

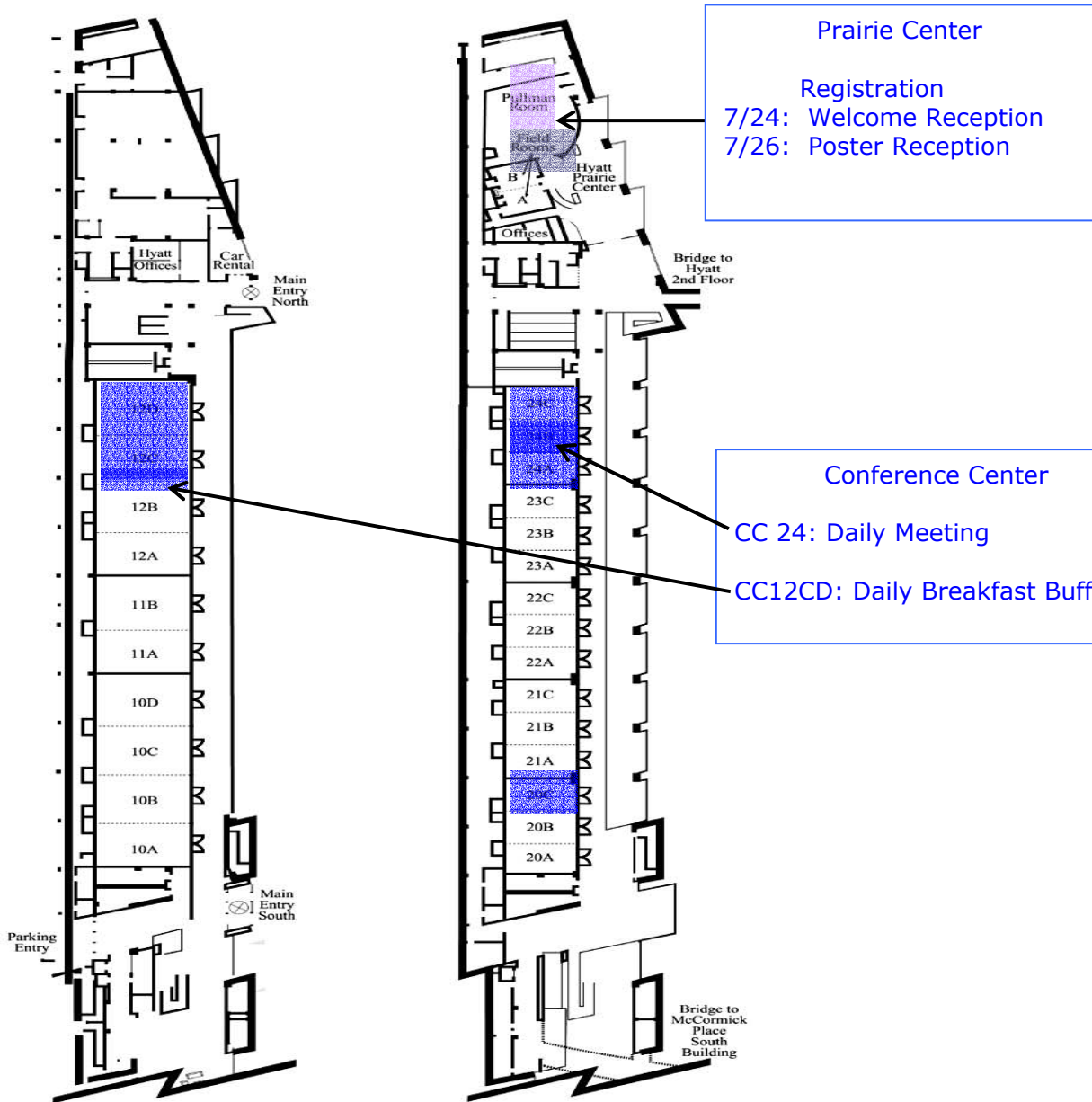


14th International Conference on
Nonequilibrium
Carrier Dynamics in Semiconductors
(HCIS 14)

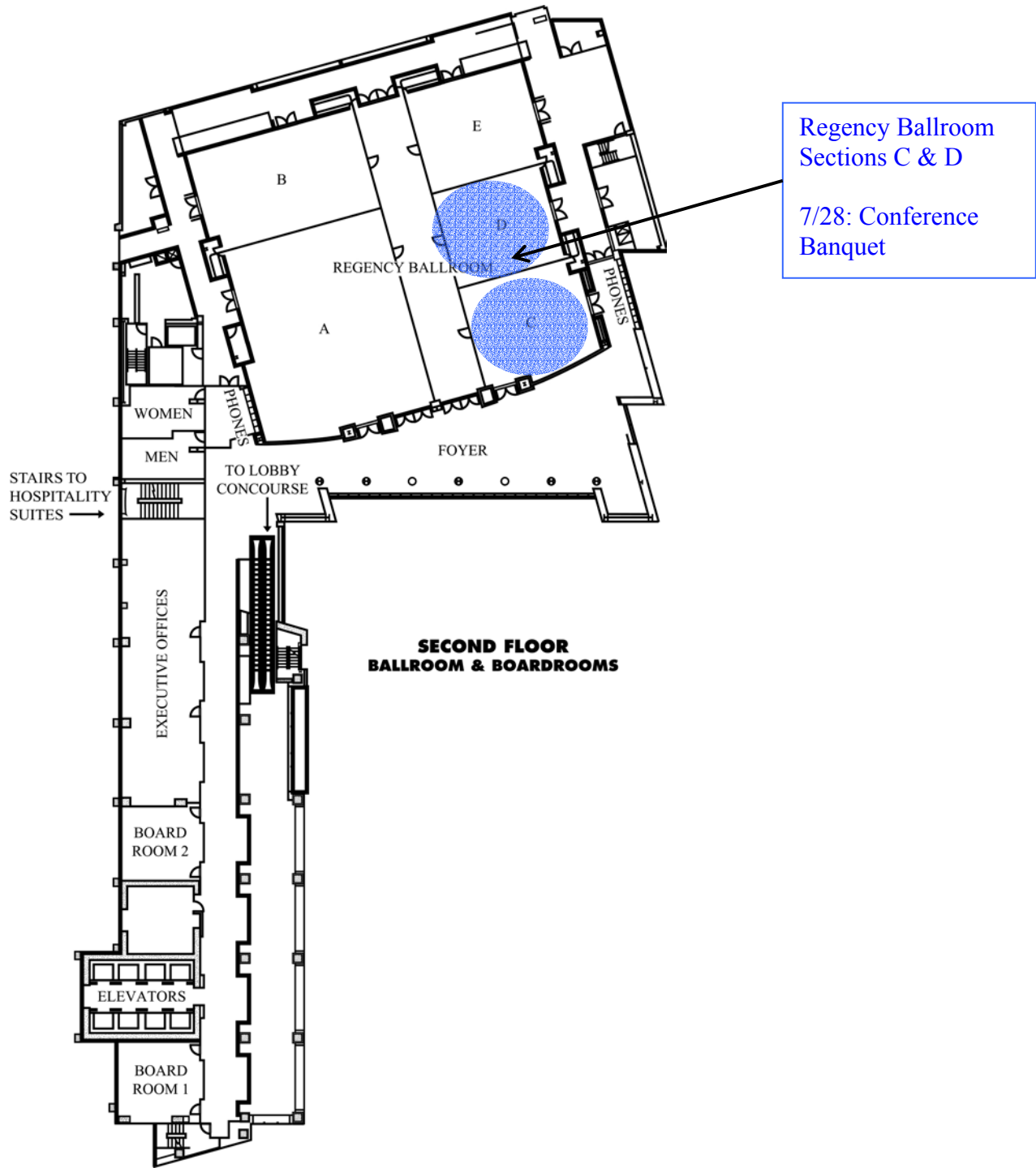
PROGRAM

Chicago, July 24-29, 2005

Hyatt Regency Conference Center
HCIS 14



Hyatt Regency McCormick Place
HCIS 14 Banquet



Sunday Evening, 24 July 2005

6:00p - 9:00p **Registration** Prairie Center
7:00p - 9:00p **Welcoming Reception** Prairie Center Lobby

Monday, 25 July through Friday, 29 July

7:30p - 8:30p **Breakfast** Conference Center, Room CC12 CD

Monday Morning, 25 July 2005

Conference Center, Room CC24

8:30a - 8:40a **Welcome and Opening Remarks**

Mesoscopic Systems – Chair: Laurence Eaves

8:40a - 9:20a **INVITED: Crossover from ‘mesoscopic’ to ‘universal’ phase for electron transmission in quantum dots**, M. Heiblum, *Weizmann Institute, Israel*
MO 1-1

9:20a - 9:40a **Electron Transport in Curved Low-Dimensional Electron Systems**, N. Shaji¹, H. Qin¹, R.C. Toonen¹, I. Knezevic¹, R.H. Blick¹, C. Deneke² and O.G. Schmidt², ¹*Laboratory for Molecular-Scale Engineering, Dept. of Electrical and Computer Engineering, University of Wisconsin-Madison, USA*, ²*Max-Planck-Institut für Festkörperforschung, Stuttgart, Germany*
MO 1-2

9:40a - 10:00a **Fabrication and Characterization of InAs Mesoscopic Devices**, M. Koyama, M. Furukawa, H. Ishii, M. Nakai, T. Maemoto, S. Sasa, and M. Inoue, *New Materials Research Center, Osaka Institute of Technology, Japan*
MO 1-3

10:00a - 10:20a **Nonlinear Conductance Characteristics in Electron Billiards**, C.A. Marlow¹, R.P. Taylor¹, M. Fairbanks¹, I. Shorubalko² and H. Linke¹, ¹*Materials Science Institute, Physics Dept., University of Oregon, USA*, ²*Nanometer Consortium, Solid State Physics, Lund University, Sweden*
MO 1-4

10:20a - 10:40a **Coffee Break**

Entanglement and Decoherence – Chair: Peter Vogl

10:40a - 11:00a **Prediction of Entanglement Detection by I-V Characteristics**, Tobias Zibold¹, Peter Vogl¹, Andrea Bertoni², ¹*Walter Schottky Institute, Technische Universität München, Germany*, ²*INFM-S3 Research Center, Modena, Italy*
MO 2-1

11:00a - 11:20a **Simulation of Entanglement Creation for Carrier-Impurity Scattering in a 2D System**, P. Bordone and A. Bertoni, *INFM-S3 Research Center, Modena, Italy and Dipartimento di Fisica, Università di Modena e Reggio Emilia, Italy*
MO 2-2

11:20a - 11:40a **Decoherence-Free Dynamics in Semiconductor Nanostructures**, I. Knezevic¹, and D.K. Ferry², ¹*Dept. of Electrical and Computer Engineering, University of Wisconsin – Madison, USA*, ²*Dept. of Electrical Engineering, Arizona State University, USA*
MO 2-3

11:40a - 12:00p **Counting Statistics of Tunneling Through Coupled Quantum Dots**, G. Kießlich¹, P. Samuelsson², A. Wacker, and E. Schöll¹, ¹*Institut für Theoretische Physik, Technische Universität Berlin, Germany*, ²*Dept. of Physics, University of Lund, Sweden*
MO 2-4

12:00p - 1:40p **Lunch Break**

Optical Phenomena in Mesoscopic Structures – Chair: Tilmann Kuhn

- 1:40p - 2:00p
MO 3-1 **Ultrafast Formation of Coupled Phonon-Plasmon Modes in InP Observed with Femtosecond Terahertz Spectroscopy**, C. Kübler¹, R. Huber², S. Tübel², F. Köhler³, M.-C. Amann³, and A. Leitenstorfer¹, ¹Fachbereich Physik, Universität Konstanz, Germany, ²Physik-Dept. E11, Technische Universität München, Germany, ³Walter-Schottky-Institut (E26), Technische Universität München, Germany
- 2:00p - 2:20p
MO 3-2 **Optical Coherent Control of Polariton Modes in ZnSe Single-Quantum Wells**, I. Kudyk, L. Wishchmeier, T. Voss, I. R"uckmann, and J. Gutowski, *Institute of Solid State Physics, University of Bremen, Germany*
- 2:20p - 2:40p
MO 3-3 **Optical Properties of Coupled Quantum Disk-Waveguide Structure**, M. Yamaguchi, H. Tanaka, M. Yokoi, H. Takagi, and N. Sawaki, *Dept. of Electrical Engineering and Computer Science, Nagoya University, Japan*
- 2:40p - 3:00p
MO 3-4 **Picosecond Spin-Preserving Carrier Capture in InGaAs/GaAs Quantum Dots**, S. Trumm¹, M. Wesseli¹, H. Krenner², D. Schuh², M. Bichler², J.J. Finley² and M. Betz¹, ¹Physik-Dept. E11, Technische Universität München, D-85747 Garching, Germany ²Walter-Schottky-Institut and Physik-Dept. E24, TU München, D-85748 Garching
- 3:00p - 3:20p **Coffee Break**

Coherence and Decoherence – Chair: Vladimir Mitin

- 3:20p - 3:40p
MO 4-1 **Influence of Surfaces on the Pure Dephasing of Quantum Dots**, T. Kuhn, B. Krummheuer, and V.M. Axt, *Institut für Festkörpertheorie, Westfälische Wilhelms-Universität Münster, Wilhelm-Klemm-Str. 10, D-48149 Münster, Germany*
- 3:40p - 4:00p
MO 4-2 **Exploiting the Non-Markovian Nature of Carrier-Phonon Dynamics: Multi-Pulse Control of Decoherence in Quantum Dots**, P. Machnikowski¹, V.M. Axt², T. Kuhn², and L. Jacak¹, ¹Institute of Physics, Wroclaw University of Technology, Poland, ²Institut für Festkörpertheorie, Westfälische Wilhelms-Universität, Münster, Germany
- 4:00p - 4:20p
MO 4-3 **Numerical Study of Weak Localization Effects in Disordered Cavities**, L. Bonci, M. Macucci, G. Iannaccone, M.G. Pala, *Dipartimento di Ingegneria dell'Informazione, Università di Pisa, Italy*
- 4:20p - 4:40p
MO 4-4 **Carrier Scattering Via Optical Phonons and Two-phonon Processes in Photon Absorption in Würtzite Crystals**, M. Dutta^{1,2} and M.A. Stroscio^{1,2,3}, G.J. Brown⁴, J. Yang¹, Chen Chen¹, ¹Departments of Electrical & Computer Engineering, ²Physics, ³Bioengineering, University of Illinois at Chicago, USA, ⁴Air Force Research Laboratory, Wright Patterson Air Force Base, USA

Terahertz Devices I – Chair: Carlo Jacoboni

- 8:40a - 9:20a
TU 1-1 **INVITED: Terahertz Nanotransistors**, Wojciech Knap, *Université Montpellier II, France*
- 9:20a - 9:40a
TU 1-2 **High-Intensity THz Radiation From a Large-Aperture Photoconductive Emitter**, S. Winner¹, A. Dreyhaupt¹, M. Krenz¹, D. Stehr¹, T. Dekorsy², and M. Helm¹, ¹*Institute of Ion Beam Physics and Materials Research, Forschungszentrum Rossendorf, Dresden, Germany*, ²*University Konstanz, Physics Dept., Konstanz, Germany*
- 9:40a - 10:00a
TU 1-3 **Broadband Terahertz Emission From Ion-Implanted Semiconductors**, J. Lloyd-Hughes¹, E. Castro-Camus¹, M. Fraser², C. Jagadish², and M.B. Johnston¹, ¹*Clarendon Laboratory, University of Oxford, United Kingdom*, ²*Dept. of Electronic Materials Engineering, Institute of Advanced Studies, Australian National University, Canberra ACT 0200, Australia*
- 10:00a-10:20a
TU 1-4 **THz Collective Real-Space Oscillations of Ballistic Electrons in Wide Parabolic Potential Wells: an Exotic Transport Regime**, M. Betz¹, S. Trumm¹, M. Eckardt², A. Schwanhäuber², S. Malzer², F. Sotier³, A. Leitenstorfer³, T. Müller⁴, K. Unterrainer⁴, and G. H. Döhler², ¹*Physik-Dept. E11, Technische Universität München, Germany*, ²*Institut für technische Physik, Universität Erlangen, Germany*, ³*Fachbereich Physik, Universität Konstanz, Germany*, ⁴*Institut für Festkörperelektronik, TU Wien, Austria*
- 10:20a - 10:40a **Coffee Break**

Terahertz Devices II – Chair: Nobuhiko Sawaki

- 10:40a - 11:20a
TU 2-1 **INVITED: Dispersive Terahertz Bloch Gain in Semiconductor Superlattices**, Kaz Hirakawa, *University of Tokyo, Japan*
- 11:20a - 11:40a
TU 2-2 **Effect of Injector Doping on Non-Equilibrium Electron Dynamics in Mid-Infrared GaAs/AlGaAs Quantum Cascade Lasers**, V.D. Jovanovic¹, D. Indjin¹, N. Vukmirovic¹, Z. Ikonc¹, P. Harrison¹, E.H. Linfield¹, H. Page², X. Marcadet², and C. Sirtori², C. Worall³, H.E. Beere³ and D.A. Ritchie³, ¹*School of Electronic and Electrical Engineering, University of Leeds, United Kingdom*, ²*Thales Research and Technology, Domaine de Corbeville, Orsay, France*, ³*Cavendish Laboratory, University of Cambridge, United Kingdom*
- 11:40a - 12:00p
TU 2-3 **Experimental Investigation of Hot Carriers in THz and Mid-IR Quantum Cascade Lasers**, G. Scamarcio¹, V. Spagnolo², M. S. Vitiello¹, C. Di Franco¹, B.S. Williams³, S. Kumar³, Q. Hu³, H. Page⁴, C. Sirtori⁴, and J.L. Reno⁵, *INFM Regional Laboratory LIT³ and Dipartimento Interateneo di Fisica "M. Merlin", Università degli Studi di Bari¹ and Politecnico di Bari², Italy*, ³*Dept. of Electrical Engineering and Computer Science and Research Laboratory of Electronics, Massachusetts Institute of Technology, USA*, ⁴*Thales Research and Technology, 91404 Orsay Cedex, France*, ⁵*Sandia National Laboratories, Albuquerque, New Mexico*
- 12:00p - 1:40p **Lunch Break**

Terahertz Devices III – Chair: Juergen Smoliner

- 1:40p - 2:00p
TU 3-1 **Quantum-Dot-Array Based Terahertz Detectors** N. Kabir¹, A. Sergeev¹, V. Mitin^{1,2}, A. Markelz^{1,2} and J. Bird^{1,2}, ¹*Electrical Engineering Dept., SUNY Buffalo, USA*, ²*Physics Dept., SUNY Buffalo, USA*
- 2:00p - 2:20p
TU 3-2 **Time and Spectrally Resolved THz Photoconductivity in Quantum Hall Devices**, C. Stellmach¹, Y.B. Vasilyev², R. Bonk¹, A. Hirsch¹, N.G. Kalugin³, G. Hein⁴ and G. Nachtwei¹, ¹*Institut für Angewandte Physik, TU Braunschweig, Germany*, ²*Ioffe Physicotechnical Institute, Russian Academy of Sciences, St. Petersburg, Russia*, ³*Dept. of Physics, Texas A&M University USA*, ⁴*Physikalisch-Technische Bundesanstalt, Braunschweig, Germany*
- 2:20p - 2:40p
TU 3-3 **Transport Properties, Current Oscillations and Terahertz Emission in Narrow Minigap GaAs/GaAlAs Superlattices**, A.A. Andronov¹, E.P. Dodin¹, M.N. Drozdov¹, Y.N. Nozdrin¹, A. Sosnin¹, A. Ustinov¹, V.I. Shashkin¹, D.I. Zinchenko¹, A.A. Marmalyuk², A.A. Padalitsa², A.V. Andrianov³, and A.O. Zakhxar`in³, ¹*Institute for Physics of Microstructures, RAS, Nizhny Novgorod GSP-105 603600, Russia*, ²*SIGM plus, Moscow, Russia*, ³*Ioffe Institute, RAS, S.Petersburg, Russia*
- 2:40p - 3:00p
TU 3-4 **Investigation of Antenna-Coupled MOM Diodes for Infrared Sensor Applications**, B. Rakos, H. Yang, J.A. Bean, G.H. Bernstein, P. Fay, and W. Porod, *Center for Nano Science and Technology, Dept. of Electrical Engineering, University of Notre Dame, USA*
- 3:00p - 3:20p **Coffee Break**

Transport in Nanotransistors – Chair: John Barker

- 3:20p - 3:40p
TU 4-1 **Transport and Noise in Ultrafast Unipolar Nanodiodes and Nanotransistors**, T. González¹, A.M. Song², B.G. Vasallo¹, D. Pardo¹, and J. Mateos¹, ¹*Departamento de Física Aplicada, Universidad de Salamanca, Spain*, ²*Dept. of Electrical Eng. and Electronics, University of Manchester, UK*
- 3:40p - 4:00p
TU 4-2 **Monte Carlo Study of Coupled SO Phonon-Plasmon Scattering in Si MOSFETs with High K- Dielectric Gate Stacks: Hot Electron Effects and Influence of Disorder**, J.R. Barker¹, J. Watling¹, A. Asenov¹, S. Roy¹, P. Zeitsoff² and G. Bersuker², ¹*Dept. of Electronics and Electrical Engineering, University of Glasgow, UK*, ²*Sematech, Austin, Texas, USA*
- 4:00p - 4:20p
TU 4-3 **Implementation of Separable Scattering Mechanisms in Three-Dimensional Quantum Mechanical Simulations of Devices**, M.J. Gilbert, R. Akis and D.K. Ferry, *Dept. of Electrical Engineering and Center for Solid State Electronics Research, Arizona State University, USA*
- 4:20p - 4:40p
TU 4-4 **A 2D-NEGF Quantum Transport Study of Unintentional Charges in a Double Gate Nanotransistor**, A. Martinez¹, J. R. Barker¹, A. Svizhenko², M.P. Anantram² and A. Asenov¹, ¹*Dept of Electronics & Electrical Engineering, University of Glasgow, UK*, ²*NASA Ames Research Center, USA*
- 4:40p - 5:00p
TU 4-5 **Self-Consistent Quantum Mechanical Treatment of the Ballistic Transport in FinFET Devices Using CBR Method**, H. Khan, D. Mamaluy, and D. Vasileska, *Dept. of Electrical Engineering, Arizona State University USA*
- 5:00p - 5:20p
TU 4-6 **Wigner Function RTD Simulations with Dilute Magnetic Semiconductor Barriers**, H.L. Grubin, *University of Hartford, 200 Bloomfield Avenue, West Hartford, CT 06117*
- 5:30p - 8:00p **POSTER SESSION AND RECEPTION** Prairie Center

High Field Transport in Nitrides I – Chair: David Ferry

- 8:40a – 9:20a
WE 1-1 **INVITED: High Field Transport in GaN and AlGaIn/GaN Heterojunction Field Effect Transistors**, Steve Goodnick, *Arizona State University, USA*
- 9:20a – 9:40a
WE 1-2 **Dilute Ga(AsN) Alloys: A New Material for Hot Electron Devices**, A. Patane¹, L. Eaves¹, J. Endicott¹, D. Fowler¹, A. Ignatov¹, D.K. Maude², M. Hopkinson³, G. Hill³, L. Geelhaar⁴ and H. Riechert⁴, ¹*School of Physics and Astronomy, University of Nottingham, UK*, ²*Grenoble High Magnetic Field Laboratory, MPI-CNRS, Grenoble, France*, ³*Dept. of Electronic and Electrical Engineering, University of Sheffield, UK*, ⁴*Infineon Technologies, Corporate Research Photonics, Munich, Germany*
- 9:40a - 10:00a
WE 1-3 **Impact Ionization and High- Field Electron Transport in GaAs, GaN, and ZnS**, A. Kuligk, N. Fitzer, and R. Redmer, *Universität Rostock, Institut für Physik, Rostock, Germany*
- 10:00a - 10:20a
WE 1-4 **Photoluminescence Study of Electric-Field-Induced Hot Carriers in a n-GaN MESFET**, K. Wang, J. Simon, N. Goel, and D. Jena, *Electrical Engineering Dept., University of Notre Dame, USA*
- 10:20a - 10:40a **Coffee Break**

High Field Transport in Nitrides II – Chair: Debdeep Jena

- 10:40a - 11:00a
WE 2-1 **Studies of High Field Transport and Non-Equilibrium LO Phonons in a High-Quality InN Film Grown on GaN by Ultrafast Raman Spectroscopy**, K.T. Tsen¹, D.K. Ferry², H. Lu³, and W.J. Schaff³, *Dept.s of ¹Physics and Astronomy, ²Electrical Engineering and Center for Solid State Electronics Research, Arizona State University, USA, ³Dept. of Electrical and Computer Engineering, Cornell University, USA*
- 11:00a - 11:20a
WE 2-2 **Monte Carlo Investigation of Dynamic Transport in Nitrides**, L. Reggiani¹, P. Shiktorov², E. Starikov², V. Gruzinskis², L. Varani³, J.C. Vaissière³, ¹*INFM - National Nanotechnology Laboratory, Dipartimento di Ingegneria dell' Innovazione, Università di Lecce, Italy*, ²*Semiconductor Physics Institute, Vilnius, Lithuania*, ³*CEM2 - Centre d'Electronique et de Micro-optoélectronique de Montpellier (CNRS UMR 5507), Université Montpellier II, France*
- 11:20a - 11:40a
WE 2-3 **High-Field Transport in Nitride Channels: A Hot-Phonon Bottleneck**, A. Matulionis, *Semiconductor Physics Institute, Vilnius, Lithuania*
- 11:40a - 12:00a
WE 2-4 **Determining Electron Velocity in GaN-based HEMTs**, T. Palacios and U.K. Mishra, *Electrical and Computer Engineering Department, University of California at Santa Barbara, USA.*

Spintronics – Chair: Lino Reggiani

- 8:40a – 9:00a
TH 1-1 **Injection of a Ballistic Pure Spin Current in a GaAs Quantum Well by Single-Color, Linearly-Polarized Light**, A.L. Smirl¹, H. Zhao¹, X. Pan¹, R.D.R. Bhat², A. Najmaie², J.E. Sipe², and H.M. van Driel², ¹Laboratory for Photonics & Quantum Electronics, University of Iowa, USA, ²Dept. of Physics, University of Toronto, Canada
- 9:00a – 9:20a
TH 1-2 **Charge and Spin Currents Induced in GaAs Quantum Wells Single Optical Beam**, M. Bieler¹, N. Laman¹, H.M. van Driel¹, A.L. Smirl², ¹Dept. of Physics, University of Toronto, Canada, ²Laboratory for Photonics and Quantum Electronics, University of Iowa, USA
- 9:20a – 9:40a
TH 1-3 **All-Optical AC Spin Currents Due to Excitonic Quantum Interference in Semiconductors**, I. Romyantsev, J.E. Sipe, Dept. of Physics, University of Toronto, Canada
- 9:40a - 10:00a
TH 1-4 **Quantum Transport and Spin Polarization in Strongly Biased Semiconductor Superlattices with Rashba Spin-Orbit Coupling**, P. Kleinert¹ and V.V. Bryksin², ¹Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany, ²Physical-Technical-Institute, Politeknicheskaya 26, St. Petersburg, Russia
- 10:00a - 10:20a
TH 1-5 **Temperature Dependent Ballistic Electron Transport in Spin Valve Transistors**, R.Heer¹, J.Smoliner², J.Bornemeier³, H.Brückl¹, ¹ARCS - Nano-Systemtechnologien, Wien, Austria ²Institut für Festkörperelektronik, TU-Wien, Austria ³Universität Bielefeld, Dept. of Thin Films and Nanostructures, Bielefeld, Germany
- 10:20a - 10:40a **Coffee Break**

Quantum Transport – Chair: Henry van Driel

- 10:40a - 11:00a
TH 2-1 **Spin Filtering Effects in Quantum Point Contacts**, R. Akis and D. K. Ferry, Center for Solid State Electronics Research and Dept. of Electrical Engineering, Arizona State University, Tempe AZ 85287-5706, USA
- 11:00a - 11:20a
TH 2-2 **Exchange Effects in the Wigner Function Approach**, E. Cancellieri, P.Bordone, and C. Jacoboni, S3 Research Center, INFM, Dipartimento di Fisica dell'Università di Modena e Reggio Emilia, Modena, Italy
- 11:20a - 11:40a
TH 2-3 **Few-Particle Quantum Transmitting Boundary Method**, A. Bertoni¹ and G. Goldoni^{1,2}, ¹INFM-S3 Research Center, Modena, Italy, ²Dipartimento di Fisica, Università di Modena e Reggio Emilia, Modena, Italy
- 11:40a - 12:00p
TH 2-4 **The R- Σ Approach to Tunneling in Nanoscale Devices**, M. Rudan¹, R. Brunetti², S. Reggiani¹, E. Gnani¹, ¹"E. De Castro" Adv. Res. C. on Electronic Systems, and Dept. of Electronics, Computer Science and Systems, University of Bologna, Italy, ²Dept. of Physics and S3, University of Modena, Italy

Thermoelectric Nanodevices – Chair: Paolo Lugli

- 1:40p – 2:00p
TH 3-1 **High Efficiency Thermoelectric Nanodevices: Combining Two Sources of Nonequilibrium to Obtain Electronic Equilibrium**, T.E. Humphrey¹ and H. Linke², ¹*School of Physics, University of New South Wales, Australia*, ²*Materials Science Institute and Physics Dept., University of Oregon, USA*
- 2:00p – 2:20p
TH 3-2 **Monte Carlo Simulation of Solid-State Thermionic Energy Conversion Devices Based on Nonplanar Heterostructure Interfaces**, Z. Bian, A. Shakouri, *Electrical Engineering Dept., University of California, Santa Cruz, USA*
- 2:20p – 3:00p
TH 3-3 **INVITED: Atomistic Simulation of Transport in Organic Nanostructures**, Aldo Di Carlo, *Università di Roma Tor Vergata, Italy*
- 3:00p - 3:20p **Coffee Break**

Molecular Electronics – Chair: Mitra Dutta

- 3:20p - 3:40p
TH 4-1 **Simulations of Inelastic Tunnelling in Molecular Bridges**, A. Pecchia¹, A. Di Carlo¹, A. Gagliardi², T. Frauenheim², G.C. Solomon³, J.R. Reimers³, N.S. Hush⁴, ¹*Dipartimento di Ingegneria, Università di Roma Tor Vergata, Italy*, ²*Dept. of Theoretical Physics, University of Paderborn, Germany*, ³*School of Chemistry, The University of Sydney, Australia*, ⁴*School of Molecular and Microbial Biosciences, The University of Sydney, Australia*
- 3:40p - 4:00p
TH 4-2 **Conductance Modulation of Carbon Nanotubes by Remote Charges**, S. Barraza-Lopez¹, S.V. Rotkin², Y. Li¹ and K. Hess¹, ¹*Dept. of Physics and Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, USA*, ²*Physics Dept., Lehigh University, USA*
- 4:00p - 4:20p
TH 4-3 **Phonon Bottleneck in Nanotubes: Scattering Rates**, A. Raichura¹, M. Dutta^{1,2}, M.A. Strosio^{1,3,2}, *Dept.s of* ¹*Electrical and Computer Engineering*, ²*Physics*, and ³*Bioengineering, University of Illinois at Chicago, USA*
- 4:20p - 4:40p
TH 4-4 **Carbon Nanotubes Films for Sensing Applications: From Piezoresistive Sensor to Gas Sensing**, M. Lucci¹, P. Regoliosi¹, F. Brunetti¹, A. Reale¹, A. Di Carlo¹, E. Tamburri², A. Fiori², S. Orlanducci², M. L. Terranova², P. Lugli³, ¹*MINASlab and Dept. of El. Eng., U. Rome Tor Vergata*, ²*MINASlab, Dept. Chem. Sc.Tech, U.Rome Tor Vergata*, ³*Lehrstuhl für Nanoelektronik, TU München*
- 4:40p – 5:00p
TH 4-5 **Electro-Thermal Transport in SOI and Carbon Nanotubes**, E. Pop, K. Goodson and H. Dai, *Stanford University, USA*
- 7:30p – 9:30p **Conference Banquet** Regency Ballroom CD, 2nd floor

Bioelectronics I – Chair: Marco Saraniti

- 8:40a-9:00a
FR 1-1 **Electrical Bioengineering on the Nanoscale: How Biological Ion Conductors Finesse Maxwell's Demon and Other Engineering Tales from the World of Biological Membrane Transport**, E. Jakobsson, *University of Illinois at Urbana-Champaign, Beckman Institute for Advanced Science and Technology, USA*
- 9:00a-9:20a
FR 1-2 **Silicon-Based Ion Channel Platforms**, S. Wilk¹, L. Petrossian¹, M. Goryll¹, J.M. Tang², R.S. Eisenberg², M. Saraniti³, S.M. Goodnick¹, T.J. Thornton¹, ¹*Arizona State University, Center for Solid State Electronics Research, Tempe, AZ 85287*, ²*Rush Medical College, Dept. of Molecular Biophysics and Physiology, Chicago, IL 60612*, ³*Illinois Institute of Technology, Dept. of Electrical and Computer Engineering, Chicago, IL 60616 USA*
- 9:20a-9:40a
FR 1-3 **Implicit Water Simulation of Non-Equilibrium Charge Transport in Ionic Channels**, U. Ravaioli, T.A. van der Straaten, G.A. Kathawala, *Beckman Institute, University of Illinois, USA*
- 9:40a-10:00a
FR 1-4 **An Investigation of the Dependence of Ionic Conduction on the Dielectric Properties of Porin**, S. Aboud¹, D. Marreiro² and M. Saraniti², ¹*ECE Dept., Worcester Polytechnic Institute, Worcester*, ²*ECE Dept., Illinois Institute of Technology, Chicago, USA*
- 10:00a-10:20a
FR 1-5 **Physical Mechanisms for Ion-Current Levelling Off in the KcsA Channel Through Combined Monte Carlo/Molecular Dynamics Simulations**, E. Piccinini³, F. Affinito¹, A. Bigiani², R. Brunetti¹, C. Jacoboni¹, and M. Rudan³, ¹*INFM-S3 Research Center and Dipartimento di Fisica*, ²*INFM and Dipartimento di Scienze Biomediche, Università di Modena e Reggio Emilia, Italy*, ³*ARCES and Dipartimento di Ingegneria Elettronica, Informatica e Sistemistica Università di Bologna, Italy*
- 10:20a-10:40a **Coffee Break**

Bioelectronics II – Chair: Shela Aboud

- 10:40a-11:00a
FR 2-1 **Simulations of the Gramicidin Channel by Using the TR-PNP Model**, S. Hu, K. Hess, *Computational Electronics Group, Beckman Institute, University of Illinois at Urbana-Champaign, USA*
- 11:00a-11:20a
FR 2-2 **Phonon Absorption and Emission by Holes in the HOMO Bands of Duplex DNA**, M.A. Strosio^{1,2,3}, M. Dutta^{1,3}, T. Rajh⁴, *Departments of* ¹*Electrical and Computer Engineering*, ²*Bioengineering*, and ³*Physics, University of Illinois at Chicago*, ⁴*Chemistry Division, Argonne National Laboratory, USA*
- 11:20a-11:40a
FR 2-3 **An Impedance Network Model for the Electrical Properties of a Single Protein Nanodevice**, V. Akimov¹, E. Alfinito¹, C. Pennetta¹, L. Reggiani¹, J. Minic², T. Gorojankina², E. Pajot-Augy² and R. Salesse², ¹*Dipartimento di Ingegneria dell'Innovazione INFM-NNL, Università di Lecce, Italy*. ²*INRA, Neurobiologie de l'Olfaction et de la Prise Alimentaire, Equipe Récepteurs et Communication Chimique, Domaine de Vilvert, France*
- 11:40a-12:00p **Conference Close**

1. **Field-Effect Transistor Constructed of Novel Structure with Short-Period (GaAs)n/(AlAs)m Superlattice**, V.T. Trofimov¹, M.V. Valeiko¹, N.A. Volchkov¹, A.I. Toropov², K.S. Zhuravlev², E.V. Kiseleva³, S.V. Obolenskii³, M.A. Kitaev⁴, V.A. Kozlov⁵, ¹P.N. Lebedev, *Physical Institute of RAS, 119991 Moscow, Leninskii pr. 53, Russia*, ²Institute of Semiconductor Physics, *Novosibirsk, Russia*, ³N.I. Lobachevskii Nizhegorodskii University, *Russia*, ⁴SPP "Salujt", *Nizhnii Novgorod, Russia*, ⁵Institute of Microstructure Physics, *Nizhnii Novgorod, Russia*
2. **Influence of an Electric Field on the Photoluminescence Kinetics of Type II GaAs/AlAs Superlattices**, D.V. Gulyaev, A.K. Bakarov, A.V. Tsarev and K.S. Zhuravlev, *Institute of Semiconductor Physics, Novosibirsk, Russia*
3. **Predominance of Geminate Process of Exciton Formation in AlGaAs Layers at Low Excitation**, E.V. Kozhemyakina¹, A.V. Efanov¹, K.S. Zhuravlev¹, J. Fuerst², and H.Pascher², ¹Institute of Semiconductor Physics, *pr.Lavrentieva, 13, Novosibirsk, 630090, Russia*, ²Physikalisches Institut, *Universitaet, Bayreuth, F.R.G.*
4. **High-Energy Tails for the Boltzmann Equation in Semiconductors**, O. Muscato, *Dipartimento di Matematica e Informatica, Università di Catania, Viale Andrea Doria 6 - 95125 Catania Italy*
5. **Giant Increase of Electron Maximum Drift Velocity in a Channel of Heterostructure Field-Effect Transistor**, J. Pozela¹, V.G. Mokerov², V. Juciene¹, ¹Semiconductor Physics Institute, *A.Gostauto str. 11, 01108 Vilnius, Lithuania*, ²Institute of UHF Semiconductor Electronics, *Russian Academy of Sciences, Russia*.
6. **Technological Crossroads: Silicon or III-V for Future Generation Nanotransistors**, M.J. Gilbert and D.K. Ferry, *Dept. of Electrical Engineering and Center for Solid State Electronics Research, Arizona State University, USA*
7. **Transport of Nonequilibrium Charge Carriers in Semiconductor Structures**, Y. Gurevich¹, O. Titov¹, I. Volovichev², and G. Logvinov³, ¹Departamento de Física, *CINVESTAV, IPN, Apartado Postal 14-740, 07000 México D.F., México*, ²Institute of Radioelectronics, *National Academy of Sciences of Ukraine, Kharkov, 310085, Ukraine*, ³SEPI-ESIME-Culhuacán, *IPN, México*
8. **Electron and Phonon Pulse Heating in Semiconductors**, Y.G. Gurevich¹ and G.N. Logvinov², ¹Departamento de Física, *CINVESTAV, IPN, Apartado Postal 14-740, 07000 México D.F., México*, ²SEPI-ESIME-Culhuacán, *IPN, México*
9. **Transport-Enhanced Relaxation of Spin Gratings in GaAs/AlGaAs Quantum Wells**, C. Tan¹, S.A. Hawkins¹, A.L. Smirl¹, H.M. van Driel², ¹Laboratory for Photonics and Quantum Electronics, *138 IATL, University of Iowa, Iowa City, Iowa 52242*, ²Dept. of Physics, *University of Toronto, Canada*
10. **Optical Phonon-Modes and Electron-Phonon Interaction in a Quantum Dot**, M. Ishida, M. Yamaguchi and N. Sawaki, *Dept. of Electronics, Nagoya University, Chikusa-ku, Nagoya, 464-8603 Japan*
11. **Resonant Tunneling in Weakly Coupled GaAs/AlGaAs Superlattices in Tilted Magnetic Field**, Y.A.Mityagin, V.N.Murzin, A.A.Pishchulin, P.N.Lebedev *Physical Institute, Moscow, Russia*
12. **Terahertz Negative Differential Conductivity in Heterostructures Due to Population Inversion and Bunching of Ballistic Electrons**, V.A. Kozlov, A.V. Nikolaev, and V.A. Verbus. *Institute for Physics of Microstructures RAS, 603950, Nizhny Novgorod, Russia*
13. **Theory of Double-Barrier Quantum Pump**, L.S. Braginsky, M.V. Entin and M.M. Mahmoodian, *Institute of Semiconductor Physics SB RAS, 630090 Novosibirsk, Russia*
14. **Carrier Dynamics of Single ZnO Nanowires**, L. Wishchmeier and T. Voss, *Institute of Solid State State Physics, University of Bremen, Germany*
15. **Anomalous Temperature Dependence of the Resonant Terahertz Photoresistance in Laterally Modulated Two-Dimensional Electron Systems**, G.R. Aizin¹, L.G. Mourokh², S.J. Allen³, M.C. Wanke⁴ ¹Kingsborough College, *The City University of New York, Brooklyn, NY 11235, USA*, ²Stevens Institute of Technology, *Hoboken, NJ 07030, USA*, ³Center for Terahertz Science and Technology, *University of California, Santa Barbara, CA 93106, USA*, ⁴Sandia National Laboratories, *Albuquerque, NM 87185, USA*
16. **Rabi Oscillations in the Conductance of a Quantum Wire Coupled to a Local Magnetic Moment**, A.Y. Smirnov¹, L.G. Mourokh², and J.P. Bird³, ¹D-Wave Systems Inc., *320-1985 W. Broadway, Vancouver, British Columbia, Canada V6J 4Y3*, ²Dept. of Physics, *Stevens Institute of Technology, Hoboken, NJ 07030, US*, ³Dept. of Electrical Engineering, *University at Buffalo, the State University of New York, USA*
17. **Traditional Hot-Electron MOS Devices for Novel Optoelectronic Applications**, T. Dekorsy¹, J. Sun¹, W. Skorupa¹, M. Helm¹, L. Rebohle² and T. Gebel², ¹Forschungszentrum Rossendorf, *Institut für Ionenstrahlphysik und Materialforschung, PO Box 510119, 01314 Dresden, Germany*, ²nanoparc GmbH, *Bautzner Landstraße 45, 01454 Dresden-Rossendorf, Germany*

18. **Investigation of Self- Heating Effect in Individual Soi Devices and Due to Device-Device Interactions**, M. Arifuzzaman, D. Vasileska, *Dept. of Electrical Engineering, Arizona State University, Tempe, AZ 85287 USA*
19. **Study of the DC Characteristics Features of SOI MESFETs**, K. Tarik, D. Vasileska and T. J. Thornton, *Arizona State University, Tempe, AZ, 85287-5706, USA*
20. **Measurements of the Electrical Excitation of QH-Devices in the Real Time Domain**. G.Vasile^{1,2}, C. Stellmach¹, G. Hein³, and G. Nachtwei¹, ¹*Institut für Angewandte Physik, TU Braunschweig, D-38106 Braunschweig, Germany*, ²*National Institute of Research-Development for Cryogenics and Isotopic Technologies, R-1000 Rm. Vâlcea, Romania*, ³*Physikalisch-Technische Bundesanstalt, D-38116 Braunschweig, Germany*
21. **A Generalized Time-Dependent Statistical Operator Describing Energy Dissipation and Irreversibility in Nanostructures**. B. Sorée and W. Magnus, *IMEC, Kapeldreef 75, B-3001 Leuven, Belgium*
22. **Impact Ionization and Avalanche Multiplication in GaAs: a Time-Resolved Study**, M. Betz¹, S. Trumm¹, M. Eckardt², A. Schwanhäußer², F. Sotier³, A. Leitenstorfer³, M. Hanson⁴, D. Driscoll⁴, A.C. Gossard⁴, S. Malzer², and G.H. Döhler², ¹*Physik-Dept. E11, Technische Universität München, D-85747 Garching, Germany*, ²*Institut für Technische Physik, Universität Erlangen, D-91058 Erlangen, Germany*, ³*Fachbereich Physik, Universität Konstanz, D-78457 Konstanz, Germany*, ⁴*Materials Dept., UCSB, Santa Barbara, CA 93106, USA*
23. **Fermi-Dirac Statistics in Monte Carlo Simulations of InGaAs MOSFETs**, K. Kalna, L. Yang and A. Asenov, *Device Modeling Group, Dept. of Electronics & Electrical Engineering, University of Glasgow, Glasgow, G12 8LT, United Kingdom*
24. **Monte Carlo Study of the Suppression of Diffusion Noise**, C. Palermo, L. Varani, J.-F. Millithaler, J.-C. Vaissière, *Centre d'Electronique et de Micro-optoelectronique de Montpellier, UMR CNRS 5507 - Université Montpellier II, Place Bataillon 34095 Montpellier Cedex 5 France*
25. **Study of Nanometric HEMTs for TeraHertz Emission**, J.-F. Millithaler¹, L. Varani¹, C. Palermo¹, J. Mateos², T. González², S. Perez², D. Pardo², W. Knap³, J. Lusakowski³, N. Dyakonova³, S. Bollaert⁴, A. Cappy⁴, Y. Roelens⁴, E. Starikov⁵, P. Shiktorov⁵, V. Gruzinskis⁵, ¹*CEM2 UMR CNRS 5507 Université Montpellier II France*, ²*Universidad de Salamanca 37008 Salamanca Spain*, ³*GES UMR CNRS 5650 Université Montpellier II France*, ⁴*IEMN UMR CNRS 8520 Avenue Poincaré 59652 Villeneuve d'Ascq France*, ⁵*Semiconductor Physics Institute A. Gostauto 11 2600 Vilnius Lithuania*
26. **Electron Transport in Novel Sb-Based Quantum Cascade Lasers**, V. Spagnolo², M.S. Vitiello¹, G. Scamarcio¹, Q. Yang³, J. Wagner³, D. Revin⁴ and J.W. Cockburn⁴, ^{1,2}*INFM Regional Laboratory LIT³ and¹Dipartimento Interateneo di Fisica "M. Merlin", Università degli Studi di Bari and²Politecnico di Bari Italy*, ³*Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany*, ⁴*Dept. of Physics and Astronomy, University of Sheffield, United Kingdom*
27. **Quantum Phonon-Limited High-Field Electron Transport in Semiconductors**, G. Ferrari, E. Cancellieri, P. Bordone and C. Jacoboni, *INFM - National Research Center on nanoStructures and bioSystems at Surfaces (S³), Modena, Italy, Dipartimento di Fisica, Università di Modena e Reggio Emilia, Via Campi 213/A - I-41100 Modena - Italy*
28. **Statistical Investigation of Electronic Transport in Decanometer Gatelength SOI MOSFETs**, M.J. Martín and R. Rengel, *Departamento de Física Aplicada, Universidad de Salamanca, Facultad de Físicas. Plaza de la Merced s/n. 37008 Salamanca. Spain*
29. **Rate Equation for Photon-Assisted Tunneling Through an Interacting Quantum Dot**, B. Dong^{1,2}, N.J.M. Horing¹, and H.L. Cui^{1,3}, ¹*Dept. of Physics and Engineering Physics, Stevens Institute of Technology, Hoboken, New Jersey 07030, USA*, ²*Dept. of Physics, Shanghai Jiaotong University, 1954 Huashan Road, Shanghai 200030, China*, ³*School of Optoelectronics Information Science and Technology, Yantai University, Yantai, Shandong, China*
30. **Collision of Fano Resonances in a Molecular Ring**, A.M. Satanin, E.R. Hedin, and Y.S. Joe, *Center for Computational Nanoscience, Dept. of Physics and Astronomy, Ball State University, Muncie, IN 47306, USA*
31. **Electron-Phonon Relaxation in Disordered Semiconductors and Structures**, A. Sergeev¹, V. Mitin¹, and M.Yu. Reizer², ¹*Electrical Engineering Dept., University at Buffalo, Buffalo, New York 14260*, ²*5614 Naiche Rd. Columbus, Ohio 43213 USA*
32. **Simulation of Domain Formation in p-Si/SiGe Quantum Cascade Structures**. Z. Ikonic, P. Harrison, and R.W. Kelsall, *School of Electronic and Electrical Engineering, University of Leeds, Leeds LS2 9JT, UK*

33. **Calculation of Optical Gain and Electron Relaxation Rates in Single- and Double-Phonon Resonant Quantum Cascade Lasers in a Magnetic Field**, J. Radovanovic¹, A. Mircetic², V. Milanovic², Z. Ikonic³, D. Indjin³, P. Harrison³, and R.W. Kelsall³, ¹*Institute of Physics, University of Belgrade, Serbia and Montenegro*, ²*Faculty of Electrical Engineering, University of Belgrade, Serbia and Montenegro*, ³*School of Electronic and Electrical Engineering, University of Leeds, UK*
34. **Quantum-Mechanical Modeling of Electron Dynamics in Topologically Unconventional Low-Dimensional Systems**, G.J. Meyer, R.H. Blick, and I. Knezevic, *Dept. of Electrical and Computer Engineering, University of Wisconsin-Madison, Madison, WI 53706, USA*
35. **Mid-Infrared Optical Absorption in Germanium Under Intense Laser Fields**, H. Furuse, Y. Nakata, H. Kubo, and N. Moriy, *Dept. of Electronic Engineering, Osaka University, Suita City, Osaka 565-0871, Japan*
36. **A Numerical Study on the Boundary Effects of Wigner Function Based Simulations of Double Barrier Resonant Tunneling Structures**, G. Recine¹, Bernard Rosen², and Hong-Liang Cui², ¹*Dept. of Electrical and Computer Engineering, University of Virginia, Charlottesville, VA 22903*, ²*Dept. of Physics and Engineering Physics, Stevens Institute of Technology, Hoboken, NJ 07030*
37. **Analytical 1-Particle Green's Functions and Their Use for Electronic Transport Calculations in Carbon Nanotubes**, S. Barraza-Lopez¹, N. Tayebi² and K. Hess¹, ¹*Dept. of Physics*, ²*Dept. of Electrical Engineering and Beckman Institute, University of Illinois at Urbana-Champaign, USA*
38. **Interface Related Radiative Recombination at Single Type-II Broken-Gap GaInAsSb/InAs Heterostructures**, K.D. Moiseev¹, K.A. Korolev², C.J. Meining³, B.D. McCombe³, M.L. Sadowski⁴, G. Martinez⁴, P.N. Brunkov¹, M.P. Mikhailova¹, Yu.P. Yakovlev¹, ¹*A.F.Ioffe Physico-Technical Institute of RAS, St. Petersburg, 194021, Russia*, ²*Dept. of Electrical and Computer Engineering, Tufts University, Medford MA, 02155 USA*, ³*Dept. of Physics and CAPEM, University at Buffalo, SUNY, Buffalo NY, 14260 USA*, ⁴*Grenoble High Magnetic Field Laboratory, Grenoble, France*
39. **Drift and Diffusion in Superlattices Within the Wannierstark Approach**, M. Rosini And L. Reggiani, *Dipartimento di Ingegneria dell'Innovazione, Università di Lecce, via Arnesano, edificio Stecca, 73100 Lecce Italy*
40. **Improved Model for Single Photon Avalanche Diode**, Z. Xiao, P.D. Dimitropoulos, A. Rochas, P.-A. Besse, R.S. Popovic, *Ecole Polytechnique Fédérale de Lausanne (EPFL), Microsystems Institut, BM, Station 17, CH-1015 Lausanne, Switzerland*
41. **Simulation Study of Arbitrarily Oriented Si, Ge, and GaAs Ballistic Nanowire MOSFETs**, M. Bescond¹, N. Cavassilas², L. Raymond², and A. Asenov¹, ¹*Device Modelling Group, Dept. of Electronics and Electrical Engineering, University of Glasgow, G12 8LT, Glasgow, Scotland, United Kingdom*, ²*Laboratory of Materials and Microelectronics of Provence (L2MP), UMR CNRS 6137 Marseille, France*
42. **Surface Electronic Transport in Ultrathin Silicon-on-Insulator**, P. Zhang¹, E. Tevaarwerk¹, B.-N. Park¹, D.E. Savag^{1e}, G. Celler², I. Knezevic¹, P.G. Evans¹, M.A. Eriksson¹, and M.G. Lagally¹, ¹*University of Wisconsin-Madison, Madison, Wisconsin 53706*, ²*Soitec, Centennial Dr, Peabody, MA 01960 USA*
43. **Effect of Regular and Irregular Potential Perturbations in Mesoscopic Cavities**, P. Marconcini, M. Macucci, *Dipartimento di Ingegneria dell'Informazione, Università di Pisa, Via Caruso-I-56122 PISA*
44. **Simulation of Electronic/Ionic Mixed Conduction in Solid Ionic Memory Devices**, H.I. Kwon^{1,2}, J.D. Lee¹, and U. Ravaioli², ¹*School of Electrical Engineering and Computer Science, Seoul National University, San 56-1, Shillim-Dong, Kwanak-Gu, Seoul 151-744, Republic of Korea*, ²*Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 405 North Mathews Ave., Urbana, IL 61801, USA*
45. **Full-Band Modeling of Magnetic Semiconductors**, S. Beysserie¹, I. Remond¹, P. Sengupta¹, S. Goodnick², and M. Saraniti¹, ¹*Dept. of Electrical and Computer Engineering, Illinois Institute of Technology, Chicago, IL*, ²*Dept. of Electrical Engineering, Arizona State University, Tempe, AZ USA*
46. **Cellular Monte Carlo Modeling of AlxIn1-xSb/InSb Quantum Well Transistors**, J. Branlard¹, S.J. Aboud², S.M. Goodnick³ and M. Saraniti¹, ¹*ECE Dept., Illinois Institute of Technology, Chicago, IL*, ²*ECE Dept., Worcester Polytechnic Institute, Worcester, MA*, ³*EE Dept., Arizona State University, Tempe, AZ USA*
47. **Non-Parabolic Model for the Solution of 2-D Quantum Transverse States Applied to Narrow Conduction Channel Simulation**, Z. Yang¹, A. Godoy², U. Ravaioli¹ and F. Gamiz², ¹*Beckman Institute, University of Illinois, 405 N Mathews Ave, Urbana, IL 61801 USA*, ²*University of Granada, 18071 Granada, Spain*
48. **Self-Consistent Quantum Transport Theory of Carrier Capture in Heterostructures**, T. Kubis, P. Vogl, *Walter Schottky Institute, Technische Universität München, Am Coulombwall 3, D-85748 Garching, Germany*
49. **Negative Quantum Capacitance of Carbon Nanotubes**, L. Latessa¹, A. Pecchia¹, A. Di Carlo¹ and P. Lugli², ¹*Università di Roma "Tor Vergata", Via del Politecnico 1, Roma, 00133, Italy*, ²*Lehrstuhl für Nanoelektronik, TU München, Arcisstrasse 21, D-80333, München, Germany*