



WOCSEMMAD '06 Program Schedule

Sunday, February 19th, 2006

7:00 p.m. – 9:00 p.m. Welcoming Reception – Courtyard Plaza 1

Sponsored by Thomas Swan Scientific Equipment Ltd./Aixtron

Monday, February 20th, 2006

8:00 a.m. – 9:00 a.m.: Continental Breakfast – Wassaja 8 & 9

Sponsored by Matheson Tri-Gas

9:00 – 9:20 a.m. Welcome & Orientation/Sponsor Thanks – Alan Doolittle, Program Chair

9:20 a.m. – 12:00 a.m. Session 1: Nitride (Part 1)

Co-Chairs: Mark Goorsky and Laura Rea

Steven Binari, Naval Research Laboratory - GaN HEMT Characterization and Reliability

Umesh Mishra, University of California, Santa Barbara – GaN for a post-Si scenario

Timothy Bogart, Penn State Electro-Optics Center - Halide Chemical Vapor Deposition of AlN

Sylvain Delage, Alcatel-Thales III-V Lab - Long term Reliability data on GaN HEMT

Bill Schaff, Cornell University - Direct-write composition patterning of InGaN during MBE

W. Alan Doolittle, Georgia Institute of Technology - Novel Roles of Nitrides and Oxides: Beyond the HEMT and Light Emitter

Lester Eastman, Cornell University - Ballistic Electron Acceleration Negative-Differential-Conductivity (Beam) Device Design and Technology

10:30 a.m. – 10:50 a.m. Break **Today's Refreshment Breaks Sponsored by Epichem**

Russell Dupuis, Georgia Institute of Technology - InGaN HBTs

Heikki Helava, The Fox Group Inc. - UV LED by CHVPE

Andrew Hanser, Kyma Technologies, Inc. - Recent native GaN substrate based materials and device results

Francisco Hernandez, University of Ulm - Nanoscale Surface Modification of Wide Band-Gap Semiconductors for Sensing Applications

Shiping Guo, EMCORE Corporation - Effects of Iron doping on GaN based HEMT performance and issues of iron doping in GaN grown by MOCVD

Xiaodong Chen, Cornell University - Effects of the nucleation layer on the polarity and structure of GaN film on sapphire grown by MBE

Siddharth Rajan, University of California, Santa Barbara - N-polar GaN materials and devices

Monday, February 20th, 2006

12:00 a.m. – 12:50 p.m. Session 2: SiC (Part 1)

Co-Chairs: Suzanne Mohney and Marek Skowronski

Leonard Brillson, The Ohio State University - SiC Interface Reactions, Defects and Schottky Barriers

T. Paul Chow, Rensselaer Polytechnic Institute - SiC and GaN MOSFETs

James Cooper, Purdue University - SiC Bipolar Integrated Circuit Technology

Mark Fanton, Penn State University - Progress on the bulk grow of SiC by halide CVD

Avi Gupta, II-VI Inc. - Growth and Characterization of Large Diameter SiC Single Crystals

12:50 p.m. – 2:00 p.m. **Lunch on Own**

2:00 p.m. – 3:00 p.m. Session 3: Traditional III-V (As, P, Sb) (Part 1)

Co-Chairs: Didier Theron and Jerry Woodall

Thomas Bird, Veeco Instruments - Current Status of the Growth of TPV Devices on Lattice-Mismatched Buffers

Robyn Woo, University of California, Los Angeles - Growth of InGaAs on Nanometer-scale Patterned Si Substrates by Metalorganic Vapor Phase Epitaxy

Jan Grahn, Chalmers University of Technology - InP HEMTs for ultra-low noise and power

Archie Holmes, Jr., University of Texas, Austin - Advanced InP-Based APDs for MWIR Applications

Chris Palmström, Embedded growth mode of thermodynamically stable metallic nanoparticles on III-V semiconductors

Joanna Mirecki-Millunchik, University of Michigan - In situ stress evolution studies in metamorphic buffer layers

3:00 p.m. – 3:20 p.m. **Break– Sponsored by Epichem**

3:20 p.m. – 4:10 p.m. Session 4: Characterization

Co-Chairs: Colin Wood and Ian Ferguson

Christian Kisielowski, Lawrence Berkeley National Laboratory - Materials characterization by electron microscopy with aberration correctors and monochromators

Atul Konkar, University of Southern California - Lattice mismatched epitaxy: three dimensional dislocations structure and strain relief

Suzanne Mohney, The Pennsylvania State University - Contacts at Small Length Scales: From III-V HBTs to Semiconductor Nanowires

Benjamin Poust, University of California, Los Angeles - Enhanced X-ray Scatter Based Metrology for Metamorphic Applications

Michael Wraback, US Army Research Laboratory - Characterization of UV emitters

4:10 p.m. – 4:40 p.m. Session 5: Integration

Co-Chairs: Donald Dorsey and Len Brillson

Mark Goorsky, University of California, Los Angeles - III-V Materials Integration

Sumiko Hayashi, UCLA - Effect of kinetics on the morphology of hydrogen exfoliated layers

Shuiqing Yu, Arizona State University - Processing and Material Integration

Dinner on own...return by 7:30 for the Rump Session

Monday, February 20th, 2006

7:30 p.m. – 9:00 p.m. - Rump Session – Wassaja 8 & 9

Session Moderator: Alan Doolittle

Beverages and Snacks - **Sponsored by Veeco**

Panel discussion of future compound semiconductor research directions for military applications. **Panelists: Donald Silversmith - AFOSR, Laura Rea - AFRL, John Prater - ARL, Henryk Temkin - DARPA, and Harry Dietrich - ONR**

Tuesday, February 21st, 2006

8:00 a.m. - 9:00 a.m. - Continental Breakfast – Wassaja 8 & 9

9:00 a.m. – 11:40 a.m. **Session 6: Nitride (Part 2)**

Co-Chairs: **Bill Schaff and Umesh Mishra**

Asif Khan, University of South Carolina - High Efficiency Deep UV Optoelectronics

Erhard Kohn, University of Ulm - Wide bandgap semiconductors in electrochemistry (diamond, AlN, GaN)

Zuzanna Liliental-Weber, Lawrence Berkeley National Laboratory - Application of nano-LEO for structural quality improvement of GaN

Primit Parikh, Cree Inc. - AlGaIn-GaN based HEMTs

Joan Redwing, Penn State University - Stress evolution during group III-nitride growth

Andy Armstrong, The Ohio State University - Deep levels in GaN device structures

Norman Sanford, National Institute of Standards and Technology (NIST) - Structural, optical, and electrical characterization of GaN nanowires grown by nitrogen-plasma-assisted molecular beam epitaxy

10:10 a.m. – 10:30 a.m. **Break**

Grigory Simin (presented by Asif Khan), University of South Carolina - Very High Power RF Switches using III-N Gated MOS-Heterojunction Capacitors

Joseph Smart, Crystal IS, Inc. - ultra-low dislocation density AlN substrates for UV LEDs and laser diodes

Christof Sommerhalter, AIXTRON Inc. - Progress in MOCVD growth of Al-Ga-In-N

Chang-Soo Suh, University of California, Santa Barbara – Enhancement-mode Power GaN HEMTs

Volker Heydemann, Penn State University - MBE growth of III-nitrides and multifunctional oxides

Mark O'Steen, Veeco Instruments - Current status of production molecular beam epitaxy for nitride based semiconductors

Fernando Ponce, Arizona State University – Mechanisms for lattice misfit relaxation in GaN-based heteroepitaxy

11:40 a.m. – 12:30 p.m. **Session 7: SiC (Part 2)**

Co-Chairs: **Chris Palmstrøm and Joanna Mirecki-Millunchik**

Marek Skowronski, Carnegie Mellon University - Deep Traps and Carrier Lifetimes in SiC Epilayers

Yaroslav Koshka, Mississippi State University - Low-temperature epitaxial growth of SiC using halo-carbon precursors

Lisa Porter, Carnegie Mellon University - Silicon carbide contacts

George Malouf, University of California, Los Angeles - Hydrogen-Induced Blistering of SiC The Role of Multi-Step Annealing Sequences

Michael Spencer, Cornell University - 2-Deg in SiC

12:30 p.m. – 2:00 p.m. – **Lunch on own**

Tuesday, February 21st, 2006

2:00 p.m. – 3:00 p.m. Session 8: Traditional III-V (As, P, Sb) (Part 2)

Co-Chairs: Les Eastman and Paul Maki

Mark Rodwell, University of California, Santa Barbara - scaling limits and solutions in ultra high frequency bipolar transistors

Jerry Woodall, Purdue University - InAs/AlInAs Schottky Diodes

Gary Wicks, University of Rochester - Infrared Sources and Detectors

Rachel Goldman, University of Michigan - Directed Seeding of Semiconductor Nanostructures

Manijeh Razeghi, Northwestern University - High-Power, Continuous-Wave Quantum Cascade Laser Operating at Room Temperature

Karen Moore, Freescale Semiconductor – Linearity Characteristics of High Voltage FET Technologies

3:00 p.m. – 3:20 p.m. **Break**

3:20 p.m. - 4:10 p.m. Session 9: Spintronics/Magnetics, Miscellaneous

Co-Chairs: Alan Doolittle and Mike Spencer

Ian Ferguson, Spin detectors and optically induced ferromagnetism in MOCVD-Grown GaMnN

George Maracas, Motorola - CNT FETs

Zhixi Bian, University of California Santa Cruz - Optoelectronics: monolithically integrated ring resonator coupled lasers

Ravi Kanjolia, Epichem Group - Performance of Semiconductors materials through Chemistry

Jiangbo Wang, Arizona State University - Photon recycling in luminescence refrigeration

4:10 a.m. – 5:00 a.m. Session 10: Nitride (Part 3)

Chair: Les Eastman and Colin Wood

Yunju Sun, Cornell University - Figure of merit of field plated gate AlGaIn/GaN HEMTs on bulk GaN substrate

Chris Schaake, University of California, Santa Barbara – Towards Nano-LEDs

Didier Theron, Institut d'Electronique et de Microelectronique du Nord (IEMN) - Large Signal Microwave Characterization of GaN HEMTs

TingGang Zhu, Velox Semiconductors Corp. - GaN Power Device Delivering SiC Performance at Si Price

Tomas Palacios, University of California, Santa Barbara – GaN HEMT's enhanced by Fluorine Treatment

Please complete and return your critique form to Shari

7:30 – 10:00 p.m. Gala Dinner – Wassaja 3

Beverages Sponsored by Cree

Entertainment provided by Daisy Fae Harper & Friend

Wednesday, February 22nd, 2006

8:00 a.m. – 9:00 a.m. Continental Breakfast – Wassaja 8

9:00 a.m. – 9:05 a.m. Presentation of the Most Valuable Contribution Award

9:05 a.m. – 11:00 a.m. Wrap-up Session (Synopsis and Feedback)

The Wrap-up session provides an opportunity for participants to gather to summarize the findings/technical information shared throughout the week.