Tuesday (7th August 2012)

7:30-18:00	**Registration Opens**
7:30-8:30	**Light Breakfast**
8:30-8:45	Open Conference **Paul Chow – Les Eastman**

S1: Green Technology **Chairs: Michael Wraback and Christian Wetzel**

G1 8:45-9:15	Recent Progress in Solid State UV Emitters **(Invited)** *Michael Wraback (Army Research Lab)*
G2 9:15-9:30	Improved Efficiency High Power 260 nm Pseudomorphic Ultraviolet Light Emitting Diodes *J. R. Grandusky, J. Chen, M.C. Mendrick, S.R. Gibb, C. Moe*, M. Wraback*, and L. J. Schowalter (Crystal IS,* Army Research Lab)*
G3 9:30-9:45	Amplified Spontaneous Emission in Electron Beam-Pumped AlGaN-based Laser Structures for Deep UV Applications *A. Yu. Nikiforov, W. Zhang, J. Yin, R. Paiella, and T. D. Moustakas (Boston University)*
G4 9:45-10:00	Physics of Visible and UV LED Devices *A. Dobrinsky, M. Shatalov, M. Shur*, and R. Gaska (Sensor Electronic Technology, Inc.,* Rensselaer Polytechnic Institute)*
10:00-10:30	**Break**
G5 10:30-11:00	White LEDs **(Invited)** *Satoshi Kamiyama (Meijo University)*
G6 11:00-11:15	GaN-based Light Emitting Diode with Embedded SiO_2 Pattern for Enhanced Light Extraction *W. Hou, L. Zhao, X. Wang, C. J. M. Stark, S. You, T. Detchprohm, and C. Wetzel (Rensselaer Polytechnic Institute)*
G7 11:15-11:30	The Role of Extended Defects in the Performance of Nitride Optoelectronic Devices *T. D. Moustakas (Boston University)*

G8 11:30-11:45	Low Threshold Lasers from Wavelength-Engineered Colloidal Quantum Dot Enabled by Single-Exciton Optical Gain *C. Dang, K. Roh, J. Lee, C. Breen*, J. S. Steckel*, S. Coe-Sullivan*, and A. Nurmikko (Brown University,* QD Vision Inc.)*
Late News 11:45-12:00	III-Nitride Interband Tunneling Devices *S. Krishnamoorthy, F. Akyol, J. Yang, P. S. Park, R. C. Myres and S. Ranjan (Ohio State University)*
Panel 12:00-12:30	Panel discussion *(Moustakas, Wrabak, Kamiyama, Wetzel with Schowalter moderator)*
12:30-14:00	**Lunch**
S2: High Speed Devices	**Chairs: Paul Maki and Kei-May Lau**
H1 14:00-14:45	**(Plenary)** *Umesh Mishra (University of California, Santa Barbara)*
H2 14:45-15:00	Gate-recessed E-mode InAlN/AlN/GaN HEMTs with f_T/f_{max} of 225/250 GHz *B. Song, B. Sensale-Rodriguez, R. Wang, M.Schuette*, A. Ketterson*, E. Beam*, P. Saunier*, X. Gao**, S. Guo**, P. Fay, D. Jena, and H. G. Xing (University of Notre Dame,* Triquint Semiconductor,** IQE RF LLC)*
H3 15:00-15:15	Performance Enhancement of GaN High Electron-Mobility Transistors with Atomic Layer Deposition Al_2O_3 Passivation *D. Xu, K. Chu, J. Diaz, W. Zhu, R. Roy, L. Mt. Pleasant, K. Nichols, and P.C. Chao, M. Xu*, and P. Ye* (BAE Systems,* Purdue University)*
H4 15:15-15:30	Fabrication and Characterization of AlInN/GaN Nanoribbon Transistors for High Linearity RF Operation *M. Azize, D. Piedra, A. Hsu, X. Guo, and T. Palacios (Massachusetts Institute of Technology)*

15:30-16:00 **Break**

H5 III-V's for beyond Si CMOS Electronics **(Invited)**
16:00-16:30 *Suman Datta (Pennsylvania State University)*

H6 III-V / Si Integration **(Invited)**
16:30-17:00 *Devendra Sadana (IBM Microelectronics)*

Panel Panel discussion *(Mishra, Xing, and Datta with Maki*
17:00-17:30 *moderator)*

17:30-18:15 Open Time

S3: Poster **Chair: Domenico Pacifici**
18:15-20:15 *Poster Reception and Food*

G-P1 Improved Photon Extraction by Substrate Thinning and Surface Roughening in 260 nm Pseudomorphic Ultraviolet Light Emitting Diodes
J. Chen, J. R. Grandusky, M. C. Mendrick, S. R. Gibb, L. J. Schowalter (Crystal IS)

G-P2 Confocal Microscopy Study of Nanoscale Compositional Inhomogeneities in Blue InGaN MQWs
C. Li, E. B. Stokes (University of North Carolina at Charlotte)

G-P3 Monolithic Optolectronic Integration of GaN High-Voltage Power FETs and LEDs
J. Waldron, R. Karlicek, and T. P. Chow (Rensselaer Polytechnic Institute)

G-P4 a-plane GaN Light Emitting Diodes On Self-assembly Ni Nano-islands
X. Wang, W. Hou, C. J. M. Stark, L. Zhao, S. You, T. Detchprohm, and C. Wetzel (Rensselaer Polytechnic Institute)

G-P5 Aluminum Gallium Nitride/Silicon Carbide Separate

Absorption and Multiplication Avalanche Photodiodes
L. E. Rodak, A.V. Sampath, C.S. Gallinat, H. Shen, M. Wraback, Y. Chen, Q. Zhou*, and J. C. Campbell**
(Army Research Lab, University of Virginia)*

H-P1 High-Speed Multi-bit SRAMs using Spatial Wavefunction Switched (SWS)-FETs
P. Gogna, M. Lingalugari, J. Chandy, E. Heller, and F. C. Jain (University of Connecticut,* Rsoft Design Group)*

H-P2 Implementation of Unipolar Inverter Based on Spatial Wave-Function Switched (SWS)-FETs
S. Karmakar, J. A. Chandy, and F. C. Jain* (Intel Corporation,* University of Connecticut)*

I-P1 Origin of Pulse Instability in Quantum Cascade Lasers and a Proposal on How to Correct it
P. M. Bouzi, Y. Yao, Y. Huang, N. Aung, X. Wang, and C. Gmachl (Princeton University,* AdTech Optics, Inc.)*

I-P2 Investigation of laterally-biased IR Quantum Dot Photodetector
D. H. Guidry, C. P. Morath, D. A. Cardimona, and V. M. Cowan (Air Force Research Lab)

N-P1 Transient Analysis of Memristors
A. Mazady, and M. Anwar (University of Connecticut)

N-P2 High Field Effect Mobility Amorphous In-Zn-O Thin Film Transistors: Contact Resistance and Metallization Strategy
S. Lee, and D. C. Paine (Brown University)

N-P3 Fabrication and Characterization of Vertically Aligned Carbon Nanofibers as a Biosensor Platform for Hypoglycemia
K. C. MacArthur, K. A. Al Mamun, F. S. Tulip, N. McFarlane, and S. K. Islam (University of Tennessee)

N-P4 Radiation Engineering with Aperiodic Nanopillar Arrays
N. Lawrence, J. Trevino, and L. D. Negro (Boston University)

N-P5 Single and Multi Photon Emission in Planar Arrays of Au Nanoparticles
G. F. Walsh, and L. D. Negro (Boston University)

P-P1 Novel Packaging and High-Current Pulse-Switching of 1.0 cm^2 SiC SGTOs
H. O'Brien, A. Ogunniyi, W. Shaheen, L. Cheng*, M. Francois***, S. Scozzie, A. Agarwal**, V. Temple*** (Army Research Lab,* Berkeley Research Associates,** Cree, Inc.,*** Silicon Power Corporation))*

P-P2 Axial Si/Ge Heteronanowires for Photovoltaic Applications
S. Le (Brown University)

P-P3 Comparison of AC I-V Characteristics of Si and SiC MOSFETs
H. Naik, and T. P. Chow (Rensselaer Polytechnic Institute)

P-P4 Design of GaN and SiC 5-20kV Vertical Superjunction Structures
Z. Li, H. Naik, and T. P. Chow (Rensselaer Polytechnic Institute)

P-P5 DC Breakdown and TDDB Study of ALD SiO2 on GaN
S. Takashima, Z. Li, and T. P. Chow (Rensselaer Polytechnic Institute)

T-P1 Large Signal Analytical and SPICE Model of THz Plasmonic FET
A. Gutin, V. Kachorovskii, T. Ytterdal**, A. Muraviev, and M. Shur (Rensselaer Polytechnic Institute,* Ioffe Physical-Technical Institute,** Norwegian University of Science and Technology)*

T-P2 Plasmonic Multi Gated FET Crystal as THz Source
V. Kachorovskii, and M. Shur (Rensselaer Polytechnic Institute)

T-P3 Rectification in Doped Mott-insulator Heterojunctions
F. C. Sabou, N. Bodington, and J. B. Marston (Brown University)

Wednesday (8th August 2012)

7:30-18:00 **Registration Opens**
7:30-8:30 **Light Breakfast**

S4: IR **Chairs: Wicks and Cardimona**

I1
8:30-9:00 High Performance III-V Focal Plane Arrays **(Invited)**
S. D. Gunapala, D. Z. Ting, A. Soibel, S. B. Rafol, A. Khoshakhlagh, J. M. Mumolo, J. K. Liu, S. A. Keo, and A. Liao (Jet Propulsion Lab)

I2
9:00-9:15 Performance of Single-and Dual-color Detectors based on InAs/GaSb Strained Layer Superlattices
E. Plis, N. Gautam, B. Klein, S. Myers, T. Schuler-Sandy, M. N. Kutty, Z.-B. Tian, S. Krishna (University of New Mexico)

I3
9:15-9:45 High Performance Antimonide-Based Interband Cascade Lasers Spanning the Mid-IR Spectral Region **(Invited)**
C. L. Canedy, W. W. Bewley, C. S. Kim, M. Kim, C. D. Merritt, J. Abell, I. Vurgaftman, and J. R. Meyera (Naval Research Lab,* Sotera Defense Solutions)*

I4 9:45-10:00	Cascaded-transition Quantum Cascade Laser *J. L. Zhang, X. Huang, V. Tokranov*, S. Oktyabrsky*, C. F. Gmachl (Princeton University,* University at Albany-SUNY)*
10:00-10:15	**Break**
S5: THz	**Chairs: Shur and Chattopadhyay**
T1 10:15-10:45	Terahertz Wave Generation Using Graphene -Toward the Creation of Terahertz Graphene Injection Lasers **(Invited)** *T. Otsuji, S. Boubanga Tombet, A. Satou, M. Ryzhii*, and V. Ryzhii (Tohoku University,* University of Aizu)*
T2 10:45-11:15	Terahertz Quantum Cascade Lasers **(Invited)** *Sushil Kumar (Lehigh University)*
T3 11:15-11:30	$ZnO/Zn_{1-x}Mg_xO$ QCL: An Alternative THz Source *H. Chou, A. Mazady, and M. Anwar (University of Connecticut)*
T4 11:30-11:45	Active THz Metamaterials based on Self-Gated 2DEGs *B. Sensale-Rodriguez, R. Yan, S. Rafique, M. Kelly, L. Liu, D. Jena, and H. G. Xing (University of Notre Dame)*
T5 11:45-12:15	Schottky Diode Based Frequency Multipliers **(Invited)** *Erich Schlecht (Caltech/NASA's Jet Propulsion Lab)*
Panel 12:15-12:45	Panel Discussion *(Gunapala, Canedy, Otsuji, Kumar, Schlecht with Chattopadhyay as moderator)*
12:45-14:00	**Lunch**
S6: Power	**Chairs: Delage and Reed**
P1 14:00-14:45	Power Electronics in Airplanes **(Plenary)** *K. Karimi (The Boeing Company)*
P2 14:45-15:00	Isolation Methods for GaN Lateral MOS-Channel HEMTs *Z. Li, J. Waldron, and T. P. Chow (Rensselaer Polytechnic Institute)*

P3 15:00-15:30	A Review of Progress and Critical Issues in SiC Power Devices **(Invited)** *Anant Agarwal (Cree Inc.)*
15:30-16:00	**Break**
G9 16:00-16:15	Plasmonic Concentrators for Enhanced Light Absorption in Ultra-Thin Film Organic Solar Cells *P. W. Flanigan, A. E. Ostfeld, Z. Ye, N. G. Serrino, and D. Pacifici (Brown University)*
N10 16:15-16:30	Plasmonic-Photonic Vogel Spiral Arrays for Enhanced Photovoltaics *J. Trevino, and L. D. Negro (Boston University)*
P4 16:30-16:45	Energy Scavenging Using ZnO Nanorods Grown on Flexible Substrates *A. Rivera, A. Mazady, H. C. Chou, and M. Anwar (University of Connecticut)*
Panel 16:45-17:15	Panel Discussion *(Karimi, Agarwal, Chow with Delage as moderator)*
17:15-18:00	Open Time
S7: Dinner 18:00-19:00 19:00-20:00	Conference Dinner Internet of Things **(Invited)** *Lawrence Larson (Brown University)*

Thursday (9th August 2012)

7:30-18:00 7:30-8:30	**Registration Opens** **Light Breakfast**
S8: Next Gen	**Chairs: Joe Smart and Tomas Palacios**
N1 8:30-9:15	Magnetic Tunnel Junction: A Spintronic Nonvolatile Device for VLSI Applications **(Plenary)** *H. Ohno (Tohoku University)*

N2 9:15-9:30	Axial Ge/Si Heterostructured Nanowires for Trigate Tunneling FETs *S. T. Le, D. Perea*, P. Jannaty, X. Luo, S. A. Dayeh*, A. Zaslavsky, and S. T. Picraux* (Brown University, * Los Alamos National Lab)*
N3 9:30-9:45	Investigation of Pyroelectric Polarization Effect on GaN MOS Capacitors and Field-Effect Transistors *J. Zhang, C. Hitchcock, Z. Li, and T. P. Chow (Rensselaer Polytechnic Institute)*
N4 9:45-10:00	Solid-State Nanopores for Detection of Rod-Like Viruses and Trapping of Single DNA Molecules *X. Liu, A. McMullen, J. Tang, D. Stein (Brown University)*
10:00-10:15	**Break**
N5 10:15-10:45	RF MEMS **(Invited)** *Dimitrios Peroulis (Purdue University)*
N6 10:45-11:00	Fast, High-Efficiency Germanium Quantum Dot Photodetectors *P. Liu, S. Cosentino*, S. T. Le, S. Lee, D. Paine, A. Zaslavsky, S. Mirabella*, M. Miritello*, I. Crupi*, A. Terrasi*, and D. Pacifici (Brown University,* University of Catania)*
N7 11:00-11:15	Photoconductive Enhancement Effects of Graphene Quantum Dots on ZnO Nanoparticle Photodetectors *D. Shao, M. Yu, J. Lian, and S. Sawyer (Rensselaer Polytechnic Institute)*
N8 11:15-11:30	Plasmonic Interferometry for Biosensing *J. Feng, V. Siu, A. Roelke, V. Mehta, S. Rhieu, G. T. R. Palmore, and D. Pacifici (Brown University)*
N9 11:30-12:00	Ballistic Transport and Future Semiconductor Devices **(Invited)** *Michael Shur (Rensselaer Polytechnic Institute)*
Panel 12:00-12:30	Panel Discussion *(Ohno, Shur, Peroulis, Smart with Palacios as moderator)*

12:30-14:00	**Lunch:** Close conference (Paul Chow); best student paper/poster award