TMS 2006 ELECTRONIC MATERIALS CONFERENCE

and Exhibition

June 28-30, 2006
Pennsylvania State University
University Park, PA

ADVANCE PROGRAM

TMS

Sponsored by the
Electronic, Magnetic & Photonic
Materials Division

www.tms.org/EMC.html

The Premier Annual Forum on the Preparation and Characterization of Electronic Materials

TMS 2006 ELECTRONIC MATERIALS CONFERENCE

June 28-30, 2006
Pennsylvania State University
University Park, PA

Who Attends?

More than 500 individuals actively engaged or interested in electronic materials research and development, both within and outside the United States, including:

- Scientists
- Engineers
- Researchers
- Technicians
- R&D Managers
- Product Managers
- Professors
- Students

Ensure you are among the professionals who gain valuable knowledge to advance their work in electronic materials by registering today!

Table of Contents

Programming

Late News Papers

Late news papers will be considered. Authors must submit a 450-word abstract at http://cmsplus.org by June 3. An optional one-page "extended abstract" can be submitted as well to assist organizers in considering the late news paper. Instructions for electronic submission are online at cmsplus.org.

Technical Sessions

Technical sessions will be held at the Penn Stater Conference Center; the conference plenary session will be located in Presidents Hall 3 & 4.

See page 21 for session and paper titles.

Program

Registrants will receive a complete program with abstracts of papers to be presented at the meeting, at the on-site registration desk.

Audio/Video Recording Policy

TMS reserves the right to all audio and video reproductions of presentations at TMS sponsored meetings. Recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of TMS and the individual authors is strictly prohibited.

About TMS

The Minerals, Metals & Materials Society (TMS) is the professional organization encompassing the entire range of materials in science and engineering, from minerals processing and primary metals production to basic research and the advanced applications of materials.

Included among its professional and student members are metallurgical and materials engineers, scientists, researchers, educators and administrators from more than 70 countries on six continents.

TMS' mission is to promote the global science and engineering professions concerned with minerals, metals and materials. To learn more, visit **www.tms.org**

Networking & Social Events

Welcoming Reception for Attendees

Wednesday, June 28, 6 to 8 p.m.

Penn Stater Conference Center, Presidents Hall 1 & 2

Evening at Beaver Stadium for Attendees and Guests

Thursday, June 29, 6 to 9 p.m.

Beaver Stadium

Enjoy a catered dinner and complimentary access to the sports museum located within Beaver Stadium.

Cost: Free to full conference and student registrants
$65 for one-day registrants and adult guests
$30 for children age 12 and under

Tickets: Advance purchase is recommended; order on the enclosed registration form. A limited number of tickets will be available for purchase at the EMC registration desk. Deadline for ticket sales is 5 p.m. on Wednesday, June 28.

Informal Coffee Breaks for Attendees

Intermission of morning and afternoon sessions
Presidents Hall 1 & 2, first and second level break areas

Light Fare and Beverages Served

Registration

Register before June 12 to save time and money!

Visit www.tms.org/EMC.html or complete the form on page 65.

Advance Registration Fees

Full Conference $400
One Day $360
Student $185

Your registration fee includes:

Technical Sessions
Exhibition
Welcoming Reception
Coffee Breaks
Thursday Banquet*

**(One Day registration does not include Thursday banquet.)*

Value for Your Cost

The Electronic Materials Conference (EMC) will be held at the Penn Stater Conference Center, June 28-30, and is being coordinated with the Device Research Conference held at the same location, June 26-28. Badges will be accepted by both conferences on Wednesday, June 28.

On-Site Registration/Advance Registrant Badge Pick-Up*

Penn Stater Conference Center, First Level

Tuesday, June 27 .....3 to 5 p.m.
Wednesday, June 28.....7:30 a.m. to 5 p.m.
Thursday, June 29 .....7:30 a.m. to 4 p.m.
Friday, June 30.....7:30 to 10 a.m.

**On-site registration fees are higher than advance registration fees.*

Refund Policy

A request for a refund due to a cancellation must be made in writing and postmarked no later than June 12, 2006. Mail to: TMS, 184 Thorn Hill Road, Warrendale, PA 15086-7514 USA. A $75 processing fee is charged for all cancellations. No refunds are issued after the deadline.

Awards

John Bardeen Award

Established in 1994, this award recognizes an individual who has made outstanding contributions, and is a leader, in the electronic materials field.

2006 Recipient: Isamu Akasaki

Citation: For his pioneering work and key discoveries in the field of GaN and related materials which has enabled their widespread development and use

About the Recipient: Isamu Akasaki is a professor at Meijo and Nagoya universities in Japan, where his research over the past 25 years has surrounded compound semiconductor materials and devices, with special emphasis on nitride semiconductors. He has published more than 580 scientific papers, edited nine books and received a total of 133 patents, including 65 for Group III Nitrides. Dr. Akasaki has also received numerous awards including selection by the Japanese government as a "Person of Cultural Merits" in 2004.

"Dr. John Bardeen is a great scientist with outstanding achievements in two fields of electronic materials in the last century, whom I highly respect. I deem it indeed a great honor to be selected as a recipient of the TMS John Bardeen Award. Moreover, all of the past recipients of this prestigious award have made significant achievements and are excellent leaders in the field of electronic materials; they have helped promote the importance of this award. It is a real honor for me to be among these distinguished scientists."

Nominate a Deserving Colleague for the TMS 2008 John Bardeen Award!

This award recognizes an individual who has made an outstanding contribution, and is a leader, in the field of electronic materials.

Who was John Bardeen?

John Bardeen's career of theoretical and experimental research set the foundation for the current state of understanding of electronic materials. Two areas where Bardeen had great impact were the invention and development of the solid-state transistor and the theory that developed greater understanding of superconductivity.

For Award Criteria and Additional Information

Pick up a nomination form at the EMC registration desk, or visit the TMS Web site at www.tms.org/Society/honors.html.

Especially for Students

Student Paper Awards

Awards of $500 are given to the authors of the top five percent of student papers presented at the 2005 EMC. Student papers are judged on both scientific content and oral presentation. Awards are funded by the Electronic Materials Committee and presented during the plenary session on Wednesday, June 28.

Student Travel Awards

Student authors who are presenting papers may be eligible for travel assistance. To apply, submit a letter no later than June 1, 2006 to:

Edward Yu, General Chair

University of California
ECE Dept. MC 0407
9500 Gilman Drive
La Jolla, CA 92093

Telephone: (858) 534-6619

Fax: (858) 822-3425

E-mail: ety@ece.ucsd.edu

Student travel assistance is made possible through generous donations from the EMC Foundation.

Attention Students!

Become a member of the Material Advantage student program for only $25 and reap the benefits of four varied materials organizations!

ACerS = The American Ceramic Society

AIST = Association for Iron & Steel Technology

ASM = ASM International

TMS = The Minerals, Metals & Materials Society

For full details on benefits, which include scholarships and awards totaling more than $600,000, **visit www.materialadvantage.org.**

Material Advantage

Everything Else Is Immaterial!

Exhibition

Attention Suppliers of Technology for Preparation and Characterization of Electronic Materials –

Be a part of the unique showcase at the EMC Technological Exhibit!

Reach more than 500 professionals from industry, government laboratories and academia looking for these products and services:

Advanced thin-film characterization
Chemical Vapor Deposition (CVD)
Compound semiconductor materials
Failure analysis
GaAs and InP-based epitaxial wafers, substrates
High performance purification
High purity metalorganics
III-V materials
Materials characterization
MOCVD
Optoelectronics
Sapphire substrates
Scanning probe and electron microscopes
Silicon heterostructures
Ultra High Purity (UHP) metals, gas and chemical
Wafer processing equipment
Wide bandgap semiconductors

Exhibit Dates and Hours

Presidents Hall 1 & 2

Wednesday, June 28..... 9:20 a.m. to 4 p.m.
6 to 8 p.m.

Thursday, June 29 ..... 10 a.m. to 4 p.m.

Your Guarantees as an Exhibitor

- Complimentary listing in the exhibition directory—distributed to all meeting registrants
- One complimentary registration to the technical sessions and exhibits
- Hosted welcoming reception in the exhibition area
- Hosted coffee and refreshment breaks in the exhibition area
- Post-show report of meeting participants
- Exhibition management services
- Booth: (1) eight-foot table, (2) chairs, standard electrical service

The program, audience and exhibition combine for an unsurpassed annual event in electronic materials.

Be there – reserve your exhibit space today online at www.tms.org/EMC.html or complete the form on page 69!

(Space reservations are accepted on a first-come, first-served basis. Cost is $1,200 per booth space.)

Exhibition

Exhibiting Companies (as of 4/5/06)

Accent Optical Technologies
Allied High Tech Products Inc.
Applied Surface Technologies
Epichem Group
EXAKT Technologies Inc.
Intrinsic Semiconductor
k-Space Associates Inc.
Kurt J. Lesker Company
Lake Shore Cryotronics Inc.
MMR Technologies Inc.
Springer
SVT Associates Inc.
United Mineral & Chemical Corporation
Vacuum Barrier Corporation
Veeco Instruments Inc.
Wafer Technology Ltd.

Join this growing list of exhibitors today before the space is sold out!

Take Advantage of Corporate Sponsorship Opportunities at EMC!

As the exclusive sponsor of an activity at EMC, your company benefits from name and logo recognition through:

Signage
EMC Web Site
Conference Promotional Materials
Conference Program

Exclusive Sponsorship Activities

Welcoming Reception
Coffee Breaks
Continental Breakfast
Conference Social Event/Banquet

For more information on sponsorship or the exhibition, contact Cindy Wilson, TMS Exhibits Coordinator.

Telephone: (800) 759-4TMS or (724) 776-9000, ext. 231

Fax: (724) 776-3770

E-mail: wilson@tms.org

About the Location

Computer/Network Facilities

The Penn Stater Conference Center has complimentary wireless Internet access throughout the facility. Ethernet connections in the sleeping rooms are also complimentary; Ethernet cables are located at the front desk. Additionally, there are a limited number of computers available on level one to check e-mail on a complimentary basis.

Messages

A message board located near the on-site registration desk on the first level of the conference center will be available for use throughout the conference.

Dress

Casual clothing is in order with a sweater or light jacket occasionally needed for the evenings. Layered clothing is recommended for cooler days or in air-conditioned buildings. The average afternoon temperatures in June in the Nittany Valley reach the middle 80s ºF (22-25ºC); nighttime temperatures drop to between 55 and 65ºF (13-15ºC). Comfortable walking shoes, a light raincoat and an umbrella are also recommended.

Campus Smoking Policy

Pennsylvania State University prohibits smoking in all buildings, including residence halls. Smoking is permitted in designated areas outside.

Americans With Disabilities Act

TMS strongly supports the federal Americans with Disabilities Act (ADA) which prohibits discrimination against, and promotes public accessibility for, those with disabilities. In support of, and in compliance with, ADA, we ask those requiring specific equipment or services to indicate their needs on the enclosed housing form or contact TMS Meeting Services in advance.

Housing: On Campus

On-campus housing is available on a first-come, first-served basis; therefore, early registrations and reservations are essential.

Penn State residence halls and dining facilities are not located within walking distance to the session meeting rooms, which are located at the Penn Stater Conference Center. A daily shuttle will be provided for those staying in the residence halls. Residence hall accommodations are single occupancy only; all rooms have private restrooms. Lodging includes beds, made on arrival day, and daily room service with washcloth and towel change. Unfortunately, there is no housing on campus accommodating children. Alternative housing for those with children are the Penn Stater Conference Center Hotel or other hotels listed on page 12.

Penn State offers the following housing plans. We regret that no adjustments can be made for late arrivals or early departures.

Please indicate your plan preference on the enclosed reservation form on page 67 and return it with your payment by May 26, 2006. Reservations received by the deadline will be confirmed by the conference office.

Plan A: Check-in Tuesday / Check-out Friday

Includes continental breakfasts on Wednesday, Thursday and Friday
$177 single occupancy

Plan B: Check-in Wednesday / Check-out Friday

Includes continental breakfasts on Thursday and Friday
$118 single occupancy

Late Departure: Check-out Saturday (July 1)

Includes lodging Friday night and continental breakfast on Saturday
Additional night's rate: $59 single occupancy

Commuter Lunch Package

Box lunches at the Penn Stater Conference Center must be purchased in advance on the enclosed registration form on page 65. The purchase of box lunches is recommended for all attendees, especially for those staying in the residence halls. The lunches will be available in the exhibition, located in Presidents Hall 1 & 2.

Three lunches: $33

On-Campus Dining Hours

Pollock Commons Dining Hall
Breakfast .....7 to 8 a.m. *(cost included in on-campus housing plan)*
Dinner.....5:30 to 7 p.m. *($10.50 per person)*

Food facilities on campus close at 7 p.m.; downtown restaurants are only a short walk from the residence halls.

Housing: Hotels

Penn Stater Conference Center Hotel

A block of rooms has been reserved at a special conference rate at the Penn Stater Conference Center, where all EMC activities will take place. Rooms will be released as early as May 26. Thereafter, reservations can be obtained only as space is available. Attendees should make reservations directly with the hotel as soon as possible:

Penn Stater Conference Center
215 Innovation Boulevard
State College, PA 16803-6603
Telephone: (814) 863-5000
Fax: (814) 863-5003

Rooms are available at the special EMC rate for Tuesday through Thursday nights; individuals must identify themselves as EMC attendees to receive the special rate. Friday or Saturday night stays are available if requested at the time the reservation is made. Please note that the listed rates do not include tax.

Rate: $85/single or $95/double occupancy (For double accommodation, attendee must book with a roommate.*)

Free parking is available as well as a full-service restaurant, indoor lap pool and whirlpool.

Conference Code: EMC0627

*If you do not have a roommate at the time of your reservation, send a fax to Mike Packard at (724) 776-3770, and he will assign a roommate for the Penn Stater Conference Center. Provide the following information in the fax:

Your Name, Contact Information (address, telephone number, fax number), Arrival Date, Departure Date, Credit Card Information, Gender

Other Hotels

Individuals staying at any of the following hotels must arrange for their own transportation to and from the Penn Stater Conference Center.

Atherton (Downtown)
$80 single/$90 double occupancy
Telephone: (814) 231-2100
Conference Code: EMCEL270606

Days Inn – Penn State
(Downtown)
$77 single/$87 double occupancy
Telephone: (814) 238-8454
Conference Code: EMC

Hampton Inn
Williamsburg Square
$89
Telephone: (814) 231-1899
Conference Code: EMC

Hilton Garden Inn State College
$89
Telephone: (814) 272-1221
Conference Code: EMC

Holiday Inn Express
$89
Telephone: (814) 867-1800
Conference Code: EMC

Nittany Lion Inn
$98
Telephone: (814) 865-8500
Conference Code: EMC0628
(Limited shuttle service available to conference center)

For evening dinner options, visit *www.lionsmenu.com* to learn about local restaurants!

Transportation

Air

The following airlines have scheduled flights to State College:

Delta Airlines – jet services
Northwest Airlines – jet service and prop planes
United Airlines – jet service and prop planes
US Airways – jet service and prop planes

Airport Code: SCE

For more information, visit www.statecollegeairport.org

Taxis and Hotel Shuttles

Shuttles do not operate at the airport. Both the Nittany Lion Inn and The Penn Stater provide complimentary transports to and from the airport. Their guests can make arrangements in advance or at the airport by using the courtesy phone.

For direct lines to participating taxi services and hotel shuttles, check the airport phone board located near the baggage terminal.

AA Transit
Telephone: (814) 231-8294

Handy Delivery Taxi
Telephone: (814) 353-6001

Nittany Express Airport Shuttle
Telephone: (814) 867-4646 or
(814) 880-6234

Diamond Limousine
Telephone: (814) 364-1960

Tim Fischer's Limousine Service
Telephone: (814) 234-3335

VIP Limo (Fullington)
Telephone: (800) 435-6556

Transportation

Parking

Parking at the Penn Stater Conference Center is complimentary.

Overnight parking at the campus residence halls is $21 for the week.

Car

Additional major airports and Map Quest driving times under 4 hours:

Harrisburg International.....2 hours
Pittsburgh International.....3.25 hours
Baltimore-Washington International .....3.5 hours
Philadelphia International .....3.75 hours
Washington Dulles International .....3.75 hours

Hertz®

Official Car Rental Company of the TMS 2006 Electronic Materials Conference

Meeting rates are guaranteed for a period beginning one week prior to the conference through one week after and are subject to car availability. Rates are available from all Hertz locations in Pennsylvania.

Advance reservations are recommended and may be made by booking online at www.hertz.com or calling the Hertz reservations line at (800) 654-2240 in the U.S. or (800) 263-0600 in Canada. International customers should contact the nearest Hertz reservation center or call +1-405-749-4434. Travelers must identify themselves as attendees of EMC and reference CV#02QJ0019 in order to receive the special rates.

Terms and Conditions

- Unlimited mileage allowance
- One-way service fee applies when cars are not returned to renting location.
- Additional daily charges for optional coverage (Loss Damage Waiver, Personal Accident Insurance, Personal Effect Protection, refueling and state tax) are not included in the listed rates.
- Drivers must meet standard Hertz age, driver and credit requirements.
- Hertz is a frequent flyer partner with US Airways, Delta, Northwest, United, and American Airlines. Frequent flyer information may be requested at time of car booking.
- Weekly rentals are from five to seven days. Weekend rentals have a minimum two-day keep, and Thursday pick-up requires a minimum three-day keep.

Recreation

Visit these attractions on Penn State's campus!

Old Main

Founded in 1855, Penn State is Pennsylvania's land-grant institution. Old Main, the chief administrative building, contains frescoes by artist Henry Varnam Poor showing the growth of the university.

University Creamery

Penn State retains its leadership in agricultural sciences. Many visitors stop by the University Creamery for ice cream made on-site.

Museums

Matson Museum of Anthropology
Earth and Mineral Sciences Museum
Frost Entomological Museum
Palmer Museum of Art

Sporting Facilities

Blue and White Golf Course (36 holes)
Tennis Courts
Indoor Tracks
Exercise and Fitness Centers
Indoor Ice Skating Rink
Swimming Pools

Hiking and Bird Watching

Shaver's Creek Environmental Center
Stone Valley Recreation Area

Nittany Lion Shrine

Located near the Nittany Lion Inn, the shrine was a gift of the Class of 1940 and is the university's most photographed landmark.

Or travel to these nearby sites!

Penn's Cave

Take a one-mile boat tour through America's only all-water cavern and visit the animal preserve.

Bellefonte Historical Railroad

Enjoy a leisurely trip through the Nittany Valley.

Pennsylvania Military Museum in Boalsburg

The history of America's citizen soldiers is preserved in this museum, surrounded by quaint shops and antique emporiums in Boalsburg, Lemont, and Centre Hall. These shops feature the works of local artists and craftspeople.

Proceedings/Publications

EMC does not publish formal conference proceedings; however, conference abstracts are published in the *Journal of Electronic Materials* (*JEM*) throughout the year. *JEM* encourages both presenters and attendees to submit manuscripts of their work.

A special issue on Group III Nitrides, SiC and ZnO is planned for early 2007. Papers are due August 1, 2006, and may be submitted through the *JEM* Web site at http://jem.msubmit.net.

About JEM

JEM is a monthly archival journal of TMS and the Institute of Electrical and Electronics Engineers (IEEE). Articles are reviewed, selected and edited by peers who serve as voluntary members of the editorial board, the board of associate editors, or section editors.

JEM's Content

JEM is a forum for the rapid circulation of the results of original research. It contains technical papers detailing critical new developments in the electronics field, as well as invited and contributed review papers on topics of current interest. The journal focuses on electronic memory and logic structures, magnetic-optical recording media, superlattices, packaging, detectors, emitters, metallization technology, superconductors, and low thermal-budget processing and includes general papers on electronic materials for device application, structure making, reliability and yield. Articles on methods for preparing and evaluating the chemical, physical and electronic properties of electronic materials are also included.

JEM Subscription for Attendees

Attendees may include the cost of a 2007 subscription to *JEM* on the registration form. The 2007 journals will include manuscripts of papers presented at the 2006 EMC. After the conference, individuals may subscribe to *JEM* through the online TMS Document Center at http://doc.tms.org at the standard rates.

Manuscript Submission

JEM employs an online manuscript submission and review system. To be considered for publication, authors must submit manuscripts electronically. Detailed submission guidelines are available from the *JEM* Web site at http://jem.msubmit.net.

Proceedings/Publications

Look for these electronic materials related publications in the TMS Document Center!

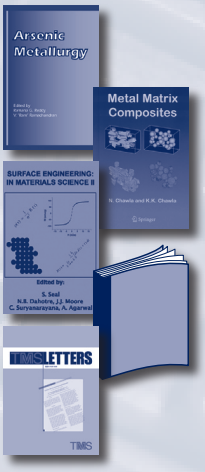
Arsenic Metallurgy

Metal Matrix Composites

Surface Engineering: Science and Technology II

Surfaces and Interfaces in Nanostructured Materials and Trends in LIGA, Miniaturization, and Nanoscale Materials

TMS Letters (2004)



Special Issues of Journal of Electronic Materials:

- Microstructures and Textures of Films and Coatings in Electronic Applications (December 2005)
- 2004 U.S. Workshop on the Physics and Chemistry of II-VI Materials (June 2005)
- Challenges in Advanced Thin Films: Microstructures, Interfaces and Reactions (May 2005)
- SiC and the Group III Nitride Semiconductors (April 2005)
- Lead-Free Solders and Processing Issues Relevant to Microelectronic Packaging (December 2004)
- Nanostructured Magnetic Materials: Recent Progress in Magnetic Nanostructures (November 2004)
- Phase Stability, Phase Transformations and Reactive Phase Formation in Electronic Materials III (October 2004)
- III-V Nitrides and Silicon Carbide (May 2004)

For other publications or to order:

Visit the TMS Document Center online at http://doc.tms.org, e-mail publications@tms.org or telephone (800) 759-4TMS, ext. 251.

Conference Organizers

Electronic Materials Committee
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Christian M. Wetzel
Uniroyal Optoelectronics

Glenn Solomon
Stanford University

Jerry M. Woodall
Purdue University

Invited Organizers

EMC thanks the following invited organizers for their support and contribution to this year's technical program:

Shigefusa Chichibu
University of Tsukuba

Debdeep Jena
University of Notre Dame

Russell Dupuis
Georgia Institute of Technology

Kei-May Lau
Hong Kong University of Science & Technology

Randy Feenstra
Carnegie Mellon University

Pat Lenahan
Pennsylvania State University

David Gundlach
ETH-Zurich

Gregory Lopinski
Steacie Institute for Molecular Sciences

Evgeni Gusev
IBM Corporation

Maria Losurdo
Institute of Inorganic Methodologies and Plasmas

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Naval Research Laboratory

Alec Talin
Sandia National Laboratories

Masaaki Tanaka
University of Tokyo

Michael Tischler
Ocis Technologies

Raymond Tsui
Motorola

Lloyd Whitman
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Shalom Wind
Columbia University

William Wong
Palo Alto Research Center

Michael Wraback
US Army Research Laboratory

Ya-Hong Xie
University of California

Grace Huili Xing
University of Notre Dame

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
June 29, 2006

Room: Conference Room 106
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
June 30, 2006

Room: Deans Hall II
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

Questions?

Registration

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