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 Cermony

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

A: Gallium Oxide—Devices
Session Chairs: Masataka Higashiwaki and Marko Tadjer
Wednesday Morning, June 28, 2017
DeBartolo Hall, Room 102

10:00 AM A1
(Student) Demonstration of a β-$(AlGa)_2O_3$/ Ga_2O_3 Heterojunction Field Effect Transistor Zhanbo Xia[1], Sriram Krishnamoorthy[1], Siddharth Rajan[1, 2] and Mark Brenner[1]; [1]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; [2]Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States

10:20 AM A2
Germanium Doped β-Ga_2O_3 MOSFETs with Mobility of 111 cm^2/Vs Jonathan P. McCandless[1], Neil A. Moser[2], Kelson D. Chabak[3], Kevin D. Leedy[3], Andrew J. Green[1], Antonio Crespo[3], Elaheh Ahmadi[4], James Speck[4] and Gregg H. Jessen[3]; [1]KBRWyle, Wright-Patterson AFB, Ohio, United States; [2]Electrical Engineering, George Mason University, Fairfax, Virginia, United States; [3]Air Force Research Laboratory, Wright-Patterson AFB, Ohio, United States; [4]Materials Science, University of California, Santa Barbara, Santa Barbara, California, United States

10:40 AM A3
Investigation of Nitrogen Ion Implantation for Current Blocking in Vertical Ga_2O_3 Transistors Man Hoi Wong[1], Chia-Hung Lin[1], Akito Kuramata[2], Shigenobu Yamakoshi[2] and Masataka Higashiwaki[1]; [1]National Institute of Information and Communications Technology (NICT), Koganei, Tokyo, Japan; [2]Tamura Corporation, Sayama, Japan

11:00 AM A4
(Student) Characterization of ZrO_2 and HfO_2 MOS Capacitors Deposited by ALD on (-201) β-Ga_2O_3 Substrates David I. Shahin[1], Marko J. Tadjer[2], Virginia D. Wheeler[2], Travis J. Anderson[2], Andrew D. Koehler[2], Karl D. Hobart[2], Charles R. Eddy[2], Fritz J. Kub[2] and Aris Christou[1]; [1]Materials Science and Engineering Department, University of Maryland, College Park, Maryland, United States; [2]U.S. Naval Research Laboratory, Washington, District of Columbia, United States

11:20 AM A5
(Student) Demonstration of Quasi-2-Dimensional β-Ga_2O_3 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-Ga_2O_3 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 Chanana[2], Joshua Winger[3], Prashanth Gopalan[1], Ajay Nahata[1], Michael Scarpulla[1,3] and Berardi Sensale-Rodriguez[1]; [2]Electrical and Computer Engineering, University of Utah, Salt Lake City, Utah, United States; [3]Materials 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 Easley[1], Erdem Arkun[2], Michael Carmody[2] and Jamie Phillips[1]; [1]University of Michigan, Ann Arbor, Michigan, United States; [2]Teledyne Imaging Sensors, Camarillo, California, United States

10:40 AM B3
Tl_6SI_4, A Promising Semiconductor Compound for γ-Ray Detection at Room Temperature Wenwen Lin[1], Zhifu Liu[2], Constantinos C. Stoumpos[1], Sanjib Das[2], Yihui He[1], Kyle M. Mccall[1], Bruce W. Wessels[2] and Mercouri G. Kanatzidis[1]; [1]Chemistry, Northwestern University, Evanston, Illinois, United States; [2]Northwestern 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 Xu[1], Alex Frenkel[1], Youxi Lin[1], Dmitri Donetsky[1], Leon Shterengas[1], Sergey Suchalkin[1], Gela Kipshidze[1], Grogery Belenky[1], Stefan P. Svensson[2] and Wendy L. Sarney[2]; [1]Department of Electrical and Computer Engineering, Stony Brook University, Stony Brook, New York, United States; [2]U.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. Renteria, Sadhvikas J. Addamane, Darryl M. Shima, Amy L. Soudachanh, 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 Kymissis 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. Muschinske[1], Emily S. Walker[1], Seung Ryul Na[2], Stephen D. March[1], Andrew F. Briggs[1], Deji Akinwande[1], Kenneth M. Liechti[2] and Seth R. Bank[1]; [1]Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; [2]Department 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 Hwang[1], Hyunhak Jeong[1], Dongku Kim[1], Yeonsik Jang[1], Jun-Woo Kim[1], Seungjun Chung[1], Gunuk Wang[2] and Takhee Lee[1]; [1]Seoul National University, Seoul, Korea (the Republic of); [2]Korea University, Seoul, Korea (the Republic of)

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

11:20 AM C5
Signature of Singlet Fission in Magnetoconductance of Single Crystalline Tetracene Field-Effect Transistors Hyuk-Jae Jang[1,2], Emily G. Bittle[1], Qin Zhang[1, 2], David J. Gundlach[1] and Curt A. Richter[1]; [1]National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [2]Theiss 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/ MoS_2 van der Waals Heterostructures Itamar Balla[1], Tejas A. Shastry[1], Hadallia Bergeron[1], Samuel H. Amsterdam[2], Xiaolong Liu[3], Gavin P. Campbell[1], Michael J. Bedzyk[1, 4, 3], Tobin J. Marks[1, 2] and Mark C. Hersam[1, 2, 5]; [1]Department of Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; [2]Department of Chemistry, Northwestern University, Evanston, Illinois, United States; [3]Graduate Program in Applied Physics, Northwestern University, Evanston, Illinois, United States; [4]Department of Physics, Northwestern University, Evanston, Illinois, United States; [5]Department 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 Kang[1], Kan-Heng Lee[2], Yimo Han[2], Hui Gao[2], Saien Xie[2], David Muller[2] and Jiwoong Park[1, 2]; [1]University of Chicago, Chicago, Illinois, United States; [2]Cornell University, Ithaca, New York, United States

10:40 AM D3 WITHDRAWN
(Student) Three-Atom-Thick Epitaxial Superlattices with Coherent Lattice Saien Xie[1, 2], Yimo Han[2], Lijie Tu[2], Robert DiStasio[2], David Muller[2] and Jiwoong Park[1]; [1]University of Chicago, Chicago, Illinois, United States; [2]Cornell 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 MoS_2-WSe_2 Heterojunctions Yi Pan[1], Stefan Foelsch[1], Yifan Nie[2], Yu-Chuan Lin[3], Bhakti Jariwala[3], Kehao Zhang[3], Kyeongjae Cho[2], Joshua . Robinson[3] and Randall M. Feenstra[4]; [1]Paul Drude Institute, Berlin, Germany; [2]Materials Science and Engineering, The University of Texas at Dallas, Dallas, Texas, United States; [3]Materials Science and Engineering, The Pennsylvania State University, University Park, Pennsylvania, United States; [4]Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

E: Ultra Wide Bandgap and Power Electronic Devices
Session Chair: F. Shadi Shahedipour-Sandvik and Doug Hall
Wednesday Morning, June 28, 2017
DeBartolo Hall, Room 155

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 $Al_xGa_{1-x}N$ (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[1], Atsunori Tanaka[2], Renjie Chen[1] and Shadi Dayeh[1, 2]; [1]Electrical and Computer Engineering, University of California, San Diego, San Diego, California, United States; [2]Material 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[1], Tingyu Bai[1], Chao Li[1], Marko Tadjer[2], Karl Hobart[2], Jennifer Hite[2], Travis Anderson[2] and Boris Feigelson[2]; [1]MSE, University of California, Los Angeles, Los Angeles, California, United States; [2]U.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[1], Francois Leonard[1], Jeramy R. Dickerson[2], Michael P. King[2], Mary H. Crawford[2], Andrew M. Armstrong[2], Andrew A. Allerman[2], Ozgur Aktas[3], Isik C. Kizilyalli[3], Robert J. Kaplar[2] and A. A. Talin[1]; [1]Sandia National Laboratories, Livermore, California, United States; [2]Sandia National Laboratories, Albuquerque, New Mexico, United States; [3]Avogy, 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[1], Hu Liang[2], Niels Posthuma[2], Dirk Wellekens[2], Stefaan Decoutere[2], Soo Min Lee[1] and Ajit Paranjpe[1]; [1]Veeco Instrument Inc, Somerset, New Jersey, United States; [2]imec, Leuven, Belgium

NOTES

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 Homoepitaxial Ga_2O_3:Si on (010) β-Ga_2O_3 by Pulsed Laser Deposition Kevin D. Leedy[1], Kelson D. Chabak[1], Vladimir Vasilyev[1], David C. Look[2], John J. Boeckl[1], Jeff L. Brown[3], Stephen E. Tetlak[1], Andrew J. Green[3], Neil A. Moser[4], Antonio Crespo[1], Robert C. Fitch[1], Jonathan P. McCandless[3] and Gregg H. Jessen[1]; [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_2O_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_2O_3 Grown Using MOCVD and HVPE Techniques Yao Yao[1], Luke A. Lyle[1], Serdal Okur[2], Gary S. Tompa[2], Tom Salagaj[2], Nick Sbrockey[2], Robert F. Davis[1] and Lisa M. Porter[1]; [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_2O_3 on Sapphire Kentaro Kaneko[1], Takayuki Uchida[1], Shin-ichi Kan[1], Toshimi Hitora[2] and Shizuo Fujita[1]; [1]Kyoto University, Kyoto, Japan; [2]FLOSFIA, 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_2O_3 Adam T. Neal[1, 2], Jian V. Li[3] and Shin Mou[1]; [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

3:50 PM F7
Structural Characteristics of HVPE-Grown Ga_2O_3 Films on Native Substrates with Different Crystallographic Orientations Nadeemullah Mahadik, Marko J. Tadjer, Jennifer Hite and Karl D. Hobart; U.S. Naval Research Laboratory, Washington, District of Columbia, United States

4:10 PM F8
Thermal Expansion Coefficients of Beta-Ga_2O_3 Wafers Determined Using High Resolution X-Ray Diffraction Mark Goorsky[1], Chao Li[1], Eva Rosker[1], Marko Tadjer[2] and Karl Hobart[2]; [1]MSE, University of California, Los Angeles, Los Angeles, California, United States; [2]U.S. Naval Research Laboratory, Washington, District of Columbia, United States

4:30 PM F9
(Student) Phonon and Near-Edge Optical Properties of Ga_2O_3 Kelsey Mengle, Guangsha Shi, Dylan Bayerl and Emmanouil Kioupakis; Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

G: 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 AlInSb Metamorphic Buffers Using Digital Alloy Technique Vinita Dahiya[1], Sadhvikas Addamane[2,4], Bed N. Pantha[3], Sen Mathews[4], Julia Deitz[5], Tyler J. Grassman[5,1], John A. Carlin[6], Nathaniel R. Miller[3], Ganesh Balakrishnan[2, 4] and Sanjay Krishna[1]; [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]SolAero Technologies Corp, Albuquerque, New Mexico, United States; [4]Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, United States; [5]Department of Materials Science Engineering, The Ohio State University, Columbus, Ohio, United States; [6]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[1], Ann K. Rockwell[1], Kyle M. McNicholas[1], Yukun Sun[2, 3], Rodolfo Salas[1], Scott J. Maddox[1], Hari P. Nair[4], Minjoo Larry Lee[2] and Seth R. Bank[1]; [1]Microelectronics Research Center and ECE Department, The University of Texas at Austin, Austin, Texas, United States; [2]Department of ECE, 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[1], Maddy Woodson[2], Min Ren[2], Scott Sifferman[1], Scott Maddox[1], Joe Campbell[2] and Seth Bank[1]; [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[1], Keisuke Odaka[1], Masakazu Kobayashi[1, 2] and Toshiaki Asahi[3]; [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

2:50 PM G5
Density Enhancements in GeTe Films Using DI Water Treatment Nadeemullah Mahadik, Laura Ruppalt and James Champlain; U.S. Naval Research Laboratory, Washington, District of Columbia, United States

3:10 PM BREAK

3:30 PM G6
Growth and Characterization of GePb Alloy Using Layer Inversion Method Hakimah Alahmada[2, 4], Murtatha Alher[3], Sattar AlKabi[2, 4], Seyed Amir Ghetmiri[4], Aboozar Mosleh[1], Shui-Qing Yu[4] and Hameed Naseem[4]; [1]Electrical Engineering, Arkansas Tech University, Russellville, Arkansas, United States; [2]Microelectronics-Photonics Graduate Program, University of Arkansas, Fayetteville, Arkansas, United States; [3]Department of Mechanical Engineering, University of Kerbala, Kerbala, Iraq; [4]Electrical Engineering, University of Arkansas, Fayetteville, Arkansas, United States

3:50 PM G7
Structural, Optical and Electrical Characterization of GeSn and SiGeSn Thin Films of Varying Composition Deposited by CVD Technique Jignesh Vanjaria[1], Tom Salagaj[2], Nick Sbrockey[2], Gary Tompa[2] and Hongbin Yu[1]; [1]Arizona State University, Tempe, Arizona, United States; [2]Structured Materials Industries, Inc., Piscataway, New Jersey, United States

4:10 PM G8
Investigation of High Voltage GaN Photoconductive Semiconductor Switches Andrew D. Koehler[1], Travis J. Anderson[1], Anindya Nath[2], Marko J. Tadjer[1], Karl D. Hobart[1] and Fritz J. Kub[1]; [1]U.S. Naval Research Laboratory, Washington, District of Columbia, United States; [2]George Mason University, Fairfax, Virginia, United States

4:30 PM G9
(Student) Demonstration of H-Terminated Single Crystal Diamond Hole-Channel MESFET with ~40mA/mm and 121 kV/cm Harshad Surdi[1], Maitreya Dutta[2] and Srabanti Chowdhury[2]; [1]School of Electrical, Energy and Computer Engineering, Arizona State University, Tempe, Arizona, United States; [2]Department of Electrical, Computer and Energy Engineering, University of California, Davis, Davis, California, United States

4:50 PM G10
(LATE NEWS) Temperature Dependent Thermal Conductivity of AlGaN Alloys Christopher B Saltonstall, Andrew Allerman and Thomas Beechem; Sandia National Laboratories, Albuquerque, New Mexico, United States.

H: Processing and Characterization of Thin-Film Devices
Session Chairs: Adam Biacchi and David Gundlach
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 138

1:30 PM H1
Surface Chemical Modification of Organic Semiconductors as Replacements for Injection, Adhesion or Passivation Layers Jacob W. Ciszek; Chemistry and Biochemistry, Loyola University Chicago, Chicago, Illinois, United States

1:50 PM H2
(Student) High Q Factor Microwave Excitations in Organic Ferrimagnet Vanadium Tetracyanoethylene Andrew Franson[1], Na Zhu[2], Ezekiel Johnston-Halperin[1] and Hong Tang[2]; [1]Physics, The Ohio State University, Columbus, Ohio, United States; [2]Electrical Engineering, Yale University, New Haven, Connecticut, United States

2:10 PM H3
(Student) Epitaxial Growth and Transfer of $Bi_{1-x}Sb_x$ Thin Films Emily S. Walker[1], Sarah Muschinske [1], Narae Yoon[1], Christopher J. Brennan[1], Seung Ryul Na[1], Stephen D. March[1], Yukun Sun[2, 3], Andrew F. Briggs[1], Erica Davis[1], Deji Akinwande[1], Minjoo Larry Lee[2, 3], Kenneth J. Liechti[1], Edward T. Yu[1], Daniel Wasserman[1] and Seth R. Bank[1]; [1]The University of Texas at Austin, Austin, Texas, United States; [2]The University of Illinois at Urbana Champagne, Urbana, Illinois, United States; [3]Yale University, New Haven, Connecticut, United States

2:30 PM H4
(Student) Electrical Transport and Power Dissipation in Aerosol-Jet-Printed Graphene Interconnects Twinkle Pandhi[1], Eric Kreit[5], Roberto Aga[5], Kiyo Fujimoto[1], Mohammad Sharbati[4], Samane Khademi[4], Feng Xiong[4], Jessica Koehne[3], Emily M. Heckman[2] and David Estrada[1]; [1]Micron School of Material Science and Engineering, Boise State University, Boise, Idaho, United States; [2]Air Force Research Laboratory, Sensors Directorate, Wright-Patterson AFB, Ohio, United States; [3]NASA Ames Research Center, Moffett Field, California, United States; [4]Swanson School of Engineering, University of Pittsburgh, Pittsburgh, Pennsylvania, United States; [5]KBRWyle, Dayton, Ohio, United States

2:50 PM H5
Purification and Ligand Exchange Chemistry of Colloidal Quantum Dots for Fluorescence and Optoelectronic Applications Andrew B. Greytak, Megan Y. Gee, Adam Roberge, Yi Shen, John H. Dunlap and Mathew L. Kelley; Chemistry and Biochemistry, University of South Carolina, Columbia, South Carolina, United States

3:10 PM BREAK

I: Electronic Materials for Bio
Session Chairs: Tzahi Cohen-Karni and David Janes
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 138

3:30 PM I1
Reaction of Viral Proteins and Sialoglycan on Biomimetic Graphene Surface Measured by Liquid Atomic Force Microscope and Graphene Field-Effect Transistor Kaho Kamada[1], Takao Ono[1], Ryota Hayashi[1], Yasushi Kanai[1], Koichi Inoue[1], Yasuhide Ohno[1, 2], Kenzo Maehashi[1, 3], Yohei Watanabe[4], Shin-ichi Nakakita[5], Yasuo Suzuki[6], Toshio Kawahara[7], Sonia A. Contera[8] and Kazuhiko Matsumoto[1]; [1]The Institute of Scientific and Industrial Research, Osaka University, Osaka, Japan; [2]Graduate School of Science and Technology, Tokushima University, Tokushima, Japan; [3]Institute of Engineering, Tokyo University of Agriculture and Technology, Tokyo, Japan; [4]Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kyoto, Japan; [5]Life Science Research Center, Kagawa University, Kagawa, Japan; [6]College of Life and Health Sciences, Chubu University, Aichi, Japan; [7]College of Engineering, Chubu University, Aichi, Japan; [8]Department of Physics, University of Oxford, Oxford, United Kingdom

3:50 PM I2
Measurement of Enzymatic Reaction Using Graphene Field-Effect Transistor and Microwell for Detection of *Helicobacter Pylori* Takao Ono[1], Yasushi Kanai[1], Yasuhide Ohno[1, 2], Kenzo Maehashi[1, 3], Koichi Inoue[1] and Kazuhiko Matsumoto[1]; [1]The Institute of Scientific and Industrial Research, Osaka University, Osaka, Japan; [2]Graduate School of Science and Technology, Tokushima University, Tokushima, Japan; [3]Institute of Engineering, Tokyo University of Agriculture and Technology, Tokyo, Japan

4:10 PM I3
(Student) Translation of PEDOT/Parylene C ECoG Microelectrode Arrays for Recording Auditory Cognitive Activity in Birds Lorraine A. Hossain[1], Ezequiel Arneodo[2], Nick Rogers[3], Mehran Ganji[4], John Hermiz[4], Vikash Gilja[4], Timothy Gentner[2] and Shadi A. Dayeh[1, 4]; [1]Materials Science and Engineering, University of California, San Diego, La Jolla, California, United States; [2]Biocircuits Institute, University of California, San Diego, La Jolla, California, United States; [3]Department of Physics, University of California, San Diego, La Jolla, California, United States; [4]Department of Electrical and Computer Engineering, University of California, San Diego, La Jolla, California, United States

4:30 PM I4
(Student) Size Effects in Scaling Electrocorticography Arrays of PEDOT:PSS/Au, PEDOT:PSS/Pt, Au and Pt Mehran Ganji, Atsunori Tanaka , Ahmed Youssef, Vikash Gilja, Eric Halgren and Shadi Dayeh; ECE, University of California, San Diego, San Diego, California, United States

4:50 PM I5
(Student) Implications of Using High Reaction Rate Amperometric Micro-Electrode Array for Measurement of Local Concentration Variations of Bioanalytes Jose F. Rivera[1], David B. Janes[1], Siddarth V. Sridharan[1], Jenna L. Rickus[2] and James Nolan[2]; [1]Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States; [2]Agricultural and Biological Engineering, Purdue University, West Lafayette, Indiana, United States

J: Computational Materials Theory
Session Chair: Chris Van de Walle and Oleg Rubel
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 140

1:30 PM J1
Characteristics of Electronic Localization in Semiconductor Alloys—Design Principles Oleg Rubel and Christopher Pashartis; Materials Science and Engineering, McMaster University, Hamilton, Canada

1:50 PM J2
(Student) Electron Localization in 2-D GaN III/V Alloys Christopher L. Pashartis and Oleg Rubel; Materials Science and Engineering, McMaster University, Hamilton, Canada

2:10 PM J3
(Student) Phase-Influenced Thermal Conductivity of Bulk VO_2 from First-Principles Lattice Dynamics Calculations Jorge O. Morales[1, 2], Francisco Herrera[1], Donovan E. Diaz-Droguett[3, 4], Diego Celentano[2, 4], David B. Go[1, 5] and Tengfei Luo[1, 5]; [1]Aerospace and Mechanical Engineering, University of Notre Dame, South Bend, Indiana, United States; [2]Mechanical Engineering, Pontificia Universidad Catolica de Chile, Santiago, Chile; [3]Fisica, Pontificia Universidad Catolica de Chile, Santiago, Chile; [4]Centro de Investigación en Nanotecnología y Materiales Avanzados (CIEN-UC), Pontificia Universidad Catolica de Chile, Santiago, Chile; [5]Center for Sustainable Energy of Notre Dame (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 Ji[1], Lok C. Lew Yan Voon[2] and Yan Zhuang[1]; [1]Electrical Engineering, Wright State University, Dayton, Ohio, United States; [2]University of West Georgia, Carrollton, Georgia, United States

2:50 PM J5
(Student) Excess Charges at the Interface of Half Heusler Semiconductors Abhishek Sharan[1] and Anderson Janotti[2]; [1]Department of Physics and Astronomy, University of Delaware, Newark, Delaware, United States; [2]Department of Materials Science and Engineering, University of Delaware, Newark, Delaware, United States

3:10 PM BREAK

3:30 PM J6
(Student) Hybrid Functional Study of the Electronic Structure of Rare-Earth Pnictides Shoaib Khalid[2, 1] and Anderson Janotti[1]; [1]Department of Material Science and Engineering, University of Delaware, Newark, Delaware, United States; [2]Department of Physics and Astronomy, University of Delaware, Newark, Delaware, United States

3:50 PM J7
Electrical Properties of a Functionalized UiO-66 Metal-Organic Framework Terence D. Musho, 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 Oyaizu; Department of Physical Science and Engineering, Nagoya Institute of Technology, Nagoya, Japan

4:30 PM J9 WITHDRAWN
(Student) Defective Graphene and Graphene Allotropes as High-Capacity Anode Materials for Mg Ion Batteries Dequan Er, Eric Detsi, Hemant Kumar and Vivek B. Shenoy; MSE, University of Pennsylvania, Philadelphia, Pennsylvania, United States

4:50 PM J10
(Student) DFT and TD-DFT Studies of Optical Absorption Spectral and Electronic Properties of Some Selected Anthocyanin Family Used in DSSC Aanuoluwapo R. Obasuyi and Norma Flores-Holguin; Material Science, Centro de Investigación en Materiales Avanzados, S.C., Chihuahua, Mexico

K: Novel 2D Processing and Devices
Session Chairs: Roberto Myers and Michael Spencer
Wednesday Afternoon, June 28, 2017
DeBartolo Hall, Room 141

1:30 PM K1
(Student) Effects of Processing Conditions on Metal-TMD Interface Chemistry and Band Alignment Christopher M. Smyth[1], Rafik Addou[1], Lee A. Walsh[1], Stephen McDonnell[2], Jiyoung Kim[1], Christopher L. Hinkle[1] and Robert M. Wallace[1]; [1]Materials Science and Engineering, The University of Texas at Dallas, Dallas, Texas, United States; [2]Materials Science and Engineering, University of Virginia, Charlottesville, Virginia, United States

1:50 PM K2
Passivation of Graphene Films and Their Visibility Isaac Ruiz, Michael Goldfalm, Bruce L. Draper and Stephen W. Howell; Sandia National Laboratories, Albuquerque, New Mexico, United States

2:10 PM K3
(Student) Effective Passivation of Black Phosphorus by a Double Boron Nitride and Sapphire Coating Sampath Gamage[1,2], Alireza Fali[1,2], Neda Aghamiri[1,2], Lingming Yang[3], Peide Ye[3] and Yohannes Abate[1,2]; [1]Physics and Astronomy, Georgia State University, Atlanta, Georgia, United States; [2]Center for Nano-optics, Georgia State University, Atlanta, Georgia, United States; [3]School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States

2:30 PM K4
(Student) Controlled Modification of Large-Area MoS_2 Monolayers Using He-Ion Irradiation Frederick Aryeetey , Kyle Nowlin and Shyam Aravamudhan; Nanoengineering, North Carolina Agricultural and Technical State University, Greensboro, North Carolina, United States

2:50 PM K5
Midwave Infrared Absorption of Thin Graphene Oxide Thermally Reduced in Ultra-High Vacuum Erin R. Cleveland, Jill A. Nolde, Glenn G. Jernigan and Edward H. Aifer; U.S. Naval Research Laboratory, Washington, District of Columbia, United States

3:10 PM BREAK

3:30 PM K6
High-Sensitivity Optical Detection Using Charge-Coupled Graphene-Based Sensors Stephen W. Howell[1], Thomas E. Beechem[2], Isaac Ruiz[1], Paul Davids[1], Richard K. Harrison[3], Sean Smith[4], Nicholas J. Martinez[1] and Jeffrey B. Martin[3]; [1]Applied Photonic Microsystems, Sandia National Laboratories, Albuquerque, New Mexico, United States; [2]Nanoscale Sciences Department, Sandia National Laboratories, Albuquerque, New Mexico, United States; [3]Nuclear Forensics Research and Development, Sandia National Laboratories, Albuquerque, New Mexico, United States; [4]Electronic, 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 Xu[1], Yu-Chuan Lin[3], David Guzman[4], Alejandro Strachan[4], Joshua Robinson[3], Alan Seabaugh[2] and Susan K. Fullerton Shirey[1]; [1]University of Pittsburgh, Pittsburgh, Pennsylvania, United States; [2]University of Notre Dame, Notre Dame, Indiana, United States; [3]The Pennsylvania State University, University Park, Pennsylvania, United States; [4]Purdue University, West Lafayette, Indiana, United States

4:10 PM K8
Controlled Doping of Two-Dimensional (2D) Materials with Molecular Reductants and Oxidants Siyuan Zhang[1], Meng-Yen Tsai[2], Steve Barlow[2], Eric Vogel[2], Seth Marder[2], Christina A. Hacker[1] and Sujitra Pookpanratana[1]; [1]National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [2]Georgia Tech, Atlanta, Georgia, United States

4:30 PM K9
(Student) 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 MoS_2 and $MoSe_2$ Thin-Film Transistors by Al_2O_3 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 Wienecke, Brian Romanczyk, Elaheh Ahmadi, Matthew Guidry, Xun Zheng, Stacia Keller and Umesh K. Mishra; Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States

1:50 PM L2
(Student) Design and Bottom-Up Development of Stretchable Geometry AlGaN/GaN High Electron Mobility Transistors Isra Mahaboob[1], Jonathan Marini[1], Kasey Hogan[1], Emma Rocco[1], F. Shadi Shahedipour-Sandvik[1], Randy Tompkins[2] and Nathan Lazarus[2]; [1]Nanoscale Science and Engineering, Colleges of Nanoscale Science and Engineering, State University of New York Polytechnic Institute, Albany, New York, United States; [2]U.S. Army Research Laboratory, Adelphi, Maryland, United States

2:10 PM L3
Suppression of Self-Heating Effect in Flexible GaN-Based HFETs with Metal Substrates Seungkyu Oh[1, 2], Moon Uk Jo[2], Taehoon Jang[3], Jie Chen[1], Weijie Wang[1], Shahab Shervin[1], Sara Pouladi[1], Joon Seop Kwak[2] and Jae-Hyun Ryou[1, 4]; [1]Department of Mechanical Engineering and Materials Science, University of Houston, Houston, Texas, United States; [2]Department of Printed Electronics Engineering, Sunchon National University, Sunchon-Si, Korea (the Republic of); [3]Semiconductor Physics Research Center, Chonbuk National University, JeonJu-Si, Korea (the Republic of); [4]Texas Center for Superconductivity at the University of Houston (TcSUH), University of Houston, Houston, Texas, United States

2:30 PM L4
(Student) GaN/AlN Quantum Well FETs on AlN/SiC Platform Using High Temperature MBE Growth Reet Chaudhuri[1], S.M. Moududul Islam[1], Samuel Bader[2], Austin L. Hickman[1], Shyam Bharadwaj[1], Huili Grace Xing[1, 3] and Debdeep Jena[1, 3]; [1]Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; [2]Applied and Engineering Physics, Cornell University, Ithaca, New York, United States; [3]Material 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 Agarwal[1], Chirag Gupta[1], Cory Lund[2], Abdullah Alhassan[3], Tom Mates[3] and Stacia Keller[1] [1]Electrical 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
(Student) Electrical Characterization of Polarization Doped Al-Rich n-AlGaN for Deep UV LEDs Shyam Bharadwaj, S.M. M. Islam, Vladimir Protasenko, Huili Grace Xing, Debdeep Jena and Kevin Lee; Cornell University, Ithaca, New York, United States

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 Yuewei Zhang[1], Sriram Krishnamoorthy[1], Fatih Akyol[1], Sanyam Bajaj[1], Zane Jamal-Eddine[1], Andrew A. Allerman[2], Michael Moseley[2], Andrew Armstrong[2] and Siddharth Rajan[1]; [1]Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; [2]Sandia 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 Harden[1], S.M. Moududul Islam[2], Kevin Lee[2], Vladimir Protasenko[2], Huili Grace Xing[2], Debdeep Jena[2] and Anthony J. Hoffman[1]; [1]University of Notre Dame, Notre Dame, Indiana, United States; [2]Cornell University, Ithaca, New York, United States

4:50 PM M5
$Al_{0.73}Ga_{0.27}N$/AlN Distributed Bragg Reflectors Grown by Metalorganic Chemical Vapor Deposition for Deep-UV Lasers Young Jae Park[1], Theeradetch Detchprohm[1], Karan Mehta[1], Shuo Wang[2], Oliver Moreno[1], Yuh-Shiuan Liu[1], Shyh-Chiang Shen[1], P. Douglas Yoder[1], Fernando Ponce[2] and Russell D. Dupuis[1]; [1]Georgia Institute of Technology, Atlanta, Georgia, United States; [2]Arizona State University, Tempe, Arizona, United States

5:10 PM M6
(LATE NEWS) Impact-Ionization Induced UV-Vis Electroluminescence in Unipolar GaN/AlN Resonant Tunneling Diodes Jimy Encomendero[1], Faiza A. Faria[2], S.M. Islam[1], Vladimir Protasenko[1], Sergei A. Rouvimov[2], Patrick A. Fay[2], Debdeep Jena[1], Huili Grace Xing[1]; [1]School of Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; [2]Department 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 Jianqiu 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 Mahadik[1], Robert Stahlbush[1] and Siddharth Sundaresan[2]; [1]U.S. Naval Research Laboratory, Washington, District of Columbia, United States; [2]GeneSiC 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, Jianqiu 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. Waskiewicz[1], Mark A. Anders[1], Patrick M. Lenahan[1] and Corey J. Cochrane[2]; [1]Engineering Science and Mechanics, The Pennsylvania State University, State College, Pennsylvania, United States; [2]NASA 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. Barker[1], Venkata S.N. Chava[2], MVS Chandrashekhar[2] and Andrew B. Greytak[1]; [1]Chemistry and Biochemistry, University of South Carolina, Columbia, South Carolina, United States; [2]Electrical 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 Jayawardena[1], Chunkun Jiao[1], Patricia M. Mooney[2] and Sarit Dhar[1]; [1]Department of Physics, Auburn University, Auburn, Alabama, United States; [2]Department 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 Jiang[1], Woongje Sung[2], Jayant Baliga[1], Sizhen Wang[1], Bongmook Lee[1] and Alex Huang[1]; [1]Electrical and Computer Engineering, North Carolina State University, Raleigh, North Carolina, United States; [2]State 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/SiO_2 Interface Structures Christopher J. Klingshirn[1], Joshua A. Taillon[2, 1], Gang Liu[3], Sarit Dhar[4], Leonard C. Feldman[3], Tsvetanka S. Zheleva[5], Aivars J. Lelis[5] and Lourdes G. Salamanca-Riba[1]; [1]Materials Science and Engineering, University of Maryland, College Park, Maryland, United States; [2]Materials Measurement Science Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [3]Institute for Advanced Materials, Rutgers University, New Brunswick, New Jersey, United States; [4]Physics, Auburn University, Auburn, Alabama, United States; [5]U.S. Army Research Laboratory, Adelphi, Maryland, United States

4:50 PM N10
Deep Reactive Ion Etching of 4H-SiC via Cyclic SF_6/O_2 Segments Lunet E. Luna[1], Marko J. Tadjer[2], Travis J. Anderson[2], Karl D. Hobart[2] and Fritz J. Kub[2]; [1]Postdoctoral Fellow residing at Naval Research Laboratory, Washington, District of Columbia, United States; [2]U.S. Naval Research Laboratory, Washington, District of Columbia, United States

PS: Poster Session
Wednesday, June 28, 2017
6:00 – 8:00 PM
McKenna Hall, Rooms 100-104

PS1
(Student) High Temperature Operation of n-$Al_{065}Ga_{0.35}N$ 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 Chandrashekhar and Asif Khan; Electrical Engineering, University of South Carolina, Columbia, South Carolina, United States.

PS2
(Student) Solar Blind UV Detection Using High-Al Content $Al_xGa_{1-x}N$ Devices—Towards Responsivity >10^6A/W Sakib Muhtadi, S. Hwang, A. Coleman, F. Asif, A. Lunev, Venkata S.N. Chava, MVS Chandrashekhar 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 Wu[1], Balaji Raghothamachar[1], Michael Dudley[1], Jaime A. Freitas[2], Tomasz Sochacki[3] and Michal Bockowski[3]; [1]Department of Materials Science and Chemical Engineering, Stony Brook University, Stony Brook, New York, United States; [2]U.S. Naval Research Laboratory, Washington DC, District of Columbia, United States; [3]Institute of High Pressure Physics, Polish Academy of Science, Warsaw, Poland.

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

PS5
Fast Hall—A High Speed Hall Measurement for Material Characterization Jeffrey Lindemuth; 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 Oxide Films Prepared by Anodization and Annealing of Gallium Arsenide Ryan J. Bunk, Jerry M. Woodall and Muhammad S. Islam; ECE, University of California, Davis, Davis, California, United States.

PS9
(Student) N-Type Quasi-2D β-Ga_2O_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 Oxide Semiconductors Yong Youn, Kanghoon Yim, Miso 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 Haseman[1], Pooneh Saadatkia[2], Jack Warfield[1], Joseph Lawrence[3], Armando Hernandez[2], Gerald Jellison[4], Lynn Boatner[4] and Farida Selim[1,2]; [1]Physics, Bowling Green State University, Napoleon, Ohio, United States; [2]Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; [3]Center for Materials and Sensors Characterization, University of Toledo, Toledo, Ohio, United States; [4]Materials 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 Larysa Khomenkova[1], Christophe Labbe[2], Xavier Portier[2] and Fabrice Gourbilleau[2] [1]V.E. Lashkaryov Institute of Semiconductor Physics, Kyiv, Ukraine; [2]CIMAP/Ensicaen, Caen, France.

PS14
(Student) Non-Thermal Plasma Based Surface Modification of ZnO-Epoxy-Graphene Flexible Nano-Composite Thin Films Sanjeev Kumar[1,2], Walker Tuff[1,2], Daniel R. Apuan[1,2] and Sankha Banerjee[1,2]; [1]Mechanical Engineering, California State University, Fresno, Fresno, California, United States; [2]Energy Engineering Research Group, California State University, Fresno, 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 Tetyana Torchynska[2], Brahim El Filali[1] and Juan Antonio J. Gomez[1]; [1]UPIITA, Instituto Politecnico Nacional, Ciudad de México, Mexico; [2]ESFM, Instituto Politecnico Nacional, CDMX, Mexico.

P17
(Student) Fundamental Bounds for the Resonance Strength in Graphene Plasmonic Structures Sara Arezoomandan 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. Pfiester, Dante DeMeo, John Chivers, 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. Morales[1,2], Donovan E. Diaz-Droguett[3,4] Diego Celentano[2,4] and Tengfei Luo[1,5]; [1]Aerospace and Mechanical Engineering, University of Notre Dame, South Bend, Indiana, United States; [2]Mechanical Engineering, Pontificia Universidad Catolica de Chile, Santiago, Chile; [3]Fisica, Pontificia Universidad Catolica de Chile, Santiago, Chile; [4]Centro de Investigación en Nanotecnología y Materiales Avanzados (CIEN-UC), Pontificia Universidad Catolica de Chile, Santiago, Chile; [5]Center for Sustainable Energy of Notre Dame (cSEND), University of Notre Dame, Notre Dame, Indiana, United States.

PS21
Seebeck Coefficient Measurements on Thin Films of $ZnSnN_2$ and the Density of States Effective Mass Jeffrey S. Dyck[1], John W. Cenker[1], Robert A. Makin[2], Nathaniel Feldberg[3] and Steven Durbin[2]; [1]Department of Physics, John Carroll University, University Heights, Ohio, United States; [2]Department of Electrical and Computer Engineering, Western Michigan University, Kalamazoo, Michigan, United States; [3]Department 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 Hsieh[1], Paritosh Wadekar[1], Chiung-Wen Chang[1], Chun-Fu Chang[1], Hui-Chun Huang[1], Sung-Wei Yeh[2], Hye-Won Seo[3], Wei-Kan Chu[4] and Quark Y. Chen[1,4]; [1]National Sun Yat-sen University, Kaohsiung, Taiwan; [2]National Kaohsiung University, Kaohsiung, Taiwan; [3]Jeju National University, Jeju, Korea (the Republic of); [4]University of Houston, Houston, Texas, United States.

PS23
(Student) Dilute GeSn—A Study on the Effects of Adding Stannic Chloride to UHV-CVD Growth Perry Grant[1,2,3], Wei Dou[3], Joshua Grant[2,3], Bader Alharthi[3], Aboozar Mosleh[3], Wei Du[4], Baohua Li[1], Mansour Mortazavi[4], Hameed Naseem[3] and Shui-Qing Yu[3]; [1]Arktonics LLC, Fayetteville, Arkansas, United States; [2]Microelectronics-Photonics Program, University of Arkansas, Fayetteville, Arkansas, United States; [3]Electrical Engineering, University of Arkansas, Fayetteville, Arkansas, United States; [4]Chemistry and Physics, University of Arkansas at Pine Bluff, Pine Bluff, Arkansas, United States.

PS24
Comparative Studies of Cu_2O Epitaxial Thin Films on MgO and r-Al_2O_3 Substrates Paritosh Wadekar[1], Wan-Chen Hsieh[1], Chaio-Wei Lin[1], Chun-Fu Chang[1], Hui-Chun Huang[1], Sung-Wei Yeh[2], Li-Wei Tu[1], Hye-Won Seo[3], Wei-Kan Chu[4] and Quark Y. Chen[1,4]; [1]National Sun Yat-sen University, Kaohsiung, Taiwan; [2]National Kaohsiung University, Kaohsiung, Taiwan; [3]Jeju National University, Jeju-si, Korea (the Republic of); [4]University of Houston, Houston, Texas, United States.

PS25
Low Temperature Ge Growth Using Plasma Enhanced UHV-CVD Technique Bader Alharthi[1], Joshua M. Grant[1], Wei Dou[1], Perry C. Grant[2], Aboozar Mosleh[1], Hameed Naseem[1] and Shui-Qing Yu[1]; [1]Electrical Engineering, University of Arkansas Fayetteville, Fayetteville, Arkansas, United States; [2]Arktonics LLC, Fayetteville, Arkansas, United States.

PS26
(Student) Characterization of Contact Metallizations on SnS Nanoribbons Jenifer R. Hajzus[1], Adam J. Biacchi[2], Son T. Le[2], Curt A. Richter[2], Angela R. Hight Walker[2] and Lisa M. Porter[1]; [1]Materials Science and Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States; [2]Engineering Physics Division, 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/HfO_2/Cu Filamentary Resistance Switches Heidi Clarke, Timothy Brown and Patrick Shamberger; Materials Science, Texas A&M University, College Station, Texas, United States.

PS29
New Precursor for Low Temperature Deposition of SiO_2 Layer Using Thermal and Plasma Enhanced ALD Techniques Hima Lingam, Venkatewsara R. Chitturi and Patrick Cobb; Nova-Kem, Germantown, Wisconsin, United States.

PS30 **WITHDRAWN**
Growth and Characterization of 3D Topological Insulator Bi_2Se_3 on Surface Passivated ZnO Hsin-Yen Lee[1,2], Ying-Chen Lee[3], Albert Davydov[1] and Yuan-Huei Chang[3]; [1]National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [2]Theiss Research, La Jolla, California, United States; [3]Department 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 $FeSb_{2-x}Bi_xSe_4$ Ferromagnetic Semiconductors Juan S. Lopez[1], Pierre Ferdinand Poudeu-Poudeu[1], Alexander Page[2] and Ctirad Uher[2]; [1]Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States; [2]Physics, 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 Sridharan[1], Jose F. Rivera[1], David B. Janes[1] and Jenna L. Rickus[2]; [1]ECE, Purdue University, West Lafayette, Indiana, United States; [2]ABE, Purdue University, West Lafayette, Indiana, United States.

PS39
(Student) Enhanced Signal-to-Noise Ratio Using Nanomaterial-Based Passive Neural Electrodes Sepideh Rastegar[1], Justin Stadlbauer[1], Kari McLaughlin[2], Kiyo Fujimoto[2], David Estrada[2] and Kurtis D. Cantley[1]; [1]Electrical and Computer Engineering, Boise State University, Boise, Idaho, United States; [2]Micron School of Materials Science and Engineering, Boise State University, Boise, Idaho, United States.

PS40
Systematic Approach for Printing Solar Cells from Perovskite Precursors Tara Holeman[1], Jason Wright[1], Juvinch Vicente[2], Jixin Chen[2], Savas Kaya[1] and Wojciech M. Jadwisienczak[1]; [1]EECS, Ohio University, Athens, Ohio, United States; [2]Department of Chemistry and Biochemistry, Ohio University, Athens, Ohio, United States.

PS41 WITHDRAWN
(Student) 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 Sangmoon Han[1], Kwanjae Lee[1], Ilgyu Choi[1], Cheul-Ro Lee[1], Jin Soo Kim[1], Seoung-Ki Lee[2] and Jeongwoo Hwang[3]; [1]Division of Advanced Materials Engineering & Research Center of Advanced Materials Development, Chonbuk National University, Jeonju, Korea (the Republic of); [2]Korea Institute of Science and Technology Jeonbuk Branch, Wanju 55324, Republic of Korea; [3]Korea 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 Fanta[1]; [1]Polymer 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.

PS48

(LATE NEWS, Student) Effects of Substrate Type and Temperature Growth on the Microstructure and Characteristics of Pulsed Laser Deposited TiO_2 Films and their Role as Buffer Layers for Conductive Films

Sahil Agarwal[1], Micah Haseman[2], Pooneh Saadatkia[1], Dave Winarski[1], Eryn Doyle[2], Le Zhang[2,3], Kevin Leedy[4] and Farida A. Selim[1,2]; [1]Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; [2]Department of Physics and Astronomy, Bowling Green State University, Bowling Green, Ohio, United States; [3]Jiangsu Key Laboratory of Advanced Laser Materials and Devices, School of Physics and Electronic Engineering, Jiangsu Normal University, Xuzhou, China; [4]Air Force Research Laboratory Sensors Directorate, Wright-Patterson Air Force Base, Dayton, Ohio, United States.

NOTES

O: Multifunctional Oxides and Dielectrics
Session Chairs: Patrick Lenahan and Farida Selim
Thursday Morning, June 29, 2017
DeBartolo Hall, Room 102

8:20 AM O1
(Student) External Strain-Induced Energy Shifts in $LaNiO_3/La_{2/3}Sr_{1/3}MnO_3$//$SrTiO_3$ Heterostructures Hantian Gao[1], Thaddeus J. Asel[1], Molly Ball[2], Jason Hoffman[3], Anand Battacharya[4], Wolfgang Windl[2] and Leonard Brillson[5, 1]; [1]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [2]The Department of Material Science and Engineering, The Ohio State University, Columbus, Ohio, United States; [3]Department of Physics, Harvard University, Boston, Massachusetts, United States; [4]Materials Science Division, Argonne National Laboratory, Argonne, Illinois, United States; [5]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

8:40 AM O2
(Student) Thickness Dependent Metal-Insulator Transition of a Correlated Oxide Heterostructure Integrated Directly on Si Kamyar Ahmadi-Majlan[1], Tongjie Chen[2], Ricky Hensley[1], Patrick Conlin[1], Zheng Hui Lim[1], Reza Moghadam[1], Dong Su[3], Divine P. Kumah[2], Hanghui Chen[4] and Joseph H. Ngai[1]; [1]Physics, University of Texas at Arlington, Arlington, Texas, United States; [2] Physics, North Carolina State University, Raleigh, North Carolina, United States; [3]Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, New York, United States; [4]Institute of Physics, New York University Shanghai, Pudong, China

9:00 AM O3
(Student) Optical Probe of Temperature Dependent Magnetization in $La_{2/3}Sr_{1/3}MnO_3$ and Related Perovskite Heterostructures Matthew Sheffield[1], Jason Hoffman[2], Hantian Gao[1], Michael Swartz[1], Leonard Brillson[1], Anand Bhattacharya[2] and Ezekiel Johnston-Halperin[1]; [1]Physics, The Ohio State University, Columbus, Ohio, United States; [2]Argonne National Laboratory, Argonne, Illinois, United States

9:20 AM O4
2 DEG at the Interface of $SrTiO_3$ and Al_2O_3 Heterostructures Farida Selim[1], David Winarski[1], Pooneh Saadatkia[1] and Kevin Leedy[2]; [1]Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; [2]Air Force Research Laboratory, Dayton, Ohio, United States

9:40 AM O5
(Student) Ferroelectric Metal-Oxide-Semiconductor Capacitors Using Ultrathin Single Crystalline $SrZr_xTi_{1-x}O_3$ Reza M. Moghadam[1, 2], Zhiyong Xiao[4], Kamyar Ahmadi-Majlan[2], Everett D. Grimley[3], Mark Bowden[5], Phuong-Vu Ong[6], James M. Lebeau[3], Scott A. Chambers[6], Xia Hong[4], Peter V. Sushko[6] and Joseph H. Ngai[2]; [1]Electrical Engineering, The University of Texas at Arlington, Arlington, Texas, United States; [2]Physics, University of Texas at Arlington, Arlington, Texas, United States; [3]Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; [4]Physics and Astronomy, University of Nebraska Lincoln, Lincoln, Nebraska, United States; [5]Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, Washington, United States; [6]Physical Sciences Division, Physical and Computational Sciences Directorate, Pacific Northwest National Laboratory, Richland, Washington, United States

10:00 AM BREAK

10:20 AM O6
(Student) Diamond-Like Carbon and Amorphous Hydrogenated Carbon Thin Films Studied with Electrically Detected Magnetic Resonance and Near-Zero Field Magnetoresistance Charles McLemore[1], Patrick M. Lenahan[1] and Sean W. King[2]; [1]Engineering Science and Mechanics, The Pennsylvania State University, University Park, Pennsylvania, United States; [2]Logic Technology Development, Intel Corporation, Hillsboro, Oregon, United States

10:40 AM O7
(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 O8
(Student) DLTS Analysis and Interface Engineering of Solution Route Fabricated Zirconia Based MIS Devices Using Plasma Treatment Arvind Kumar, Sandip Mondal and KSR Koteswara Rao; Physics, Indian Institute of Science, Bangalore, India

11:20 AM O9
(Student) Formation Mechanism of Atomically Flat Si(100) Surface by Annealing in Ar/H_2 Ambient Sohya Kudoh and Shun-ichiro Ohmi; Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Yokohama, Japan

11:40 AM O10
High-Dielectric Materials for Fabrication by Two-Photon Polymerization Eric M. Weis[1], Kevin M. Hubbard[1], Matthew J. Herman[1], Reuben J. Peterson[1], Ghanshyam Pilania[5], Dmitry Shchegolkov[2], Ting S. Luk[3], Anatoly V. Efimov[4] and Evgenya I. Simakov[2]; [1]MST-7 Engineered Materials, Los Alamos National Laboratory, Los Alamos, New Mexico, United States; [2]AOT-AE: Accelerators and Electrodynamics, Los Alamos National Laboratory, Los Alamos, New Mexico, United States; [3]CINT, Sandia National Laboratories, Albuquerque, New Mexico, United States; [4]MPA-CINT Center for Integrated Nanotechnologies, Los Alamos National Laboratory, Los Alamos, New Mexico, United States; [5]MST-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 Sharma[1], Md Rezaul Karim[1], Pavan K. Kasanaboina[2] and Shanthi Iyer[2, 1]; [1]Nanoengineering, North Carolina Agricultural and Technical State University, Greensboro, North Carolina, United States; [2]Electrical and Computer Engineering, North Carolina Agricultural and Technical State University, Greensboro, North Carolina, United States

8:40 AM P2
The Effect on Carrier Transport Properties of Nanowire Scaling Using Strained, Lattice-Mismatched Semiconductor Interfaces Erin I. Vaughan[1], Mahmoud Behzadirad[2, 3], Clay Mayberry[1], Danhong Huang[1, 2] and Ashwani Sharma[1, 4]; [1]Air Force Research Laboratory, Albuquerque, New Mexico, United States; [2]Center for High Technology Materials, Albuquerque, New Mexico, United States; [3]Optical Science and Engineering, University of New Mexico, Albuquerque, New Mexico, United States; [4]Electrical and Computer Engineering, University of New Mexico, Albuquerque, New Mexico, United States

9:00 AM P3
(Student) Infrared Absorption of 3-D Core-Shell ZnO – a-Si:H Nanowire Structures Bright C. Iheanacho, Czang-Ho Lee and William S. Wong; Electrical and Computer Engineering, University of Waterloo, Waterloo, Canada

9:20 AM P4
(Student) *In Situ* Fabrication and Defect Characterization of Pt-Based Ohmic and Schottky Contacts to ZnO Nanowires Jon W. Cox[1], Geoffrey M. Foster[2], Alexander Jarjour[2], Holger von Wenckstern[3], Marius Grundmann[3] and Leonard J. Brillson[1, 2]; [1]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; [2]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [3]Institut für Exp. Physik II, Universität Leipzig, Leipzig, Germany

9:40 AM P5
(Student) Flexible Shear Force Sensor Arrays Using Position- and Morphology-Controlled ZnO Nanotubes Grown on Graphene Films Jun Beom Park, Youngbin Tchoe, Hee-Hoon Kim and Gyu-Chul Yi; Department of Physics and Astronomy, Institute of Applied Physics, Research Institute of Advanced Materials (RIAM), Seoul National University, Seoul, Korea (the Republic of)

10:00 AM BREAK

10:20 AM P6 WITHDRAWN
Growth of AAO Template Assisted Ordered ZnO Nanowires and ZnO/rGO Nanocomposites for Gas Sensors Ghanshyam D. Varma[1], Nagesh Kumar[2], Bipin K. Gupta[3], Arvind K. Srivastava[4] and Jyoti Jyoti[1]; [1]Physics, I.I.T. Roorkee, Roorkee, India; [2]National Chiao Tung University, Hsinchu, Taiwan; [3]National Physical Laboratory, New Delhi, India; [4]Raja Ramanna Centre of Advanced Technology, Indore, India

10:40 AM P7
(Student) Studying Morphology-Dependent Carrier Dynamics of Semiconductor Nanocrystals for Efficient Photon Upconversion Zhuohui Li, Eric Y. Chen, Christopher C. Milleville and Matthew F. Doty; Materials Science and Engineering, University of Delaware, Newark, Delaware, United States

11:00 AM P8
Modification of Light Emitting Mechanisms versus Stoichiometry of Si-Rich Silicon Nitride Films Tetyana V. Torchynska[1], Jose Luis Casas Espinola[1], Larysa Khomenkova[2] and A Slaoui[3]; [1]Physics, Instituto Politecnico Nacional, Mexico City, Mexico; [2]Photoelectronics, V. Lashkaryov Institute of Semiconductor Physics at NASU, Ukraine, Kiev, Ukraine; [3]Semiconductors, ICube, Strasbourg, France

11:20 AM P9
(Student) Characterization of Self-Doping in Ge Microwires Grown by Electrochemical Liquid-Liquid-Solid (ec-LLS) Saurabh Acharya[1] and Stephen Maldonado[2, 3]; [1]Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Ann Arbor, Michigan, United States; [2]Department of Chemistry, University of Michigan, Ann Arbor, Ann Arbor, Michigan, United States; [3]Applied Physics Program, University of Michigan, Ann Arbor, Ann Arbor, Michigan, United States

11:40 AM P10
(Student) Thread-Like Carbon Nanotube-Based Fiber Field-Effect Transistors and Complementary Circuits for High Performance Wearable E-Textile Devices Jae Sang Heo, Insik Hwang, Jun-Ho Lee and Sung Kyu Park; Chung-Ang University, Seoul, Korea (the Republic of)

Q: Photovoltaics—Organic and Hybrid
Session Chairs: David Gundlach and Adrienne Stiff-Roberts
Thursday Morning, June 29, 2017
DeBartolo Hall, Room 138

8:20 AM Q1
(LATE NEWS) Molecular Electronic Devices from Selectively Fluorinated Self-Assembled Monolayers with Controllable Surface Dipoles Robert Bruce[1], Lin You[1, 2], Sujitra Pookpanratana[1], Olivia Pomerenk[1] and Christina A. Hacker[1]; [1]Engineering Physics Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [2]Theiss Research, La Jolla, California, United States

8:40 AM Q2
(Student) Structure-Property Studies of Fluorinated Azadipyrromethene Derivatives as N-Type Acceptors in Organic Photovoltaics Sandra Pejic, Forrest S. Etheridge, Chunlai Wang, Roshan Fernando and Genevieve Sauve; Chemistry, Case Western Reserve University, Cleveland, Ohio, United States

9:00 AM Q3
(Student) High Dielectric Constant Organic Semiconductors for Electronic Application Chunlai Wang[1], Zhongbo Zhang[2], Sandra Pejic[1] and Genevieve Sauve[1]; [1]Chemistry, Case Western Reserve University, Cleveland, Ohio, United States; [2]Macro, Case Western Reserve University, Cleveland, Ohio, United States

9:20 AM Q4
(Student) Deposition of Crystalline Organic-Inorganic Hybrid Materials by RIR-MAPLE Enrique T. Barraza[1], Wiley Dunlap-Shohl[2], Yuankai Liu[1], David B. Mitzi[2] and Adrienne D. Stiff-Roberts[1]; [1]Electrical and Computer Engineering, Duke University, Durham, North Carolina, United States; [2]Mechanical Engineering and Materials Science, Duke University, Durham, North Carolina, United States

9:40 AM Q5
Interfacial Interactions at Reduced Graphene Oxide/ Perovskite Interfaces for Photovoltaics Muge Acik and Richard A. Rosenberg; Argonne National Laboratory, Lemont, Illinois, United States

10:00 AM BREAK

10:20 AM Q6
(Student) Probing Coupled Slow and Fast Charge Dynamics in Cesium Lead Halide Perovskite Using Scanning Kelvin Probe Microscopy Ali Moeed Tirmzi[1], Ryan P. Dwyer[1], Tobias Hanrath[2] and John Marohn[1]; [1]Chemistry and Chemical Biology, Cornell University, Ithaca, New York, United States; [2]School of Chemical and Biomolecular Engineering, Cornell University, Ithaca, New York, United States

10:40 AM Q7
Enhanced Photocarrier Lifetime with Fullerenes in Polymer/MoS_2 Heterojunctions Chengmei Zhong[1, 2]; [1]Chemistry, Northwestern University, Evanston, Illinois, United States; [2]South China University of Technology, Guangzhou, China

11:00 AM Q8
A Model for the Frenkel-Charge-Transfer Exciton Intermixing in Periodic Organic Chains—Application to Crystalline Copper Phthalocyanine Adrian Popescu 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 PBDTT-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 WITHDRAWN
(Student) Investigation of Photoconductivity of Lead-Free Halide Perovskite Semiconductors Emilio A. Codecido[2], Eric T. McClure[1], Patrick M. Woodward[1] and Roberto C. Myers[3]; [1]Department of Chemistry, The Ohio State University, Columbus, Ohio, United States; [2]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [3]Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States

R: Energy Harvesting and Storage
Session Chairs: Jamie Phillips and Louis Piper
Thursday Morning, June 29, 2017
DeBartolo Hall, Room 140

8:20 AM R1 WITHDRAWN
Superior Lithium Intercalation Capacity of Incommensurate Graphene Layers Tereza Paronyan, Arjun K. Thapa, Andriy Sherihy, Jacek B. Jasinski and John S. Jangam; University of Louisville, Louisville, Kentucky, United States

8:40 AM R2
(Student) On-Chip Energy Storage with Microsupercapacitor Based on Vacuum Annealed Graphene Hao Yang and Wu Lu; The Ohio State University, Columbus, Ohio, United States

9:00 AM R3
X-Ray Spectroscopy Studies of Nano-Engineered Lone Pair Active Photo-Catalysts for More-Efficient Water Splitting Louis Piper[1], Sarbajit Banerjee[2] and David Watson[3]; [1]Binghamton University, Binghamton, New York, United States; [2]Texas A&M, College Station, Texas, United States; [3]University at Buffalo, Buffalo, New York, United States

9:20 AM R4
(Student) Demonstration of GaAs Nanowire Photoanode for the Oxygen Evolution Reaction Joy S. Zeng[1], Xiaoqing Xu[2, 3], Vijay Parameshwaran[4], Jon Baker[1], Stacey Bent[1], H. S. P. Wong[2] and Bruce Clemens[5]; [1]Chemical Engineering, Stanford University, Silver Spring, Maryland, United States; [2]Electrical Engineering, Stanford University, Stanford, California, United States; [3]Stanford Nanofabrication Facility, Stanford University, Stanford, California, United States; [4]U.S. Army Research Laboratory, Adelphi, Maryland, United States; [5]Materials 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 $Li_{1-x}Ni_{0.80}Co_{0.15}Al_{0.05}O_2$? Zachary Lebens-Higgins[1], Nicholas Faenza[2], Shawn Sallis[3], Nathalie Pereira[2], Glenn G. Amatucci[2] and Louis F. Piper[1, 3]; [1]Physics, Applied Physics, and Astronomy, Binghamton University, Binghamton, New York, United States; [2]Energy Storage Research Group, Materials Science and Engineering, Rutgers University, North Brunswick, New Jersey, United States; [3]Materials 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 Chen[1], Shahab Shervin[1], Seungkyu Oh[2, 3], Sara Pouladi[1], Weijie Wang[2] and Jae-Hyun Ryou[1, 2, 4]; [1]Materials Science and Engineering Program, University of Houston, Houston, Texas, United States; [2]Department of Mechanical Engineering, University of Houston, Houston, Texas, United States; [3]Department of Printed Electronics Engineering, Sunchon National University, Sunchon, Korea (the Republic of); [4]Texas 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. DeMeo, 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 Xuanqi Huang[1], Houqiang Fu[1], Hong Chen[1], Zhijian Lu[1], Jossue Montes[1], Michael Iza[2], Steven P. DenBaars[2], Shuji Nakamura[2], and Yuji Zhao[1]; [1]School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, Arizona, United States; [2]Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States.

S: BN, BP, TMD and Novel 2D Materials
Session Chairs: Susan Fullerton Shirey and Christopher Hinkle
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 Junmo Kang[1], Deep Jariwala[1], Christopher R. Ryder[1], Spencer A. Wells[1], Yongsuk Choi[2, 4], Euyheon Hwang[2, 3], Jeong Ho Cho[2, 4], Tobin J. Marks[1, 5] and Mark C. Hersam[1, 5, 6]; [1]Department of Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; [2]SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, Suwon, Korea (the Republic of); [3]Department of Physics, Sungkyunkwan University, Suwon, Korea (the Republic of); [4]School of Chemical Engineering, Sungkyunkwan University, Suwon, Korea (the Republic of); [5]Department of Chemistry, Northwestern University, Evanston, Illinois, United States; [6]Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, Illinois, United States

8:40 AM S2
(Student) Defects and Surface States in the 2D Semiconductor Germanane Thaddeus J. Asel[1], Aldriel Barnum[1, 2], Eric Yanchenko[1], Shishi Jiang[3], Kevin Krymowski[4], Wolfgang Windl[4], Joshua E. Goldberger[3] and Leonard J. Brillson[1, 2]; [1]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [2]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; [3]Department of Chemistry and Biochemistry, The Ohio State University, Columbus, Ohio, United States; [4]Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States

9:00 AM S3
Large Area Growth and Characterization of $Mo_xW_{1-x}Te_2$ for Phase Change Applications Rachel Koltun[1], Xiang Zhang[2], Claire Pettiette-Hall[1], Teresa Ha[1], Pulickel M. Ajayan[2] and Vincent Gambin[1]; [1]NG Next, Northrop Grumman Aerospace Systems, Redondo Beach, California, United States; [2]Materials Science and Nanoengineering, Rice University, Houston, Texas, United States

9:20 AM S4
(Student) Growth Optimization of Epitaxial Bismuth Thin Films towards the 2D Limit Emily S. Walker[1], Christopher J. Brennan[1], Anupam Roy[1], Jeff Damasco[2], Stephen D. March[1], Andrew F. Briggs[1], Erica Davis[1], Weinan Zhu[1], Deji Akinwande[1], Nadya Mason[2], Edward T. Yu[1] and Seth R. Bank[1]; [1]Electrical and Computer Engineering, University of Texas at Austin, Austin, Texas, United States; [2]Physics, University of Illinois at Urbana-Champagne, Urbana, Illinois, United States

9:40 AM S5
(LATE NEWS, Student) Ohmic Contact between Mechanically Exfoliated Tungsten Diselenide and Epitaxial Graphene Dacen Waters, Jun Li, Sergio C. de La Barrera and Randall M. Feenstra, Department of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States.

10:00 AM BREAK

10:20 AM S6 WITHDRAWN
(Student) Chemical Vapor Deposition Growth of Large Single-Crystal Monolayer and Bilayer Hexagonal Boron Nitride Yanxin Ji, Brian Calderon and Michael Spencer; Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States

10:40 AM S7
(Student) 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 Spataru, Jeffrey Figiel and Michael Smith; Sandia National Laboratories, Albuquerque, New Mexico, United States

11:20 AM S9
(Student) Substrate Impact on Charge Density Wave Phase Transitions in 1T Tantalum Disulfide (1T-TaS_2) Rui Zhao[1], Benjamin Grisafe[2], Donna Deng[1], Yi Wang[1], Long-Qing Chen[1], Zi-Kui Liu[1], Suman Datta[2] and Joshua Robinson[1]; [1]Materials Science and Engineering, The Pennsylvania State University, University Park, Pennsylvania, United States; [2]Department of Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States

11:40 AM S10
(Student) Molecular Beam Epitaxy of $MoSe_2$ Directly on Si Brelon J. May[1] and Roberto C. Myers[1, 2]; [1]Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States; [2]Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

T: Characterization of III-Nitrides
Session Chairs: Andrew Allerman and Christian Wetzel
Thursday Morning, June 29, 2017
McKenna Hall, Auditorium

8:20 AM T1
(Student) 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
(Student) Investigation of Polarization Field in AlGaN Multiple Quantum Wells Qiang Guo[1], Ronny Kirste[2], Seiji Mita[2], Pramod Reddy[2], Ramon Collazo[1] and Zlatko Sitar[1,2]; [1]Department of Materials Science and Engineering, North Caroline State University, Raleigh, North Carolina, United States; [2]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/AlN Quantum Wells Hugo Condori[1], Ashish Chanana[1], S.M. Moududuil Islam[2], Ajay Nahata[1], Debdeep Jena[2] and Berardi Sensale-Rodriguez[1]; [1]Department of Electrical and Computer Engineering, The University of Utah, Salt Lake City, Utah, United States; [2]Department 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 E_C-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. Gleason[1], Kevin Galiano[1], Jeff L. Brown[2], Albert M. Hilton[2], Eric R. Heller[3], Donald L. Dorsey[3] and Jonathan P. Pelz[1]; [1]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [2]KBRwyle Aerospace Group, Dayton, Ohio, United States; [3]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. Haughn[1], Gregory Rupper[1], Sergey Rudin[1], Thomas Wunderer[2], Zhihong Yang[2], Noble M. Johnson[2], Michael Wraback[1] and Gregory Garrett[1]; [1]U.S. Army Research Laboratory, Adelphi, Maryland, United States; [2]Palo Alto Research Center, Palo Alto, California, United States

11:00 AM U3
(Student) Impact of Al Composition of $Al_xGa_{1-x}N$ 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. Breckenridge[1], Biplab Sarkar[1], Shun Washiyama[1], Ronny Kirste[2], William Mecouch[2], James Tweedie[2], Ramon Collazo[1] and Zlatko Sitar[1]; [1]Material Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; [2]Adroit 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 Park[1], Jin-Young Na[2], Sun-Kyung Kim[2] and Tae-Yeon Seong[1]; [1]Korea University, Seoul, Korea (the Republic of); [2]Kyunghee 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 Alrobei[1,2], Manoj K. Ram[3]; [1]Department of Mechanical Engineering, University of South Florida, Tampa, Florida, United States; [2]Department of Mechanical Engineering, Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia; [3]Clean Energy Research Center, University of South Florida, Tampa, Florida, United States.

1:50 PM V2
(Student) Impact of Native Defects on Schottky Barriers at IrO_x/ZnO Interfaces Geoffrey M. Foster[1], Grace Mackessy[2], Alana Hyland[3, 4], Martin Allen[3, 4], Buguo Wang[5] and Leonard J. Brillson[1, 6]; [1]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [2]Columbus School for Girls, Columbus, Ohio, United States; [3]Department of Electrical and Computer Engineering, University of Canterbury, Chirstchurch, New Zealand; [4]The MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand; [5]Semiconductor Research Center, Wright State University, Dayton, Ohio, United States; [6]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

2:10 PM V3
(Student) Native Point Defect Formation, Thermal Runaway and Dielectric Breakdown in Flash Sintered ZnO Hantian Gao[1], Thaddeus Asel[1], Jon Cox[2], Yuanyao Zhang[3], Jian Luo[3] and Leonard J. Brillson[2, 1]; [1]Department of Physics, The Ohio State University, Columbus, Ohio, United States; [2]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; [3]Department of NanoEngineering Program of Materials Science and Engineering, University of California at San Diego, San Diego, California, United States

2:30 PM V4
(Student) *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, Ann Arbor, Michigan, United States

2:50 PM V5
(Student) Luminescence of $SrTiO_3$ During Phase Transition and the Role of Lattice Relaxation Pooneh Saadatkia[1, 2], David Winarski[1, 2] and Farida Selim[1, 2]; [1]Center for Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; [2]Physics 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 Tomko[1], Abdon Pena-Francesch[3], Melik Demirel[3] and Patrick Hopkins[2]; [1]Materials Science and Engineering, University of Virginia, Charlottesville, VA, United States; [2]Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, VA, United States; [3]Materials Science and Engineering, The Pennsylvania State University, University Park, PA, United States.

3:50 PM W2
Stress Induced Resistive Switching in Pt/HfO_2/Ti Devices Gilad Zeevi[2], Alexander Katsman[1] and Yuval Yaish[2]; [1]Materials Science and Engineering, Technion–Israel Institute of Technology, Haifa, Israel; [2]Department 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 King[1, 2], Nabil El-Hinnawy[1, 3], Pavel Borodulin[1], Andy Ezis[1], Carlos Padilla[1], Vivien Luu[1], Doyle Nichols[1], Elizabeth Dickey[2], Jon-Paul Maria[2] and Robert Young[1]; [1]Northrop Grumman, Linthicum, Maryland, United States; [2]North Carolina State University, Raleigh, North Carolina, United States; [3]Carnegie 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. McNicholas[1], Rodolfo Salas[1], Scott D. Sifferman[1], Daehwan Jung[2], Minjoo Larry Lee[3] and Seth R. Bank[1]; [1]Microelectronics Research Center and Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; [2]The Institute for Energy Efficiency, The University of California Santa Barbara, Santa Barbara, California, United States; [3]Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States

1:50 PM X2
(Student) Optical and Transport Properties of ErAs and TbAs Thin Films Yuejing Wang[1], Silvia Hertel[2], Bo E. Tew[1], Dongxia Wei[1], Stephanie Law[1] and Joshua Zide[1]; [1]Materials Science and Engineering, University of Delaware, Newark, Delaware, United States; [2]Fraunhofer Institute for Electronic Nanosystems (ENAS), Chemnitz, Germany

2:10 PM X3
Surface Reconstruction Driven Dewetting of Thin GaAs Layers from Single Layer ErAs/GaAs Nanocomposites Kurt Eyink, 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 W D. Zhang[1], A Mingardi[1], Elliott R. Brown[1], Buguo Wang [3], David Look[3], Ari Feldman[2], Todd Harvey[2] and Richard Mirin[2]; [1]THz Sensors Lab, Wright State University, Dayton, Ohio, United States; [2]Quantum Electronics and Photonics Division, National Institute of Standards and Technology, Boulder, Colorado, United States; [3]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[1], Delin Zhang[2], Jie Zhu[1], Jian-Ping Wang[2] and Xiaojia Wang[1]; [1]Mechanical Engineering, University of Minnesota Twin Cities, Minneapolis, Minnesota, United States; [2]Electrical Engineering, University of Minnesota Twin Cities, Minneapolis, Minnesota, United States

3:50 PM Y2
(Student) Dependence of Ferromagnetic Properties on Strain Profile of $Ga_{1-x}Mn_xAs_{1-y}P_y$ with Various P Concentrations Xiang Li, Xinyu Liu, Sining Dong, Jacek 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

Z: III-V and Chalcopyrite Photovoltaic Materials
Session Chairs: Steven Durbin and Jeffrey Dyck
Thursday Afternoon, June 29, 2017
DeBartolo Hall, Room 138

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

2:10 PM Z2
(Student) Plasma Assisted Molecular Beam Epitaxy Growth Space of $ZnSnN_2$ Robert Makin[1], Krystal York[1], Steven Durbin[1], Nancy Senabulya[2], James Mathis[2], Roy Clarke[2], Nathaniel Feldberg[3] and Patrice Miska[3]; [1]Electrical and Computer Engineering, Western Michigan University, Kalamazoo, Michigan, United States; [2]University of Michigan, Ann Arbor, Michigan, United States; [3]Institut Jean Lamour, University of Lorraine, Vandoeuvre, France

2:30 PM Z3
(Student) Optical Characterization of Epitaxial $ZnSnN_2$ Films Roy Clarke[1], James P. Mathis[1], Nancy Senabulya[1], Robert A. Makin[2], Steven Durbin[2], Nathaniel Feldberg[3] and Roger Reeves[4]; [1]Department of Applied Physics, University of Michigan, Ann Arbor, Michigan, United States; [2]Department of Electrical and Computer Engineering, Western Michigan University, Kalamazoo, Michigan, United States; [3]Department of Physics, University at Buffalo, Buffalo, New York, United States; [4]Department of Physics, University of Canterbury, Christchurch, New Zealand

2:50 PM Z4
(Student) ALD Grown, Band-Tunable Indium Oxysulfide $(In_2(O\text{-}S)_3)$—A Nontoxic Electron Transport Layer for the Chalcogenide Absorbers SnS and CZTS-Se Ashwin N. Jayaraman[1], Sang B. Kim[2], Richard Haight[3], Oki Gunawan[3] and Roy Gordon[2]; [1]John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts, United States; [2]Harvard University, Cambridge, Massachusetts, United States; [3]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 Kunal Mukherjee[1], Michelle Vaisman[2] and Minjoo Larry Lee[3, 2]; [1]Department of Materials, University of California Santa Barbara, Santa Barbara, California, United States; [2]Department of Electrical Engineering, Yale University, New Haven, Connecticut, United States; [3]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 Yukun Sun[1,2], Joseph Faucher[1], Shizhao Fan[2], Ryan Hool[3] and Minjoo Larry Lee[2]; [1]Department of Electrical Engineering, Yale University, New Haven, Connecticut, United States; [2]Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States; [3]Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, 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 Rathi, Seungkyu Oh, Devendra Khatiwada, Pavel Dutta, Shahab Shervin, Yao Yao, Jie Chen, Venkat Selvamanickam and Jae-Hyun Ryou; 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 Vadiee[1], Heather McFavilen[2], Alec Fischer[3], Joshua J. Williams[1], Christiana Honsberg[1] and Stephen Goodnick[1]; [1]Electrical and Computer Engineering, Arizona State University, Atlanta, New Mexico, United States; [2]Photonitride Devices Inc., Tempe, Arizona, United States; [3]Department of Physics, Arizona State University, Tempe, Arizona, United States

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 Tan[1], Fengyuan Shi[2], Shiqiang Hao[2], Li-Dong Zhao[3], Hang Chi[4], Xiaomi Zhang[2], Ctirad Uher[4], Chris Wolverton[2], Vinayak Dravid[2] and Mercouri Kanatzidis[1, 5]; [1]Chemistry, Northwestern University, Evanston, Illinois, United States; [2]Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; [3]Materials Science and Engineering, Beihang University, Beijing, China; [4]Physics, University of Michigan, Ann Arbor, Michigan, United States; [5]Materials Science Division, Argonne National Laboratory, Argonne, Illinois, United States

1:50 PM AA2
(Student) Thermoelectric Properties of the $NaPb_mSbTe_{m+2}$ (m=0.25-20) System Tyler Slade[1], Jann Grovogui[2], Shiqiang Hao[2], Chris Wolverton[2], Vinayak Dravid[2] and Mercouri G. Kanatzidis[1]; [1]Chemistry, Northwestern University, Evanston, Illinois, United States; [2]Materials Science and Engineering, Northwestern University, Evanston, 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. DeCoster[1], Xin Chen[2], Kai Zhang[2], Helmut Baumgart[3] and Patrick E. Hopkins[1]; [1]Mechanical and Aerospace Engineering, University of Virginia, Crozet, Virginia, United States; [2]Applied Research Center, Old Dominion University, Newport News, Virginia, United States; [3]Electrical and Computer Engineering, Old Dominion University, Newport News, Virginia, United States

2:30 PM AA4
(Student) Grain Boundary Scattering Effects of Mobility in P-Type Polycrystalline SnSe Si Wang[1, 2], Si Hui[1], Kunling Peng[3], Xiaoyuan Zhou[3], Xinfeng Tang[2] and Ctirad Uher[1]; [1]Department of Physics, University of Michigan, Ann Arbor, Michigan, United States; [2]State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China; [3]College of Physics, Chongqing University, Chongqing, China

2:50 PM AA5
Atomic Layer Deposited (ALD) Al_2O_3 Thin Films as an Efficient Environmental Barrier Coating for PbTe Based Thermoelectric Materials Sumanta Sarkar[1], Duyen Cao[1], Muhammad S. Islam[1], Christos Malliakas[1], Xiaomi Zhang[2], Vinayak P. Dravid[2] and Mercouri G. Kanatzidis[1]; [1]Department of Chemistry, Northwestern University, Evanston, Illinois, United States; [2]Department of Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States

3:10 PM BREAK

3:30 PM AA6
High Thermoelectric Performance in *N*-Type PbTe-GeTe Alloys Zhongzhen Luo[1, 2]; [1]Department of Chemistry, Northwestern University, Singapore, Singapore; [2]Nanyang Technological University, Singapore, Singapore

3:50 PM AA7
High Thermoelectric Performance of PbSe-*M*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 $CoSb_3$ Skutterudites—Influence of Electron Population, Local Thermal Expansion and Bonding Interactions Riley Hanus[2], Xingyu Guo[1], Yinglu Tang[3], Guodong Li[1], G. Jeff Snyder[1] and Wolfgang Zeier[4]; [1]Materials Science, Northwestern University, Chicago, Illinois, United States; [2]Materials Science, Northwestern University, Evanston, Illinois, United States; [3]EMPA Swiss Federal Laboratories, Dubendorf, Switzerland; [4]Physikalisch-Chemisches Institut, Giessen, Germany

4:30 PM AA9
Thermoelectric and Magnetic Properties of Nanostructured n-Type $Ti_{0.25}Zr_{0.25}Hf_{0.5}(Ni,Fe_x)Sn_{0.975}Sb_{0.025}$ Half-Heusler Alloys Ruiming Lu and Pierre Ferdinand Poudeu-Poudeu; Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

BB: Nanoscale Characterization
Session Chairs: Paul Blanchard and Randy Feenstra
Thursday Afternoon, June 29, 2017
DeBartolo Hall, Room 141

1:30 PM BB1
III-V Semiconductor Nanowires—An Exciting Toolbox for Heterostructure Design Studied by Scanning Tunneling Microscopy Johan Knutsson[1], Sarah McKibbin[1], Martin Hjort[1], Olof Persson[1], Sebastian Lehmann[1], Nate S. Wilson[2], Christopher J. Palmstrom[2, 3], Anders Mikkelsen[1] and Rainer Timm[1]; [1]Department of Physics and NanoLund, Lund University, Lund, Sweden; [2]Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States; [3]Department 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. Hagmann[1], Xiqiao Wang[1], Pradeep Namboodiri[1], Jonathan Wyrick[1], Roy Murray[2], Michael D. Stewart[2], Richard M. Silver[1] and Curt A. Richter[1]; [1]Engineering Physics Division, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [2]Quantum 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 MoS_2 Using Piezoresponse Force Microscopy Christopher J. Brennan[1], Rudresh Ghosh[1,2], Kalhan Koul[1], Sanjay K. Banerjee[1], Nanshu Lu[3] and Edward T. Yu[1]; [1]Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; [2]NovaCentrix, Austin, Texas, United States; [3]Aerospace 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 MoS_2 Zhongjian Zhang[1], Christopher J. Brennan[1], Rudresh Ghosh[1, 2], Sanjay K. Banerjee[1] and Edward T. Yu[1]; [1]Electrical and Computer Engineering, University of Texas at Austin, Austin, Texas, United States; [2]NovaCentrix, Austin, Texas, United States

4:10 PM BB8
(Student) Heterojunction Electronic Properties and Compositional Differences of $CdCl_2$ Post-Treated CdTe Solar Cells Dean Collett[1], Jeffery A. Aguiar[2, 3], Brian v. Devener[4], Yohan Yoon[5, 6], Paul Haney[6], Nikolai Zhitenev[6], Michael Scarpulla[1, 3], Prakash Koirala[7], Robert W. Collins[7] and Heayoung P. Yoon[1]; [1]Electrical and Computer Engineering, University of Utah, Salt Lake City, Utah, United States; [2]Fuel Design and Development Department, Idaho National Laboratory, Idaho Falls, Idaho, United States; [3]Department of Materials Science and Engineering, University of Utah, Salt Lake City, Utah, United States; [4]Utah Nanofab, University of Utah, Salt Lake City, Utah, United States; [5]Maryland NanoCenter, University of Maryland, College Park, Maryland, United States; [6]Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, Maryland, United States; [7]Department of Physics and Astronomy, Center for Photovoltaics 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, Alexana 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 Tanaka[1], Shadi A. Dayeh[1, 2] and Renjie Chen[2]; [1]Materials Science and Engineering, University of California, San Diego, La Jolla, California, United States; [2]Electrical 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 Shervin[1], Kamrul Alam[1], Kaveh Shervin[1], Jie Chen[1], Seung-Hwan Kim[2], Tae Hoon Chung[3], Sara Pouladi[1], Ruiteng Li[1], Rebecca Forrest[1], Jiming Bao[1] and Jae-Hyun Ryou[1]; [1]University of Houston, Houston, Texas, United States; [2]Hongik University, Seoul, Korea (the Republic of); [3]Korea Photonics Technology Institute, Gwangju, Korea (the Republic of)

2:10 PM CC3
Nitrogen-Rich Growth of Smooth GaN Layers by Plasma-Assisted MBE Henryk Turski[1, 2], Anna Feduniewicz-Zmuda[2], Debdeep Jena[1, 3] and Czeslaw Skierbiszewski[2, 4]; [1]Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; [2]Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; [3]Department of Material Science and Engineering, Cornell University, Ithaca, New York, United States; [4]Top GaN Ltd., Warsaw, Poland

2:30 PM CC4
(Student) Strain Balancing in InGaN-Based Multiple Quantum Wells Using AlGaN Interlayers Syed Ahmed Al Muyeed[1], Wei Sun[1], Xiongliang Wei[1], Renbo Song[1], Nelson Tansu[1], Jonathan J. Wierer[1] and Daniel Koleske[2]; [1]Center for Photonics and Nanoelectronics, Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, Pennsylvania, United States; [2]Sandia 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. Cetnar[1], David C. Look[1, 2], Amber N. Reed[3], Bruce Claflin[1], Vladimir Vasilyev[1] and Shivashankar Vangala[1, 4]; [1]Sensors Directorate, Air Force Research Laboratory, WPAFB, Ohio, United States; [2]Wright State University, Dayton, Ohio, United States; [3]Materials and Manufacturing Directorate, Air Force Research Laboratory, WPAFB, Ohio, United States; [4]Azimuth Corporation, 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 Detchprohm[1], Karan Mehta[1], Yuh-Shiuan Liu[1], Young Jae Park[1], Shuo Wang[2], Oliver Moreno[1], Shyh-Chiang Shen[1], P. Douglas Yoder[1], Fernando Ponce[2] and Russell D. Dupuis[1]; [1]Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; [2]Physics, Arizona State University, Tempe, Arizona, United States

3:50 PM CC7
Structural Properties and Growth Modes of MOCVD-Grown AlN with TMAl Pretreatment of Sapphire Substrate Haiding Sun[1], Feng Wu[1], Talal M. Altahtamouni[2], Nasir Alfaraj[1], Theeradetch Detchprohm[3], Russell Dupuis[3] and Xiaohang Li[1]; [1]King Abdullah University of Science & Technology, Thuwal, Saudi Arabia; [2]Qatar University, Doha, Qatar; [3]Georgia Institute of Technology, Atlanta, Georgia, United States

4:10 PM CC8 **DISCUSSION TIME**

4:30 PM CC9
Growth of $B_xAl_{1-x}N$ 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

4:50 PM CC10
Investigation of Microstructure, Strain and Defect of BAlN/Al(Ga)N Heterostructures Haiding Sun[1], Feng Wu[1], Talal M. Altahtamouni[2], Dalaver H. Anjum[1], Theeradetch Detchprohm[3], Russell Dupuis[3] and Xiaohang Li[3]; [1]King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia; [2]Qatar University, Doha, Qatar; [3]Georgia Institute of Technology, Atlanta, Georgia, United States

DD: Point Defects, Doping and Extended Defects
Session Chairs: Mark Goorsky and Christian Wetzel
Friday Morning, June 30, 2017
DeBartolo Hall, Room 102

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 Dependent Charge Transport and Persistent Conductivity in Tl_6SeI_4 Single Crystals Sanjib Das[1], John A. Peters[1], Wenwen Lin[2], Svetlana S. Kostina[1], Pice Chen[1], Joon-Il Kim[1], Mercouri Kanatzidis[2] and Bruce W. Wessels[1]; [1]Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; [2]Chemistry, Northwestern University, Evanston, Illinois, United States

9:00 AM DD3
(Student) Coloration and Defect Chemistry of Fe-Doped $SrTiO_3$ Jonathon 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 $SrTiO_3$ 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. Scott[1], Khalid Hattar[2], John Gaskins[1] and Patrick Hopkins[1]; [1]Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, Virginia, United States; [2]Sandia National Laboratories, Albuquerque, New Mexico, United States

10:00 AM BREAK

10:20 AM DD6
Point Defect Reduction in MOCVD GaN by Chemical Potential Control and Defect Quasi Fermi Level Control Pramod Reddy[1, 2], Shun Washiyama[1], Felix Kaess[1], Ronny Kirste[2], Seiji Mita[2], Michael Gerhold[3], James Tweedie[2], Ramon Collazo[1] and Zlatko Sitar[1]; [1]Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; [2]Adroit Materials, Inc., Cary, North Carolina, United States; [3]Army 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 Washiyama[1], Pramod Reddy[1, 2], Qiang Guo[1], Andrew Klump[1], Biplab Sarkar[1], Ronny Kirste[2], Seiji Mita[2], Ramon Collazo[1] and Zlatko Sitar[1]; [1]Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; [2]Adroit Materials, Cary, North Carolina, United States

11:00 AM DD8
(Student) Suppression of Mg Migration in Non-Interrupted MOCVD Grown GaN Andrew J. Klump[1], Felix Kaess[1, 2], Pramod Reddy[1], Ramon Collazo[1] and Zlatko Sitar[1]; [1]Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; [2]Technische Universität-Berlin, Berlin, Germany

11:20 AM DD9
(Student) First-Principles Study of Compensation in Si-Doped AlN 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 Rounds[1], Luis Hernandez-Balderrama[1], Ronny Kirste[1], Alexander Franke[1], Tomasz Sochacki[2], Michal Bockowski[2], Ramon Collazo[1] and Zlatko Sitar[1]; [1]Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; [2]Polish 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 Rupper[1], Michael Shur[2] and Sergey Rudin[1]; [1]U.S. Army Research Laboratory, Adelphi, Maryland, United States; [2]Rensselaer 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 Athith Krishna[1], Ioannis Chatzakis[2], Nick Sharac[2]; Brian R. Calderon[1], Joshua Caldwell[2] and Michael G. Spencer[1]; [1]Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; [2]U.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 Xiangfan 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 Bi_2Se_3 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. Nordin[1], Owen Dominguez [2], Sukrith Dev[1], Zuoming Dong[1], Anthony J. Hoffman[2] and Daniel Wasserman[1]; [1]ECE, The University of Texas at Austin, Austin, Texas, United States; [2]Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States

11:00 AM EE8
(Student) Epsison-near-Zero Mode Field Enhancement with Nanoantennas Owen Dominguez[1], Leland Nordin[2], Kaijun Feng[1], Junchi Lu[1], Daniel Wasserman[2] and Anthony Hoffman[1]; [1]Electrical Engineering, University of Notre Dame, South Bend, Indiana, United States; [2]Electrical 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 Wei[1], Christian Harris[2] and Stephanie Law[1]; [1]Material Science and Engineering, University of Delaware, Newark, Delaware, United States; [2]Lincoln University, Lincoln University, Pennsylvania, United States

11:40 AM EE10
Sub-Diffraction Confinement in all Semiconductor Hyperbolic Metamaterial Resonators Kaijun Feng[1], Galen Harden[1], Deborah L. Sivco[2] and Anthony J. Hoffman[1]; [1]Electrical Engineering, University of Notre Dame, South Bend, Indiana, United States; [2]Electrical 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 Hazari[1], Lifan Yan[2], Joanna M. Millunchick[2] and Pallab Bhattacharya[1]; [1]Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, United States; [2]Material Science and Engineering, University of Michigan, Ann Arbor, Ann Arbor, Michigan, United States

8:40 AM FF2
(Student) Morphology and Strain Relaxation in High Lattice Mismatched InGaN Nanowire Heterostructures Lifan Yan[1], Arnab Hazari[2], Pallab Bhattacharya[2] and Joanna Millunchick[1]; [1]Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States; [2]EECS, University of Michigan, Ann Arbor, Michigan, United States

9:00 AM FF3
(Student) Photoinduced Thermodynamic Behavior in InGaN/GaN Double-Heterostructure Nanowires Nasir Alfaraj[1], Somak Mitra[2], Feng Wu[1], Idris A. Ajia[2], Bilal Janjua[1], Aditya Prabaswara[1], Renad A. Aljefri[1], Haiding Sun[1], Tien Khee Ng[1], Boon S. Ooi[1], Iman S. Roqan[2] and Xiaohang Li[1]; [1]Computer, Electrical, and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; [2]Physical 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. May[1], Matthew R. Belz[2], ATM Golam Sarwar[4], Camelia M. Selcu[3] and Roberto C. Myers[1, 2]; [1]Materials Science and Engineering, The Ohio State University, Columbus, Ohio, United States; [2]Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States; [3]Physics, The Ohio State University, Columbus, Ohio, United States; [4]Intel, Portland, Oregon, United States

9:40 AM FF5
Optical and Electrical Characterization of GaN/InGaN Core-Shell Nanowire Light-Emitting Diodes Mohsen Nami[1], Ashwin Rishinaramangalam[2], Isaac Stricklin[1], Steve Brueck[1], Igal Brener[3] and Daniel Feezell[2]; [1]Physics, The University of New Mexico, Center for High Technology Materials, Albuquerque, New Mexico, United States; [2]Electrical and Computer Engineering, The University of New Mexico, Albuquerque, New Mexico, United States; [3]Center 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. Hill[1], Max Sonner[2], Julian Treu[2], Jonathan Becker[2], Jonathan J. Finley[2], Gregor Koblmueller[2] and Lincoln J. Lauhon[1]; [1]Materials Science and Engineering, Northwestern University, Evanston, Illinois, United States; [2]Walter 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 MoS_2 Monolayers—Toward Selective Area van der Waals Epitaxy Mohadeseh Asadolahi-Baboli[1, 2], Michael A. Slocum[2], Alessandro Giussani[2], Thomas S. Wilhelm[1,2], Hyun Kum[2], Seth M. Hubbard[1, 2] and Parsian Katal Mohseni[1,2]; [1]Microsystems Engineering, Rochester Institute of Technology, Rochester, New York, United States; [2]NanoPower 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 Mikulik[1], Maria Ricci[2], Pablo Romero-Gomez[1], Gozge Tutuncuoglu[1], Federico Matteini[1], Jelena Vukajlovic[1], Esther Alarcon-Llado[3] and Anna Fontcuberta i Morral[1]; [1]LMSC, EPFL, Lausanne, Switzerland; [2]Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom; [3]FOM 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 Chen[1], Katherine L. Jungjohann[2], William M. Mook[2], John Nogan[2] and Shadi A. Dayeh[1, 3, 4]; [1]Department of Electrical and Computer Engineering, University of California, San Diego, San Diego, California, United States; [2]Center for Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, New Mexico, United States; [3]Department of NanoEngineering, University of California, San Diego, San Diego, California, United States; [4]Materials 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 GaSbN Nanowire Heterostructures for Visible Light Emitting Devices Mohammad F. Chowdhury[1], Qing Shi[3], Sharif Sadaf[1], Hong Guo[3] and Zetian Mi[1, 2]; [1]Electrical and Computer Engineering, McGill University, Montreal, Canada; [2]Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, United States; [3]Department of Physics, McGill University, Montreal, Canada

GG: Transparent Conductors
Session Chairs: Rebecca Peterson and Angel Yanguas-Gil
Friday Morning, June 30, 2017
DeBartolo Hall, Room 138

8:20 AM GG1
(Student) Size Effects on Thermal Conductivity in Transparent Conducting Oxides David Olson, Chester Swejkowski, 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 Winarski[1, 2], Emily Heckman[3], Eric Kreit[3] and Farida Selim[1, 2]; [1]Photochemical Sciences, Bowling Green State University, Bowling Green, Ohio, United States; [2]Physics and Astronomy, Bowling Green State University, Bowling Green, Ohio, United States; [3]Sensors 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 Youn, Miso Lee and Seungwu Han; Materials Science and Engineering, Seoul National University, Seoul, Korea (the Republic of)

9:20 AM GG4
(Student) Highly Conductive Metal Oxide Thin Films Using Low-Temperature Activated Catalytic Synthesis Seok Gyu Ban[1], Su-Min Jung[1], Jun-Ho Lee[1], Jeong-Wan Jo[1], Jaehyun Kim[1], Myung-Gil Kim[2] and Sung Kyu Park[1]; [1]Electronic Electrical Engineering, Chung-Ang University, Seoul, Korea (the Republic of); [2]Chemistry, Chung-Ang University, Seoul, Korea (the Republic of)

9:40 AM GG5
(LATE NEWS, Student) Lipid Membrane and Zinc Oxide Thin-Film Transistor Based Biosensors Akanksha Gupta[1], Esther Gomez[1] and Thomas Jackson[2]; [1]Chemical Engineering, Pennsylvania State University, State College, Pennsylvania, United States; [2]Electrical Engineering, Pennsylvania State University, University Park, Pennsylvania, United States.

10:00 AM BREAK

10:20 AM GG6
(Student) Optical and Electrical Characterization of CuNW/Graphene Hybrid Structure for Transparent Conductor Doosan Back[1], Yuki Mori[2], Kazuhiko Matsumoto[2] and David Janes[1]; [1]School of Electrical and Computer Engineering and Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, United States; [2]The Institute of Scientific and Industrial Research, Osaka University, Ibaraki, Japan

10:40 AM GG7
(Student) Transparent Electrodes Based on Silver Nanowire Networks—Physical Properties, Electrical Distribution and Integration into Devices Thomas Sannicolo[1, 2], David Munoz-Rojas[2], Stephane Moreau[3], Yves Brechet[4], Ngoc Duy Nguyen[5], Caroline Celle[1], Jean-Pierre Simonato[1] and Daniel Bellet[2]; [1]CEA Liten, Université Grenoble Alpes, Grenoble, France; [2]CNRS LMGP, Université Grenoble Alpes, Grenoble, France; [3]CEA Leti, Université Grenoble Alpes, Grenoble, France; [4]CNRS SIMAP, Université Grenoble Alpes, Grenoble, France; [5]Département de Physique, Université Liège, Liège, Belgium

11:00 AM GG8
(Student) Thermal Transient Response of Microscopic Hotspots in Silver Nanowire Transparent Conducting Electrodes Sajia Sadeque[1, 3], Aaditya Candadai[2, 3], Yu Gong[1, 3], Amir K. Ziabari[1, 3], Kerry Maize[1, 3], Ali Shakouri[1, 3], Tim Fisher[2,3] and David B. Janes[1,3]; [1]School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States; [2]School of Mechanical Engineering, Purdue University, West Lafayette, Indiana, United States; [3]Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, 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 HH1
Thermal Conductivity and Optical Polarizability of Amorphous Titania Thin Films Prepared by Atomic Layer Deposition (ALD) Mark D. Losego[1], Brandon Piercy[1], Kelsey Meyer[2] and Patrick Hopkins[2]; [1]School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; [2]Department of Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, Virginia, United States

8:40 AM HH2
(Student) Impact of Oxygen Vacancies on Thermal Transport in $La_{0.5}Sr_{0.5}CoO_{3-\delta}$ Epitaxial Thin Films Xuewang Wu[1], Jeff Walter[2], Tianli Feng[3], Jie Zhu[1], Xiulin Ruan[3], Chris Leighton[2] and Xiaojia Wang[1]; [1]Mechanical Engineering, University of Minnesota at Twin Cities, Minneapolis, Minnesota, United States; [2]Department of Chemical Engineering and Material Science, University of Minnesota, Twin Cities, Minneapolis, Minnesota, United States; [3]Department 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[1,2], Xianfan Xu[1, 2] and Peide Ye[2, 3]; [1]Mechanical Engineering, Purdue University, West Lafayette, Indiana, United States; [2]Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, United States; [3]Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States

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

10:00 AM BREAK

10:20 AM HH6
(Student) Optimizing the Thermoelectric Properties of a Computationally Predicted Material—The Case of AlSb Trevor P. Bailey[1], Alan Olvera[2], Alexander A. Page[1], Pierre Ferdinand Poudeu-Poudeu[2] and Ctirad Uher[1]; [1]Department of Physics, University of Michigan, Ann Arbor, Michigan, United States; [2]Department of Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

10:40 AM HH7
(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[1], Ke Chen[1], Emily S. Walker[2], Seth R. Bank[2] and Yaguo Wang[1, 3]; [1]Department of Mechanical Engineering, The University of Texas at Austin, Austin, Texas, United States; [2]Microelectronic Research Center and Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, Texas, United States; [3]Texas 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, Sriram Krishnamoorthy and Siddharth Rajan; The Ohio State University, Columbus, Ohio, 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[1], Goutam Koley[2] and MVS Chandrashekhar[1]; [1]University of South Carolina, Columbia, South Carolina, United States; [2]Electrical 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[1], Yu-Chuan Lin[1], Tanushree Choudhury[1], Xiaotian Zhang[1], Sarah Eichfeld[1], Boaming Wang[2], Jun Li[3], Aman Haque[2], Randall M. Feenstra[3], Joan M. Redwing[1] and Joshua A. Robinson[1]; [1]Material Science and Engineering, Center for 2-Dimensional and Layered Materials, The Pennsylvania State University, State College, Pennsylvania, United States; [2]Mechanical Engineering, The Pennsylvania State University, State College, Pennsylvania, United States; [3]Department of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

9:20 AM II4
(Student) Growth and Characterization of Molecular Beam Epitaxy $MoSe_xTe_{2-x}$ Aditya Sundar[3], Suresh Vishwanath[1, 2], Long Yuan[4], Xinyu Liu[5], Edward Lochocki[6], Huai-Hsun Lien[3], Malgorzata Dobrowolska-Furdyna[5], Jacek K. Furdyna[5], Libai Huang[4], Kyle M. Shen[6, 7], Debdeep Jena[1, 3, 2] and Huili Grace Xing[1, 3, 2]; [1]School of Electrical Engineering, Cornell University, Ithaca, New York, United States; [2]Department of Electrical Engineering, University of Notre Dame, Ithaca, New York, United States; [3]Department of Materials Science and Engineering, Cornell University, Ithaca, New York, United States; [4]Department of Chemistry, Purdue University, West Lafayette, Indiana, United States; [5]Department of Physics, University of Notre Dame, South Bend, Indiana, United States; [6]Department of Physics, Cornell University, Ithaca, New York, United States; [7]Kavli Institute at Cornell for Nanoscale Science, Cornell University, Ithaca, New York, United States

9:40 AM II5
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 II6
(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 II7
Investigations on MOVPE Growth Parameters of 2D MoS_2 Matthias Marx[1], Annika Grundmann[1], You-Ron Lin[1], Michael Heuken[2], Holger Kalisch[1] and Andrei Vescan[1]; [1]GaN Device Technology, RWTH-Aachen University, Aachen, Germany; [2]AIXTRON SE, Herzogenrath, Germany

11:00 AM II8
Spectroscopic and Electrical Characterization of Solution-Synthesized Metal Chalcogenide Nanoelectronic Materials Adam Biacchi[1], Son T. Le[1], Joseph A. Hagmann[1], Brian G. Alberding[2], Sugata Chowdhury[1], Edwin J. Heilweil[1], Curt A. Richter[1] and Angela R. Hight Walker[1]; [1]Engineering Physics Division, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, United States; [2]Sensor Science Division, National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, United States

11:20 AM II9
(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 II10
(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.

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

8:20 AM JJ1
(Student) Growth and Characterization of GaN *p-i-p-i-n* Ultraviolet Avalanche Photodiodes Mi-Hee Ji[1], Jeomoh Kim[2], Theeradetch Detchprohm[1], Yuanzheng Zhu[1], Shyh-Chiang Shen[1] and Russell Dupuis[1]; [1]Georgia Institute of Technology, Atlanta, Georgia, United States; [2]Materials and Devices Advanced Research Institute, LG Electronics, Seoul, Korea (the Republic of)

8:40 AM JJ2
(Student) Investigation of Surface Treatments for Improved Quantum Efficiency in III-N Photocathodes Emma Rocco[1], Jonathan Marini[1], Isra Mahaboob[1], Kasey Hogan[1], J. D. McNamara[2], M. A. Reshchikov[2], L. D. Bell[3] and F. Shadi Shahedipour-Sandvik[1]; [1]Colleges of Nanoscale Science and Engineering, State University of New York Polytechnic Institute, Albany, New York, United States; [2]Physics, Virginia Commonwealth University, Richmond, Virginia, United States; [3]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[2], Isra Mahaboob[2], Kasey Hogan[2], Emma Rocco[2], L. D. Bell[1] and F. Shadi Shahedipour-Sandvik[2]; [1]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, United States; [2]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 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 $In_{1-x}Ga_xN$ Nanowire Light-Emitting Diodes Mohsen Asad[1], Renjie Wang[2], Yong-Ho Ra[2], Zetian Mi[3] and William Wong[1]; [1]Electrical and Computer Engineering, University of Waterloo, Waterloo, Canada; [2]Electrical and Computer Engineering, McGill University, Montreal, Canada; [3]Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan, United States

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This index indicates the paper number for authors and the session numbers for the session chairs. Bold lettered paper numbers indicate those being presented by the author; non-bolded indicates associate author status. The Plenary speaker's paper numbers is preceeded by an asterisk. The following typical examples show the code system whereby individuals are noted.

A	Session Chair for Session A
A1	Author of Paper Number (Session A, First Paper)
PS1	Poster Author (Poster Session, First Paper)