

CSW 2017

Compound Semiconductor Week 2017



ISCS 2017
The 44th International
Symposium on Compound
Semiconductor



IPRM 2017
The 29th International Conference
on Indium Phosphide and Related
Materials



Sunday, May 14th

13:30 h **Short Course 1: Lateral GaN power devices, circuits and technologies**

Patrick Waltereit, Fraunhofer IAF, Freiburg, Germany

Room Köpenick, 3rd Floor

14:00 h **Long Course (Part 1): Photonic Integrated Circuits in Indium-Phosphide**

Moritz Baier, Fraunhofer HHI, Berlin, Germany

Room Friedrichshain, 4th Floor

15:30 h **Coffee Break**

16:00 h **Short Course 2: Topological Spintronics**

Nitin Samarth, Department of Physics, Pennsylvania State University, PE, USA

Room Köpenick, 3rd Floor

16:30 h **Long Course (Part 2): Photonic Integrated Circuits in Indium-Phosphide**

Moritz Baier, Fraunhofer HHI, Berlin, Germany

Room Friedrichshain, 4th Floor

18:00 h **Welcome Reception**

Lichthof, 1st Floor

Monday, May 15th

08:00 h–12:30 h

8:00 h **Registration**

Atrium I–II, 1st Floor

08:30 h **Opening**

*Conference Chair: Henning Riechert,
Paul-Drude-Institut, Berlin, Germany*

*Programm Chair: Martin Walther,
Fraunhofer IAF, Freiburg, Germany*

08:45 h **Plenary Session I**

*Yong-Hee Lee, Korea Advanced Institute of Science
and Technology (KAIST), Korea*

Very Small Semiconductor Lasers

Heike Riel, IBM Research, Zurich, Switzerland

**III-V Semiconducting Nanostructures on Si.
What are they good for?**

10:10 h **Coffee Break**

10:30 h **Plenary Session II**

Debdeep Jena, Cornell University, NYC, USA

**Do 2D crystals really offer anything NEW for
electronics or photonics?**

Martin Straßburg, Osram-Licht AG, Munich, Germany

LEDs: State of the art and upcoming trends

12:00 h **Award Ceremony**

Monday, May 15th

14:00 h–16:00 h

A1 – Vertical High Voltage Devices

Room: Atrium I–II, 1st Floor

Chair: Tomas Palacios, MIT – Massachusetts Institute of Technology, USA

A1.1 Vertical high-voltage GaN pin diodes on Si

14:00 h *Yuhao Zhang, Daniel Piedra and Min Sun*

INVITED

(Massachusetts Institute of Technology, USA); Jonas Hennig (Otto-von-Guericke-University Magdeburg, USA); Armin Dadgar (Universität Magdeburg, Germany); Tomas Palacios (Massachusetts Institute of Technology, USA)

A1.2 New Heterostructure Concepts for III-Nitride High-Frequency Devices

14:30 h

INVITED

Siddharth Rajan (The Ohio State University, USA)

A1.3 Fully vertical GaN p-n diode on Si substrate with conductive buffer layer

15:00 h

Suguru Mase (Nagoya Institute of Technology, Japan)

A1.4 1.3 kV AlGaIn/GaN nanowire-based Schottky barrier diodes with ultra-low leakage current

15:15 h

Jun Ma (POWERlab, EPFL, Switzerland); Elison Matioli (EPFL, Switzerland)

A1.5 Diamond Based Power Electronic Devices using Bulk Diamond Substrates

15:30 h

INVITED

Srabanti Chowdhury (UC Davis & ASU, USA)

Monday, May 15th

14:00 h–16:00 h

B1 – Nanowires: Growth I

Room: Atrium IV–V, 1st Floor

Chair: Grace Xing, Cornell University, USA

B1.1 Comprehensive insights into Si-doping of catalyst-free InAs nanowires

14:00 h

Gregor Koblmüller (Technische Universität München & Walter Schottky Institut, Germany)

B1.2 Influence of strain relaxation in axial (In,Ga)N/GaN nanowire heterostructures on their polarization potentials and electronic properties

14:15 h

Oliver Marquardt (Paul-Drude-Institut für Festkörperelektronik, Germany)

B1.3 Understanding and controlling diameter widening during self-assisted growth of GaAs nanowires

14:30 h

Hanno Küpers, Ryan Lewis and Abbas Tahraoui (Paul-Drude-Institut für Festkörperelektronik, Germany); Mathias Matalla and Olaf Krüger (Ferdinand-Braun-Institut, Germany); Faebian Bastiman, Henning Riechert and Lutz Geelhaar (Paul-Drude-Institut für Festkörperelektronik, Germany)

B1.4 Fabrication of InAs in-plane nanowires with raised heavily doped contacts using selective area molecular beam epitaxy

14:45 h

Ludovic Desplanque (Institute of Electronics, Microelectronics and Nanotechnology, France)

B1.5 Thick InGaN shell grown coaxially on GaN microrods: Direct visualization of selective Indium incorporation

15:00 h

Frank Bertram, Marcus Müller, Sebastian Metzner, Peter Veit and Jürgen Christen (Otto von Guericke University Magdeburg, Germany); Jana Hartmann (TU Braunschweig, Germany); Hao Zhou (TU Braunschweig, Germany); Andreas Waag (TU Braunschweig); H Wehmann (TU Braunschweig, Germany)

B1.6 InGaAs nanowire avalanche photodiodes with a separate-absorption-multiplication structure

15:15 h

Xiao Meng and Diana Huffaker (Cardiff University, United Kingdom); Alan Farrell (University of California at Los Angeles, USA)

B1.7 Transport in Nanowire Structures

15:30 h

Jim Greer (Tyndall National Institute, Ireland)

INVITED

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C1 – Photonic Integrated Circuits

Room: Köpenick 3rd Floor

Chair: Norbert Grote, Fraunhofer Heinrich-Hertz-Institut, Germany

C1.1 III-V-on-silicon photonic integrated circuits for communication and sensing applications

14:00 h

INVITED

Gunther Roelkens (Ghent University - IMEC, Belgium)

C1.2 64 Gbit/s Generation from a Fully Integrated Serial 0.25 x 2.0 mm² Dual-Polarization Electroabsorption Modulator PIC in InP

14:30 h

Moritz Baier (Fraunhofer Heinrich Hertz Institut, Germany); Francisco M. Soares (Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, Germany); Marko Gruner (Fraunhofer Institut für Nachrichtentechnik, Heinrich-Hertz-Institut, Germany); Tom Gaertner (Fraunhofer Heinrich Hertz Institut, Germany); Martin Moehrle (Fraunhofer Heinrich-Hertz-Institute, Germany); Norbert Grote and Martin Schell (Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, Germany)

C1.3 Wide bandwidth and high responsivity of InP-based photodetector monolithically integrated with 90° hybrid for over 400 Gbps coherent transmission systems

14:45 h

Takuya Okimoto (Sumitomo Electric Device Innovations, Inc., Japan); Hideki Yagi (Sumitomo Electric Industries, LTD., Japan); Ryuji Masuyama, Kenji Sakurai and Yoshifumi Nishimoto, Kazuhiko Horino, Takayuki Watanabe (Sumitomo Electric Device Innovations, Inc., Japan); Mitsuru Ekawa (Sumitomo Electric Industries, Ltd., Japan); Yoshihiro Yoneda (Sumitomo Electric Device Innovations, Inc., Japan)

C1.4 TxRx InP PIC integration platform on semi-insulating substrate

15:00 h

INVITED

Moritz Baier (Fraunhofer Heinrich Hertz Institut, Germany)

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C1.5 InP-based photonic crystal microcavities embedded with InAs quantum dots for telecom wavelengths

15:30 h

Andrei Kors and Johann Peter Reithmaier (University of Kassel, Germany); Mohamed Benyoucef (Institute of Nanostructure Technologies and Analytics (INA), CINSaT, University of Kassel, Germany)

C1.6 Monolithic Polarization Controller with InGaAlAs/InAlAs Multiple-Quantum-Well Phase Shifter

15:45 h

Mohiyuddin Kazi, Samir Ghosh and Hassanet Sodabanlu, Takuo Tanemura and Yoshiaki Nakano (University of Tokyo, Japan)

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14:00 h–16:00 h

D1 – 2D Heterostructures

Room: Friedrichshain, 4th Floor

Chair: Joao Marcelo J. Lopes, Paul-Drude-Institut, Germany

D1.1 Semiconductor Heterojunctions Based on 2D

14:00 h **Materials**

INVITED

Yasumitsu Miyata (Tokyo Metropolitan University, Japan)

D1.2 Electronic Band Structure Investigations of Various 2D Materials/van der Waals Heterostructures Using Synchrotron-based Techniques (e.g. nanoARPES)

14:30 h

INVITED

Maria-Carmen Asensio (Synchrotron Soleil, Saint-Aubin, France)

D1.3 van der Waals Epitaxy of 2D Materials

15:00 h

INVITED

Fabrizio Arciprete (University of Rome Tor Vergata, Italy & Paul-Drude Institute, Germany)

D1.4 Growth of h-BN and h-BN/graphene

15:30 h

heterostructures using molecular beam epitaxy

Siamak Nakhaie, Joseph Wofford, Uwe Jahn and Thilo Krause (Paul-Drude-Institut für Festkörperelektronik, Germany); Xianjie Liu (Linköping University, Germany); Manfred Ramsteiner, Michael Hanke, Marcelo Lopes and Henning Riechert (Paul-Drude-Institut für Festkörperelektronik, Germany)

D1.5 Realization of a vertical topological p-n junction in Sb₂Te₃/Bi₂Te₃ heterostructures

15:45 h

Gregor Mussler (Peter Grünberg Institute & Forschungszentrum Jülich, Germany)

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16:30 h–18:30 h

P1 – Poster Session I

Room: Kreuzberg, 3rd Floor (Poster P1.1–P1.24)
Charlottenburg, 4th Floor (Poster P1.25–P1.48)
Atrium III, 1st Floor (Poster P1.49–P1.60)

Room Kreuzberg, 3rd Floor

P1.1 Modeling and optimization of InGaN-based double-junction solar cell

Abdoulwahab Adaine (Université de Lorraine, Laboratoire Matériaux Optiques Photonique et Systèmes, Metz & Laboratoire Matériaux Optiques Photonique et Systèmes, CentraleSupélec, Université Paris-Saclay, Metz, France)

P1.2 Polarization dependence of photoluminescence from InAs quantum dots and superlattice grown by digital embedding on InP(311)B substrates

Kouichi Akahane (National Institute of Information and Communications Technology, Japan); Hiroyuki Yamamoto (Aoyama Gakuin University, Japan); Atsushi Matsumoto, Toshimasa Umezawa (National Institute of Information and Communication Technology (NICT), Japan); Hideyuki Sotobayashi (Aoyama Gakuin University, Japan); Naokatsu Yamamoto (National Institute of Information and Communications Technology, Japan)

P1.3 GaN based vertical n channel MISFETs for switching applications

Eldad Bahat Treidel, Oliver Hilt (FBH, Germany); Julian Stöver (EIT+, Poland); Veit Hoffmann and Frank Brunner, Karina Ickert, Stefan Hochheim (Ferdinand-Braun-Institut, Germany); Franziska Naumann and Hassan Gargouri (SENTECH, Germany); Bryan Martinez, Markus Weyers, Joachim Wuerfl (Ferdinand-Braun-Institut, Germany)

P1.4 Physical Simulation of Transferred substrate InP/InGaAs DHBT

Mohamed Brahem, Dimitri Stoppel, Nils Weimann (Ferdinand-Braun-Institut, Germany)

P1.5 Analysis of Thermal Mechanisms of Current Gain in Quantum Well-Based Heterojunction Bipolar Transistor

Yun-Hsuan Chang, Yung-Lin Chou, Cheng-Han Wu and Chao-Hsin Wu (National Taiwan University, Taiwan)

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- P1.6 Aiming towards hybrid SML-SK quantum dot heterostructures for infrared photodetector application**
Debabrata Das, Debi Panda, Vinayak Chavan and Nilesh Shinde (Indian Institute of Technology Bombay, India); Subhananda Chakrabarti (Center for Excellence in Nanoelectronics, IIT Bombay, India)
- P1.7 Degradation of InGaN-based solar cells under monochromatic photoexcitation**
Carlo De Santi and Matteo Meneghini (University of Padova, Italy); Ezgi Dogmus (IEMN-CNRS Lille, Italy); Malek Zegaoui (IEMN-CNRS, France); Farid Medjdoub (Institute of Electronics, Microelectronics and Nanotechnology, France); Alessandro Caria and Gaudenzio Meneghesso (University of Padova, Italy); Enrico Zanoni (DEI, Italy)
- P1.8 GaSb based Mid-Infrared Photonic Materials and Devices Monolithically grown onto Silicon**
E. Delli, P. D. Hodgson E. Repiso, A. Craig, A. Marshall, A. Krier and P.J. Carrington (Lancaster University, United Kingdom)
- P1.9 Surface properties of n-, p-, and semi-insulating GaN layers on sapphire**
Aqdas Fariza and Silvio Neugebauer, Andreas Lesnik Matthias Wieneke, Jürgen Bläsing and Hartmut Witte (Otto-von-Guericke University & Institut für Experimentelle Physik, Germany), Armin Dadgar (Universität Magdeburg, Germany); André Strittmatter (Otto-von-Guericke University & Institut für Experimentelle Physik, Germany);
- P1.10 Power law photoluminescence transients from polar (In,Ga)N/GaN quantum wells: Impact of nonradiative recombination and diffusion of electrons**
Felix Feix (Paul-Drude-Institut, Germany)
- P1.11 Wafer scale formation of self-organized GaInP nanopillars by ion bombardment**
Gabriel Haddad, Juliana Jaramillo Fernandez, Dennis Visser, Yohan Désières and Clivia Sotomayor Torres, Srinivasan Anand (KTH Royal Institute of Technology,

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Sweden)

- P1.12 InP/InGaAs nano-ridge array on exact (001) silicon substrate emitting at telecommunication wavelengths**
Yu Han, Qiang Li, Si Zhu and Kei May Lau (Hong Kong University of Science and Technology, Hong Kong)
- P1.13 Acousto-electric transport in coated epitaxial graphene on SiC**
Alberto Hernández-Mínguez, Abbas Tahraoui and Marcelo Lopes (Paul-Drude-Institut für Festkörperelektronik, Germany); Paulo Santos (Paul Drude Institut für Festkörperelektronik, Germany)
- P1.14 Characteristic improvement of red-light AlGaInP-based flip-chip micro LEDs**
Ray-Hua Horng (National Chiao Tung University, Taiwan)
- P1.15 Growth-condition-induced transition from vertical to horizontal growth of WS₂ thin films**
Emroj Hossain, Amit Shah, Carina B Maliakkal, Bagyshri A Chalke, Rudheer D Bapat, Nilesh Kulkarni and Arnab Bhattacharya (Tata Institute of Fundamental Research, India)
- P1.16 Direct growth of CdTe on a (211) Si substrate with vapor phase epitaxy using a metallic Cd source**
Kenji Iso (Tokyo University of Agriculture and Technology, Japan)
- P1.17 Scanning electron microscope imaging of the crystal structure and orientation of polytypic GaAs nanowires and the correlation with their optical properties**
Uwe Jahn (Paul-Drude-Institut für Festkörperelektronik, Germany)
- P1.18 Thermal Conductivity of Epitaxial Lateral Overgrown InP on Silicon**
Juliana Jaramillo Fernandez (KTH Royal Institute of Technology, Sweden); Emigdio Chavez-Angel (Catalan Institute of Nanoscience and Nanotechnology, Spain); Reza Sanatinia, Himanshu Kataria, Srinivasan Anand,

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Sebastian Lourdudoss, Clivia Sotomayor Torres (KTH Royal Institute of Technology, Sweden)

P1.19 Ten-fold enhancement of photoluminescence from InAs nanowires using an ultra-thin InP passivation layer

Pamela Jurczak and Yunyan Zhang (University College London, United Kingdom); Huiyun Liu (University College London & Torrington Place, London WC1E 6BT, United Kingdom)

P1.20 Lasing Characteristics and Temperature Dependence of 1.5 μm GaInAsP Laser Diode grown on Directly Bonded InP/Si substrate

N Kamada, Tetsuo Nishiyama, Yuya Onuki and Kazuhiko Shimomura (Sophia University, Japan)

P1.21 Electrical characterization of n-type GaAs:N δ -doped superlattices

Ryo Kato and Shuhei Yagi (Saitama University, Japan); Hiroyuki Yaguchi (Department of Electrical and Electronic Systems Engineering, Saitama University, Japan); Yoshitaka Okada (The University of Tokyo, Japan)

P1.22 Structural and optical characterization of InGaN/GaN ultrafine nanostructures fabricated by low-damage selective etching based on hydrogen assisted thermal decomposition

Akihiko Kikuchi (Sophia University, Japan)

P1.23 Photonic Crystal Circular Defect Laser for Intra-chip Optical Interconnections

Masahiko Kondow (Osaka University, Japan)

P1.24 Double-layer step formation on Si (100) surfaces by moderate-temperature annealing coupled with TBA exposure

Boram Kim (the University of Tokyo, Japan); Oliver Supplie (Ilmenau University of Technology, Germany); TQa Watanabe (The University of Tokyo, Japan); Agnieszka Paszuk (TU Ilmenau, Germany); Thomas

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Hannappel (Helmholtz Zentrum Berlin für Materialien und Energie, Germany); Yoshiaki Nakano and

Room Charlottenburg, 4th Floor

P1.25 Rotational twins in GaP/Si(111):As hetero-substrates and their impact on III-V nanowire growth

Christian Koppka and Lars Winterfeld (Technical University Ilmenau, Germany); Markus Feifel (Fraunhofer ISE, Germany); Matthias Steidl (Technical University Ilmenau, Germany); Agnieszka Paszuk (TU Ilmenau, Germany); Peter Kleinschmidt (TU Ilmenau, Institute of Physics, Germany); Erich Runge (Technical University Ilmenau, Germany); Thomas Hannappel (TU Ilmenau, Institute of Physics, Germany)

P1.26 Impact of rotational twin boundaries in GaP/Si(111) on III-V nanowire growth

Christian Koppka, Matthias Steidl, Lars Winterfeld and Katharina Peh, Peter Kleinschmidt (TU Ilmenau, Institute of Physics, Germany); Beatriz Galiana Blanco (Universidad Carlos III de Madrid, Spain); Thomas Hannappel, Erich Runge (Technical University Ilmenau, Germany)

P1.27 1.0 THz detection using InAs MOSHEMT on quartz glass

Eiji Kume (IRspec Corporation, Japan)

P1.28 Heterovalent ZnSe/GaAs/ZnSe double heterostructures and quantum wells grown using MBE

Maxwell Lassise, Guopeng Chen, Brian Tracy, Peng Wang, David J Smith and Yong-hang Zhang (Arizona State University, USA)

P1.29 High-Speed 850 nm VCSELs with 8% Indium-Alloyed Quantum Wells

Yan-Chien Lee, Chun-Yen Pong, Shan-Fong Leong and Chao-Hsin Wu (National Taiwan University, Taiwan)

P1.30 C-doped GaN buffer layer using propane for

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voltage enhancement of FETs

Andreas Lesnik (Otto-von-Guericke University & Institut für Experimentelle Physik, Germany)

P1.31 Au-free AlGaIn/GaN MIS-HEMTs with Embedded Current Sensing Structure for Power Switching Applications

Yung C. Liang (National University of Singapore, Singapore)

P1.32 Investigations of the Initial Growth of 2D MoS₂ via MOVPE

Matthias Marx (RWTH Aachen University, Germany)

P1.33 Binding & Dissociation Process of Influenza Virus with Sugar Chain monitored by Graphene FET

Kazuhiko Matsumoto (Osaka University, Japan)

P1.34 Improved Crystal Quality of AlN Layer Grown on 4 inch Sapphire Substrate by High Temperature Annealing in Nitrogen Atmosphere

Akira Mishima, Yuji Tomita, Yoshiki Yano, Koh Matsumoto and Toshiya Tabuchi, Hideto Miyake (Taiyo Nippon Sanso Corporation, Japan)

P1.35 Improved Ω c Contact by Pre-Annealing Process in Quaternary In_{0.04}Al_{0.65}Ga_{0.31}N/GaN HEMTs

Ha Jin Mun, Ji Hyun Hwang, Young-Ki Kwon, Sung-Min Hong and Jae-Hyung Jang (Gwangju Institute of Science and Technology, Korea)

P1.36 Degradation of AlInGaP light-emitting diodes with multi-quantum wells exposed by electron irradiation

Vladimir Oleinik, Ilya Prudaev and Valentin Brudnyi (Tomsk State University, Russia); Yuri Ryaboshtan, Pavel Gorlachuk and Alexander Marmaluk (M. F. Stelmakh Research Institute Polyus, Russia)

P1.37 Annealing Temperature Dependence of GaInAsP LD Characteristics on InP/Si substrate Fabricated by Wafer Direct Bonding

Yuya Onuki, Tetsuo Nishiyama, N Kamada and Kazuhiko Shimomura (Sophia University, Japan)

P1.38 Optical property enhancement through barrier potential variation of InAlGaAs/InGaAs/GaAs capped self-assembled InAs QDs

Debi Panda, Debabrata Das, Vinayak Chavan and

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Nilesh Shinde (Indian Institute of Technology Bombay, India); Subhananda Chakrabarti (Center for Excellence in Nanoelectronics, IIT Bombay, India)

P1.39 Gate capacitance modeling of InGaAs/InAlAs quantum-well MOSFETs

Jung Ho Park, Do-Kywn Kim, Ji-Min Baek, Seung-Woo Son and Sung-Wook Yoon, Jung-Hee Lee, Dae-Hyun Kim (Kyungpook National University, Germany)

P1.40 Vertically-Mounted InGaN Light-Emitting Diode Stripe

Yonghua Park, Kwai Hei Li, Yuk Fai Cheung, Wai Yuen Fu and Hoi Wai Choi (The University of Hong Kong, Hong Kong)

P1.41 Structural and optical characterization of InAs/GaNSb superlattices

Mikhail Patrashin, Norihiko Sekine, Kouichi Akahane, Iwao Hosako (National Institute of Information & Communications Technology, Japan)

P1.42 Quantum Dash-based Vertical-External-Cavity Surface-Emitting Laser on InP

Salvatore Pes, Christophe Levallois, Cyril Paranthoen and Nicolas Chevalier (FOTON-INSA lab, France); Cyril Hamel (IPR - Université de Rennes 1, France); Carmen Gomez, Jean-Christophe Harmand and Sophie Bouchoule (Laboratory for Photonics and Nanostructures, France); Hervé Folliot (INSA Rennes, France); Mehdi Alouini (IPR - Université Rennes 1 - CNRS, France)

P1.43 N-polar GaN/AlGaIn/GaN MIS-HEMTs on sapphire substrates with small off-cut for flat interface by MOVPE

Kiattiwut Prasertsuk, Tomoyuki Tanikawa, Takeshi Kimura, Tetsuya Suemitsu, Takashi Matsuoka (Tohoku University, Japan)

P1.44 Trench-confined epitaxial regrowth for integrated driver electronics in InP-based spatial light modulator arrays

Carl Reuterskiöld Hedlund (KTH-Royal Institute of

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Technology, Sweden); Olof Öberg, Jang-Kwon Lim, Qin Wang and Michael Salter (Acreo AB, Sweden); Mattias Hammar (KTH-Royal Institute of Technology, Sweden)

P1.45 Gas interaction and doping dependent transport properties of the In₂O₃ surface electron accumulation layer

Julius Rombach and Alexandra Papadogianni (Paul-Drude-Institut für Festkörperelektronik, Germany); Theresa Berthold (Technische Universität Ilmenau, Germany); Stefan Krischok (TU Ilmenau, Germany); Marcel Himmerlich (Technische Universität Ilmenau, Germany); Vladimir Polyakov and Volker Cimalla (Fraunhofer Institut für Angewandte Festkörperphysik, Germany); Oliver Bierwagen (Paul-Drude-Institut für Festkörperelektronik, Germany)

P1.46 ICP-RIE etching of beta-Ga₂O₃ in BCl₃/Cl₂/Ar plasma chemistry

Amit Shah and Arnab Bhattacharya (Tata Institute of Fundamental Research, India)

P1.47 Electron transport through single self-assembled InSb quantum dots coupled to nanogap metal electrodes

Kenji Shibata (Tohoku Institute of Technology, Japan); Masato Oori (Toyota Technological Institute, Japan); Katsumi Nagase (Tohoku University, Japan); Hiroyuki Sakaki (Toyota Technological Institute, Japan); Yoshiro Hirayama (Tohoku University & ERATO Nuclear Spin Electronics Project, Japan); Kazuhiko Hirakawa (University of Tokyo, Japan)

P1.48 Low Temperature Growth of Highly Doped n++ GaN by MOVPE

Atrium III, 1st Floor

(EPFL-LASPE, Switzerland); Nicolas Grandjean (EPFL, Switzerland)

P1.49 Porous silicon layer with ion-implanted silver nanoparticles

Andrey L. Stepanov (Kazan Physical-Technical Institute, Russian Academy of Sciences, Russia)

P1.50 InP-on-Si Hybrid Interface bonded at 300 °C with a 1nm-thick oxide layer demonstrating High Optical Quality and relevant for Electrical Injection

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Anne Talneau and Isabelle Sagnes, Gilles Patriarche (CNRS Laboratoire de Photonique et de Nanostructures, France)

P1.51 Proposal of organic single crystal growth method using electrospray deposition and thin-film ionic liquid

Hiroyuki Ueda, Akihiko Kikuchi, Keita Takeuchi, Ryo Terada and Sora Ishii (Sophia University, Japan)

P1.52 Fabrication and Optical Properties of InP and Si Nanodisk Arrays

Dennis Visser, Saravana Balaji Basuvalingam (KTH Royal Institute of Technology, Sweden); Chandra Prajapati (IISc, India); Ding Chen and Yohan Désières (KTH Royal Institute of Technology, Sweden); Navakanta Bhat (IISc, India); Srinivasan Anand (KTH, Sweden)

P1.53 Fabrication of high efficient thin film CdTe solar cells and device performance under high- and low-intensity light irradiance

Deliang Wang (University of Science and Technology of China, P.R. China)

P1.54 Loading Effect of W-band Resonant Tunneling Diode Oscillator by using Load-Pull Measurement

Jue Wang, Abdullah Khalidi, Andrei Cornescu, Razvan Morariu and Ata Khalid (University of Glasgow, United Kingdom); Liqun Wang (Shanghai Electro-Mechanical Engineering Institute, P.R. China); David Cumming and Edward Wasige (University of Glasgow, United Kingdom)

P1.55 InAs/InAsP core/shell nanowire photodiode on Si substrate

Shiyu Xie (Cardiff University, United Kingdom); Hyunseok Kim (University of California, Los Angeles, USA); Wook Jae Lee (Cardiff University, United Kingdom); Alan Farrell, Diana Huffaker (University of California at Los Angeles, USA);

P1.56 Comparison of electrical properties of Ni/n-GaN Schottky Diodes on c-plane and m-plane GaN

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Substrates

Hisashi Yamada (National Institute of Advanced Industrial Science and Technology, Japan)

P1.57 Manufacturable Lg = 0.5 μm $\text{In}_{0.7}\text{Ga}_{0.3}\text{As}$ PHEMTs on 3-inch InP substrate

Ji-Min Baek (Kyungpook National University, Korea); Dae-Hyun Kim (Kyungpook National University, Germany); Seung-Woo Son, Jung Ho Park, Do-Kywn Kim and Sung-Wook Yoon (Kyungpook National University, Korea); Jacoby Yoon, Jong-Keun Park, Jeong-Kuen Kwak and Dong-Soo Bang (Quantum Semiconductor International (QSI), Korea); Sung-Kyu Lim (National Nano Fab Center, Korea)

P1.58 A SPICE Model of Magnetic Tunnel Junctions and Switching Delay Time Investigation

Lucas Yang and Chao-Hsin Wu (National Taiwan University, Taiwan)

P1.59 Strain relaxation in nonpolar ZnO/ZnMgO heterostructures grown on ZnO substrate: from theoretical calculations to nanodiffraction characterization

Jesus Zúñiga-Pérez, Maud Nemoz (UCA, CRHEA-CNRS, France); Omar Jamadi (Institut Pascal, France); Philippe Vennéguès (CNRS - CRHEA, France); Blandine Alloing and Christiane Deparis; Mathieu Leroux (CNRS - CRHEA, France); Gilbert Chahine and Tobias Schulli (ESRF, France); Marius Grundmann (Universität Leipzig, Germany)

P1.60 Improvement of light-extraction efficiency of AlGaIn UVC-LEDs by using superlattice hole spreading layer and Al reflector

Noritoshi Maeda (RIKEN, Japan)

Tuesday, May 16th

08:30 h–10:30 h

A2 – Oxide Semiconductors: Growth

Room: Atrium I–II, 1st Floor

Chair: Takeyoshi Onuma, Kogakuin University, Japan

INVITED

A2.1 β -Ga₂O₃ bulk crystal growth for wide-bandgap electronics and optoelectronics

08:30 h

Zbigniew Galazka (Leibniz Institute for Crystal Growth –IKZ, Germany)

A2.2 Comparison between homoepitaxial β -Ga₂O₃ layers grown by MOVPE on (100) and (010)-oriented substrates for power device applications

08:45 h

Michele Baldini, Martin Albrecht, Andreas Fiedler, Zbigniew Galazka, Klaus Irmscher, Robert Schewski and Günter Wagner (Leibniz Institute for Crystal Growth - IKZ, Germany)

A2.3 Control of Ga₂O₃ crystal structure on sapphire substrates by introducing β -(Al_xGa_{1-x})₂O₃ buffer layers

09:00 h

Riena Jinno, Takayuki Uchida, Kentaro Kaneko and Shizuo Fujita (Kyoto University, Japan)

A2.4 Electrical properties of Si doped corundum structure Ga₂O₃ on sapphire substrate

09:15 h

Takayuki Uchida, Riena Jinno, Shu Takemoto, Kentaro Kaneko and Shizuo Fujita (Kyoto University, Japan)

A2.5 Successful modulation-doping for γ -(Al_xGa_{1-x})₂O₃/Ga₂O₃ system

09:30 h

Takayoshi Oshima, Yuji Kato and Naoto Kawano (Saga University, Japan); Akito Kuramata and Shigenobu Yamakoshi (Tamura Corporation, Japan); Shizuo Fujita (Kyoto University, Japan); Toshiyuki Oishi and Makoto Kasu (Saga University, Japan)

A2.6 Oxide semiconductors by green growth technology for green innovation

09:45 h

Shizuo Fujita (Kyoto University, Japan)

INVITED

Tuesday, May 16th

08:30 h–10:30 h

B2 – Quantum Dots, Entangled Photons

Room: Atrium IV–V, 1st Floor

Chair: Yoshiro Hirayama, Tohoku University, Japan

B2.1 Structural Analysis of InGaAs/GaP Quantum Dots

08:30 h *Christopher Prohl, Andrea Lenz, Holger Eisele and Andre Strittmatter, Udo Pohl, Dieter Bimberg, Mario Dähne (Technische Universität Berlin, Germany); Yuncheng Song and Minjoo Larry Lee (Yale University, USA)*

B2.2 Thermal behavior and carrier injection of GaAs/GaP quantum dots light emitting diodes

08:45 h *Christian Golz (Humboldt-Universität zu Berlin, Germany)*

B2.3 Enhanced color conversion efficiency of colloidal quantum dot nanophosphors via photonic crystal band-edge effect

09:00 h *Kyungtaek Min (Ajou University, Korea); Hyunho Jung and Jongho Lee (Seoul National University, Korea); Yeonsang Park and Kyung-Sang Cho (Samsung Advanced Institute of Technology, Korea); Heonsu Jeon (Seoul National University, Korea)*

B2.4 Scalable semiconductor sources of entanglement: site-controlled, wavelength-tunable, entangled-photon emitting pyramidal quantum dots

09:15 h *Stefano Moroni, Gediminas Juska, Tung-Hsun Chung (Tyndall National Institute, Ireland); Javier Martín-Sánchez and Rinaldo Trotta (Johannes Kepler Universität, Austria); Armando Rastelli (University of Linz, Austria); Agnieszka Gocalinska and Emanuele Pelucchi (Tyndall National Institute, Ireland)*

B2.5 Broadband control of polarization characteristics in closely-stacked InAs/GaAs quantum dots

09:30 h *Toshiyuki Kaizu, Yusuke Tajiri and Takashi Kita (Kobe University, Japan)*

B2.6 Highly entangled photons with quantum dot devices

09:45 h *Armando Rastelli, Daniel Huber, Marcus Reindl, Yongheng Huo (Johannes Kepler University, Austria); Eugenio Zallo and Oliver Schmidt (IFW Dresden, Germany); Rinaldo Trotta (Johannes Kepler University, Austria)*

INVITED

Tuesday, May 16th

08:30 h–10:30 h

C2 – Optoelectronics: Heterogeneous Integration

Room: Köpenick 3rd Floor

Chair: Yoshi Nakano, The University of Tokyo, Japan

C2.1 Novel optical-mode converter between III-V/SOI hybrid devices

08:30 h

Junichi Suzuki, Kazuto Ito, Yusuke Hayashi, Satoshi Inoue, Kumi Nagasaka, Tomohiro Amemiya, Nobuhiko Nishiyama and Shigehisa Arai (Tokyo Institute of Technology, Japan)

C2.2 Effect of GaInAsP Absorption Layer Composition on Voltage Modulation in 1.3- μ m Wavelength npn-AlGaInAs/InP Transistor Lasers

08:45 h

Kentaro Yamanaka, Shotaro Tadano, Shoichi Yoshitomi, Nobuhiko Nishiyama and Shigehisa Arai (Tokyo Institute of Technology, Japan)

C2.3 III-V Quantum-dot lasers monolithically grown on silicon

09:00 h

INVITED

Huiyun Liu, Mengya Liao, Mingchu Tang, Jiang Wu and Siming Chen (University College London, United Kingdom)

C2.4 InAs/GaAs quantum dot lasers on a Si (100) on-axis substrate

09:30 h

Jinkwan Kwoen, Bongyong Jang, Joohang Lee, Takeo Kageyama and Katsuyuki Watanabe, Satoshi Iwamoto and Yasuhiko Arakawa (University of Tokyo, Japan)

C2.5 Monolithically integrated GaAs nanowire lasers on Si and SOI waveguides

09:45 h

Gregor Koblmüller (Technische Universität München & Walter Schottky Institut, Germany)

C2.6 Heterogeneously Integrated Photonic-Crystal Lasers on Silicon

10:00 h

INVITED

Shinji Matsuo and Koji Takeda (NTT Corporation, Japan)

Tuesday, May 16th

08:30 h–10:30 h

D2 – Spintronics

Room: Friedrichshain, 4th Floor

Chair: Nitin Samarth, Penn State University, USA

INVITED

D2.1 Spintronics with Holes in III-V Semiconductor Structures

08:30 h

Alex Hamilton (University of New South Wales, Australia)

D2.2 Electron interference and spin-orbit coupling in GaAs/InSb core/shell nanowires

09:00 h

Patrick Zellekens, Torsten Rieger, Johanna Janßen, Natalia Demarina and Gregor Panaitov, Mihail Ion Lepsa, Hans Lueth and Detlev Gruetzmacher, Thomas Schaeppers (Forschungszentrum Jülich, Germany)

D2.3 Transport of Spin-polarized Electrons in GaAs(111) Quantum Wells Controlled by Transverse Electric Fields

09:15 h

Alberto Hernández-Mínguez and Klaus Biermann, Rudolf Hey and Paulo Santos (Paul-Drude-Institut für Festkörperelektronik, Germany)

D2.4 Heat focusing using directional phonon transport in nanostructured Si membrane

09:30 h

Masahiro Nomura, Aymeric Ramiere, Jeremie Maire and Roman Anufriev (The University of Tokyo, Japan)

D2.5 Exciton-polaritons in a laterally structured GaAs(001) based microcavity

09:45 h

Klaus Biermann, Alexander S. Kuznetsov, Paul L. J. Helgers and Abbas Tahraoui, Paulo Santos (Paul-Drude-Institut für Festkörperelektronik, Germany)

D2.6 Temporal dynamics and single photon correlations of exciton-polariton solitons in acoustic lattices

10:00 h

Alexander S. Kuznetsov, Jakov Buller and Klaus Biermann, Paulo Santos (Paul-Drude-Institut für Festkörperelektronik, Germany)

D2.7 Dielectric interaction of infrared light and electron-phonon coupling system in metal/semiconductor composites

10:15 h

Yoshihiro Ishitani (Chiba University, Japan)

Tuesday, May 16th

11:00 h–12:30 h

A3 – Power Electronics I

Room: Atrium I–II, 1st Floor

Chair: Armin Dadgar, Otto-von-Guericke-Universität, Germany

**A3.1 Silicon versus GaN versus SiC based power devices
11:00 h - comparison of key parameters with respect to use
in power electronics**

INVITED

*Gerald Deboy (Infineon Technologies Austria AG,
Austria)*

**A3.2 Germain: AlGaIn/GaN Epitaxy on Large Silicon
11:30 h Substrates**

INVITED

Marianne Germain (EpiGaN nv, Belgium)

**A3.3 Trench regrowth studies by MOCVD for GaN based
12:00 h power devices**

*Anchal Agarwal, Onur Koksaldi and Chirag Gupta,
Stacia Keller and Umesh Mishra (University of
California Santa Barbara, USA)*

**A3.4 Towards normally-off GaN power devices: Impact
12:15 h of GaN polarity and (Al,Si)O gate dielectrics on the
MOS Flat-band voltage**

*Silvia H. Chan, Haoran Li, Chirag Gupta, Nirupam
Hatui, Stacia Keller and Umesh Mishra (University of
California Santa Barbara, USA)*

Tuesday, May 16th

11:00 h–12:30 h

B3 – Physics for Future Devices

Room: Atrium IV–V, 1st Floor

Chair: Thomas Schäpers, Forschungszentrum Jülich, Germany

B3.1 Even-odd effects in hybrid semiconductor-superconductor nanowires

11:00 h

INVITED

Ferdinand Kuemmeth (University of Copenhagen & Center for Quantum Devices, Denmark)

B3.2 Gaussian electron beam optics with quantum point contacts

11:30 h

Jaan Freudenfeld (Paul-Drude-Institut für Festkörperelektronik, Germany)

B3.3 Anderson-localized modes observed experimentally in disordered photonic structures

11:45 h

Myungjae Lee (Seoul National University, Korea); Ségolène Callard and Christian Seassal (Institut des Nanotechnologies de Lyon, France); Heonsu Jeon (Seoul National University, Korea)

B3.4 Topological Insulator Phase in InAs/GaSb Coupled Quantum Wells

12:00 h

INVITED

Thomas Ihn, Susanne Müller, Matija Karalic, Christopher Mittag, Klaus Ensslin, Thomas Tschirky and Werner Wegscheider (ETH Zürich, Switzerland)

Tuesday, May 16th

11:00 h–12:30 h

D3 – vis-LEDs

Room: Friedrichshain, 4th Floor

Chair: Bharat Jalan, University of Minnesota, MN, USA

D3.1 Development of blue superluminescent light emitting diodes

11:00 h

Marco Malinverni, Marco Rossetti, Antonino Castiglia, Marcus Duellk and Christian Velez (EXALOS AG, Switzerland); Denis Martin Nicolas Grandjean (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

D3.2 Investigation of InGaN Superlattices on the Efficiency of InGaN/GaN Quantum Wells

11:15 h

Camille Haller (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Jean-François Carlin (EPFL-LASPE, Switzerland); Gwénoél Jacopin and Raphaël Butté (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Kanako Shojiki (Institute for Materials Research, Tohoku University, Japan); Gordon Callsen (Technical University of Berlin, Germany); Denis Martin, Nicolas Grandjean (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

D3.3 Scanning near-field microscopy of carrier lifetimes in m-plane InGaN QWs

11:30 h

Ruslan Ivanov (KTH Royal Institute of Technology, Sweden)

D3.4 Defect generation during constant current stress of InGaN laser diodes

11:45 h

Desiree Monti, Matteo Meneghini, Carlo De Santi and Gaudenzio Meneghesso (University of Padova, Italy); Enrico Zanoni (DEI, Italy); Agata Bojarska and Piotr Perlin (Unipress, Poland)

D3.5 Degradation of polymer light-emitting diodes

12:00 h

Paul Blom (Max Planck Institute for Polymer Research, Germany)

INVITED

Tuesday, May 16th

14:00 h–16:00 h

A4 – Oxide Semiconductors: Properties

Room: Atrium I–II, 1st Floor

Chair: Shizuo Fujita, Kyoto University, Japan

A4.1 Optical Properties of Ga₂O₃ Films and Crystals

14:00 h *Takeyoshi Onuma (Kogakuin University, Japan);*

INVITED

Shingo Saito (National Institute for Information and Communications Technology, Japan); Kohei Sasaki, Ken Goto and Takekazu Masui (Tamura Corporation, Japan); Tomohiro Yamaguchi, Tohru Honda (Kogakuin University, Japan); Akito Kuramata (Tamura Corporation, Japan); Masataka Higashiwaki (National Institute of Information and Communications Technology, Japan)

A4.2 Band-gap engineering of metastable γ -(Al_xGa_{1-x})₂O₃ alloy system

14:30 h

Takayoshi Oshima and Yuji Kato (Saga University, Japan); Masaya Oda and Toshimi Hitora (FLOSFIA, INC, Japan); Makoto Kasu (Saga University, Japan)

A4.3 Relation between electrical and optical properties of p-type NiO films

14:45 h

Mizuki Ono and Takeyoshi Onuma (Kogakuin University, Japan); Kohei Sasaki (Tamura Corporation, Japan); Hiroki Nagai, Tomohiro Yamaguchi (Kogakuin University, Japan); Masataka Higashiwaki (National Institute of Information and Communications Technology, Japan); Akito Kuramata and Shigenobu Yamakoshi (Tamura Corporation, Japan); Mitsunobu Sato and Tohru Honda (Kogakuin University, Japan)

A4.4 Advances in the Development of High Performance p-Type Transparent Conducting Materials: A Study of Copper Iodide Thin Film

15:00 h

Chang Yang, Max Kneiß, Michael Lorenz and Marius Grundmann (Universität Leipzig, Germany)

A4.5 Gas interaction of In₂O₃(111) surfaces studied by photoelectron spectroscopy

15:15 h

Theresa Berthold and Jonas Michel, Stefan Krischok (TU Ilmenau, Germany); Vladimir Polyakov and Volker Cimalla (Fraunhofer Institut für Angewandte Festkörperphysik, Germany); Julius Rombach and Oliver Bierwagen (Paul-Drude-Institut für Festkörperelektronik, Germany); Marcel Himmerlich (Technische Universität Ilmenau, Germany)

A4.6 Complex Oxide Thin Films and Heterostructures with Wide Bandgap and High Room-Temperature Mobility

15:30 h

Bharat Jalan (University of Minnesota, USA)

INVITED

Tuesday, May 16th

14:00 h–16:00 h

B4 – Nanowires: Transistors

Room: Atrium IV–V, 1st Floor

Chair: Jim Greer, Tyndall National Institute, Ireland

B4.1 In-plane Nanowire Transistors

14:00 h *Li Xiuling (University of Illinois Urbana-Champaign, USA)*

INVITED

B4.2 III-V Nanowire RF MOSFETs

14:30 h *Erik Lind (Lund University, Sweden)*

INVITED

B4.3 Top-down InGaAs Vertical Nanowire MOSFETs with Record Characteristics

15:00 h *Xin Zhao, Christopher Heidelberg and Eugene A. Fitzgerald Jesus del Alamo (Massachusetts Institute of Technology, USA)*

B4.4 Vertical InAs/InGaAs Nanowire MOSFETs with Reduced Ioff

15:15 h *Olli-Pekka Kilpi (Lund University, Sweden); Jun Wu (University of California, Santa Barbara, USA); Johannes Svensson, Axel Persson, Erik Lind and Lars-Erik Wernersson (Lund University, Sweden)*

Tuesday, May 16th

14:00 h–16:00 h

C4 – UV-Emitters and Detectors

Room: Köpenick 3rd Floor

Chair: Hiroshi Yamaguchi NTT Basic Research Laboratories

INVITED

C4.1 UV Laser Diodes

14:00 h *Zlatko Sitar (North Carolina State University, USA)*

C4.2 AlGa_N-based UVB light emitting diodes with enhanced quantum efficiencies

14:30 h *Johannes Enslin, Norman Susilo, Martin Guttmann, Martin Hermann, Luca Sulmoni, Christian Kuhn and Frank Mehnke, Tim Wernicke and Michael Kneissl (Technische Universität Berlin, Germany)*

C4.3 Development of AlGa_N-based Deep UV LEDs for Nitrogen Oxide Sensing

14:45 h *Frank Mehnke, Martin Guttmann, Johannes Enslin, Christian Kuhn, Christoph Reich and Jakob Jordan (Technische Universität Berlin, Germany); Arne Knauer, Sylvia Hagedorn and Mickael Lapeyrade (Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Germany); Hendrik Krüger and Marian Rabe (University of Rostock, Germany); Sven Einfeldt (Ferdinand-Braun-Institut, Germany); Tim Wernicke (Technical University Berlin, Germany); Markus Weyers (Ferdinand-Braun-Institut Berlin, Germany); Michael Kneissl (Technical University Berlin, Germany)*

C4.4 Low Resistivity High Aluminum Content n-AlGa_N Cladding Layer for use in Deep UV LEDs

15:00 h *Shyam Bharadwaj, SM Islam, Kazuki Nomoto, Huili Xing and Debdeep Jena (Cornell University, USA)*

C4.5 AlGa_N photodiodes with large avalanche gain for the ultraviolet regime

15:15 h *Robert Rehm (Fraunhofer-IAF, Germany); Lars Hahn and Frank Fuchs (Fraunhofer IAF, Germany); Lutz Kirste, Rachid Driad and Thorsten Passow (Fraunhofer Institute for Applied Solid State Physics, Germany); Klaus Köhler (Fraunhofer IAF, Germany)*

Tuesday, May 16th

14:00 h–16:00 h

C4.6 Separation of degradation effects in (AlGa)N-based UVB-LEDs

15:30 h

Jan Ruschel, Johannes Glaab and Moritz Brendel (Ferdinand-Braun-Institut, Germany); Jens Rass (Technical University Berlin, Germany); Christoph Stölmacker (Ferdinand-Braun-Institut, Germany); Tim Wernicke, Frank Mehnke and Johannes Enslin (Technische Universität Berlin, Germany); Sven Einfeldt, Markus Weyers (Ferdinand-Braun-Institut Berlin, Germany); Michael Kneissl (Technical University Berlin, Germany)

C4.7 Elimination of leakage of optical modes to GaN substrate in nitride laser diodes using a thick InGaN waveguide

15:45 h

Grzegorz Muziol, Henryk Turski, Marcin Siekacz, Pawel Wolny and Szymon Grzanka (Institute of High Pressure Physics, PAS, Poland); Piotr Perlin and Czeslaw Skierbiszewski (Unipress, Poland)

Tuesday, May 16th

14:00 h–16:00 h

D4 – 2D Materials

Room: Friedrichshain, 4th Floor

Chair: Fabrizio Arciprete, University of Rome Tor Vergata, Italy

D4.1 Ultra-Thin Epitaxial GeTe Films: Ferroelectric Lower Thickness Limit

14:00 h

Raffaella Calarco (Paul-Drude-Institut für Festkörperelektronik, Germany)

D4.2 GeSn/SiGeSn Heterostructures for Si Optoelectronics

14:15 h

Daniela Stange (Forschungszentrum Jülich GmbH, Germany)

D4.3 General Trends in Electronic Structures of III-V and II-VI Alloys Based on the Interacting-Quasi-Band Theory

14:30 h

Yuzo Shinozuka (Wakayama University, Japan)

D4.4 Graphene-based high-frequency electronics

14:45 h

Daniel Neumaier (Advanced Microelectronic Center Aachen, AMO GmbH, Germany)

INVITED

D4.5 Direct Photo-Patterning and High Mobility Materials for Flexible OTFTs

15:15 h

Jochen Brill (BASF SE, Germany)

INVITED

Tuesday, May 16th

16:30 h–18:30 h

P2 – Poster Session II

Room: Kreuzberg, 3rd Floor (Poster P2.1 – P2.24)
Charlottenburg, 4th Floor (Poster P2.25 – P2.48)
Atrium III, 1st Floor (Poster P2.49 – P2.60)

Room Kreuzberg, 3rd Floor

- P2.1 Influence of Droplet Size on the Growth of High-Quality Self-Catalyzed GaAsP Nanowires**
Yunyan Zhang (University College London, United Kingdom)
- P2.2 Broad-Area Quantum-Cascade Lasers with a Watt-level continuous-wave power at room temperature**
Anna Aleksandrova, Mykhaylo Semtsiv and W. Ted Masselink (HU Berlin, Germany)
- P2.3 Technology Route towards SiC Thyristor Devices with Amplifying Gate Design**
Ralf Hassdorf (French-German Research Institute of Saint-Louis, France)
- P2.4 Investigation of the GaN/Al₂O₃ Interface by First Principles Calculations**
Kenta Chokawa, Masaaki Araidai and Kenji Shiraishi (University of Nagoya, Japan)
- P2.5 Phase discrimination in CdSe structures by means of Raman scattering**
Ramon Cusco (Institut Jaume Almera (CSIC), Spain); Vincent Consonni (Universite Grenoble Alpes, CNRS, LMGP, France); Edith Bellet-Amalric (CEA-Grenoble, France); Regis Andre (Universite Grenoble Alpes, CNRS Institut Neel, France); Luis Artus (Institut Jaume Almera (CSIC), Spain)
- P2.6 Thermal investigations of heterogeneously integrated GaN HEMTs on Si-CMOS by micro-Transfer-Printing**
Ralf Lerner (X-FAB Semiconductor Foundries AG, Germany)
- P2.7 Branch formation in GaAs/GaAsBi nanowires on Si(111)**
Yano Kosuke (Graduate School of Science and Engineering, Ehime University & Institute for Materials Chemistry and Engineering, Kyushu University, Japan)

Tuesday, May 16th

16:30 h–18:30 h

P2.8 Planar Defect Characterization and Polytypism Control in InAs Nanowire Selective Area Epitaxy on Si (111) Substrate

Ziyang Liu (IMEC & KULeuven, Belgium); Clement Merckling, Rita Rooyackers, Olivier Richard and Hugo Bender (IMEC, Belgium); Maria Vila, Juan Rubio-Zuazo and German Castro (ESRF, France); Nadine Collaert, Matty Caymax, Wilfried Vandervorst and Marc Heyns (IMEC, Belgium)

P2.9 Theoretical investigations for strain relaxation and growth mode of InAs thin layers on GaAs (110)

Tomonori Ito (Mie University, Japan)

P2.10 Characterizations of GaN films grown on 4H-SiC substrates with 4° miscutting orientation by Plasma-Assisted Molecular Beam Epitaxy

Iwan Susanto (National Dong Hwa University, Taiwan)

P2.11 Microstructure analysis of GaN quantum dots grown by droplet epitaxy

Yang-Che Su (National Dong Hwa University, Taiwan)

P2.12 Effect of buffer layer preparation on InGaAsBi epilayers grown by GSMBE

Likun Ai (Shanghai Institute of Microsystem and Information Technology CAS, P.R. China)

P2.13 Optical and electrical properties of amorphous $\text{Cd}_x\text{In}_{0.6-x}\text{Ga}_{0.4}\text{O}_y$ thin films

Minseok Kim and Hiroshi Yanagi (University of Yamanashi, Japan)

P2.14 On-chip integration of colloidal quantum dot photonic crystal band-edge lasers with passive waveguides

Hyunho Jung and Changhyun Han (Seoul National University, Korea); Yeonsang Park and Kyung-Sang Cho (Samsung Advanced Institute of Technology, Korea); Heonsu Jeon (Seoul National University, Korea)

P2.15 Ultra-thin Polyimide for heterogeneous integration of high mobility InGaAs MOFSETs on Si substrate

Tatsuro Maeda and Hiroyuki Ishii (AIST, Japan)

P2.16 THz quantum cascade lasers toward high output power near liquid nitrogen temperature operation with Dewar condenser

Tsung-Tse Lin (RIKEN, Japan)

Tuesday, May 16th

16:30 h–18:30 h

- P2.17 Variable height active structure design THz QCLs operating at 3.7 THz with the maximum operation temperature 145 K**
Tsung-Tse Lin (RIKEN, Japan)
- P2.18 Design of indirect injection scheme THz QCLs with high operation temperature**
Tsung-Tse Lin (RIKEN, Japan)
- P2.19 Monte Carlo study of the formation of In/GaAs(001) nanostructures by droplet epitaxy**
Sergey Balakirev, Maxim Solodovnik, Oleg Ageev, Mikhail Eremenko and Ilya Mikhaylin (Southern Federal University, Russia)
- P2.20 MBE growth of GaAs on substrates with different orientations studied by Monte Carlo simulations**
Maxim Solodovnik, Sergey Balakirev, Mikhail Eremenko and Oleg Ageev (Southern Federal University, Russia)
- P2.21 Effect of thin InAlAs buffer layer on InAs/InGaAs quantum dots grown on InP (311)B substrate**
Yasushi Shoji and Yoshitaka Okada (The University of Tokyo, Japan)
- P2.22 Self-formation of in-plane ultrahigh-density InAs quantum dots and their photoluminescence properties**
Koichi Yamaguchi, Shingo Oikawa, Akinori Makaino and Tomah Sogabe (The University of Electro-Communications, Japan)
- P2.23 The effect of the SiC(0001) surface morphology on the growth of epitaxial monolayer graphene nanoribbons**
Lauren Galves and Joseph Wofford (Paul-Drude-Institut für Festkörperelektronik, Germany); Gabriel Soares (Universidade Federal do Rio Grande do Sul, Brazil); Uwe Jahn, Carsten Pfüller, Henning Riechert and Marcelo Lopes (Paul-Drude-Institut für Festkörperelektronik, Germany)
- P2.24 High temperature MBE technology and equipment to provide device quality HEMT heterostructures for microwave electronics**
Stanislav Petrov (SemiTEq JSC, Russia)

Tuesday, May 16th

16:30 h–18:30 h

Room Charlottenburg, 4^d Floor

- P2.25 Quaternary In_{0.04}Al_{0.55}Ga_{0.41}N/GaN HEMTs With In_{0.10}Ga_{0.90}N Back Barrier**
Ji Hyun Hwang, Suhyeong Cha, Young-Ki Kwon, Ha Jin Mun, Sung-Min Hong and Jae-Hyung Jang (Gwangju Institute of Science and Technology, Korea)
- P2.26 A Deep Guard-ring InGaAs/InP PIN Photodiode with High Sensitivity for SWIR Imaging Applications**
Hyunjun Noh (KAIST); Jaejin Lim, Kiwon Lee and Kyounghoon Yang (KAIST, Korea)
- P2.27 Investigation of annealing effect and environmental instability of Few-layer Black Phosphorus Transistors**
Hsun Ming Chang (Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan); Chao-Hsin Wu (National Taiwan University, Taiwan)
- P2.28 Post-He Plasma Treatment on ZnO Thin Films Fabricated by Atmospheric Pressure Cold Plasma**
Xiaoyuan MA and Yoshifumi Suzaki (Kagawa University, Japan)
- P2.29 Wafer scale metrology for the fabrication of graphene-based devices**
Grzegorz Lupina (IHP, Germany)
- P2.30 Frequency modulation operation of microelectromechanical resonators for fast terahertz detection**
Ya Zhang, Suguru Hosono, Naomi Nagai and Kazuhiko Hirakawa (University of Tokyo, Japan)
- P2.31 Resonant-Tunneling-Diode Terahertz Oscillators Integrated with Broadband Bow-tie Antenna**
Shun Sasaki, Safumi Suzuki and Masahiro Asada (Tokyo Institute of Technology, Japan)

Tuesday, May 16th

16:30 h–18:30 h

P2.32 Disappearance of dislocations in GaSb quantum dots grown on GaP upon capping: breakthrough for nanoflash memories

Xavier Wallart and David Troadec (Institute of Electronics, Microelectronics and Nanotechnology, France); Leo Bonato, Dieter Bimberg (Technische Universität Berlin, Germany); Ludovic Desplanque (Institute of Electronics, Microelectronics and Nanotechnology, France); Christophe Coinon (IEMN, France); Pierre Ruterana (CIMAP (CNRS and ENSICAEN), France); Gilles Patriarche (CNRS Laboratoire de Photonique et de Nanostructures, France)

P2.33 Dependence on growth conditions in selective-area growth of GaN nanowires using RF-plasma-assisted molecular beam epitaxy

Yuya Yamamoto (Hokkaido University, Japan)

P2.34 Photoluminescence of GaSbBi/GaSb Quantum Wells Grown by Molecular Beam Epitaxy

Li Yue (Shanghai Institute of Microsystem and Information Technology, P.R. China)

P2.35 Tuning of the quantum-confined Stark effect in wurtzite [0001] nanostructures by the Internal-Field-Guarded-Active-Region Design

Sarah Schlichting (Technische Universität Berlin, Germany)

P2.36 Proposal and Gain Estimation of Terahertz Amplifier Using Resonant Tunneling Diodes with 90 Degree Hybrid Coupler

Shintaro Fukuma, Safumi Suzuki and Masahiro Asada (Tokyo Institute of Technology, Japan)

P2.37 Growth and characterization of wurtzite GaP based nanowires

Carina B. Maliakkal, Mahesh Gokhale, Nirupam Hatui and Arnab Bhattacharya (Tata Institute of Fundamental Research, India)

P2.38 Impact of threading dislocations on the device performance of GaN trench MOSFETs and potential yield of large area devices

Chirag Gupta, Silvia H. Chan and Anchal Agarwal (University of California Santa Barbara, USA); William Leach (UC Santa Barbara, USA); Cory C Lund, Stacia Keller and Umesh Mishra (UCSB, USA)

Tuesday, May 16th

16:30 h–18:30 h

P2.39 Monte Carlo Study on Electron Transport Properties of Ga_xIn_{1-x}Sb HEMT Structures Considering Roughness Scattering

Yui Fujisawa, Takuto Takahashi, Shougo Kawamura, Sachie Fujikawa and Hiroki Fujishiro (Tokyo University of Science, Japan)

P2.40 Performance Comparisons of Light-Emitting Thyristor with Indium Tin Oxide Transparent Conductive Layers

Ray-Hua Horng (National Chiao Tung University, Taiwan)

P2.41 Study on vertical-direction leakage current flowing through dislocations in AlN on Si for AlGaN/GaN high electron-mobility transistors

Yuya Yamaoka (Taiyo Nippon Sanso Corporation, Japan); Ken Kakamu (Nagoya Institute of Technology, Japan); Akinori Ubukata, Yoshiki Yano, Toshiya Tabuchi and Koh Matsumoto (Taiyo Nippon Sanso Corporation, Japan); Takashi Egawa (Nagoya Institute of Technology, Japan)

P2.42 Enhanced photodetector performance of pulsed-laser-deposited single crystalline ZnO nanorods using a ZnS seed layer

Dong-Sing Wu (National Chung Hsing University, Taiwan)

P2.43 Recess etching for improvement of the electrical performance of Ga_{0.08}In_{0.12}Al_{0.80}N/AlN/GaN HEMTS

Sandra Riedmüller (UMS GmbH Ulm, Germany)

P2.44 Growth of high quality ZnO epitaxial films on c-plane sapphire and GaN templates by a chemical vapor deposition route

Rajendra Saroj (Indian Institute of Technology Bombay, India); Subhabrata Dhar (Indian Institute of Technology, Bombay, India)

P2.45 Current-Voltage Characteristics of Stabilised Resonant Tunnelling Diodes

Andrei Cornescu (University of Glasgow, United Kingdom); Jue Wang (University of Glasgow & University of Glasgow, United Kingdom); Edward Wasige, Abdullah Khalidi and Razvan Morariu (University of Glasgow, United Kingdom)

Tuesday, May 16th

16:30 h–18:30 h

P2.46 Effect of nano-apertures pattern on InAs nanowires evolution process grown by selective area molecular beam epitaxy

Muhammad Asad (Chalmers University of Technology & Not valid, Sweden); Ghada Badawy (Chalmers University of Technology, Egypt); Huan Zhao and Mahdad Sadeghi (Chalmers University of Technology, Sweden); Shumin Wang (Chinese Academy of Sciences, P.R. China)

P2.47 Towards the ultimate goal of AlN-based HEMTs grown on silicon substrates

Stephanie Rennesson, Fabrice Semond, Maud Nemoz, Jean Massies and Sebastien Chenot (Université Côte D'Azur, CRHEA-CNRS, France); Ludovic Largeau (Laboratoire de Photonique et de Nanostructures (LPN)-CNRS, France); Ezgi Dogmus and Malek Zegaoui (IEMN-CNRS, France); Farid Medjdoub (Institute of Electronics, Microelectronics and Nanotechnology, France)

P2.48 Polarization induced two dimensional confinement of carriers in wedge shaped polar semiconductors

Subhabrata Dhar (Indian Institute of Technology, Bombay, India)

Atrium III, 1st Floor

P2.49 Comparative photoluminescence study of InAs quantum dots capped with GaAsN layer and embedded in GaAsN quantum well

Mahitosh Biswas (Indian Institute of Technology Bombay, India); Roshan Makkar (Society for Applied Microwave Electronics Engineering & Research, India); A Bhatnagar (SAMEER, India); Subhananda Chakrabarti (Center for Excellence in Nanoelectronics, IIT Bombay, India)

P2.50 Structural and Photoluminescence analysis of GaAs barrier thickness on Coupled Bilayer InAs/GaAs Quantum Dots heterostructure

Binita Tongbram and Debi Panda (Indian Institute of Technology Bombay, India); Subhananda Chakrabarti (Center for Excellence in Nanoelectronics, IIT Bombay, India)

Tuesday, May 16th

16:30 h–18:30 h

- P2.51 Monocrystalline CdTe/MgCdTe double-heterostructure solar cells with a remote junction using a p-CuZnS polycrystalline layer**
Jacob Becker (Arizona State University, USA)
- P2.52 Carrier localization effects in GaBiAs QWs grown on (311)B GaAs substrates**
Gabriela Prando, Vanessa Gordo, Miguel Balanta, Bruno dos Santos, Marcelo Piton and Helder Galeti (Universidade Federal de São Carlos, Brazil); Janne Puustinen (Tampere University of Technology, Finland); Haifa Alghamdi (University of Nottingham, United Kingdom); Mohammed Hennini (Nottingham University, United Kingdom); Mircea Guina (Optoelectronics Research Centre, Tampere University of Technology, Finland); Yara Galvao Gobato (Universidade Federal de São Carlos, Brazil)
- P2.53 Electron Transport Properties of InSb/Ga_{0.35}In_{0.65}Sb Composite Channel Structure**
Sachie Fujikawa (Tokyo University of Science, Japan); Takuya Iwaki, Yoshiaki Harada, Jun Takeuchi and Yuuki Endoh (Tokyo University of Science, Japan); Issei Watanabe and Yoshimi Yamashita (National Institute of Information and Communications Technology, Japan); Akira Endoh (National Institute of Information and Communications Technology, Japan); Shinsuke Hara (National Institute of Information and Communications Technology); Akifumi Kasamatsu (National Institute of Information and Communications Technology (NICT), Japan); Hiroki Fujishiro (Tokyo University of Science, Japan)
- P2.54 Improvement of p-type carrier concentration for carbon doped AlInAs with in-situ annealing**
Hiroaki Tsuchiya (Mitsubishi Electric, Japan)
- P2.55 Bonding Technology for Covalent, Oxide-free and Conductive Bonds for Compound Semiconductors**
Elisabeth Brandl (EV Group, Austria)
- P2.56 Growth and characteristics of lateral In_{1-x}Ga_xAs nanowires on Si substrates**
Thorsten Wierzkowski, Torsten Rieger, Lidia Kibkalo, Hilde Hardtdegen and Detlev Gruetzmacher (Forschungszentrum Juelich, Germany)

Tuesday, May 16th

16:30 h–18:30 h

- P2.57 Negative Base Threshold Current of a Single Quantum-Well Transistor Laser**
Cheng-Han Wu (National Taiwan University, Taiwan)
- P2.58 Fabrication of β -Ga₂O₃ using carbon-free precursor by the mist CVD method**
Riena Jinno, Takayuki Uchida, Kentaro Kaneko and Shizuo Fujita (Kyoto University, Japan)
- P2.59 Fabrication of GaSb/AlGaSb Multi Quantum Wells Structure Grown on Si(100) Substrate Using Heteroepitaxial GaSb Thin-film and Dots Nucleation Layers**
Ryuto Machida (Tokyo University of Science, Japan); Kouichi Akahane (National Institute of Information and Communications Technology, Japan); Issei Watanabe (National Institute of Information and Communications Technology); Shinsuke Hara (National Institute of Information and Communications Technology, Japan); Sachie Fujikawa (Tokyo University of Science, Japan); Akifumi Kasamatsu (National Institute of Information and Communications Technology (NICT), Japan); Hiroki Fujishiro (Tokyo University of Science, Japan)
- P2.60 Trade-off Analysis between Relaxation Oscillation and its Modulation Limit in Resonant Tunneling Diodes with Bow-tie Antenna towards Wireless Transmitters in Radio over Fiber Technology**
Naoto Okumura, You Zheng and Hiroki Sudo (Tokyo Metropolitan University, Japan); Masahiro Fukuoka and Kiyoto Asakawa (Tokyo Metropolitan College of Industrial Technology, Japan); Michihiko Suhara (Tokyo Metropolitan University, Japan)

Wednesday, May 17th

08:00 h–10:00 h

A5 – High Frequency FETs

Room: Atrium I–II, 1st Floor

Chair: Nils Weimann, Ferdinand-Braun-Institut, Germany

INVITED

A5.1 InGaAs mHEMT Technology for High-Resolution Radar, Imaging and Communication

08:00 h

Arnulf Leuther (Fraunhofer Institute for Applied Solid State Physics, Germany); Axel Tessmann, Hermann Massler, Rainer Weber and Daniela Bleh (Fraunhofer IAF, Germany); Markus Roesch (Fraunhofer Institute for Applied Solid State Physics, Germany); Rainer Sommer (Fraunhofer-FHR, Germany); Ingmar Kallfass (University of Stuttgart, Germany); Michael Schlechtweg (Fraunhofer IAF, Germany)

A5.2 Sub-20 nm Fin-Width InGaSb p-channel FinFETs

08:30 h

Wenjie Lu (MIT, USA); Shawn Mack and Brian Bennett (Naval Research Laboratory, USA); Jesus del Alamo (MIT, USA)

A5.3 Threshold Voltage Improvement Through Sidewall Control of InGaAs Fin-structured High Electron Mobility Transistors (Fin-HEMTs)

08:45 h

Cheng-Jia Dai, Li-Cheng Chang and Chao-Hsin Wu (National Taiwan University, Taiwan)

A5.4 Metal-Organic Vapor-Phase Epitaxy of InP-based HEMT structures with InAs/In_{0.8}Ga_{0.2}As/In_{0.53}Ga_{0.47}As composite channel

09:00 h

Hiroki Sugiyama (NTT Device Technology Laboratories, NTT Corporation, Japan)

A5.5 Effective electron velocity in InGaAs-HEMTs with slant field plates

09:15 h

Tomotaka Hosotani, Taiichi Otsuji and Tetsuya Suemitsu (Tohoku University, Japan)

A5.6 Improvement of High Frequency Characteristics of HEMTs with Novel Cavity Structure using STP Technology

09:30 h

Kazuhiro Maeda (Mitsubishi Electric Corporation & High Frequency & Optical Device Works, Japan)

A5.7 Unilateral Power Gain Resonances in mm-Wave InP HEMTs

09:45 h

Tamara Saranovac, Ralf Flückiger, Olivier Ostinelli and Diego Marti (ETH Zurich, Switzerland); Colombo Bolognesi (ETH Zürich & Millimeter-Wave Electronics, Switzerland)

Wednesday, May 17th

08:00 h–10:00 h

B5 – Advanced Characterization

Room: Atrium IV–V, 1st Floor

Chair: Holger Eisele, Technische Universität Berlin, Germany

INVITED

B5.1 Luminescence Nano-Characterization Using High-Resolution TEM-CL

08:00 h

Jürgen Christen (Otto von Guericke University Magdeburg, Germany)

B5.2 Near-surface band alignment of InAs quantum dots on GaAs(001) studied by Kelvin probe force microscopy (KFM)

08:30 h

Tomohiro Kobayashi, Fumihiko Yamada, Ko Takabayashi, Kenichi Shimomura, Yuwei Zhang and Itaru Kamiya (Toyota Technological Institute, Japan)

B5.3 Influence of well width fluctuations on recombination properties of InGaN quantum wells studied by time-resolved near-field photoluminescence

08:45 h

Tomas Uzdavinys (KTH Royal Institute of Technology, Sweden)

B5.4 Scanning gate microscopy in quantum Hall system in the high current region

09:00 h

Toru Tomimatsu, Katsushi Hashimoto, Syunsuke Taninaka and Ken Sato (Tohoku University, Japan); Yoshiro Hirayama (Tohoku University & ERATO Nuclear Spin Electronics Project, Japan)

B5.5 Atomic structure and electronic properties of the In₂O₃(111) cleavage surface investigated by STM/STS

09:15 h

Robert Zielinski and Celina Seraphin Schulze (Technische Universität Berlin, Germany); Zbigniew Galazka (Leibniz Institute for Crystal Growth - IKZ, Germany); Andrea Lenz and Holger Eisele (Technische Universität Berlin, Germany)

B5.6 Carrier Recombination levels in Intermediate-Band type GaPN revealed by Time Resolved and Two-Wavelength Excited Photoluminescence

09:30 h

Norihiko Kamata, Makiko Suetsugu, Md Dulal Haque and Shuhei Yagi (Saitama University, Japan); Hiroyuki Yaguchi (Department of Electrical and Electronic Systems Engineering, Saitama University, Japan); Fredrik Karlsson and Per Olof Holtz (Linköping University, Sweden)

Wednesday, May 17th

08:00 h–10:00 h

B5.7 Development of dual-focus scanning internal
09:45 h **photoemission microscopy for mapping of both top
and rear surfaces of 3C-SiC layers**

*Kenji Shiojima (University of Fukui, Japan); Naoto
Ichikawa, Masashi Kato (Nagoya Institute of
Technology, Japan)*

Wednesday, May 17th

08:00 h–10:00 h

C5 – Mid-infrared and Tunneling Devices

Room: Köpenick 3rd Floor

Chair: Tim Stadelmann, Fraunhofer IAF, Germany

C5.1 High Bi-content GaSbBi alloys for mid-infrared optoelectronics

08:00 h

Olivier Delorme (University of Montpellier, France)

C5.2 Midwave Infrared Type-II Superlattice

Heterojunction Photodiodes with Reduced Dark Current

08:15 h

Johannes Schmidt and Frank Rutz, Robert Rehm, Volker Daumer, Andreas Wörl (Fraunhofer-IAF, Germany)

C5.3 Design and modelling of longwave infrared InAs/GaSb superlattice barrier detectors

08:30 h

Marie Delmas (Cardiff University, United Kingdom); Rémi Rossignol (IES Université Montpellier, France); Jean Baptiste Rodriguez (IES Université Montpellier II, France); Philippe Christol (IES Université Montpellier, France); Diana Huffaker (Cardiff University, United Kingdom)

C5.4 Explore on III-V avalanche photodiodes: lower operating voltage, wavelength extending, and quantum dot multiplication

08:45 h

Yingjie Ma and Yonggang Zhang (Shanghai Institute of Microsystem and Information Technology, P.R. China); Yi Gu (Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, P.R. China); Xingyou Chen, Suping Xi and Ben Du (Shanghai Institute of Microsystem and Information Technology, P.R. China); Yanhui Shi (Shanghai Institute of Microsystem and Information Technology, USA); Wanyan Ji and Aizhen Li (Shanghai Institute of Microsystem and Information Technology, P.R. China)

C5.5 AlInSb mid-infrared LEDs of high luminous efficiency for gas sensors

09:00 h

Koichiro Ueno (Asahi Kasei Microdevices Corporation, Japan); Osamu Morohara (Asahi Kasei Microdevices Corporation); Hiromi Fujita and Edson Camargo (Asahi Kasei Microdevices Corporation, Japan); Hirotaka Geka (Asahi Kasei Microdevices Corporation); Yoshihiko Shibata and Naohiro Kuze (Asahi Kasei Microdevices Corporation, Japan)

Wednesday, May 17th

08:00 h–10:00 h

**C5.6 Thin-TFETs, Tunneling Field Effect Transistors for
High- Efficiency Logic Electronics**

09:15 h

INVITED

*Huili Xing, Mingda Oscar Li, Rusen Yan and Debdeep
Jena (Cornell University, USA)*

Wednesday, May 17th

08:00 h–10:00 h

D5 – Postdeadline

Room: Friedrichshain 4th Floor

Chair: Andy Carter, Teledyne Scientific & Imaging, Calif., USA

D5.1 Study of structural and electrical properties of superlattice buffer for high voltage HEMT devices on 150 mm silicon substrate

08:00 h

Tomas Novak and Petr Kostelnik (ON Semiconductor Czech Republic, Czech Republic); Abhishek Banerjee (ON Semiconductor & ON Semiconductor, Belgium); Peter Moens (ON Semiconductor, Belgium); Martin Konecny (Brno University of Technology, Czech Republic); Jan Sik (ON Semiconductor Czech Republic, Czech Republic)

D5.2 Flexible and scalable heterogeneous integration of GaN HEMTs on Si-CMOS by micro-Transfer-Printing

08:15 h

Ralf Lerner, Stefan Eisenbrandt and Frank Fischer (X-FAB Semiconductor Foundries AG, Germany); Christopher Bower (X-Celeprint Ltd, Ireland); Patrick Waltereit (Fraunhofer IAF, Germany); Richard Reiner (IAF Fraunhofer, Germany); Heiko Czap (Fraunhofer IAF, Germany)

D5.3 Extrapolation of Terahertz-Regime Detection Sensitivity in GaAsSb/InGaAs Backward Diodes Analyzed by Using Quantum Transport Models and S-parameter Measurements in Millimeter-Wave Range

08:30 h

Michihiko Suhara and Ryouusuke Inoue (Tokyo Metropolitan University, Japan); Kiyoto Asakawa (Tokyo Metropolitan College of Industrial Technology, Japan); Hisanari Fujita (Tokyo Metropolitan University, Japan); Tsuyoshi Takahashi (Fujitsu Laboratories Ltd., Japan)

D5.4 N-Polar GaN HEMTs with High Breakdown Voltage (>1750 V) and Low Dynamic On-Resistance

08:45 h

Onur Koksaldi (University of California Santa Barbara, USA); Jeffrey Haller (UCSB, Transphorm); Haoran Li (UCSB, USA); Brian Romanczyk, Steven Wienecke, Jr and Matthew Guidry (University of California Santa Barbara, USA); Stacia Keller and Umesh Mishra (UCSB, USA)

Wednesday, May 17th

08:00 h–10:00 h

D5.5 High-power sub-200-fs semiconductor disk laser based on quantum dot layers

09:00 h

Cesare Alfieri (ETH Zürich, Switzerland); Dominik Waldburger (ETH Zürich & Institute for Quantum Electronics, Switzerland); Matthias Golling and Ursula Keller (ETH, Switzerland)

D5.6 Efficiency improvement of AlGaIn UVC-LEDs using highly-reflective Ni/Al p-type electrode

09:15 h

Noritoshi Maeda (RIKEN, Japan)

D5.7 High Efficiency and High-speed Modulation Characteristics of Membrane Distributed-Reflector Laser on Si

09:30 h

Takahiro Tomiyasu, Takuo Hiratani, Daisuke Inoue, Nagisa Nakamura, Kai Fukuda, Tatsuya Uryu, Tomohiro Amemiya, Nobuhiko Nishiyama, Shigehisa Arai (Tokyo Institute of Technology, Japan)

D5.8 Study of WSe₂ Van der Waals Epitaxy by Plasma-Assisted MBE

09:45 h

Salim EL Kazzi, Wouter Mortelmans, Thomas Nuytten, Matty Caymax, Iuliana Radu and Clement Merckling (IMEC, Belgium)

Wednesday, May 17th

10:30 h–12:00 h

A6 – Power Electronics II

Room: Atrium I–II, 1st Floor

Chair: Elisa Matioli, Ecole Polytechnique Fédérale de Lausanne, Switzerland

A6.1 GaN HEMT Device Technology for W-band Power Amplifiers

10:30 h

INVITED

Kozo Makiyama, Yoshitaka Niida, Shirou Ozaki and Toshihiro Ohki, Naoya Okamoto, Yuichi Minoura, Masaru Sato and Yoichi Kamada, Kazukiyo Joshin, Keiji Watanabe (Fujitsu Laboratories Ltd., Japan); Yasuyuki Miyamoto (Tokyo Institute of Technology, Japan)

A6.2 mm-Wave N-Polar GaN Deep Recess MISHEMT Delivering Over 7 W/mm and 25% Power-Added Efficiency at 94 GHz

11:00 h

Brian Romanczyk; Haoran Li, Matthew Guidry, Steven Wienecke, Jr, Elaheh Ahmadi, Anchal Agarwal, Xun Zheng and Shubhra Pasayat, Stacia Keller and Umesh Mishra (University of California Santa Barbara, USA)

A6.3 Nanoscale AlGaIn/GaN In-Plane Gate Field Effect Transistors

11:15 h

Giovanni Santoruvo (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Elisa Matioli (EPFL, Switzerland)

A6.4 Progress and Future Challenges of SiC Material and Power Devices

11:30 h

INVITED

Tsunenobu Kimoto (Kyoto University, Japan)

Wednesday, May 17th

10:30 h–12:00 h

B6 – Nanowires: Growth II

Room: Atrium IV–V, 1st Floor

Chair: Guoqiang Zhang, NTT Basic Research Laboratories, Japan

B6.1 MOCVD growth of GaSb nano ridges on V-grooved Si substrates

10:30 h

Qiang Li and Kei May Lau (Hong Kong University of Science and Technology, Hong Kong)

B6.2 Comparing electron beam lithography and nanoimprint lithography for the selective-area growth of GaAs nanowires by molecular beam epitaxy

10:45 h

Abbes Tahraoui, Hanno Küpers, Sander Rauwerdink, Ryan Lewis and Faebian Bastiman (Paul-Drude-Institut für Festkörperelektronik, Germany); Mathias Matalla and Olaf Krüger (Ferdinand-Braun-Institut, Germany); Henning Riechert and Lutz Geelhaar (Paul-Drude-Institut für Festkörperelektronik, Germany)

B6.3 Real-time investigation of III-V nanowire growth using in-situ TEM

11:00 h

Kimberly A. Dick (Lund University, Sweden)

INVITED

B6.4 Epitaxy Feasibility of n-type GaN/AlGaN Nanowires on Silica Glass

11:30 h

Andreas Liudi Mulyo (Norwegian University of Science and Technology & Sophia University, Norway); Bjørn-Ove Fimland and Helge Weman (Norwegian University of Science and Technology, Norway); Katsumi Kishino (Sophia University, Japan)

B6.5 Position-controlled VLS Growth of Nanowires on Mask-patterned GaAs Substrates for Axial GaAsSb/InAs Heterostructures

11:45 h

Kenichi Kawaguchi, Tsuyoshi Takahashi, Naoya Okamoto, Masaru Sato (Fujitsu Limited & Fujitsu Laboratories Ltd., Japan)

Wednesday, May 17th

10:30 h–12:00 h

C6 – Semiconductor Lasers I

Room: Köpenick 3rd Floor

Chair: Osamu Wada, Kobe University, Japan

C6.1 Waveguide-Coupled III-V Nanowire Array Laser on Silicon-on-Insulator

10:30 h

Hyunseok Kim (University of California, Los Angeles, USA); Wook Jae Lee (Cardiff University, United Kingdom); Alan Farrell, Diana Huffaker (University of California, Los Angeles, USA)

C6.2 Silicon nanowire waveguide integrated membrane buried heterostructure lasers

10:45 h

Takuma Aihara, Tatsuou Hiraki, Koichi Hasebe, Takuro Fujii, Koji Takeda, Hidetaka Nishi and Tai Tsuchizawa, Takaaki Kakitsuka, Shinji Matsuo (NTT Device Technology Laboratories, Japan)

C6.3 Waveguide loss reduction of GaInAsP/InP membrane lasers by reduction of doping concentration of p-InP cladding layer

11:00 h

Takahiro Tomiyasu, Takuo Hiratani, Daisuke Inoue, Nagisa Nakamura, Tomohiro Amemiya, Nobuhiko Nishiyama and Shigehisa Arai (Tokyo Institute of Technology, Japan)

C6.4 Temperature-dependent properties and optimization of type-II (GaIn)As/Ga(AsSb)/(GaIn)As "W"-quantum well lasers at 1.2 μm

11:15 h

Christian Fuchs, Anja Brüggemann, Maria Weseloh, Christian Berger, Christoph Möller and Stefan Reinhard (Philipps Universität Marburg, Germany); Jörg Hader and Jerome Moloney (University of Arizona & Nonlinear Control Strategies, Inc., USA); Stephan Koch, Wolfgang Stolz (Philipps University Marburg, Germany)

C6.5 Controlling surface roughening instabilities as a viable paradigm for MOVPE-grown metamorphic lasers at 1.3 μm

11:30 h

Enrica Mura, Agnieszka Gocalinska, Gediminas Juska, Stefano Moroni, Andrea Pescaglini, James O'Callaghan and Brian Corbett, Emanuele Pelucchi (Tyndall National Institute-University College Cork, Ireland);

Wednesday, May 17th

10:30 h–12:00 h

C6.6 **Effect of Vacancies Induced by Ar⁺ Implantation to Quantum Dot Intermixing for 1550 nm-Band QD Photonic Integrated Circuits**

11:45 h

Atsushi Matsumoto (National Institute of Information and Communications Technology, Japan); Shin'e Matsui and Yota Akashi (Waseda University, Japan); Kouichi Akahane, Toshimasa Umezawa, Naokatsu Yamamoto (National Institute of Information and Communications Technology, Japan); Yuichi Matsushima (Waseda University, Japan); Hiroshi Ishikawa (National Institute of Advanced Industrial Science and Technology, Japan); Katsuyuki Utaka (Waseda University, Japan)

Wednesday, May 17th

10:30 h–12:00 h

D6 – Materials for PV

Room: Friedrichshain 4th Floor

Chair: Yong-Hang Zhang, Arizona State University, USA

D6.1 Physical properties of 3D and 2D Ruddlesden-

10:30 h Popper halide perovskite semiconductors

Jacky Even (INSA Rennes, France); Hsinhan Tsai, W. Nie and A. Neukirch (Los Alamos National Laboratory, USA); J. Blancon (Los Alamos National Laboratory, France); Laurent Pedesseau (UMR FOTON, CNRS, INSA-Rennes, France); Soline Richard (INSA Rennes, France); B. Traore and M. Kepenekian (ISCR UMR 6226, France); Jean-Marc Jancu (INSA Rennes, France); C. Stoumpos (Northwestern University, France); S. Tretiak (Los Alamos National Laboratory, USA); M. Kanatzidis (Northwestern University, USA); A. Mohite (Los Alamos National Laboratory, USA); C. Katan (ISCR UMR 6226, France)

D6.2 The potential of GaAsBi MQWs for photovoltaics

10:45 h *Robert Richards (University of Sheffield, UK); Alexander Mellor (Imperial College London, UK); Faezah Harun and Jeng Cheong (University of Sheffield, UK); Nicholas Hylton, Thomas Wilson and Tomos Thomas (Imperial College London, UK); John Roberts (University of Sheffield); Nicholas Ekins-Daukes (Imperial College London, UK); John David (University of Sheffield, UK)*

D6.3 AllInAs:C/InP:S tunnel junction grown by MOVPE for photovoltaic applications

11:00 h *Stefano Soresi (III-V Lab, France)*

D6.4 Effect of Hydrogen Annealing for Dilute Nitride GaInNAsSb Solar Cells

11:15 h *Naoya Miyashita (The University of Tokyo, Japan)*

D6.5 Investigation into the current loss in Si-doped InAs/GaAs quantum dot solar cells

11:30 h *Dongyoung Kim, Mingchu Tang and Jiang Wu (University College London, United Kingdom); Huiyun Liu (University College London & Torrington Place, London WC1E 6BT, United Kingdom)*

Wednesday, May 17th

10:30 h–12:00 h

- D6.6 In-situ control over dimer orientation on Si(100) surfaces in arsenic ambient and its impact on the sublattice orientation of subsequently grown GaP**
11:45 h *Agnieszka Paszuk, Oliver Supplie (Ilmenau University of Technology, Germany); Sebastian Brückner (Fraunhofer Institute for Solar Energy Systems, Germany); Matthias May (University of Cambridge, Germany); Andreas Nägelein (TU Ilmenau, Institute of Physics, Germany); Boram Kim, Tohma Watanabe, Yoshiaki Nakano and Masakazu Sugiyama (University of Tokyo, Japan); Peter Kleinschmidt and Thomas Hannappel (TU Ilmenau, Institute of Physics, Germany)*

Thursday, May 18th

08:30–10:30 h

A7 – Heterogeneous Integration, MOSFETs

Room: Atrium I–II, 1st Floor

Chair: Arnulf Leuther, Fraunhofer IAF, Freiburg, Germany

A7.1 High-Frequency SiGe HBTs for Communication, Radar and Imaging

08:30 h

INVITED

Bernd Heinemann (IHP, Germany)

A7.2 3D Integration of Compound Semiconductor Devices with Silicon

09:00 h

INVITED

Andrew Carter, Miguel Urteaga (Teledyne Scientific & Imaging LLC, USA)

A7.3 $f_{\text{MAX}} > 700$ GHz in InP/GaAsSb DHBTs with a 10 μm Long Emitter

09:30 h

Wei Quan, Ralf Flückiger, Olivier Ostinelli and Colombo R. Bolognesi (ETH Zurich, Switzerland)

A7.4 Gate-Recessed $\beta\text{-Ga}_2\text{O}_3$ MOSFETs with Small Signal Radio Frequency Operation

09:45 h

Andrew Green, Kelson Chabak (Air Force Research Laboratory, USA)

A7.5 A Common Gate-Stack Process for Ge p-MOSFETs and InGaAs n-MOSFETs

10:00 h

Nai Rong Hsu and Cheng Yu Chen (National Central University, Taiwan); Szu Hung Chen, Chun Lin Chu, Guang Li Luo and Wen kuan Yeh (National Nano Device Laboratories, Taiwan); Pei Chia Lee and Wei Jen Hsueh, An Jye Tzou and Hao-Chung Kuo (National Chiao Tung University, Taiwan); Jen-Inn Chyi (National Central University, Taiwan)

A7.6 Fabrication and characterization of InGaAs/InAlAs quantum-well MOSFETs on 300-mm Si substrate by MOCVD

10:15 h

Seung-Woo Son (Kyungpook National University, Korea); Dae-Hyun Kim (Kyungpook National University, Germany); Ji-Min Baek, Jung Ho Park and Do-Kywn Kim, Jung-Hee Lee (Kyungbook National University, Korea); Sung-Kyu Lim (National Nano Fab Center, Korea)

Thursday, May 18th

08:30–10:30 h

B7 – Nanowires: Transport and Optical Properties

Room: Atrium IV–V, 1st Floor

Chair: Erik Lind, Lund University, Sweden

B7.1 Electron-hole drift and light coupling in bent GaAs-based core-multishell nanowire heterostructures

08:30 h

Pierre Corfdir (Paul-Drude-Institut, Germany)

B7.2 Infrared Absorption in InAsSb Nanowire Clusters

08:45 h

Johannes Svensson (Lund University, Sweden)

B7.3 Correlation of structural and optical properties of InGaN/GaN quantum discs embedded in nanowires using highly spatially resolved cathodoluminescence microscopy

09:00 h

Bowen Sheng (Peking University, P.R. China & Otto-von-Guericke-Universität, Magdeburg, Germany); Frank Bertram (Otto von Guericke University Magdeburg, Germany); Xiaoxiao Sun and Ping Wang (Peking University, P.R. China); Marcus Müller and Peter Veit (Otto von Guericke University Magdeburg, Germany); Thomas Hempel (Otto-von-Guericke-Universität, Magdeburg, Germany); Jürgen Christen (Otto von Guericke University Magdeburg, Germany); Xinqiang Wang (Peking University, P.R. China)

B7.4 Nanoscopic insights into the optical and structural properties of GaAs/AlGaAs core-shell nanowires by cathodoluminescence imaging in a scanning transmission electron microscope

09:15 h

Marcus Müller and Peter Veit (Otto von Guericke University Magdeburg, Germany); Bernhard Loitsch, Julia Winnerl and Sonja Matich (Technische Universität München & Walter Schottky Institut, Germany); Frank Bertram (Otto von Guericke University Magdeburg, Germany); Gregor Koblmüller, Jonathan Finley (TU München, Germany); Jürgen Christen (Otto von Guericke University Magdeburg, Germany)

B7.5 Au-free InP/InAs heterostructure nanowires

09:30 h

Guoqiang Zhang (NTT Basic Research Laboratories & NTT Corporation, Japan)

INVITED

Thursday, May 18th

08:30–10:30 h

B7.6 Luminescence characteristics of coupled GaAs/
10:00 h **AlGaAs quantum ring+dot structure under applied
electric field**

Martin Elborg, Takeshi Noda, Takaaki Mano, Takashi Kuroda, Yuanzhao Yao and Yoshiaki Sakuma (National Institute for Materials Science, Japan)

B7.7 Vertical nanowire-LED array using InGaAs/InP core-
10:15 h **multishell nanowires with strained-quantum well on
Si substrate**

Katsuhiko Tomioka, Junichi Motohisa, Akinobu Yoshida, Kohei Chiba (Hokkaido University, Japan)

Thursday, May 18th

08:30–10:30 h

C7 – Semiconductor Lasers II

Room: Köpenick 3rd Floor

Chair: Shigehisa Arai, Tokyo Institute of Technology, Japan

INVITED

C7.1 High Power and Narrow Linewidth Tunable Light Source for Coherent Transmission Integrated with DR Laser Array and AWG coupler

08:30 h

Kazuaki Kiyota (Furukawa Electric Co., LTD.); Toshihito Suzuki, Shunsuke Okuyama, Maiko Ariga, Yusuke Inaba, Kazuki Yamaoka and Hajime Mori (Furukawa Electric Co., LTD., Japan); Tatsuro Kurobe (Furukawa Electric Co., LTD.)

C7.2 Temperature dependence of threshold current of GaInAsP/InP membrane lasers with Bragg wavelength detuning

09:00 h

Daisuke Inoue, Takuo Hiratani, Kai Fukuda, Takahiro Tomiyasu, Tatsuya Uryu, Tomohiro Amemiya, Nobuhiko Nishiyama and Shigehisa Arai (Tokyo Institute of Technology, Japan)

C7.3 Integration of active, passive and buried-grating sections for a GaAs-based, widely tunable laser with sampled grating Bragg reflectors

09:15 h

Pietro Della Casa (Ferdinand Braun Institut Leibniz Institut für Höchstfrequenztechnik, Germany)

C7.4 Narrow Linewidth Quantum Dot distributed Feedback Lasers

09:30 h

Jianan Duan (Télécom ParisTech, Université Paris-Saclay, France); Heming Huang and Kevin Schires (Télécom Paristech, Université Paris-Saclay, France); Zhenguo Lu and Philip Poole (National Research Council Canada, Canada); Frédéric Grillot (Télécom Paristech, Université Paris-Saclay, France)

C7.5 Wavelength stabilized high pulse power laser diodes for automotive LIDAR

09:45 h

Andrea Knigge (Ferdinand-Braun-Institut & Leibniz-Institut fuer Hoechstfrequenztechnik, Germany)

C7.6 Improved dynamic properties of directly modulated high-speed

10:00 h

1.5 μm quantum dot lasers

Alireza Abdollahinia and Saddam Banyoudeh (University of Kassel, Germany); Ori Eyal (Technion - Israel Institute of Technology, Israel); Gadi Eisenstein (Technion Institute of Technology, Israel); Johann Peter Reithmaier (University of Kassel, Germany)

Thursday, May 18th

08:30–10:30 h

C7.7 Gigahertz 100-fs semiconductor disk lasers

10:15 h *Dominik Waldburger (ETH Zürich & Institute for Quantum Electronics, Switzerland); Cesare Alfieri, Sandro Link and Emilio Gini (ETH Zürich, Switzerland); Matthias Golling and Ursula Keller (ETH, Switzerland)*

Thursday, May 18th

11:00–12:30 h

A8 – Nitrides: Growth

Room: Atrium I–II, 1st Floor

Chair: Martin Strassburg, Osram Opto Semiconductors GmbH, Germany

A8.1 Status of AlN Bulk Crystal Growth for Use as Substrates in Deep-UV Applications

11:00 h

Matthias Bickermann (Leibniz Institute for Crystal Growth (IKZ), Germany)

A8.2 In/GaN(0001)-($\sqrt{3} \times \sqrt{3}$)R30° adsorbate structure as a template for embedded (In,Ga)N/GaN monolayers and short-period superlattices by molecular beam epitaxy

11:15 h

Caroline Chèze, Felix Feix (Paul-Drude-Institut, Germany); Mariia Anikeeva and Tobias Schulz, Martin Albrecht (Leibniz-Institut für Kristallzüchtung, Germany); Henning Riechert, Oliver Brandt and Raffaella Calarco (Paul-Drude-Institut für Festkörperelektronik, Germany)

A8.3 Thick nonpolar m-plane and semipolar (10 $\bar{1}\bar{1}$) GaN grown on an ammonothermal seed by tri-halide vapor phase epitaxy using GaCl₃

11:30 h

Kenji Iso (Tokyo University of Agriculture and Technology, Japan)

A8.4 Strain Compensated M-plane Nitride Superlattices by NH₃-MBE

11:45 h

Micha Fireman, Erin Young and Bastien Bonef, James Speck (University of California, Santa Barbara, USA)

A8.5 Effects of Hydrogen and Nitrogen Carrier Gas on the Electrical Properties of AlInN/AlN/GaN Heterostructures

12:00 h

Yen-Chang Lee, Ji-Xian Chen, Geng-Yen Lee, Hsing-Ching Pan and Jen-Inn Chyi (National Central University, Taiwan)

A8.6 Analysis of Vegard's Law for Lattice Matching In_xAl_{1-x}N to GaN by Metalorganic Chemical Vapor Deposition

12:15 h

Humberto Foronda (University of California, Santa Barbara, USA); Baishakhi Mazumder (University at Buffalo, SUNY, USA); Matthew Laurent (UC Davis, USA); Erin Young (University of California, Santa Barbara, USA); Steven DenBaars (Advisor, USA); James Speck (University of California, Santa Barbara, USA)

Thursday, May 18th

11:00–12:30 h

B8 – Surfaces and Processing

Room: Atrium III-IV

Chair: Lutz Geelhaar, Paul-Drude-Institut, Germany

B8.1 Improving the characteristics of $\text{HfO}_2/\text{Al}_2\text{O}_3/\text{GaSb}$ MOSCAPs using sequential hydrogen plasma and nitrogen plasma treatments

11:00 h

Kuan-Hua Su, Wei Jen Hsueh, Cheng Yu Chen and Jen-Inn Chyi (National Central University, Taiwan)

B8.2 Effective surface passivation of InP nanowires by ALD Al_2O_3 with PO_x interlayer

11:15 h

Lachlan E. Black and Alessandro Cavalli (Eindhoven University of Technology, The Netherlands); Marcel A Verheijen (Eindhoven University of Technology & Philips Innovation Services Eindhoven, The Netherlands); Jos E. M. Haverkort, Erik P. A. M. Bakkers and Erwin Kessels (Eindhoven University of Technology, The Netherlands)

B8.3 Effects of in-situ nitrogen plasma surface treatment on the electrical properties of $\text{HfO}_2/\text{Al}_2\text{O}_3/\text{InAs}$ MOS capacitors

11:30 h

Wei Jen Hsueh, Cheng Yu Chen, Gong-Bang He and Jen-Inn Chyi (National Central University, Taiwan)

B8.4 Profile control for InP-related III-V quaternary semiconductors in inductively coupled plasma dry etch processes

11:45 h

Ligang Deng (Oxford Instruments & Plasma Technology, United Kingdom)

B8.5 Thin-Film GaN p-n Diodes and Epitaxial Lift-Off From GaN Substrates

12:00 h

Jingshan Wang (University of Notre Dame, USA); Chris Youtsey (MicroLink Devices, Inc., USA); Robert McCarthy and Rekha Reddy (MicroLink Devices, USA); Noah Allen (Virginia Tech, USA); Louis Guido (Virginia Tech, USA); Jinqiao Xie and Edward Beam (Qorvo, Inc., USA); Patrick Fay (University of Notre Dame, USA)

B8.6 Sublattice reversal in GaAs/Ge/GaAs (113)B heterostructures grown by MBE

12:15 h

Xiangmeng LU and Yasuo Minami (Tokushima University, Japan); Takahiro Kitada (The University of Tokushima, Japan)

Thursday, May 18th

11:00–12:30 h

C8 – THz QCLs and tunneling devices

Room: Köpenick 3rd Floor

Chair: W. Ted Masselink, Humboldt-Universität zu Berlin, Germany

C8.1 **Statistics of InAs/InGaAsSb/GaSb TFETs with sub-50 mV/decade operation at VDS of 0.3V**

11:00 h

Elvedin Memisevic, Johannes Svensson, Erik Lind and Lars-Erik Wernersson (Lund University, Sweden)

C8.2 **Enhanced RF-power performance of a Reflection-type RTD Amplifier using RTD Pair Topology**

11:15 h

Jaehong Park, Dong Hee Cho, Kyoungsoon Yang (KAIST & Korea Advanced Institute of Science and Technology, Korea)

C8.3 **GaAsSb/InGaAs Double-Gate Vertical Tunnel FET with a Subthreshold Swing of 68mV/dec at Room Temperature**

11:30 h

Nobukazu Kise (Tokyo Institute of Technology, Japan)

C8.4 **High performance low-effective mass THz quantum cascade lasers**

11:45 h

INVITED

Karl Unterrainer (Vienna University of Technology, Austria)

C8.5 **Terahertz GaAs/AlAs quantum-cascade lasers**

12:15 h

Lutz Schrottke, Xiang Lü, Klaus Biermann, Abbas Tahraoui, Martin Hempel, Benjamin Röben and Holger Grahn (Paul-Drude-Institut für Festkörperlektronik, Germany)

Thursday, May 18th

12:30 h–13:00 h

Closing Session

Atrium I–II, 1st Floor