

2010 LESTER EASTMAN CONFERENCE ON HIGH PERFORMANCE DEVICES



August 3-5, 2010 (Tues-Thurs)
Rensselaer Polytechnic Institute

Conference Registration Opens at 7:30 Each Morning

Session	Tuesday (Aug 3)	
I-A	High Speed Devices	8:15 – 9:45
	Morning Break	9:45 – 10:15
I-B	High Speed Devices	10:15 – 12:30
	Lunch	12:30 – 2:00
II-A	Power Conversion	2:00 – 3:15
	Afternoon Break	3:15 – 3:45
II-B	Power Conversion	3:45 – 6:00
	Open Time	6:00 – 6:45
III	Poster Session Speaker	6:45 – 7:05
	Poster Session & Reception	7:05 – 9:05
Wednesday (Aug 4)		
IV-A	Green Technology	8:00 – 9:45
	Morning Break	9:45 – 10:15
IV-B	Green Technology	10:15 – 12:00
	Lunch	12:00 – 1:30
V-A	Infrared Photonics	1:30 – 3:15
	Afternoon Break	3:15 – 3:45
V-B	Infrared Photonics	3:45 – 5:30
	Open Time	5:30 – 6:15
	Conference Dinner	6:15 – 8:15
	Conference Dinner Speaker	7:15 – 8:15
Thursday (Aug 5)		
VI-A	Terahertz Technology	8:00 – 9:45
	Morning Break	9:45 – 10:15
VI-B	Terahertz Technology	10:15 – 12:00
	Lunch	12:00 – 1:30
VII-A	Next Generation Devices	1:30 – 3:15
	Afternoon Break	3:15 – 3:45
VII-B	Next Generation Devices	3:45 – 5:30
	Closing Remarks	5:30 – 5:45

2010 LESTER EASTMAN CONFERENCE ON HIGH PERFORMANCE DEVICES



Tuesday (Aug 3)

8:00–8:15 **CONFERENCE INTRODUCTION** Greg DeSalvo

Session I: **High Speed Devices**

Session Co-Chairs: Alfred Hung and Paul Maki

8:15–8:45 <i>(Invited)</i>	High Power GaN HEMT MMIC for millimeter-wave application Toshi Kikkawa (Fujitsu Limited & Fujitsu Laboratories, Ltd.)
8:45–9:00	Influence of the AlGaIn Back-barrier Composition on the DC and RF performance of N-polar AlGaIn/GaN MIS-HEMTs Seshadri Kolluri, David F. Brown, Stacia Keller and Umesh K. Mishra (University of California, Santa Barbara)
9:00–9:15	AlInN/AlN/GaN-ON-SiC HEMTs J.G. Felbinger, D.Q. Hao, W.J. Schaff, L.F. Eastman, X. Gao and S. Guo (Cornell University)
9:15–9:45 <i>(Invited)</i>	W-Band GaN MMIC Power Amplifiers M. Micovic, A. Kurdoghlian, K. Shinohara, S. Burnham, I. Milosavljevic and D.H. Chow (HRL Laboratories LLC)

9:45–10:15 **BREAK**

10:15–10:45 <i>(Invited)</i>	GaN-Based Technology for Power Microwave Application Sylvain L. Delage (Alcatel-Thales III-V Lab)
10:45–11:00	Wafer Fusion Enabled Heterojunction Transistors (WAFEHT) Huili (Grace) Xing (University of Notre Dame)
11:00–11:15	InGaAs/InP DHBT in a refractory emitter technology with $b \sim 50$, $f_t/f_{max} \sim 400/620$ GHz, operating above 40 mW/um² Vibhor Jain, Evan Lobisser, Ashish Baraskar, Brian J. Thibeault, Mark Rodwell, Z. Griffith, M. Urteaga, D. Loubychev, A. Snyder, Y. Wu, J.M. Fastenau, Amy W.K. Liu (University of California, Santa Barbara)
11:15–11:30	Performance Enhancement of Asymmetrically Recessed 50-nm Metamorphic High Electron-Mobility Transistors With Reduction of Source-Drain Spacing Dong Xu, Xiaoping Yang, P. Seekell, R. Isaak, Wendell M.T. Kong, G. Cueva, K. Chu, L. Mohnkern, L. Schlesinger, R. Stedman, H. Karimy, R. Carnevale, A. Vera, B. Golja, K.H.G. Duh, P.M. Smith and P.C. Chao (BAE Systems)
11:30–12:00 <i>(Invited)</i>	Recent Trend of Power Amplifiers for Transmitters of Mobile Communications Bumman Kim (Postech)
12:00–12:30	Panel Session Topic: Gallium Nitride vs. the Rest of the III-V's; What Will Be the Real Impact on RF and High Speed and When Will it Happen?

12:30–2:00 **LUNCH**

Session II: Power Conversion

Session Co-Chairs: Paul Chow and Meredith Reed

2:00—2:30 <i>(Invited)</i>	Revolutionary Advances in Power Conversion Using Silicon Carbide Ljubisa Stevanovic (GE Global Research Center)
2:30—2:45	Performance of a 1200 V, 30 A, Bi-Directional SiC Solid-State Circuit Breaker Damian Urciuoli and Victor Veliadis (US Army Research Laboratory)
2:45—3:00	Cryogenic Operation of GaN Schottky Rectifiers H. Naik, T. Marron and T.P. Chow (Rensselaer Polytechnic Institute)
3:00—3:15	III-Nitride Devices on Silicon Substrates by MOCVD Kei May Lau (Hong Kong University of Science and Technology)

3:15—3:45 BREAK

3:45—4:15 <i>(Invited)</i>	High Frequency Integrated Power Converters S. Bedair, B. Morgan, J. Pulskamp, R. Polcawich, C. Meyer, C. Dougherty, X. Lin, D. Arnold and R. Bashirullah (US Army Research Laboratory)
4:15—4:30	Design of AlGaIn/GaN Heterojunction in High-Voltage Lateral GaN MOS-HEMTs Z. Li and T.P. Chow (Rensselaer Polytechnic Institute)
4:30—4:45	GaN MISHFET power switching devices with HfO₂ passivation Junxia Shia and Lester F. Eastman (Cornell University)
4:45—5:15 <i>(Invited)</i>	Progress in InGaIn-based Solar Cells James S. Speck (University of California, Santa Barbara)
5:15—5:30	Effects of the Refractive Index of Light Concentrators on Their Optical Concentration Ratio Ming Ma, Frank W. Mont, David J. Poxson, Jaehee Cho and E. Fred Schubert (Rensselaer Polytechnic Institute)
5:30—6:00	Panel Session Topic: SiC and GaN: Will Either or Both Challenge Silicon in Power Switching Devices?
6:00—6:45	<i>Open Time</i>

Session III: Poster Session

Session Chair: PC Chao

6:45—7:05 <i>(Invited)</i>	Patent Litigation and Cross-Licensing in the Compound Semiconductor Industry: 2010 Update David C. Radulescu (Weil, Gotshal & Manges)
7:05—9:05	<i>Poster Session & Reception</i>
Poster	Optical time division multiplexer on silicon chip Abdelsalam A. Aboketaf, Ali W. Elshaari and Stefan F. Preble (Rochester Institute of Technology)
Poster	Spatial Wavefunction Switched (SWS)-FET: A Novel Device to Process Multiple Bits Simultaneously F.C. Jain, J. Chandy and E. Heller (University of Connecticut)
Poster	Broad band optical router based on adiabatic coupler Liang Cao (Rochester Institute of Technology)
Poster	Design of ADCs and DACs using 25nm Quantum dot gate FETs Supriya Karmakar, John A. Chandy, Faquir C. Jain (University of Connecticut)
Poster	Growth and characteristics of polarization-matched GaInN/GaN MQW light-emitting diodes Wonseok Lee, Min-Ho Kim, Di Zhu, Ahmed N. Noemaun, Jong Kyu Kim, Jaehee Cho and E.F. Schubert (Rensselaer Polytechnic Institute)

Poster	<i>DC and Small-Signal Performance of Ultra-thin GaN/AlN/GaN HFETs</i> Kelson D. Chabak, Dennis E. Walker Jr., Antonio Crespo, Manuel Trejo, Steve Tetlak, Mauricio Kossler, James K. Gillespie, Glen D. Via, Gregg H. Jessen (Air Force Research Laboratory)
Poster	<i>Performance comparison of discrete multi-layer step-graded and continuously graded antireflection coatings</i> David J. Poxson, Martin F. Schubert, Frank W. Mont, Jong Kyu Kim and E. Fred Schubert (Rensselaer Polytechnic Institute)
Poster	<i>Complementary White Light Emitting Diodes Reducing Inherent Variances of Electrical and Optical Properties</i> Guan-Bo Lin, Martin F. Schubert, Jaehee Cho and E. Fred Schubert (Rensselaer Polytechnic Institute)
Poster	<i>Characteristics of Dot-shaped Green Emission in GaInN Blue Light-emitting Diode</i> An Mao, Qi Dai, Jaehee Cho and E. Fred Schubert (Rensselaer Polytechnic Institute)
Poster	<i>A 570-630 GHz Frequency Domain Spectroscopy System Based on Broadband Quasi-Optical Zero Bias Schottky Diode Detectors</i> L. Liu, J.L. Hesler, R.M. Weikle, T. Wang, P. Fay, H. Xing (University of Notre Dame, Rensselaer Polytechnic Institute)
Poster	<i>Enhanced light extraction in GaInN light-emitting diodes by graded-refractive-index micropillars</i> Frank W. Mont, Ahmed N. Noemaun, David J. Poxson, Jaehee Cho and E. Fred Schubert (Rensselaer Polytechnic Institute)
Poster	<i>Anti-Reflection Coating Made of Indium-Tin-Oxide (ITO) Electrode for Liquid Crystal Display Panel</i> Xing Yan, Frank W. Mont, David J. Poxson, Martin F. Schubert, Jaehee Cho and E. Fred Schubert (Rensselaer Polytechnic Institute)
Poster	<i>Trap Characterization in GaN/AlGaIn HFETs Using GTLM Structures</i> Richard T. Webster and A.F.M. Anwar (University of Connecticut)
Poster	<i>Strain Induced Active Layer Design of GaN-THz Quantum Cascade Lasers</i> Tariq Manzur and Mehdi Anwar (University of Connecticut)
Poster	<i>Universal SOI Based High Temperature Gate Driver Integrated Circuit for SiC Power Switches with Short Circuit Protection</i> Liang Zuo, Robert Greenwell, Syed K. Islam, Benjamin J. Blalock and Leon M. Tolbert (University of Tennessee Knoxville)
Poster	<i>Optical Polarization of Non-Polar GaN-Based LED Structures</i> S. You, T. Detchprohm, M. Zhu, W. Hou and C. Wetzel (Rensselaer Polytechnic Institute)
Poster	<i>Surface Acoustic Wave Propagation and Deep UV Detection in AlN/sapphire</i> V. Chivukula, D. Ciplys, M. Shur and R. Gaska (Rensselaer Polytechnic Institute)
Poster	<i>GRAPHENE RF AMBIPOLAR FETs USING LARGE-AREA CVD GRAPHENE AND ADVANCED PIEZOELECTRIC DIELECTRICS</i> Osama M. Nayfeh, Stephen J. Kilpatrick and Madan Dubey (US Army Research Laboratory)
Poster	<i>Fabrication of Ridge-Type GaInN Laser Diode by Selective MOVPE Regrowth</i> W. Zhao, W. Hou, T. Detchprohm and C. Wetzel (Rensselaer Polytechnic Institute)
Poster	<i>Thermal Properties of GaN Based Light-Emitting Diodes and Laser Diodes</i> Qifeng Shan, Jaehee Cho, E. Fred Schubert (Rensselaer Polytechnic Institute)
Poster	<i>Modeling the temperature performance of monolithic mode-locked quantum dot lasers</i> M.T. Crowley, N. Patel, D. Murrell, M. Breivik, C.-Y. Lin, Y. Li and L.F. Lester (University of New Mexico)
Poster	<i>Optical nonlinearities in hydrogenated amorphous silicon waveguides</i> Karthik Narayanan and Stefan F. Preble (Rochester Institute of Technology)
Poster	<i>Carrier-loss mechanisms and efficiency droop in GaInN/GaN light-emitting diodes</i> Qi Dai, Qifeng Shan, Jing Wang, Sameer Chhajed, Jaehee Cho and E. Fred Schubert and Mary H. Crawford and Daniel D. Koleske (Rensselaer Polytechnic Institute)
Poster	<i>Semiconducting Large-Area Nanoperforated Graphene Materials and Devices</i> Nathaniel S. Safron, Myungwoong Kim, Padma Gopalan, Michael S. Arnold (University of Wisconsin, Madison)
Poster	<i>Second Breakdown and Safe Operating Area of E-Mode Power pHEMTs</i> V. Pala and T.P. Chow (Rensselaer Polytechnic Institute)

Poster	<i>Cryogenic Operation of GaN Schottky Rectifiers</i> H. Naik, T. Marron and T.P. Chow (Rensselaer Polytechnic Institute)
Poster	<i>Generating Terahertz Signals in Bulky CMOS</i> Qun Jane Gu, Zhiwei Xu and Mau-Chung Frank Chang (University of California, Los Angeles)
Poster	<i>Improved efficiency of pseudomorphic ultraviolet light emitting diodes grown on bulk AlN substrates</i> James R. Grandusky, Shawn R. Gibb, Mark Mendrick and Leo J. Schowalter (Crystal IS Inc.)
Poster	<i>IR absorption in Mg-doped AlGaN</i> C Li, E.B. Stokes (University of North Carolina at Charlotte)
Poster	<i>Detection of multiple biosignatures using vertically aligned carbon nanofibers (VACNF)</i> Ashraf B. Islam, Syed K. Islam, Touhidur Rahman, Paul D. Frymier (The University of Tennessee, Knoxville)
Poster	<i>Novel High Temperature Annealed Schottky Metal for GaN Devices</i> Quentin Diduck, Ian Walsh and Lester F. Eastman (Cornell University)
Poster	<i>High Efficiency Ka-Band MMIC SSPA Power Combiners for NASA's Space Communications</i> R.N. Simons, E.G. Wintucky and J.C. Freeman (NASA Glenn Research Center)
Poster	<i>Improved Nanoparticle Spacing Using Thiophene-Thiol as a Capping Ligand on CdSe-ZnS Core-Shell Quantum Dots</i> Alexander J. Giles and Edward B. Stokes (University of North Carolina at Charlotte)
Poster	<i>Efficiency enhanced GaInN-based green light-emitting diode grown on patterned sapphire substrate</i> Yufeng Li, M. Zhu, L. Zhao, S. You, W. Hou, W. Zhao, Y. Xia, T. Detchprohm, C. Wetzel, A. Fukano, J. Wachi, S. Tanaka (Rensselaer Polytechnic Institute)
Poster	<i>AlGaIn/GaN Heterojunction Bipolar Transistors grown by Ammonia-Molecular Beam Epitaxy</i> Ajay Raman, Christophe Hurni, Jim Speck, Umesh K. Mishra (University of California, Santa Barbara)
Poster	<i>3.0 mW Common Base Power Amplifier with 3 dB Small Signal Gain at 221 GHz in InP DHBT Technology</i> T.B. Reed, V. Jain, E. Lobisser, A. Baraskar, Brian J. Thibeault, M.J.W. Rodwell, Z. Griffith, M. Seo (University of California, Santa Barbara)
Poster	<i>Extraction of gate capacitance of high-frequency and high-power GaN HEMTs by means of CMC simulations</i> Diego Guerra, Fabio Alessio Marino, Stephen Goodnick, David Ferry and Marco Saraniti (Arizona State University)
Poster	<i>Simulation of Subwavelength Aperture - Micro Sensor System</i> C.S. Meierbachtol, P. Chahal (Michigan State University)
Poster	<i>Avoiding Degradation of N-Contact Performance on GaN in Light Emitting Diodes</i> W. Hou, T. Detchprohm and C. Wetzel (Michigan State University)
Poster	<i>Performance analysis of Uniaxial Strained Zero-Schottky-Barrier Single- and Double-Walled Carbon Nanotube Transistors</i> Md. Abdul Wahab and Quazi D.M. Khosru (Bangladesh University of Engineering and Technology)
Poster	<i>OHMIC CONTACTS TO MBE GROWN GE DOPED N-GAN FOR TERAHERTZ EMITTERS</i> K.D. Matthews, I. Walsh, Q. Diduck, W.J. Schaff, L.F. Eastman (Cornell University, Rice University)
Poster	<i>Pulse Evaluation and Reliability Analysis of 4H-SiC SGTO Modules</i> Aderinto Ogunniyi and Heather O'Brien (Army Research Laboratory)
Poster	<i>Impacts of Different Passivation Approaches on InAs-Channel HEMTs</i> Heng-Kuang Lin (National Central University, Taiwan)
Poster	<i>Versatile Gate for Artificial Neural Network Circuit</i> Abdul Rahman (Texas A&M University)

Wednesday (Aug 4)

Session IV: Green Technology

Session Co-Chairs: Leo Schowalter and Christian Wetzel

8:00—8:30 <i>(Invited)</i>	Efficiency Issues from Green to UV Asif Khan (University of South Carolina)
8:30—8:45	Performance of pseudomorphic Ultraviolet -LEDs grown on bulk AlN substrates Shawn R. Gibb, James R. Grandusky, Mark Mendrick and Leo J. Schowalter (Crystal IS Inc.)
8:45—9:00	Reducing efficiency droop in GaInN based light-emitting diodes by matching material polarization Jiuru Xu, Martin. F. Schubert, Ahmed. N. Noemaun, Jaehee Cho and E. Fred Schubert (Rensselaer Polytechnic Institute)
9:00—9:15	Structural Wavelength Control and Light Extraction Enhancement in Nano-Structured Green AlGaInN LEDs Christoph Stark, Theeradetch Detchprohm and Christian Wetzel (Rensselaer Polytechnic Institute)
9:15—9:45 <i>(Invited)</i>	Optical ceramics for LED conversion M. Raukas and G. Wei (Osram Sylvania)

9:45—10:15 **BREAK**

10:15—10:30	Performance Enhancement of InGaN-based Laser Diodes Using a Step-Graded Al_xGa_{1-x}N Electron Blocking Layer Yun Zhang, Jianping Liu, Tsung-Ting Kao, Seong-Soo Kim, Yi-Che Lee, Zachary Lochner, Jae-Hyun Ryou, Paul D. Yoder, Russell D. Dupuis and Shyh-Chiang Shen (Georgia Institute of Technology)
10:30—11:00 <i>(Invited)</i>	SiC Ultraviolet Avalanche Photodetectors Joe C. Campbell (University of Virginia)
11:00—11:15	III-Nitride/SiC Separate Absorption and Multiplication Avalanche Photodiodes: The importance of controlling polarization induced interface charge A.V Sampath, R.W. Enck, H. Shen, M. Wraback and Q. Zhou, D. McIntosh and J. Campbell (US Army Research Laboratory)
11:15—11:30	Bio-sensing Sensitivity of a Nanoparticle based Ultraviolet Photodetector Christopher Shing, Liqiao Qin and Shayla Sawyer (Rensselaer Polytechnic Institute)
11:30—12:00	Panel Session Topic: What Does Smart Lighting Really Need?

12:00—1:30 **LUNCH**

Session V: Infrared Photonics

Session Co-Chairs: Sanjay Krishna and Jerry Meyer

1:30—2:00 <i>(Invited)</i>	Limits of Infrared Imaging W.E. Tennant (Teledyne Imaging Sensors)
2:00—2:30 <i>(Invited)</i>	Carrier Recombination Phenomena in Type-2 Strained Layer Superlattices and Bulk MCT Materials G. Belenky, D. Donetsky and S.Svensson (State University of NY at Stony Brook)
2:30—2:45	Time-Resolved Photoluminescence Study of Type II Superlattice Structures Blair C. Connelly, Grace D. Metcalfe, Paul H. Shen and Michael Wraback (US Army Research Laboratory)
2:45—3:00	Long Wave Infrared nBn Based Type II Superlattice Detectors Ha sul Kim, Elena Plis, Stephen Myers, Nutan Gautam, Maya Kutty and Sanjay Krishna (University of New Mexico)
3:00—3:15	Application of Epitaxial Unipolar Barriers to Reduce Noise Currents in Photodetectors G.R Savich, J.R. Pedrazzani, S. Maimona and G.W. Wicks (University of Rochester)

3:15—3:45 **BREAK**

3:45—4:15 <i>(Invited)</i>	External cavity QC and semiconductor disks lasers – high-brightness 2-10 μm laser sources for sensing and security applications Joachim Wagner (Fraunhofer Institute)
4:15—4:30	High-Performance Interband Cascade Lasers for $\lambda = 3\text{-}4.5 \mu\text{m}$ W.W. Bewley, C.S. Kim, M. Kim, I. Vurgafman, C.L. Canedy, J.R. Lindle, J. Abell and J.R. Meyer (Naval Research Laboratory)
4:30—4:45	Engineering the Barrier of Quantum Dots-in-a-Well (DWELL) Infrared Photodetectors for High Temperature Operation A.V. Barve, Y. Sharma, J. Montoya, J. Shao, T. Vandervelde, T. Rotter and S. Krishna (University of New Mexico)
4:45—5:00	Theoretical Investigation of Intraband, Infrared Absorbance in Inorganic/Organic Nanocomposite Thin Films with Varying Colloidal Quantum Dot Surface Ligand Materials Kevin R. Lantz and Adrienne D. Stiff-Roberts (Duke University)
5:00—5:30	Panel Session Topic: Peering into the Crystal Ball: Whence the Future of Semiconductor Infrared Lasers and Detectors?
5:30—6:15	<i>Open Time</i>
6:15—8:15	Conference Dinner and Speaker
7:15—8:15 <i>(Invited)</i>	Lighting: Past, Present and Future Robert Karlicek (Rensselaer Polytechnic Institute)

Thursday (Aug 5)

Session VI: Terahertz Technology

Session Co-Chairs: Richard Averitt and Grace Metcalfe

8:00—8:30 <i>(Invited)</i>	<i>Terahertz Technologies for Military Applications</i> Henry Everitt (US Army AMRDEC)
8:30—8:45	<i>Terahertz plasmon resonances in grating-gate GaN HEMT structures with submicron grating periods</i> A.V. Muravjov, V.V. Popov, X. Hu, R. Gaska, W.J. Stillman and M.S. Shur (Rensselaer Polytechnic Institute)
8:45—9:00	<i>Transistor Gain per Stage up to 0.5 THz</i> S. Sarkozy, X. Mei, W. Yoshida, P.H. Liu, M. Lange, J. Lee, Z. Zhou, W.R. Deal, V. Radisic, K. Leong and R. Lai (Northrop Grumman Corp.)
9:00—9:15	<i>FET THz Detectors Operating in the Quantum Capacitance Limited Region</i> Berardi Sensale-Rodriguez, Lei Lu, Ronghua Wang, Debdeep Jena and Huili (Grace) Xing (University of Notre Dame)
9:15—9:45 <i>(Invited)</i>	<i>A High Resolution Terahertz Spectrometer for Chemical Detection</i> Alexander Majewski (Goodrich ISR Systems)

9:45—10:15 **BREAK**

10:15—10:45 <i>(Invited)</i>	<i>Future Perspectives in Terahertz Imaging and Spectroscopy</i> Michael Pepper (Teraview)
10:45—11:00	<i>Reflecting THz Waveplates</i> Andrew C. Strickwerda, Kebin Fan, Grace D. Metcalfe, Michael Wraback, Xin Zhang and Richard D. Averitt (Boston University)
11:00—11:15	<i>A Physics-Based Tunneling Model for Sb-Heterostructure Backward Tunnel Diode Millimeter-Wave Detectors</i> Z. Zhang, R. Rajavel, P. Deelman, Y. Cao, M. Kelly, D. Jena and P. Fay (University of Notre Dame)
11:15—11:30	<i>Non-linear plasma oscillations in semiconductor and graphene conduction channels and application to the detection of terahertz signals</i> S. Rudin (US Army Research Laboratory)
11:30—12:00	<i>Panel Session Topic: Bridging the THz Gap – From Electronic to Photonic Devices</i>

12:00—1:30 **LUNCH**

Session VIII: Next Generation Devices

Session Co-Chairs: Michael Gerhold and Grace Xing

1:30—2:00 <i>(Invited)</i>	<i>Interfacing with Carbon Nanomaterials—Difficulties in Accessing the Intrinsic Properties</i> Aaron D. Franklin (IBM T.J. Watson Research Center)
2:00—2:15	<i>Graphene Nanoribbon p-n Junction Channel FETs: Experiment and Modeling</i> Kristof Tahy, Huili (Grace) Xing and Debdeep Jena (University of Notre Dame)
2:15—2:30	<i>Electrical and noise properties of graphene transistors</i> S. Romyantsev, G. Liu, W. Stillman, M. Shur and A.A. Balandin (Rensselaer Polytechnic Institute)
2:30—2:45	<i>Extremely Scalable Cross-Point Top-Gated Hetero-junction Tunneling Transistors</i> Osama M. Nayfeh and Madan Dubey (US Army Research Laboratory)
2:45—3:15 <i>(Invited)</i>	<i>Compound Semiconductor Based Tunnel Transistor Logic</i> Suman Datta (Penn State)

3:15—3:45 BREAK

3:45—4:15 <i>(Invited)</i>	<i>How small can we make semiconductor lasers?</i> L. Jay Guo (University of Michigan)
4:15—4:30	<i>Toward Optical Memory on Silicon Chip</i> Ali W. Elshaari, Abdelsalam A. Aboketaf and Stefan F. Preble (Rochester Institute of Technology)
4:30—4:45	<i>Performance of a quantum dot passively mode-locked laser under optical feedback and temperature control</i> C.-Y. Lin, F. Grillot, N.A. Naderi, Y. Li, J.H. Kim, C.G. Christodoulou and L.F. Lester (University of New Mexico; Rensselaer Polytechnic Institute)
4:45—5:00	<i>Thin Film Semiconducting Carbon Nanotube Photovoltaic and Photodetector Devices</i> Dominick J. Bindl and Michael S. Arnold (University of Wisconsin, Madison)
5:00—5:30	<i>Panel Session Topic: Grand Challenges for Next Generation Devices</i>

5:30—5:45 **Closing Remarks** Greg DeSalvo