International Semiconductor Device Research Symposium  
December 7-9, 2005  
Holiday Inn Select Bethesda  
Bethesda, Maryland, USA  

Technical Program  

Wednesday, December 7, 2005  

WP1: Oxides and Dielectrics I - 1:30pm - 3:30pm  
Chairperson: Jerry Thaler, University of Florida  
Meeting Room: Versailles I & II  

1:30pm - 2:00pm  
WP1-01 Invited  
Electrical Characterization of Defects in High-k Gate Dielectrics  
Eric M. Vogel, NIST  

2:00pm - 2:20pm  
WP1-02  
Highly Reliable High-k Gate Dielectrics by Gradual Hf-profile in the  
HfO2/SiO2 Interface Region  
K. Iwamoto, A. Ogawa, T. Nabatame, and H. Satake, MIRAI-ASET, W.  
Mizubayashi and A. Toriumi, MIRAI-ASRC, AIST  

2:20pm - 2:40pm  
WP1-03 Student*  
Trapping in Deep Defects under Substrate Hot Electron Stress in TiN/Hf-silicate  
Based Gate Stacks  
N. A. Chowdhury, P. Srinivasan and D. Misra, New Jersey Institute of  
Technology  

2:40pm - 3:00pm  
WP1-04 Student  
Gate-Dielectric Interface Effects on Low-Frequency (1/f) Noise in p-MOSFETs  
with High-K Dielectrics  
P. Srinivasan, E. Simoen, R. Singanamalla, H.Y. Yu, and C. Claeys, IMEC  
Belgium, D. Misra, New Jersey Institute of Technology  

3:00pm - 3:20pm  
WP1-05 Student  
Magnetic Properties of Atomic-Layer-Deposited Hafnium Dioxide  
H.-Y. Chen and P.D. Ye, Purdue University, J. Murray, P. Xiong, and S. von  
Molnar, Florida State University, G.D. Wilk, ASM America  

* = Nominated for the Best Student Paper Award  

2005 ISDRS, Bethesda, MD, USA
WP2: GaN Material and Characterization - 1:30pm - 3:30pm
Chairperson: Ken Jones, ARL
Meeting Room: Versailles III & IV

1:30pm - 2:00pm  WP2-01 Invited
Nitride-based UV Geiger-Mode Avalanche Photodiodes
Richard Molnar, MIT

2:00pm - 2:30pm  WP2-02 Invited
Physics of textured III-Nitride Quantum Wells for Applications to LEDs
T. Moustakas and J.S. Cabalu, Boston University, S. Rypopoulus, SAIC

2:30pm - 2:50pm  WP2-03
Schottky Barrier Height in GaN/AlGaN Heterostructures
A. F. M. Anwar and Elias W. Faraclas, University of Connecticut, Kurt V. Smith, Raytheon Company

2:50pm - 3:10pm  WP2-04 Student
Ge/Cu/Ti Ohmic Contacts to N-type GaN
Nadeemullah Mahadik and Mulpuri V. Rao, George Mason University, Albert V. Davydov, National Institute of Sciences and Technology

3:10pm - 3:30pm  WP2-05
Temperature-dependent Radiative Lifetimes of Excitons in Non-polar GaN/AlGaN Quantum Wells

WP3: Molecular and Organic Electronics - 1:30pm - 3:30pm
Chairperson: Dean DeLongchamp, NIST
Meeting Room: Washington

1:30pm - 2:00pm  WP3-01 Invited
New Tools for Molecular Electronics
James Kushmerick, National Institute of Standards and Technology

2:00pm - 2:30pm  WP3-02 Invited
Organic Field-effect Transistor Channel Perturbation at Two Surfaces through Analyte Binding and Dielectric Charging
H.E. Katz, C. Huang, J. Huang, K. See, J Miragliotta, A. Becknell, Johns Hopkins University

2:30pm - 2:50pm  WP3-03
Organic and Carbon Nanotube Thin-film Transistors Fabricated on Flexible Substrates using Transfer Printing
Daniel R. Hines, Mihaela Breban, Vinod Sangwan, Andrew Tunnell, Ellen D. Williams, Vince W. Ballarotto, Gokhan Esen, and Michael Fuhrer, University of Maryland, Yue Shao and Stuart A. Solin, Washington University in St. Louis

* = Nominated for the Best Student Paper Award
2:50pm - 3:10pm  **WP3-04**  
Transport in Metal-Molecule-Silicon Devices  
*Adina Scott and David Janes, Purdue University*

3:10pm - 3:30pm  **WP3-05**  
Interface Characterization of Molecular-Monolayer/SiO2 Based Molecular Junctions  
*C.A. Richter, C.A. Hacker, O.A. Kirillov, E.M. Vogel, and L.J. Richter, National Institute of Standards and Technology*

3:30pm - 3:45pm  **Coffee Break - Versailles Foyer**

**WP4: Oxides and Dielectrics II - 3:45pm - 5:45pm**  
*Chairperson: Eric Vogel, NIST*  
*Meeting Room: Versailles I & II*

3:45pm - 4:15pm  **WP4-01 Invited**  
Interface Passivation of Silicon Dioxide layers on Silicon Carbide  
*S. Dhar, S.T. Pantelides and L.C Feldman, Vanderbilt University, S. Wang, T. Issacs-Smith, J.R. Williams, Auburn University*

4:15pm - 4:35pm  **WP4-02**  
Low Leakage Current Transport and High Breakdown Strength of HfO2/SiC MIS Device Structures  
*S.S. Hullavarad, E.B. Jones, R.D. Vispute, and T. Venkatesan, University of Maryland*

4:35pm - 4:55pm  **WP4-03**  
Dramatic Reduction of Gate Leakage Current of Ultrathin Oxides Through Oxide Structure Modification  
*Zhi Chen, Jun Guo and Chandan B. Samantaray, University of Kentucky*

4:55pm - 5:15pm  **WP4-04 Student**  
A New Gate Dielectric HfLaO with Metal Gate Work Function Tuning Capability and Superior NMOSFETs Performance  
*X.P. Wang, M.F. Li, Albert Chin, C.X. Zhu, Ren Chi, X.F. Yu, C. Shen, and D.S.H. Chan, National University of Singapore, A.Y. Du, Institute of Microelectronics, and Dim-Lee Kwong, University of Texas at Austin*

5:15pm - 5:35pm  **WP4-05**  
Characterization of Sb-Doped Fully-Silicided NiSi/SiO2/Si MOS Structure  
*Takuji Hosoi, Kousuke Sano, Masaki Hino, Akio Ohta, Katsunori Makihara, Hirotaka Kaku, Seiichi Miyazaki, and Kentaro Shibahara, Hiroshima University*

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* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
WP5: GaN Devices and Characterization - 3:45pm - 5:45pm  
*Chairperson: Pankaj Shah, ARL*  
*Meeting Room: Versailles III & IV*

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<tr>
<th>Time</th>
<th>WP5-01 Invited</th>
<th>WP5-02</th>
<th>WP5-03 Student</th>
<th>WP5-04 Student</th>
<th>WP5-05 Student</th>
</tr>
</thead>
</table>
| 3:45pm - 4:15pm | Reliability Optimization for Wide Bandgap Devices: Recent Developments in High-spatial Resolution Thermal Imaging of GaN Devices  
M. Kuball, University of Bristol, M.J. Uren and T. Martin, QinetiQ Ltd. | Monitoring the Self-Heating in a High Frequency GaN HFET  
S.P. McAlister, J.A. Bardwell, S. Haffouz, and H. Tang, Institute for Microstructural Sciences, National Research Council of Canada | Analysis of Temperature Model on Device Characteristics for AlGaN/GaN MODFET for High Power Electronics  
Hasina F. Huq, Mohammad T. Alam, and Syed K. Islam, The University of Tennessee | AlGaN/GaN HEMTs: Experiment and Simulation of DC Characteristics  
Elias W. Faraclas and A.F.M. Anwar, University of Connecticut, Richard T. Webster, Air Force Research Laboratory | Characterization of Post-Gate Annealing Impact on Traps in AlGaN/GaN Schottky Diodes by Capacitance and Conductance Dispersion  
Junghui Song, Hyeongnam Kim, and Wu Lu, The Ohio State University |
| 4:15pm - 4:35pm |               |        |                |                |                |
| 4:35pm - 4:55pm |                |        |                |                |                |
| 4:55pm - 5:15pm |                |        |                |                |                |
| 5:15pm - 5:35pm |                |        |                |                |                |

WP6: MEMS and Integrated Sensors - 3:45pm - 5:45pm  
*Chairperson: Paul Pellegrino, ARL*  
*Meeting Room: Washington*

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<tr>
<th>Time</th>
<th>WP6-01 Invited</th>
<th>WP6-02 Invited</th>
<th>WP6-03 Invited</th>
</tr>
</thead>
</table>
| 3:45pm - 4:15pm | Nanosystems - The Next MEMS Revolution  
Dennis Polla, DARPA | Applications of Semiconductor Ultraviolet Optical Sources and Detectors to Bioagent Detection and Sterilization  
M. Wraback, U.S. Army Research Laboratory | Heat and Temperature in Micromechanical Systems  
J. Talghader, University of Minnesota |
| 4:15pm - 4:45pm |                |                |                |
| 4:45pm - 5:15pm |                |                |                |

* = Nominated for the Best Student Paper Award  
2005 ISDRS, Bethesda, MD, USA
5:15pm - 5:35pm  **WP6-04**  
Microhotplate-Based Sensor Platform for Submicron CMOS SoC Designs Interfaces  
*M. Afridi, A. Hefner, J. Geist, and C. Ellenwood, National Institute of Standards and Technology, A. Varma, and B. Jacob, University of Maryland*

5:35pm - 5:55pm  **WP6-05 Student**  
Silicon Substrates with Buried Distributed Bragg Reflectors for Biosensing  
*David A. Bergstein, Michael F. Ruane, and M. Selim Ünlü, Boston University*

5:55pm - 6:15pm  **WP6-06 Student**  
Indium Phosphide MEMS for Integrated Bio-Sensing  
*Nathan Siwak, Marcel Pruessner, Jonathan McGee, and Reza Ghodssi, University of Maryland*

7:30pm - 10:00pm  *Welcome Reception and Poster Session - Versailles Ballroom*

**WP7: Poster Presentations - 7:30pm - 10pm**  
*Chairperson: Marc Sherwin, Northrup Grumman Corporation*  
*Meeting Room: Versailles Ballroom*

**WP7-01 - Oxides and Dielectrics**

**WP7-01-01**  
Fluorinated ALD Al2O3 Gate Dielectrics by CF4 Plasma  
*Chao Sung Lai, Kung Ming Fan, Yi Jung Chen, Kuo Hui Su, Chang Rong Wu, Shian Jyh Lin, and Chung-Yuan Lee, Chang Gung University*

**WP7-01-02 Student**  
Implications of SiO2 Breakdown in an Integrated Nanoscale Power Supply  
*Mark M. Budnik and Kaushik Roy, Purdue University*

**WP7-01-03 Student**  
Characterization of Sputtered-TaN Metal Gate for SiO2 and HfO2 Gate Dielectrics  
*Yijie Zhao, Brandon Eberly, and Marvin H. White, Lehigh University, Huiling Shang, IBM T.J. Watson Research Center*

**WP7-01-04**  
Al2O3 MIM Capacitor with Various Metal Bottom Electrodes for DRAM Applications  
*Seung Woo Do, Cheol Yeong Jang, Dae Gab Lee, Sung Hwan Choi, and Yong Hyun Lee, Kyungpook National University*

**WP7-01-05**  
Characteristics of RuO2 Bottom Electrode for MIM Capacitor  
*Seung Woo Do, Cheol Yeong Jang, Dae Gab Lee, Sung Hwan Choi, and Yong Hyun Lee, Kyungpook National University*

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
WP7-01-06 Student
CMOS Compatibility of Crystalline Gd2O3 High-K / Metal Gate Stacks

WP7-02 - Wide Bandgap Materials and Devices

WP7-02-01 Student
Morphological Evaluation and Binding Properties of Interleukin-6 on Thin ZnO Layers Grown on (100) Silicon Substrates for Biosensor Applications
Soumya Krishnamoorthy and Agis Iliadis, University of Maryland, Thaleia Bei, Emmanouil Zoumakis, and George P. Chrousos, NIH

WP7-02-02
High Breakdown Voltage AlGaN/GaN MIS-HEMT with SiN and TiO2 Gate Insulator
Shuich Yagi, Mitsuaki Shimizu, Yuki Yamamoto, and Guanxi Piao, National Institute of Advanced Industrial Science and Technology, Yoshiki Yano and Hajime Okumura, Taiyo Nippon Sanso Corporation

WP7-02-03 Student
Structural Characteristics of Hydride Vapor Phase Epitaxially Grown GaN
Nadeemullah Mahadik and Mulpuri V. Rao, George Mason University, S.B. Qadri and James P. Yesinowski, Naval Research Laboratory

WP7-02-04 Student
Athermal Annealing of Ion-implanted SiC

WP7-02-05 Student
Large-Signal Modeling of SiC-Based RF MESFET
Sankha S. Mukherjee and Syed S. Islam, Rochester Institute of Technology

WP7-02-06
The Reverse Leakage Current of Present-Day Manufactured Silicon PN
Vasile V.N. Obreja, National R&D Institute for Microtechnology

WP7-02-07
Thermal Modeling of Multi-finger SiC Power MESFETs
C.-M. Zetterling, W. Liu, and M.Östling, KTH, Royal Institute of Technology

WP7-02-07
Parameter Extraction and SPICE Model Development for 4H-Silicon Carbide (SiC) Power MOSFET
Md Hasanuzzaman, Tennessee State University, Syed K. Islam and Mohammad T. Alam, The University of Tennessee, Knoxville

* = Nominated for the Best Student Paper Award
WP7-02-08
Homo and Heteroepitaxial Growth of Hexagonal and Cubic MgZn1-xO Alloys

WP7-02-09
Characterization and Application of SiC Ti-VJFETs
K. Sheng, J. H. Lee, P. Alexandrov, and J. H. Zhao, Rutgers University

WP7-02-10  Student
The Effects of Implanting Al and Al and C at Different Temperatures in Different Concentrations into SiC

WP7-02-11
Structural Comparison of the (3 -3 2n) and (3 -3 n) 2H, 4H and 6H Surfaces for Application to the Growth of AlGaN on Off-Axis 4H- and 6H-SiC Substrates
K. A. Jones, Army Research Lab – SEDD

WP7-02-12

WP7-02-13
Growth and Characterization of Cd 0.22Zn0.78S Thin Films Prepared by Spray Pyrolysis Method: Optical and Structural Properties
M.C. Baykul, N. Orhan, and A. Gulec, Eskisehir Osmangazi University

WP7-02-14
Preparation and Characterization of ZnS Thin Films Produced by Chemical Bath Deposition (CBD) Method: Optical, Electrical, and Structural Properties
M.C. Baykul and C. Turkmen, Eskisehir Osmangazi University

WP7-02-15
High Current (200 A), Low Resistance (0.87 mΩ-cm²) Normally-off SiC VJFETs for Power Switching Applications

WP7-02-16
The Reverse Leakage Current of Present-Day Manufactured Silicon PN Junctions and Their Maximum Permissible Operation Temperature
Vasile V.N. Obreja, National R&D Institute for Microtechnology

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
**WP7-03 - Molecular and Organic Electronics**

**WP7-03-01**
Temperature and Gate Field Dependent Transport of Pentacene Thin Film Transistors  
*Dong Guo, The University of Tokyo*

**WP7-03-02 Student**
Molecular Dynamics of Biological Ion Channels  
*Santosh Pandey, Akwete Bortei-Doku, and Marvin H. White, Lehigh University*

**WP7-03-03 Student* 
Capacitance-Voltage Hysteresis Effects in Metal-SiO2-Thin Film Organic Semiconductor Devices  
*Darrell Niemann, Norman Gunther, Charles Kwong, Mark Barycza, and Mahmud Rahman, Santa Clara University*

**WP7-03-04**
Conductivity Measurements of Few Molecule Systems in Metal-Molecule-Metal Device Structure  
*Ajit Kumar Mahapatro and David B. Janes, Purdue University*

**WP7-04 - MEMS and Integrated Sensors**

**WP7-04-01 Student**
A BioMEMS Platform for Planar Patch-Clamping  
*Santosh Pandey, Rajiv Mehrotra, Matthew Chabalko, Akwete Bortei-Doku, and Marvin H. White, Lehigh University*

**WP7-04-02 Student**
A Novel CMOS Integrated Amplifier for Sensing Single Ion-Channel Current in Biological Cells  
*Santosh Pandey, Akwete Bortei-Doku, and Marvin H. White, Lehigh University*

**WP7-04-03**
1/f Noise Characteristics of Gold Nanocluster Chemical Sensors  
*W. Kruppa, M.G. Ancona, R.W. Rendell, A.W. Snow, E.E. Foos, and R. Bass, Naval Research Laboratory*

**WP7-04-04**
A Microshield RF MEMS Shunt Switch  
*Jeyasingh Nithianandam and Satish N. Samson, Morgan State University, Eugene Zakar, U.S. Army Research Laboratory*

**WP7-04-05 Student**
Realization of Self-Powered Electronics by 3-D Integration  
*Zeynep Dilli, Neil Goldsman, and Martin Peckerar, University of Maryland, George Metze, Laboratory for Physical Sciences*

**WP7-04-06**
Characteristics of Capacitive Membrane-Type RF MEMS Switches  
*Yeong-Lin Lai and Yueh-Hung Chen, National Changhua University of Education*

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
WP7-05 - SiGe Materials and Devices

WP7-05-01 Student
CMOS Device Reliability for Emerging Cryogenic Space Electronics Applications
Tianbing Chen, Laleh Najafizadeh, Chendong Zhu, Adnan Ahmed, Ryan Diestelhorst, Gustavo Espinel, and John D. Cressler, Georgia Institute of Technology

WP7-05-02 Impact of Device Scaling on VCOs Phase Noise in SiGe HBTs
Ulrich L. Rohde and Ajay K. Poddar, Synergy Microwave Corporation

WP7-05-03 Efficient Approach to Optimization of fT for Graded-Base SiGe HBTs
Lei Ai, University of California, Irvine, Ming-Cheng Cheng, Clarkson

WP7-05-04 Student*
Analysis of the Biasing Conditions and Latching Operation for Si/SiGe Resonant Interband Tunnel Diode Based Tunneling SRAM
Stephen Sudirgo, David J. Pawlik, Sean L. Rommel, and Santosh K. Kurinec, Rochester Institute of Technology, Phillip E. Thompson, Naval Research Laboratory, Paul R. Berger, The Ohio State University

WP7-05-05 Student
Analytical Modeling and Simulation of Vth and Vt of the Delta-Doped MOS-Gate Si/SiGe HEMT

WP7-06 - Narrow Bandgap Materials and Devices

WP7-06-01 Student
Modeling and Simulation of Narrowband Gap Semiconductor Indium Antimonide (InSb) Based MOSFET
Lei Ma, Yawei Jin, Chang Zeng, and Doug Barlage, North Carolina State University

WP7-07 - NanoElectronics Materials and Devices

WP7-07-01 Characterization of Compositional Oscillations in InGaAs Films Induced by MBE Cell Configuration and Substrate Rotation
Wendy L. Sarney and Stefan P. Svensson, US Army Research Laboratory

* = Nominated for the Best Student Paper Award
2005 ISDRS, Bethesda, MD, USA
WP7-07-02
Deposition and Electrical Characterization of a MOS Memory Structure Containing Au Nanoparticles in a High-K Dielectric Layer
Ch. Sargentis and D. Tsamakis, National Technical University of Athens, K. Giannakopoulos and A. Travlos, National Centre for Scientific Research Demokritos

WP7-07-03 Student
Two-Dimensional Quantum Mechanical Modeling for Multiple-Channel FinFET
Joong-sik Kim and Taeyoung Won, Inha University

WP7-07-04 Student
Transport Properties of Wide Band Gap Nanotubes
Gary Pennington, Akin Akturk, James M. McGarrity, and Neil Goldman, University of Maryland

WP7-07-05 Student
Kousuke Miyaji, Masaharu Kobayashi, Tetsu Ohtou, and Toshiro Hiramoto, University of Tokyo, Masumi Saitoh, Toshiba Corporation

WP7-07-06 Student*
Selective MBE Growth of Shape-, Size-, and Position- Controlled GaAs Nanowire Networks on (111)B Patterned Substrates
Isao Tamai, Taketomo Sato, and Hideki Hasegawa, Hokkaido University

WP7-07-07 Student
Densified Vertically-Aligned Carbon Nanotube Arrays by Chemical Vapor Infiltration
Stephen J. Kilpatrick, U.S. Army Research Laboratory, Anyuan Cao, Xuesong Li, Nicholas J. Renna, and Pulickel M. Ajayan, Rensselaer Polytechnic Institute Research Laboratory

WP7-07-08 Student
Large Scale Assembly of GaN Nanowires using Electric Field Assisted Alignment Techniques for Device Applications
Abhishek Motayed and Albert V. Davydov, National Institute of Standards and Technology, Dr. Maoqi He and S. N. Mohammad, Howard University

WP7-08 - Device Modeling

WP7-08-01
Effect of Channel Doping Levels in LDMOSFET on the Transfer Characteristic of CMOS Inverter
Nam-Soo Kim, Hyung-Gyoo Lee and Cuizhiyuan, Chingbuk National University

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
**WP7-08-02**  
*Student*  
First Principle Study of Si and Ge Band Structure for UTB MOSFETs Applications  
*T. Low, G. Samudra, Y.C. Yeo, and Y.P. Feng, National University of Singapore, M.F. Li, Institute of Microelectronics, P. Bai, Institute of High Performance Computing, D.L. Kwong, University of Texas, Austin, and L. Chan, Chartered Semiconductor*

**WP7-08-03**  
A Subthreshold Drain Current Model for Deep Submicron Pocket Implanted MOSFETs  
*S. Baishya and C.K. Sarkar, Jadavpur University, A. Mallik, Kalyani Gov't Engineering College*

**WP7-08-04**  
*Student*  
Critical Substrate Bias in Variable Threshold Voltage CMOS (VTCMOS) Scheme with Short Channel Devices  
*A. Tamsir P., T. Ohtou, T. Nagumo, and T. Hiramoto, University of Tokyo*

**WP7-08-05**  
*Student*  
Modeling of Doping Profile in Active-Silicon Region of Silicon-On-Insulator transistor as a function of Channel Length  
*Jay Mody, IMEC Belgium and Prasanta Ghosh, Syracuse University*

**WP7-08-06**  
Numerical Modeling and Characterization of n-Channel 4H-SiC Double-Diffused Vertical Power MOSFET  
*J. Wu, S. Potbhare, and N. Goldsman, University of Maryland, A. Lelis, U.S Army Research Laboratory*

**WP7-08-07**  
*Student*  
Full Wave Modeling of Substrate Doping Effects and Nonideal Conductors in Integrated Circuit Interconnects  
*Bo Yang, Xi Shao, Neil Goldsman, Omar Ramahi, and Parvez N. Guzdar, University of Maryland*

**WP7-08-08**  
*Student*  
Gate Line Edge Roughness Amplitude and Frequency Variation Effects on Intra Die MOS Device Characteristics  
*Emad Hamadeh, Norman Gunther, Darrell Nieman, and Mahmud Rahman, Santa Clara University*

**WP7-08-09**  
*Student*  
Accurate MOS Gate Impedance Model for 200MHz-20GHz Frequency Range  
*Sripriya R Bandi, Clyde Washburn, and P.R.Mukund, Rochester Institute of Technology, Jan Kolnik, Ken Paradis, Steve Howard, and Jeff Burleson, LSI Logic Corporation*

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
WP7-08-10 Student
CMOS Foundry Schottky Diode Microwave Power Detector Fabrication, Spice Modeling, and Application
Woochul Jeon and John Melngailis, University of Maryland

WP7-08-11 Student
Quantum Mechanical Modeling of Nanoscale MOSFETs Carrier Transportation
Huixian Wu, Marvin H. White, and James Cargo, Lehigh University

WP7-08-12
High-Frequency Modeling of Quad Flat No-Lead Packages
Yeong-Lin Lai and Cheng-Yu Ho, National Changhua University of Education

WP7-08-13 Student
Modeling of MOSFET Gate Leakage for High k Gate Dielectrics
Huixian Wu, Yijie Zhao, and Marvin H. White, Lehigh University

WP7-08-14 Student
Topography Simulation for Wafer-scale Structural Analysis
Jun-Gu Lee and Taeyoung Won, Inha University

WP7-08-15 Student
First Principle Study of Si and Ge Band Structure for UTB MOSFETs Applications
T. Low, G. Samudra, Y.C. Yeo, and Y.P. Feng, National University of Singapore, M.F. Li, Institute of Microelectronics, P. Bai, Institute of High Performance Computing, D.L. Kwong, University of Texas, Austin, and L. Chan, Chartered Semiconductor

WP7-09 - Novel Devices and Concepts

WP7-09-01 Student
A Novel Flash Memory Device Based on Recessed Channel Structure
Kyoung-Rok Han, Ki-Heung Park, Sang-Goo Jung, Young-Min Kim, and Jong-Ho Lee, Kyungpook National University

WP7-09-02 Student
25nm Programmable Virtual Source/drain MOSFETs Using a Twin SONOS Memory Structure
Woo Young Choi, Byung Yong Choi, Ju Hee Park, Jong Duk Lee, Young June Park, and Byung-Gook Park, Seoul National University, Dong-Won Kim, Choong-Ho Lee, and Donggun Park, Samsung Elec. Co.

WP7-09-03 Student
A Low Voltage SANOS Nonvolatile Semiconductor Memory (NVSM) Device
Yijie Zhao, Xiaonan Wang, and Marvin H. White, Lehigh University, Huiling Shang, IBM T.J. Watson Research Center

* = Nominated for the Best Student Paper Award
WP7-09-04  Student
An Optimum Design of Saddle MOSFET with Recess Channel and Side-Gate
Ki-Heung Park, Kyoung-Rok Han, and Jong-Ho Lee, Kyungpook National University

WP7-09-05  Student
The Impact of InAlAs Spacer Layer on DC Characteristics of
InP/InAlAs/GaAsSb/InP DHBTs
S. W. Cho, M. S. Park, T. W. Kim, and J. H. Jang, Gwangju Institute of Science
and Technology, I. Adesida, University of Illinois at Urbana Champaign, N.
Pan, Microlink Devices

WP7-09-06  Student
Design of Silicon Devices for Pass-Transistor-Logic Circuits
F. Vasefi and Z. Abid, University of Western Ontario

WP7-09-07
Effect of Graded Base Doping on the Gain of SiC BJT
J. H. Zhao, J. Zhang, X. Li, and K. Sheng, Rutgers University

WP7-09-08  Student
Compact n-Well Design of High Density p-type Bulk FinFET for CMOS
Technology
Byung-Kil Choi, Kwang-Ho Baek, Young Min Kim and Jong-Ho Lee,
Kyungpook National University

WP7-10 - Advanced Processing and Characterization

WP7-10-01  Student
Piezoelectric Coupling Constant in Epitaxial Mg-doped GaN
X. Xu and R.C. Woods, Iowa State University

WP7-10-02
A New Low-cost Technique for Mobility Enhancement of PMOSFETs Strained
by Ge Pre-amorphization Implantation for Source/Drain Extension
Qiuxia Xu, Xiaofong Duan, He Qian, Haihua Liu, and Ming Liu, Chinese
Academy of Sciences

WP7-10-03
Determination of Evolution Path for BmIn Clusters in Atomistic Model
Jae-Hyun Yoo, Chi-Ok Hwang, Kwan-Sun Yoon, Jung-Sik Kim, and Taeyoung
Won, Inha University

WP7-10-04  Student*
Impact Ionization Rate of the Bulk FinFETs with Width and Bias Condition
Sang-Yun Kim, Kwang-Ho Baek, Kyoung-Rok Han, Byung-Kil Choi, and Jong-
Ho Lee, Kyungpook National University

* = Nominated for the Best Student Paper Award
2005 ISDRS, Bethesda, MD, USA
WP7-10-05 Student
Investigation of Ni Induced Deep Levels in N-Type Si by a Temperature
Shoichiro Sato, Shin-ichi Fukushima, Tetsuo Ikari and Kentaro Sakai, Miyazaki
University, Shuji Tanaka and Atsuhiko Fukuyama, Fukuoka Institute of
Technology

WP7-10-06 Student
Piezoelectric Photo Thermal and Surface Photo Voltage Spectra of Chalcopyrite
CuGaSe2 Epitaxial Layers Fabricated on Semi-insulating GaAs

Naoto Ohryoji, Akihiro Goto, Hirosumi Yokoyama, Kentaro Sakai, Atsuhiko
Fukuyama, and Tetsuo Ikari, Miyazaki University, Akimasa Yamada and
Shigeru Niki, National Institute of AIST

WP7-10-07 Student
Carrier Recombination Mechanism at SiO2/Si Interface Studied by a Photothermal and a Surface Photo-voltage Spectroscopy
T. Saisho, K. Sakai, H. Hayashi, S. Sato, A. Fukuyama, and T. Ikari, University of Miyazaki, M. Saemitsu, Tohoku University

WP7-10-08 Student
Piezoelectric Photothermal and Surface Photovoltage Spectra in Extremely Thin
GaInNAs/GaAs Single Quantum Well
Shinichi Fukushima, Tetsuo Ikari, Atsuhiko Fukuyama, Kentaro Sakai, and
Hirosumi Yokoyama, Miyazaki University, Masahiko Kondow, Osaka University

WP7-10-09 Student
Characterization of Polysilicon-Oxide-Nitride-Oxide-Silicon (SONOS)
Nonvolatile Semiconductor Memory (NVSM) Devices
Xiaonan Wang, Yu Wang, Matthew J. Chabalko, Marvin H. White, and Stephen
J. Wrazien, Lehigh University

WP7-10-10 Student
Isolation Method for Bulk FinFET without Using CMP Process
Il Hwan Cho, Junsoo Kim, Il Han Park, Hyungcheol Shin, Byung-Gook Park,
and Jong Duk Lee, Seoul National University, Jong Ho Lee, Kyungpook
National University

WP7-10-11 Student
Ab-initio Calculations for Indium Diffusion in Silicon
Kwan-Sun Yoon, Chi-Ok Hwang, and Taeyoung Won, Inha University

WP7-11 - Optoelectronics and LED Lighting

WP7-11-01 Student
Responsivity and Lifetime of Resonant Cavity Enhanced HgCdTe Detectors
University of Western Australia

* = Nominated for the Best Student Paper Award
WP7-11-02 Student
A Silicon-based Light Emitter
Yanli Zhang, Yijie Zhao, Issac Wildeson, Marvin H. White, Zackery Fleischman, and Volkmar Dierolf, Lehigh University

WP7-11-03 Student*
Optical Thin Films with Very Low Refractive Index and Their Application in Photonic Devices

WP7-11-04
Optical Properties of Full Digital-alloy InGaAlAs Multi-quantum Wells and Application to CW 200-mW 1.3- Laser Diodes
J. D. Song, D. C. Heo, W. J. Choi, I. K. Han, and J. I. Lee, Korea Institute of Science and Technology, J. M. Kim, K. S. Chang, and Y. T. Lee, Gwangju Institute of Science and Technology

WP7-11-05 Student
Investigation of Frequency Modulation Method for Detection of Optical Beam
Asmolova O.V., National Technical University of Ukraine

WP7-11-06
Investigation and Design of Wide Dynamic Range Gating Photosensor Module on the Base Hamamatsu Photomultiplier Tube R7400U with Output Signal Compression for LIDAR-RADAR Applications
Pavlo Molchanov, Olha Asmolova, Iryna Petrosyuk, and Yulia Podobna, National Technical University of Ukraine "KPI", Vincent Contarino, Naval Air Systems Command Research and Engineering Group

WP7-11-07
Feasibility of High Speed Operation of 1.55 Quantum Dot Laser Diode
Byung Seok Choi, Jin Soo Kim, Sung Ui Hong, Jin Hong Lee, Ho-Sang Kwack, and Dae Kon Oh, Electronics and Telecommunications Research Institute (ETRI)

WP7-11-08
Injection-Locking in Fabry-Perot Quantum-well Lasers
X. Jin, California Polytechnic State University, S. L. Chuang, University of Illinois at Urbana-Champaign

WP7-12 - Flexible Electronics

WP7-12-01 Student*
Nanocrystalline-Si Thin Film Fabricated by Inductively Coupled Plasma Chemical Vapor Deposition for Flexible Electronics
Sang-Myeon Han, Joong-Hyun Park, Hye-Jin Lee, Kwang-Sub Shin and Min-Koo Han, Seoul National University

* = Nominated for the Best Student Paper Award
WP7-13 - SOI

WP7-13-01
Electrothermal Modeling of an SOI Differential Amplifier
Feixia Yu, Eastman Kodak Company, Ming-Cheng Cheng, Clarkson University

WP7-13-02
Influence of SOI-generated Stress on BiCMOS Performance
Ted Johansson, B. Gunnar Malm, and Mikael Östling, KTH – Royal Institute of Technology, Hans Norström, Infineon Technologies Sweden AB, Ulf Smith, Uppsala University

WP7-13-03
Large-Signal Modeling of SOI MESFETs
Asha Balijepalli, Joseph Ervin, Jinman Yang and Trevor J. Thornton, Arizona State University, Rajagopal Vijayaraghavan and Syed K. Islam, University of Tennessee

WP7-13-04 Student*
Simulation Study of Source/Drain Doping Profile for 10nm Gate Length Fully Depleted N-type SOI MOSFET
Yawei Jin, Lei Ma, Chang Zeng, and Doug Barlage, North Carolina State University

WP7-14 - High Frequency and THz Devices

WP7-14-01 Student*
Basic Study of Plasma Wave Interactions in GaAs Interdigital-Gated HEMT Devices from Microwave up to THz Frequencies
Abdul Manaf Hashim, Seiya Kasai, Hideki Hasegowa, and Tamotsu Hashizume, Hokkaido University

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
Thursday, December 8, 2005

Plenary Session - 8am - 10:30am
Chairperson: Marc Sherwin, Northrup Grumman Corporation
Meeting Room: Versailles I & II

8:15am - 9:00am  PL1  Invited
TFT Technology for Large Area Electronics
R. Reuss, DARPA

9:00am - 9:45am  PL2  Invited
Lattice-Mismatch and CMOS
Gene Fitzgerald, MIT

9:45am - 10:30am  PL3  Invited
Nanotechnology
Charlie Lieber, Harvard

10:30am - 10:45am  Coffee Break - Versailles Foyer

TA1: Oxides and Dielectrics III - 10:45am - 12:15pm
Chairperson: Sarit Dahr, Vanderbilt University
Meeting Room: Versailles I & II

10:45am - 11:15am  TA1-01  Invited
New Dielectrics for Gate Oxides and Surface Passivation on GaN

11:15am - 11:35am  TA1-02
The Electrical Characteristics of Thin Gadoline Oxide Films on Silicon Substrate by DC Reactive RF-sputtering
Tung-Ming Fan, Chao-Sung Lai, Hui-Hsin Hsu, Kuan-Di Wang, Chun-Lin Chen, Jian-Chi Lin, and Jian-Der Lee, Chang Gung University, Jer-Chyi Wang, Nanya Technology Corporation

11:35am - 11:55am  TA1-03  Student*
Electrical Characterization of Itrathin Atomic-layer-deposited Al2O3 on GaAs
H.C. Lin and P.D. Ye, Purdue University

11:55am - 12:15pm  TA1-04  Student
Electrical Characteristics of Epitaxial γ-Al2O3 Films for Quantum Tunneling Device
Jang-Seop Kim, Kazuaki Sawada, and Makoto Ishida, Toyokashi University of Technology, Mohammad Shahjahan, Rajshahi University

* = Nominated for the Best Student Paper Award
**TA2: SiC Material and Characterization - 10:45am - 12:25pm**

*Chairperson: Chip Eddy, NRL*

*Meeting Room: Versailles III & IV*

10:45am - 11:15am  **TA2-01 Invited**
Degradation of Hexagonal Silicon Carbide-based Bipolar Devices  
Marek Skowronsni, Carnegie Mellon University

11:15am - 11:35am  **TA2-02**
Structural and Analytical Studies of 4H Silicon Carbide MOSFETs with Thermally Grown Oxides  
Tsvetanka Zheleva, Dan Habersat, and Aivars Lelis, U.S. Army Research Laboratory, Igor Levin, NIST, Morgen Dautrich and Patrick Lenahan, Penn State University

11:35am - 12:05pm  **TA2-03 Invited**
The Impact of Surface Defects on SiC Schottky and Ohmic Contact Formation  
L.J. Brillson, S.P. Tumakha, and M. Gao, The Ohio State University, D.J. Ewing and L.M. Porter, Carnegie Mellon University, R.S. Okojie, NASA Glenn Research Center, M. Zhang and P. Pirouz, Case Western Reserve University, Q. Wahab, Linköping University, X. Ma, MaxMile Technologies, T.S. Sudharshan, University of South Carolina, T. Onishi, S. Tsukimoto, and M. Murakami, Kyoto University

12:05pm - 12:25pm  **TA2-04**
Impact of Surface Steps on the Roughness Mobility in 4H-SiC  
Gary Pennington, Siddharth Potbhare, Neil Goldman, and James M. McGarrity, University of Maryland, Aivars Lelis, U.S. Army Research Laboratory

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**TA3: Narrow Bandgap Materials and Devices - 10:45am - 12:05pm**

*Chairperson: Jerry Woodall, Purdue University*

*Meeting Room: Washington*

10:45am - 11:15am  **TA3-01 Invited**
Ultra-low-power HEMT and HBT Devices and Circuit Demonstrations  

11:15am - 11:45am  **TA3-02 Invited**
High Quality Epitaxially-grown InAs on GaP Substrates  
Aristo Yulius, Yale University, Jerry M. Woodall, Purdue University

11:45am - 12:05pm  **TA3-03**
Quantum Dots with Type II Band Alignments for Infrared Detector Applications  

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
12:30pm - 1:30pm  Lunch (on your own)

TP1: Strained MOS and NDR Devices - 1:30pm - 3:40pm
Chairperson: John Cressler, Georgia Tech University
Meeting Room: Versailles I & II

1:30pm - 2:00pm  TP1-01 Invited
High Mobility Strained Ge MOSFETs with High-k Gate Dielectric on Si
Joseph P. Donnelly, David Q. Kelly, Sachin Joshi, Sagnik Dey, Davood
Shahrjerdi, Issac Wiedeman, Doreen Ahmad, and Sanjay K. Banerjee,
University of Texas at Austin

2:00pm - 2:20pm  TP1-02 Student
Low Sidewall Damage Plasma Etching with ICP-RIE and HBr Chemistry of
Si/SiGe Resonant Interband Tunnel Diode
Si-Young Park, Sung-Yong Chung, Ronghua Yu, and Paul R. Berger,
The Ohio State University, Phillip E. Thompson, Naval Research Laboratory

2:20pm - 2:40pm  TP1-03 Student
High Temperature Characterization of Si/SiGe Resonant Interband Tunnel
Diodes
David J. Pawlik, Stephen Sudirgo, santosh K. Kurinec, and sean L. Rommel,
Rochester Institute of Technology, Phillip E. Thompson, Naval Research
Laboratory, Paul R. Berger, The Ohio State University

2:40pm - 3:00pm  TP1-04 Student
Monolithic Si/SiGe HBT-RITD Circuit with Controllable Negative Differential
Resistance For Voltage Controlled Oscillator Applications
Sung-Yong Chung, Si-Young Park, Jeffrey W. Daulton, Ronghua Yu, and Paul
R. Berger, The Ohio State University, Phillip E. Thompson, Naval Research
Laboratory

3:00pm - 3:20pm  TP1-05 Student*
Si-based Resonant Interband Tunnel Diode with Cutoff Frequency over 20 GHz
and Estimated Peak Current Density of 218 kA/cm²
Sung-Yong Chung, Ronghua Yu, Niu Jin, Si-Young Park, and Paul R.
Berger, The Ohio State University, Phillip E. Thompson, Naval Research
Laboratory

3:20pm - 3:40pm  TP1-06
A New Negative-Differential-Resistance Effect in 350 GHz SiGe HBTs
Operating at Cryogenic Temperatures
Qingqing Liang, Ramkumar Krithivasan, Adnan Ahmed, Yuan Lu, and John D.
Cressler, Georgia Tech, Ying Li and Guofu Niu, Auburn University, Jae-Sung
Rieh, Korea University, Greg Freeman, Dave Ahlgren, and Alvin Joseph, IBM

* = Nominated for the Best Student Paper Award
TP2: Wide Bandgap Power Switching Devices - 1:30pm - 3:20pm

Chairperson: Karl Hobart, NRL
Meeting Room: Versailles III & IV

1:30pm - 2:00pm  TP2-01  Invited
High-Voltage SiC and GaN Devices for Power Electronics Applications
T. Paul Chow, Rensselaer Polytechnic Institute

2:00pm - 2:30pm  TP2-02  Invited
High Speed Switching Devices in 4H-SiC – Performance and Reliability
Sei-Hyung Ryu, Sumi Krishnaswami, Brett Hull, Bradley Heath, Mrinal Das,
James Richmond, Anant Agarwal, and John Palmour, Cree, Inc., Aivars Lelis,
Bruce Geil, Dimosthenis Katsis, and Charles Scozzie, Army Research
Laboratory, James Scofield, Air Force Research Laboratory

2:30pm - 2:50pm  TP2-03
1.5 kV Power AlGaN/GaN HFETs
G. Simin, N. Tipirneni, S. Rai, A. Koudymov, V. Adivarahan, J. Yang and M.
Asif Khan, University of South Carolina

2:50pm - 3:10pm  TP2-04
2.1 mΩ-cm2, 1.6 kV 4H-Silicon Carbide VJFET for Power Applications
Victor Veliadis, Li-Shu Chen, Eric Stewart, Megan McCoy, Ty McNutt, Steve
Van Campen, Chris Clarke, and Gregory DeSalvo, Northrop Grumman
Advanced Technology Laboratory

3:10pm - 3:30pm  TP2-05
High Temperature Characterization of SiC BJTs for Power Switching
Applications
K. Sheng, L.C. Yu, J. Zhang and J. H. Zhao, Rutgers University

TP3: Si-Based Nanoelectronics - 1:30pm - 3:30pm

Chairperson: Curt Richter, NIST
Meeting Room: Washington

1:30pm - 2:00pm  TP3-01  Invited
High-power 4-µm Quantum Cascade Lasers
W.T. Masselink, M. Semtiv, S. Dressler, M. Zieler, Humbolt University, N.
Georgiev, T. Dekorsy, and M. Helm, Forschungszentrum Rossendorf

2:00pm - 2:30pm  TP3-02  Invited
Silicon Nanowire Field Effect Transistor Test Structures Fabricated by Top-
down Approaches
Sang-Mo Koo, Qiliang Li, Monica D. Edelstein, Curt A. Richter, and Eric M.
Vogel, National Institute of Standards and Technology

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
TP3-03  **Student**
Large Temperature Dependence of Negative Differential Conductance in Room-Temperature Operating Silicon Single-Electron/Single-Hole Transistor  
Masaharu Kobayashi, Kousuke Miyaji, and Toshiro Hiramoto, University of Tokyo, Masumi Saitoh, Toshiba Corporation

TP3-04  **Student**
An Assessment of Single-Electron Effects in Multiple-Gate SOI MOSFETs with 1.6-nm Gate Oxide near Room Temperature  
Wei Lee and Pin Su, National Chiao Tung University, Hou-Yu Chen, Chang-Yun Chang, Ke-Wei Su, Sally Liu and Fu-Liang Yang, Taiwan Semiconductor Manufacturing Company

TP3-05  **Student**
Fluoride Resonant Tunneling Diodes on Si Substrates  
So Watanabe, Yohei Toriumi, Motoki Maeda, Tsuyoshi Sugisaki and Kazuo Tsutsui, Tokyo Institute of Technology

**Coffee Break - Versailles Foyer**

TP4: **SiGe HBTs and Strained FETs - 3:45pm - 5:35pm**

*Chairperson: Paul R. Berger, Ohio State University*

**Meeting Room: Versailles I & II**

TP4-01  **Invited**
SiGe Heterostructure Devices and Applications  
Steven J. Koester, IBM T. J. Watson Research Center

TP4-02  **Student**
An Ultrahigh Performance 8 GHz SiGe Power HBT  
Guogong Wang, Hao-Chih Yuan, and Zhengqiang Ma, University of Wisconsin-Madison

TP4-03  **Student**
Reverse Active Operation of 200 GHz SiGe HBTs  
W.-M.L Kuo, Marco Bellini, Aravind Appaswamy, Ramkumar Krithivasan, and John D. Cressler, Georgia Institute of Technology, Greg Freeman, IBM Microelectronics

TP4-04  **Student**
Strained-Si NMOSFETs on Thin 200 nm Virtual Substrates  
Per-Erik Hellström, Jonas Edholm, and Mikael Östling, KTH, Royal Institute of Technology, Sarah Olsen and Anthony O'Neill, University of Newcastle, Klara Lyutovich, Michael Oehme, and Erich Kasper, Universität Stuttgart

TP4-05  **Student**
Calculation of the Electron Mobility in Silicon Inversion Layers: Dependence on Surface Orientation, Channel Direction, and Stress  
I.-J. Yang, C.-Y. Peng, and C. W. Liu, National Taiwan University, S.T. Chang, National Chung Hsing University

* = Nominated for the Best Student Paper Award
TP5: ZnO Material and Devices - 3:45pm - 5:45pm
Chairperson: Agis Iliadis, University of Maryland
Meeting Room: Versailles III & IV

3:45pm - 4:05pm  TP5-01 Student*
Development of High frequency Love Mode Surface Acoustic Wave ZnO/SiO2/Si Devices
Soumya Krishnamoorthy and Agis Iliadis, University of Maryland

4:05pm - 4:25pm  TP5-02
Role of Low O2 Pressure and Growth Temperature on Electrical Transport of PLD Grown ZnO Thin Films on Si Substrates
Ch. Pandis, N. Brilis, and D. Tsamakis, National Technical University of Athens, H. Ali, S. Krishnamoorthy, and A. A. Iliadis, University of Maryland

4:25pm - 4:45pm  TP5-03 Student
Structural and Rectifying Junction Properties of Self-assembled ZnO Nanoparticles in Polystyrene Diblock Copolymers on (100) Si Substrates
H. A. Ali, A. A. Iliadis, and L. J. Martinez-Miranda, University of Maryland, U. Lee, Army Research Labs

4:45pm - 5:05pm  TP5-04
Surface and Interface Analysis of MgxZn1-xO Cubic and Hexagonal Phases by X-Ray Photoelectron and Rutherford Back Scattering Spectroscopies

5:05pm - 5:25pm  TP5-05
Bandgap Engineering of UV-Luminescent Nanomaterials
Leah Bergman, John L. Morrison, Xiang-Bai Chen, Jesse Huso, and Heather Hoeck, University of Idaho, Tsvetanka Zheleva, Army Research Lab

TP6: SOI - 3:45pm - 5:45pm
Chairperson: Marvin White, Lehigh University
Meeting Room: Washington

3:45pm - 4:15pm  TP6-01 Invited
Emerging Reliability Issues of Nano-Scale SOI Technology
Dimitris P. Ioannou, Rahul Mishra, and Dimitris E. Ioannou, George Mason University

4:15pm - 4:35pm  TP6-02
An Experimental Study on the Thermal Stability of Sputtered TiN Gates for Gate-first FinFETs

* = Nominated for the Best Student Paper Award
2005 ISDRS, Bethesda, MD, USA
4:35pm - 4:55pm **TP6-03 Student**
Worst Case Stress Conditions for Hot Carrier Induced Degradation of p-Channel SOI MOSFETs

4:55pm - 5:15pm **TP6-04 Student**
Design Guideline of Multi-Gate MOSFETs Considering Body Effect
_Toshiharu Nagumo and Toshiro Hiramoto, University of Tokyo_

5:15pm - 5:35pm **TP6-05 Student**
N-type Thin-Film Transistors Fabricated on Transferred, Elastically Strain-Shared Si/SiGe/Si Membranes
_Hao-Chih Yuan, Michelle M. Roberts, Donald E. Savage, Max G. Lagally, and Zhenqiang Ma, University of Wisconsin-Madison_

7pm - 10:00pm **Symposium Awards Banquet - Versailles Ballroom**

* = Nominated for the Best Student Paper Award
Friday, December 9, 2005

**FA1: High Frequency and THz Devices - 8am - 9:40am**

*Chairperson: Shayla Sawyer, Rensselaer Polytechnic Institute*

*Meeting Room: Versailles I & II*

8:00am - 8:20am **FA1-01**
An Efficient THz Source with a Tuning Range of 71.1-2830 µm (0.106-4.22 THz) Based on Frequency Mixing in a GaP Crystal
*Yujie J. Ding and Wei Shi, Lehigh University*

8:20am - 8:40am **FA1-02 Student**
CMOS & post CMOS on-chip Microwave Pulse Power Detectors
*Woochul Jeon and John Melngailis, University of Maryland*

8:40am - 9:00am **FA1-03 Student**
Degradation of Characteristics and Critical Bit-Flip Errors in Cascaded 3-Stage CMOS Inverters Due to RF Interference
*K. Kim and A. A. Iliadis, University of Maryland*

9:00am - 9:20am **FA1-04 Student**
Study of Dual-Gate SOI MOSFETs as RF Mixers
*S. Varadharajan and S. Kaya, Ohio University*

9:20am - 9:40am **FA1-05 Student**
Growth, Fabrication, and Characterization of In0.52Al0.48As/In0.53Ga0.47As/InAs0.3P0.7 Composite Channel HEMTs
*Dongmin Liu, Mantu Hudait, Yong Lin, Hyeongnam Kim, Steven A. Ringel, and Wu Lu, The Ohio State University*

**FA2: Novel Devices I - 8am - 9:40am**

*Chairperson: Marc Sherwin, Northrup Grumman Corporation*

*Meeting Room: Versailles III & IV*

8:00am - 8:20am **FA2-01 Student**
The Temperature Dependence in the Subthreshold Regime of Fully Depleted Double-Gate FinFETs
*Raphael K. Sulley, Dr. William F. Clark, and Dr. Edward J. Nowak, IBM Microelectronic Division*

8:20am - 8:40am **FA2-02 Student**
Scaling Rules for Tunnel Field-Effect Transistors
*Krishna K. Bhuwalka, Mathias Born, Markus Schindler, and Ignaz Eisele, Universität der Bundeswehr München*

* = Nominated for the Best Student Paper Award
8:40am - 9:00am  **FA2-03**
Layout and Geometry Tolerances in COSMOS
*A. Al-ahmadi and S. Kaya, Ohio University*

9:00am - 9:20am  **FA2-04 Student***
A Novel High Performance Integrated Phototransistor Photodetector (PTPD) In Standard SiGe BiCMOS Technology
*Klaus Y.J. Hsu, Kuang Sheng Li, Ji-Chen Huang, National Tsing Hua University*

9:20am - 9:40am  **FA2-05**
An Experimental 4RTD Logic Gate
*A. Yamada, H. Yamada, T. Waho, Sophia University and V. Khorenko, T. Do, W. Prost, University of Duisburg-Essen*

9:40am - 10:00am  **FA2-06**
A CMOS Compatible Single Polysilicon Embedded NVM
*J. Bu, C. Parker, H. Prosack, APTD, National Semiconductor Corporation*

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**FA3: Emerging Nanoelectronic Materials and Devices - 8am-10am**

*Chairperson: Stephen Goodnick, Arizona State University*

*Meeting Room: Washington*

8:00am - 8:30am  **FA3-01 Invited**
Real-time Detection of Single-electron Tunneling Current
*Toshimasa Fujisawa, NTT Corp*

8:30am - 9:00am  **FA3-02 Invited**
Magnetic Logic Devices Based on Field-Coupled Nanomagnets
*Alexandra Imre, Lili Ji, Alexei Orlov, Gary H. Bernstein, and Wolfgang Porod, University of Notre Dame and Gyorgy Csaba, Institute for Nanoelectronics*

9:00am - 9:20am  **FA3-03**
Electrical and Structural Characterization of GaN Nanowire Based Devices
*G. Koley and L. Lakshmanan, University of South Carolina, Ho-Young Cha and Huaqiang Yu, Cornell University*

9:20am - 9:40am  **FA3-04**
Performance Enhancement of ZnO Nanowire Field-effect Transistors with Self-Assembled Organic Nanodielectrics
*Sanghyun Ju, Kangho Lee, and David B. Janes, Purdue University, Myung-Han Yoon, Antonio Facchetti, and Tobin J. Marks, Northwestern University*

9:40am - 10:00am  **FA3-05**
A New Approach for Fabricating Horizontally Grown Semiconductor Nanowires (Case of Zinc Oxide)
*Babak Nikoobakht, Mark D. Vaudin, and Stephan J. Stranick, National Institute of Standards and Technology*

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* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
FA4: Device Modeling I - 10:15am - 12:05pm
Chairperson: Neil Goldsman, University of Maryland
Meeting Room: Versailles I & II

10:15am - 10:45am
FA4-01 Invited
Electrical Conduction in Metallic Nanotubes
M. P. Anantram and Hatem Mehrez, NASA Ames Research Center, Alexei Svizhenko, Stanford University

10:45am - 11:05am
FA4-02 Student
An Accurate Model of the C-V Characteristic due to Quantum Mechanical Effects for the Surrounding Gate Transistor
Hideo Haneda, Wataru Sakamoto, Iliya I. Pestic, Hiroki Nakamura, and Fujio Masuoka, Tohoku University, Hiroshi Sakuraba, Miyagi National College of Technology

11:05am - 11:25am
FA4-03 Student
A Fully 2-dimensional Poisson-Schrödinger Modeling of the HEMT: Effects of Short Gate Lengths
G. Krokidis, JP Xanthakis and N. Uzunoglu, National Technical University of Athens

11:25am - 11:45am
FA4-04
I-V Characteristics Modeling and Parameter Extractions for CNT-FETs
Jose M. Marulanda and Ashok Srivastava, Louisiana State University

11:45am - 12:05pm
FA4-05
Full 3D Process and Device Simulation for FinFET Optimization

FA5: Novel Devices II - 10:15am - 12:15pm
Chairperson: Mikael Ostling, KTH - Royal Institute of Technology
Meeting Room: Versailles III & IV

10:15am - 10:35am
FA5-01 Student
Breaking the Theoretical Limit of SiC Unipolar Power Device – A Simulation Study
L.C. Yu and K. Sheng, Rutgers University

10:35am - 10:55am
FA5-02
Study of Leakage-Induced Photon Emission Processes in sub-90 nm CMOS Devices
Yoav Weizman, Arie Margulis, Yefim Fefer, and Ezra Baruch, Freescale Semiconductor Israel Ltd., Moshe Gurfinkel and Yoram Shapiro, Tel-Aviv University

* = Nominated for the Best Student Paper Award
10:55am - 11:15am  **FA5-03**  
Silicide/Si Hetero-Nanocrystal Nonvolatile Flash Memory  
*Jianlin Liu, Dengtao Zhao, and Yan Zhu, University of California, Riverside*

11:15am - 11:35am  **FA5-04 Student**  
A Novel Tri-Control Gate Surrounding Gate Transistor (TCG-SGT) Flash Memory Cell  
*Takuya Ohba, Hiroki Nakamura, and Fujio Masuoka, Tohoku University, Hiroshi Sakuraba, Miyagi National College of Technology*

11:35am - 11:55am  **FA5-05**  
Novel Reconfigurable Semiconductor Photonic Bandgap-MEMS Device  
*Weimin Zhou, David Mackie, Monica Taysing-Lara, Gerard Dang, and Peter G. Newman, U.S. Army Research Laboratory*

11:55am - 12:15pm  **FA5-06 Student**  
On-chip 2-Axis Optical Fiber Actuator using Gray-scale Technology  
*Brian Morgan and Reza Ghodssi, University of Maryland*

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**FA6: Photonics - 10:15am - 12:15pm**  
*Chairperson: Michal Lipson, Cornell University*  
*Meeting Room: Washington*

10:15am - 10:45am  **FA6-01 Invited**  
All-Epitaxial Quantum Dot Microcavities for VCSELs and Single Photon Sources  
*D. G. Deppe, S. Freisem, D. Lu, J. Ahn, D. Gazula, A. Muller and C. K. Shih, The University of Texas at Austin*

10:45am - 11:15am  **FA6-02 Invited**  
Where Nanophotonics and Microfluidics Meet  
*A. Scherer, E. Kartalov, M. Hochberg, T. Baehr-Jones, and G. Wang, Caltech, F. Anderson, University of Southern California, L. Dalton and A. Jen, University of Washington*

11:15am - 11:35am  **FA6-03 Student**  
In-plane Indium Phosphide Tunable Optical Filter using Ridge Waveguides  
*Jonathan McGee, Nathan Siwak, Brian Morgan, and Reza Ghodssi, University of Maryland*

11:35am - 11:55am  **FA6-04 Student**  
Room Temperature Lasing of GaAs Quantum Wire Vertical-cavity Surface-emitting Lasers Grown on (775)B GaAs Substrates by Molecular Beam Epitaxy  
*Y. Higuchi, S. Osaki, T. Kitada, S. Shimomura, and S. Hiyamizu, Osaka University, Y. Takasuka, Shibaura Institute of Technology, K. Komori and M. Ogura, National Institute of Advanced Industrial Science and Technology*

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* = Nominated for the Best Student Paper Award  
2005 ISDRS, Bethesda, MD, USA
11:55am - 12:15pm  **FA6-05**  
Slope Efficiency Versus Cavity Length in Quantum Dot Lasers  
*Levon V. Asryan, Virginia Polytechnic Institute and State University*

12:15pm - 1:15pm  **Lunch (on your own)**

**FP1: Device Modeling II - 1:15pm - 3:15pm**

*Chairperson: Gary Pennington, University of Maryland*

*Meeting Room: Versailles I & II*

1:15pm - 1:35pm  **FP1-01**  
Non-Quasi-Static Modeling of Field Effect Transistors  
*Ibrahim M. Abdel-Motaleb and Gauthami Arikatla, Northern Illinois University*

1:35pm - 1:55pm  **FP1-02 Student**  
An Impulse-Response Based Methodology for Modeling Complex Interconnect Networks  
*Zeynep Dilli, Neil Goldsman, and Akin Akturk, University of Maryland*

1:55pm - 2:15pm  **FP1-03 Student**  
Modeling Voltage-gated KcsA Ion Channels as Solid-State Nanodevices  
*Santosh Pandey, Akwete Bortei-Doku, and Marvin H. White, Lehigh University*

2:15pm - 2:35pm  **FP1-04 Student**  
Reduction of Lasing Thresholds in Circular Photonic Molecule Microdisk Lasers  
*Elena I. Smotrova and Alexander I. Nosich, Institute of Radio-Physics and Electronics NASU, Trevor M. Benson and Phillip Sewell, University of Nottingham*

2:35pm - 2:55pm  **FP1-05 Student**  
Modeling the Temperature Dependence and Optical Response of HgCdTe Diodes  
*A. Akturk and N. Goldsman, University of Maryland, N. Dhar and P.S. Wijewarnasuriya, U.S Army Research Laboratory*

2:55pm - 3:15pm  **FP1-06 Student**  
Three Region Hetero-Material Gate Oxide Stack (TMGOS) Epi-MOSFET: A New Device Structure for Reduced Short Channel Effects  
*Kirti Goel, Manoj Saxena, Dr. Mridula Gupta, and Professor R.S. Gupta, University of Delhi South Campus*

* = Nominated for the Best Student Paper Award
FP2: Advanced Processing and Characterization I - 1:15pm - 3:25pm  
Chairperson: Phillip Thompson, NRL  
Meeting Room: Versailles III & IV

1:15pm - 1:35pm  
**FP2-01**  
Network Analyzer Measurements and Physically Based Analysis of Amplitude and Phase Distortion in SiGeC HBTs  
B. Gunnar Malm and Mikael Östling, KTH, Royal Institute of Technology

1:35pm - 1:55pm  
**FP2-02**  
Controlled Selective Epitaxy for 3-D LSI  
X.X. Zhang, H.S. Cho, W.X. Xianyu, H.X. Yin, and T. Noguchi, Samsung Advanced Institute of Technology (SAIT)

1:55pm - 2:15pm  
**FP2-03 Student**  
Selective Epitaxial Growth of Boron Doped SiGe-structures with LPCVD  
Markus Schindler, Tanja Stimpel-Linder, and Ignaz Eisele, University of the German Federal Armed Forces Munich, William Taylor, Freescale Advanced Products R&D Labs - Austin, TX

2:15pm - 2:35pm  
**FP2-04**  
Process Integration, Characterization, Modeling and Reliability of a 10K Poly Resistor for Low Power Mixed Signal VLSI Applications  
Muhammad Anser and Jagdish Prasad, AMI Semiconductor

2:35pm - 2:55pm  
**FP2-05**  
New Excimer Laser Annealing Process for Single-Crystal 3-D Stacked Thin-Film Transistors  
Wenxu Xianyu, Huaxiang Yin, Hans S. Cho, Xiaoxin Zhang, and Takashi Noguchi, Samsung Advanced Institute of Technology

2:55pm - 3:15pm  
**FP2-06 Student**  
Novel Schottky Barrier Strained Germanium PMOS  

FP3: Optoelectronics and LED Lighting - 1:15pm - 3:15pm  
Chairperson: Fred Schubert, Rensselaer Polytechnic Institute  
Meeting Room: Washington

1:15pm - 1:45pm  
**FP3-01 Invited**  
High Power InGaN LEDs and Applications  
Michael R. Krames, Lumileds Lighting

1:45pm - 2:15pm  
**FP3-02 Invited**  
Development of Deep UV LEDs and LED Based Lamps  
Thomas M. Katona, Jianping Zhang, Xuhong Hu, Jianyu Deng, Alex Lunev, Yuri Bilenko, and Remis Gaska, Sensor Electronic Technology Inc., Asif Khan, University of South Carolina

* = Nominated for the Best Student Paper Award  
2005 ISDRS, Bethesda, MD, USA
2:15pm - 2:35pm  **FP3-03 Student**
Optical and Current Noise of GaN-based Light Emitting Diodes

2:35pm - 2:55pm  **FP3-04 Student**
High-power Packages for Phosphor-based White-light-emmitting Diode Lamps
Hong Luo, Jong Kyu Kim, Yangang Xi, and E. Fred Schubert, Rensselaer Polytechnic Institute, Jaehee Cho, Cheolsoo Sone, and Yongjo Park, Samsung Advanced Institute of Technology

2:55pm - 3:15pm  **FP3-05 Student**
Colloidal Quantum Dot Active Layers for Light Emitting Diodes

3:15pm - 3:30pm  **Coffee Break - Versailles Foyer**

**FP4: Device Modeling III - 3:30pm - 5:30pm**
*Chairperson: M.P. Anantram, NASA*
*Meeting Room: Versailles I & II*

3:30pm - 3:50pm  **FP4-01**
One-Dimensional Sub-Threshold Model for Symmetric Double-Gate MOSFETs
S. Qureshi and Gaurav Chhabra, Indian Institute of Technology

3:50pm - 4:10pm  **FP4-02 Student**
Analytical Modeling of Short-Channel Multi-Gate SOI MOSFETs with Special Emphasis on the Partially-Depleted and Fully-Depleted Surrounding Gate Transistor
Iliya Pesic, Hiroki Nakamura, Hideo Haneda, Hiroaki Yamazaki, and Fujio Masuoka, Tohoku University, Hiroshi Sakuraba, Miyagi National College of Technology

4:10pm - 4:30pm  **FP4-03 Student**
An Efficient Inclusion of Self-Heating and Quantum Effects in SOI Device Simulations
A. Akturk and N. Goldsman, University of Maryland, G. Metze, Laboratory for Physical Sciences

4:30pm - 4:50pm  **FP4-04 Student**
Novel Flash Memory Cell with a Γ Channel Mutli-Gate Transistor

* = Nominated for the Best Student Paper Award

2005 ISDRS, Bethesda, MD, USA
4:50pm - 5:10pm  **FP4-05 Student**
Effects of Channel Doping Profile on Electrical Characteristics of Impact Ionization MOS
Sang Joon Hwang, Jee-Young Yoon, Ey Goo Kang, and Man Young Sung, Korea University

5:10pm - 5:30pm  **FP4-06**
Investigation of Gate Tunnelling Leakage Current in a Novel Fully Depleted SOI MOSFET with a Thin Oxide
Ehsanollah Fathi, Yousof Mortazavi, and Morteza Fathipour, University of Tehran, Farzan Farbiz, University of Illinois at Urbana-Champaign

**FP5: Advanced Processing and Characterization II - 3:30pm - 5:30pm**
Chairperson: Martin Peckerar, University of Maryland
Meeting Room: Versailles III & IV

3:30pm - 3:50pm  **FP5-01 Student***
Impact of Source/Drain Si1-yCy Stressors on the Strained Si NMOSFETs
Jacky Huang and S.T. Chang, National Chung Hsing University

3:50pm - 4:10pm  **FP5-02**
Impurity Induced Voiding in Copper Interconnects
M. Kovler, M. Buchbinder, and H. Cohen, Tower Semiconductor Ltd., E. Rabkin, Technion-Israel Institute of Technology, Y. Estrin, Clausthal University of Technology

4:10pm - 4:30pm  **FP5-03**
Impact of Epitaxial NiSi2 Source/Drain on Short Channel Effect and Line Edge Roughness in Extremely Scaled MOSFETs

4:30pm - 4:50pm  **FP5-04**
Improved Electrical Characteristics and Retention Time of DRAMs Using HSG-merged-AHO Cylinder Capacitor

4:50pm - 5:10pm  **FP5-05**
Electrical Characteristic Enhancement of HfTaSiON-Gated Metal-Oxide-Semiconductor Devices Using HfON Buffer Layer
Chin-Lung Cheng, National Formosa University, Kuei-Shu Chang-Liao, Hsin-Chun Chang and Tien-Ko Wang, National Tsing Hua University

5:10pm - 5:30pm  **FP5-06 Student**
Work Function Tuning Via Ultra Thin Charged Reaction Layers Using AlTa and AlTaN Alloys
Bei Chen, Rashmi Jha and Veena Misra, North Carolina State University

* = Nominated for the Best Student Paper Award
2005 ISDRS, Bethesda, MD, USA
FP6: Flexible Electronics -3:30pm - 5:20pm

Chairperson: Steve Kilpatrick, ARL
Meeting Room: Washington

3:30pm - 4:00pm  FP6-01 Invited
Polysilicon TFT Technology on Metal Foils for Large Area Flexible Electronics

4:00pm - 4:30pm  FP6-02 Invited
The Short and Long Channel Pick-up Stick Transistors: A Promising Technology for Micro- and Macro-Electronics
M.A. Alam, N. Pimparkar, S. Kumar, and J. Murthy, Purdue University

4:30pm - 5:00pm  FP6-03 Invited
Advanced Laser Crystallization of Si Films for High Performance Thin Film Transistors
James Im, Columbia University

5:00pm - 5:20pm  FP6-04 Student*
High Performance TFT Circuits for On-Board Display Driving on Flexible Stainless Steel Foils
Matias Troccoli, Abbas Jamshidi, Ta-Ko Chuang, and Miltiadis K. Hatalis, Lehigh University

* = Nominated for the Best Student Paper Award