Stephanie Law and Berardi Sensale-Rodriguez
Friday Morning, June 30, 2017
DeBartolo Hall, Room 117

8:20 AM EE1
Nonlinear Plasmonic Effects and Low-Frequency Noise in Two-Dimensional Electron Gas Gregory Rupper1, Michael Shur2 and Sergey Rudin1; 1U.S. Army Research Laboratory, Adelphi, Maryland, United States; 2Rensselaer Polytechnic Institute, Troy, New York, United States

8:40 AM EE2
(Student) Investigation of Unpatterned Etching of Nanostructures in Immobilized Cubic-Boron Nitride for Infrared Nanophotonic Elements Arthib Krishna1, Joannis Chatzakis2, Nick Sarac2; 1Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; 2U.S. Naval Research Laboratory, Washington, District of Columbia, United States

9:00 AM EE3
(Student) Epitaxial Integration of High-Contrast Photonic Structures Daniel J. Ironside, Alec M. Skipper, Emily S. Walker, Stephen D. March, Leland J. Nordin, Daniel Wasserman and Seth R. Bank; Microelectronics Research Center, The University of Texas at Austin, Austin, Texas, United States

9:20 AM EE4
(Student) UV Surface Plasmon Resonance Modification in Aluminum Nanohole-Arrays Using Graphene Sourangsu Banerji, Yunshan Wang, Jieying Mao, Sara Arezoomandan, Steve Blair and Berardi Sensale-Rodriguez; Department of Electrical and Computer Engineering, The University of Utah, Salt Lake City, Utah, United States
9:40 AM EE5
(Student) Gigahertz All-Optical Modulation Using Reconfigurable Plasmonic Metamolecules Xiangfeng Chen, Biqin Dong, Fan Zhou, Chen Wang and Cheng Sun; Mechanical Engineering, Northwestern University, Evanston, Illinois, United States

10:00 AM BREAK

10:20 AM EE6
(Student) Thickness Dependence of Coupled Dirac Plasmons in Bi2Se3 Thin Films Theresa P. Ginley and Stephanie Law; Material Science and Engineering, University of Delaware, Newark, Delaware, United States

10:40 AM EE7
(Student) Strong Absorption from Berreman Modes in Thin AlN Films Leland J. Nordin1, Owen Dominguez1, Sukrith Dev1, Zuoong Dong1, Anthony J. Hoffman2 and Daniel Wasserman3; 1EECS, University of Texas at Austin, Austin, Texas, United States; 2Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States

11:00 AM EE8
(Student) Epsilon-near-Zero Mode Field Enhancement with Nanoantennas Owen Domínguez1, Leland Nordin2, Kaijun Feng3, Junchi Lu1, Daniel Wasserman4 and Anthony Hoffman5; 1Electrical Engineering, University of Notre Dame, South Bend, Indiana, United States; 2Electrical Engineering, The University of Texas at Austin, Austin, Texas, United States

11:20 AM EE9
(Student) Excitation of High-k Modes in Semiconductor Hyperbolic Metamaterials Dongxia Wei1, Christian Harris2 and Stephanie Law1; 1Material Science and Engineering, University of Delaware, Newark, Delaware, United States; 2Lincoln University, Pennsylvania, United States

11:40 AM EE10
Sub-Diffraction Confinement in all Semiconductor Hyperbolic Metamaterial Resonators Kaijun Feng1, Galen Harden1, Deborah L. Sivo1 and Anthony J. Hoffman2; 1Electrical Engineering, University of Notre Dame, South Bend, Indiana, United States; 2Electrical Engineering, Princeton University, Princeton, New Jersey, United States

FF: III-V Nanowire Growth, Characterization and Devices
Session Chairs: Zetian Mi and Parsian K. Mohseni
Friday Morning, June 30, 2017
DeBartolo Hall, Room 119

8:20 AM FF1
(Student) 1.3 μm InN/InGaN/GaN Nanowire Array Diode Lasers and Photodiodes on (001) Silicon Arnab Hazari1, Lian Yan2, Joanna M. Millunchick2 and Pallab Bhattacharya2; 1Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, United States; 2Material Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

8:40 AM FF2
(Student) Morphology and Strain Relaxation in High Lattice Mismatched InGaN Nanowire Heterostructures Lifan Yan1, Arnab Hazari1, Pallab Bhattacharya2 and Joanna Millunchick1; 1Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States; 2EECS, University of Michigan, Ann Arbor, Michigan, United States

9:00 AM FF3
(Student) Photoinduced Thermodynamic Behavior in InGaN/ GaN Double-Heterostructure Nanowires Nasir Alfaraj1, Somak Mitra2, Feng Wu3, Idris A. Ajia2, Bilal Janjua2, Aditya Prabaswara1, Renad A. Aljefri1, Haiding Sun1, Tien Khee Ng1, Boon S. Ooi1, Iman S. Roqan2 and Xiaohang Li1; 1Computer, Electrical, and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; 2Physical Sciences and Engineering Division, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

9:20 AM FF4
(Student) Current Conditioning of Nanowire-Based Optoelectronic Devices Brelon J. May1, Matthew R. Belz2, ATM Golam Sarwar1, Camelia M. Sele2 and Roberto C. Myers21, 2; 1Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States; 2Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; 3Physics, The Ohio State University, Columbus, Ohio, United States; 4Intel, Portland, Oregon, United States

9:40 AM FF5
Optical and Electrical Characterization of GaN/InGaN Core-Shell Nanowire Light-Emitting Diodes Mohsen Nami1, Ashwin Rishinaramangalam1, Isaac Stricklin1, Steve Brueck1, Igal Brerner2 and Daniel Feezell2; 1Physics, The University of New Mexico, Center for High Technology Materials, Albuquerque, New Mexico, United States; 2Electrical and Computer Engineering, The University of New Mexico, Albuquerque, New Mexico, United States; 3Center for Integrated Nanotechnologies, Albuquerque, New Mexico, United States

10:00 AM BREAK

10:20 AM FF6
(Student) Si Dopant Incorporation Limit Observed in Catalyst-Free InAs Nanowires Using Atom Probe Tomography Megan O. Hill1, Max Sonner2, Jonathan Treu2, Jonathan Becker2, Jonathan J. Finley1, Gregor Koblmüller2 and Lincoln J. Lauhon1; 1Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; 2Walter Schottky Institut and Physik Department, Technical University Munich, Garching, Germany

10:40 AM FF7
Parameter Space Mapping of InAsP Nanowire Arrays on Graphene, h-BN and MoS2, Monolayer—Toward Selective Area van der Waals Epitaxy Mohammadseh Asadollahi-Baboli1, 2, Michael A. Slocum2, Alessandro Giussani2, Thomas S. Wilhelm1, 2 and Parsian Katal Mohseni1, 2; 1Microsystems Engineering, Rochester Institute of Technology, Rochester, New York, United States; 2Nanopower Research Laboratories, Rochester Institute of Technology, Rochester, New York, United States
11:00 AM FF8
(Student) Single Nanowire Current-Voltage Measurements by C-AFM and Its Effect on the Output Characteristics of Solar Cells Based on Nanowire Ensembles Dmitry Mikulik1, Maria Ricci2, Pablo Romero-Gomez3, Georgijs Tautucovs1, Federico Mattei1, Jelena Vakajlovic1, Esther Alarcon-Llado1 and Anna Fontcuberta i Morral1; 1LMS, EPFL, Lausanne, Switzerland; 2Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; 3FOM Institute AMOLF, Amsterdam, Netherlands

11:20 AM FF9
(Student) Recording and Analysis of the Atomic Scale Dynamics of Contact Formation in the Cross-Section and Along InGaAs Nanowire Channels Renjie Chen1, Katherine L. Jungjohann2, William M. Mook3, John Nogan3 and Shadi A. Dayeh1,3,4; 1Department of Electrical and Computer Engineering, University of California, San Diego, San Diego, California, United States; 2Center for Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, New Mexico, United States; 3Department of Nanoelectronics, University of California, San Diego, San Diego, California, United States; 4Materials Science and Engineering Program, University of California, San Diego, San Diego, California, United States

11:40 AM FF10
(Student) Bandgap Tuning of Optically Active Dilute-Antimonide GaSb/Nanowire Heterostructures for Visible Light Emitting Devices Mohammad F. Chowdhury1, Qing Shi1, Sharif Sadaf1, Hong Guo1 and Zetian Mi2; 1Department of Electrical and Computer Engineering, University of California, San Diego, San Diego, California, United States; 2Center for Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, New Mexico, United States; 3Department of NanoEngineering, University of California, San Diego, San Diego, California, United States; 4Department of Materials Science and Engineering Program, University of California, San Diego, San Diego, California, United States

10:00 AM BREAK

10:20 AM GG4
(Student) Highly Conductive Metal Oxide Thin Films Using Low-Temperature Activated Catalytic Synthesis Seok Gyu Ban, Su-Min Jung1, Jun-Ho Lee, Jeong-Wan Jo1, Jaehyun Kim1, Myung-Gil Kim2 and Sung Kyu Park1; 1Electronic Electrical Engineering, Chung-Ang University, Seoul, Korea (the Republic of); 2Chemical Engineering, Chung-Ang University, Seoul, Korea (the Republic of)

10:40 AM GG5
(LATE NEWS, Student) Lipid Membrane and Zinc Oxide Thin-Film Transistor Based Biosensors Akanksha Gupta1, Esther Gomez2 and Thomas Jackson3; 1Chemical Engineering, Pennsylvania State University, State College, Pennsylvania, United States; 2Electrical Engineering, Pennsylvania State University, University Park, Pennsylvania, United States.

10:40 AM GG6
(Student) Optical and Electrical Characterization of CuNW/Graphene Hybrid Structure for Transparent Conductor Doosan Bae1, Yuki Morii1, Kazuhiko Matsumoto2 and David Janes1; 1School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, United States; 2The Institute of Scientific and Industrial Research, Osaka University, Ibaraki, Japan

11:00 AM GG7
(Student) Thermal Transient Response of Microscopic Hotspots in Silver Nanowire Transparent Conducting Electrodes Sajia Sadeque1,2, Aaditya Candadai2,3, Yu Gong1,3, Amir K. Ziabari1,3, Kerry Maize1,3, Ali Shakouri1,3, Tim Fisher2,3 and David B. Janes1,4; 1School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States; 2School of Mechanical Engineering, Purdue University, West Lafayette, Indiana, United States; 3Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, United States

11:40 AM HH1
(IEEE-ARCSAN 2017 Student) Therman Conductivity and Optical Polarizability of Amorphous Titania Thin Films Prepared by Atomic Layer Deposition (ALD) Mark D. Losego1, Brandon Piercy1, Kelsey Meyer2 and Patrick Hopkins2; 1School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; 2Department of Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, Virginia, United States

HH: Thermal Transport and New Thermoelectric Materials
Session Chairs: Xinyu Liu and Seth Bank
Friday Morning, June 30, 2017
DeBartolo Hall, Room 140

8:20 AM GG1
(Student) Size Effects on Thermal Conductivity in Transparent Conducting Oxides David Olson, Chester Siewjkowsk, Jeffery Braun and Patrick Hopkins; Mechanical Engineering, University of Virginia, Charlottesville, Virginia, United States

8:40 AM GG2
(Student) Inkjet Printing of Photoconductive ZnO Thin Films on Flexible Substrates David Winarski1,2, Emily Heckman1, Eric Kreit1 and Farida Selim1,2; 1Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; 2Physics and Astronomy, Bowling Green State University, Bowling Green, Ohio, United States; 3Sensors Directorate, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio, United States

9:00 AM GG3
High-Throughput Screening of New p-Type Transparent Semiconducting Oxides Kanghoon Yim, Yong Yoon, Miso Lee and Seungwu Han; Materials Science and Engineering, Seoul National University, Seoul, Korea (the Republic of)
8:40 AM HH2
(Student) Impact of Oxygen Vacancies on Thermal Transport in La$_x$Sr$_{4-x}$CoO$_y$ Epitaxial Thin Films Xuewang Wu, Jeff Walter, Tianli Feng, Jie Zhu, Xinlin Ruan, Chris Leighton and Xiaoija Wang; 1Mechanical Engineering, University of Minnesota at Twin Cities, Minneapolis, Minnesota, United States; 2Department of Chemical Engineering and Material Science, University of Minnesota, Twin Cities, Minneapolis, Minnesota, United States; 3Department of Mechanical Engineering and the Birck Nanotechnology Center, Purdue University, West Lafayette, Illinois, United States

9:00 AM HH3
First-Principles Simulations of Non-Equilibrium Phonon Dynamics in III-V Materials Sridhar Sadasivam, Yi Xia, Maria K. Chan and Pierre Darancet; Center for Nanoscale Materials, Argonne National Laboratory, Lemont, Illinois, United States

9:20 AM HH4
(Student) Carrier Dynamics in Black Phosphorus for Applications in 2D Electronics Vasudevan Rajagopal Iyer, Jinseon Jeong, Ke Chen, Emily S. Walker, Seth R. Bank and Yaguo Wang; 1Department of Mechanical Engineering, The University of Texas at Austin, Austin, Texas, United States; 2Microelectronic Research Center and Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; 3Texas Materials Institute, The University of Texas at Austin, Austin, Texas, United States

9:40 AM HH5
Single Crystal Microwire for Thermoelectric Applications Leonid Konopko, Albina Nikolajeva, Tito Huber, Anna Kobylinskaya and Oxana Botnari; 1Ghiti Institute of Electronic Engineering and Nanotechnologies, Chisinau, Moldova (the Republic of); 2International Laboratory of High Magnetic Field Engineering and Nanotechnologies, Chisinau, Moldova (the Republic of); 3International Laboratory of High Magnetic Field and Low Temperatures, Wroclaw, Poland; 'Howard University, Washington, District of Columbia, United States

10:00 AM HH6 BREAK

10:20 AM HH7
(Student) Optimizing the Thermoelectric Properties of a Computationally Predicted Material—The Case of AlSb Trevor P. Bailey, Alan Olvera, Alexander A. Page, Pierre Ferdinand Poudre-Poudre and Citrad Uher; 1Department of Physics, University of Michigan, Ann Arbor, Michigan, United States; 2Department of Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

10:40 AM HH8
(Student) Thermoelectric Enhancement in Silicon Metamaterials via Phonon Localization and Resonance Blocking Taishan Zhu and Elif Ertekin; Mechanical Engineering, University of Illinois at Urbana Champaign, Champaign, Illinois, United States

11:00 AM HH8
(Student) Molecular Fin Effect on Interfacial Thermal Conductance across Hard-Soft Interfaces Xingfei Wei and Tengfei Luo; Aerospace and Mechanical Engineering, University of Notre Dame, Notre Dame, Indiana, United States

11:20 AM HH9
(Student) Nanosecond Grating Imaging Technique for Measuring Thermal Transport Properties Jihoon Jeong, Ke Chen, Emily S. Walker, Seth R. Bank and Yaguo Wang; 1Department of Mechanical Engineering, The University of Texas at Austin, Austin, Texas, United States; 2Microelectronic Research Center and Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; 3Texas Materials Institute, The University of Texas at Austin, Austin, Texas, United States

II: Transition Metal Dichalcogenide Growth, Characterization and Devices
Session Chairs: Mona Ebrish and Randall Feenstra
Friday Morning, June 30, 2017
DeBartolo Hall, Room 141

8:20 AM II1
(Student) MBE Grown 2D Semiconductor/GaN Heterojunction Choong Hee Lee, Sridhar Sadasivam, Yi Xia, Maria K. Chan and Pierre Darancet; Center for Nanoscale Materials, Argonne National Laboratory, Lemont, Illinois, United States

8:40 AM II2
(Student) Synthesis of Large-Area, Transfer-Free and Few Layers Thick MoS$_2$ for Enhanced Mobility Field Effect Transistors Ifat Jahangir, Goutam Koley and MVS Chandrashekar; 1University of South Carolina, Columbia, South Carolina, United States; 2Electrical and Computer Engineering, Clemson University, Clemson, South Carolina, United States

9:00 AM II3
Epitaxial Tungsten Diselenide (WSe$_2$) Film with Controlled Layer Growth and Interface Properties Bhakti Jariwala, Yu-Chuan Lin, Tanushree Choudhury, Xiaotian Zhang, Sarah Eichfeld, Boaming Wang, Jun Li, Aman Haque, Randall M. Feenstra, Joan M. Redwing and Joshua A. Robinson; 1Material Science and Engineering, Center for 2-Dimensional and Layered Materials, The Pennsylvania State University, State College, Pennsylvania, United States; 2Department of Mechanical Engineering, The Pennsylvania State University, State College, Pennsylvania, United States; 3Department of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

9:20 AM II4
(Student) Growth and Characterization of Molecular Beam Epitaxy MoSe$_2$, Te$_2$, Sb and Bi$_2$ Te$_3$ Aditya Sundar, Suresh Vishwanathan, Long Yuan, Xinyu Liu, Edward Lochocki, Huai-Hsun Lien, Malgorzata Dobrowolska-Furdyna, Jacek K. Furdyna, Libai Huang, Kyle M. Shen and Huili Grace Xing; 1School of Electrical Engineering, Cornell University, Ithaca, New York, United States; 2Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States; 3Department of Materials Science and Engineering, Cornell University, Ithaca, New York, United States; 4Department of Physics, Cornell University, Ithaca, New York, United States; 5Kavli Institute at Cornell for Nanoscale Science, Cornell University, Ithaca, New York, United States

II: Transition Metal Dichalcogenide Growth, Characterization and Devices
Session Chairs: Mona Ebrish and Randall Feenstra
Friday Morning, June 30, 2017
DeBartolo Hall, Room 141

8:20 AM II1
(Student) MBE Grown 2D Semiconductor/GaN Heterojunction Choong Hee Lee, Sridhar Sadasivam, Yi Xia, Maria K. Chan and Pierre Darancet; Center for Nanoscale Materials, Argonne National Laboratory, Lemont, Illinois, United States

8:40 AM II2
(Student) Synthesis of Large-Area, Transfer-Free and Few Layers Thick MoS$_2$ for Enhanced Mobility Field Effect Transistors Ifat Jahangir, Goutam Koley and MVS Chandrashekar; 1University of South Carolina, Columbia, South Carolina, United States; 2Electrical and Computer Engineering, Clemson University, Clemson, South Carolina, United States

9:00 AM II3
Epitaxial Tungsten Diselenide (WSe$_2$) Film with Controlled Layer Growth and Interface Properties Bhakti Jariwala, Yu-Chuan Lin, Tanushree Choudhury, Xiaotian Zhang, Sarah Eichfeld, Boaming Wang, Jun Li, Aman Haque, Randall M. Feenstra, Joan M. Redwing and Joshua A. Robinson; 1Material Science and Engineering, Center for 2-Dimensional and Layered Materials, The Pennsylvania State University, State College, Pennsylvania, United States; 2Department of Mechanical Engineering, The Pennsylvania State University, State College, Pennsylvania, United States; 3Department of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

9:20 AM II4
(Student) Growth and Characterization of Molecular Beam Epitaxy MoSe$_2$, Te$_2$, Sb and Bi$_2$ Te$_3$ Aditya Sundar, Suresh Vishwanathan, Long Yuan, Xinyu Liu, Edward Lochocki, Huai-Hsun Lien, Malgorzata Dobrowolska-Furdyna, Jacek K. Furdyna, Libai Huang, Kyle M. Shen and Huili Grace Xing; 1School of Electrical Engineering, Cornell University, Ithaca, New York, United States; 2Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States; 3Department of Materials Science and Engineering, Cornell University, Ithaca, New York, United States; 4Department of Physics, Cornell University, Ithaca, New York, United States; 5Kavli Institute at Cornell for Nanoscale Science, Cornell University, Ithaca, New York, United States

II: Transition Metal Dichalcogenide Growth, Characterization and Devices
Session Chairs: Mona Ebrish and Randall Feenstra
Friday Morning, June 30, 2017
DeBartolo Hall, Room 141
9:40 AM JJ5
Ultrafast Dynamics of Exciton Capture by Mid-Gap Defects in CVD Grown MoSe$_2$, Ke Chen, Xianghai Meng, Feng He and Yaguo Wang; ME, The University of Texas at Austin, Austin, Texas, United States

10:00 AM BREAK

10:20 AM JJ6
(Student) Direct Growth of High Quality 2D Materials-Based Metal-Semiconductor-Metal Photodiodes Sudiksha Khadka, Eric Stinaff, Martin Kordesch, Miles Lindquist, Thushan Wickramasinghe and Shrouq Aleithan; Ohio University, Athens, Ohio, United States

10:40 AM JJ7
Investigations on MOVPE Growth Parameters of 2D MoS$_2$ Matthias Marx, Annika Grundmann, You-Ron Lin, Michael Heukens, Holger Kalisch and Andrei Vescan; ‘GaN Device Technology, RWTH-Aachen University, Aachen, Germany;
‘AIXTRON SE, Herzogenrath, Germany

11:00 AM JJ8
Spectroscopic and Electrical Characterization of Solution-Synthesized Metal Chalcogenide Nanoelectronic Materials Adam Biačchi, Son T. Le, Joseph A. Hagmann, Brian G. Alberding, Sugata Chowdhury, Edwin J. Heilweil, Curt A. Richter and Angela R. Hight Walker; ‘Engineering Physics Division, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, United States; ‘Sensor Science Division, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, United States

11:20 AM JJ9
(LATE NEWS, Student) Study of Temperature Ramp Down Effects on Chemically Accelerated Epitaxial Graphene Grown on 4H-SiC Using TFS Towards High Power Applications Anusha Balachandran, Surya N. Chava, Joshua A. Letton and MVS Chandrashekhar; Electrical Engineering, University of South Carolina, Columbia, South Carolina, United States.

11:40 AM JJ10
(LATE NEWS, Student) Influenza Virus Detection System Using Graphene Field-Effect Transistor Takuya Kawata; The Institute of Scientific and Industrial Research, Osaka University, Osaka, Japan.

8:40 AM JJ2
(Student) Investigation of Surface Treatments for Improved Quantum Efficiency in III-N Photocathodes Emma Rocco, Jonathan Marini, Isra Mahaboob, F. Shadi Shahedipour-Sandvik; ‘Colleges of Nanoscale Science and Engineering, State University of New York Polytechnic Institute, Albany, New York, United States; ‘Physics, Virginia Commonwealth University, Richmond, Virginia, United States;
‘Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, United States

9:00 AM JJ3
(Student) Monte Carlo Simulation of III-Nitride Photocathodes Jonathan Marini, Isra Mahaboob, Kasey Hogan, Emma Rocco, L. D. Bell and F. Shadi Shahedipour-Sandvik; ‘Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, United States; ‘Colleges of Nanoscale Science and Engineering, State University of New York Polytechnic Institute, Albany, New York, United States

9:20 AM JJ4
(Student) Towards High Performance (Al)GaN Based Betavoltaic Device Kasey Hogan, Jonathan Marini, Isra Mahaboob, Emma Rocco and F. Shadi Shahedipour-Sandvik; ‘Nanoscale Science and Engineering, Colleges of Nanoscale Science and Engineering, State University of New York Polytechnic Institute, Albany, New York, United States

9:40 AM JJ5
(Student) Dependence of Electromagnetic Coupling of Flexible In$_x$Ga$_{1-x}$N Nanowire Light-Emitting Diodes Mohsen Asad, Renjie Wang, Yong-Ho Ra, Zetian Mi and William Wong; ‘Electrical and Computer Engineering, University of Waterloo, Waterloo, Canada; ‘Electrical and Computer Engineering, McGill University, Montreal, Canada; ‘Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, United States

9:40 AM JJ6
(LATE NEWS, Student) Study of Temperature Ramp Down Effects on Chemically Accelerated Epitaxial Graphene Grown on 4H-SiC Using TFS Towards High Power Applications Anusha Balachandran, Surya N. Chava, Joshua A. Letton and MVS Chandrashekhar; Electrical Engineering, University of South Carolina, Columbia, South Carolina, United States.

JJ: III-Nitride Optical Devices
Session Chairs: Nelson Tansu and Jonathan Wierer
Friday Morning, June 30, 2017
DeBartolo Hall, Room 155

8:20 AM JJ11
(Student) Growth and Characterization of GaN $p$-$i$-$p$-$i$-$n$ Ultraviolet Avalanche Photodiodes Mi-Hee Ji, Jeomoh Kim, Theeradetch Detchprohm, Yuanzheng Zhu, Shyh-Chiang Shen and Russell Dupuis; ‘Georgia Institute of Technology, Atlanta, Georgia, United States; ‘Materials and Devices Advanced Research Institute, LG Electronics, Seoul, Korea (the Republic of)
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PS1  Poster Author (Poster Session, First Paper)

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