PRELIMINARY SCHEDULE OF EVENTS
48TH TMS ELECTRONIC MATERIALS CONFERENCE

TUESDAY, JUNE 27, 2006

Registration.....3:00 PM-5:00 PM
Location.....Penn Stater Conference Center Lobby

WEDNESDAY, JUNE 28, 2006

Registration.....7:00 AM-5:00 PM
Location.....Penn Stater Conference Center Lobby

Exhibition.....9:30 AM-4:00 PM & 6:00 PM-8:00 PM
Location.....Presidents Hall I & II - Main Level

Welcome Reception.....6:00 PM-8:00 PM
Location.....Presidents Hall III & IV - Main Level

SESSIONS

Plenary Session.....8:20 AM
(Including Student Awards Ceremony)
Location.....Presidents Hall III & IV

Session A. ZnO Nanomaterials.....10:00 AM

Session B. III-Nitride Optoelectronic Devices.....10:00 AM

Session C. Narrow Bandgap Semiconductors.....10:00 AM

Session D. Fun with Nanostructures.....10:00 AM

Session E. Nitride and Oxide Nanowires.....10:00 AM

Session F. Directed Assembly of Nanostructures.....1:30 PM

Session G. Quantum Dot Growth.....3:30 PM

Session H. III-Nitride Electronic Devices.....1:30 PM

Session I. Materials Integration: Wafer Bonding and Alternative Substrates.....1:30 PM

Session J. Nanotubes.....1:30 PM

Session K. Chemical and Biological Sensors I.....1:30 PM

Session L. Contacts to Organic Thin Film Transistors.....3:30 PM

Session M. Oxide Thin Film Integration I.....1:30 PM

Session N. GaN Processing.....1:30 PM

Session O. Semiconductors: Processing and Oxidation.....3:30 PM

THURSDAY, JUNE 29, 2006

Registration.....7:00 AM-4:00 PM
Location.....Penn Stater Conference Center Lobby

Exhibition.....9:00 AM-3:30 PM
Location.....Presidents Hall I & II - Main Level

Banquet.....6:00 PM-9:00 PM
Location.....Beaver Stadium

SESSIONS

Session P. Device Aspects for ZnO.....8:20 AM

Session Q. III-Nitride MOCVD Growth.....8:20 AM

Session R. Lattice Engineered Epitaxy of III-V and IV Semiconductors.....8:20 AM

Session S. SiC: Growth and Interface Studies.....8:20 AM

Session T. Materials and Processing for Organic Transistors.....8:20 AM

Session U. Oxide Thin Film Integration II.....8:20 AM

Session V. Non-Destructive Testing and In-Situ Monitoring and Control.....8:20 AM

Session W. ZnO Growth.....1:30 PM

Session X. MBE Growth of Group III-Nitrides.....1:30 PM

Session Y. Epitaxy for Devices.....1:30 PM

Session Z. SiC: Characterization.....1:30 PM

Session AA. Organic/Inorganic Hybrid Photovoltaics.....1:30 PM

Session BB. Oxide Thin Film Integration III.....1:30 PM

Session CC. Dilute Nitride Semiconductors.....1:30 PM

FRIDAY, JUNE 30, 2006

Registration.....7:00 AM-10:00 AM
Location.....Penn Stater Conference Center Lobby

SESSIONS

Session DD. P-Type Doping and Electroluminescence in ZnO.....8:20 AM

Session EE. Contacts to III-Nitrides.....8:20 AM

Session FF. Indium Nitride.....8:20 AM

Session GG. Silicon and Germanium Nanowires.....8:20 AM

Session HH. Molecular Electronics: Devices, Materials and Contacts.....8:20 AM

Session II. Trapping and Charge Transport in Organic Transistors.....8:20 AM

Session JJ. Spintronic Materials.....8:20 AM

Session KK. GaN Characterization.....1:30 PM

Session LL. Compound Semiconductor Nanowires.....1:30 PM

Session MM. Chemical and Biological Sensors II.....1:30 PM

EMC Plenary Lecture/Student Awards

Ceremony: 8:20 AM

Room: Presidents Hall III & IV

Plenary Speaker: Arthur C. Gossard, University of California, Santa Barbara

Topic: Growth and Uses of Metal/Semiconductor Heterostructures

Break: 9:20 AM - 10:00 AM

Session A: ZnO Nanomaterials

Wednesday AM Room: Presidents Hall III
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Yicheng Lu, Rutgers University; David P. Norton, University of Florida

10:00 AM Student
A1, Undoped and Doped ZnO Nanorods: *Jinkyoung Yoo*[1]; Gyu-Chul Yi[1]; [1]POSTECH

10:20 AM Student
A2, Spatially-Dependent Optical Emission from ZnO Nanotips on $Al_2O_3$3 and Si Substrates: *Lei Fang*[1]; Yuri Strzhemechny[2]; Michael J. Hetzer[1]; Leonard J. Brillson[1]; H. Chen[3]; Yicheng Lu[3]; [1]Ohio State University; [2]Texas Christian University; [3]Rutgers University

10:40 AM Student
A3, Selective Growth of Zinc Oxide Nanowires Grown from Thin Film Multilayer Structure for Shadow Lithography: Bing Hu[1]; Pawan Tyagi[1]; *Bruce J. Hinds*[1]; [1]University of Kentucky

11:00 AM
A4, Piezoelectric and Electrical Properties of Solution Grown ZnO Nanorods: *David Scrymgeour*[1]; Thomas L. Sounart[1]; Neil C. Simmons[1]; Yun-Ju Lee[1]; Paul G. Clem[1]; Julia W. P. Hsu[1]; [1]Sandia National Laboratory

11:20 AM
A5, ZnO/ZnMgO Quantum Wells Embedded in Nanorods: *Andrey Bakin*[1]; Abdel-Hamid El Shaer[1]; Augustine Che Mofor[1]; Muhamed Aid Mansur Al-Suleiman[1]; Sergey Ivanov[2]; Johannis Stoimenos[3]; Andreas Waag[1]; [1]Technical University Braunschweig; [2]Ioffe Physico-Technical Institute of RAS; [3]Aristotele University

11:40 AM
A6, Catalyst-Free Two-Step Growth of Quasi-Aligned ZnMgO Nanorods and Their Properties: *Liping Zhu*[1]; Mingjia Zhi[1]; Zhizhen Ye[1]; [1]Zhejiang University

Session B:
III-Nitride Optoelectronic Devices

Wednesday AM Room: Presidents Hall IV
June 28, 2006 Location: Pennsylvania State University

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

10:00 AM Student
B1, Growth and Characterization of High-Performance III-N Avalanche Photodiodes Grown on Bulk GaN Substrates: *Jae Limb*[1]; Dongwon Yoo[1]; Jae-Hyun Ryou[1]; Wonseok Lee[1]; Shyh-Chiang Shen[1]; Meredith Reed[2]; Charles J. Collins[2]; Michael Wraback[2]; Drew Hanser[3]; Edward Preble[3]; N. Mark Williams[3]; Keith Evans[3]; Russell Dupuis[1]; [1]Georgia Institute of Technology; [2]US Army Research Laboratory; [3]Kyma Technologies, Inc.

10:20 AM Student
B2, MOCVD Growth of AlGaN Heterostructures and UV LEDs on Bulk AlN Substrates: *Zaiyuan Ren*[1]; Qian Sun[1]; Soon-Yong Kwon[1]; Jung Han[1]; Kristina Davitt[2]; Yoon-Kyu Song[2]; Arto Nurmikko[2]; Wayne Liu[3]; Joe Smart[3]; Leo Schowalter[3]; [1]Yale University; [2]Brown University; [3]Crystal IS Inc.

10:40 AM Student
B3, Characterization of Green LED Structures with *p*-InGaN and *p*-GaN Layers: *Wonseok Lee*[1]; Jae Limb[1]; Jae-Hyun Ryou[1]; Dongwon Yoo[1]; Michael Stevens[2]; Sridhar Srinivasan[2]; Fernando Ponce[2]; Russell Dupuis[1]; [1]Georgia Institute of Technology; [2]Arizona State University

11:00 AM Student
B4, High Light-Extraction Efficiency in GaInN Light-Emitting Diode with Pyramid Reflector: *J.-Q. Xi*[1]; Alyssa J. Pasquale[1]; Jong Kyu Kim[1]; Hong Luo[1]; E. F. Schubert[1]; [1]Rensselaer Polytechnic Institute

11:20 AM Student
B5, Temperature Dependence of the Quantum Efficiency in Green and Deep Green GaInN/GaN Light Emitting Diodes: *Yufeng Li*[1]; W. Zhao[1]; Y. Xia[1]; M. Zhu[1]; T. Detchprohm[1]; E. F. Schubert[1]; C. Wetzel[1]; [1]Rensselaer Polytechnic Institute

11:40 AM Student
B6, Nitride-Based Type-II InGaN-GaNAs 'W' Quantum Well Gain Media at 420-550 nm: *Ronald A. Arif*[1]; Yik-Khoon Ee[1]; Nelson Tansu[1]; [1]Lehigh University

Session C:
Narrow Bandgap Semiconductors

Wednesday AM Room: Conference Room 106
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Brian R. Bennett, Naval Research Laboratory; L. Ralph Dawson, University of New Mexico

10:00 AM
C1, Carrier Recombination Kinetics in 2.3-2.4 μM InGaAsSb/AlGaAsSb QW Laser Heterostructures: *Dmitri Donetsky*[1]; Leon Shterengas[1]; George Kim[2]; Gregory Belenky[1]; Alex Gourevitch[1]; David Westerfeld[3]; Ray

Martinelli[2]; [1]Stony Brook University; [2]Sarnoff Corporation; [3]Power Photonic Corporation

10:20 AM
C2, Electron and Hole Energy Relaxation in InGaAsSb/InAs/InGaSb Type-II QW Laser Heterostructures: Leon Shterengas[1]; Andrew Ongstad[2]; Ron Kaspi[2]; Serge Suchalkin[1]; Gregory Belenky[1]; Michail Kisin[1]; *Dmitri Donetsky*[1]; [1]Stony Brook University; [2]Air Force Research Laboratory

10:40 AM
C3, Improved Properties of MOCVD Grown InAs/GaSb Superlattices on (001) GaSb Substrate by Introducing an InAsSb Layer at the Interfaces: *Xue-Bing Zhang*[1]; C. Xu[2]; Shin Mou[2]; Jae-Hyun Ryou[1]; K. C. Hsieh[2]; Shun-Lien Chuang[2]; Russell Dupuis[1]; [1]Georgia Institute of Technology; [2]University of Illinois at Urbana-Champaign

11:00 AM Student
C4, Effects of Ga and Sb Precursor Chemistry on the Alloy Composition in Pseudomorphically Strained GaAsSb Films Grown via Metalorganic Vapor Phase Epitaxy: *A. A. Khandekar*[1]; J. Y. Yeh[1]; L. J. Mawst[1]; Xueyan Song[1]; S. E. Babcock[1]; T. F. Kuech[1]; [1]University of Wisconsin

11:20 AM Student
C5, Island Size and Development of Systematic Crystallographic Tilt during Growth of InAs on (100) GaAs Substrates: *Suryanarayanan Ganesan*[1]; Anish A. Khandekar[1]; Manish Rathi[1]; Joshua Webb[1]; Thomas F. Kuech[1]; Susan E. Babcock[1]; [1]University of Wisconsin-Madison

11:40 AM Student
C6, Growth Mechanisms for InAs Deposition on Low Index GaAs Substrates by Metalorganic Vapor Phase Epitaxy: *A. A. Khandekar*[1]; J. Webb[1]; G. Suryanarayanan[1]; M. Rathi[1]; S. Babcock[1]; T. F. Kuech[1]; [1]University of Wisconsin-Madison

Session D: Fun with Nanostructures

Wednesday AM Room: Conference Room 208
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Glenn S. Solomon, National Institute of Standards and Technology; Ben Shanabrook, Naval Research Laboratory

10:00 AM
D1, Structural and Optical Studies of Quantum Dot Molecules: *Valeria G. Stoleru*[1]; Anup Pancholi[1]; William Kerr[1]; Hassan Shah[1]; [1]University of Delaware

10:20 AM Student
D2, Fluorescence Intermittency of Localized Excitons in CdSe Nanowires: *Vladimir Protasenko*[1]; Masaru Kuno[1]; [1]University of Notre Dame

10:40 AM
D3, Discrimination of Isoelectronic Centers and Type-II Quantum Dots with ZnTe Embedded in ZnSe: *Masafumi Jo*[1]; Michiaki Endo[1]; Hidekazu Kumano[1]; Ikuo Suemune[1]; [1]Hokkaido University

11:00 AM
D4, Thermoelectric Properties of Vertically Aligned InAs/GaAs Quantum Dot Superlattices: *Abhishek Yadav*[1]; Kevin Pipe[1]; Weifeng Ye[1]; Rachel S. Goldman[1]; [1]University of Michigan

11:20 AM Student
D5, Fabrication of High Frequency Ultrasound Transducers: *Hyunsoo Kim*[1]; Sungkyu Park[1]; Ioanna Mina[2]; Insoo Kim[3]; S. Bharadwaja[2]; X. Li[4]; Kyusun Choi[3]; Susan Trolier-Mckinstry[2]; Richard Tutwiler[5]; Theresa Mayer[4]; Thomas N. Jackson[1]; [1]Pennsylvania State/Center for Thin Film Devices and Materials Research Institute; [2]Pennsylvania State/Material Science and Engineering; [3]Pennsylvania State/Computer Science and Engineering; [4]Pennsylvania State/Electrical Engineering; [5]Pennsylvania State/Applied Research Laboratory

11:40 AM
D6, Electron Energy Levels in ZnSe:Mn Quantum Dots: *Shailaja Mahamuni*[1]; Amit D. Lad[1]; Shashikant P. Patole[1]; [1]University of Pune

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Session E: Nitride and Oxide Nanowires

Wednesday AM Room: Conference Room 207
June 28, 2006 Location: Pennsylvania State University

Session Chair: Joan M. Redwing, Pennsylvania State University

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10:00 AM
E1, Polarization-Resolved Photoluminescence Study of Isolated GaN Nanowires Grown by Catalyst-Free MBE: *John B. Schlager*[1]; Norman A. Sanford[1]; Kris A. Bertness[1]; Joy M. Barker[1]; Alexana Roshko[1]; Paul T. Blanchard[1]; [1]National Institute of Standards and Technology

10:20 AM
E2, Structural Control and Characterization of GaN Nanowires: *Blake S. Simpkins*[1]; Pehr E. Pehrsson[1]; [1]Naval Research Laboratory

10:40 AM Student
E3, Experimental and Computational Modeling Studies of MOCVD Growth of GaN Nanowires: *Robert A. Burke*[1]; Daniel R. Lamborn[1]; Trevor E. Clark[1]; Elizabeth C. Dickey[1]; Joan M. Redwing[1]; [1]Pennsylvania State University

11:00 AM
E4, Epitaxial Growth and Applications of Aligned GaN Nanowires: *Kyungkon Kim*[1]; Tania Henry[1]; George Cui[1]; Jung Han[1]; Yoon-Kyu Song[2]; Arto V. Nurmikko[2]; [1]Yale University; [2]Brown University

11:20 AM
E5, Growth and Characterization of Vanadium Oxide Nanowires: *Jongsun Maeng*[1]; Takhee Lee[1]; [1]Gwangju Institute of Science and Technology

11:40 AM Student
E6, Integration and Characterization of High Aspect Ratio Ferroelectric Microtubes Fabricated by Vacuum Infiltration of Macroporous Silicon Templates: *Xin Li*[1]; S. S. N. Bharadwaja[1]; N. Bassiri Gharb[1]; E. Hong[1]; M. Olszta[1]; F. Roozeboom[1]; Theresa S. Mayer[1]; Susan Trolier McKinstry[1]; [1]Pennsylvania State University

Session F:
Directed Assembly of Nanostructures

Wednesday PM Room: Presidents Hall III
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Diana Huffaker, University of New Mexico; Ben Shanabrook, Naval Research Laboratory

1:30 PM Student
F1, Selective Growth and Characterization of GaAs Quantum Dots on Patterned Substrate by Utilizing Diblock Copolymer Template: *Joo Hyung Park*[1]; Anish Arun Khandekar[1]; Sang-Min Park[1]; Luke J. Mawst[1]; Thomas F. Kuech[1]; Paul F. Nealey[1]; [1]University of Wisconsin-Madison

1:50 PM Student
F2, Simulation of Thermal-Field Directed Self-Assembly of Epitaxial Quantum Dots: *Chandan Kumar*[1]; Lawrence H. Friedman[1]; [1]Pennsylvania State University

2:10 PM Student
F3, Real-Time Studies of Ga Droplet Formation for the Directed Seeding of Semiconductor Nanopillars: *Weifeng Ye*[1]; Ben L. Cardozo[1]; Xiaojun Weng[2]; John F. Mansfield[1]; Rachel S. Goldman[1]; [1]University of Michigan; [2]Pennsylvania State University

2:30 PM
F4, Self-Assembly of Heterojunction Quantum Dots(HeQuaDs): *Kurt G. Eyink*[1]; David H. Tomich[1]; Jeremey J. Pitz[1]; Krishnamurthy Mahalingam[2]; J. M. Shank[3]; S. Munshi[1]; Bruno Ulrich[4]; Wally Rice[5]; [1]Air Force Research Laboratory; [2]Universal Technology Corporation; [3]Southwestern Ohio Council for Higher Education; [4]Bowling Green University; [5]Wright State University

2:50 PM
F5, Fabrication of Nanometer-Period Gratings on Si Using HSQ Etching Mask: *Niu Jin*[1]; Vipan Kumar[1]; Sookyung Choi[1]; Mark Shannon[1]; Ilesanmi Adesida[1]; [1]University of Illinois

3:10 PM Break

Session G:
Quantum Dot Growth

Wednesday PM Room: Presidents Hall III
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Ben Shanabrook, Naval Research Laboratory; Diana Huffaker, University of New Mexico

3:30 PM Student
G1, Growth of High Quality Stransky-Krastanov GaSb Quantum Dots on a GaAs Substrate: *Ganesh Balakrishnan*[1]; Shenghong Huang[1]; Arezou Khoshakhlagh[1]; Anitha Jallipalli[1]; Jun Tatebayashi[1]; L. R. Dawson[1]; D. L. Huffaker[1]; [1]University of New Mexico

3:50 PM Student
G2, Characteristics of InGaAs/GaAs(P) Quantum Dot Stacks Grown by MOCVD: *Nam-Heon Kim*[1]; Gene Tsvid[1]; Anish A. Khandekar[1]; Luke J. Mawst[1]; Thomas F. Kuech[1]; Manoj Kanskar[2]; [1]University of Wisconsin-Madison; [2]Alfalight Inc.

4:10 PM
G3, Influence of Strain Modulations in Capping Layers of InAs Quantum Dots with Compressive-InGaAs and Tensile-GaAsN Layer Structures: Wei Zhang[1]; Katsuhiro Uesugi[1]; *Ikuo Suemune*[1]; [1]Hokkaido University

4:30 PM Student
G4, Growth of High Density InAs Quantum Dots by Metalorganic Chemical Vapor Deposition with Periodic Interruption of AsH_3: *Youngsoo Lee*[1]; Eungjin Ahn[1]; Jungsub Kim[1]; Pilkyung Moon[1]; Euijoon Yoon[1]; [1]Seoul National University

4:50 PM
G5, Late News

Session H: III-Nitride Electronic Devices

Wednesday PM Room: Presidents Hall IV
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Russell Dupuis, Georgia Institute of Technology; April S. Brown, Duke University

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1:30 PM
H1, Growth and Characterization of Graded InGaN Heterojunction Bipolar Transistors: Theodore Chung[1]; David Keogh[2]; Dongwon Yoo[1]; *Jae-Hyun Ryou*[1]; Jae Limb[1]; Wonseok Lee[1]; Shyh-Chiang Shen[1]; Peter Asbeck[2]; Russell Dupuis[1]; [1]Georgia Institute of Technology; [2]University of California, San Diego

1:50 PM Student
H2, Device Performance of Full-Vertical GaN *p-i-n* Rectifiers Using Conducting Buffer Layers on SiC Substrates: *Dongwon Yoo*[1]; Jae Boum Limb[1]; Jae-Hyun Ryou[1]; Wonseok Lee[1]; Russell Dupuis[1]; [1]Georgia Institute of Technology

2:10 PM Student
H3, EBIC and XPS Study of Post-Annealing Process on AlGaN/GaN Schottky Diodes: *Hyeongnam Kim*[1]; Michael Schuette[1]; Hyunchul Jung[1]; Junghui Song[1]; Jaesun Lee[1]; Wu Lu[1]; James C. Mabon[2]; [1]Ohio State University; [2]Material Research Laboratory

2:30 PM
H4, Gate Dielectric Considerations for Scaleable III-V MOS Structures: *Mark Johnson*[1]; J. A. Grenko[1]; Y. N. Saripalli[1]; D. W. Barlage[1]; Y. Jin[1]; Dave Braddock[2]; [1]North Carolina State University; [2]OSEMI, Inc.

2:50 PM Student
H5, Fabrication and Characterization of Enhancement-Mode n-Channel GaN MOSFETs: *Weixiao Huang*[1]; Tahir Khan[1]; T. Paul Chow[1]; [1]Rensselaer Polytechnic Institute

3:10 PM Break

3:30 PM
H6, Spin-Orbit Quantum Interference and Dephasing in High Mobility GaN/AlGaN Heterostructures: *Michael Manfra*[1]; Stefan Schmult[1]; Alex Punnoose[1]; Richard Molnar[2]; [1]Bell Laboratories; [2]Massachusetss Institute of Technology Lincoln Laboratory

3:50 PM
H7, Transport Characterization of AlGaN/AlN/GaN Heterostructures Grown on SiC: *Said Elhamri*[1]; William C. Mitchel[2]; William D. Mitchell[2]; Rex Berney[1]; Adam Saxler[3]; [1]University of Dayton; [2]Air Force Research Laboratory; [3]Cree, Inc.

4:10 PM Student
H8, High Voltage AlGaN/GaN HFETs with Fe-Doped GaN Buffer on Silicon Substrate: *Young Chul Choi*[1]; Milan Pophristic[2]; Ho-Young Cha[3]; Boris Peres[2]; Michael G. Spencer[1]; Lester F. Eastman[1]; [1]Cornell University; [2]Velox Semiconductor Company; [3]GE Global Research

4:30 PM Student
H9, Effects of UHV Surface Preparation and Gate Deposition on AlGaN/GaN HEMT Device Performance: *Dennis E. Walker, Jr.*[1]; Robert C. Fitch[2]; James K. Gillespie[2]; Gregg H. Jessen[2]; Leonard J. Brillson[1]; [1]Ohio State University; [2]Air Force Research Laboratory

4:50 PM Student
H10, Growth and Characterization of $(AlN)_x(Si_3N_4)_{1-x}$ Thin Films for the Passivation of AlGaN/GaN HEMT Structures: *Richard J. Brown*[1]; James R. Shealy[1]; [1]Cornell University

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Session I: Materials Integration: Wafer Bonding and Alternative Substrates

Wednesday PM Room: Conference Room 106
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Peter D. Moran, Michigan Technological University; Karl Hobart, Naval Research Laboratory

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1:30 PM
I1, Exfoliation Temperature Dependence on Hydrogen Exfoliated Layer Properties: *Sumiko L. Hayashi*[1]; Rajinder Sandhu[2]; Mark S. Goorsky[1]; [1]University of California, Los Angeles; [2]Northrop Grumman Space Technology

1:50 PM Student
I2, Interfacial Chemistry of InP/GaAs Bonded Pairs: *Ning Liu*[1]; Thomas F. Kuech[1]; [1]University of Wisconsin-Madison

2:10 PM Student
I3, Dislocation-Gettering in Hydrogen-Induced Exfoliation of Metamorphic InAs Epilayers: *Atif M. Noori*[1]; Sumiko Hayashi[1]; Rajinder Sandhu[2]; Abdullah Cavus[2]; Vincent Gambin[2]; Augusto Gutierrez-Aitken[2]; Mark Goorsky[1]; [1]University of California, Los Angeles; [2]Northrop Grumman Space Technology

2:30 PM
I4, Ultra-High Vacuum-Wafer Direct Bonding of III-V Compounds Semiconductors to Si-Wafer Using Low Energy (300 eV) Hydrogen Ion Beam Surface Cleaning: *N. Razek*[1]; A. Schindler[1]; B. Rauschenbach[1]; [1]Leibniz-Institut für Oberflächenmodifizierung

2:50 PM Student
I5, Stress Analysis of Transferred Thin-GaN Light Emitting Diode by Au-Si Wafer Bonding: *Shih-Chieh Hsu*[1]; Cheng-Yi Liu[1]; [1]National Central University

3:10 PM Break

3:30 PM
I6, Copper Interconnect Bonding for Polymer Pillar I/O Interconnects and Three-Dimensional (3D) Integration Application: *Kuan-Neng Chen*[1]; Muhannad S. Bakir[2]; James D. Meindl[2]; Rafael Reif[1]; [1]Massachusetts Institute of Technology; [2]Georgia Institute of Technology

3:50 PM Student
I7, Fabrication of Poly-Silicon TFT on Flexible Thin Glass Substrate: *Yoochul Jung*[1]; Sunghwan Won[1]; Dieter G. Ast[1]; [1]Cornell University

4:10 PM Student
I8, Built-In Strain in Silicon Nitride Films on Polymer Foils: *Alex Z. Kattamis*[1]; I-Chun Cheng[1]; Ke Long[1]; James C. Sturm[1]; Sigurd Wagner[1]; [1]Princeton University

4:30 PM
I9, Digital Lithographically Patterned Fine-Features for Flexible Thin-Film Transistor Array Backplanes: *William S. Wong*[1]; Scott Limb[1]; Eugene Chow[1]; Michael Chabinyc[1]; Rene Lujan[1]; Beverly Russo[1]; [1]Palo Alto Research Center

4:50 PM
I10, Late News

Session J: Nanotubes

Wednesday PM Room: Conference Room 208
June 28, 2006 Location: Pennsylvania State University

Session Chair: Ray Tsui, Motorola Laboratories; Alec Talin, Sandia National Laboratories

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1:30 PM
J1, Thin Film Transistors from Transparent Conducting Single-Wall Carbon Nanotube Networks: *Giovanni Fanchini*[1]; Husnu Emrah Unalan[1]; Manish Chhowalla[1]; [1]Rutgers University

1:50 PM
J2, Carbon Nanotube Single-Electron Transistors Fabricated with Focused-Ion-Beam Technique: *Kenzo Maehashi*[1]; Hirokazu Ozaki[1]; Yasuhide Ohno[1]; Koichi Inoue[1]; Kazuhiko Matsumoto[1]; Shu Seki[1]; Seiichi Tagawa[1]; [1]Osaka University

2:10 PM
J3, Contact Metallization Process for Vertical Carbon Nanotube Arrays Templated in Porous Anodic Alumina: *Aaron Franklin*[1]; Matthew R. Maschmann[1]; Manuel DaSilva[1]; Timothy D. Sands[1]; Timothy S. Fisher[1]; David B. Janes[1]; [1]Purdue University

2:30 PM
J4, Field Emission Induced UV Electroluminescence from Atomic Layer Deposition ZnO Coated Carbon Nanotubes: *John F. Conley*[1]; Joshua M. Greene[2]; Lifeng Dong[2]; Jun Jiao[2]; Yoshi Ono[1]; [1]Sharp Laboratories of America; [2]Portland State University

2:50 PM Student
J5, Characterization and Application of Transparent and Conductive Single Walled Carbon Nanotube Thin Films: *Husnu Unalan*[1]; Aurelien Du Pasquier[1]; Giovanni Fanchini[1]; Manish Chhowalla[1]; [1]Rutgers University

3:10 PM Break

3:30 PM Student
J6, Precise Control of Number of Carbon Nanotube Growth by Digital Growth Process: *Masatoshi Maeda*[1]; Takafumi Kamimura[2]; Kazuhiko

Matsumoto[2]; [1]University of Tsukuba; [2]Osaka University

3:50 PM Student
J7, Assemblies of Single Wall Carbon Nanotubes and Unencapsulated Sub-10 nm Gold Nanoparticles: *Qingling Hang*[1]; Matt Maschmann[1]; Timothy S. Fisher[1]; David B. Janes[1]; [1]Purdue University

4:10 PM Student
J8, Characterization of the Field Emission Properties of Carbon Nanotube Films Formed on Silicon Carbide Substrates by Surface Decomposition: *Michael C. Pochet*[1]; James A. Fellows[1]; John J. Boeckl[2]; [1]Air Force Institute of Technology; [2]Air Force Research Laboratory/Materials and Manufacturing Directorate

4:30 PM
J9, Oxygen Effects on Formation of Carbon Nanotube Structure in SiC Decomposition: Weijie Lu[1]; *Senthil N. Sambandam*[1]; John Rigueur[1]; Warren E. Collins[1]; John J. Boeckl[2]; William C. Mitchel[2]; [1]Fisk University; [2]Air Force Research Laboratory

4:50 PM
J10, Late News

Session K: Chemical and Biological Sensors I

Wednesday PM Room: Conference Room 207
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Stephen W. Howell, Sandia National Laboratories; David B. Janes, Purdue University

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1:30 PM
K1, Large Area, Dense Si Nanowire Array Chemical Sensors: *Alec Talin*[1]; Luke Hunter[1]; Francois Leonard[1]; Rokad Bhavin[2]; Blake Simmons[1]; [1]Sandia National Laboratories; [2]Cornell University

1:50 PM
K2, A Self-Assembling Semiconductor Nanowire-Based Pathogen Detection System: *Debdeep Jena*[1]; Ronghui Zhou[1]; Hsueh-Chia Chang[1]; Masaru Kuno[1]; [1]University of Notre Dame

2:10 PM
K3, Trace Chemical Detection Using Single-Walled Carbon Nanotubes: *Joshua A. Robinson*[1]; Eric Snow[1]; F. Keith Perkins[1]; [1]Naval Research Laboratory

2:30 PM Student
K4, High-Sensitive Detection of Immunoglobulin E Using Aptamer-Modified Carbon Nanotube Field-Effect Transistors: *Taiji Katsura*[1]; Kenzo Maehashi[1]; Kazuhiko Matsumoto[1]; Kagan Kerman[2]; Yuzuru Takamura[2]; Eiichi Tamiya[2]; [1]Osaka University; [2]Japan Advanced Institute of Science and Technology

2:50 PM
K5, Real-Time Sensing of Proteins by Using a Top-Gate CNT-FET Biosensor: *Masuhiro Abe*[1]; Katsuyuki Murata[2]; Atsuhiko Kojima[3]; Yasuo Ifuku[4]; Mitsuaki Shimizu[5]; Tatsuaki Ataka[1]; Kazuhiko Matsumoto[6]; [1]Olympus Corporation, NEDO; [2]Olympus Corporation, NEDO, CREST-JST; [3]CREST-JST, Mitsubishi Kagaku; [4]Mitsubishi Kagaku Iatron; [5]AIST; [6]AIST, Osaka University, CREST-JST

3:10 PM Break

Session L:
Contacts to Organic Thin Film Transistors

Wednesday PM Room: Conference Room 207
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Max Shtein, University of Michigan; Alberto Salleo, Stanford University

3:30 PM
L1, Surface Chemistry Modifications to Contact Resistances in Organic Field-Effect Transistors: Behrang H. Hamadani[1]; David A. Corley[1]; Jacob W. Ciszek[1]; James M. Tour[1]; *Douglas Natelson*[1]; [1]Rice University

3:50 PM Student
L2, Chemical Doping Modified Contacts to Organic Thin Film Transistors: *Bo Bai*[1]; Thomas N. Jackson[1]; [1]Pennsylvania State University

4:10 PM
L3, Characterization of Top-Contact Pentacene Thin Film Transistors with Submicron-Length Channel: *Kazuhito Tsukagoshi*[1]; Kunji Shigeto[1]; Fumihiro Fujimori[1]; Tetze Hamano[1]; Takeo Minari[1]; Iwao Yagi[1]; Yoshinobu Aoyagi[1]; [1]RIKEN

4:30 PM Student
L4, Electrical Contacts and Patterning Technique in n-Channel Organic Transistors: *Byungwook Yoo*[1]; Taeho Jung[1]; Brooks A. Jones[2]; Antonio Facchetti[2]; Tobin J. Marks[2]; Ananth Dodabalapur[1]; [1]University of Texas at Austin; [2]Northwestern University

4:50 PM
L5, Late News

Session M:
Oxide Thin Film Integration I

Wednesday PM Room: Conference Room 206
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Michael Lanagan, Pennsylvania State University; Darrell G. Schlom, Pennsylvania State University

1:30 PM Student
M1, Growth and Structural Characterization of TiO2 Thin Films Deposited on SrTiO3, LaAlO3, and Al2O3 Substrates Using Reactive Molecular Beam Epitaxy: *Patrick Fisher*[1]; Oleg Maksimov[2]; Hui Du[1]; Marek Skowronski[1]; Paul Salvador[1]; [1]Carnegie Mellon University; [2]Electro-Optics Center

1:50 PM Student
M2, Microwave Characterization of Thin Film Titanium Dioxide: *Lance Haney*[1]; Michael T. Lanagan[1]; Mark W. Horn[1]; [1]Pennsylvania State University

2:10 PM
M3, Lattice Dynamics and Ferroelectric Phase Transitions in $BaTiO_3$/$SrTiO_3$ Superlattices Studied by Ultraviolet Raman Spectroscopy: *Dmitri A. Tenne*[1]; A. Bruchhausen[2]; A. Fainstein[2]; R. S. Katiyar[3]; A. Cantarero[4]; A. Soukiassian[1]; V. Vaithyanathan[1]; W. Tian[1]; D. G. Schlom[1]; Y. L. Li[1]; L. Q.

Chen[1]; S. M. Nakhmanson[5]; K. M. Rabe[5]; C. B. Eom[6]; H. P. Sun[7]; X. Q. Pan[7]; X. X. Xi[1]; [1]Pennsylvania State University; [2]Centro Atomico Bariloche and Instituto Balseiro; [3]University of Puerto Rico; [4]University of Valencia; [5]Rutgers University; [6]University of Wisconsin; [7]University of Michigan

2:30 PM
M4, Epitaxial Lanthanum Lutetium Oxide Thin Films Prepared by Pulsed Laser Deposition: *Juergen Schubert*[1]; O. Trithaveesak[1]; M. Wagner[1]; T. Heeg[1]; H. Y. Chen[1]; C. L. Jia[1]; Y. Jia[2]; D. G. Schlom[2]; [1]Forschungszentrum Jülich GmbH; [2]Pennsylvania State University

2:50 PM
M5, Rare-Earth Scandate Multi-Layer Thin Films: *Tassilo Heeg*[1]; Jürgen Schubert[1]; Christoph Buchal[1]; Markus Boese[2]; Martina Luysberg[2]; [1]Research Centre Juelich, ISG1-IT/CNI; [2]Research Centre Juelich, ER-C/CNI

3:10 PM Break

3:30 PM Student
M6, Atomic Layer Deposition of Cubic Tantalum Nitride Thin Films for Gate Electrode Application: *Raghavasimhan Sreenivasan*[1]; Krishna Saraswat[1]; Paul McIntyre[1]; [1]Stanford University

3:50 PM Student
M7, Resistive Switching Behavior in Cr-Doped SrZrO3 Heterostructures: The Affects of Metal Electrode, Oxide Thickness, and Cr-Doping Levels: *Sukwon Choi*[1]; Paul A. Salvador[1]; Hwansoo Lee[1]; James A. Bain[1]; Jeong-Heon Park[1]; Marek Skowronski[1]; [1]Carnegie Mellon University

4:10 PM
M8, Comparative Investigation of Epitaxial Gd2O3 Thin Films Grown on Si Substrates with Different Orientations for High-K Application: *Apurba Laha*[1]; Andreas Fissel[2]; Hans Jörg Osten[1]; [1]Institute of Electronic Materials and Devices; [2]Information Technology Laboratory

4:30 PM Student
M9, Epitaxial $BaTiO_3$/$SrTiO_3$ Superlattices for Phonon Bragg Mirrors and Cavities: *Arsen Soukiassian*[1]; W. Tian[1]; D. A. Tenne[1]; X. X. Xi[1]; D. G. Schlom[1]; N. D. Lanzillotti Kimura[2]; A. Bruchhausen[2]; A. Fainstein[2]; H. P. Sun[3]; X. Q. Pan[3]; A. Cross[4]; A. Cantarero[4]; [1]Pennsylvania State University; [2]Centro Atómico Bariloche and Instituto Balseiro; [3]University of Michigan; [4]University of Valencia

4:50 PM
M10, Epitaxial and Amorphous Lu_2O_3 and $LaLuO_3$ on Si for Alternative Gate Dielectrics Applications: *Wei Tian*[1]; L. F. Edge[1]; D. G. Schlom[1]; V. V. Afanas'ev[2]; A. Stesmans[2]; S. Shamuilia[2]; B. Holländer[3]; J. Schubert[3]; [1]Pennsylvania State University; [2]University of Leuven; [3]Research Centre Juelich

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Session N: GaN Processing

Wednesday PM Room: Conference Room 108
June 28, 2006 Location: Pennsylvania State University

Session Chair: Michael J. Manfra, Lucent Technologies

1:30 PM
N1, Substantial Advantages of Cat-CVD SiN Surface Passivation over PECVD in Electrical Properties of AlGaN/GaN Heterostructure: *Norio Onojima*[1]; Masataka Higashiwaki[1]; Toshiaki Matsui[1]; Takashi Mimura[2]; [1]National Institute of Information and Communications Technology; [2]Fujitsu Laboratories

1:50 PM Student
N2, Oxygen Induced Gate Leakage in AlGaN/GaN HFETs and Its Suppression by a Novel Surface Control Process: *Junji Kotani*[1]; Masamitsu Kaneko[1]; Hideki Hasegawa[1]; Tamotsu Hashizume[1]; [1]Hokkaido University

2:10 PM Student
N3, SF_6/O_2 Plasma Effects on AlGaN/GaN Heterojunction Field Effect Transistors: *David J. Meyer*[1]; Joseph R. Flemish[1]; Joan M. Redwing[1]; [1]Pennsylvania State University

2:30 PM
N4, Processing of LiAlO2 Substrates for m-Plane GaN Epitaxy: *Maria Losurdo*[1]; Tong-Ho Kim[2]; Soojeong Choi[2]; Pae Wu[2]; Maria Giangregorio[1]; Giovanni Bruno[1]; April Brown[2]; [1]IMIP-CNR; [2]Duke University

2:50 PM Student
N5, Matrix-Addressable III-Nitride LED Arrays on Si Substrates by Flip-Chip Technology: *Chi Wing Keung*[1]; Kei May Lau[1]; [1]Hong Kong University of Science and Technology

3:10 PM Break

Session O: Semiconductors: Processing and Oxidation

Wednesday PM Room: Conference Room 108
June 28, 2006 Location: Pennsylvania State University

Session Chairs: Douglas C. Hall, University of Notre Dame; Michael A. Capano, Purdue University

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3:30 PM Student
O1, The Electrical and Physical Analysis of $Co_xNi_{1-x}Si_2$ Gate/SiO_2/p-Si (100) with Dual Work Function for Deep Submicron Complementary Metal-Oxide-Semiconductor Device: *Jun Liu*[1]; Dim Lee Kwong[1]; [1]University of Texas at Austin

3:50 PM Student
O2, Studies of Surface Wetting Phenomena during Thin Film Formation by Mist Deposition: *Karthikeyan Shanmugasundaram*[1]; Matt Brubaker[2]; Kyuhwan Chang[1]; Jerzy Ruzyllo[1]; [1]Pennsylvania State University; [2]Symetrix Corporation

4:10 PM Student
O3, Dry Etching of PbSrSe Epitaxial Layers toward Distributed Bragg Reflectors: *An Cheng*[1]; Jian Xu[1]; Edward Basgall[1]; Guy Lavallee[1]; Michael Gerhold[2]; Fanghai Zhao[3]; Zhengping Guan[3]; Dewali Ray[3]; Zhisheng Shi[3]; [1]Pennsylvania State University; [2]North Carolina State University; [3]University of Oklahoma

4:30 PM Student
O4, A Novel Masking Technology for Deep Glass Wet Etching: *Ying-Ming Huang*[1]; Maruti Uppalapati[1]; William O. Hancock[1]; Thomas N. Jackson[1]; [1]Pennsylvania State University

4:50 PM
O5, Late News

Session P:
Device Aspects for ZnO

Thursday AM Room: Deans Hall I
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Julia W.P. Hsu, Sandia National Laboratories; Jamie D. Phillips, University of Michigan

8:20 AM Student
P1, Electrical and Optical Properties of ZnO Thin Films for Transparent Electrodes and Antireflection Coatings in Optoelectronic Devices: *J. H. Yun*[1]; C. H. Lim[2]; J. H. Lim[1]; J. H. Jang[1]; S. J. Park[1]; [1]Gwangju Institute of Science and Technology; [2]Korea Institute of Energy Research

8:40 AM
P2, Switchable Interface Charges in Zinkoxide-Bariumtitanite Heterostructures: Concepts for New Oxide-Based Electronic Device Structures: *Mathias M. Schubert*[1]; Nurdin Ashkenov[2]; Rao Voora[2]; Holger Hochmuth[2]; Michael Lorenz[2]; Marius Grundmann[2]; [1]University of Nebraska-Lincoln; [2]University Leipzig

9:00 AM Student
P3, Metal-Ferroelectric-Semiconductor Capacitors Based on PZT/ZnO Heterostructures: *Emine Cagin*[1]; Ding-Yuan Chen[1]; Jeffrey Siddiqui[1]; Jamie D. Phillips[1]; [1]University of Michigan

9:20 AM Student
P4, ZnO Schottky Diode Performance as a Function of Contact Metal and Surface Polarity: *Martin W. Allen*[1]; W. C. T. Lee[1]; P. Miller[1]; R. J. Reeves[1]; M. M. Alkaisi[1]; S. M. Durbin[1]; [1]University of Canterbury

9:40 AM Student
P5, Zinc Oxide Thin Films Deposited by Reactive RF Sputtering for Metal-Semiconductor-Metal Photodectors and Solar Cells: *Meiya Li*[1]; Nehal Chokshi[2]; Robert L. DeLeon[2]; Gary Tompa[2]; Wayne A. Anderson[1]; [1]State University of New York at Buffalo; [2]AMBP Tech Corporation

10:00 AM Break

10:20 AM
P6, Hybrid II-VI and III-V Compound Double Heterostructures and Their Properties: *Yahya Alivov*[1]; [1]Virginia Commonwealth University

10:40 AM Student
P7, Investigation of ZnO Dry Etching in Inductively Coupled CH_4/H_2- and C_2H_6/H_2-Based Plasmas: *Wantae Lim*[1]; Lars Voss[1]; Rohit Khanna[1]; Brent P. Gila[1]; David P. Norton[1]; Stephen J. Pearton[1]; Fan Ren[1]; [1]University of Florida

11:00 AM Student
P8, Magnetic Properties and Observation of Anomalous Hall Effect in Cobalt-Doped ZnO: *Mathew Ivill*[1]; Ryan Pate[1]; David P. Norton[1]; Arthur F. Hebard[1]; Ritesh Das[1]; [1]University of Florida

11:20 AM Student
P9, Growth and Physical Properties of N-Al or Cu Co-Doped (Zn,Co)O Dilute Magnetic Semiconductors: *Govind Mundada*[1]; Craig J. Vera[1]; Damon E. Horst[1]; Theodore W. Kehl[1]; Srikanth Manchiraju[1]; Sandhya Pulugam[1]; Pawan K. Kahol[1]; Manivannan Kandiah[1]; Kartik Ghosh[1]; [1]Missouri State University

11:40 AM
P10, Optical and Magnetic Properties of ZnVo Prepared by Ion Implantation: *Vitaliy Avrutin*[1]; Umit Ozgur[1]; Sergey Chevtchenko[1]; Hadis Morkoc[1]; Michael Callahan[2]; [1]Virginia Commonwealth University; [2]Air Force Research Laboratory

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Session Q: III-Nitride MOCVD Growth

Thursday AM Room: Deans Hall II
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Andrew Allerman, Sandia National Laboratories; Jae-Hyun Ryou, Georgia Institute of Technology

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8:20 AM
Q1, Pulsed Lateral over Growth (PLOG) of $Al_xGa_{1-x}N$: M. Asif Khan[1]; *Qhalid Fareed*[2]; Chen Zheng[1]; Mickael Gaevski[1]; Vinod Adivarahan[1]; Jinwei Yang[1]; [1]University of South Carolina; [2]Sensor Electronic Technology Inc.

8:40 AM Student
Q2, MOCVD Growth of Nonpolar *M*-Plane AlN on (1-100) 6H-SiC Substrate: *Qian Sun*[1]; Zaiyuan Ren[1]; Soon-Yong Kwon[1]; Jung Han[1]; [1]Yale University

9:00 AM
Q3, Halide Chemical Vapor Deposition of AlN: *Timothy E. Bogart*[1]; Mark Fanton[1]; Xiaojun Weng[2]; Ed Oslosky[1]; Brian Weiland[1]; Rodney Ray[1]; Adam Dilts[1]; David Snyder[1]; [1]Pennsylvania State Electro-Optics Center; [2]Pennsylvania State University

9:20 AM
Q4, Extremely High Quality AlN Grown on (0001) Sapphire by Using Metal-Organic Vapor Phase Epitaxy: *Yangang A. Xi*[1]; Kaixuan Chen[1]; Frank W. Mont[1]; Xiaolu Li[1]; Jong Kyu Kim[1]; E. Fred Schubert[1]; Wayne Liu[2]; Joseph A. Smart[2]; [1]Rensselaer Polytechnic Institute; [2]Crystal IS

9:40 AM
Q5, Late News

10:00 AM Break

10:20 AM
Q6, Effects of Compositionally Graded $Al_{1-x}Ga_xN$ Buffer Layers on the Threading Dislocation Evolution in GaN Films Grown on (111) Si Substrates: *Xiaojun Weng*[1]; Srinivasan Raghavan[1]; Abhishek Jain[1]; Jeremy Acord[1]; Elizabeth Dickey[1]; Joan Redwing[1]; [1]Pennsylvania State University

10:40 AM Student
Q7, Crack Free GaN Grown on Patterned Si(111) Substrates by Metal-Organic Chemical Vapor Deposition: *Hu Liang*[1]; Baoshun Zhang[1]; Kar Wei Ng[1]; Chi Wing Keung[1]; Kei May Lau[1]; [1]Photonics Technology Center

11:00 AM Student
Q8, Defect Reduction in Nonpolar A-Plane GaN Films Using In-Situ SiNx Nano-Mask: *Kwang-Choong Kim*[1]; Arpan Chakraborty[1]; Feng Wu[1]; James S. Speck[1]; Umesh K. Mishra[1]; Steven DenBaars[1]; [1]University of California, Santa Barbara

11:20 AM
Q9, Maskless Epitaxial Lateral Overgrowth of GaN Using Dimethylhydrazine as a Nitrogen Precursor: *Toshiyuki Takizawa*[1]; Jun Shimizu[1]; Tetsuzo Ueda[1]; [1]Matsushita Electric Industrial, Company, Ltd.

11:40 AM
Q10, Room Temperature Layer-by-Layer Epitaxial Growth of GaN

on Lattice-Matched Hf (0001): *Hiroshi Fujioka*[1]; Shigeru Inoue[2]; Atsushi Kobayashi[2]; Jitsuo Ohta[1]; [1]University of Tokyo/KAST; [2]University of Tokyo

Session R: Lattice Engineered Epitaxy of III-V and IV Semiconductors

Thursday AM Room: Conference Room 106
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Sarah Olsen, University of Newcastle-upon-Tyne; Jerry M. Woodall, Purdue University

8:20 AM Student
R1, Materials Optimization for High Indium Content (In,Ga)As Channel HEMTs: *Mike Morse*[1]; [1]Duke University

8:40 AM Student
R2, High-Mobility 2DEG in InAlAs/InAs Heterostructures Grown on InP Using Metamorphic $InAs_yP_{1-y}$ Graded Buffers: *Yong Lin*[1]; Aaron R. Arehart[1]; Andrew M. Carlin[1]; John A. Carlin[1]; Steven A. Ringel[1]; [1]Ohio State University

9:00 AM Student
R3, High-Quality InP on GaAs Using Graded Buffers Grown by MOVPE (Metal Organic Vapor Phase Epitaxy): *Nate Quitoriano*[1]; Eugene A. Fitzgerald[1]; [1]Massachusetts Institute of Technology

9:20 AM
R4, Optical and Electrical Defect Characterization of $In_{0.49}Ga_{0.51}P$ Grown on Metamorphic SiGe Substrates: *Maria Gonzalez*[1]; Andrew Armstrong[1]; Carrie Andre[2]; Steven Ringel[1]; Arthur Pitera[3]; Eugene Fitzgerald[4]; [1]Ohio State University; [2]Akzo Nobel; [3]Contour Semiconductor; [4]Massachusetts Institute of Technology

9:40 AM Student
R5, Lattice-Engineering for Monolithic Visible Yellow-Green Light Emitters: *Michael J. Mori*[1]; Eugene A. Fitzgerald[1]; [1]Massachusetts Institute of Technology

10:00 AM Break

10:20 AM Student
R6, The Fabrication of Misfit Dislocation-Free Strained Si Thin Films Using Porous Si Substrates: *Jeehwan Kim*[1]; Ya-hong Xie[1]; [1]University of California at Los Angeles

10:40 AM
R7, Novel Fabrication Process for Multi SOI Layers Using Selective Etching of SiGe in Multi Si/SiGe Layers: *Shun-Ichiro Ohmi*[1]; Tomoyuki Nakanishi[1]; Ken-Ichi Yahashi[1]; Tetsushi Sakai[1]; [1]Tokyo Institute of Technology

11:00 AM
R8, Perimeter-Limited Strain in Patterned Structures of SSOI: *Albert J. Paul*[1]; [1]National Institute of Standards and Technology

11:20 AM
R9, FET Mobilities in Layers Grown by Ultra-High Growth Rate CVD with High-Order Silane Precursor: *Keith H. Chung*[1]; J. C. Sturm[1]; K. K. Singh[2]; D. Carlson[2]; S. Kuppurao[2]; [1]Princeton University; [2]Applied Materials

11:40 AM
R10, Late News

Session S:
SiC: Growth and Interface Studies

Thursday AM Room: Conference Room 208
June 29, 2006 Location: Pennsylvania State University

Session Chair: Michael A. Capano, Purdue University

8:20 AM
S1, Effects of Hydrogen on Physical Vapor Transport Growth and Deep Trap Concentrations in 6H SiC: *Mark Fanton*[1]; Marek Skowronski[2]; Alexander Polyakov[2]; Randal Cavalero[1]; Rodney Ray[1]; [1]Pennsylvania State University; [2]Carnegie Mellon University

8:40 AM Student
S2, Surface Morphology, Doping and Oxide Field of 4H-SiC C-Face Epitaxial Layer Grown by Horizontal Hot-Wall Chemical Vapor Deposition: *Kung-Yen Lee*[1]; Wenzhou Chen[1]; Michael A. Capano[1]; [1]Purdue University

9:00 AM
S3, Chemical Vapor Deposition of Silcon Carbide Epitaxial Films and Their Characterization: Yi Chen[1]; *Govindhan Dhanaraj*[1]; Hui Chen[1]; William Vetter[1]; Hui Zhang[1]; Michael Dudley[1]; [1]Stony Brook University

9:20 AM
S4, Formation Mechanism of Half-Loop Array Defect in Silicon Carbide Homo-Epilayers: *Zehong Zhang*[1]; Robert Stahlbush[2]; Pirouz Pirouz[3]; Amitesh Shrivastava[1]; Tangali Sudarshan[1]; [1]University of South Carolina; [2]Naval Research Laboratory; [3]Case Western Reserve University

9:40 AM
S5, Structural and Electrical Characterization of Carbon Nanotubes Formed on Silicon Carbide Materials by Surface Decomposition: *John Boeckl*[1]; William C. Mitchel[1]; Bill Riehl[2]; Mike Check[2]; [1]Air Force Research Laboratory; [2]Riehl-Check Industries

10:00 AM Break

10:20 AM
S6, Role of Interface Layers and Localized States in TiAl-Based Ohmic Contacts to P-Type 4H-SiC: *Min Gao*[1]; Sergey Tumakha[1]; Stefen Goss[1]; T. Onishi[2]; Susumu Tsukimoto[2]; Masanori Murakami[2]; Leonard Brillson[2]; [1]Ohio State University; [2]Kyoto University

10:40 AM
S7, As-Deposited Ohmic Contacts Using Ti on InN on SiC: Feroz A. Mohammad[1]; Yan Cao[1]; *Lisa M. Porter*[1]; Ariel Virshup[1]; [1]Carnegie Mellon University

11:00 AM Student
S8, Electronic States of Chemically Treated and/or Oxidized SiC Surfaces: *Shu Nie*[1]; R. M. Feenstra[1]; Y. Ke[2]; R. P. Devaty[2]; W. J. Choyke[2]; [1]Carnegie Mellon University; [2]University of Pittsburgh

11:20 AM Student
S9, Effect of Oxide Deposition Temperature on Interface Properties of SiC/SiO_2: *Tahir A. Khan*[1]; Mahalingam K. Balasubramanian[1]; T. P. Chow[1]; [1]Rensselaer Polytechnic Institute

11:40 AM
S10, Late News

Session T:
Materials and Processing for Organic Transistors

Thursday AM
June 29, 2006

Room: Conference Room 207
Location: Pennsylvania State University

Session Chair: Alberto Salleo, Stanford University; Jon Nichols, 3M Center

8:20 AM Invited
T1, Solution-Processable Organic Conductors and Semiconductors: Viable Materials for Thin Film Electronics: *Lynn Loo*[1]; [1]University of Texas

9:00 AM
T2, Acene-Based Materials for Thin-Film Transistors: *John E. Anthony*[1]; [1]University of Kentucky

9:20 AM Student
T3, Pentacene Devices Fabricated by Organic Vapor Phase Deposition: *Cédric Rolin*[1]; Soeren Steudel[1]; Kris Myny[1]; David Cheyns[1]; Stijn Verlaak[1]; Jan Genoe[1]; Paul Heremans[1]; [1]IMEC

9:40 AM Student
T4, Molecular Ordering of Solution Processed TIPS-Pentacene: *Sungkyu Park*[1]; Thomas N. Jackson[1]; John E. Anthony[2]; [1]Pennsylvania State University; [2]University of Kentucky

10:00 AM Break

10:20 AM Student
T5, Zinc Tetrabenzoporphyrin Organic Field-Effect Transistors: *Patrick Shea*[1]; Jerzy Kanicki[1]; Hiroko Yamada[2]; Noboru Ono[2]; [1]University of Michigan; [2]Ehime University

10:40 AM Student
T6, Modeling and Experiments of Organic Material Patterning by Stamping in the Fabrication of Organic Electronic Devices: *Yifang Cao*[1]; Changsoon Kim[1]; Stephen R. Forrest[1]; Winston O. Soboyejo[1]; [1]Princeton University

11:00 AM Student
T7, Pentacene OTFTs with Parylene Active Layer Patterning and Passivation: Lisong Zhou[1]; *Dalong Zhao*[1]; Thomas N. Jackson[1]; [1]Pennsylvania State University

11:20 AM
T8, All Organic Non-Volatile Switching Device Fabricated by Using Conducting Polymer Micropores: *Oleg Kirillov*[1]; John S. Suehle[1]; Lauren Cohen[2]; Wendy Wu[3]; Dean M. DeLongchamp[1]; Curt A. Richter[1]; [1]National Institute of Standards and Technology; [2]Duke University; [3]University of Texas at Austin

11:40 AM
T9, Late News

Session U:
Oxide Thin Film Integration II

Thursday AM Room: Conference Room 206
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Patrick Lenahan, Pennsylvania State University; Michael Lanagan, Pennsylvania State University

8:20 AM
U1, Photocurrent-Voltage Measurements for Characterizing Oxide Charge in HfO_2 Gate Dielectrics: *Daniel Felnhofer*[1]; Evgeni Gousev[1]; Douglas A. Buchanan[2]; [1]Qualcomm MEMS Technologies; [2]University of Manitoba

8:40 AM
U2, Internal Photoemission Studies of TaSiN and TaCN Metal Gates on SiO_2 and HfO_2: *Nhan V. Nguyen*[1]; H. Xiong[1]; J. S. Suehle[1]; E. M. Vogel[1]; [1]National Institute of Standards and Technology

9:00 AM Student
U3, Electron Spin Resonance and Spin Dependent Recombination Study of Deep Levels within the near Si/Dielectric Interfacial Layer of HfO2 Based Metal Oxide Silicon Field Effect Transistors: *Jason T. Ryan*[1]; Patrick Lenahan[1]; Jason Campbell[1]; Gennadi Bersuker[2]; Patrick Lysaght[2]; Wilman Tsai[3]; [1]Pennsylvania State University; [2]SEMATECH; [3]Intel

9:20 AM
U4, Photoemission and Inverse Photoemission Studies of Band Offsets in Alternative High-k Metal Oxide Semiconductor (MOS) Stacks: *Eric Bersch*[1]; Sylvie Rangan[1]; Robert Bartynski[1]; Eric Garfunkel[1]; [1]Rutgers University

9:40 AM
U5, Growth and Characterization of Epitaxial Sc_2O_3 on Silicon by Molecular Beam Epitaxy for Alternative Gate Dielectric Applications: Lisa Friedman Edge[1]; Wei Tian[1]; Venu Vaithyanathan[1]; *Darrell G. Schlom*[1]; Dmitri Klenov[2]; Susanne Stemmer[2]; Marilyn E. Hawley[3]; [1]Pennsylvania State University; [2]University of California, Santa Barbara; [3]Los Alamos National Laboratory

10:00 AM Break

10:20 AM
U6, Medium Energy Ion Scattering Study of Oxygen Diffusion-Reactions in High-k Dielectrics on Si: *Lyudmila Goncharova*[1]; Mateus Dalponte[1]; Eric Garfunkel[1]; Torgny Gustafsson[1]; Patrick Lysaght[2]; Brendan Foran[2]; Gennadi Bersuker[2]; [1]Rutgers University; [2]Sematech

10:40 AM
U7, $In_{0.13}Ga_{0.87}As$ and GaAs MOS Capacitors with ALD HfO_2 and Al_2O_3 Gate Dielectrics: *N. Goel*[1]; C. Chui[1]; P. Majhi[1]; D. Choi[2]; J. Harris[2]; W. Tsai[1]; [1]Intel; [2]Stanford University

11:00 AM Student
U8, Characterization of n-MISFETs with Ultrathin HfO_xN_y Gate Insulator Formed by ECR-Ar/N_2 Plasma Nitridation: *Masaki Satoh*[1]; Tomoki Kurose[1]; Shun-Ichiro Ohmi[1]; [1]Tokyo Institute of Technology

11:20 AM
U9, Late News

11:40 AM
U10, Late News

Session V:
Non-Destructive Testing and In-Situ Monitoring and Control

Thursday AM
June 29, 2006

Room: Conference Room 108
Location: Pennsylvania State University

Session Chairs: Andrew M. Hoff, University of South Florida; Kurt G. Eyink, Air Force Research Laboratory

8:20 AM Student
V1, Surface Plasmon Resonance of Ga and In Nanoparticles Measured by *In-Situ* Spectroscopic Ellipsometry: *Pae C. Wu*[1]; Maria Losurdo[2]; Tong-Ho Kim[1]; Soojeong Choi[1]; Henry Everitt[1]; Jianhua Jiang[3]; April S. Brown[1]; [1]Duke University; [2]Institute of Inorgranic Methodologies and of Plasmas — CNR; [3]University of Alabama, Huntsville

8:40 AM Student
V2, Kinetics of Ga Adlayer Formation on Gallium Nitride (0001) Surface: *Soojeong Choi*[1]; Tong-Ho Kim[1]; Henry O. Everitt[1]; April Brown[1]; Maria Losurdo[2]; Giovanni Bruno[2]; Akihiro Moto[3]; [1]Duke University; [2]IMIP-CNR; [3]Innovation Core SEI, Inc

9:00 AM Student
V3, Spectroscopic Ellipsometric Characterization of Metal-Free Carbon Nanotube Formation by SiC Surface Decomposition: *Jeremy Harrison*[1]; Senthil N. Sambandam[1]; John J. Boeckl[2]; William C. Mitchel[2]; Warren E. Collins[1]; Weijie Lu[1]; [1]Fisk University; [2]Air Force Research Laboratory

9:20 AM
V4, Reduced Interference Photoreflectance for Measurement of HBTs: *Eric Rehder*[1]; Peter Rice[1]; [1]Kopin Corporation

9:40 AM Student
V5, AlGaAs/GaAs Interface States by Surface Photovoltage Studies: *Clara Vargas*[1]; Gregory B. Lush[1]; [1]University of Texas at El Paso

10:00 AM Break

10:20 AM
V6, Quantification of Ultra-Thin Indium MBE Layers by Low Energy X-Ray Emission Spectroscopy (LEXES): *Kurt G. Eyink*[1]; Jeremey J. Pitz[1]; David H. Tomich[1]; John A. Carlin[2]; Krishnamurthy Mahalingam[3]; Howard E. Smith[4]; C. A. Hitzman[5]; C. A. Evans[5]; [1]Air Force Research Laboratory; [2]Ohio State University; [3]Universal Technology Corporation; [4]University of Dayton; [5]Full Wafer Analysis Inc

10:40 AM Student
V7, In-Situ Investigation of Surface Stoichiometry during $YMnO_3$, InGaN and GaN Growth by Plasma-Assisted Molecular Beam Epitaxy Using RHEED-TRAXS: *Randy P. Tompkins*[1]; Eric D. Schires[1]; Kyoungnae Lee[1]; Yewhee Chye[1]; David Lederman[1]; Thomas H. Myers[1]; [1]West Virginia University

11:00 AM
V8, Composition Driven Surface Transition and Electronic Transport in $LaSrMnO_3$: *Maitri P. Warusawithana*[1]; Xiaofang Zhai[2]; Seongshik Oh[3]; Darrell G. Schlom[4]; James N. Eckstein[2]; [1]Department of Physics, University of Illinois at Urbana-Champaign; Department of Materials Science and Engineering, Pennsylvania State University; [2]Department of Physics, University of Illinois at Urbana-Champaign; [3]Department of Physics, University of Illinois at Urbana-Champaign; National Institute of Standards and Technology, Boulder; [4]Department of Materials Science and Engineering, Pennsylvania State University

11:20 AM Student
V9, Structural Transformations Underlying the Refractive Index Contrast for Optical Waveguides in He-Implanted Single Crystal PZN-PT: N. Tangtrakarn[1]; J. Dziedzac[1]; S. Hackney[1]; *Peter Moran*[1]; [1]Michigan Technological University

11:40 AM Student
V10, Pre-Oxidation Iron Contamination of Silicon and 4H-SiC Substrates: *Helen Benjamin*[1]; Elena Oborina[1]; Andrew M. Hoff[1]; [1]University of South Florida

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Session W: ZnO Growth

Thursday PM Room: Deans Hall I
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Jamie D. Phillips, University of Michigan; Julia W.P. Hsu, Sandia National Laboratories

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1:30 PM Student
W1, Zinc Oxide Thin Films Deposited by Laser Assisted Molecular Beam Deposition: *Meiya Li*[1]; Nehal Chokshi[2]; Robert L. DeLeon[2]; Gary Tompa[2]; Wayne A. Anderson[1]; [1]State University of New York at Buffalo; [2]AMBP Tech Corporation

1:50 PM Student
W2, The Effect of Substrate Material and Post-Annealing on DC Sputtered ZnO: *Leo P. Schuler*[1]; Paul Miller[1]; Martin Allen[1]; Nagarajan Valanoor[1]; Roger Reeves[1]; Maan Alkaisi[1]; [1]MacDiarmid Institute

2:10 PM
W3, Effect of Substrate Surface Structure and Chemistry on Microstructure and Properties of Epitaxial ZnO Thin Films Grown on Sapphire and ZnO Substrates: *Xiaoqing Pan*[1]; Haiping Sun[1]; Yanbin Chen[1]; Xinqiang Wang[2]; Akihiko Yoshikawa[2]; [1]University of Michigan; [2]Chiba University

2:30 PM
W4, Plasma-Assisted MOCVD Growth of Highly Oriented ZnO Thin Films: *Maria Losurdo*[1]; Maria M. Giangregorio[1]; Pio Capezzuto[1]; Giovanni Bruno[1]; Graziella Malandrino[2]; Ignazio Fragala[2]; [1]IMIP-CNR; [2]Universita di Catania

2:50 PM Student
W5, Surface and Interface Characterization of A-Plane ZnO and $Mg_xZn_{1-x}O$ Films: *Gaurav Saraf*[1]; Jian Zhong[1]; Yicheng Lu[1]; Olga Dulub[2]; Ulrike Diebold[2]; Theo Siegrist[3]; [1]Rutgers University; [2]Tulane University; [3]Bell Laboratories

3:10 PM Break

3:30 PM
W6, *Three Step Growth* as a Novel Approach for the Growth of ZnO on Si(111) by MOVPE: *Takumi Moriyama*[1]; Shizuo Fujita[1]; [1]Kyoto University

3:50 PM Student
W7, Growth of ZnO on Cubic Substrates by Molecular Beam Epitaxy: *Emine Cagin*[1]; Jun Yang[1]; Jamie D. Phillips[1]; Pallab Bhattacharya[1]; [1]University of Michigan

4:10 PM Student
W8, ZnO Thin Films Produced via Reactive Pulsed Arc Molecular Beam Deposition: *Chi-Tung Chiang*[1]; Robert L. DeLeon[2]; James F. Garvey[1]; [1]University at Buffalo; [2]AMBP Tech Corporation

4:30 PM Student
W9, Low Temperature Highly Conducting Boron-Doped ZnO Films by Plasma Enhanced Chemical Vapor Deposition: *Jie Sun*[1]; Diwakar Garg[2]; Thomas N. Jackson[1]; [1]Pennsylvania State University; [2]Air Products and Chemicals, Inc

4:50 PM
W10, Late News

Session X:
MBE Growth of Group III-Nitrides

Thursday PM Room: Deans Hall II
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Thomas Myers, West Virginia University; Steven M. Durbin, University of Canterbury

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1:30 PM
X1, Optical Investigation of the Dependence of Luminescence Efficiency on Stokes Shift in Nanoscale Compositionally Inhomogeneous AlGaN: *Gregory A. Garrett*[1]; Anand V. Sampath[1]; H. Shen[1]; Michael Wraback[1]; [1]U.S. Army Research Laboratory

1:50 PM Student
X2, The Use of Cathodoluminescence in Gallium Nitride during Growth to Determine Substrate Temperature: K*youngnae Lee*[1]; Eric D. Schires[1]; Thomas H. Myers[1]; [1]West Virginia University

2:10 PM Student
X3, A New Mechanism for the Tilting of Dislocations in Oxygen Doped Gallium Nitride Layers Grown by Molecular Beam Epitaxy: *Michael E. Hawkridge*[1]; David Cherns[1]; Kyoung-Nae Lee[2]; Tom Myers[2]; [1]University of Bristol; [2]West Virginia University

2:30 PM
X4, Unintentional Si Incorporation in GaN/AlN Interface Grown on SiC by PAMBE: *Tong-Ho Kim*[1]; Soojeong Choi[1]; Pae Wu[1]; Changhyun Yi[1]; April Brown[1]; Maria Losurdo[2]; Giovanni Bruno[2]; Akihiro Moto[3]; [1]Duke University; [2]IMIP-CNR; [3]Innovation Core SEI, Inc.

2:50 PM
X5, High-Quality Nonpolar 4H-AlN Grown on 4H-SiC by Molecular-Beam Epitaxy: *Masahiro Horita*[1]; Jun Suda[1]; Tsunenobu Kimoto[1]; [1]Kyoto University

3:10 PM Break

3:30 PM Student
X6, Physical Processes during Growth of InN on GaN (0001) by Plasma-Assisted Molecular Beam Epitaxy: *Emmanouil Dimakis*[1]; Eleftherios Iliopoulos[1]; Alexandros Georgakilas[1]; [1]Microelectronics Research Group, University of Crete/Institute of Electronic Structure and Laser (IESL), Foundation for Research and Technology-Hellas (FORTH)

3:50 PM
X7, Study of PA-MBE Growth of In- and N-Polar InN on SiC Substrates: *Maria Losurdo*[1]; Maria Giangregorio[1]; Giovanni Bruno[1]; Tong-Ho Kim[2]; Soojeong Choi[2]; Pae Wu[2]; April Brown[2]; [1]IMIP-CNR; [2]Duke University

4:10 PM Student
X8, Direct Write Composition Patterning of InGaN during Molecular Beam Epitaxy: *Xiaodong Chen*[1]; William J. Schaff[1]; [1]Cornell University

4:30 PM
X9, Growth of In-Rich $In_xAl_{1-x}N$ Films on (0001) Sapphire by RF-MBE and Their Properties: *Hiroyuki Naoi*[1]; Keisuke Fujiwara[1]; Masahito Kurouchi[1]; Daisuke Muto[1]; Tsutomu Araki[1]; Hyunseok Na[1]; Yasushi Nanishi[1]; [1]Ritsumeikan University

4:50 PM Student
X10, Structural, Optical and Electronic Properties of InN Grown on GaN Substrate by Molecular Beam Epitaxy: *Kejia (Albert) Wang*[1]; John Simon[1]; Jing Zhang[1]; Kai Sun[1]; Tom Kosel[1]; Alexander Mintairov[1]; James Merz[1]; Debdeep Jena[1]; [1]University of Notre Dame

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Session Y: Epitaxy for Devices

Thursday PM Room: Conference Room 106
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Michael Tischler, Ocis Technology; Archie L. Holmes, University of Texas

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1:30 PM
Y1, Selective MBE Growth of Hexagonal Networks of GaAs Triangular Nanowires on (111)B Patterned Substrates: Isao Tamai[1]; Takahiro Tamura[1]; Taketomo Sato[1]; *Hideki Hasegawa*[1]; Tamotsu Hashizume[1]; [1]Hokkaido University

1:50 PM Student
Y2, Structural and Electronic Characterization of Homoepitaxial $SrTiO_3$ Films Prepared by Molecular Beam Epitaxy: *Charles M. Brooks*[1]; Wei Tian[1]; Darrell G. Schlom[1]; Shawn Walsh[2]; Leonard Brillson[2]; Tassilo Heeg[3]; Jürgen Schubert[3]; [1]Pennsylvania State University; [2]Ohio State University; [3]Forschungszentrum Jülich GmbH

2:10 PM Student
Y3, Asymmetric Relaxation of Semiconductor Grade $SrTiO_3$ Films: *Michael D. Biegalski*[1]; Dillon Fong[2]; Yulan Li[1]; Jeffory Haeni[1]; Long Qing Chen[1]; Reinhert Uecker[3]; Paul Reiche[3]; Jeffery Eastman[2]; Paul Fuoss[2]; Stephen Streiffer[2]; Susan Trolier-McKinstry[1]; Darrell Schlom[1]; [1]Pennsylvania State University; [2]Argonne National Laboratory; [3]Institue of Crystal Growth, Berlin

2:30 PM Student
Y4, Structural and Magnetic Properties of MBE Grown Single Crystal Co_2MnGe on $SrTiO_3$(001), $BaTiO_3$ (001) and MgO (001) Substrates: *Swedesh Kumar Srivastava*[1]; Christoph Adelmann[1]; Darrell Schlom[2]; Charles Ahn[3]; Christopher Palmstrom[1]; [1]University of Minnesota; [2]Pennsylvania State University; [3]Yale University

2:50 PM Student
Y5, Fabrication and Optical Modulation of Silicon-Filled Capillary Fiber: *Dong-Jin Won*[1]; Hoonsoo Kang[1]; Neil Baril[2]; Adrian Amezcua-Correa[3]; Chris. E. Finlayson[3]; Pier J.A. Sazio[3]; Venkatraman Gopalan[1]; John V. Badding[2]; [1]Materials Research Institute, Pennsylvania State University; [2]Department of Chemistry, Pennsylvania State University; [3]Optoelectronics Research Centre, University of Southampton

3:10 PM Break

3:30 PM Student
Y6, MBE-Grown $Zn_xCd_{(1-x)}Se/Zn_{x'}Cd_{y'}Mg_{(1-x'-y')}Se$ Multi-Quantum Wells for Intersubband Devices: *Hong Lu*[1]; A. Shen[2]; S. K. Zhang[2]; R. R. Alfano[2]; C. Y. Song[3]; H. C. Liu[3]; M. C. Tamargo[2]; [1]City College of New York and Graduate Center of CUNY; [2]City College of New York; [3]Institute for

Microstructural Sciences, National Research Council, Canada

3:50 PM Student
Y7, Effectiveness of SiGe Buffer Layers in Reducing Dark Current in Ge-on-Si Photodetectors: *Zhihong Huang*[1]; Ning Kong[1]; Jungwoo Oh[2]; Sanjay K. Banerjee[1]; Joe C. Campbell[3]; [1]University of Texas at Austin; [2]Sematech; [3]University of Virginia

4:10 PM Student
Y8, Accurate Carbon Doping System for Low-Voltage and Low-Loss VCSELs: *Yu-Chia Chang*[1]; Chad S. Wang[1]; John E. English[2]; Larry A. Coldren[1]; [1]ECE Department, University of California, Santa Barbara; [2]Materials Department, University of California, Santa Barbara

4:30 PM Student
Y9, Optically Pumped GaSb Based "Arsenic Free" Mid IR Vertical Cavity Surface Emitting Laser Design: *Ravi Kalyanam*[1]; Abdenour Amtout[1]; Ralph Dawson[1]; Phil Dowd[1]; Sanjay Krishna[1]; [1]Center for High Technology Materials

4:50 PM Student
Y10, Monolithic GaSb-Based VCSEL on Si: *Ganesh Balakrishnan*[1]; Shenghong Huang[1]; Anitha Jallipalli[1]; Arezou Khoshakhlagh[1]; Manish Mehta[1]; Paul Rotella[1]; L. R. Dawson[1]; Sanjay Krishna[1]; D. L. Huffaker[1]; [1]University of New Mexico

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Session Z:
SiC: Characterization

Thursday PM Room: Conference Room 208
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Robert S. Okojie, NASA Glenn Research Center; Robert Stahlbush, Naval Research Laboratory

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1:30 PM
Z1, Optical Characterization of Stacking Faults in 4H-SiC PiN Diodes: *Joshua D. Caldwell*[1]; Paul B. Klein[1]; Robert E. Stahlbush[1]; Orest J. Glembocki[1]; Kendrick X. Liu[1]; Karl D. Hobart[1]; Fritz Kub[1]; [1]Naval Research Laboratory

1:50 PM
Z2, A 180 A/4.5 kV 4H-SiC PiN Diode for High Current Power Modules: *Brett A. Hull*[1]; Mrinal K. Das[1]; James T. Richmond[1]; Joseph J. Sumakeris[1]; Robert Leonard[1]; John W. Palmour[1]; Scott Leslie[2]; [1]Cree, Inc.; [2]Powerex, Inc.

2:10 PM
Z3, Improvement of PMOS Channel Properties for 4H-SiC P-IGBTs: *Mrinal K. Das*[1]; Sarah K. Haney[1]; Sei-Hyung Ryu[1]; Qingchun Zhang[1]; [1]Cree, Inc.

2:30 PM
Z4, Photo and Electro Luminescence Imaging of Carrot Defect in 4H-SiC Epitaxy: *Kendrick X. Liu*[1]; Robert E. Stahlbush[1]; Joshua D. Caldwell[1]; Karl D. Hobart[1]; Francis J. Kub[1]; Evan R. Glaser[1]; [1]US Naval Research Laboratory

2:50 PM
Z5, Identification of a Three-Site Defect in SI 4H-SiC: *Nelson Y. Garces*[1]; William E. Carlos[1]; Evan R. Glaser[1]; Mark A. Fanton[2]; [1]Naval Research Laboratory; [2]Electro-Optics Center

3:10 PM Break

3:30 PM
Z6, EPR Characterization of Halide CVD 4H SiC: *Mary Ellen Zvanut*[1]; H. J. Chung[2]; A. Y. Polyakov[2]; [1]University of Alabama at Birmingham; [2]Carnegie Mellon University

3:50 PM
Z7, Effect of Electron-Irradiation on Deep Centers in High-Purity Semi-Insulating 6H-SiC: *Zhaoqiang Fang*[1]; Gary C. Farlow[1]; Bruce Claflin[1]; David C. Look[1]; [1]Wright State University

4:10 PM Student
Z8, Deep Level Defects which Limit Current Gain in 4H SiC Bipolar Junction Transistors: *Corey Cochrane*[1]; Patrick Lenahan[1]; Aivars Lelis[2]; [1]Pennsylvania State University; [2]Army Research Laboratories

4:30 PM
Z9, Performance of SiC Field-Effect Devices at Elevated Temperature during Several Months of Continuous Operation: *Ruby N. Ghosh*[1]; Reza Loloee[1]; [1]Michigan State University

4:50 PM
Z10, Late News

Session AA: Organic/Inorganic Hybrid Photovoltaics

Thursday PM Room: Conference Room 207
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Max Shtein, University of Michigan; David J. Gundlach, National Institute of Standards and Technology

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1:30 PM Invited
AA1, Metal Nanostructure Enhanced Organic Solar Cells: *Peter Peumans*[1]; [1]Stanford University

2:10 PM Student
AA2, Organic Photovoltaic Cells with External Antennas: *Jonathan K. Mapel*[1]; Timothy D. Heidel[1]; Celebi Kemal[1]; Marc A. Baldo[1]; [1]Massachusetts Institute of Technology

2:30 PM Student
AA3, A Quantum Dot Photovoltaic Device Fabricated via Microcontact Printing: *Alexi Arango*[1]; David Oertel[2]; Moungi Bawendi[2]; Vladimir Bulovic[1]; [1]Massachusetts Institute of Technology, Department of Electrical Engineering; [2]Massachusetts Institute of Technology, Department of Chemistry

2:50 PM
AA4, Late News

3:10 PM Break

3:30 PM
AA5, Transparent Conducting SWNT Electrodes for Plastic Solar Cells: *Aurelien Du Pasquier*[1]; Husnu Emrah Unalan[1]; Alokik Kanwal[1]; Steve Miller[1]; Manish Chhowalla[1]; [1]Rutgers University

3:50 PM Student
AA6, Hybrid Conjugated Polymer/Nanostructured ZnO Photovoltaic Devices: *Dana C. Olson*[1]; Sean E. Shaheen[1]; Matthew S. White[1]; Reuben T. Collins[2]; David S. Ginley[1]; [1]National Renewable Energy Laboratory (NREL); [2]Colorado School of Mines

4:10 PM Student
AA7, Nanostructured Hybrid Solar Cells: *Vignesh Gowrishankar*[1]; Shawn R. Scully[1]; Albert T. Chan[1]; Michael D. McGehee[1]; [1]Stanford University

4:30 PM Student
AA8, Investigating Charge Dynamics of Small Molecule Organic Heterojunction Interfaces in Lateral Photoconductor Devices: *John Ho*[1]; Vladimir Bulovic[1]; [1]Massachusetts Institute of Technology

4:50 PM
AA9, Late News

Session BB: Oxide Thin Film Integration III

Thursday PM Room: Conference Room 206
June 29, 2006 Location: Pennsylvania State University

Session Chairs: Darrell Schlom, Pennsylvania State University; Patrick Lenahan, Pennsylvania State University

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1:30 PM
BB1, Electrical Evaluation of MBE-Grown Lanthanum Aluminate Dielectric on Ge Channels: *Chi On Chui*[1]; Wilman Tsai[1]; Lisa Edge[2]; Maitri Warusawithana[2]; Darrell Schlom[2]; [1]Intel Corporation; [2]Pennsylvania State University

1:50 PM Student
BB2, GaN MOSFET with ALD High-k Gate Dielectric: *Yanqing Wu*[1]; Peide (Peter) Ye[1]; Glen Wilk[2]; [1]Purdue University; [2]ASM America

2:10 PM Student
BB3, CV Studies on ALD Al_2O_3/GaAs and Al_2O_3/InGaAs Interfaces for Enhancement-Mode GaAs MOSFET Application: *H. C. Lin*[1]; Yi Xuan[1]; Peide (Peter) Ye[1]; Glen Wilk[2]; [1]Purdue University; [2]ASM America

2:30 PM Student
BB4, GaAs Growth on Silicon Substrates Using a Thin (~80 Nm) Si_xGe_{1-x} Step-Graded Buffer Layer for High-k III-V MOSFET Applications: *Michael M. Oye*[1]; Davood Shahrjerdi[1]; Xiaojun Yu[2]; Sagnik Dey[1]; David Q. Kelly[1]; Shannon D. Lewis[1]; Mark A. Wistey[2]; Jeffrey B. Hurst[1]; Sachin Joshi[1]; Terry J. Mattord[1]; James S. Harris[2]; Archie L. Holmes[1]; Sanjay K. Banerjee[1]; [1]University of Texas at Austin; [2]Stanford University

2:50 PM
BB5, Passivation of Ge Surface Using Ceria: *Yerassimos A. Panayiotatos*[1]; Andreas Sotiropoulos[1]; Sotiria Galata[1]; Athanasios Dimoulas[1]; [1]MBE Laboratory, Institute of Materials Science, NCSR Demokritos

3:10 PM Break

3:30 PM Student
BB6, Nonlinear Optical Probing of Polarization Dynamics in Strained Ferroelectric $SrTiO_3$ Films: *Aravind Vasudeva Rao*[1]; Sava Denev[1]; Alok Sharan[1]; Michael Biegalski[1]; Yulan Li[2]; Susan Troiler-McKinstry[1]; Long-Qing Chen[1]; Darrell Schlom[1]; Venkatraman Gopalan[1]; [1]Pennsylvania State University; [2]Los Alamos National Laboratory

3:50 PM Student
BB7, Epitaxial $BiMnO_3$ Films with Reduced Twinning and the Effect of Film Composition on Ferromagnetism: *June Hyuk Lee*[1]; Yunfa Jia[1]; Tassilo Heeg[2]; Rafael S. Freitas[1]; Dmitry A. Tenne[1]; Xiaoxing Xi[1]; Venkatraman Gopalan[1]; Peter E. Schiffer[1]; Jürgen Schubert[2]; Darrell G. Schlom[1]; [1]Pennsylvania State University; [2]Institut für Schichten und Grenzflächen

4:10 PM
BB8, Single Nanoparticle Transistors: A New Thin Film Device: *Steve Campbell*[1]; Yongping Ding[1]; Ying Dong[1]; Ameya Bapat[1]; Sang Ho Song[1]; Julia Daneen[1]; C. Barry Carter[1]; Uwe Kortshagen[1]; [1]University of Minnesota

4:30 PM
BB9, Late News

4:50 PM
BB10, Late News

Session CC: Dilute Nitride Semiconductors

Thursday PM — Room: Conference Room 108
June 29, 2006 — Location: Pennsylvania State University

Session Chairs: Charles W. Tu, University of California; Rachel S. Goldman, University of Michigan

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1:30 PM
CC1, Effect of Strain on the Nitrogen Incorporation in InGaAsN Quantum Wells Grown on GaAs and InP Substrates by Metalorganic Vapor Phase Epitaxy: *Nelson Tansu*[1]; Jeng-Ya Yeh[2]; Luke J. Mawst[2]; [1]Lehigh University; [2]University of Wisconsin-Madison

1:50 PM Student
CC2, TEM Analysis of GaInNAsSb Quantum Wells Grown and Annealed at Varied Temperatures: *Evan R. Pickett*[1]; Seth R. Bank[2]; Hopil P. Bae[1]; Homan B. Yuen[1]; Mark A. Wistey[1]; James S. Harris[1]; [1]Stanford University; [2]University of California at Santa Barbara

2:10 PM Student
CC3, Relative Speed and Temperature Dependence of Constituent Pro-cesses in the Annealing of GaInNAs(Sb) and Their Implications on Device Growth and Annealing: *Hopil P. Bae*[1]; Seth R. Bank[2]; Homan B. Yuen[1]; Evan R. Pickett[1]; Mark A. Wistey[1]; [1]Stanford University; [2]University of California, Santa Barbara

2:30 PM Student
CC4, The Role of Bismuth as a Surfactant during Beryllium Doping of GaAsN Grown by Molecular Beam Epitaxy: *Ting Liu*[1]; Dimitris Korakakis[1]; Thomas H. Myers[1]; [1]West Virginia University

2:50 PM Student
CC5, Strong Luminescence Enhancement in GaInNAsSb Quantum Wells through Variation of the Group-V Fluxes: *Seth R. Bank*[1]; Hopil Bae[1]; Homan B. Yuen[1]; Evan R. Pickett[1]; Mark A. Wistey[1]; Akihiro Moto[2]; James S. Harris[1]; [1]Stanford University; [2]Innovation Core SEI, Inc.

3:10 PM Break

3:30 PM Student
CC6, Influence of Nitrogen Incorporation on Electron Transport in Selectively Doped GaAsN/AlGaAs Heterostructures: *Yu Jin*[1]; Matthew Reason[1]; Xiaogang Bai[1]; Hugh Mckay[1]; Rachel Goldman[1]; Cagliyan Kurdak[1]; [1]University of Michigan

3:50 PM Student
CC7, Growth and Fabrication of InGaNP Quantum Well Based Yellow-Red Light-Emitting Diodes: *Vladimir A. Odnoblyudov*[1]; Charles Tu[1]; [1]University of California, San Diego

4:10 PM
CC8, Electrical and Luminescence Properties of n- and p-Type GaPN: *Yuzo Furukawa*[1]; Hiroo Yonezu[1]; Akihiro Wakahara[1]; Sato Atsushi[1]; [1]Toyohashi University of Technology

4:30 PM
CC9, The Role of Kinetic Effects in Radiative and Non-Radiative Recombination of Optical Excitations in Dilute Nitride Heterostructures:

Theory and Experiment: *Oleg Rubel*[1]; S. D. Baranovskii[1]; B. Kunert[1]; K. Hantke[1]; W. W. Rühle[1]; P. Thomas[1]; K. Volz[1]; W. Stolz[1]; [1]Philipps University Marburg

4:50 PM Student
CC10, Bandgap Reduction and Lattice Matching in Dilute Nitride Antimonide Alloys: *Paul Jefferson*[1]; Tim Veal[1]; Louis Piper[1]; Chris McConville[1]; Brian Bennett[2]; Louise Buckle[3]; Tim Ashley[3]; [1]University of Warwick; [2]Naval Research Laboratory; [3]QinetiQ Ltd.

Session DD: P-Type Doping and Electroluminescence in ZnO

Friday AM — Room: Deans Hall I
June 30, 2006 — Location: Pennsylvania State University

Session Chairs: David P. Norton, University of Florida; Yicheng Lu, Rutgers University

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8:20 AM Student
DD1, Band-Edge Electroluminescence from N^+-Implanted Bulk ZnO: *Hung-Ta Wang*[1]; Fan Ren[1]; Byoung S. Kang[1]; Jau-Jiun Chen[1]; Travis Anderson[1]; Soohwan Jiang[1]; Hyun-Sik Kim[1]; Yuanjie Li[1]; David Norton[1]; Stephen Pearton[1]; [1]University of Florida

8:40 AM Student
DD2, Photoluminescence and Electroluminescence Properties of ZnO Nanotips Grown on p-Type GaN: *Jian Zhong*[1]; Hanhong Chen[1]; Gaurav Saraf[1]; Yicheng Lu[1]; H. M. Ng[2]; C. K. Choi[3]; J. J. Song[4]; [1]Rutgers University; [2]Bell Laboratories, Lucent Technologies; [3]ZN Technology; [4]ZN Technology, University of California, San Diego

9:00 AM
DD3, Changes in Electrical Characteristics of p-Type Zinc Oxide Thin Films Due to Light and Gas Ambient: *Bruce Claflin*[1]; David C. Look[1]; Gene Cantwell[2]; David P. Norton[3]; [1]Semiconductor Research Center; [2]Zn Technology; [3]University of Florida

9:20 AM Student
DD4, Bi-Doped ZnO Films Grown by Molecular-Beam Epitaxy: *Faxian Xiu*[1]; Leelaprasanna J. Mandalapu[1]; Zheng Yang[1]; Jianlin Liu[1]; [1]University of California, Riverside

9:40 AM Student
DD5, Phosphorus Bipolar Doping of ZnO Thin Films Fabricated by Pulsed Laser Deposition: *Arnold Allenic*[1]; Wei Guo[1]; Yanbin Chen[1]; Guangyuan Zhao[1]; Yong Che[2]; Zhendong Hu[2]; Bing Liu[2]; Xiaoqing Pan[1]; [1]University of Michigan; [2]IMRA America, Inc.

10:00 AM Break

10:20 AM
DD6, ZnO Light-Emitting Diode Fabricated by Plasma-Assisted Metal-organic Chemical Vapor Deposition: *Zhizhen Ye*[1]; Weizhong Xu[1]; Yujia Zeng[1]; Liping Zhu[1]; [1]Zhejiang University

10:40 AM
DD7, MOCVD Growth of ZnO and p-Type Doping: *Ming Pan*[1]; Varatharajan Rengarajan[1]; Jeff Nause[1]; [1]Cermet, Inc.

11:00 AM
DD8, Characterization of Defects in Zinc Oxide Single Crystals: Balaji Raghothamachar[1]; *Govindhan Dhanaraj*[1]; Yi Chen[1]; Hui Chen[1]; Michael Dudley[1]; Michael Callahan[2]; Erik Grant[2]; Buguo Wang[3]; [1]Stony Brook University; [2]Air Force Research Laboratory; [3]Solid State Scientific Corporation

11:20 AM
DD9, Late News

11:40 AM
DD10, Late News

Session EE: Contacts to III-Nitrides

Friday AM Room: Deans Hall II
June 30, 2006 Location: Pennsylvania State University

Session Chairs: Huili (Grace) Xing, University of Notre Dame; Lisa Porter, Carnegie Mellon University

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8:20 AM Student
EE1, Comparison of Thermally Stable TiB_2, CrB_2 and W_2B_5 Based Ohmic Contacts on n-GaN: *Rohit Khanna*[1]; S. J. Pearton[1]; F. Ren[1]; I. I. Kravchenko[1]; [1]University of Florida

8:40 AM Student
EE2, Reduction of Metal/GaN Barrier Height Using Nanopatterning: *Ho Gyoung Kim*[1]; Parijat Deb[1]; Timothy Sands[1]; [1]Purdue University

9:00 AM Student
EE3, Investigation of a Low-Temperature Cu_3Ge Ohmic Contact to *N*-GaN: *Michael L. Schuette*[1]; Wu Lu[1]; [1]Ohio State University

9:20 AM
EE4, Formation of High-Quality Ag Ohmic Contacts for Flip-Chip LEDs by Using Transparent Conducting Oxide Interlayers: Hyun-Gi Hong[1]; June-O Song[2]; J. Cho[3]; Y. Park[3]; J. S. Kwak[4]; *Tae-Yeon Seong*[5]; [1]Gwangju Institute of Science and Technology; [2]Georgia Institute of Technology; [3]SAIT; [4]Sunchon National University; [5]Korea University

9:40 AM
EE5, Late News

10:00 AM Break

10:20 AM Student
EE6, Analytical Transmission Electron Microscopy (TEM) Investigation of the Structural Evolution of Ti-Based Ohmic Contacts on GaN and AlGaN/GaN at Different Annealing Temperatures: *Liang Wang*[1]; Fitih M. Mohammed[1]; Ilesanmi Adesida[1]; [1]University of Illinois at Urbana-Champaign

10:40 AM Student
EE7, Low-Temperature-Annealed Mo-Based Ohmic Contacts for AlGaN/GaN Heterostructures: *Anirban Basu*[1]; Fitih M. Mohammed[1]; Liang Wang[1]; Vipan Kumar[1]; Ilesanmi Adesida[1]; [1]University of Illinois, Urbana-Champaign

11:00 AM Student
EE8, Si and Ge Incorporation in Ti/Al/Mo/Au for AlGaN/GaN HEMTs: Effects on Electrical and Microstructural Properties: *Fitih M. Mohammed*[1]; Liang Wang[1]; Ilesanmi Adesida[1]; [1]University of Illinois at Urbana-Champaign

11:20 AM Student
EE9, Comparison of V- and Ti-Based Ohmic Contacts to High Al-Fraction n-$Al_xGa_{1-x}N$: *Mary A. Horsey*[1]; Katherine H. A. Bogart[2]; Andrew Allerman[2]; G. S. Cargill III[3]; Alexey Nikiforov[4]; [1]Pennsylvania State University; [2]Sandia National Laboratories; [3]Lehigh University; [4]Boston University

11:40 AM
EE10, Late News

Session FF: Indium Nitride

Friday AM Room: Conference Room 106
June 30, 2006 Location: Pennsylvania State University

Session Chairs: Joan M. Redwing, Pennsylvania State University; William J. Schaff, Cornell University

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8:20 AM
FF1, Origin of the N-Type Conductivity of InN – The Role of Positively Charged Nitrogen Vacancies along Threading Dislocations: *Tim Veal*[1]; Louis Piper[1]; Chris McConville[1]; Hai Lu[2]; William Schaff[2]; [1]University of Warwick; [2]Cornell University

8:40 AM
FF2, Optical Properties of the In-Polarity InN/$In_{0.7}Ga_{0.3}N$ MQWs Grown by RF-MBE: *Song-Bek Che*[1]; Takuro Shinada[1]; Yoshihiro Ishitani[1]; Akihiko Yoshikawa[1]; [1]Chiba University

9:00 AM
FF3, In-Polar InN: Evidence of a Possible Hole Accumulation Layer: Phillip A. Anderson[1]; *Steven M. Durbin*[1]; Craig Swartz[2]; Thomas H. Myers[2]; S. J. Kim[3]; M. C. Chung[3]; Alexander N. Cartwright[3]; [1]University of Canterbury; [2]West Virginia University; [3]University at Buffalo, State University of New York

9:20 AM
FF4, Anisotropy of the Γ-Point Electron Effective Mass in Hexagonal InN: *Tino Hofmann*[1]; T. Chavdarov[2]; V. Darakchieva[3]; H. Lu[4]; William J. Schaff[4]; Mathias M. Schubert[1]; [1]University of Nebraska-Lincoln; [2]Universität Leipzig; [3]Linköping University; [4]Cornell University

9:40 AM Student
FF5, Structural and Optical Properties of InN Layers Grown by HPCVD: *Mustafa Alevli*[1]; Goksel Durkaya[1]; Aruna Weerasekara[1]; William Fenwick[2]; Vincent Woods[2]; Ian T. Ferguson[2]; Unil Perera[1]; Nikolaus Dietz[1]; [1]Georgia State University; [2]Georgia Institute of Technology

10:00 AM Break

10:20 AM
FF6, Effect of the Growth Mode and Substrate Properties on the Biaxial Strain in InN (0001) Epilayers: *Eleftherios Iliopoulos*[1]; Emmanouil Dimakis[1]; Jaroslaw Domagala[2]; Katerina Tsagaraki[1]; Alexandros Georgakilas[1]; [1]Microelectronics Research Group, University of Crete, Greece, and Institute of Electronic Structure and Laser (IESL), Foundation for Research and Technology-Hellas (FORTH), Greece; [2]Institute of Physics, Polish Academy of Sciences

10:40 AM
FF7, Study of Graded InGaN Buffer Layers for MOCVD Growth of Indium Nitride Thin Films: *Abhishek Jain*[1]; Xiaojun Weng[1]; Joan M. Redwing[1]; [1]Pennsylvania State University

11:00 AM Student
FF8, Optical Properties of InN Epilayer and Self-Organized InN Quantum Dots Grown by Flow-Rate Modulated Epitaxy: *Chen-Pang Fu*[1]; Wen-Cheng Ke[1]; Wei-Kuo Chen[1]; Chin-Hau Chia[1]; Wu-Ching Chou[1]; Wen-Hao Chang[1]; Ming-Chih Lee[1]; Ching-Shun Ku[1]; [1]National Chiao Tung University

11:20 AM
FF9, Low Temperature Epitaxial Growth of InN on Substrates with Small Lattice Mismatches: *Hiroshi Fujioka*[1]; Jitsuo Ohta[1]; Kazuya Mitamura[2]; Masaharu Oshima[2]; [1]University of Tokyo/KAST; [2]University of Tokyo

11:40 AM
FF10, Ammonothermal Growth and Characterization of Indium Nitride Crystals: *Buguo Wang*[1]; M. J. Callahan[2]; L. Bouthillette[2]; K. Rakes[2]; M. Suscavage[2]; D. Bliss[2]; [1]Solid State Scientific; [2]Air Force Research Laboratory

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Session GG: Silicon and Germanium Nanowires

Friday AM Room: Conference Room 208
June 30, 2006 Location: Pennsylvania State University

Session Chairs: Hou T. Ng, Hewlett-Packard Company; Christopher Chidsey, Stanford University

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8:20 AM Student
GG1, RF Dielectric Properties of Silicon Nanowire Networks: Wenchong Hu[1]; Alexey Kovalev[1]; Sarah Dilts[1]; Yanfeng Wang[1]; Joan M. Redwing[1]; *Theresa S. Mayer*[1]; [1]Pennsylvania State University

8:40 AM Student
GG2, Nanowire Bandgap Engineering through Highly Strained Si/Ge Heterostructures: *Teresa J. Clement*[1]; J. L. Taraci[1]; A. Batwal[2]; P. Peralta[2]; Jeff Drucker[3]; S. T. Picraux[4]; [1]Department of Chemical and Materials Engineering, Arizona State University; [2]Department of Mechanical and Aerospace Engineering, Arizona State University; [3]Department of Physics and Astronomy, Arizona State University; [4]Center for Integrated Nanotechnology, Los Alamos National Laboratory

9:00 AM Student
GG3, Unintentional Background Doping of Vapor-Liquid-Solid Synthesized SiNWs: *Tsung-Ta Ho*[1]; Yanfeng Wang[1]; Kok-Keong Lew[1]; Trevor Clark[1]; Elizabeth Dickey[1]; Joan Redwing[1]; Theresa Mayer[1]; [1]Pennsylvania State University

9:20 AM Student
GG4, Synthesis and X-Ray Diffraction Characterization of Heteroepitaxially Grown Germanium Nanowires: *Irene A. Goldthorpe*[1]; Joshua B. Ratchford[1]; Jacob H. Woodruff[1]; Christopher E.D. Chidsey[1]; Paul C. McIntyre[1]; [1]Stanford University

9:40 AM Student
GG5, Structural and Field-Effect Properties of Thermally-Oxidized Silicon Nanowires: *Yanfeng Wang*[1]; Bangzhi Liu[1]; Daniel Shir[1]; Kok-Keong Lew[1]; Sarah Dilts[1]; Chad Eichfeld[1]; Joan Redwing[1]; Suzanne Mohney[1]; Theresa Mayer[1]; [1]Pennsylvania State University

10:00 AM Break

10:20 AM Student
GG6, Growth and Passivation of Vertically Aligned Germanium Nanowires for Three Dimensional Nanoelectronics: *Hemant Adhikari*[1]; Paul C. McIntyre[1]; Christopher E. D. Chidsey[1]; [1]Stanford University

10:40 AM Student
GG7, Integrated Silicon Nanowire Diodes: *Justin B. Jackson*[1]; Sun-Gon Jun[1]; Divesh Kapoor[1]; Mark S. Miller[1]; [1]University of Utah

11:00 AM
GG8, Silicidation of Silicon Nanowires: *Bangzhi Liu*[1]; Suzanne E. Mohney[1]; Yanfeng Wang[1]; Theresa S. Mayer[1]; [1]Pennsylvania State University

11:20 AM Student
GG9, Self-Assembled Nickel Silicide Nanowire Contacts and Direct Electrical Measurement: *Joondong Kim*[1]; Wayne A. Anderson[1]; [1]University at Buffalo

11:40 AM
GG10, Late News

Session HH: Molecular Electronics: Devices, Materials and Contacts

Friday AM Room: Conference Room 207
June 30, 2006 Location: Pennsylvania State University

Session Chairs: Mark C. Hersam, Northwestern University; David B. Janes, Purdue University

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8:20 AM Student
HH1, Ordered Molecular Films on Semiconductors: Characterization of Ordered Organothiolate Monolayers on GaAs (100) and (110) for Molecular Electronic Applications: *Christine McGuiness*[1]; Daniel Blasini[2]; Zihua Zhu[1]; Sundararajan Uppili[1]; Andrey Shaporenko[3]; Michael Zharnikov[3]; Detlef Smilgies[4]; Nicholas Winograd[1]; David Allara[1]; [1]Pennsylvania State University; [2]Cornell University; [3]University of Heidelburg; [4]CHESS

8:40 AM Student
HH2, Investigating the Stability of Organic Molecules Bound to Semiconductor Surfaces with Low Temperature UHV-STM: *Nathan L. Yoder*[1]; Nathan P. Guisinger[1]; Mark C. Hersam[1]; [1]Northwestern University

9:00 AM Student
HH3, High Resolution Inelastic Electron Tunneling Spectroscopy of Nanoscale Crossed-Wire Molecular Junctions: *Heayoung Yoon*[1]; Lintao Cai[1]; Marco Cabassi[1]; Theresa S. Mayer[1]; [1]Pennsylvania State University

9:20 AM
HH4, Single-Molecule Transistors to Characterize Bistability in Molecular Conduction: Zachary K. Keane[1]; David A. Corley[1]; Jacob W. Ciszek[1]; James M. Tour[1]; *Douglas Natelson*[1]; [1]Rice University

9:40 AM Student
HH5, Criteria for Statistical Determination of Working Devices of Microscale via-Hole Molecular Structures: *Tae-Wook Kim*[1]; Gunuk Wang[1]; Takhee Lee[1]; [1]Gwangju Institute of Science and Technology

10:00 AM Break

10:20 AM
HH6, Fundamental Studies of Vapor Deposited Metal Contacts for Molecular Electronics Devices: *Thomas A. Daniel*[1]; David L. Allara[1]; Masato Maitani[1]; Tim Tighe[1]; [1]Pennsylvania State University

10:40 AM Student
HH7, Electrical and Structural Characterization of Evaporated Contacts in Au/Molecule/GaAs Devices: *Patrick D. Carpenter*[1]; Saurabh Lodha[1]; David B. Janes[1]; Amy V. Walker[2]; [1]Purdue University; [2]Washington University in St. Louis

11:00 AM Student
HH8, Molecule-Electrode Contact Effect on the Conductance of Single Alkanedithiols: *Xiulan Li*[1]; Joshua Hihath[1]; [1]Arizona State University

11:20 AM Student
HH9, Scalable Molecular Electrodes at the Paterned Edge of a Metal/Insulator/Metal Junction: *Pawan Tyagi*[1]; Dong Feng[1]; Steve Holmes[1]; Bruce J. Hinds[1]; [1]University of Kentucky

11:40 AM Student
HH10, From Quantum Chemistry to Molecular Electronic Circuits: *Yuhui Lu*[1]; Craig Lent[1]; [1]University of Notre Dame

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Session II: Trapping and Charge Transport in Organic Transistors

Friday AM Room: Conference Room 206
June 30, 2006 Location: Pennsylvania State University

Session Chairs: Thomas Jackson, Pennsylvania State University; David J. Gundlach, National Institute of Standards and Technology

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8:20 AM Invited
II1, Trapping of Majority and Minority Carriers at the Insulator-Polymer Semiconductor Interface: *David M. Taylor*[1]; Oscar Fernandez[1]; Janet Lancaster[1]; [1]University of Wales, Bangor

9:00 AM Student
II2, Trap Energy Determination by Analysis of Isothermal Gated Space-Charge-Limited Current in Organic Thin-Film Transistors: *Richard D. Yang*[1]; Xiaotian Zhou[1]; Edward Yu[1]; Andrew Kummel[1]; [1]University of California, San Diego

9:20 AM Student
II3, Measurement of Drift Velocity and Mobility of Carriers in a Polymer Thin-Film Transistor: *Debarshi Basu*[1]; Liang Wang[1]; Lawrence Dunn[1]; Ananth Dodabalapur[1]; Martin Heeney[2]; Iain McCulloch[2]; [1]University of Texas at Austin; [2]Merck Chemicals

9:40 AM
II4, Influence of Charged Dielectrics and Adsorbed Dipoles on Organic Semiconductors in Transistor Architectures: *Howard E. Katz*[1]; Cheng Huang[1]; Kevin See[1]; Alan Becknell[2]; [1]Johns Hopkins University; [2]Applied Physics Laboratory

10:00 AM Break

10:20 AM Student
II5, Charge Transport as a Function of Gate Voltage and Temperature in N,N'-bis(n-octyl)-Dicyanoperylene-3,4:9,10-bis(Dicarboximide) [PDI-8CN2]: *Yeon Taek Jeong*[1]; Byungwook Yoo[1]; Brooks Jones[2]; Antonio Facchetti[2]; Tobin Marks[2]; Ananth Dodabalapur[1]; [1]University of Texas at Austin; [2]Northwestern University

10:40 AM
II6, Using High-Sensitivity Electric Force Microscopy to Probe Charge Trapping in Pentacene Thin-Film Transistors: *Michael J. Jaquith*[1]; Showkat M. Yazdanian[1]; Tse Nga Ng[2]; John A. Marohn[1]; [1]Cornell University;

[2]Palo Alto Research Center

11:00 AM Student
II7, Charge Transport at Very High Carrier Densities in Organic Semiconductor Thin Films and Single Crystals: *Matthew J. Panzer*[1]; C. Daniel Frisbie[1]; [1]University of Minnesota

11:20 AM
II8, Building Blocks for Single-Component Organic Electronics: Electrostatic Modulation and Majority Carrier Sign Inversion of Organic Semiconductors via Polarized Gates: *Cheng Huang*[1]; Howard E. Katz[1]; James E. West[1]; [1]Johns Hopkins University

11:40 AM
II9, High-Mobility Charge Transport in Laminated Rubrene Crystal/Polymer Field-Effect Transistors: *Jun Takeya*[1]; Koichi Yamada[2]; Kazuhito Tsukagoshi[3]; Yoshinobu Aoyagi[3]; Yasuhiro Nakazawa[1]; Yoshihiro Iwasa[4]; [1]Osaka University; [2]CRIEPI; [3]RIKEN; [4]Tohoku University

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Session JJ: Spintronic Materials

Friday AM — Room: Conference Room 108
June 30, 2006 — Location: Pennsylvania State University

Session Chairs: Chris J. Palmstrom, University of Minnesota; Nitin Samarth, Pennsylvania State University

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8:20 AM
JJ1, Magnetoresistance and Insulator-Metal Transition of EuO_{1-x} Thin Films Grown on (110) $YAlO_3$ and (001) Si Substrates: *Andreas Schmehl*[1]; Venu Vaithyanathan[1]; Raghava Panguluri[2]; Boris Nadgorny[2]; Marco Liberati[3]; Yves Idzerda[3]; Alexander Weber[4]; Jochen Mannhart[4]; Darrell G. Schlom[1]; [1]Pennsylvania State University; [2]Wayne State University; [3]Montana State University; [4]University of Augsburg

8:40 AM Student
JJ2, High Field Magnetoresistance and Hall Effect Studies of Nonmagnetic Al- and Cu-Doped (Zn,Mn)O Dilute Magnetic Semiconductors: *Theodore W. Kehl*[1]; C. Vera[1]; S. Manchiraju[1]; D. Horst[1]; K. Manivannan[1]; J. Griffiths[2]; P. Kahol[1]; K. Ghosh[1]; S. R. Mishra[2]; [1]Missouri State University; [2]University of Memphis

9:00 AM
JJ3, Conduction-Band Electron Effective Mass in $Zn_{0.87}Mn_{0.13}Se$ Measured by Terahertz and Far-Infrared Magnetooptic Ellipsometry: *Tino Hofmann*[1]; K. C. Agarwal[2]; B. Daniel[2]; C. Klingshirn[2]; M. Hetterich[2]; C. M. Herzinger[3]; M. M. Schubert[1]; [1]University of Nebraska-Lincoln; [2]Universität Karlsruhe; [3]J.A.Woollam Company, Inc.

9:20 AM Student
JJ4, Ferromagnetism in Fe-Implanted ZnO Films and Nanotips: *Pan Wu*[1]; Gaurav Saraf[1]; Yicheng Lu[1]; David Hill[1]; Dario Arena[2]; Robert Bartynski[1]; Leszek Wielunski[1]; Jeremy Raley[3]; Yung Kee Yeo[3]; [1]Rutgers University; [2]Brookhaven National Laboratory; [3]Air Force Institute of Technology

9:40 AM Student
JJ5, Dilute Magnetic MnGe Semiconductor Using Ion Implantation of Mn into Nano-Patterned Ge: *Jingjing Chen*[1]; Kos Galatsis[1]; Kang Wang[1]; Jiayu Wang[2]; Thomas P. Russell[2]; [1]University of California, Los Angeles; [2]University of Massachusetts

10:00 AM Break

10:20 AM
JJ6, Direct Imaging of Photo-Induced Changes in Magnetization Orientation in (Ga,Mn)As by a Scanning Magneto-Optical Microscope: *Tsuyoshi Kondo*[1]; Kenta Nomura[1]; Gaku Koizumi[1]; Hiro Munekata[1]; [1]Tokyo Institute of Technology

10:40 AM Student
JJ7, Electroluminescence Studies of (Ga,Mn)As-Based p-i-n Structures: *Zhiguo Ge*[1]; Raja Chakarvorty[1]; Shaoping Shen[1]; Weng-Lee Lim[1]; Xinyu Liu[1]; Jacek Furdyna[1]; Malgorzata Dobrowolska[1]; [1]University of Notre Dame

11:00 AM Student
JJ8, Ferromagnetic Co_2MnGe Contacts for GaAs: Growth, Characterization, and Interface Stability: *J. L. Hilton*[1]; B. D. Schultz[1]; X. Lou[2]; P. A. Crowell[2]; C. J. Palmstrom[1]; [1]Department of Chemical Engineering and Materials Science, University of Minnesota; [2]School of Physics and Astronomy, University of Minnesota

11:20 AM
JJ9, Magnetic Characterization of Fe/Tb Superlattice Grown on InAs as a Vertically Magnetized Spin Injector: *Kanji Yoh*[1]; Robert Peters[2]; Marhoun Ferhat[3]; Saori Kashiwada[1]; Werner Keune[2]; [1]Hokkaido University; [2]University of Duisburg-Essen; [3]JST

11:40 AM Student
JJ10, Thickness Determination of Ultra-Thin Oxide Films and the Application in Magnetic Tunnel Junctions: *Jianhua Joshua Yang*[1]; Chengxiang Ji[1]; Y. Austin Chang[1]; Ying Yang[1]; Feng X. Liu[2]; Bharat B. Pant[2]; Allan E. Schultz[2]; [1]University of Wisconsin-Madison; [2]Seagate Technologies

Session KK: GaN Characterization

Friday PM Room: Deans Hall II
June 30, 2006 Location: Pennsylvania State University

Session Chairs: Randall M. Feenstra, Carnegie Mellon University; Michael Wraback, U.S. Army Research Laboratory

1:30 PM
KK1, A Dynamic Micro-Analysis of Temperature Distribution and Electric Potential Distribution of AlGaN/GaN HFETs Using Micro-Raman Spectroscopy and Kelvin-Force Microscopy: *Akira Suzuki*[1]; Shin-Ichi Kamiya[2]; Masayuki Iwami[2]; Yuichi Hiroyama[2]; Tadayoshi Tsuchiya[2]; Tomoyuki Yamada[2]; Junjiroh Kikawa[2]; Ken-Ichi Kosaka[1]; Tsutomu Araki[1]; Yasushi Nanishi[1]; [1]Ritsumeikan University; [2]Advanced HF Device R&D Center, R&D Association for Future Electron Devices

1:50 PM Student
KK2, Selective Quantification of AlGaN-Related Deep Levels in AlGaN/GaN Heterostructures Using Capacitance-Mode Deep Level Optical Spectroscopy: *Andrew Armstrong*[1]; Christiane Plobenz[2]; Siddharth Rajan[2]; James S. Speck[2]; Umesh K. Mishra[2]; Steven A. Ringel[1]; [1]Ohio State University; [2]University of California, Santa Barbara

2:10 PM
KK3, Anisotropic Strain in GaN Films Grown on *a*-Plane and *r*-Plane Sapphire: Effect on GaN Phonons: *V. Darakchieva*[1]; T. Paskova[2]; M. Schubert[3]; P. P. Paskov[1]; H. Arwin[1]; B. Monemar[1]; M. Heuken[4]; S. Figge[2]; D. Hommel[2]; B. A. Haskell[5]; P. T. Fini[5]; S. Nakamura[5]; [1]Linkoping University; [2]University of Bremen; [3]University of Nebraska; [4]Aixtron AG; [5]University of California, Santa Barbara

2:30 PM Student
KK4, Phase Separation and Defects in Quaternary $In_XAl_YGa_{1-X-Y}N$ Layers: *Fanyu Meng*[1]; Rao Manu[1]; Nathan Newman[1]; Subhash Mahajan[1]; [1]Department of Chemical and Materials Engineering and Center for Solid State Electronics Research, Arizona State University

2:50 PM
KK5, Consequences of Polarity and Related Defects on the Electrical Properties of GaN Grown by MOVPE: *Ramon Collazo*[1]; Aleks Aleksov[1]; Seiji Mita[1]; Raoul Schlesser[1]; Zlatko Sitar[1]; [1]North Carolina State University

3:10 PM Break

3:30 PM Student
KK6, Defect Reduction in GaN through Formation of 'Dislocation Clusters' at the Nanoheteroepitaxial Interface: *Mohammad Ferdous*[1]; Xinyu Sun[1]; Xin Wang[1]; Michael Fairchild[1]; Steve Hersee[1]; [1]University of New Mexico

3:50 PM Student
KK7, Influence of Arsenic Isovalent Co-Doping on the Electronic Properties of N-Type and P-Type GaN Grown by Metal-Organic Chemical Vapor Deposition: *David Gray*[1]; Michael Willemann[1]; Kai Zhang[1]; Ali Hajjiah[1]; Kevin Chern[1]; Alex Aning[1]; Louis J. Guido[1]; [1]Virginia Tech

4:10 PM
KK8, Strong Light-Matter Coupling a Room Temperature in GaN Microcavities: *Ian R. Sellers*[1]; Fabrice Semond[1]; Mathieu Leroux[1]; Jean Massies[1]; Pierre Disseix[2]; Joel Leymarie[2]; [1]Centre de Recherche sur l'Hétéro-Epitaxie et ses Applications; [2]LASMEA-Université Baisle Pascal

4:30 PM Student
KK9, Microstructural Investigation of AlN Re-Growth by MOCVD: *Xianglin Li*[1]; Ramon Collazo[1]; Rafael Dalmau[1]; Seiji Mita[1]; Zlatko Sitar[1]; [1]North Carolina State University

4:50 PM
KK10, Late News

Session LL: Compound Semiconductor Nanowires

Friday PM, June 30, 2006
Room: Conference Room 208
Location: Pennsylvania State University

Session Chair: Timothy D. Sands, Purdue University

1:30 PM
LL1, InAs Nanowire Transistors Using Solution-Grown Nanowires with Acceptor Doping: *Qingling Hang*[1]; David Janes[1]; Fudong Wang[2]; William Buhro[2]; [1]Purdue University; [2]Washington University in St. Louis

1:50 PM
LL2, Photocurrent Spectroscopy of Solution-Synthesized Nanowire-Based Photodetectors: *Huili (Grace) Xing*[1]; Xiangyang Li[2]; Amol K. Singh[1]; Debdeep Jena[1]; Masaru K. Kuno[1]; [1]University of Notre Dame; [2]Shanghai Institute of Technical Physics, Chinese Academy of Science

2:10 PM Student
LL3, Growth Mechanism and Optimization of InAs Nanowires Synthesized by OMVPE: *Shadi A. Dayeh*[1]; David Aplin[1]; Edward T. Yu[1]; Deli Wang[1]; Paul K. L. Yu[1]; [1]University of California, San Diego

2:30 PM
LL4, III-V Nanostructures Formed from GaP Nanowires on Si(111) Substrates: *Kouta Tateno*[1]; Hiroki Hibino[1]; Haruki Sanada[1]; Hideki Gotoh[1]; Hidetoshi Nakano[1]; [1]NTT Basic Research Laboratories

2:50 PM
LL5, The Fabrication of Extreme Aspect Ratio Semiconductor and Metal Wires within Photonic Crystal Fibers: *Neil Baril*[1]; Don-Jin Won[1]; Thomas Scheidemantel[1]; Adrian Amezcua-Correa[2]; Chris Finlayson[2]; John Hayes[2]; Pier Sazio[2]; Venkatraman Gopalan[1]; John Badding[1]; [1]Pennsylvania State University; [2]University of Southampton

3:10 PM Break

3:30 PM
LL6, In Situ Electrical Annealing of Bio-Templated Nanowires: *Yan Gao*[1]; Gary Braun[1]; Chung-Yi Chiang[2]; Jing C. Zhou[3]; Norbert O. Reich[1]; Angela Belcher[2]; Bruce Dunn[3]; Evelyn Hu[1]; [1]University of California, Santa Barbara; [2]Massachusetts Institute of Technology; [3]University of California, Los Angeles

3:50 PM Student
LL7, Contacts to Gold Nanowires in Porous Anodic Alumina Templates: *Kalapi Biswas*[1]; Yexian Qin[1]; Manuel Da'Silva[1]; Ron Reifenberger[1]; Tim Sands[1]; [1]Purdue University

4:10 PM
LL8, Three-Dimensional Nanoscale Composition Mapping of Semiconductor Nanowires: *Lincoln J. Lauhon*[1]; Daniel E. Perea[1]; Steven J. May[1]; Jessica L. Lensch[1]; Jonathan E. Allen[1]; Bruce W. Wessels[1]; David N. Seidman[1]; [1]Northwestern University

4:30 PM Student
LL9, Photoluminescent Properties of ZnO/$Mg_{0.2}Zn_{0.8}O$ Coaxial Nanorod Quantum Structures: *Jinkyoung Yoo*[1]; Gyu-Chul Yi[1]; Bonghwan Chon[1]; Taiha Joo[1]; Takahashi Yatsui[2]; Motoichi Ohtsu[3]; [1]POSTECH; [2]Japan Science and Technology Agency; [3]University of Tokyo

4:50 PM Student
LL10, Transport Properties of Solution Grown Thin Film Nanowire Solids: *Amol K. Singh*[1]; Xiangyan Li[2]; Vladimir Protasenko[1]; Masaru Ken Kuno[1]; Huili Grace Xing[1]; Debdeep Jena[1]; [1]University of Notre Dame; [2]Shanghai Institute of Technical Physics

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Session MM: Chemical and Biological Sensors II

Friday PM — Room: Conference Room 207
June 30, 2006 — Location: Pennsylvania State University

Session Chairs: Debdeep Jena, University of Notre Dame; Alec Talin, Sandia National Laboratories

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1:30 PM Student
MM1, Chemical Sensor Applications Using Functionalized Conducting Polymer Nanojunction Array: *Alvaro Diaz Aguilar*[1]; Erica Silvia Forzani[1]; Xiulan Li[1]; Larry Nagahara[2]; Islamshah Amlani[2]; Raymond Tsui[2]; Nongjian Tao[1]; [1]Arizona State University; [2]Motorola Laboratories

1:50 PM
MM2, Modification of Nanoparticle-Organic Composite Electronic Materials for Improved Chemical Sensors: *Stephen W. Howell*[1]; Shawn Dirk[1]; David Wheeler[1]; Robert J. Simonson[1]; [1]Sandia National Laboratories

2:10 PM
MM3, Conductance Sensor Based on Polyion Stabilized and Thiol Functionalized Double Stranded DNA Molecules: *Ajit K. Mahapatro*[1]; Kyung J. Jeong[1]; Sugata Bhattacharya[1]; Gil U. Lee[1]; David B. Janes[1]; [1]Purdue University

2:30 PM Student
MM4, AFM Study of Current Transport through Porphyrin Based Molecules: *Raghu Ramachandran*[1]; Kim Lewis[1]; Sathish Thiruvengadam[1]; Roy Siow[1]; Theda Daniels-Race[1]; [1]Louisiana State University

2:50 PM Student
MM5, Surface Plasmon Resonance: Sensing Chips and Applications: *Kyle Foley*[1]; Erica Forzani[1]; Nguyen Ly[1]; Paul Westerhoff[1]; Nongjian Tao[1]; [1]Arizona State University

3:10 PM Break

3:30 PM Student
MM6, The Functionalization of GaN and AlGaN Surfaces with Hemin for Nitric Oxide Detection: *Michael A. Garcia*[1]; Scott D. Wolter[1]; James B. Sund[1]; Tong-Ho Kim[1]; Joseph Bonaventura[1]; April Brown[1]; [1]Duke University

3:50 PM
MM7, BioFETs Based on GaN/AlGaN Devices: *Kendra McCoy*[1]; Stephen Pearton[2]; Lloyd Whitman[1]; [1]Naval Research Laboratory; [2]University of Florida

4:10 PM
MM8, Sensing Characteristics and Mechanism of Liquid-Phase and Gas-Phase Sensors Using AlGaN/GaN Heterostructure: Takuya Kokawa[1]; Kazuo Matsuo[1]; Takeshi Kimura[1]; *Hideki Hasegawa*[1]; Tamotsu Hashizume[1]; [1]Hokkaido University

4:30 PM Student
MM9, Scalable Dope-Coded Biosensing Particles for Protein Detection: *Nguyen H. Ly*[1]; Nongjian Tao[1]; [1]Arizona State University

4:50 PM
MM10, Electric Field Dependence of Photoluminescence of Silica Coated CdSe/CdS Quantum Dots: *Yang Xu*[1]; Kathleen Meehan[1]; [1]Virginia Polytechnic Institute and State University