

Tuesday, March 19th, 2019

08:00 – 09:00 **Registration**

09:00 – 09:15 **Welcome**

HgCdTe Detectors

09:15 – 09:45 **1.1 Invited paper: HgCdTe detector technology at AIM**

H. Figgemeier

AIM Infrarot-Module GmbH, Heilbronn, Germany

09:45 – 10:05 **1.2 Correlation between electrical properties of CdTe passivation and p-on-n HgCdTe photodiodes performances**

L. Mangin¹, F. Rochette¹, A. Even, M. Soria¹, P. Bleuet¹, J. Rothman¹, and G. Ghibaudo²

¹*Univ. Grenoble Alpes, CEA LETI, France*

²*Univ. Grenoble Alpes, CNRS, Grenoble-INP, IMEP-LAHC, France*

10:05 – 10:25 **1.3 Feasibility of HgTe-CdTe superlattice absorber for VLWIR applications**

N.D. Akhavan, G.A. Umana-Membreno, R. Gu, J. Antoszewski, and L. Faraone

The University of Western Australia, Crawley, Australia

10:25 – 10:45 **1.4 Type-II superlattice photodetectors versus HgCdTe photodiodes**

A. Rogalski, P. Martyniuk, and M. Kopytko

Military University of Technology, Institute of Applied Physics, Warsaw, Poland

10:45 – 11:15 **Coffee Break**

Type-II Superlattice Detectors

11:15 – 11:45 **2.1 Invited paper: Type-II superlattice infrared detectors**

D. Ting

Jet Propulsion Laboratory, NASA, Pasadena, USA

11:45 – 12:05 **2.2 MWIR and VLWIR type-II superlattices: FPA production and development at IRnova**

L. Höglund, S. Naureen, R. Ivanov, M. Pozzi, S. Almqvist, W. Diel, S. Smuk, and E. Costard

IRnova AB, Kista, Sweden

12:05 – 12:25 **2.3 Characterization and performance analysis of InAs/GaSb T2SL photodetector for LWIR/VLWIR spectral domain**

R. Alchaar¹, J.B. Rodriguez¹, L. Höglund², and P. Christol¹

¹*IES, Univ. Montpellier, CNRS, Montpellier, France*

²*IRnova AB, Kista, Sweden*

12:25 – 12:45 **2.4 Type-II superlattice and InGaAs detector development at Fraunhofer IAF**

R. Rutz, R. Aidam, A. Bächle, V. Daumer, T. Hugger, V. Klinger, N. Kohn, W. Luppold, R. Müller, J. Niemasz, T. Stadelmann, M. Wauro, A. Wörl, and R. Rehm

Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany

13:00 – 14:00 **Lunch at badenova cafeteria**

14:00 – 15:30

3 Poster Session & Coffee Break

- 3.1 **Elastic modulus and hardness of MBE-grown $\text{Hg}_{1-x}\text{Cd}_x\text{Se}$ films on Gasb (211)B substrates**
Z.K. Zhang, W.W. Pan, W. Lei, and L. Faraone
Dept. E. E. & C. Engineering, The University of Western Australia, Perth Australia
- 3.2 **LWIR QWIPs at IRnova for next generation polarimetric imaging**
R. Ivanov, S. Smuk, S. Hellström, D. Evans, L. Höglund, and E. Costard
IRnova AB, Kista, Sweden
- 3.3 **Long wavelength type-II InAs/GaSb superlattice with interface layers grown by migration-enhanced epitaxy**
M. Delmas¹, D. Kwan¹, M. Debnath², B. L. Liang², and D. L. Huffaker^{1,2}
¹*School of Physics and Astronomy, Cardiff University, UK*
²*California NanoSystem Institute, Univ. of California, Los Angeles, USA*
- 3.4 **High-resolution mobility spectrum analysis of electronic transport in InAs/GaSb type-II superlattices**
G. A. Umana-Membreno, N.D. Akhavan, J. Antoszewski, and L. Faraone
Dept. E. E. & C. Engineering, The University of Western Australia, Perth Australia
- 3.5 **Magnetotransport characterization of InAs/GaInSb superlattices for long wavelength photodetectors**
M. Patrashin, N. Sekine, K. Akahane, A. Kasamatsu, and I. Hosako
National Institute of Information and Communications Technology, Tokyo, Japan
- 3.6 **Low-resistivity-contact-layer characterization in the context of magneto-transport measurements**
J. Wróbel, A. Kowalewski, J. Boguski, and P. Martyniuk
Institute of Applied Physics, Military University of Technology, Warsaw, Poland
- 3.7 **InAs/GaSb type-II superlattices – an emerging material for thermoelectrically-cooled detectors for the longwave infrared**
R. Müller¹, J. Niemasz¹, L. Kirste¹, V. Daumer¹, A. Janaszek², J. Jureńczyk², and R. Rehm¹
¹*Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany*
²*VIGO System S.A., Ożarów Mazowiecki, Poland*
- 3.8 **Status of HOT LWIR detectors based on $\text{InAs}_{1-x}\text{Sb}_x$ material system at Vigo System S.A.**
J. Jureńczyk¹, Ł. Kubiszyn¹, K. Michalczewski¹, K. Lipski², A. Ornoch¹, and J. Piotrowski¹
¹*VIGO System S.A., Ożarów, Poland*
²*Institute of Applied Physics, Military University of Technology, Warsaw, Poland*
- 3.9 **Testbed for thermal imager characterization using an infrared scene projector**
M. Koerber, D. Wegner, B. Schwarz, G. Ritt, S. Kessler, and B. Eberle
Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB, Ettlingen, Germany

- 3.10 **SI traceable measurement of the spectral responsivity of a thermopile detector in the mid infrared spectral range**
P. Meindl¹, U. Johannsen¹, T. Pohl¹, and L. Werner¹
¹*Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany*
- 3.11 **Carbon nanotube based black coatings for IR applications**
J. Bonitz¹, M. Kini², S.E. Schulz^{1,2}, and S. Hermann^{1,2}
¹*Fraunhofer Institute for Electronic Nano Systems ENAS, Chemnitz, Germany*
²*Technische Universität Chemnitz, Center for Microtechnologies, Germany*
- 3.12 **15th International WORKshop on infrared technologies: Highlights and trends**
 J. Kunsch
Laser Components GmbH, Olching, Germany
- 3.13 **Spectral and spatially scanning MIR laser for point of interest spectroscopy**
M. Härtelt¹, D. Stothard², S. Hugger¹, Y. Flores¹, A. Merten³, A. Dreyhaupt³, A. Polack², C. Carson², M. Warden², and R. Ostendorf¹
¹*Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany*
²*Fraunhofer Centre for Applied Photonics FCAP, Glasgow, United Kingdom*
³*Fraunhofer Institute for Photonic Microsystems IPMS, Dresden, Germany*
- 3.14 **Quasi-static MOEMS grating scanner for wavelength tuning of MIR external cavity quantum cascade lasers**
A. Merten¹, R. Schroedter¹, A. Dreyhaupt¹, T. Graßhoff¹, C. Drabe¹, M. Schwarzenberg¹, S. Hugger², C. Schilling², M. Rattunde², M. Härtelt², J. Grahmann¹, and R. Ostendorf²
¹*Fraunhofer Institute for Photonic Microsystems IPMS, Dresden, Germany*
²*Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany*
- 3.15 **Prediction of novel quantum cascade devices using non-equilibrium Green's functions**
T. Grange¹, M. Virgilio², K. Wang³, T.-T. Lin³, L. Wang³, J. Yun³, W. Terashima³, H. Hirayama³, D. Stark⁴, G. Scaleri⁴, J. Faist⁴, L. Persichetti⁵, L. Di Gaspare⁵, M. De Seta⁵, M. Ortolani⁶, D.J. Paul⁷, G. Capellini⁸, Z. Jéhn¹, and S. Birner¹
¹*nextnano GmbH, Garching b. München, Germany*
²*Dipartimento di Fisica "E. Fermi", Università di Pisa, Italy*
³*THz Quantum Device Team, RIKEN Center for Advanced Photonics, Sendai, Japan*
⁴*Institute for Quantum Electronics, ETH Zurich, Switzerland*
⁵*Dipartimento di Scienze, Università di Roma Tre, Italy*
⁶*Dipartimento di Fisica, Università di Roma "La Sapienza", Italy*
⁷*School of Engineering, University of Glasgow, UK*
⁸*IHP - Leibniz-Institut für innovative Mikroelektronik, Frankfurt (Oder), Germany*

- 3.16 **Experimental set-up for dynamic material investigation at high-temperatures for power engineering and additive manufacturing**
J. Hartmann¹, J. Manara², M. Zipf², T. Stark², M. Arduini², K. Knopp¹, P. Lenski¹, D. Ochs¹, M. Zänglein¹, E. Schreiber³, and F. Schmidt⁴
¹*University of Applied Science Würzburg, Schweinfurt, Germany*
²*Bavarian Center for Applied Energy Research (ZAE Bayern), Würzburg, Germany*
³*KE-Technologie GmbH, Stuttgart, Germany*
⁴*Techno Team Bildverarbeitung GmbH, Illmenau, Germany*

Detector Applications

- 15:30 – 16:00 **4.1 Invited paper: Infrared detectors for future space applications**
O. Saint-Pé
Airbus D&S SAS, Toulouse, France
- 16:00 – 16:20 **4.2 IR FPA offset stability in the context of space-borne hyperspectral imaging**
H. Ceeh, B. König, C. Neumann, A. Neuzner, and B. Sang
OHB System, Wessling, Germany
- 16:20 – 16:40 **4.3 Colorimetry and multispectral imaging using four filter discrimination in the shortwave infrared**
M. Gerken, M. Schlemmer, and T. Becker
HENSOLDT Optronics GmbH, Oberkochen, Germany
- 16:40 – 17:00 **4.4 Assessing night vision VIS/LWIR-fusion detection performance**
U. Adomeit
Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB Ettlingen, Germany

19:00 – 23:00 **Conference dinner**
Restaurant VOLANTE, Kirchzarten

Wednesday, March 20th, 2019

Advanced Photon Detectors

- 09:15 – 09:45 **5.1 Invited paper: Single-photon avalanche detectors for quantum key distribution**
H. Zbinden
Université de Genève, Switzerland
- 09:45 – 10:05 **5.2 Investigation of low energy Be implantation and annealing conditions in InAs avalanche photodiodes**
L. Woon Lim, J. Petticrew, A. Krysa, J. S. Ng, and C. H. Tan
Department of Electrical and Electronic Engineering, University of Sheffield, United Kingdom
- 10:05 – 10:25 **5.3 Thin-film photodetectors for NIR and SWIR image sensors with 0.13 μm tech node CMOS read-out**
E. Georgitzikis^{1,2}, P. E. Malinowski¹, J. Maes³, S. Gielen⁴, F. Frazzica¹, Y. Li¹, P. Boulenc¹, J. Lee¹, C. Cavaco¹, S. Guerrieri¹, Z. Hens³, P. Heremans^{1,2}, and D. Cheyns¹
¹*imec, Leuven, Belgium*
²*KU Leuven, Belgium*
³*Center for Nano- and Biophotonics, Ghent University, Belgium*
⁴*Hasselt University – IMO, Belgium*
- 10:25 – 10:45 **5.4 Hot electron mechanisms in InSb photodiodes**
C. Bonvalot^{1,2}, F. Aniel², and A. Nedelcu¹
¹*SOFRADIR, Palaiseau, France*
²*C2N Université Paris-Saclay, Palaiseau, France*

10:45 – 11:15 Coffee Break

Interband Emitters

- 11:15 – 11:45 **6.1 Invited paper: Recent progress on antimonide based emitters and detectors in the mid infrared**
L. Qi
Lancaster University, UK
- 11:45 – 12:05 **6.2 GaSb based diode laser pump sources**
M.T. Kelemen¹ and J. Neukum²
¹*Coherent | DILAS GmbH, Freiburg, Germany*
²*Coherent | DILAS GmbH, Mainz, Germany*
- 12:05 – 12:25 **6.3 Bismide based semiconductor alloys for near- and mid-infrared lasers**
S. J. Sweeney and I. P. Marko
Advanced Technology Institute and Department of Physics, University of Surrey, United Kingdom
- 12:25 – 12:45 **6.4 Mid-infrared interband cascade light emitting devices (ICLEDs) with enhanced light out-coupling efficiency**
N. Schäfer¹, J. Scheuermann¹, R. Weih¹, S. Höfling², and J. Koeth¹
¹*nanoplus GmbH, Gerbrunn, Germany*
²*Technische Physik, Physikalisches Institut and Wilhelm-Conrad-Röntgen-Research Center for Complex Material Systems, Universität Würzburg, Germany*

13:00 – 14:00 **Lunch at badenova cafeteria**

Cascade Lasers

- 14:00 – 14:30 **7.1 Invited paper: Interband cascade lasers**
R.Q. Yang
University of Oklahoma, USA
- 14:30 – 14:50 **7.2 Extended tuning DFBs and high power FPs quantum cascade lasers**
S. Blaser¹, T. Gresch¹, R. Maulini¹, N. Villa¹, G. Strübi¹, and A. Müller¹
¹*Alpes Lasers SA, St-Blaise, Switzerland*
- 14:50 – 15:10 **7.3 Recent advances of hyper-spectral-imaging based on QCLs in microscopy**
M. Godejohann¹ and L. Bromley²
¹*MG Optical Solutions Utting/Ammersee, Germany*
²*Daylight Solutions, San Diego, USA*
- 15:10 – 15:30 **7.4 Advances of MOEMS-based external cavity QCLs**
S. Hugger¹, M. Haertelt¹, L. Butschek¹, C. Schilling¹, P. Holl¹, A. Merten², M. Schwarzenberg², A. Dreyhaupt², J. Grahmann², M. Rattunde¹, and R. Ostendorf¹
¹*Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany*
²*Fraunhofer Institute for Photonic Microsystems IPMS, Dresden, Germany*

15:30 – 16:00 **Coffee Break**

Photonic Sensing

- 16:00 – 16:30 **8.1 Invited paper: New mid-IR sensing architectures for trace gas sensing and liquid spectroscopy**
B. Lendl
TU Wien, Austria
- 16:30 – 16:50 **8.2 High-speed analysis of chemical processes using the IRis-F1 spectrometer based on quantum cascade laser frequency combs**
P. Allmendinger, R. Horvath, P. Jouy, M. Mangold, M. Geiser, and A. Hugi
IRsweep AG, Stäfa, Switzerland
- 16:50 – 17:10 **8.3 IR detection by nonlinear-optical upconversion for highly time-resolved MWIR spectroscopy**
S. Wolf¹, J. Kießling¹, V. Weiser², S. Knapp², and F. Kühnemann¹
¹*Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg, Germany*
²*Fraunhofer Institute for Chemical Technology ICT, Pfinztal, Germany*
- 17:10 – 17:30 **8.4 Novel approach for the integration of photonic circuits with mid-IR detectors**
A. Vasiliev¹, F. Pavanello¹, M. Muneeb¹, J. Jurénczyk², A. Janaszek², M. Liebert², and G. Roelkens¹
¹*Photonics Research Group, Ghent University – imec and Center for Nano- and Biophotonics, Ghent, Belgium*
²*VIGO System S.A., Ożarów, Poland*

17:30 – 17:45 **Closing remarks**