17th International Conference on

Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures

EDISON 17

August 7-12th, 2011
Santa Barbara, California

Conference Chair: Umesh Mishra

Program Chair: Stephen M. Goodnick

CONFERENCE VENUE
University of California Santa Barbara
Santa Barbara, California, USA

CONFERENCE CORRESPONDENCE

EDISON 17
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FORWARD

The International Conference on Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures is the 17th meeting of the series that originally started as the International Conference on Hot Carriers in Semiconductors (HCIS). Under the HCIS name, meetings were held in Modena, Italy (1973), Denton, USA (1977), Montpellier, France (1981), Innsbruck, Austria (1985), Boston, USA (1987), Scottsdale, USA (1989), Nara, Japan (1991), Oxford, UK (1993), Chicago, USA (1995), and Berlin, Germany (1997). Although the original name of the conference was Hot Carriers in Semiconductors (HCIS), it was decided in 1997 after the Berlin conference, to change the name to Nonequilibrium Carrier Dynamics in Semiconductors to reflect the expanded scope of the conference to include coherent phenomenon and nonlinear dynamics within the framework of HCIS (while keeping the original acronym) to reflect advances in ultrafast optics and nanostructured materials and devices beyond the conventional description of 'hot electrons'. Under this name, meetings were held at Kyoto, Japan (1999), Santa Fe, New Mexico (2001), Modena, Italy (2003), Chicago, Illinois (2005), and Tokyo, Japan (2007). After the Tokyo meeting, a decision was made by the International Advisory Committee, to rename the conference to reflect the expansion of conference topics from bulk semiconductor phenomena, to include nanostructures and other materials. Hence the name EDISON (Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures) was adopted, and used for the first time at the meeting held in Montpellier, France, in 2009. The conference has enjoyed sustained attendance over the years, with over 250 attendees at the Montpellier meeting in 2009. The conference has been a focus of the hot electron community since its inception in the early 1970s. In the 1980s, the rapid developments in ultra-fast optical measurements in semiconductor systems brought the optics community together with the hot-carrier community, a partnership which has remained to the present. Likewise, rapid advances in fabrication of quantum confined semiconductor systems in the 1990s until the present has shifted the focus from primarily bulk materials and devices, to a whole host of material and device structures based on quantum wells, quantum wires, and quantum dots, as well as carbon based, organic and biological materials.

The scope of EDISON 17 covers nonequilibrium and hot carrier dynamics in semiconductors, optoelectronics and nanostructure devices, with the emphasis on the physics of transport and optical phenomena, including:

Nonequilibrium carrier transport in bulk and low dimensional materials
- high field transport in bulk materials, quantum wells, nanostructures
- quantum wires and dots, tunneling, coupled dots/anti-dots, Coulomb blockade
- point contacts, quantized conductance, ballistic transport

Coherent electron dynamics in solids for quantum processing and communications
- carrier dynamics and quantum computing
- coherent control

Coherent/incoherent carrier dynamics and ultra-fast optical phenomena
- optical studies of carrier dynamics in quantum wires and dots
- excitons, plasmons, inter-band polarization, coherent control, hole burning
- incoherent dynamics, carrier-carrier, carrier-phonon interactions, screening, nonequilibrium phonons

Terahertz interactions with semiconductors
- semiconductor THz sources, quantum cascade lasers, electo-optic phenomena
- THz plasma oscillations, THz interactions in quantum dots and nanostructures
- THz frequency electronic devices and transport phenomena

Semiconductor based spintronics
- spin injection, spin dynamics and relaxation processes
- spin dependent transport in nanostructures
- spin devices, spin detection

Carrier transport and carrier dynamics in organic materials
- nonequilibrium transport in organic materials, molecular structures
- carrier dynamics in carbon based nanoelectronics, carbon nanotubes, graphene
- ionic transport in biological systems

Ultrafast carrier dynamics in energy conversion processes
- third generation photovoltaic converters
- multi-exciton generation, exciton relaxation dynamics in nanocrystals
- intermediate band generation, multi-energy level and quantum dot solar cells

- hot carrier solar cells, nonequilbrium phonons
- electron and phonon transport nanoscale thermoelectric converters

Quantum carrier dynamics in ultrasmall structures and devices
- ultra small field effect transistors, Schottky barrier transistors
- band to band tunneling, resonant tunneling devices, interband tunneling transistors
- velocity overshoot, ballistic transport, quantum effects in ultra-scale devices
- 1/f noise, hot carrier induced oxide breakdown

Non-equilibrium carrier dynamics and fluctuations
- instabilities, current filaments, domains, noise, chaos

The EDISON 17 conference has been supported through the Office of Naval Research, the Defense Advanced Research Projects Agency, the School of Electrical, Computer and Energy Engineering at Arizona State University, and the University of California Santa Barbara. Without this generous support, the conference would not have been possible.

On behalf of the many individuals involved in the organization of this conference, we would like to invite you to attend the many and varied sessions related to nonequilibrium carrier dynamics in semiconductors, optoelectronics and nanostructures, and to enjoy the setting at the University of California, Santa Barbara campus and the beautiful environs of the California coast. We look forward to your participation in the success of EDISON 17.

Sincerely,

Umesh Mishra, Chair EDISON 17

Stephen Goodnick, Program Chair EDISON 17

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CONFERENCE SCHEDULE

Aug. 7	16:00-20:00	Registration: De Anza Building
(Sun)	18:00-19:30	*Welcome Reception-Las Encinas Courtyard*
Aug. 8	8:30-8:40	Opening Remarks: Loma Pelona Center
(Mon)	8:40-10:10	M1. Quantum Cascade Lasers
	10:10-10:40	*Coffee Break*
	10:40-12:00	M2. Terahertz Phenomena and Devices
	12:00-13:30	*Lunch*
	13:30-14:40	M3. Carrier Transport Phenomena
	14:40-15:10	*Coffee Break*
	15:10-16:30	M4. Carrier Dynamics in Nanodevices
Aug. 9	8:30-10:00	Tu1. Energy Applications
(Tues)	10:00-10:30	*Coffee Break*
	10:30-12:00	Tu2. Quantum Dots
	12:00-13:30	*Lunch*
	13:30-15:00	Tu3. Spins
	15:00-17:00	P1. *Poster Session I*
Aug. 10	8:30-9:20	W1. Carbon Based Materials
(Wed)	9:20-10:20	W2. Disordered Materials
	10:20-10:40	*Coffee Break*
	10:40-12:20	W3. Electron Dynamics and Devices
	12:20-17:00	*Conference Excursion*
Aug. 11	8:30-10:20	Th1. Terahertz Phenomena
(Thurs)	10:20-10:50	*Coffee Break*
	10:30-12:00	Th2. Quantum Cascade Devices and Lasers
	12:00-13:30	*Lunch*
	13:30-15:00	Th3. Graphene Materials and Devices
	15:00-17:00	*Poster Session II*
	18:00-21:30	*Conference Banquet (History Museum)*
Aug. 12	8:30-9:50	F1. Micro-and Nano-mechanical Systems
(Fri)	9:50-10:20	*Coffee Break*
	10:20-11:20	F2. Transport Phenomena
	11:20-11:30	Closing Remarks

GENERAL TECHNICAL INFORMATION

General Conference Information

The EDISON 17 talks and poster sessions are scheduled in the Loma Pelona Center which is located on the west side of the main campus near Manzanita Village. On campus housing is in the Manzanita Village Quad located on the bluffs overlooking the Pacific Ocean and the UCSB Lagoon. Manzanita Village is adjacent to the Loma Pelona Center. More information on travel and maps of the UCSB campus and surrounding area may be found on the conference website, http://www.asu.edu/aine/EDISON17.

Visitor Parking

Visitor parking is permitted in designated parking lots on campus, provided a valid visitor permit is displayed. Permits can be purchased from the permit dispensers located in lots throughout campus. An all day parking permit costs $8. Certain lots allow visitor parking at all times while others allow visitor parking only after 5:00PM and on weekends. Please refer to the lot entrance sign to be assured that visitor parking is allowed within the lot. Note that other restrictions may apply to specific spaces or areas within a lot or parking structure. Please refer to the UCSB Visitor Parking map for lots and additional information:
http://www.aw.id.ucsb.edu/maps/images/aw_pdfs/UCSB_Visitor.pdf

Visitors to UCSB's scenic shoreline may look for four-hour Coastal Access parking in 6 Parking, 10 Parking, 22 Parking or 5 Parking. Coastal Access parking is permitted at all times. Note, however, that the spaces are intended for coastal visitors and the time limit is **four** hours. One to four-hour permits may be purchased from onsite permit dispensers or the Parking Services sales office.

Presentation of Papers

The program includes invited papers (25 + 5 minutes) and contributed oral papers (15 + 5 minutes). In addition, two sessions have been scheduled for poster presentations. The presentations will be made using digital projectors. Poster boards will be provided for the poster presentations. Poster size should be 1 meter by 1 meter maximum. Materials for attaching the posters will be available in the poster area.

SOCIAL PROGRAM

Conference Registration and Welcome Reception

The registration desk will be open from 4:00 to 6:00pm at the De Anza building (located next to the Manzanita Village dining commons) on Sunday, August 7th. Please register early to pick up all the conference materials. A Welcome Reception will follow registration beginning at 6:00pm until 7:30pm in the Las Encinas Courtyard. Drinks and hors d'oeuvres will be served.

Conference Banquet

The EDISON 17 banquet, scheduled the evening of August 11, will be held at the Santa Barbara Museum of Natural History. Light refreshments and the bar will open at 6:30 p.m. with dinner starting at 7:00 p.m. The museum will be open to EDISON participants only (including EDISON guests) that evening so that you can enjoy the exhibits. Bus transportation information to get from UCSB to the museum will be updated to this location soon. The museum is located at 2559 Puesta del Sol, Santa Barbara, CA 93105
http://www.sbnature.org/about/68.html

Guest Program

No formal guest program is planned for accompanying persons. However, we will be happy to help arrange tours and other activities in the Santa Barbara area through a local tour company.

Conference Excursion

The conference excursion is offered as part of the registration for the afternoon of Wednesday, August 10th. More information will be provided on the website of the conference.

Conference Meals

During the conference a full and varied lunch will be available to all attendees on the UCSB campus. Breakfast and dinner are not included in the registration fee apart from the reception and banquet.

Weather

The weather in Santa Barbara is generally typical of coastal California. Average day/night temperatures in August are 79/58° F. During summer, the mornings can be typically foggy and chilly, clearing in late morning and becoming sunny. Inland from the coast may be quite warm in the summer. It is advised to bring a variety of clothing for the range of temperatures.

ACKNOWLEDGEMENTS

The 17th International Conference on Nonequilibrium Carrier Dynamics in Semiconductors, Optoelectronics and Nanostructures, EDISON 17

would like to acknowledge the generous support by the following:

The Office of Naval Research (ONR)

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School of Electrical, Computer and Energy Engineering
Arizona State University (ASU)

The University of California Santa Barbara (UCSB)

TECHNICAL PROGRAM

Monday, August 8th

8:30 *Opening Remarks*, Stephen Goodnick, *Arizona State University*

8:40 **Session M1**: *Quantum Cascade Lasers*

8:40 M1.1: (*Invited*) C. Sirtori, *University of Paris, France*, "Electrical injected intersubband polariton devices."

9:10 M1.2: C. Deutsch, A. Benz, H. Detz, P. Klang, M. Nobile, A. M. Andrews, W. Schrenk, T. Kubis, P. Vogl, G. Strasser and K. Unterrainer, *Vienna University of Technology, Austria*, "InGaAs/GaAsSb Terahertz Quantum Cascade Lasers."

9:30 M1.3: A. Mátyás, P. Lugli, and C. Jirauschek, *Technical University Munich, Germany*, "Modeling of high-efficiency mid-infrared quantum cascade lasers."

9:50 M1.4: F. Castellano, M. I. Amanti, A. Bismuto, R. Terazzi, M. Beck and J. Faist, *Swiss Federal Institute of Technology, Switzerland*, "Development of quantum cascade lasers between THz and mid-infrared."

10:10 *Coffee Break*

10:40 **Session M2**: *Terahertz Phenomena and Devices*

10:40 M2.1: H. Hirori, K. Shinokita, M. Shirai, S. Tani, Y. Kadoya, and K. Tanaka, *Kyoto University, Japan*, "Extraordinary Carrier Multiplication in GaAs MQWs by Intense Terahertz Pulse Excitation."

11:00 M2.2: B. Zaks, D. Stehr, T.-A. Troung, P. M. Petroff, S. Hughes, and M. S. Sherwin, *University of California Santa Barbara, USA*, "Cavity-Free Ultra-Strong Coupling of Quantum Wells with Terahertz Radiation."

11:20 M2.3: D. Turchinovich, B. S. Monozon, D. A. Livshits, E. U. Rafailov, and M. C. Hoffmann, *Technical University of Denmark, Denmark*, "THz Electro-absorption Effect in Quantum Dots."

11:40 M2.4: B. Mayer, F. Junginger, C. Schmidt, S. Mährlein, O. Schubert, A. Sell, A. Pashkin, R. Huber, and A. Leitenstorfer *University of Konstanz, Germany*, "Field-resolved Multi-wave Mixing with intense THz Transients in InSb."

12:00 *Lunch*

1:30 **Session M3**: *Carrier Transport Phenomena*

1:30 M3.1: (*Invited*) C. Jacoboni, *University of Modena and Reggio Emilia, Italy*, "Quantum transport and carrier dynamics."

2:00 M3.2: F. Gouider, M. Salman, Y. B. Vasilyev, D. Smirnov, P. D. Buckle and G. Nachtwei, *Technical University of Braunschweig, Germany*, "Magneto-optical Response of InSb/AlInSb quantum well structure."

2:20 M3.3: M. Bareiβ, A. Hochmeister, G. Jegert, U. Zschieschang, H. Klauk, B. Fabel, G. Scarpa, W. Porod and P. Lugli, *Technical University of Munich, Germany*, "Quantum carrier dynamics in ultra-thin MIM tunneling diodes."

2:40 *Coffee Break*

3:10 **Session M4**: *Quantum Carrier Dynamics in Nanostructures and Nanodevices*

3:10 M4.1: B. Novakovic and I. Knezevic, *University of Wisconsin-Madison, USA*, "Coherent electron transport in planar and curved nanostructures and decoherence due to the coupling with contacts."

3:30 M4.2: M. Stallhofer, C. Kastl, K.-D. Hof, N. Erhard, D. Schuh, W. Wegscheider, J. P. Kotthaus and A. W. Holleitner, *Walter Schottky Institute, Technical University Munich, Germany*, "Ballistic and quantized photocurrents in nanoscale circuits."

3:50 M4.3: I. Iñiguez-de-la-Torre, J. Mateos, Y. Roelens, S. Bollaert, and T. Gonzalez, *University of Salamanca, Spain,* "Surface charge effects in T-branch nanojunctions evidenced by ultrafast pulse testing."

4:10 M4.4: T. Kiso, T. Maemoto, K. Nishisaka, S. Sasa, S. Kasai, and M. Inoue, *Osaka Institute of Technology, Japan,* "Nonlinear Transport Properties in InAs based Ballistic Rectifiers and Self-Switching Diodes."

Tuesday, August 9th

8:30 **Session Tu1**: *Ultrafast Carrier Dynamics and Energy Applications*

8:30 Tu1.1: (*Invited*) M. C. Beard, J. M. Luther, M. C. Hanna, A. G. Midgett, and A. J. Nozik, *National Renewable Energy Laboratory, USA*, "Hot Electron Effects in Quantum Dots, Multiple Exciton Generation, and Third Generation Solar Cells."

9:00 Tu1.2: V. Mitin, K. A. Sablon, J. W. Little, A. Sergeev, N. Vagidov, and K. Reinhardt, *University of Buffalo, USA*, "Solar Cells and Photodetectors: High Performance Provided by Built-in-Dot Charge."

9:20 Tu1.3: M. Berr, A. Vaneski. C. Mauser, S. Fishbach, A. S. Susha, A. L. Rogach, F. Jäckel, and J. Feldmann, *Ludwig-Maximilians Universit, Germany*, "Slow-Down of Photoelectron Transfer in Pt-Decorated CdS Nanorods Under Hydrogen Generation Conditions."

9:40 Tu1.4: C. Galland, Y. Ghosh, A. Steinbrück, M. Sykora, J. A. Hollingsworth, V. I. Klimov, and H. Htoon, *Los Alamos National Laboratory, USA,* "Two Mechanisms for Photoluminescence Blinking Revealed by Time-resolved Single-Nanocrystal Spectroelectrochemistry."

10:00 *Coffeee Break*

10:30 **Session Tu2**: *Ultrafast Carrier Dynamics in Quantum Dots*

10:30 Tu2.1: (*Invited*) Y. Arakawa, *RCAST, University of Tokyo, Japan*, "Cavity-QED in coupled single-quantum-dot-2D/3D-photonic crystal-nanocavity systems."

11:00 Tu2.2: L. Nevou, V. Liverini, A. Mohan, G. Cerulo, P. Friedli, F. Castellano, A. Bismuto, H. Sigg, E. Kapon and J. Faist, *Swiss Federal Institute of Technology, Switzerland*, "Optically driven electron pump using InAs quantum dots."

11:20 Tu2.3: J. Huneke, I. D'Amico, P. Machnikowski and T. Kuhn, *University of Münster, Germany*, "The Signatures of Coulomb Correlations in Single Dot Femtosecond Pump-Probe Signals."

11:40 Tu2.4: S-K. Shin, S. Huang, N. Fukata, and K. Ishibashi, *RIKEN, Japan*, "Few-electron germanium-nanowire quantum dots."

12:00 *Lunch*

1:30 **Session Tu3**: *Spins*

1:30 Tu3.1: (*Invited*) A. Oiwa, R. S. Deacon, Y. Kanai, S. Takahashi, K. Yoshida, K. Shibata, K. Hirakawa, and S. Tarucha, *University of Tokyo, Japan*, "Electrical tuning of g-tensor in self-assembled uncapped InAs quantum dots."

2:00 Tu3.2: C. Schindler, and P. Vogl, *Technical University of Munich, Germany*, "Prediction of spin transistor in topological insulators."

2:20 Tu3.3: D. R. McCamey, J. van Tol, G. W. Morley, D. Edwards, S. Takahashi, L. C. Brunel, M. S. Sherwin and C. Boehme, *University of California Santa Barbara, USA*, "Coherent Electron and Nuclear Spin Dynamics Probed by Terahertz Radiation."

2:40 Tu3.4: P. Olbrich, V. V. Bel'kov, S. A. Tarasenko, and S. D. Ganichev, *University of Regensberg, Germany*, "Spin polarized currents in InAs based quantum well structures induced by terahertz and microwave radiation."

3:00 **Poster Session I**

P1.1: D. M. Gaponova, V. Ya. Aleshkin, L. V. Gavrilenko, Z. F. Krasil'nik, D. I. Kryzhikov, D. I. Kuritsyn, S. M. Sergeev, V. G. Lyssenko, and C. B. Sørensen, *Institute for Physics of Microstructures, Nizhny Novgorod, Russia,* "Influence of the Electric Field on the Exciton and Trion Luminescence in Quantum Wells."

P1.2: N. Ohtani and M. Takahashi, *Doshisha University, Kyoto, Japan*, "Improved carrier injection into wide-bandgap emissive polymer by doping of carrier-transporting materials and high-effective ultraviolet emission."

P1.3: F. L. Traversa, G. Albareda, and X. Oriols, *Universitat Autònoma de Barcelona, Spain*, "Sequential Measurement Correlations of Current in Nanostructures."

P1.4: L. G. Mourokh and J. P. Bird, *Queens College City University of New York, USA*, "Localized state in a quantum point contact: Fano resonance and 0.7–anomaly."

P1.5: I. Iñiguez-de-la-Torre, H. Rodilla, J. Mateos, and T. González, *University of Salamanca, Spain*, "Time domain response of III-V nanoscale Y-branch junctions: a numerical microscopic analysis by Monte Carlo simulations."

P1.6: J. C. Yi, *Hongik University, Seoul, Korea*, "Optical Gain Properties of Quantum Dot Arrays Fabricated by the Edge-Defined Nanowires."

P1.7: R. Chen, T.-Y. Lin, J.-W. Song, D. Eason, G. Strasser and J. P. Bird, *University of Buffalo, USA*, "Memristor Functionality of Strongly-Depleted Semiconductor nanoconstrictions."

P1.8: N. Mori, H, Minari, S. Uno, H. Mizuta, and N. Koshida, *Osaka University, Japan,* "Impact ionization and avalanche multiplication in a silicon nanodot array."

P1.9: G. Morris, G. Fasching, E. Pratt, H. Kim, B. Zaks, T. Truong, V. Nguyen, C. P. Pryor, P. M. Petroff, and M. S. Sherwin, *University of California Santa Barbara, USA*, "Efficient charge injection and extraction into quantum post nanostructures for terahertz quantum cascade lasers."

P1.10: L. Tohme, S. Blin, P. Nouvel, J. Torres, J. Wang, K.P. Tse, K.Y. Chu, Y.C. Chan, C. Palermo, and L. Varani, *University of Montpellier, France,* "Long-Term Memory Effects in Photo-Excited InGaAs High-Electron-Mobility-Transistors."

P1.11: V. Gružinskis, P. Shiktorov, E. Starikov, A. Penot, P. Nouvel, J. Torres, C. Palermo, and L. Varani, *Center for Physical Sciences and Technology, Vilnius, Lithuania*, "THz emission enhancement in FET/HEMT due to excess electrons in channel-under-gate regions."

P1.12: T. Laurent, R. Sharma, A. Penot, J. Torres, P. Nouvel, S. Blin, C. Palermo, L. Varani, Y. Cordier, M. Chmielowska, S. Chenot, J.-P. Faurie, B. Beaumont, E. Starikov, P. Shiktorov, V. Gružinskis, V. Korotyeyev, and V. Kochelap, *University Montpellier II, France*, "Voltage Control of Terahertz Transmission Through GaN Quantum Wells: Experiments and Theory."

P1.13: K. Wang, R. Ramaswamy, A. Muraviev, A. Stier, B. D. McCombe, M. Shur, D. Billingsley, J. Yang, R. Gaska, A. Sergeev, and V. Mitin, *University of Buffalo, USA*, "Room Temperature - Operating hot Electron Microbolometers based on GaN Heterostructures for THz Sensing."

P1.14: C. Balocco, L. Zhang, Y. Alimi, A. M. Song, *University of Manchester, UK*, "Low-frequency noise of a novel unipolar nanodiode for microwave and THz detection."

P1.15: F. Teppe, C. Consejo, J. Torres, B. Chenaud, P. Solignac, Z. R. Wasilewski, M. Zholudev, N. Dyakonova, D. Coquillat, P. Buzatu, A. El Fatimy, and W. Knap, *University Montpellier II, France*, "Terahertz Detection of Quantum Cascade Laser Emission by Plasma Waves in Field Effect Transistors."

P1.16: N. Dyakonova, A. El Fatimy, Y. Meziani, D. Coquillat, W. Knap, F. Teppe, P. Buzatu, H. Marinchio, J. Torres, P. Nouvel, and L. Varani, *University Montpellier II, France,* "THz emission related to hot plasmons and plasma wave instability in field effect transistors."

P1.17: Y. Mukai, H. Hirori, T. Tanaka, M. Nagai, K. Tanaka, *Kyoto University, Japan*, "Terahertz field ionization of acceptors in p-Ge."

P1.18: Y. Sakasegawa, T. Idehara, Y. Yamaguchi, S. Mitsudo, and K. Hirakawa, *University of Tokyo, Japan*, "Current suppression in semiconductor superlattices driven by intense sub-THz radiation from a gyrotron."

Wednesday, August 10th

8:30 **Session W1**: *Electron Dynamics in Carbon Based Materials*

8:30 W1.1: (*Invited*) Z. Zhong, *University of Michigan, USA*, "Terahertz ballistic electrons in carbon nanotubes."

9:00 W1.2: L. Prechtel, N. Erhard, L. Song, P. Ajayan, D. Schuh, W. Wegscheider, and A. W. Holleitner, *Walter Schottky Institute, Technical University Munich, Germany*, "Picosecond time-resolved optoelectronic transport in carbon nanotubes and graphene."

9:20 **Session W2**: *Transport in Organic and Disordered Materials*

9:20 W2.1: S. Locci, F. Ante, U. Zschieschang, H. Klauk, T. Sekitani, T. Someya, T. W. Canzler, J. Blochwitz-Nimoth, F. Letzkus, J. N. Burghartz, and P. Lugli, *Technical University of Munich, Germany*, "Tuning of non-linear contact resistances in organic thin film transistors."

9:40 W2.2: E. Albert, A. Abdellah, A. Yaqub, G. Scarpa, and P. Lugli, *Technical University of Munich, Germany*, "Transport Modeling in Random CNT based Thin Films."

10:00 W2.3: E. Piccinini, F. Buscemi, M. Rudan, R. Brunetti, and C. Jacoboni, *University of Bologna, Italy*, "Monte Carlo simulation of sub-threshold trap-limited conduction in chalcogenide glasses."

10:20 *Coffee Break*

10:40 **Session W3**: *Electron Dynamics and Semiconductor Devices*

10:40 W3.1: D. J. Denninghoff, D. Dasgupta, D. F. Brown, S. Keller, J. Speck, and U. K. Mishra, *University of California, Santa Barbara, USA*, "Analysis of effect of source-drain spacing of N-polar GaN MIS-HEMTs with 310-GHz fmax."

11:00 W3.2: D. Guerra, F. Marino, R. Akis, S. M. Goodnick, D. K. Ferry, and M. Saraniti, *Arizona State University, USA,* "Carrier Dynamics Study on Transit Time and Frequency response in Highly Scaled HEMTs through Full-Band Monte Carlo Device Simulations."

11:20 W3.3: M. V. Fischetti and S. Jin, *University of Texas Dallas, USA*, "An empirical pseudopotential appraoch to surface and line-edge roughness scattering in nanostructures: Application to SI thin films and nanowires and to graphene nanoribbons."

11:40 W3.4: A. Martinez, and A. Asenov, *University of Glasgow, UK*, "Nanoscale-dissipation in Gate-All-Around FET using a NEGF formalism."

12:00 W3.5: M. Mohamed, W. Vitale, Z. Aksamija, F. Ismail, and U. Ravaioli, *University of Illinois at Urbana-Champaign, USA,* "Coupled Electro-thermal Modeling of Self-Heating in SOI Nanowire."

12:20 **Conference Excursion/Free Afternoon**

Thursday, August 11th

8:30 **Session Th1**: *Carrier Dynamics and Terahertz Phenomena*

8:30 Th1.1: (*Invited*) M. Asada and S. Suzuki, *Tokyo Institute of Technology, Japan*, "Terahertz Oscillation of Resonant Tunneling Diodes at Room Temperature."

9:00 Th1.2: S. Preu, P. Burke, M. S. Sherwin and A. C. Gossard, *University of California Santa Barbara, USA*, "THz Detection with Antenna-Coupled Field Effect Transistors at Room Temperature."

9:20 Th1.3: S. Boubanga-Tombet, S. Chan, A. Satou, T. Watanabe, V. Ryzhii, and T. Otsuji, *Tohoku University, Japan*, "Amplified Stimulated Terahertz Emission at Room Temperature from Optically Pumped Graphene."

9:40 Th1.4: J. Torres, F. Teppe, P. Nouvel, S. Boubanga-Tombet, A. El Moutaouakil, D. Coquillat, N. Dyakonova, C. Palermo, W. Knap, L. Varani, T. Ostuji, E. Starikov, P. Shiktorov, V. Gružinskis, Y. Roelens, A. Shchepetov, and S. Bollaert, *University of Montpellier II, France*, "Terahertz Emissions from Optically Excited Plasma Oscillations in HEMTs."

10:00 Th1.5: M. C. Hoffmann and D. Turchinovich, *University of Hamburg, Germany*, "Ultrafast nonlinear carrier dynamics in doped semiconductors in high THz fields."

10:20 *Coffee Break*

10:50 **Session Th2**: *Semiconductor Lasers and Quantum Cascade Devices*

10:50 Th2.1: (*Invited*) J. Bessette, *Massachusetts Institute of Technology, USA*, "A Germanium-on-silicon Laser for On-chip Integrated Photonic Applications."

11:20 Th2.2: M. Martl, J. Darmo, C. Deutsch, M. Brandstetter, A. Benz, A. M. Andrews, P. Klang, G. Strasser, and K. Unterrainer, *Vienna University of Technology, Austria*, "Probing double metal THz quantum cascade laser dynamics by THz time-domain spectroscopy."

11:40 Th2.3: T. Grange, and P. Vogl, *Walter Schottky Institute, Technical University of Munich, Germany*, "Theory of nanowire-based quantum cascade laser."

12:00 *Lunch*

1:30 **Session Th3**: *Graphene Materials and Devices*

1:30 Th3.1: (*Invited*) T. Mueller, *Vienna University of Technology, Austria,* "Optical interactions with graphene."

2:00 Th3.2: N. Mori and Ando, *Osaka University, Japan,* "The magnetophonon effect in monolayer graphene."

2:20 Th3.3: T. Nakanishi, M. Koshino and T. Ando, *AIST, Japan*, "Effective-mass theory of boundary properties between multilayer graphenes."

2:40 Th3.4: S. Aboud, S. M. Goodnick, and M. Saraniti, *Stanford University, USA*, "Phonon Modes and Electron Transport in Graphene Nanoribbons."

3:00 **Poster Session II**

P2.1: H. Marinchio, C. Palermo, J. Torres, L. Varani, P. Shiktorov, E. Starikov and V. Gružinskis, *University Montpellier II, France*, "External excitation of hybrid plasma modes in FETs."

P2.2: B. G. Vasallo, H. Rodilla, T. González, G. Moschetti, J. Grahn, and J. Mateos, *University of Salamanca, Spain*, "Monte Carlo study of Kink-effect and related noise in InAs HEMTs with isolated gate."

P2.3: Z. Aksamija, E. B. Ramayya, and I. Knezevic, *University of Wisconsin-Madison, USA,* "Thermal and thermoelectric properties of SOI nanomembranes, Si nanowires, and Si/Ge superlattices."

P2.4: C. Riddet, K. H. Chan and A. Asenov, *University of Glasgow, UK*, "Full-band Monte Carlo Simulations of Hole Transport in Germanium: from bulk material to devices."

P2.5: N. Sawaki, T. Kimata, J. Sugiura, and S. Takuwa, *Aichi Institute of Technology, Japan*, "Modification of current localization in a percolation network."

P2.6: S. Tani, M. Nagai, H. Hirori, and K. Tanaka, *Kyoto University, Japan*, "Enhancement of carrier scattering rate near the Mott density in photo-excited semiconductors."

P2.7: A. Cappelli, R. Brunetti, C. Jacoboni, F. Buscemi, and E. Piccinini, *University of Modena and Reggio Emiglia, Italy*, "Electric-field effect on phonon-induced electronic transitions between localized states in hopping conduction."

P2.8: V. Ryzhii, M. Ryzhii, A. Satou, T. Otsuji, and V. Mitin, *University of Aizu, Japan*, "Nonequilibrium Carriers and Phonons in Optically Excited Graphene: Heating and Cooling."

P2.9: F. Buscemi, P. Bordone, and A. Bertoni, *University of Bologna, Italy*, "Quantum teleportation of electron states by using the integer quantum Hall regime."

P2.10: F. Buscemi, P. Bordone, and A. Bertoni, *University of Bologna, Italy*, "Quantum wires architectures of electron interferometers with distinguishable and indistinguishable particles."

P2.11: T. Novotný, F. Haupt, and W. Belzig, *Charles University Prague, Czech Republic*, "Inelastic effects on the electronic current noise through nanojunctions."

P2.12: M. Carretero, M. Álvaro, L. L. Bonilla, *University Carlos III Madrid, Spain*, "Spatially confined Bloch oscillations in semiconductor superlattices."

P2.13: D. M.Gaponova, V. Ya. Aleshkin, L. V. Gavrilenko, Z. F. Krasil'nik, D. I. Kryzhkov, D. I. Kuritsyn, S. M. Sergeev, V. G. Lyssenko, C. B. Sørensen, *Institute for Physics of Microstructures, Russian Academy of Sciences, Nizhny Novgorod, Russia*, "Hole Tunneling in Coupled GaAs/Al(Ga)As Quantum Wells Under Electric Field."

P2.14: A. A. Andronov, E. P. Dodin, D. I. Zinchenko and Yu. N. Nozdrin, *Institute for Physics of Microstructures, Russian Academy of Sciences, Nizhny Novgorod, Russia*, "Identification of the long range electron tuneling in Wannier-Stark laser weak barrier superlattices by optical modulation."

P2.15: T. Papenkort, T. Kuhn, and P. M. Axt, *University Münster, Germany*, "LO phonon generation dynamics in optically driven quantum wells."

P2.16: O. Morandi, *Technical University of Graz, Austria*, "Wigner approach for quantum transport of the electrons and holes in graphene."

P2.17: W. Lee, U. Ravaioli, *University of Illinois at Urbana-Champaign*, *USA*,"The P3M (particle-particle-particle-mesh) Method to Treat Discrete-impurity Scattering in 2D Monte Carlo Simulations."

P2.18: A. K. Storebo, T. Brudevoll, O. Skaaring, C. Kirkemo, O. C. Norum, and O. Olsen, *FFI (Norwegian Defense Research Establishment), Kjeller, Norway*, "Cooling Dynamics of Photoexcited Carriers in HgCdTe."

6:00 **Buses leave for Banquet**

6:30 **Reception and Banquet: Santa Barbara Museum of Natural History**

Friday, August 12th

8:30 **Session F1**: *Micro- and Nano-mechanical Systems*

8:30 F1.1: (*Invited*) E. M. Weig, *Ludwig-Maximilians University, Germany,* "Near-field cavity optomechanics."

9:00 F1.2: (*Invited*) H. Okamoto, D. Ito, T. Watanabe, K. Onomitsu, H. Sanada, H. Gotoh, T. Sogawa, and H. Yamaguchi, *NTT Basic Research Laboratories, Japan,* "Carrier-mediated opto-mechanical coupling in GaAs micromechanical resonators."

9:30 F1.3: D. Hatanaka, I. Mahboob, and H. Yamaguchi, *NTT Basic Research Laboratories, Japan*, "Contactless actuation of a GaAs/AlGaAs based piezoelectric mechanical resonator."

9:50 *Coffee Break*

10:20 **Session F2**: *Transport Phenomena*

10:20 F2.1: T. Ihara, J. R. Cardenas, R. Ferreira, G. Bastard and K. Hirakawa, *University of Tokyo, Japan,* "Photoquenching of transient miniband transport in semiconductor superlattices."

10:40 F2.2: M. Feiginov, C. Sydlo, O. Cojocari and P. Meissner, *Technical University Darmstadt, Germany*, "On the Inherent Limitations of RTD Oscillators: Operation Beyond Tunnel-Lifetime Limit."

11:00 F2.3: J. Silvano de Sousa, H. Detz, P. Klang, M. Nobile, A. M. Andrews, W. Schrenk, E. Gornik, G. Strasser, and J. Smoliner, *Vienna University of Technology, Austria,* "Large Spin and Non-parabolicity Effects In InGaAs/GaAsSb Resonant Tunneling Diodes."

11:20 *Closing Remarks***:** Umesh Mishra, *University of California Santa Barbara*