

ELECTRONIC MATERIALS CONFERENCE

and EXHIBITION

June 24-26, 2009

The Pennsylvania State University
University Park, Pennsylvania

Preliminary Technical Program

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To view abstracts, visit the EMC Conference Web site:
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www.tms.org/EMC.html

WEDNESDAY		THURSDAY		FRIDAY	ROOM
AM	PM	AM	PM	AM	
EMC Plenary Lecture/Student Awards	REGISTRATION in Penn State Conference Center, 1st Level 3:00-5:00 PM, Tuesday, June 23 7:30 AM-5:00 PM, Wednesday, June 24 7:30 AM-4:00 PM, Thursday, June 25 7:30-10:00 AM, Friday, June 26		EXHIBITS in Presidents Hall I & II 9:30 AM-4:00 PM; 6:00-8:00 PM, Wednesday, June 24 10:00 AM-4:00 PM, Thursday, June 25		Presidents Hall III & IV
Session A: Epitaxy	Session G: Narrow Bandgap Materials Session H: Epitaxy for Devices	Session S: Epitaxy on Si Session T: Metamorphic and Templated Growth			105
Session B: Low Dimensional Structures: Wires and Dots; Dots in Wires	Session I: Quantum Dot Optical Characterizations and Photonic Devices Session J: Quantum Dot Materials Characterization and Epitaxy	Session U: Flexible and Printed Thin-film Electronics	Session CC: III-V NW - Characterization Session DD: III-V NW - Growth and Processing	Session NN: Contacts to Semiconductor Epilayers and Nanowires	106
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		Session W: ZnO Growth	Session FF: ZnO Characterization		Deans Hall I
		Session X: Molecular Electronics: Devices, Materials, and Molecular Electronics and Chem/Bio Sensors	Session GG: Organic Thin Film and Crystalline Transistors: Devices, Materials and Processing II	Session QQ: Solar Cells - Organic, Hybrid and Inorganic	Deans Hall II

SESSION LISTING

Tuesday, June 23, 2009

Registration 3:00-5:00 PM Penn Stater Conference Center, 1st Level

Wednesday, June 24, 2009

Registration 7:30 AM-5:00 PM Penn Stater Conference Center, 1st Level

Exhibits 9:30 AM-4:00 PM; 6:00-8:00 PM Presidents Hall I & II

Welcoming Reception 6:00-8:00 PM Presidents Hall I & II

EMC Plenary Lecture/Student Awards/Presidents	8:20 AM	Presidents Hall III & IV
Session A: Epitaxy	10:00 AM	105
Session B: Low Dimensional Structures: Wires and Dots; Dots in Wires	10:00 AM	106
Session C: Semiconductor Processing	10:00 AM	108
Session D: Materials Integration: Wafer Bonding and Engineered Substrates	10:00 AM	206
Session E: Organic Thin Film and Crystalline Transistors: Devices, Materials and Processing I	10:00 AM	207
Session F: III-Nitride: Growth of Electronic Devices	10:00 AM	208
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Session H: Epitaxy for Devices	3:30 PM	105
Session I: Quantum Dot Optical Characterizations and Photonic Devices	1:30 PM	106
Session J: Quantum Dot Materials Characterization and Epitaxy	3:30 PM	106
Session K: ZnO Thin Film Transistors	1:30 PM	108
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Session M: Carbon Based Nanowires and Tubes	1:30 PM	206
Session N: Group IV Nanowires	3:30 PM	206
Session O: III-Nitride: Optical Devices on Non-Polar Substrates	1:30 PM	207
Session P: III-Nitride: Growth and Characterization of Non-Polar Materials	3:30 PM	207
Session Q: III-Nitride: Processing of Electronic Devices	1:30 PM	208
Session R: III-Nitride: AlGaIn Materials and Devices	3:30 PM	208

Thursday, June 25, 2009

Registration 7:30 AM-4:00 PM Penn Stater Conference Center, 1st Level

Exhibits 10:00 AM-4:00 PM Presidents Hall I & II

EMC SummerFest 7:00-9:00 PM Presidents Hall

Session S: Epitaxy on Si	8:20 AM	105
Session T: Metamorphic and Templated Growth	10:20 AM	105
Session U: Flexible and Printed Thin-film Electronics	8:20 AM	106
Session V: Oxide Thin Film Integration I	8:20 AM	108
Session W: ZnO Growth	8:20 AM	Deans Hall I
Session X: Molecular Electronics: Devices, Materials, and Molecular Electronics and Chem/Bio Sensors	8:20 AM	Deans Hall II
Session Y: Graphene I	8:20 AM	206
Session Z: III-Nitride: MBE Growth and Intersubband Structures	8:20 AM	207
Session AA: III-Nitride: MBE Growth	10:20AM	207
Session BB: III-Nitride: Optical Devices I	8:20 AM	208
Session CC: III-V NW - Characterization	1:30 PM	106
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Session EE: Oxide Thin Film Integration II	1:30 PM	108
Session FF: ZnO Characterization	1:30 PM	Deans Hall I
Session GG: Organic Thin Film and Crystalline Transistors: Devices, Materials and Processing II ...	1:30 PM	Deans Hall II
Session HH: Spin-Dependent (or Spintronic) Electronic Materials	1:30 PM	205
Session II: Graphene II	1:30 PM	206
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Session KK: III-Nitride: Nanostructures	3:30 PM	207
Session LL: III-Nitride: Optical Devices II	1:30 PM	208
Session MM: III-Nitride: MOCVD Growth and Pseudo-Substrates	3:30 PM	208

Friday, June 26, 2009

Registration 7:30-10:00 AM Penn Stater Conference Center, 1st Level

Session NN: Contacts to Semiconductor Epilayers and Nanowires	8:20 AM	106
Session OO: Nanoscale Characterization	8:20 AM	108
Session PP: Non-Destructive Testing and In-Situ Control	10:20 AM	108
Session QQ: Solar Cells - Organic, Hybrid and Inorganic	8:20 AM	Deans Hall II
Session RR: Silicon Carbide	8:20 AM	206
Session SS: III-Nitride: Characterization of Defects	8:20 AM	207
Session TT: III-Nitride: Growth and Characterization of Optical Devices	10:20 AM	207

EMC Plenary Lecture/Student Awards

Wednesday AM
June 24, 2009

Room: Presidents Hall I & II
Location: Pennsylvania State University

Session Chair: Mark Goorsky, University of California, Los Angeles

8:20 AM Ceremony

Plenary Speaker: *Richard King*, Boeing Spectrolab

9:20 AM Break

Session A: Epitaxy

Wednesday AM
June 24, 2009

Room: 105
Location: Pennsylvania State University

Session Chairs: Seth Bank, University of Texas at Austin; Archie Holmes, University of Virginia

10:00 AM

A1, Optical and Structural Investigations of the Novel Direct Band Gap Material Ga(NAsP) Grown Lattice-Matched on (001) Si Substrate: *Bernardette Kunert*¹; Sven Liebich²; Martin Zimprich²; Steffen Zinnkann²; Kerstin Volz²; Wolfgang Stolz²; ¹NAsP III/V GmbH; ²Material Sciences Center and Faculty of Physics

10:20 AM Student

A2, Effects of Mg Doping on the Luminescence Characterization of GaAsN Alloys Grown by MBE: *Kazuyuki Umeno*¹; Yuzo Furukawa¹; Saburo Mitsuyoshi¹; Noriyuki Urakami¹; Hiroshi Okada¹; Akihiro Wakahara¹; Hiroo Yonezu¹; ¹Toyohashi University of Technology

10:40 AM Student

A3, Effect of Si-Cap Thickness on Device Performance of Buried Channel Si/Ge_{1-x}C_x/Si Devices: *Mustafa Jamil*¹; En-shao Liu¹; Fahmida Ferdousi¹; Joseph Donnelly¹; Emanuel Tutuc¹; Luigi Colombo²; Sanjay Banerjee¹; ¹The University of Texas at Austin; ²Texas Instruments Inc.

11:00 AM Student

A4, Impact of High-Order Silane Precursors for Silicon Epitaxial Growth on Surface Open Sites: *Keith Chung*¹; James Sturm¹; ¹Princeton University

11:20 AM

A5, Photovoltaic-Quality Silicon Epitaxy by Hot-Wire CVD at Glass-Compatible Temperatures: *Charles Teplin*¹; Ina Martin¹; Maxim Shub¹; Robert Reedy¹; Kim Jones¹; Manuel Romero¹; Paul Stradins¹; Howard Branz¹; ¹NREL

11:40 AM

A6, Structural Characteristics of TaC Films as Buffer Layers for Epitaxy of GaN on SiC: *Tsvetanka Zheleva*¹; Kevin Kirchner¹; Michael Derenge¹; Kenneth Jones¹; R.D. Vispute²; ¹Army Research Laboratory; ²University of Maryland

Session B: Low Dimensional Structures: Wires and Dots; Dots in Wires

Wednesday AM
June 24, 2009

Room: 106
Location: Pennsylvania State University

Session Chairs: Ping-Show Wong, University of California, Los Angeles; James Merz, University of Notre Dame

10:00 AM Invited

B1, Reengineering the Optics of Quantum Dots with Mechanical Strain: *Garnett Bryant*¹; Natalia Malkova¹; James Sims¹; Michal Zielinski²; W. Jaskolski³; Javier Aizpuru⁴; ¹National Institute of Standards and Technology (NIST); ²Institute of Microstructural Sciences; ³Instytut Fizyki; ⁴Donostia International Physics Center

10:40 AM

B2, Nano-Fabrication and Optical Characterization of InAs QDs Pillar Structures Embedded with Niobium: *Yasuhiro Idutsu*¹; Makoto Takada²; Saki Ito²; Hiroyasu Sato²; Huh Jae-Hoon³; Daimotsu Kato²; Sotaro Ida²; Hirotaka Sasakura¹; Hidekazu Kumano¹; Ikuo Suemune¹; ¹Hokkaido University, JST-CREST; ²Hokkaido University; ³Hokkaido University, GCOE

11:00 AM Student

B3, Lithography-Free Synthesis of Freestanding Gold Nanoparticle Arrays Encapsulated within Dielectric Nanowires: *Wenchong Hu*¹; Bangzhi Liu¹; Nicholas Dellas¹; Sarah Eichfeld¹; Pramod Nimmatoori¹; Joan Redwing¹; Suzanne Mohnney¹; Theresa Mayer¹; ¹Pennsylvania State University

11:20 AM Student

B4, Effect of Indium Seeding Layer on the Formation and Properties of InN Nanowires on Si by Molecular Beam Epitaxy: *Yi-Lu Chang*¹; Arya Fatehi¹; Jonathan Guillemette¹; Thomas Szkopek¹; Zetian Mi¹; ¹McGill University

11:40 AM

B5, High Efficiency Green Emission from InGaN Wires Measured in 4K-300K Range: *Vladimir Protasenko*¹; Kevin Goodman¹; Thomas Kosel¹; Huili (Grace) Xing¹; Debdeep Jena¹; ¹University of Notre Dame

Session C: Semiconductor Processing

Wednesday AM
June 24, 2009

Room: 108
Location: Pennsylvania State University

Session Chairs: Patrick Fay, University of Notre Dame; Thomas Kuech, University of Wisconsin

10:00 AM Student

C1, Dynamic Study on Formation Processes and Thermal Stability of Nickel Germanides by Using *In Situ* Transmission Electron Microscopy: *Jae-Wook Lee*¹; Kwan-Woo Song¹; Jee-Hwan Bae¹; Min-Ho Park¹; Han-Byul Kang¹; Hyounsub Kim¹; Cheol-Woong Yang¹; ¹Sungkyunkwan University

10:20 AM

C2, Experimental Raman Study and Finite Element Modeling of Strain Distribution in Patterned Device Islands on Strained Silicon-on-Insulator (sSOI) Substrates: *Diefeng Gu*¹; Mingyao Zhu²; Falk Naumann³; Matthias Petzold³; Helmut Baumgart¹; ¹Old Dominion University; ²The College of William and Mary; ³Fraunhofer Institute for Mechanics of Materials

10:40 AM Student

C3, Electronic Passivation of Silicon (100) Surfaces by Organic Layer of 1,10-Phenanthrenequinone: *Sushobhan Avasthi*¹; Yabing Qi¹; Jeffrey Schwartz¹; Antoine Kahn¹; James Sturm¹; ¹Princeton University

11:00 AM

C4, The Role of Atomic Displacements and Vacancy Complexes in Hydrogen Ion-Induced GaN Thin Layer Exfoliation: *Oussama Moutanabbir*¹; Yves Chabal²; Martin Chicoine³; Reinhard Klause-Rehberg⁴; Roland Scholz¹; Oliver Seitz²; Stephan Senz¹; Ulrich Goesele¹; ¹Max Planck Institute of Microstructure Physics; ²Department of Materials Science, University of Texas at Dallas; ³Universite de Montreal; ⁴Martin-Luther-University Halle-Wittenberg

11:20 AM

C5, Late News

11:40 AM

C6, Late News

Session D:

Materials Integration: Wafer Bonding and Engineered Substrates

Wednesday AM

June 24, 2009

Room: 206

Location: Pennsylvania State University

Session Chairs: Cindy Colinge, Tyndall National Institute; Kevin Turner, University of Wisconsin, Madison

10:00 AM

D1, Unveiling the Complex Evolution of Strain in Nanopatterned Strained Si Membrane Directly on Oxide: *Oussama Moutanabbir*¹; Manfred Reiche¹; Nikolai Zakharov¹; Angelika Hähnel¹; Wilfried Erfurth¹; Falk Naumann²; Matthias Petzold²; Ulrich Goesele¹; ¹Max Planck Institute of Microstructure Physics; ²Fraunhofer for Mechanics of Materials

10:20 AM Student

D2, Cleave Engineered Layer Transfer Substrates with InP Templates for Growth of InGaAs/InAlAs Quantum Well Structures: *Monali Joshi*¹; Song Hu¹; Sumiko Hayashi¹; Sara Lu¹; Mark Goorsky¹; ¹University of California, Los Angeles

10:40 AM

D3, Surface Chemistry, Electrical Properties, and Passivation-Enhanced Luminescence Achieved Using Dry Sulfur Surface Passivation for Wafer Bonding Applications: *Mike Jackson*¹; Jeremy Ou-Yang¹; Sumiko Hayashi¹; Mark Goorsky¹; ¹University of California, Los Angeles

11:00 AM Student

D4, Effect of Radical Activation for Low Temperature Si to Si Wafer Bonding: *Ki Yeol Byun*¹; Isabelle Ferain¹; Cindy Colinge¹; ¹Tyndall National Institute

11:20 AM Student

D5, Study of the Formation, Evolution and Dissolution of Interfacial Bonding Defects Based on the Hydrogen Storage and Diffusion Mechanisms: *Sebastien Vincent*¹; Ionut Radu¹; Jean-Daniel Penot²; Francois Rieutord²; ¹SOITEC S.A.; ²CEA-INAC

11:40 AM

D6, Late News

Session E:

Organic Thin Film and Crystalline Transistors: Devices, Materials and Processing I

Wednesday AM

June 24, 2009

Room: 207

Location: Pennsylvania State University

Session Chairs: Michael Chabinyk, University of California, Santa Barbara; Alberto Salleo, Stanford University

10:00 AM

E1, Organic Complementary Inverters and Non-Volatile Memory Elements Based on Ferroelectric Field-Effect Transistors: *Tse Nga Ng*¹; Sanjiv Sambandan¹; Robert Street¹; Rene Lujan¹; Ana-Claudia Arias¹; Chris Newman²; He Yan²; Antonio Facchetti²; ¹Palo Alto Research Center; ²Polyera Inc

10:20 AM Student

E2, Dependence of Charge Injection on Contact Height in Poly(3-Hexylthiophene)-Based Bottom-Contact Field-Effect Transistors: *Kumar Singh*¹; Tomasz Young¹; Tomasz Kowalewski¹; Richard McCullough¹; Lisa Porter¹; ¹Carnegie Mellon University

10:40 AM Student

E3, Fabrication and Application of Graphene Electrodes and Graphene-Coated Gold Electrodes in Organic Field-Effect Transistors: *Chen-Guan Lee*¹; ¹University of Texas at Austin

11:00 AM

E4, Compact Model for Sub-Threshold Operation in Polymer Semiconductor Thin Film Transistors: *Sanjiv Sambandan*¹; Rene Kist¹; Rene Lujan¹; Tse Ng¹; Ana Arias¹; Robert Street¹; ¹Palo Alto Research Center

11:20 AM

E5, Fluoroalkyl Phosphonic Acid Self-Assembled Monolayer Gate Dielectrics to Control the Threshold Voltage in Low-Voltage Organic Thin-Film Transistors: *Ulrike Kraft*¹; Ute Zschieschang¹; Frederik Ante¹; Claudia Kamella¹; Konstantin Amsharov¹; Edwin Weber²; Martin Jansen¹; Klaus Kern¹; Hagen Klauk¹; ¹Max Planck Institute for Solid State Research; ²TU Bergakademie Freiberg

11:40 AM

E6, Late News

Session F:

III-Nitride: Growth of Electronic Devices

Wednesday AM

June 24, 2009

Room: 208

Location: Pennsylvania State University

Session Chair: Michael Manfra, Purdue University

10:00 AM Student

F1, Low-Sheet-Resistance Multiple AlN/GaN Heterojunctions Grown by MBE: *Yu Cao*¹; Huili Xing¹; Debdeep Jena¹; ¹University of Notre Dame

10:20 AM Student

F2, Growth and Characterization of N-Polar GaN/AlGaIn/GaN HEMTs on SiC by Metal Organic Chemical Vapor Deposition: *David Brown*¹; Stacia Keller¹; Rongming Chu¹; Steven DenBaars¹; Umesh Mishra¹; ¹University of California at Santa Barbara

10:40 AM Student

F3, Nanoscale Temperature Distribution, Defect Mapping and Evolution Inside Active AlGaIn/GaN High Electron Mobility Transistors: *Chung-Han Lin*¹; T. Merz²; D. Doutt²; M. Hetzer²; Jungwoo Joh³; Jesús del Alamo³; U. Mishra⁴; L. Brillson⁵; ¹Department of Electrical and Computer Engineering, The Ohio State University; ²Department of Physics, The Ohio State University; ³Microsystems Technology Laboratories, Massachusetts Institute of Technology (MIT); ⁴Departments of Electrical and Computer Engineering and Materials, University of California, Santa Barbara; ⁵Departments of Electrical and Computer Engineering, Physics, and Center for Materials Research, The Ohio State University

11:00 AM Student

F4, The Dominant Gain Limiting Mechanism in Wafer-Fused AlGaAs/GaAs/GaN HBTs: *Chuanxin Lian*¹; Huili Xing¹; ¹University of Notre Dame

11:20 AM Student

F5, Ultra-Low Contact Resistance for Self-Aligned HEMT Structures on N-Polar GaN by MBE Regrowth of InGaIn-Based Contact Layers: *Nidhi Nidhi*¹; Sansaptak Dasgupta¹; Man Hoi Wong¹; Uttam Singiseti¹; Mark Wistey¹; Mark Rodwell¹; James Speck¹; Umesh Mishra¹; ¹University of California Santa Barbara

11:40 AM Student

F6, Investigation of Mg Ion-Implanted GaN as Current Blocking Layer in a CAVET: *Srabanti Chowdhury*¹; Brian Swenson¹; Stacia Keller¹; Umesh Mishra¹; ¹University of California, Santa Barbara

Session G: Narrow Bandgap Materials

Wednesday PM
June 24, 2009

Room: 105
Location: Pennsylvania State University

Session Chair: Ganesh Balakrishnan, University of New Mexico

1:30 PM

G1, Improved Migration-Enhanced Epitaxy for Self-Aligned InGaAs Devices: *Mark Wistey*¹; Uttam Singiseti¹; Ashish Baraskar¹; Greg Burek¹; Arthur Gossard²; Mark Rodwell¹; ¹University of California, Santa Barbara, ECE Department; ²University of California, Santa Barbara, Materials Department

1:50 PM Student

G2, Transport Properties of δ -Doped InSb/Al_xIn_{1-x}Sb Quantum Well Heterostructures with Varying Subband Occupation: *Oliver Pooley*¹; Adam Gilbertson²; Louise Buckle³; Stuart Coomber³; Martin Emeny³; Mike Fearn³; Phil Buckle³; Lesley Cohen²; Tim Ashley³; ¹University of Manchester; ²Imperial College; ³Qinetiq

2:10 PM

G3, Integration of n- and p-Channel InGaSb Quantum Wells for Low-Power Complementary Logic Circuits: *Brian Bennett*¹; James Champain¹; J. Boos¹; Mario Ancona¹; Nicolas Papanicolaou¹; ¹Naval Research Laboratory

2:30 PM

G4, Strain Balanced InAs/InAsSb Superlattices for Mid IR Photodetectors: *David Lackner*¹; Tom Cherng¹; Oliver Pitts¹; Michael Steger¹; Michael Thewalt¹; Simon Watkins¹; ¹Simon Fraser University

2:50 PM Student

G5, Performance Augmentation of InAs/GaSb Superlattice LWIR Detectors by Surface Treatments: *Maya Narayanan Kutty*¹; Elena Plis¹; Arezou Khoshakhlagh¹; Stephen Myers¹; Nutan Gautam¹; Sanjay Krishna¹; ¹University of New Mexico

3:10 PM Break

Session H: Epitaxy for Devices

Wednesday PM
June 24, 2009

Room: 105
Location: Pennsylvania State University

Session Chair: Brian Bennett, Naval Research Laboratory

3:30 PM Student

H1, Comparison of Device Performance of Light Emitting Transistors with Zn-Doped and C-Doped Base: *Yong Huang*¹; Jae Hyun Ryou¹; Forest Dixon²; Milton Feng²; Nick Holonyak²; Russell Dupuis¹; ¹Georgia Institute of Technology; ²The University of Illinois at Urbana-Champaign

3:50 PM Student

H2, Annealing Stability of Nanoparticle-Enhanced Tunnel Junctions for High-Efficiency Solar Cells and Mid-Infrared Lasers: *Adam Crook*¹; Hari Nair¹; Karun Vijayraghavan¹; Mark Wistey²; Jeremy Zimmerman³; Joshua Zide⁴; Arthur Gossard²; Seth Bank¹; ¹University of Texas at Austin; ²University of California, Santa Barbara; ³University of Michigan; ⁴University of Delaware

4:10 PM

H3, AlGaInSb-VECSEL Grown on GaAs Based DBRs for High-Power Emission at 2 μ m: *Thomas Rotter*¹; Ganesh Balakrishnan²; Diana Huffaker¹; Jerome Moloney³; Joerg Hader³; Mike Yarborough³; ¹University of California, Los Angeles; ²University of New Mexico; ³University of Arizona

4:30 PM

H4, Fabrication of Narrow Ridges for High-Performance High-Temperature cw Interband Cascade Lasers: *Chulsoo Kim*¹; Mijin Kim¹; William Bewley¹; J. Lindle¹; Chadwick Canedy¹; J. Abell¹; Igor Vurgaftman¹; Jerry Meyer¹; ¹Naval Research Laboratory

4:50 PM

H5, Late News

Session I: Quantum Dot Optical Characterizations and Photonic Devices

Wednesday PM
June 24, 2009

Room: 106
Location: Pennsylvania State University

Session Chairs: Garnett Bryant, National Institute of Standards and Technology (NIST); James Merz, University of Notre Dame

1:30 PM Student

I1, Lasing of Whispering-Gallery Modes in Asymmetric Waveguide GaInP Micro-Disks with InP Quantum Dots: *Yaya Chu*¹; A. Mintairov¹; Y. He¹; J. Merz¹; N. Kalyuzhnyy²; V. Lantratov²; S. Mintairov²; ¹University of Notre Dame; ²Ioffe Physical Technical Institute

1:50 PM Student

I2, Nanocrystal Laser from Colloidal InP/ZnS Quantum Dots: *Shuai Gao*¹; Chunfeng Zhang¹; ¹Pennsylvania State University

2:10 PM

I3, Ultrahigh Spontaneous Emission Extraction Efficiency Induced by Evanescent Wave Coupling: *Xue-Lun Wang*¹; Shigenori Furue¹; Mutsuo Ogura¹; Valia Voliotis²; Marco Ravano²; Alexandre Enderlin²; Roger Grousson²; ¹AIST; ²Institut des Nanosciences de Paris, Université Pierre et Marie Curie

2:30 PM Student

I4, Properties of InAs/GaAs Quantum Rings and Their Application to Terahertz Detection: Guan Huang¹; Wei Guo¹; Pallab Bhattacharya¹; Gamin Ariyawansa²; A. G. U. Perera²; ¹University of Michigan; ²Georgia State University

2:50 PM

I5, Energy Transfer Pumped Efficient Infrared Colloid Quantum Dot Light Emission Diodes: Chunfeng Zhang¹; Ting Zhu¹; Shuai Gao¹; Jian Xu¹; ¹Pennsylvania State University

3:10 PM Break

Session J:

Quantum Dot Materials Characterization and Epitaxy

Wednesday PM Room: 106
June 24, 2009 Location: Pennsylvania State University

Session Chairs: Ben Shanabrook, Naval Research Laboratory; Diana Huffaker, University of California, Los Angeles

3:30 PM

J1, Isotopically Controlled Semiconductor Low Dimensional Systems: Oussama Moutanabbir¹; ¹Max Planck Institute of Microstructure Physics

3:50 PM Student

J2, MBE Growth of Highly Tensile Strained Thin Ge Layers: Yijie Huo¹; Hai Lin¹; Yiwen Rong¹; Theodore Kamins²; James Harris¹; ¹Stanford University; ²Hewlett-Packard Laboratories

4:10 PM Student

J3, Application of Mist Deposition Process in the Formation of Semiconductor Quantum Nanodot Films: Aditya Kshirsagar¹; S. Ramani¹; K. Shanmugasundaram²; T. Zhu¹; K. Sridhara¹; S. Gao¹; Q. Zhang¹; S. Mohney¹; J. Xu¹; J. Ruzyllo¹; ¹Pennsylvania State University; ²Intel Corp.

4:30 PM

J5, Formation of Si-Nanocrystals in SiO₂ via Ion Implantation and Rapid Thermal Processing: Iain Crowe¹; Andrew Knights²; Matthew Halsall³; Uschi Bangert⁴; Russel Gwilliam³; Reza Kalilikashiban¹; Paul Coleman⁴; ¹University of Manchester; ²McMaster University; ³Surrey Ion Beam Centre; ⁴University of Bath

4:50 PM Student

J6, Deep Level Traps in Single and Multiple InAs/(InGaAs)/GaAs Self-Assembled Quantum Dot Structures: Tetsuya Asano¹; Zhaoqiang Fang²; Anupam Madhukar¹; ¹University of Southern California; ²Wright State University

Session K: ZnO Thin Film Transistors

Wednesday PM Room: 108
June 24, 2009 Location: Pennsylvania State University

Session Chairs: Thomas Jackson, Pennsylvania State University; David Norton, University of Florida

1:30 PM

K1, Fabrication and Characterization of Amorphous InGaZnO-Based Thin Film Transistors: Wantae Lim¹; Erica Douglas¹; S. Kim¹; David Norton¹; Steve Pearton¹; Fan Ren¹; H. Shen¹; W. Chang¹; ¹University of Florida

1:50 PM Student

K2, Low Temperature Annealing of the Room Temperature Deposited Amorphous InGaZnO₄ Thin Film Transistors: Young Gwang Yoon¹; ¹GIST

2:10 PM

K3, Design and Characterization of ZnO-Based Metal-Semiconductor Field-Effect Transistors on Glass Substrate: Heiko Frenzel¹; Michael Lorenz¹; Alexander Lajn¹; Holger von Wenckstern¹; Holger Hochmuth¹; Gisela Biehne¹; Marius Grundmann¹; ¹Universität Leipzig

2:30 PM Student

K4, Plasma-Enhanced Atomic Layer Deposition ZnO TFTs: Devin Mourey¹; Dalong Zhao¹; David Saint John¹; Nikolas Podraza¹; Thomas Jackson¹; ¹Pennsylvania State University

2:50 PM Student

K5, Low Temperature Pulsed PECVD ZnO Thin Film Transistors: Dalong Zhao¹; Devin Mourey¹; Thomas Jackson¹; ¹Pennsylvania State University

3:10 PM Break

3:30 PM

K6, ZnO Field Effect Transistors on Silicon by MOCVD: Bruce Willner¹; Shangzhu Sun¹; Gary Tompa¹; ¹Structured Materials Industries, Inc.

3:50 PM Student

K7, ZnO Field-Effect Transistors with Dual-Gate Structure: Chan Ho Park¹; Kimoon Lee¹; Min Suk Oh¹; Seongil Im¹; Byoung Hoon Lee²; Myung Mo Sung²; ¹Yonsei University; ²Hanyang University

4:10 PM Student

K8, Dual-Gate Operated ZnO Nanowire Field-Effect Transistors: Jung-hwan Hyung¹; Dong-joo Kim¹; Duk-il Suh²; Sang-kwon Lee¹; ¹Chonbuk National University; ²Gwangju Institute of Science and Technology

4:30 PM

K9, Thin Film Encapsulation of Oxide Based Thin Film Transistors: Patrick Goerrn¹; Thomas Riedl²; Wolfgang Kowalsky²; ¹Princeton University; ²Technical University of Braunschweig

4:50 PM

K10, Transparent Photo-Stable Complementary Inverter with Organic-Inorganic Nano-Hybrid Dielectrics: Min Suk Oh¹; Sung Kyu Park¹; Yong Hoon Kim¹; Jeong In Han¹; Kimoon Lee²; Kwang Hyun Lee²; Sung Hoon Cha²; Byoung Hoon Lee³; Myung Mo Sung³; Seongil Im²; ¹Korea Electronics Technology Institute; ²Yonsei University; ³Hanyang University

Session L: Thermoelectrics and Thermionics

Wednesday PM Room: 205
June 24, 2009 Location: Pennsylvania State University

Session Chairs: Mayank Bulsara, Massachusetts Institute of Technology; Timothy Sands, Purdue University

1:30 PM Student

L1, Scanning Hot Probe Method for Thermoelectric Characterization of Nanostructured Thin-Films: Controlling the Heat Transfer Mechanisms between the Tip and the Sample: Yanliang Zhang¹; Eduardo Castillo¹; Claudiu Hapenciu¹; Theodorian Borca-Tasciuc¹; ¹Rensselaer Polytechnic Institute

1:50 PM Student

L2, Thermoelectric Power Characterization of Individual Sb₂Se₃ Single Crystal Nanowires and Nanotubes: Wei Jiang¹; C. Karthik¹; R. Mehta¹; G. Ramanath¹; T. Borca-Tasciuc¹; ¹Rensselaer Polytechnic Institute

2:10 PM

L3, Self-Supporting Nanowire Arrays Templated in Branched Porous Anodic Alumina for Thermoelectric Devices: Hatem Elmatbouly¹; Timothy Sands¹; Kalapi Biswas¹; ¹Purdue University

2:30 PM Student

L4, Ultrafast Microwave-Stimulated Sculpting and Thermoelectric Properties of Bismuth and Antimony Chalcogenide Nanoplates: *Rutvik Mehta*¹; C. Karthik¹; B. Singh¹; Y. Zhang¹; E. Castillo¹; W. Jiang¹; N. Ravishanker¹; T. Borca-Tasciuc¹; G. Ramanath¹; ¹Rensselaer Polytechnic Institute

2:50 PM

L5, Nonlinear Electric Transport in Wet-Chemically Synthesized Sb₂Se₃ Nanowire: *C. Karthik*¹; Rutvik Mehta¹; Wei Jiang¹; Ganapathiraman Ramanath¹; Theodorian Borca-Tasciuc¹; ¹Rensselaer Polytechnic Institute

3:10 PM Break

3:30 PM

L6, Hydrothermal Synthesis of Bi_{0.5}Sb_{1.5}Te₃ and the Effect of Sintering Temperature on Thermoelectric Characteristics of the Pressed Mats: *Chia-Jyi Liu*¹; Gao-Jih Liu¹; ¹National Changhua University of Education

3:50 PM Student

L7, Fabrication of p-Type Pb_{0.5}Sn_{0.5}Te Thermoelectric Power Generation Elements by Mechanical Alloying: *Aaron Lalonde*¹; Lakshmi Krishna¹; Peter Moran¹; ¹Michigan Technological University

4:10 PM Student

L8, Alternative Substrates for Metal/Semiconductor Superlattices for Thermionic Energy Conversion: *Jeremy Schroeder*¹; Polina Burmistrova¹; Robert Wortman¹; Timothy Sands¹; ¹Purdue University

4:30 PM

L9, Cooling Effects of Field Emission from Semiconductors: *Moon Sung Chung*¹; Alexander Mayer²; Brock Weiss³; Nicholas Miskovsky³; Paul Cutler³; ¹University of Ulsan; ²Universitaires Notre-Dame de la Paix; ³Pennsylvania State University

4:50 PM

L10, Late News

Session M:

Carbon Based Nanowires and Tubes

Wednesday PM
June 24, 2009

Room: 206
Location: Pennsylvania State University

Session Chairs: Ya-Hong Xie, University of California, Los Angeles; Suneel Kodambaka, University of California, Los Angeles

1:30 PM Student

M1, Horizontally Aligned Single-Walled Carbon Nanotubes on Patterned SiO₂/Si Substrates: *Takaomi Kishimoto*¹; Shin Iwasaki¹; Yasuhide Ohno¹; Kenzo Maehashi¹; Koichi Inoue¹; Kazuhiko Matsumoto¹; ¹Osaka University

1:50 PM

M2, Electromagnetic Shielding Properties of Excimer-Laser-Synthesized Single-Wall-Carbon Nanotubes/Polyurethane Nanocomposite Films: *Brahim Aissa*¹; M.A. Habib¹; L.L. Laberge²; T.A. Denidni¹; D. Theriault²; My Ali El Khakani¹; ¹Institut National de la Recherche Scientifique; ²Ecole Polytechnique de Montreal

2:10 PM

M3, Electroluminescence from Electrolyte-Gated Carbon Nanotube Arrays: *Jana Zaumseil*¹; Xinning Ho²; Jeffrey Guest¹; John Rogers²; Gary Wiederrecht¹; ¹Argonne National Laboratory; ²University of Illinois at Urbana-Champaign

2:30 PM

M4, Late News

2:50 PM

M5, Late News

3:10 PM Break

Session N: Group IV Nanowires

Wednesday PM
June 24, 2009

Room: 206
Location: Pennsylvania State University

Session Chairs: Ya-Hong Xie, University of California, Los Angeles; Suneel Kodambaka, University of California, Los Angeles

3:30 PM Student

N1, Growth of Silicon Nanostructures Synthesized by Au-Catalyzed Chemical Vapor Deposition: *Tae-Hong Kim*¹; Seung-Yong Lee¹; Dong-Joo Kim¹; Sang-Kwon Lee¹; ¹Chonbuk National University

3:50 PM

N2, 'Bulk' P Doping of Ge Nanowires Reduces Conductivity: *Shixiong Zhang*¹; Danny Perea¹; Eric Hemesath¹; Lincoln Lauhon¹; ¹Northwestern University

4:10 PM Student

N3, Twinning Superlattices: A Correlated Raman and Transmission Electron Microscopy Study on Individual Silicon Nanowires: *Francisco Lopez*¹; Eric Hemesath¹; Lincoln Lauhon¹; ¹Northwestern University

4:30 PM

N4, Self-Cleaning Silicon Nanowire Elastomeric Composites: *William Wong*¹; Tse-Nga Ng¹; Rene Lujan¹; ¹Palo Alto Research Center

4:50 PM Student

N5, Confined and Guided Catalytic Growth of Crystalline Silicon Films on a Dielectric Substrate: *Aurélie Lecestre*¹; Emmanuel Dubois¹; ¹IEMN, STMicroelectronics

Session O:

III-Nitride: Optical Devices on Non-Polar Substrates

Wednesday PM
June 24, 2009

Room: 207
Location: Pennsylvania State University

Session Chair: Jung Han, Yale University

1:30 PM Student

O1, Polarization Study of Yellow Defect Luminescence from Polar and Non-Polar Bulk GaN: *Shi You*¹; Yong Xia¹; Yufeng Li¹; Theeradetch Detchprohm¹; Christian Wetzel¹; ¹Future Chip Constellation, Rensselaer Polytechnic Institute

1:50 PM Student

O2, MOCVD Growth of True Blue m-Plane GaN Laser Diodes: *Kathryn Kelchner*¹; ¹University of California, Santa Barbara

2:10 PM Student

O3, Blue-Green GaInN/GaN Light Emitting Diode on Non-Polar m-Plane Bulk GaN: *Mingwei Zhu*¹; Theeradetch Detchprohm¹; Shi You¹; Wei Zhao¹; Wenting Hou¹; Yufeng Li¹; Yong Xia¹; Liang Zhao¹; Stephanie Tomasulo¹; Tanya Paskova²; Edward Preble²; Drew Hanser²; Christian Wetzel¹; ¹Rensselaer Polytechnic Institute; ²Kyma Technologies, Inc.

2:30 PM Student

O4, Growth and Characterization of High Indium Content m-Plane InGaN LEDs: *You-Da Lin*¹; Arpan Chakraborty²; Hsun Chih Kuo¹; Stuart Brinkley¹; James Speck²; Steven DenBaars²; Shuji Nakamura²; ¹ECE Department, University of California, Santa Barbara; ²Materials Department, University of California, Santa Barbara

2:50 PM Student

O5, N-Polar (Al, In, Ga)N Grown by Metalorganic Chemical Vapor Deposition: *Qian Sun*¹; Yu Zhang¹; Tsung Shine Ko¹; Benjamin Leung¹; Christopher Yerino¹; In-Hwan Lee¹; Jung Han¹; Hyunjin Kim²; Arto Nurmikko²; ¹Yale University; ²Brown University

3:10 PM Break

Session P:

III-Nitride: Growth and Characterization of Non-Polar Materials

Wednesday PM Room: 207
June 24, 2009 Location: Pennsylvania State University

Session Chair: Jung Han, Yale University

3:30 PM Student

P1, The Origin of Pits and Striations on the Surface of Nonpolar a-Plane GaN: *Christopher Yerino*¹; Qian Sun¹; Tsung-Shine Ko¹; In-Hwan Lee¹; Jung Han¹; ¹Yale University

3:50 PM Student

P2, Nucleation and Evolution in the Two-Step Growth of a-Plane GaN for Improving the Microstructural Quality: *Qian Sun*¹; Tsung Shine Ko¹; Christopher Yerino¹; Yu Zhang¹; In-Hwan Lee¹; Jung Han¹; Bo Hyun Kong²; Hyung Koun Cho²; ¹Yale University; ²Sungkyunkwan University

4:10 PM

P3, Carrier Lifetime of m-Plane GaN: *Grace Metcalfe*¹; Paul Shen¹; Michael Wraback¹; Asako Hirai²; Erin Young²; James Speck²; ¹US Army Research Laboratory; ²University of California, Santa Barbara

4:30 PM Student

P4, Kinetic Wulff Diagram: Toward Rational Design of Nonpolar and Semipolar GaN Heteroepitaxy: *Christopher Yerino*¹; Qian Sun¹; Tsung-Shine Ko¹; Benjamin Leung¹; In-Hwan Lee¹; Jung Han¹; ¹Yale University

4:50 PM

P5, 4H-Polytype AlN/AlGa_N MQW Structure Isopolytypically Grown on m-Plane 4H-SiC: *Masahiro Horita*¹; Tsunenobu Kimoto¹; Jun Suda¹; ¹Kyoto University

Session Q:

III-Nitride: Processing of Electronic Devices

Wednesday PM Room: 208
June 24, 2009 Location: Pennsylvania State University

Session Chair: Michael Manfra, Purdue University

1:30 PM Student

Q1, Mechanism of Interaction between Hydrogen and the Two Dimensional Electron Gas in AlGa_N/Ga_N High Electron Mobility Transistors: *Jason Gu*¹; Jacob Melby¹; Mahak Khandelwal¹; Robert Davis¹; Yuh-Renn Wu²; ¹Carnegie Mellon University; ²National Taiwan University

1:50 PM Student

Q2, Surface Passivation and Gate Insulation of AlGa_N/Ga_N High Electron Mobility Transistors Using in-situ SiNx: *Marko Tadjer*¹; Travis Anderson²; Michael Mastro²; Karl Hobart²; Yoosuf Picard²; Fritz Kub²; Charles Eddy, Jr.²; ¹University of Maryland; ²Naval Research Laboratory

2:10 PM

Q3, Plasma Surface Cleaning of Ultrathin Barrier AlN/GaN Heterostructures for Device Fabrication: *Qingling Hang*¹; Yu Cao¹; Tom Zimmermann¹; Debdeep Jena¹; Huili (Grace) Xing¹; ¹University of Notre Dame

2:30 PM Student

Q4, Comparison of Plasma-Etching Induced Damage Recovery Treatments on GaN MOS Capacitors and Electrical Performance of Plasma-Etched GaN MOSFETs: *Ke Tang*¹; T. Chow¹; ¹Rensselaer Polytechnic Institute

2:50 PM

Q5, Influence of NH₃ in the Surface Passivation Dielectrics on AlGa_N/Ga_N Heterostructures Grown on a-Plane (11-20) and c-Plane (0001) Sapphire: *Subramaniam Arulkumar*¹; Ng Geok Ing¹; Susai Lawrence Selvaraj²; Takashi Egawa²; ¹Nanyang Technological University; ²Nagoya Institute of Technology

3:10 PM Break

Session R:

III-Nitride: AlGa_N Materials and Devices

Wednesday PM Room: 208
June 24, 2009 Location: Pennsylvania State University

Session Chairs: Alan Doolittle, Georgia Institute of Technology; Randall Feenstra, Carnegie Mellon University

3:30 PM Student

R1, Surface Characteristics of Single Crystalline, (0001)-Oriented AlN Wafers and Implications for Epitaxial Growth: *Anthony Rice*¹; Ramon Collazo¹; Rafael Dalmau²; James Tweedie¹; Seiji Mita¹; Zlatko Sitar¹; ¹North Carolina State University; ²HexaTech, Inc.

3:50 PM

R2, Photoluminescence Lifetimes and Internal Quantum Efficiencies of AlGa_N Based 250-nm Light Emitting Diodes from Pseudomorphic Growth on Bulk AlN: *Gregory Garrett*¹; Hongen Shen¹; Michael Wraback¹; James Grandusky²; Shawn Gibb²; Leo Schowalter²; ¹US Army Research Laboratory; ²Crystal IS, Inc.

4:10 PM

R3, Low-Dislocation Density Al_xGa_{1-x}N Layers for High-Power UV-Visible Light Emitters Using an "in-situ" Silane Treatment: *Qhalid Fareed*¹; Joseph Dion¹; Jiawei Li¹; Bin Zhang¹; Asif Khan¹; ¹University of South Carolina

4:30 PM Student

R4, Growth of AlGa_N and InAlN Ternary Alloys Using Digitally-Alloyed Modulated Precursor Flow Epitaxial Growth: *Suk Choi*¹; Hee Jin Kim¹; Jae-Hyun Ryou¹; Russell Dupuis¹; ¹Georgia Institute of Technology

4:50 PM Student

R5, Polarization Enhanced p-Type Conductivity in Graded N-Face AlGa_N Slabs: John Simon¹; Vladimir Protasenko¹; Chuanxin Lian¹; Huili Xing¹; Debdeep Jena¹; ¹University of Notre Dame

5:10 PM

R6, MOCVD Growth and Characterization of Mg-Doped AlN-AlGa_N Short-Period Superlattices: *Andrew Allerman*¹; Mary Crawford¹; Mary Miller¹; Stephen Lee¹; ¹Sandia National Laboratories

Session S: Epitaxy on Si

Thursday AM
June 25, 2009

Room: 105
Location: Pennsylvania State University

Session Chairs: L. Ralph Dawson, University of New Mexico; Jerry Woodall, Purdue University

8:20 AM Student

S1, Annihilation Mechanism of Stacking Faults on GaP Layers Grown on Si Substrates within the Critical Thickness: *Yamane Keisuke*¹; Tsuyoshi Kawai¹; Yuzo Furukawa¹; Akihiro Wakahara¹; Hiroshi Okada¹; Hiroo Yonezu¹; ¹Toyoashi University of Technology

8:40 AM Student

S2, Evolution of Epitaxial (211)Ge on (211)Si Grown by CVD: *Shashidhar Shintri*¹; Sunil Rao¹; Ishwara Bhat¹; Priyalal Wijewarnasuriya²; ¹Rensselaer Polytechnic Institute; ²Army Research Laboratory

9:00 AM

S3, Growth of High-Quality Ge on Si through Nanoscale Windows in Thin Chemical Oxide for Multijunction Solar Cells: *Darin Leonhardt*¹; Josephine Sheng¹; Jeffrey Cederberg²; Malcolm Carroll²; Sang Han¹; ¹University of New Mexico; ²Sandia National Laboratories

9:20 AM

S4, Monolithic Integration of Ga(NAsP)/(BGa)(AsP) - Laser Device Structures Lattice-Matched on (001) Silicon Substrate: *Bernardette Kunert*¹; Sven Liebich²; Steffen Zinnkann²; Rafael Fritz²; Igor Neméth²; Jens Ohlmann²; Kerstin Volz²; Wolfgang Stolz²; ¹NAsP III/V GmbH; ²Material Sciences Center and Faculty of Physics

9:40 AM Student

S5, Structural and Optical Properties of Rolled-up InGaAs/GaAs Quantum Dot Microtubes on Si: *Vicknesh Sahnuganathan*¹; Feng Li¹; Arya Fatehi¹; Zetian Mi¹; ¹McGill University

10:00 AM Break

Session T: Metamorphic and Templated Growth

Thursday AM
June 25, 2009

Room: 105
Location: Pennsylvania State University

Session Chairs: Steven Ringel, Ohio State University; Christine Wang, Massachusetts Institute of Technology, Lincoln Laboratory

10:20 AM Student

T1, Metamorphic InGaAs and InGaP on GaAs for Multispectral Detector Applications: *Krishna Swaminathan*¹; Tyler Grassman¹; Qilin Gu¹; Tony Homan¹; Steven Ringel¹; ¹The Ohio State University

10:40 AM Student

T2, Block Copolymer Lithography for Defect Reduction in Epitaxial Growth of Large Lattice-Mismatched Materials: *Smita Jha*¹; Thomas Kuech²; Susan Babcock³; Luke Mawst⁴; ¹Department of Chemistry, University of Wisconsin-Madison; ²Department of Chemical and Biological Engineering, University of Wisconsin-Madison; ³Department of Materials Science and Engineering, University of Wisconsin-Madison; ⁴Department of Electrical and Computer Engineering, University of Wisconsin-Madison

11:00 AM

T3, Heteroepitaxial Growth of Single Crystalline-like Films of Ge and Si on Flexible, Polycrystalline Substrates: *Venkat Selvamani*¹; ¹University of Houston

11:20 AM

T4, Metalorganic Vapor Phase Epitaxial Growth of (211)B CdTe on (211) Si Substrates Using Ge and ZnTe Interfacial Layers: *Sunil Rao*¹; Shashidhar Shintri¹; Ishwara Bhat¹; Randolph Jacobs²; ¹Rensselaer Polytechnic Institute; ²US Army NVESD

11:40 AM

T5, Low Dislocation Density GaN via Nanowire Templated Lateral Epitaxial Growth (NTLEG): *George Wang*¹; Qiming Li¹; Yong Lin¹; J. Randall Creighton¹; ¹Sandia National Laboratories

Session U: Flexible and Printed Thin-film Electronics

Thursday AM
June 25, 2009

Room: 106
Location: Pennsylvania State University

Session Chairs: William Wong, Palo Alto Research Center; Michael Chabiny, University of California, Santa Barbara

8:20 AM

U1, Printable Bottom-Contact Organic Field-Effect Transistors: *Seonghoon Lee*¹; Jung-Pyo Hong¹; ¹Seoul National University

8:40 AM Student

U2, Inkjet Printed Small Molecule Organic Thin Film Transistors: *Yuanyuan Li*¹; Devin Mourey¹; Sankar Subramanian²; John Anthony²; Thomas Jackson¹; ¹Pennsylvania State University; ²University of Kentucky

9:00 AM

U3, Self Organised Electrodes Using Controlled Coffee Stain Phenomena for High Aspect Ratio Polymer Field Effect Transistors on 3D Substrates: *Sanjiv Sambandan*¹; Ana Arias¹; William Wong¹; Robert Street¹; ¹Palo Alto Research Center

9:20 AM Student

U4, Printing Silicon from Nanoparticle Suspensions: *Noah Jafferis*¹; James Sturm¹; ¹Princeton Institute for the Science and Technology of Materials (PRISM) and Department of Electrical Engineering, Princeton University

9:40 AM

U5, High Resolution Patterning by Selective Surface Modification and Dip-Casting for Low-Cost Fully Printed Electronics: *Yong-Hoon Kim*¹; Sung Kyu Park¹; Min-Koo Han²; Jeong-In Han¹; ¹Korea Electronics Technology Institute; ²Seoul National University

10:00 AM Break

10:20 AM

U6, Towards Low-Noise Flexible Electronics: *Oana Jurchescu*¹; Hao Xiong¹; Devin Mourey²; Dalong Zhao²; Jie Sun²; Marsha Loth³; Curt Richter¹; John Anthony³; Thomas Jackson²; David Gundlach¹; ¹National Institute of Standards and Technology; ²Pennsylvania State University; ³University of Kentucky

10:40 AM Student

U7, Two-Level Stretchable Conductors on Elastomeric Substrates: *Joyelle Jones*¹; Oliver Graudejus¹; Wenzhe Cao¹; Sigurd Wagner¹; ¹Princeton University

11:00 AM

U8, A New Method for Integrating Electronics into Textiles: *Thomas Kinkeldei*¹; Kunigunde Cherenack¹; Gerhard Troester¹; ¹Swiss Federal Institute of Technology

11:20 AM Student

U9, Mechanical and Thermal Stretching of Fully Encapsulated Elastomeric Conductors: *Wenzhe Cao*¹; Oliver Graudejus¹; Joyelle Jones¹; Sigurd Wagner¹; ¹Princeton University

11:40 AM

U10, Late News

Session V: Oxide Thin Film Integration I

Thursday AM
June 25, 2009

Room: 108
Location: Pennsylvania State University

Session Chairs: Patrick Lenahan, Pennsylvania State University; Susanne Stemmer, University of California, Santa Barbara

8:20 AM Student

V1, Atomic-Layer-Deposited HfO₂ Gate Dielectrics on InP Using Silicon Interface Passivation Layer: *Yen-Ting Chen*¹; Han Zhao¹; Jung Hwan Yum¹; Yanzhen Wang¹; Jack C. Lee¹; ¹The University of Texas at Austin

8:40 AM Student

V2, Growth of Epitaxial (110) 0.7Pb (Mg_{1/3}Nb_{2/3}) O₃ - 0.3PbTiO₃ Thin Films on r-Plane Sapphire Substrates by RF Magnetron Sputtering: *Lakshmi Krishna*¹; Madhana Sunder¹; Peter Moran¹; ¹Michigan Technological University

9:00 AM

V3, High Quality SrTiO₃ Thin Films Grown by Hybrid Molecular Beam Epitaxy: *Roman Engel-Herbert*¹; Bharat Jalan¹; Susanne Stemmer¹; ¹University of California, Santa Barbara

9:20 AM Student

V4, Growth and Microstructure of Homoepitaxial Strontium Titanate Thin Films by Molecular-Beam Epitaxy: *Charles Brooks*¹; Lena Fitting Kourkoutis²; Tassilo Heeg²; Jürgen Schubert³; David Muller²; Darrell Schlom²; ¹The Pennsylvania State University; ²Cornell University; ³Research Centre Jülich

9:40 AM Student

V5, The Growth and Properties of Sr_{n+1}Ti_nO_{3n+1} Ruddlesden-Popper Phases: *Che-Hui Lee*¹; Xiaoxing Xi¹; Darrell Schlom²; Wei Tian¹; Nathan Orloff¹; Nik Podraza¹; ¹Pennsylvania State University; ²Cornell University; ³University of Maryland

10:00 AM Break

10:20 AM

V6, Stabilization of a Very High-k Tetragonal ZrO₂ Phase by Direct Doping with Germanium: *Athanasios Dimoulas*¹; Dimitra Tsoutsou¹; Sotiria¹; Georgia Mavrou¹; Yerassimos Panayiotatos¹; Georgios Apostolopoulos¹; ¹NCSR Demokritos

10:40 AM Student

V7, Atomic Layer Deposited HfO₂ Thin Films on InGaAs/InP: Technology Development and Application in Realization of Memory Diode and Quantum Devices: *Jie Sun*¹; Marcus Larsson¹; Ivan Maximov¹; H. Q. Xu¹; ¹Lund University

11:00 AM Student

V8, Impact of Growth Process on Native Point Defects and Correlation with Dielectric Properties of Barium Strontium Titanate: *Mitchell Rutkowski*¹; J. Zhang¹; D. R. Douth¹; L.M.B. Alldredge²; W. Chang²; S. W. Kirchoefer²; L. J. Brillson¹; ¹The Ohio State University; ²Naval Research Laboratories

11:20 AM

V9, The Growth and Characterization of Crystalline MgO Films on 6H-SiC by Molecular Beam Epitaxy: *Matthew Snyder*¹; Mark Fanton¹; David Rearick¹; Jeremy Acord¹; Joshua Robinson¹; Xiaojun Weng²; ¹Pennsylvania State University Electro-Optics Center; ²Pennsylvania State University Materials Research Institute

11:40 AM Student

V10, Adsorption-Controlled Growth of Ferromagnetic EuO and the Effect of La Doping: *Alexander Melville*¹; ¹Pennsylvania State University

Session W: ZnO Growth

Thursday AM
June 25, 2009

Room: Deans Hall I
Location: Pennsylvania State University

Session Chairs: Jamie Phillips, University of Michigan; Yicheng Lu, Rutgers University

8:20 AM Student

W1, Properties of In-Doped ZnO Films Grown by Metalorganic Chemical Vapor Deposition on GaN(0001) Templates: *Tammy Ben-Yaacov*¹; Tommy Ive¹; Chris Van de Walle¹; Umesh Mishra¹; James Speck¹; Steven DenBaars¹; ¹University of California, Santa Barbara

8:40 AM Student

W2, MBE Growth and Characterization of Ag-Doped Zinc Oxide Thin Films: *Jessica Chai*¹; Robert Burke¹; Rueben Mendelsberg¹; Roger Reeves¹; John Kennedy²; Holger Wenckstern³; Marius Grundmann³; Kevin Doyle⁴; Tom Myers⁴; Steve Durbin¹; ¹University of Canterbury; ²GNS Science; ³Universität Leipzig; ⁴Texas State University

9:00 AM Student

W3, Growth and Characterization of Non-Polar ZnO/ ZnMgO Quantum-Wells Synthesized by Pulsed Laser Deposition: *Mei-Hui Liang*¹; Yen-Teng Ho¹; Wei-Lin Wang¹; Yi-Sen Shih¹; Li Chang¹; ¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan

9:20 AM

W4, Ultrasonic Spray Assisted Mist-CVD for the Growth of Crystalline and Amorphous ZnO: Hiroyuki Nishinaka¹; Yudai Kamada¹; Naoki Kameyama¹; Kentaro Kaneko¹; *Shizuo Fujita*¹; ¹Kyoto University

9:40 AM

W5, MOCVD of Zinc Oxide Transparent Conductive Oxide: *Bruce Willner*¹; Shangzhu Sun¹; Gary Tompa¹; ¹Structured Materials Industries, Inc.

10:00 AM Break

10:20 AM

W6, Low Temperature ZnO Growth for Nanotube Fabrication by Atomic Layer Deposition: *Diefeng Gu*¹; Kanda Tapily¹; Yao Yao²; Pragya Shrestha¹; Helmut Baumgart¹; ¹Old Dominion University; ²University of Virginia

10:40 AM Student

W7, Ag/N/Ag-N Doped ZnO Nanostructures Prepared by Wet-Oxidation: *Ruiqun Chen*¹; Wei Gao¹; ¹University of Auckland

11:00 AM

W8, Photoluminescence Properties of Highly Dispersed ZnO Quantum Dots in Polyvinylpyrrolidone Nanotubes Prepared by a Single Capillary Electrospinning: Y.C. Liu¹; X.H. Li¹; C.L. Shao¹; X.Y. Chu¹; C.H. Wang¹; *G.L. Yang*²; ¹Centre for Advanced Optoelectronic Functional Materials Research, Key Laboratory of UV Light-Emitting Materials and Technology, Ministry of Education, Northeast Normal University; ²Department of Physics, Drexel University

11:20 AM Student

W9, Generalized Theoretical Model for Ferroelectric Properties of BaTiO₃, BaTiO₃-ZnO, and ZnO-BaTiO₃-ZnO Thin Films: *Venkata Voora*¹; T. Hofmann¹; M. Brandt²; M. Lorenz²; M. Grundmann²; N. Ashkenov²; M. Schubert¹; ¹Department of Electrical Engineering, and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln; ²Institut für Experimentelle Physik II, Universität Leipzig

11:40 AM Student

W10, Ferroelectric Thin Film Field-Effect Transistors Based on ZnO/BaTiO₃ Heterostructures: *Matthias Brandt*¹; Heiko Frenzel¹; Holger Hochmuth¹; Michael Lorenz¹; Marius Grundmann¹; ¹Universitaet Leipzig

Session X:

Molecular Electronics: Devices, Materials, and Molecular Electronics and Chem/Bio Sensors

Thursday AM
June 25, 2009

Room: Deans Hall II
Location: Pennsylvania State University

Session Chair: Avik Ghosh, University of Virginia

8:20 AM Student

X1, Understanding Molecular Modulation of Semiconductor Band-Diving through Transport Studies on Metal-Molecule-Semiconductor Device Junctions: *Archana Bahuguna*¹; Fernanda Alanis-Camacho¹; Avik Ghosh¹; Nathan Swami¹; ¹University of Virginia

8:40 AM

X2, Temperature-Dependent Transport in Gold-Molecule-p+ Si Devices: Adina Scott¹; *David Janes*¹; ¹Purdue University

9:00 AM Student

X3, Optical and Electronic Multi-Probe Vibrational Spectroscopic Characterization of Molecular Junction Based on Self-Assembled Monolayer: *Masato Maitani*¹; Heayoung Yoon¹; Orlando Cabarcos¹; Theresa Mayer¹; David Allara¹; ¹Pennsylvania State University

9:20 AM Student

X4, Investigation of Semiconductor-Molecule-Semiconductor Devices: ZnS/MHA/GaAs Devices: *Patrick Carpenter*¹; Peng Lu²; David Janes¹; Amy Walker²; ¹Purdue University; ²Washington University in St. Louis

9:40 AM Student

X5, Passivation of GaAs Surface Using SAM of Redox-Active Ruthenium Based Organic Molecules in a Matrix of Non Redox Active OPE1 Molecules: *Rand Jean*¹; Dmitry Zemlianov¹; Bin Xi¹; Tong Ren¹; David Janes¹; ¹Purdue University

10:00 AM Break

10:20 AM Student

X6, 1.55 Micron Light Emission from Microcavity Light-Emitting Devices with PbSe Colloidal Quantum Dots: *Fan Zhang*¹; Lai Wei¹; Ting Zhu¹; Shuai Gao¹; Chunfeng Zhang¹; Jian Xu¹; Brian Downey¹; Suzanne Mohney¹; ¹Pennsylvania State University

10:40 AM

X7, Microfluidic Biochips for Label-Free Multi-Immunosensors Based on Carbon Nanotube Arrayed Microelectrodes: *Kenzo Maehashi*¹; Yuichi Tsujita¹; Kazuhiko Matsumoto¹; ¹Osaka University

11:00 AM

X8, Carbon-Derived Nanocrystalline Diamond Films - Tailoring the Electronic and Bio-Sensing Properties by Nitrogen Incorporation: *Supil Raina*¹; Weng Kang¹; Jim Davidson¹; ¹Vanderbilt University

11:20 AM

X9, Late News

11:40 AM

X10, Late News

Session Y: Graphene I

Thursday AM
June 25, 2009

Room: 206
Location: Pennsylvania State University

Session Chairs: Randall Feenstra, Carnegie Mellon University; Rajinder Sandhu, Northrop Grumman Space Technology

8:20 AM Invited

Y1, Graphene Synthesis on C-Face and Si-Face 4H-SiC: *Michael Capano*¹; M. L. Bolen¹; B. Biedermann²; G. Prakash²; R. G. Reifengerger²; Y.Q Wu¹; P. D. Ye¹; ¹Purdue University, School of Electrical and Computer Engineering and Birck Nanotechnology Center; ²Purdue University, Birck Nanotechnology Center and Department of Physics

9:00 AM Student

Y2, Uniformity of Epitaxial Graphene Films on Si-Face SiC(0001): *Luxmi Luxmi*¹; Nishtha Srivastava¹; Patrick Fisher¹; Randall Feenstra¹; Jakub Kedzierski²; Yugang Sun³; ¹Carnegie Mellon University; ²Massachusetts Institute of Technology (MIT), Lincoln Laboratory; ³Center for Nanoscale Materials, Argonne National Laboratory

9:20 AM

Y3, Effects of SiC Surface Orientation and Temperature on the Quality of Epitaxial Graphene: *Virgil Shields*¹; M.V.S. Chandrashekar¹; Shriram Shivaraman¹; Michael Spencer¹; ¹Cornell University

9:40 AM

Y4, Few-Layer Graphene Formation Mechanisms on 4H-SiC(0001): *Michael Bolen*¹; Sara Harrison¹; Michael Capano¹; ¹Purdue University

10:00 AM Break

10:20 AM Invited

Y5, Epitaxial Graphenes on Silicon Carbide: *Phillip First*¹; ¹Georgia Institute of Technology

11:00 AM Student

Y6, Three-Dimensional Island Morphology of Graphene on C-Face SiC(000-1): *Nishtha Srivastava*¹; Luxmi Luxmi¹; Patrick Fisher¹; Randall Feenstra¹; Jakub Kedzierski²; Yugang Sun³; ¹Carnegie Mellon University; ²Massachusetts Institute of Technology (MIT), Lincoln Laboratory; ³Center for Nanoscale Materials, Argonne National Laboratory

11:20 AM Student

Y7, AFM Studies of Wrinkles and Ridges on Graphene Grown on the Carbon Face of 4H-SiC (000-1): *Gyan Prakash*¹; Michael Bolen¹; Michael Capano¹; Dmitri Zemlyanov¹; Ronald Reifengerger¹; ¹Purdue University

11:40 AM Student

Y8, STM and XPS Studies of Moiré Superlattices and Ridges on Few-Layer Graphene Grown on 4H-SiC(000-1): *Laura Biedermann*¹; Michael Bolen¹; Michael Capano¹; Dmitri Zemlyanov¹; Ronald Reifengerger¹; ¹Purdue University

Session Z:

III-Nitride: MBE Growth and Intersubband Structures

Thursday AM Room: 207
June 25, 2009 Location: Pennsylvania State University

Session Chair: Thomas Myers, Texas State University

8:20 AM

Z1, Near-Infrared Intersubband Absorption in MBE-Grown Lattice-Matched InAlN/GaN Superlattices: *Oana Malis*¹; C. Edmunds²; M. Manfra¹; D. Sivco³; R. Molnar⁴; ¹Purdue University; ²Binghamton University; ³Alcatel-Lucent; ⁴Massachusetts Institute of Technology (MIT), Lincoln Laboratory

8:40 AM

Z2, GaN/AlN-Based Nanostructures for Intersubband Devices: Prem Kandaswamy¹; Lise Lahourcade¹; Alexander Wirthmüller¹; Catherine Bougerol¹; Eva Monroy¹; Houssaine Machhadani²; S. Sakr²; Maria Tchernycheva²; François Julien²; Alon Vardi³; Gad Bahir³; ¹CEA-Grenoble; ²Université Paris-Sud; ³Technion

9:00 AM Student

Z3, Growth and Characterization of N-Polar InGaN and InGaN/GaN MQWs by Plasma Assisted Molecular Beam Epitaxy: *Sansaptak Dasgupta*¹; Nicholas Toledo¹; Hisashi Masui²; James Speck²; Steve Denbaars²; Umesh Mishra¹; ¹ECE Department, University of California, Santa Barbara; ²Materials Department, University of California, Santa Barbara

9:20 AM

Z4, Change in Stress Evolution of MBE GaN across Growth Mode Regimes: *Jeremy Acord*¹; David Rearick¹; Xiaojun Weng¹; Joshua Robinson¹; Mark Fanton¹; Joan Redwing¹; David Snyder¹; ¹Pennsylvania State University

9:40 AM Student

Z5, Low Dislocation-Mediated Reverse Bias Leakage in (0001) GaN via Novel High-Temperature MBE Growth: *Jeremy Law*¹; Gregor Koblmüller²; Feng Wu²; James Speck²; Edward Yu¹; ¹University of California, San Diego; ²University of California, Santa Barbara

10:00 AM Break

Session AA:

III-Nitride: MBE Growth

Thursday AM Room: 207
June 25, 2009 Location: Pennsylvania State University

Session Chair: Thomas Myers, Texas State University

10:20 AM Student

AA1, Enhancement of Breakdown Voltage Using Selective-Area Growth by Plasma-Assisted Molecular Beam Epitaxy: *Liang Pang*¹; Hui-Chan Seo¹; Patrick Chapman¹; Kyekyoon Kim¹; ¹University of Illinois at Urbana-Champaign

10:40 AM Student

AA2, Effect of AlN Nucleation on the Heteroepitaxial Growth of N-Face GaN on C-Face SiC by Plasma-Assisted MBE for High Electron Mobility Transistors: *Man Hoi Wong*¹; Yi Pei¹; James Speck¹; Umesh Mishra¹; ¹University of California Santa Barbara

11:00 AM Student

AA3, Analysis of Degenerate p-Type GaN by Metal Modulated Epitaxy: *Elaiissa Trybus*¹; Walter Henderson¹; Gon Namkoong²; Jaime Freitas³; Alan Doolittle¹; ¹Georgia Institute of Technology; ²Old Dominion University; ³Naval Research Laboratory

11:20 AM

AA4, Near Band-Gap Luminescence of Hexagonal Boron Nitride Grown on Ni(111) Substrate by Plasma-Assisted MBE: *Chiun-Lung Tsai*¹; Yasuyuki Kobayashi¹; Tetsuya Akasaka¹; Mokoto Kasu¹; ¹NTT Basic Research Laboratories

11:40 AM

AA5, Late News

Session BB:

III-Nitride: Optical Devices I

Thursday AM Room: 208
June 25, 2009 Location: Pennsylvania State University

Session Chair: Christian Wetzel, Rensselaer Polytechnic Institute

8:20 AM Student

BB1, Growth and Characterization of GaInN Blue Light-Emitting Diodes with GaInN Quantum Barriers: *Wonseok Lee*¹; Min-Ho Kim¹; Di Zhu¹; Ahmed Noemaun¹; E. Fred Schubert¹; Jong Kyu Kim¹; ¹Rensselaer Polytechnic Institute

8:40 AM Student

BB2, High Efficiency GaInN-Based Multi-Quantum Wells Grown on High-Crystalline Quality, Freestanding, and Thick GaInN Layer: *Daisuke Iida*¹; Ryota Senda¹; Tetsuya Matsubara¹; Motoaki Iwaya¹; Satoshi Kamiyama¹; Hiroshi Amano¹; Isamu Akasaki¹; ¹Meijo University

9:00 AM Student

BB3, Design and Characterization of Electrically-Injected InGaN/GaN Photonic Crystal LEDs: *Elizabeth Rangel*¹; Elison Matioli¹; Claude Weisbuch¹; James Speck¹; Evelyn Hu¹; ¹University of California, Santa Barbara

9:20 AM Student

BB4, A Monolithic LED Micro-Display on an Active Matrix Substrate by Flip-Chip Technology: *Zhaojun Liu*¹; Ka Ming Wong¹; Chak Wah Tang¹; Kei May Lau¹; ¹The Hong Kong University of Science and Technology

9:40 AM Student

BB5, Fabrication of Moth-Eye Structure on p-GaN Layer of GaN-Based LEDs Using UV Nanoimprint Lithography: *Eun-Ju Hong*¹; Kyeong-Jae Byeon¹; Hyoungwon Park¹; Jaeyeon Hwang¹; Heon Lee¹; ¹Korea University

Session CC: III-V NW - Characterization

Thursday PM
June 25, 2009

Room: 106
Location: Pennsylvania State University

Session Chairs: David Janes, Purdue University; Kris Bertness, National Institute of Standards and Technology

1:30 PM

CC1, Surface Recombination in GaN Nanowires before and after Surface Treatments: *John Schlager*¹; Alexana Roshko¹; Kris Bertness¹; Norman Sanford¹; Aric Sanders¹; Albert Davydov¹; Denis Tsetkov¹; ¹National Institute of Standards and Technology (NIST)

1:50 PM

CC2, Temporal Analysis of Photoconductive Decay in GaN Nanowires: *Norman Sanford*¹; Lorelle Mansfield¹; Kris Bertness¹; Paul Blanchard¹; John Schlager¹; Christopher Dodson¹; Aric Sanders¹; Benjamin Klein¹; ¹National Institute of Standards and Technology (NIST)

2:10 PM Student

CC3, Growth, Structural, Optical, and Electrical Characterization of Nitride Nanowires Grown by MBE on Silicon Substrates: *Kevin Goodman*¹; Vladimir Protasenko¹; John Simon¹; Thomas Kosel¹; Debdeep Jena¹; ¹University of Notre Dame

2:30 PM Student

CC4, Polarization-Sensitive Two-Color Detectors and Photovoltaic Devices by Solution-Synthesized Quantum-Wire Solids: *Amol Singh*¹; Rachel Thompson¹; Vladimir Protasenko¹; Ken Kuno¹; Huili Xing¹; Debdeep Jena¹; ¹University of Notre Dame

2:50 PM

CC5, Late News

3:10 PM Break

Session DD: III-V NW - Growth and Processing

Thursday PM
June 25, 2009

Room: 106
Location: Pennsylvania State University

Session Chairs: David Janes, Purdue University; Kris Bertness, National Institute of Standards and Technology

3:30 PM

DD1, Self-Catalyzed Growth of GaAs Nanopillars on Nanopatterned GaAs, Silicon, and Silicon Dioxide Surfaces by MOCVD: *Ping-Show Wong*¹; Baolai Liang¹; Diana Huffaker¹; ¹University of California, Los Angeles

3:50 PM

DD2, Core-Shell p-n Gallium Nitride Nanowires: *Aric Sanders*¹; Kris Bertness¹; Paul Blanchard¹; Albert Davydov¹; Christopher Dodson¹; Lorelle Mansfield¹; Norman Sanford¹; John Schlager¹; Dennis Tsetkov¹; Abhishek Monteyed¹; ¹National Institute of Standards and Technology (NIST)

4:10 PM

DD3, Fabrication of Large Scale GaN Nanowire Vertical Devices in Parallel: *Christopher Dodson*¹; Grant Aivazian¹; Aric Sanders¹; Paul Blanchard¹; John Schlager¹; Kris Bertness¹; ¹National Institute of Standards and Technology

4:30 PM Student

DD4, Oxygen Plasma Exposure Effects on Indium Oxide Nanowire Transistors: *Seongmin Kim*¹; Collin Delker¹; Pochiang Chen²; Chongwu Zhou²; Sanghyun Ju³; David Janes¹; ¹Purdue University; ²University of Southern California, Los Angeles; ³Kyonggi University

4:50 PM Student

DD5, Evidence of Mg Enhanced Desorption of GaN: *Lorelle Mansfield*¹; Kris Bertness¹; Todd Harvey¹; Norman Sanford¹; ¹National Institute of Standards and Technology

5:10 PM

DD6, Late News

Session EE: Oxide Thin Film Integration II

Thursday PM
June 25, 2009

Room: 108
Location: Pennsylvania State University

Session Chairs: Peter Moran, Michigan Technological University; Patrick Lenahan, Pennsylvania State University

1:30 PM Student

EE1, Thermodynamic Properties and Phase Diagram of Ferroelectric PbTiO₃ from First-Principles Calculations: *Zhi-Gang Mei*¹; ShunLi Shang¹; Yi Wang¹; Clive A. Randall¹; Zi-Kui Liu¹; ¹Pennsylvania State University

1:50 PM Student

EE2, Cation Dominated Memristive Behavior in Lithium Niobite Thin Films: *William Calley*¹; Walter Henderson¹; Alexander Carver¹; Hang Chen¹; William Doolittle¹; ¹The Georgia Institute of Technology

2:10 PM Student

EE3, Impact of the Presence of Sub-Micron Grain Boundaries on the in-Plane Ionic Conductivity of Thin Film Gd-Doped CeO₂: *Matthew Swanson*¹; Natee Tangtrakarn¹; Madhana Sunder¹; Peter Moran¹; ¹Michigan Technological University

2:30 PM

EE4, Effect of Stoichiometry on the Two-Dimensional Electron Gas at the LaAlO₃/SrTiO₃ Interface Grown by MBE: *Maitri Warusawithana*¹; C. Brooks³; S. Thiel²; M. Zheng³; B. Mulcahy³; N. Reyren⁴; A. Cavaglia⁴; S. Gariglio⁴; J-M. Triscone⁴; J. Eckstein³; J. Mannhart²; D. Schlom¹; ¹Pennsylvania State University; ²University of Augsburg; ³University of Illinois, Urbana - Champaign; ⁴University of Geneva

2:50 PM

EE5, Structural and Magnetic Properties of Epitaxial EuTiO₃ Thin Films Grown by Molecular-Beam Epitaxy: *June Hyuk Lee*¹; Xianglin Ke¹; Lena Fitting Kourkoutis²; Tassilo Heeg¹; Martin Roeckerath³; Craig Fennie²; Jürgen Schubert³; David Muller²; Peter Schiffer¹; Darrell Schlom²; ¹Pennsylvania State University; ²Cornell University; ³Forschungszentrum Jülich GmbH

3:10 PM Break

3:30 PM

EE6, Optical Properties and Structure of Magnetron Sputtered Vanadium Oxide Thin Films: *Orlando Cabarcos*¹; Bryan Gauntt¹; Nikolas Podraza¹; Elizabeth Dickey¹; David Allara¹; Mark Horn¹; ¹Pennsylvania State University

3:50 PM

EE7, Magnetic and Electric Properties in (SrMnO₃)_n / (LaMnO₃)_{2n} Superlattices: *Carolina Adamo*¹; Carmela Aruta²; Xianglin Ke³; Valentina Bisogno⁴; Nik Brookes⁴; Julios Cezar⁴; Pasquale Orgiani⁵; Peter Schiffer³; Giacomo Ghiringhelli⁶; Luigi Maritato⁵; Darrell Schlom¹; ¹Cornell University; ²CNR-INFN Coherentia, Dip. di Scienze Fisiche, Università di Napoli "Federico II"; ³Pennsylvania State University; ⁴European Synchrotron Radiation Facility; ⁵CNR-INFN Coherentia and Dip. di Matematica ed Informatica; ⁶CNR-INFN Coherentia and Dip. di Fisica, Politecnico di Milano

4:10 PM Student

EE8, Dielectric Tensors of High-k *Pb*nm Perovskites from First Principles: *Sinisa Coh*¹; David Vanderbilt¹; ¹Rutgers University

4:30 PM

EE9, Dielectric Tensor of Single Crystals of the Alternative Gate Oxide Candidate LaLuO₃: *Tassilo Heeg*¹; Klaus Wiedenmann²; Martin Roeckerath³; *Sinisa Coh*⁴; David Vanderbilt⁴; Darrell Schlom¹; ¹Cornell University; ²Universität Augsburg; ³Research Centre Jülich; ⁴Rutgers, The State University of New Jersey

4:50 PM Student

EE10, Atomic Scale Effects of Fluorine in MOS Gate Stacks: *Jason Ryan*¹; Patrick Lenahan¹; Anand Krishnan²; Srikanth Krishnan²; Jason Campbell³; ¹Pennsylvania State University; ²Texas Instruments; ³National Institute of Standards and Technology (NIST)

5:10 PM

EE11, Late News

Session FF: ZnO Characterization

Thursday PM
June 25, 2009

Room: Deans Hall I
Location: Pennsylvania State University

Session Chair: Leonard Brillson, Ohio State University

1:30 PM

FF1, The Richardson Constant for Schottky Contacts to n-ZnO: *Martin Allen*¹; Steven Durbin¹; Karthik Sarpatwari²; Osama Awadelkarim²; Suzanne Mohny²; ¹University of Canterbury; ²The Pennsylvania State University

1:50 PM

FF2, Stability of Schottky Barriers on ZnO PLD Thin Films beyond 400 K: *Holger von Wenckstern*¹; Stefan Müller¹; Matthias Schmidt¹; Matthias Brandt¹; Alexander Lajn¹; Florian Schmidt¹; Michael Lorenz¹; Marius Grundmann¹; ¹Universität Leipzig

2:10 PM

FF3, Identification of Native Defects in as-Grown ZnO Single Crystals: X. J. Wang¹; L. Vlasenko¹; S. J. Pearton²; W. M. Chen¹; *Irina Buyanova*¹; ¹Linkoping University; ²University of Florida

2:30 PM Student

FF4, Nanoscale Deep Level Defect Mapping and Energetics at ZnO(0001) Surfaces: *Tyler Merz*¹; Dan Doust¹; Leonard Brillson¹; ¹The Ohio State University

2:50 PM

FF5, Stoichiometry Dependent Incorporation and Electrical Activity of Zn Interstitials in Homoepitaxial ZnO Thin Films: *Alexander Lajn*¹; H. von Wenckstern¹; G. Benndorf¹; C. Dietrich¹; M. Brandt¹; G. Biehne¹; H. Hochmuth¹; M. Lorenz¹; M. Grundmann¹; ¹Universität Leipzig

3:10 PM Break

3:30 PM

FF6, Defects at Oxygen Plasma Cleaned ZnO Polar Surfaces: *Yufeng Dong*¹; Z.-Q. Fang²; David C. Look²; D. R. Doust¹; R. Adur¹; M. J. Hetzer¹; Leonard J. Brillson¹; ¹Ohio State University; ²Wright State University

3:50 PM

FF7, Atomistic Structure of Dislocations in ZnO Revealed by Opto-TEM and PL Spectroscopy: *Yutaka Ohno*¹; Toshinori Taishi¹; Ichiro Yonenaga¹; Katsushi Fujii¹; Hiroki Goto¹; Takafumi Yao¹; ¹Tohoku University

4:10 PM

FF8, Electrical Characterization of Defect Levels in MgZn_{1-x}O PLD Thin Films: *Holger von Wenckstern*¹; Kerstin Brachwitz¹; Matthias Schmidt¹; Florian Schmidt¹; Stefan Müller¹; Christoph Dietrich¹; Jan Zippel¹; Martin Ellguth¹; Michael Lorenz¹; Marius Grundmann¹; ¹Universität Leipzig

4:30 PM Student

FF9, Effect of Post-Deposition Processing on ZnO Thin Films: *Tingfang Yen*¹; Michal DiNezza¹; Alan Haungs¹; Sung Jin Kim¹; Alexander Cartwright¹; Wayne Anderson¹; ¹SUNY-Buffalo

4:50 PM Student

FF10, Characterization of Channel/Dielectric Interfacial Trap States in ZnO-Based Thin-Film Transistors by Spectral Response Analysis: *Kimoon Lee*¹; Min Suk Oh²; Gyubaek Lee¹; Chan Ho Park¹; Seongil Im¹; Chi-Sun Hwang³; Sang-Hee Park³; ¹Yonsei University; ²Korea Electronics Technology Institute (KETI); ³Electronics and Telecommunications Research Institute (ETRI)

5:10 PM

FF11, Late News

Session GG: Organic Thin Film and Crystalline Transistors: Devices, Materials and Processing II

Thursday PM
June 25, 2009

Room: Deans Hall II
Location: Pennsylvania State University

Session Chairs: Michael Chabynyc, University of California, Santa Barbara; Alberto Salleo, Stanford University

1:30 PM

GG1, Time-Resolved Electric Force Microscope Studies of Long-Lived Charge Traps in Functionalized Pentacene and Anthradithiophene Transistors: Michael Jaquith¹; Justin Luria¹; John Anthony²; *John Marohn*¹; ¹Cornell University; ²University of Kentucky

2:10 PM

GG2, Controlled p-Doping of Organic Wide Band Gap Materials with Molybdenum Trioxide: *Michael Kroeger*¹; Sami Hamwi²; Jens Meyer²; Thomas Riedl²; Wolfgang Kowalsky²; Antoine Kahn¹; ¹Princeton University; ²Technische Universität Braunschweig

2:30 PM Student

GG3, New Fluorinated Anthradithiophene Derivatives: *Marsha Loth*¹; Sean Parkin¹; John Anthony¹; Marina Feric²; Oana Jurchescu²; David Gundlach²; Thomas Jackson³; ¹University of Kentucky; ²National Institute of Standards and Technology; ³Pennsylvania State University

2:50 PM Student

GG4, Investigations of Charge Transport and Bias Stress in Anisotropic Polythiophene Thin Films Fabricated via Directional Crystallization: *Leslie Jimison*¹; Michael Toney²; Ian McCulloch³; Martin Heeney⁴; Alberto Salleo¹; ¹Stanford University; ²Stanford Synchrotron Radiation Laboratory; ³Imperial College of London; ⁴Queen Mary University of London

3:10 PM Student

GG5, The Effect of Polydispersity on Intermolecular Packing in π -Stacking Conducting Polymer Systems: *Tomasz Young*¹; Rui Zhang¹; Jessica Cooper¹; Courtney Balliet¹; Richard McCullough¹; Tomasz Kowalewski¹; ¹Carnegie Mellon University

3:30 PM Break

3:50 PM

GG6, Halogen Substitution to Improve Crystal Packing and Performance of Soluble Organic Semiconductors: *John Anthony*¹; Balaji Purushothaman¹; Ying Shu¹; Sankar Subramanian¹; Thomas Jackson²; Sung Kyu Park²; David Gundlach²; Oana Jurchescu³; Marina Feric³; ¹University of Kentucky; ²Pennsylvania State University; ³National Institute of Standards and Technology (NIST)

4:10 PM Student

GG7, Transport Anisotropy in Films of Organic n-Type Semiconductor with Controlled in-Plane Grain-Boundary Orientation: *Jonathan Rivnay*¹; Leslie Jimison¹; Michael Toney²; Antonio Facchetti³; Alberto Salleo¹; ¹Stanford University; ²Stanford Synchrotron Radiation Laboratory; ³Polyera Corporation

4:30 PM

GG8, Functionalized Tetrafluorotetracenes: Synthesis and Characterization of New Materials for OTFTs: *Adolphus Jones*¹; Oana Jurchescu²; Marina Feric²; David Gundlach²; John Anthony¹; ¹University of Kentucky; ²National Institute of Standards and Technology

4:50 PM Student

GG9, Light-Induced Trap Release Probed in Polycrystalline Pentacene Films by Time-Resolved Electric Force Microscopy: *Justin Luria*¹; John Marohn¹; Michael Jacquith¹; ¹Cornell University

5:10 PM

GG10, Late News

Session HH: Spin-Dependent (or Spintronic) Electronic Materials

Thursday PM
June 25, 2009

Room: 205
Location: Pennsylvania State University

Session Chairs: Xinyu Liu, University of Notre Dame; Bruce Wessels, Northwestern University

1:30 PM Invited

HH1, Efficient Room Temperature Spin Filter Based on a Non-Magnetic Semiconductor at Zero Magnetic Field: X. Wang¹; I. Buyanova¹; F. Zhao²; D. Lagarde²; A. Balocchi²; X. Marie²; C. Tu³; J. Harmand⁴; *Weimin Chen*¹; ¹Linköping University; ²University of Toulouse; ³University of California; ⁴LPN

2:10 PM

HH2, MCD Investigation on Mn Doped CdSe Quantum Ribbons: *Xinyu Liu*¹; Shaoping Shen¹; Kritsanu Tivakornsasithorn¹; Jacek Furdyna¹; Margaret Dobrowolska¹; Jung Ho Yu²; Jin Joo²; Dong Won Lee²; Jae Sung Son²; Taeghwan Hyeon²; Jiwon Park²; Young-Woon Kim²; ¹University of Notre Dame; ²Seoul National University

2:30 PM

HH3, Multiple Magnetic States in Silicon Carbide Diluted Magnetic Semiconductors: *Andrei Los*¹; Victor Los²; Andrei Timoshevskii²; ¹Freescale Semiconductor Inc. and ISS. Ltd; ²Institute of Magnetism, National Academy of Science of Ukraine

2:50 PM

HH4, Late News

3:10 PM Break

3:30 PM Invited

HH5, Antiferromagnetic Interlayer Exchange Couplings in Ga_{1-x}Mn_xAs/GaAs Diluted Ferromagnetic Semiconductor Multilayers: *Jae-Ho Chung*¹; Sun Jae Chung¹; Sanghoon Lee¹; Brian Kirby²; Julie Borchers²; Yong-Jin Cho³; Xinyu Liu³; Jacek Furdyna³; ¹Korea University; ²National Institute of Standards and Technology; ³University of Notre Dame

4:10 PM Student

HH6, Magnetotransport Measurements on In_{1-x}Mn_xSb Ferromagnetic Semiconductor Alloys: *Nidhi Parashar*¹; Nikhil Rangaraju¹; Bruce Wessels¹; ¹Northwestern University

4:30 PM Student

HH7, Engineering the Interlayer Exchange Interaction between MnAs and (Ga,Mn)As: *Mark Wilson*¹; Meng Zhu¹; Roberto Myers²; David Awschalom²; Peter Schiffer¹; Nitin Samarth¹; ¹Pennsylvania State University; ²University of California-Santa Barbara

4:50 PM

HH8, Late News

5:10 PM

HH9, Late News

Session II: Graphene II

Thursday PM
June 25, 2009

Room: 206
Location: Pennsylvania State University

Session Chairs: Debdeep Jena, University of Notre Dame; Huili (Grace) Xing, University of Notre Dame

1:30 PM Invited

II1, Influence of Edges on the Morphology, Electronic Structure and Magnetism in Graphene Sheets and Nanoribbons: *Vivek Shenoy*¹; ¹Brown University

2:10 PM Student

II2, Thermal Conduction in Graphene and Graphene Multilayers: *Suchismita Ghosh*¹; Irene Calizo¹; Evgenii P. Pokatilov¹; Denis Nika¹; Desalegne Teweldebrhan¹; Alexander A. Balandin¹; Wenzhong Bao²; Feng Miao²; Chun Ning Lau²; ¹Department of Electrical Engineering and Materials Science and Engineering Program, University of California Riverside; ²Department of Physics and Astronomy, University of California Riverside

2:30 PM Student

II3, Current Saturation and High-Field Transport in Graphene: *Tian Fang*¹; Aniruddha Konar¹; Kristof Tahy¹; Xiangning Luo¹; Huili Xing¹; Debdeep Jena¹; ¹University of Notre Dame

2:50 PM Student

II4, High-Field Characteristics of Top-Gated Epitaxial Graphene Field-Effect Transistors: *David Shilling*¹; Kristof Tahy¹; Xiangning Luo¹; Huili (Grace) Xing¹; Debdeep Jena¹; Luxmi Luxmi²; Randall Feenstra²; ¹University of Notre Dame; ²Carnegie Mellon University

3:10 PM Break

3:30 PM Student

II5, Graphene Field-Effect Transistors Formed on Semi-Insulating 4H-SiC: *Konishi Keita*¹; Yoh Kanji¹; Hibino Hiroki²; ¹Hokkaido University/Research Center for Integrated Quantum Electronics; ²NTT Basic Research Laboratories

3:50 PM

II6, Epitaxial Graphene: Predicting Carrier Mobility Using Raman Spectroscopy: *Joshua Robinson*¹; Maxwell Wetherington¹; Randal Cavlero¹; Mark Fanton¹; Eric Frantz¹; David Snyder¹; Joseph Tedesco²; Brenda Van Mill²; Paul Campbell²; Glenn Jernigan²; Rachel Myers-Ward²; Charles Eddy²; D. Gaskill²; ¹Pennsylvania State University; ²Naval Research Laboratory

4:10 PM Student

II7, Discrepancies in Calculating Mobility in 2D Graphene and Graphene Nanoribbon FETs: *Kristof Tahy*¹; Debdeep Jena¹; Huili Xing¹; ¹University of Notre Dame

4:30 PM Student

II8, Epitaxial Graphene Micro-Bridges: *Shriram Shivaraman*¹; Xun Yu¹; Robert Barton¹; Jonathan Alden¹; Lihong Herman¹; MVS Chandrashekar¹; Jiwoong Park¹; Jeevak Parpia¹; Harold Craighead¹; Paul McEuen¹; Michael Spencer¹; ¹Cornell University

4:50 PM

II9, Stress and Disorder in Epitaxial Graphene/SiC by Raman Spectroscopy: *M.V.S. Chandrashekar*¹; Virgil Shields¹; Shriram Shivaraman¹; Michael Spencer¹; ¹Cornell University

5:10 PM

II10, Late News

Session JJ: III-Nitride: Indium Nitride

Thursday PM
June 25, 2009

Room: 207
Location: Pennsylvania State University

Session Chair: George Wang, Sandia National Laboratories

1:30 PM

JJ1, Multiple Mobility Channel Electron Transport Properties in InN Grown by MBE: *Kejia Wang*¹; Yu Cao¹; Shaoping Shen¹; Zhiguo Ge¹; Malgorzata Dobrowolska-Furdyna¹; Debdeep Jena¹; ¹University of Notre Dame

1:50 PM

JJ2, Auger Recombination and Photoluminescence in Mg-Doped InN: Chito Kendrick¹; Maurice Cheung²; Alexander Cartwright²; Young Wook Song¹; Roger Reeves³; Timothy Veal³; Philip King³; *Steven Durbin*¹; Christopher McConville³; ¹University of Canterbury; ²University at Buffalo, SUNY; ³University of Warwick

2:10 PM Student

JJ3, Adducts Formation in MOCVD Growth of InAlN: Growth Pressure Dependence: *Mikiyasu Tanaka*¹; Masatomo Yamamoto¹; Ting-Ting Kang¹; Akihiro Hashimoto¹; Akio Yamamoto¹; ¹University of Fukui

2:30 PM Student

JJ4, Selective Area Growth of InN Nano-Crystals on Pt-Mask Patterned Sapphire (0001) Substrate by RF-MBE: *Junpei Kamimura*¹; Katsumi Kishino¹; Akihiko Kikuchi¹; ¹Sophia University

2:50 PM Student

JJ5, Pt Catalyst-Assisted Metalorganic Vapor Phase Epitaxy of InN: *Kohei Sasamoto*¹; Ken-ich Sugita¹; Akihiro Hashimoto¹; Akio Yamamoto¹; ¹University of Fukui

3:10 PM Break

Session KK: III-Nitride: Nanostructures

Thursday PM
June 25, 2009

Room: 207
Location: Pennsylvania State University

Session Chair: Huili (Grace) Xing, University of Notre Dame

3:30 PM

KK1, Nanoribbon AlN/GaN HFETs: Towards Enhancement Mode Devices: *Tom Zimmermann*¹; Yu Cao¹; Xiangning Luo¹; Guangle Zhou¹; Tom Kosel¹; Debdeep Jena¹; Huili (Grace) Xing¹; ¹University of Notre Dame

3:50 PM Student

KK2, OMVPE Growth and Characterization of III-Nitride Nanorod LEDs: *Isaac Wildeson*¹; David Ewoldt¹; Robert Colby¹; Zhiwen Liang¹; Dmitri Zakharov¹; R. Edwin Garcia¹; Eric Stach¹; Timothy Sands¹; ¹Purdue University

4:10 PM

KK3, Position Dependent, above and below Band Gap Photoconductivity in GaN Nanowire Photo-Gated FETs: *Aric Sanders*¹; Norman Sanford¹; Paul Blanchard¹; John Schlager¹; Kris Bertness¹; Lorelle Mansfield¹; Christopher Dodson¹; ¹National Institute of Standards and Technology

4:30 PM

KK4, Control of the Growth Kinetics of GaN(11-22) for the Synthesis of GaN/AlN Nanostructures with Reduced Internal Electric Field: Lise Lahourcade¹; Julien Renard¹; Prem Kandaswamy¹; Marie-Pierre Chauvat²; Pierre Ruterana²; Bruno Gayral¹; *Eva Monroy*¹; ¹CEA-Grenoble; ²CNRS-ENSICAEN

4:50 PM

KK5, Late News

5:10 PM

KK6, Late News

Session LL: III-Nitride: Optical Devices II

Thursday PM
June 25, 2009

Room: 208
Location: Pennsylvania State University

Session Chairs: Russell Dupuis, Georgia Institute of Technology; Andrew Allerman, Sandia National Laboratories

1:30 PM Student

LL1, Efficiency Limitations of Green GaInN/GaN Light Emitting Diodes under High Excitation: *Wei Zhao*¹; Yong Xia¹; Mingwei Zhu¹; Yufeng Li¹; Theeradetch Detchprohm¹; Christian Wetzel¹; ¹Rensselaer Polytechnic Institute

1:50 PM Student

LL2, Barrier Effect on Hole Transport and Carrier Distribution in InGaN/GaN Multiple Quantum Well Visible Light-Emitting Diodes: *Zachary Lochner*¹; Jianping Liu¹; Jae-Hyun Ryou¹; P. Doug Yoder¹; Russell Dupuis¹; ¹Georgia Institute of Technology

2:10 PM

LL3, Effect of MOCVD Growth Temperature on the Optical and Structural Properties of InGaN Quantum Well Structures: *Mary Crawford*¹; Daniel Koleske¹; Stephen Lee¹; Andrew Armstrong¹; Karl Westlake¹; Nancy Missert¹; Mary Miller¹; Karen Cross¹; ¹Sandia National Laboratories

2:30 PM Student

LL4, Device Performance of Fabricated Yellow Emitting GaInN/GaN LED on C-Plane Bulk GaN Substrate: *Wenting Hou*¹; Wei Zhao¹; Mingwei Zhu¹; Theeradetch Detchprohm¹; Christian Wetzel¹; ¹Rensselaer Polytechnic Institute

2:50 PM Student

LL5, Well Width Study of InGaN Multiple Quantum Well Structures for Blue-Green Laser Diodes: *Veit Hoffmann*¹; Arne Knauer¹; Casten Netzell¹; Ute Zeimer¹; Hans Wenzel¹; Sven Einfeldt¹; Markus Weyers¹; Günther Tränkle¹; Jan Robert van Look²; Michael Kneissl²; ¹Ferdinand-Braun-Institut für Höchstfrequenztechnik; ²Technische Universität Berlin

3:10 PM Break

Session MM:

III-Nitride: MOCVD Growth and Pseudo-Substrates

Thursday PM
June 25, 2009

Room: 208
Location: Pennsylvania State University

Session Chair: Russell Dupuis, Georgia Institute of Technology

3:30 PM

MM1, Dislocation Reduction in GaN Epilayers on Sapphire and Silicon Using a Self-Assembled Monolayer of Silica Microspheres: *Qiming Li*¹; Jeffrey Figiel¹; George Wang¹; ¹Sandia National Laboratories

3:50 PM Student

MM2, High Pressure MOVPE Having High-Speed Switching Valves for the Realization of High Quality AlGaInN at Low Temperature: *Kentaro Nagamatsu*¹; Daisuke Iida¹; Kenichiro Takeda¹; Kensuke Nagata¹; Toshiaki Asai¹; Yoshinori Oshimura¹; Motoaki Iwaya¹; Satoshi Kamiyama¹; Hiroshi Amano¹; Isamu Akasaki¹; ¹Meijo University

4:10 PM

MM3, Device Applications of GaN Lateral Polarity Junctions: *Ramón Collazo*¹; Jinqiao Xie²; Anthony Rice¹; James Tweedie¹; Rafael Dalmau²; Zlatko Sitar¹; ¹North Carolina State University; ²HexaTech, Inc.

4:30 PM Student

MM4, Realization of Full Wafer Low Dislocation Density Al_{0.25}Ga_{0.75}N on AlN/Sapphire Using Facet-Controlled Epitaxial Lateral Overgrowth: *Kenichiro Takeda*¹; Fumiaki Mori¹; Motoaki Iwaya¹; Satoshi Kamiyama¹; Hiroshi Amano¹; Isamu Akasaki¹; ¹Meijo University

4:50 PM

MM5, Growth of GaN through Confined Epitaxy: Improving Materials, Enabling Devices: *Jennifer Hite*¹; M. Mastro¹; C. Eddy¹; M. Twigg¹; Y. Picard¹; O. Glembocki¹; ¹Naval Research Laboratory

5:10 PM

MM6, Growth Mechanism of AlN/Sapphire Grown by Vapor Phase Epitaxy Using Al and Li₃N: *Yoshihiro Kangawa*¹; Toshihiko Nagano²; Tetsuya Ezaki²; Noriyuki Kuwano²; Koichi Kakimoto²; ¹Kyushu University, JST PRESTO; ²Kyushu University

PRELIMINARY

THURSDAY
PM

Session NN:

Contacts to Semiconductor Epilayers and Nanowires

Friday AM
June 26, 2009

Room: 106
Location: Pennsylvania State University

Session Chairs: Suzanne Mohney, Pennsylvania State University; Lisa Porter, Carnegie Mellon University

8:20 AM Student

NN1, Size Dependence of Nanowires (NWs) on the Formation of Silicide Contacts to Silicon Nanowire Field-Effect Transistors (SiNW FETs): *Seung-Yong Lee*¹; Dong-Joo Kim¹; Tae-Hong Kim¹; Duk-Won Suh¹; Sang-Kwon Lee¹; ¹Chonbuk National University

8:40 AM Student

NN2, Method for Extracting Schottky Barrier Heights of Contacts to Semiconductor Nanowires: *Nicholas Dellas*¹; Karthik Sarpatwari¹; Sharis Minassian¹; Joan Redwing¹; Theresa Mayer¹; Suzanne Mohney¹; ¹Pennsylvania State University

9:00 AM Student

NN3, Numerical Simulation of Reduced Contact Resistance via Nanoscale Topography at the Metal/Semiconductor Interface: *Brian Downey*¹; Suman Datta¹; Suzanne Mohney¹; ¹Pennsylvania State University

9:20 AM Student

NN4, High Doping Effects on the In-Situ and Ex-Situ Ohmic Contacts to n-InGaAs: *Ashish Baraskar*¹; Mark Wistey¹; Vibhor Jain¹; Uttam Singiseti¹; Greg Burek¹; Brian Thibeault¹; Yong Lee²; Arthur Gossard¹; Mark Rodwell¹; ¹University of California, Santa Barbara; ²Intel Corporation

9:40 AM

NN5, Nanofabrication of Niobium Electrodes for Superconducting Light Emitting Diodes: *Jae-Hoon Huh*¹; Yujiro Hayashi¹; Yasuhiro Idutsu¹; Ikuo Suemune¹; ¹Hokkaido University

10:00 AM Break

10:20 AM Student

NN6, The Role of Interfacial Oxidation on the Long-Term Stability of Ni-Based Ohmic Contacts to n-Type SiC: *Ariel Virshup*¹; Dorothy Lukco²; Kristina Buchholtz³; Anita Lloyd Spetz³; Lisa Porter¹; ¹Carnegie Mellon University; ²ASRC Aerospace Corporation; ³Linkoping University

10:40 AM Student

NN7, Ohmic Contacts to Implanted (0001)4H-SiC: *Mingyu Li*¹; Z. Chen¹; X. Zhu¹; A. Ahyi¹; T. Isaacs-Smith¹; J. Crofton¹; J. Williams¹; ¹Auburn University

11:00 AM

NN8, Improved n-Type 4H-SiC Schottky Barrier Diodes Using Metal Boride Contacts: *Rani Kumhari*¹; Tom Oder¹; ¹Youngstown State University

11:20 AM Student

NN9, Reduction of the Specific Contact Resistance in p-Type GaN-Based Devices via Polarization Doping: *Jacob Melby*¹; Li Huang¹; Jason Gul¹; Fang Liu¹; Robert Davis¹; Lisa Porter¹; ¹Carnegie Mellon University

11:40 AM

NN10, Electrical Characteristics of Ti/Al Contacts to N-Polar n-Type GaN for Vertical LEDs: Joon-Woo Jeon¹; *Tae-Yeon Seong*¹; Hyunsoo Kim²; Jae-Hyun Ryou²; Russell D. Dupuis²; ¹Korea University; ²Georgia Institute of Technology

12:00 PM Student

NN11, Characterization of Contact Resistance of Al, Ti, and Ni on High-Quality InN Films Grown by RF-MBE: *Shogo Kikuchi*¹; Narihiko Maeda²; Tomohiro Yamaguchi¹; Yasushi Nanishi¹; ¹Ritsumeikan University; ²NTT Photonics Laboratories

Session OO:

Nanoscale Characterization

Friday AM
June 26, 2009

Room: 108
Location: Pennsylvania State University

Session Chair: Edward Yu, University of California, San Diego

8:20 AM Student

OO1, Influence of InGaAs Well on the Size and Distribution of InAs/GaAs Quantum Dots: *Vaishno Dasika*¹; Rachel Goldman¹; Jin Dong Song²; W. J. Choi¹; N. K. Cho²; J. I. Lee²; ¹University of Michigan; ²Korea Institute of Science and Technology

8:40 AM Student

OO2, Using Scanned Probe Microscopy to Measure Local Electric Field Gradient Fluctuations in Polymers: Showkat Yazdani¹; *Nikolas Hoepker*¹; Seppe Kuehn¹; Roger Loring¹; John Marohn¹; ¹Cornell University

9:00 AM

OO3, Effects of Embedded Dipoles on the Electrical Response of Self-Assembled Monolayers: *Pengpeng Zhang*¹; Orlando Cabarcos¹; Tad Daniel¹; Paul Weiss¹; David Allara¹; ¹The Pennsylvania State University

9:20 AM

OO4, Spatially-Resolved Cathodoluminescence Study of III-Nitride Nanowires: *George Wang*¹; Qiming Li¹; A. Alec Talin¹; Andrew Armstrong¹; M. Eugenia Toimil Molares¹; ¹Sandia National Laboratories

9:40 AM

OO5, Combination of Optical Characterization and In Situ Electron Microscopy: *Min Gao*¹; Wenliang Li¹; Chengyao Li¹; Qing Chen¹; Lian-Mao Peng¹; ¹Peking University

10:00 AM Break

Session PP:

Non-Destructive Testing and In-Situ Control

Friday AM
June 26, 2009

Room: 108
Location: Pennsylvania State University

Session Chair: Kurt Eyink, U.S. Air Force Research Laboratory

10:20 AM

PP1, Characterization of Planar InAs Thin Films by Transmission Electron Microscopy and Spectroscopic Ellipsometry: Krishnamurthy Mahalingam¹; *Kurt Eyink*¹; Marlon Twymann¹; Larry Grazulis¹; Jodi Shoaf¹; ¹Air Force Research Laboratory

10:40 AM Student

PP2, Characterization of Near-Surface Electrical Properties of Multi-Crystalline Silicon Wafers: *Patrick Drummond*¹; Jerzy Ruzyllo¹; ¹Pennsylvania State University

11:00 AM Student

PP3, 1/f Noise Characterization of Si:H Thin Films for Microbolometers: *Myung-Yoon Lee*¹; Hang-Beum Shin¹; David John¹; Nikolas Podraza¹; Thomas Jackson¹; ¹Pennsylvania State University

11:20 AM Student

PP4, Piezoelectric Thin Films for Low Voltage, High Frequency MEMS Transducer Array: *Hyunsoo Kim*¹; Flavio Griggio¹; Insoo Kim¹; Kyusun Choi¹; Richard Tutwiler¹; Susan Trolrier-McKinstry¹; Thomas Jackson¹; ¹Pennsylvania State University

11:40 AM

PP5, Effect of Applied Pressure on the Electrical Properties of Nano-Deformed Materials: *David Vodnick*¹; Ryan Major¹; ¹Hysitron, Inc.

12:00 PM Student

PP6, Electronic Properties of Nanostructured PbTe(In) Films: *Alexandr Dobrovolsky*¹; Ivan Belogorokhov¹; Zinovi Dashevsky²; Vladimir Kasiyan²; Ludmila Ryabova¹; Dmitry Khokhlov¹; ¹M.V.Lomonosov Moscow State University; ²Ben-Gurion University

Session QQ:

Solar Cells - Organic, Hybrid and Inorganic

Friday AM

June 26, 2009

Room: Deans Hall II

Location: Pennsylvania State University

Session Chairs: Christian Wetzel, Rensselaer Polytechnic Institute; Mayank Bulsara, Massachusetts Institute of Technology

8:20 AM

QQ1, Toward Metamorphic Multijunction GaAsP/Si Photovoltaics Grown on Optimized GaP/Si Virtual Substrates Using Anion-Graded GaAs_yP_{1-y} Buffers: *Tyler Grassman*¹; Mark Brenner¹; Andrew Carlin¹; Jeongho Park¹; Srinivasa Rajagopalan¹; Raymond Unocic¹; Ryan Dehoff¹; Michael Mills¹; Hamish Fraser¹; Steven Ringel¹; ¹The Ohio State University

8:40 AM

QQ2, Growth and Characterization of BaSi₂/Si Heterostructure toward Si-Based High-Efficiency Solar Cells: *Yuta Matsumoto*¹; Dai Tsukada¹; Ryo Sasaki¹; Michitoshi Takeishi¹; Takanobu Saito¹; Takashi Suemasu¹; ¹Institute of Applied Physics, University of Tsukuba (Suemasu Lab)

9:00 AM

QQ3, Etched Silicon Pillar Array Solar Cells: *Heayoung Yoon*¹; Yu Yuwen¹; Chito Kendrick¹; Greg Barber¹; Thomas Mallouk¹; Joan Redwing¹; Theresa Mayer¹; ¹Pennsylvania State University

9:20 AM

QQ4, Epitaxial Film Silicon Solar Cells Fabricated by Low-Temperature Hot Wire Chemical Vapor Deposition: *David Young*¹; Kirstin Alber¹; Ina Martin¹; Charles Teplin¹; Eugene Iwaniczko¹; Yueqin Xu¹; Anna Duda¹; Paul Stradins¹; Steve Johnston¹; Howard Branz¹; ¹NREL

9:40 AM

QQ5, Microstructural and Electronic Properties of Thin Film Si:H and Ge:H for Uncooled Microbolometer Applications: *Nikolas Podraza*¹; David Saint John¹; Myung-Yoon Lee¹; Hang-Beum Shin¹; Thomas Jackson¹; Robert Collins²; ¹The Pennsylvania State University; ²University of Toledo

10:00 AM Break

10:20 AM

QQ6, Characterizing the Interfacial Composition of Organic Bulk Heterojunction Solar Cells Using Organic Thin-Film Transistor Analogues: *Calvin Chan*¹; David Germack¹; Behrang Hamadani¹; Lee Richter¹; Dean DeLongchamp¹; David Gundlach¹; ¹National Institute of Standards and Technology

10:40 AM

QQ7, Material and Device Requirements for Intermediate-Band Solar Cells: Albert Lin¹; Weiming Wang¹; *Jamie Phillips*¹; ¹University of Michigan

11:00 AM

QQ8, Newly Developed Acene-Based Organic Semiconductors for Solar Cell Applications: *Zhong Li*¹; John Anthony¹; Karthik Shankar²; Craig Grimes²; Stephanie Lee³; Lynn Loo³; ¹University of Kentucky; ²Pennsylvania State University; ³Princeton University

11:20 AM

QQ9, Investigation of the Photo Response in Blended Organic Photovoltaic Films Using Conductive-Tip Atomic Force Microscopy: *Behrang Hamadani*¹; Suyong Jung¹; Nikolai Zhitenev¹; ¹National Institute of Standards and Technology

11:40 AM

QQ10, Late News

12:00 PM

QQ11, Late News

Session RR: Silicon Carbide

Friday AM

June 26, 2009

Room: 206

Location: Pennsylvania State University

Session Chairs: Robert Stahlbush, Naval Research Laboratory; Michael Dudley, State University of New York at Stony Brook

8:20 AM Student

RR1, MOS Characteristics of (000-1) 4H-SiC: *Zengjun Chen*¹; Xingguang Zhu¹; Mingyu Li¹; A.C. Ahyi¹; John Williams¹; ¹Auburn University

8:40 AM

RR2, Study of 4H-SiC/SiO₂ Interface Traps in n-Type Nitrided MOS Capacitors Using Thermally Stimulated Current and Capacitance Voltage Methods: *Peter Muzykov*¹; Sarit Dhar²; Sei-Hyung Ryu²; Anant Agarwal²; Tangali Sudarshan¹; ¹University of South Carolina; ²Cree, Inc.

9:00 AM Student

RR3, Nucleation Mechanism of Polytype Transformation in 6H and 15R SiC Crystals: *Yu Zhang*¹; Hui Chen¹; Ning Zhang¹; Michael Dudley¹; James Edgar²; K. Grasza³; Emil Tymicki³; Yimei Zhu⁴; ¹Stony Brook University; ²Kansas State University; ³Institute of Electronic Materials Technology; ⁴Brookhaven National Laboratory

9:20 AM Student

RR4, The Physical Distribution of Defects in 4H SiC MOS Structures: *Brad Bittel*¹; Corey Cochrane¹; Patrick Lenahan¹; Jody Fronheiser²; Kevin Matocha²; Aivars Lelis³; ¹Pennsylvania State University; ²GE Global Research; ³US Army Research Laboratory

9:40 AM

RR5, MOCVD HfO₂/SiO₂ Gate Stacks for Improved Reliability in SiC MOSFET's: *Nick Sbrockey*¹; Mvs Chandrashekar²; Elane Coleman¹; Michael Spencer²; Gary Tompa¹; ¹Structured Materials Industries, Inc.; ²Cornell University

10:00 AM Break

10:20 AM

RR6, On the Driving Force for Shockley Stacking Fault Motion in Hexagonal SiC: *Joshua Caldwell*¹; Mario Ancona¹; Robert Stahlbush¹; Orest Glembocki¹; Karl Hobart¹; Kendrick Liu¹; ¹Naval Research Laboratory

10:40 AM Student

RR7, Nucleation Mechanism of Dislocation Half-Loop Arrays in 4H-Silicon Carbide Homo-Epitaxy: *Ning Zhang*¹; Yu Zhang¹; Michael Dudley¹; Robert Stahlbush²; ¹The State University of New York at Stony Brook; ²Naval Research Laboratory

11:00 AM Student

RR8, Characterization of 4H-SiC Schottky and p-n Diodes Using Thermally Stimulated Current: *Marko Tadjer*¹; Robert Stahlbush²; Karl Hobart²; Fritz Kub²; Akin Akturk¹; Sarah Haney³; Brett Hull³; ¹University of Maryland; ²Naval Research Laboratory; ³CREE, Inc.

11:20 AM Student

RR9, Generation of Dislocations and Precipitates in Heavily Al-Doped 4H-SiC Epitaxial Layers Grown by the Low-Temperature Halo-Carbon Method: *Hrishikesh Das*¹; Bharat Krishnan¹; Siva Kotamraju¹; Yaroslav Koshka¹; ¹Mississippi State University

11:40 AM

RR10, Application of CL/EBIC Techniques for Evaluation of Influence of Crystallographic Defects on Electrical Properties in 4H-SiC Epitaxial Layers: *Serguei Maximenko*¹; Jaime Freitas, Jr.¹; ¹Naval Research Laboratory

12:00 PM

RR11, Surface Related Defect in 4H SiC Substrates: *Mary Ellen Zvanut*¹; Sarah Thomas¹; ¹University of Alabama at Birmingham

Session SS:

III-Nitride: Characterization of Defects

Friday AM
June 26, 2009

Room: 207
Location: Pennsylvania State University

Session Chair: Joan Redwing, Pennsylvania State University

8:20 AM

SS1, Quantitative and Depth-Resolved Defect Spectroscopy in InGaN/GaN Heterostructures: *Andrew Armstrong*¹; Mary Crawford¹; Daniel Koleske¹; ¹Sandia National Laboratories

8:40 AM Student

SS2, Characterization of Traps in N-Face AlGaIn/GaN Materials and Devices Using Deep Level Optical Spectroscopy: *Tony Homan*¹; Aaron Arehart¹; Andrew Malonis¹; Man Hoi Wong²; Yi Pei²; Christy Poblentz²; Andrea Corrion²; Rongming Chu²; Umesh Mishra²; James Speck²; Steven Ringel¹; ¹The Ohio State University; ²University of California, Santa Barbara

9:00 AM Student

SS3, Evidence of a Donor Trap at the Negative Polarization Interface of a Ga-Face GaN / InGaIn / GaN Quantum Well: *Christopher Schaake*¹; Brian Swenson¹; David Brown¹; Stacia Keller¹; James Speck¹; Umesh Mishra¹; ¹University of California, Santa Barbara

9:20 AM Student

SS4, Photo-Assisted High-Frequency Capacitance-Voltage Characterization of Interface States Density in Si₃N₄/GaN Metal-Insulator-Semiconductor Interfaces: *Brian Swenson*¹; Umesh Mishra¹; ¹University of California at Santa Barbara

9:40 AM Student

SS5, Elastic Buckling of AlN Ribbons on Elastomeric Substrate: *Huichan Seo*¹; Ivan Petrov¹; Hyejin Jeong¹; Patrick Chapman¹; Kyekyoon Kim¹; ¹University of Illinois at Urbana-Champaign

10:00 AM Break

Session TT:

III-Nitride: Growth and Characterization of Optical Devices

Friday AM
June 26, 2009

Room: 207
Location: Pennsylvania State University

Session Chair: Joan Redwing, Pennsylvania State University

10:20 AM

TT1, Characterization of Recessed-Gate AlGaIn/GaN HEMTs as a Function of Etch Depth: *Travis Anderson*¹; Marko Tadjer²; Michael Mastro¹; Karl Hobart¹; Fritz Kub¹; ¹Naval Research Laboratory; ²University of Maryland

10:40 AM Student

TT2, AlGaIn/GaN HFET Structures Grown on Vicinal Bulk GaN: *Judith Grenko*¹; T. Paskova²; A. Hanser²; E. Preble²; K. Evans²; C. Ebert³; C. L. Reynolds, Jr.¹; M. A. L. Johnson¹; ¹NCSU; ²Kyma Technologies, Inc.; ³Veeco Turbodisc

11:00 AM Student

TT3, Study of Growth Kinetics and Characterization of AlGaIn Grown by Ammonia-Based Metal-Organic Molecular Beam Epitaxy: *Daniel Billingsley*¹; Walter Henderson¹; David Pritchett¹; William Doolittle¹; ¹Georgia Institute of Technology

11:20 AM Student

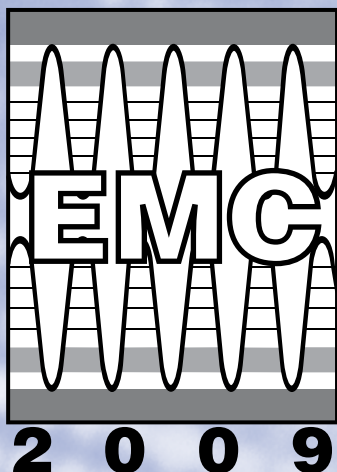
TT4, Interface Analysis of Ti/Al/Ti/Au Ohmic Contacts with Regrown n+-GaIn Layers Using Molecular Beam Epitaxy: *Huichan Seo*¹; Shankar Sivaramakrishnan¹; Jian-Min Zuo¹; Patrick Chapman¹; Kyekyoon Kim¹; ¹University of Illinois at Urbana-Champaign

11:40 AM Student

TT5, Growth and Characterization of Gallium Nitride on Magnesium Calcium Oxide: *Andrew Gerger*¹; Brent Gila¹; Cammy Abernathy¹; ¹University of Florida

12:00 PM

TT6, Late News



Questions?

Registration

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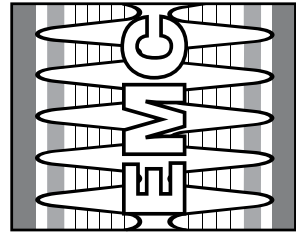


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