TeraNano V: Fifth International Symposium on Terahertz Nanoscience

December 1-5, 2014
Hôtel La Batelière, Schœlcher, Martinique

Organizers: Jean Léotin (Toulouse University, France), Junichiro Kono (Rice University), and Masayoshi Tonouchi (Osaka University)

Sunday, November 30, 2014	
16:00 – 18:00	Check in, *Registration table will be in lobby (Registration table will move to Sapotille Meeting room December 1st - 5th)*
18:00 – 21:00	Welcome Cocktail Reception, *Sapotille Meeting Room*

Monday, December 1, 2014	
8:30 – 9:00	**OPENING: President of Region Martinique, Serge Letchimy** ***Lafitte Meeting Room***
9:00 – 10:30	**SESSION 1: Ultrafast and Nonlinear Spectroscopy** **Chair: Junichiro Kono (Rice University, U.S.A.)** ***Lafitte Meeting Room***
09:00 – 09:50	**Rupert Huber** (University of Regensburg, Germany) *New frontiers of sub-cycle THz optics: the fast, the strong and the small (plenary talk)*
09:50 – 10:10	**Tetsuo Ogawa** (Osaka University, Japan) *Mechanism of high-order harmonic generation in semiconductors under strong electric field (invited talk)*
10:10 – 10:30	**Mackillo Kira** (Philipps-University, Germany) *Extreme spectroscopies with semiconductors (invited talk)*
10:30 – 10:50	Coffee Break
10:50 – 12:10	**SESSION 2: THz Devices and Technology** **Chair: Mackillo Kira (Philipps-University, Germany)** ***Lafitte Meeting Room***
10:50 – 11:10	**Kenji Ikushima** (Tokyo University of A & T, Japan) *Manipulating THz photons on a solid state chip surface (invited talk)*
11:10 – 11:30	**Ken Wood** (QMC Instruments, Ltd., UK) *Cryogen-free technology: high sensitivity THz detection and imaging (invited talk)*
11:30 – 11:50	**Jeffrey Hesler** (Virginia Diodes, Inc., U.S.A.) *THz harmonic mixers for quantum cascade laser phase locking (invited talk)*
11:50 – 12:10	**Miriam S. Vitiello** (NEST, CNR-Istituto Nanoscienze and Scuola Normale Superiore, Italy) *Novel materials for high-performance THz nanodetectors (invited talk)*

12:10 – 13:30	Included Lunch
13:30 – 15:00	**SESSION 3: Magnetospectroscopy** **Chair: Jean Léotin (Toulouse University, France)** ***Lafitte Meeting Room***
13:30 – 14:00	**Bruce D. McCombe** (University at Buffalo, U.S.A.) *Using THz Magnetospectroscopy to study spin and spin-orbit effects in narrow gap semiconductors and their nanostructures (master talk)*
14:00 – 14:20	**Masaya Nagai** (Osaka University, Japan) *THz spectroscopy using a few-cycle circularly polarized THz pulses (invited talk)*
14:20 – 14:40	**Stephan Winnerl** (Helmholtz-Zentrum Dresden-Rossendorf, Germany) *Ultrafast spectroscopy on Landau quantized graphene: Evidence for strong Auger scattering (invited talk)*
14:40 – 15:00	**Dmitry Smirnov** (National High Magnetic Field Laboratory, U.S.A.) *Magnetic-field tunable Dirac plasmons (invited talk)*
15:00 – 15:30	Coffee Break
15:30 – 17:00	**SESSION 4: THz Sources and Strong-Field Phenomena** **Chair: Bruce McCombe (University at Buffalo, U.S.A.)** ***Lafitte Meeting Room***
15:30 – 15:50	**Mona Jarrahi** (University of California Los Angeles, U.S.A.) *Plasmonic THz sources for high performance terahertz imaging and spectroscopy (invited talk)*
15:50 – 16:10	**Thomas Dekorsy** (Konstanz University, Germany) *Large-area THz emitters and high-speed asynchronous optical sampling (invited talk)*
16:10 – 16:30	**Dmitry Turchinovich** (Max Planck Institute for Polymer Research, Germany) *Graphene in strong THz fields (invited talk)*
16:30 – 16:50	**Tsuneyuki Ozaki** (INRS-EMT, Advanced Laser Light Source, INRS, Canada) *Intense-THz-field-induced carrier dynamics in graphene (invited talk)*
16:50 – 17:00	**Jérome Tignon** (Ecole Normale Supérieure, CNRS, France) *Injection seeding of metal-metal THz quantum cascade lasers (invited talk)*
17:00 – 18:00	Happy Hour I: Posters, Demos & Company Exhibitions with Drinks and Hors d'oeuvres (Sapotille Meeting Room)

TUESDAY, December 2, 2014	
Early Morning	Breakfast on your own.
9:00 – 10:30	**SESSION 5: THz Technology** **Chair: Masayoshi Tonouchi (Osaka University, Japan)** ***Lafitte Meeting Room***
09:00 – 09:50	**Tadao Nagatsuma** (Osaka University, Japan) *Present and future of THz wireless communications (plenary talk)*
09:50 – 10:10	**Iwao Hosako** (NICT, Japan) *Phase-locking of a THz-QCL using a low noise HEB mixer and a THz frequency-comb as a reference (invited talk)*
10:10 – 10:30	**Anselm Deninger** (TOPTICA Photonics AG, Germany) *Progress in 1.5 μm technology for pulsed and CW THz applications (invited talk)*
10:30 – 10:50	Coffee Break
10:50 – 12:10	**SESSION 6: Advanced THz Spectroscopy** **Chair: Ken Wood (QMC Instruments, Ltd., UK)** ***Lafitte Meeting Room***
10:50 – 11:10	**Eiji Kato** (Advantest America, Inc., U.S.A.) *Recent progresses in scientific and practical industrial application using rapid and all-fiber THz wave sampling instrument (invited talk)*
11:10 – 11:30	**Toshihiko Kiwa** (Okayama University, Japan) *Immune assay using a laser-excited THz technique (invited talk)*
11:30 – 11:50	**Yuichi Ogawa** (Kyoto University, Japan) *Characterization of the water dynamics inside cells using THz attenuated total reflection spectroscopy (invited talk)*
11:50 – 12:10	**Hitoshi Tabata** (University of Tokyo, Japan) *THz and near-infrared plasmonics for biosensing (invited talk)*
12:10 – 13:30	Included Lunch
13:30 – 15:00	**SESSION 7: Spectroscopy of Nanostructures** **Chair: Petr Kužel (Academy of Sciences of the Czech Republic)** ***Lafitte Meeting Room***
13:30 – 14:00	**Susumu Komiyama** (University of Tokyo, Japan) *Passive THz near-field microscopy of matters (master talk)*
14:00 – 14:20	**Rainer Hillenbrand** (CIC nanoGUNE, and UPV/EHU, Spain) *Infrared nanoscopy and nanospectroscopy - from plasmons to proteins (invited talk)*
14:20 – 14:40	**Kazuhiko Hirakawa** (University of Tokyo, Japan) *THz spectroscopy of single InAs quantum dots (invited talk)*
14:40 – 14:50	**Harald Schneider** (Helmholtz-Zentrum Dresden-Rossendorf, Germany) *THz dephasing of intersublevel transitions in InAs/GaAs quantum dots (contributed talk)*
14:50 – 15:00	**Weilu Gao** (Rice University, U.S.A.) *Nonlinear current-voltage characteristics of GaAs/AlGaAs nanoconstrictions driven by the Gunn effect (contributed talk)*

15:00 – 15:30	Coffee Break
15:30 – 17:00	**SESSION 8: THz Dynamics in Nanosystems** **Chair: Susumu Komiyama (University of Tokyo, Japan)** ***Lafitte Meeting Room***
15:30 – 15:50	**Petr Kužel** (Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic) *THz photoconductivity in nanoscaled systems: effective medium theory aspects (invited talk)*
15:50 – 16:10	**Hannah J. Joyce** (University of Cambridge, UK) *Accurate contact-free measurement of charge carrier dynamics and transport in III-V nanowires (invited talk)*
16:10 – 16:30	**David G. Cooke** (McGill University, Canada) *Exciton dynamics in quantum dots and rods probed with multi-THz spectroscopy (invited talk)*
16:30 – 16:50	**Mikhail E. Portnoi** (University of Exeter, U.S.A.) *THz transitions and excitons in narrow-gap carbon nanotubes (invited talk)*
16:50 – 17:00	**Hynek Němec** (Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic) *THz photoconductivity in light-emitting Si nanocrystals: The role of distribution of particle sizes (contributed talk)*
17:00 – 18:00	Happy Hour II: Posters, Demos & Company Exhibitions with Drinks and Hors d'oeuvres (Sapotille Meeting Room)

WEDNESDAY, December 3, 2014

Free Day, Explore Martinique!

THURSDAY, December 4, 2014	
Early Morning	Breakfast on your own.
9:00 – 10:30	**SESSION 9: THz Plasmonics and Metasurfaces** **Chair: Daniel M. Mittleman (Rice University, U.S.A.)** ***Lafitte Meeting Room***
09:00 – 09:50	**Dai-Sik Kim** (Seoul National University, Korea) *An array of infinitely long one-nanometer gaps for THz funneling (plenary talk)*
09:50 – 10:10	**Viacheslav Popov** (Kotelnikov Institute of Radio Engineering & Electronics (Saratov Branch, Russia) *THz photogalvanic currents on plasmonic metasurfaces (invited talk)*
10:10 – 10:30	**Wojciech Knap** (L2C & TERALAB, Montpellier University, France) *Physical limits of THz plasma field effect transistors (invited talk)*
10:30 – 10:50	Coffee Break
10:50 – 12:10	**SESSION 10: Intense THz Fields and THz Sources** **Chair: Dai-Sik Kim (Seoul National University, Korea)** ***Lafitte Meeting Room***
10:50 – 11:10	**Matthias C. Hoffmann** (SLAC National Accelerator Laboratory, U.S.A.) *THz field driven phase transition in VO_2 probed by ultrafast X-ray pulses (invited talk)*
11:10 – 11:30	**Yun-Shik Lee** (Oregon State University, U.S.A.) *THz control of semiconductor nanostructures (invited talk)*
11:30 – 11:50	**Kodo Kawase** (Nagoya University, Japan) *THz-wave parametric amplifier (invited talk)*
11:50 – 12:10	**Masahiro Asada** (Tokyo Institute of Technology, Japan) *Room-temperature resonant-tunneling-diode THz oscillators toward high frequency and high functionality (invited talk)*
12:10 – 13:30	Included Lunch
13:30 – 15:00	**SESSION 11: THz Generation and Detection in Graphene** **Chair: Robert Vajtai (Rice University, U.S.A.)** ***Lafitte Meeting Room***
13:30 – 13:50	**Juliette Mangeney** (Laboratoire Pierre Aigrain, France) *THz generation by optical rectification in graphene at room temperature (invited talk)*
13:50 – 14:00	**Avinash Rustagi** (University of Florida, U.S.A.) *THz radiation from accelerating photo-excited carriers in graphene (contributed talk)*
14:00 – 14:10	**Klaas-Jan Tielrooij** (ICFO – Institut de Ciéncies Fotóniques, Spain) *Ultrafast and broadband photosensing with graphene through efficient carrier heating (contributed talk)*
14:10 – 14:20	**Stephane Albon Boubanga-Tombet** (Tohoku University, Japan) *THz detection using a dual-grating-gate plasmonic detector (contributed talk)*

14:20 – 14:40	**Sergey Mikhailov** (University of Augsburg, Germany) *Quantum theory of harmonics generation in graphene and semiconductor electron systems (invited talk)*
14:40 – 15:00	**Alexey Belyanin** (Texas A&M University, U.S.A.) *Terahertz nonlinear optics of graphene and 3D topological insulators (invited talk)*
15:00 – 15:30	Coffee Break
15:30 – 16:50	**SESSION 12: THz Detectors and Sources** **Chair: Alexey Belyanin (Texas A&M University, U.S.A.)** ***Lafitte Meeting Room***
15:30 – 15:50	**Vladimir V. Mitin** (University at Buffalo, U.S.A.) *THz and infrared detectors based on double-graphene-layer structures (invited talk)*
15:50 – 16:10	**Taiichi Otsuji** (Tohoku University, Japan) *Graphene heterostructures for current-injection THz lasing (invited talk)*
16:10 – 16:30	**Mahi R. Singh** (Holon Institute of Technology, Israel) *The study of graphene nanocomposites for THz applications (invited talk)*
16:30 – 16:50	**Alexey Kavokin** (University of Southampton, UK) *Bosonic cascade lasers (invited talk)*
16:50 – 17:00	Break
17:00 – 18:00	**SESSION 13: THz Education** **Chair: Jean Léotin (Toulouse University, France)** ***Lafitte Meeting Room***
17:00 – 17:05	**Jean Leotin** (Toulouse University, France)
17:05 – 17:15	**Eiji Kato** (Advantest America, Inc., U.S.A.)
17:15 – 17:25	**James Bain** (M Squared Lasers, UK)
17:25 – 17:35	**Ken Wood** (QMC Instruments, Ltd., UK)
17:35 – 17:45	**Anselm Deninger** (TOPTICA Photonics AG, Germany)
17:45 – 17:55	**Jeffrey Hesler** (Virginia Diodes, Inc., U.S.A.)
17:55 – 18:10	Panel discussion
18:00 – 19:00	*Free Time*
19:00 – 22:00	Conference Banquet, Buses will meet attendees at the Hôtel La Batelière and take them to La Fontane for dinner and drinks.

FRIDAY, December 5, 2014	
9:00 – 10:30	**SESSION 14: POSTER SESSION** ***Sapotille Meeting Room***
10:30 – 10:50	Coffee Break
10:50 – 12:10	**SESSION 15: THz Spectroscopy of Condensed Matter** **Chair: Christopher J. Stanton (University of Florida, U.S.A.)** ***Lafitte Meeting Room***
10:50 – 11:10	**Chiko Otani** (RIKEN, Japan) *THz-IR-vis spectroscopy of organic conducting polymer PEDOT:PSS (invited talk)*
11:10 – 11:30	**Kouhei Takahashi** (Panasonic Corporation, Japan) *Indication of an ultrafast Seebeck effect in THz emission from thermoelectric thin films (invited talk)*
11:30 – 11:50	**Noriaki Kida** (University of Tokyo, Japan) *Visualization of ferroelectric domains and domain walls in organic ferroelectrics using emission of THz radiation (invited talk)*
11:50 – 12:00	**Shin Miyahara** (Fukuoka University, Japan) *Theory of dynamical magnetoelectric effects in multiferroic materials via magnon excitations (contributed talk)*
12:00 – 12:10	**Jonathan Ludwig** (National High Magnetic Field Laboratory, Japan) *Cyclotron resonance of single valley Dirac fermions in a gapless HgTe quantum well (contributed talk)*
12:10 – 13:30	Included Lunch
13:30 – 15:00	**SESSION 16: Nanoscale Imaging and Spectroscopy** **Chair: Manfred Helm (Helmholtz-Zentrum Dresden-Rossendorf, Germany)** ***Lafitte Meeting Room***
13:30 – 14:00	**Fritz Keilmann** (Ludwig-Maximilians-Universität, München, Germany) *THz nanoscopy from 2DEG to interstellar dust (master talk)*
14:00 – 14:20	**Yukio Kawano** (Tokyo Institute of Technology, Japan) *Semiconductor and graphene devices for nanoscale THz imaging and spectroscopy (invited talk)*
14:20 – 14:30	**Koichiro Tanaka** (Kyoto University, Japan) *THz near-field sensing with fractal metallic structure (contributed talk)*
14:30 – 14:50	**Hiroaki Minamide** (RIKEN, Japan) *Real-time THz-wave imaging using nonlinear up-conversion detection (invited talk)*
14:50 – 15:00	**Gaetano Scamarcio** (Univ. degli Studi e Politecnico di Bari, Italy) *Imaging of free carriers by self-mixing in THz quantum cascade lasers (contributed talk)*
15:00 – 15:30	Coffee Break

15:30 – 17:00	**SESSION 17: THz Components and Devices** **Chair: Fritz Keilmann (Ludwig-Maximilians-Universität, München, Germany)** ***Lafitte Meeting Room***
15:30 – 15:40	**Alexander Shkurinov** (Russian Academy of Sciences, Russia) *Functional magnetic, semiconductor and oxide nanoscale materials studied by THz linear and nonlinear spectroscopy lasers (contributed talk)*
15:40 – 15:50	**Daniel M. Mittleman** (Rice University, U.S.A.) *Stacked-metallic-plate artificial dielectrics for the THz region (contributed talk)*
15:50 – 16:10	**Pernille Klarskov** (Technical University of Denmark, Denmark) *Field enhancing coupling between lattice modes and microslits resonant at THz frequencies (contributed talk)*
16:10 – 16:30	**Yutaka Kadoya** (Hiroshima University, Japan) *Asymmetric bull's eye coupler generating focused axial THz electric field (invited talk)*
16:30 – 16:40	**Kimberly S. Reichel** (Rice University, U.S.A.) *In situ spectroscopic characterization of a THz resonant cavity (contributed talk)*
16:40 – 16:50	**Robert Vajtai** (Rice University, U.S.A.) *Hot-silicon THz attenuator (contributed talk)*
16:50 – 17:00	**Closing:** ***Lafitte Meeting Room***