

Tuesday, March 18, 2025

08:00 – 09:00 **Registration**

09:00 – 09:15 **Welcome**

Session 1 **HgCdTe Detectors**

09:15 – 09:45 **1.1 Invited Paper: The Army's Vision for VISION: The Future of Military EOIR Sensing**

M. Groenert

US Army, Ft. Belvoire, United States of America

09:45 – 10:05 **1.2 Progress on Infrared Bispectral MCT Detectors Towards Small Pixel Pitch**

A. Epping, M. Beer, D. Eich, H. Figgemeier, S. Hanna, L. Lunczer, M. Mahlein, E. Reutter, A. Sieck, M. Ullrich, J. Wenisch

AIM, Heilbronn, Germany

10:05 – 10:25 **1.3 Latest HOT II-VI Technologies Development at LYNRED**

Laurent Rubaldo¹, Cécile Grezes¹, Nicolas Morisset¹, Jocelyn Berthoz¹, Alexandre Brunner¹, Diane Sam-Giao¹, Eric Havard¹, Magalie Maillard¹, Clement Lobre², Olivier Gravrand², Pierre Jenouvrier¹

¹*LYNRED, Veurey-Voroize, France*

²*CEA-LETI, Grenoble, France*

10:25 – 10:45 **1.4 HgCdTe-Based Avalanche Photodiodes Fabricated by Plasma-Induced p-to-n Type Conversion**

G.A. Umana-Membreno, P.N. Mukherji, N.D. Akhavan, H. Kala, R. Gu, J. Antoszewski, L. Faraone

The University of Western Australia, Perth, Australia

10:45 – 11:15 **Coffee Break**

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Session 2 Type-II Superlattice Detectors 1

- 11:15 – 11:45 2.1 **Invited Paper: Evolution of SCD's MWIR Detector Technology Since the Year 2000**
P. Klipstein
SCD Semiconductor Devices, Colorado Springs, United States of America
- 11:45 – 12:05 2.2 **Development of Large Format T2SL Detectors at IRnova**
M. Delmas¹, L. Höglund¹, D. Ramos¹, R. Ivanov¹, L. Žurauskaitė¹, T. Kohl¹, D. Evans¹, D. Rihtnesberg¹, D. Visser¹, D. Gökçen Buldu Kohl¹, S. Becanovic¹, S. Högnadottir¹, S. Smuk¹, L. Bendrot¹, P. Martin-Gonthier², E. Costard¹
¹*IRnova, Kista, Sweden*
²*ISAE SUPAERO, Toulouse, France*
- 12:05 – 12:25 2.3 **GaSb-Bbased MWIR Infrared Detector Structures Grown on 200 mm GaAs and Ge Substrates for Ultra-Large-Format FPA Applications**
A. W. K. Liu, J. M. Fastenau, S. A. Nelson, S. Cramb, E. L. Routh, K. E. Sautter, R. Dargis, W. Black
IQE, North Carolina, United States of America
- 12:25 – 12:45 2.4 **Nonequilibrium Green's Function Modeling of Auger Recombination in Superlattice Infrared Photodetectors**
J. A. Gonzalez Montoya¹, A. Tibaldi¹, M. Goano^{1,2}, F. Bertazzi^{1,2}
¹*Politecnico di Torino, Italy*
²*CNR IEIIT, Torino, Italy*
- 13:00 – 14:00 Lunch (Canteen of Badenova AG)**

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Session 3 Poster Session

14:00 – 15:30

- 3.1 **Analyzing Read-Out Noise Correlations in BDI Detector Architectures With Physical Binning in CAIRT LWIR Detector Pre-Development**
M. Sege¹, D. Hübner¹, P. Bohr¹, W. Horn¹, J. Kessel-Erleka¹, R. Oelmaier¹, M. Skegg², M. Haiml² and C. Reim²
¹AIM-IR Module, Heilbronn, Germany
²Airbus Defence and Space, Taufkirchen, Germany
- 3.2 **Extraction of Traps Parameters in Narrow Gap Material Using Bias Variation of a DI Focal Plane Array**
H. Rousset¹, N. Baier¹, D. Sam-Giao², T. Le Goff¹, J.-A. Nicolas¹, O. Gravrand¹
¹CEA-LETI, Grenoble, France
²LYNRED, Veurey-Voroize, France
- 3.3 **An Electron Beam Induced Current Study on Reactive Ion Etch Induced pn Junctions in Mercury Cadmium Telluride**
D. J. B. Morley, G. A. Umana-Membreno, H. Kala, R. Gu, J. Antoszewski, L. Faraone
University of Western Australia, Crawley, Australia
- 3.4 **Design and Simulation of Metalens Arrays for Enhanced MWIR Imaging Performance**
W. Pan¹, G. A. Umana-Membreno¹, N. Dehdashtiakhavan¹, L. Faraone¹, H. Tan², D. Neshev², L. Wesemann³, P. Leslie⁴, R. Driggers⁴
¹The University of Western Australia, Crawley, Australia
²The Australian National University, Canberra, Australia
³The Univ. of Melbourne, Victoria, Australia
⁴College of Optical Sciences, Tuscon, United States of America
- 3.5 **MEMS-Based Tunable Infrared Filters: From SWIR Spectroscopic Sensing to MWIR Multi-Spectral Imaging**
Y. Liu, D. Silva, G. Gill, H. Kala, G. Membreno, J. Antoszewski, L. Faraone
The University of Western Australia, Crawley, Australia
- 3.6 **Interband Cascade Infrared Photodetectors Based on Type-II Superlattice Absorbers**
A. Bader, F. Rothmayr, R. Weih, J. Koeth
nanoplus Advanced Photonics, Gerbrunn, Germany

- 3.7 **Quantum Transport and Detectivity of Type-II Superlattice Photodetectors Simulated by Non-Equilibrium Green's Function Formalism**
T. Sato^{1,2}, S. Birner¹, T. Grange³
¹*nextnano, München, Germany*
²*Technical Univ. of Munich, TUM, München, Germany*
³*nextnano Lab SaS, Corenc, France*
- 3.8 **Cation Segregation Effects and Interface Properties in Type-II Superlattices and Novel IR Materials Based on Dilute Bismides**
E. Luna¹, D.J. Smith², Y.-H. Zhang², J. Puustinen³, J. Hilska³, M. Guina³
¹*Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany*
²*Arizona State University, Tempe, United States of America*
³*Tampere Univ., Optoelectronic Research Centre, Tampere, Finland*
- 3.9 **Feasibility Study of Antimony Based Device Growth in MOVPE on Silicon Substrates**
N. Mayner^{1,2}, M. Delmas¹, M. Hammar², A. Strömberg², E. Costard¹, L. Höglund¹
¹*IRnova, Kista, Sweden*
²*KTH School of Electrical Engineering, Kista, Sweden*
- 3.10 **An Extremely Low Noise-Equivalent Power Photoreceiver Using High-Gain InGaAs/AlGaAsSb APDs**
B. Sheridan^{1,2}, X. Collins², J. Taylor-Mew¹, B. White², J.S. Ng¹, C.H. Tan¹
¹*University of Sheffield, United Kingdom*
²*Phlux Technology, Sheffield, United Kingdom*
- 3.11 **Quality Data Initiative at Classic Infrared Single Element Detectors Such as 2.6 μm InGaAs Photodiodes, PbS and PbSe Photoconductors and Thin LiTaO₃ Pyroelectrics for Quantitative Measurement Applications**
S. Baliga¹, R. Kim¹, J. Kunsch², A. Patadia¹
¹*LASER COMPONENTS, Detector Group, Chandler, United States of America*
²*LASER COMPONENTS Germany, Olching, Germany*
- 3.12 **Calibration of Infrared Radiometers for Longwave Downward Radiation Measurements by Using the Hemispherical Blackbody (HSBB) and by Performing Spectral Responsivity Measurements**
M. Feierabend¹, T. Pohl¹, C. Müller¹, P. Meindl¹, C. Monte¹
Physikalisch-Technische Bundesanstalt PTB, Berlin, Germany

3.13 Calibration of the Spectral Responsivity of Infrared Detectors Traceable to the SI

T. Pohl¹, M. Feierabend¹, P. Meindl¹, U. Johannsen¹, L. Werner¹
Physikalisch-Technische Bundesanstalt PTB, Berlin, Germany

3.14 Multi-Purpose High Precision Measurement Using Advanced Cryogenic Probe Stations

J. Klier¹, K. Jacob¹, G. Fisher¹, P. Shrivastava¹, and V. Meded¹
FormFactor, Thiendorf, Germany

3.15 Machine Learning Enabled Material Detection Based on Fixed-Wavelength MIR QCLs

M. Martynow, S. Kurlov, W. T. Masselink
Humboldt University of Berlin, Germany

3.16 5.2 μm GaSb-based Interband Cascade Laser with Hybrid Superlattice Plasmon-Enhanced Claddings

B. Petrović¹, A. Bader², J. Nauschütz², T. Sato³, S. Birner³, R. Weih², F. Hartmann¹, S. Höfling¹

¹*Julius-Maximilians-Universität Würzburg, Phys. Institut, Germany*

²*nanoplus Advanced Photonics, Gerbrunn, Germany*

³*nextnano, München, Germany*

3.17 Spectral Engineering of Interband Cascade LEDs for Gas and Liquid Spectroscopy

N. Schäfer¹, R. Weih¹, J. Scheuermann¹, J. Koeth¹ and S. Höfling²

¹*nanoplus Advanced Photonics, Gerbrunn, Germany*

²*Julius-Maximilians-Universität Würzburg, Phys. Institut, Germany*

3.18 Up-Conversion Spectroscopy in the MIDIR for Black Plastic Sorting

M. Godejohann¹, S. Friis²

¹*MG Optical Solutions, Utting/Ammersee, Germany*

²*NLIR ApS, Farum, Danmark*

3.19 Non-invasive Blood Glucose Measurement by Mid-infrared Spectroscopy: Principle and Validation

W. Mäntele^{1,2}, M. Kaluza¹, S. Janik¹, P. Lachmann¹, L. Canini¹, V. Lepro¹, T. Lubinski¹

¹*DiaMonTech, Berlin, Germany*

²*Goethe-Universität Frankfurt, Inst. für Biophysik, Germany*

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Session 4 Quantum and Interband Cascade Lasers

- 15:30 – 16:00 **4.1 Invited Paper: Quantum Walk Effects in QCL Frequency Comb Generation**
J. Faist
ETH Zürich, Schweiz
- 16:00 – 16:20 **4.2 Coherent Beam Combining of QCL Amplifiers at 4.7 μm**
S. Hugger, P. Holl, Q. Yang, R. Keil, S. Giudicatti, C. Schilling,
M. Rattunde
Fraunhofer IAF, Freiburg, Germany
- 16:20 – 16:40 **4.3 High-Power Fiber-Coupled Quantum Cascade Lasers for Mid-Infrared Applications**
G. Maisons, M. Guais, J. Abautret, R. Teissier, M. Carras
mirSense, Orsay, France
- 16:40 – 17:00 **4.4 Enhancing Wall-Plug Efficiency in GaSb-based Interband Cascade Lasers**
J. Nauschütz, R. Weih, J. Scheuermann, J. Koeth
Nanoplus Advanced Photonics, Gerbrunn, German

19:00 – 23:00 Conference Dinner at *Augustiner Im Bankepeter*

For detailed information please go to www.infrared-colloquium.de

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Session 5 SWIR Detection

- 09:15 – 09:35 5.1 **Low Photon to Single Photon Detection Using Extremely Low Noise InAs and AlGaAsSb Avalanche Photodiodes**
C. H. Tan, T. Blain, B. Sheridan, J. Taylor-Mew, L. Li, J. Petticrew, J. P. David, S. Ng
Univ. of Sheffield, School of Electrical and Electronic Eng., United Kingdom
- 09:35 – 09:55 5.2 **InGaAs/InP SPAD Technology With Novel Method for Zn Diffusion**
F. Rutz, A. Wörl, A. Bächle, J. Niemasz, S. M. Khan, L. Lochtenbergh, R. Rehm
Fraunhofer IAF, Freiburg, Germany
- 09:55 – 10:15 5.3 **Advances in QD SWIR Image Sensors for Broadband Imaging and Beyond**
G. Kara¹, V. Pejovic¹, W. Song¹, A. B. Siddik^{1,2}, J. H. Kim¹, T. Weydts¹, I. Pintor Monroy¹, S. Y. Lee^{1,2}, L. M. Hagelsieb¹, M. Jin¹, A. Uz Zaman¹, M. J. Lim¹, M. Vildanova¹, M. Chu¹, P. E. Malinowski¹, I. Lieberman¹
¹IMEC, Leuven, Belgium
²ESAT, KU Leuven, Belgium
- 10:15 – 10:45 Coffee Break**

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Session 6 Type-II Superlattice Detectors 2

- 10:45 – 11:05 6.1 **LYNRED's III-V Technology Developments Addressing a High Operating Temperature**
N. Péré-Laperne¹, A. Brunner¹, G. Dagher¹, A. Saintoyant¹, N. Morisset¹, J. Coussement¹, A. Evirgen², J.L. Reverchon², B. Simozrag², M. Garcia², B. Gérard², C. Cervera³, O. Gravrand³
LYNRED, Veurey-Voroize, France
- 11:05 – 11:25 6.2 **Development of Ga-free T2SL Detector Technology for High-Resolution MWIR HOT Imaging**
R. Müller, V. Daumer, M. Wagstaffe, J. Niemasz, M. Wobrock, W. Luppold, P. Rivas-Lazaro, R. Rehm
Fraunhofer IAF, Freiburg, Germany
- 11:25 – 11:45 6.3 **Prospects on Interface Properties for Optimizing the Performance of InAs/InAsSb T2SL Infrared Detectors**
M. Tornay^{1,2}, J-P. Perez¹, K. Pantzas³, G. Patriarche³, L. Rousseaux^{2,4}, Y. Guldner⁴, N. Péré-Laperne², P. Christol¹
¹*IES Université de Montpellier, France*
²*LYNRED, Veurey-Voroize, France*
³*Université Paris-Saclay, CNRS, France*
⁴*ENS 'Ecole normale supérieure, Université PSL, Paris, France*
- 11:45 – 12:05 6.4 **Cascade Detectors Optimized for Mid-IR Integrated Photonics Platform**
J. Jureńczyk¹, B. Seredyński¹, Ł. Kubiszyn¹, S. Stopiński^{1,2}, K. Anders^{1,2}, K. Michalczewski¹, R. Piramidowicz^{1,2}
¹*VIGO, Ożarów Mazowiecki, Poland*
²*Warsaw Univ. of Technology, Institute of Microelectronics and Optoelectronics, Poland*
- 12:05 – 12:25 6.5 **Digital Pixel Sensor for Very-high Full-Well Charge Capacity Used in InfraRed Fourier Transform Spectrometer for Space Applications**
M. Lapeyre¹, V. Goiffon¹, P. Martin-Gonthier¹, O. Saint-Pe², S. Rizzolo², D. Marchais², T. Kohl³
¹*ISAE-SUPAERO, Toulouse, France*
²*AIRBUS, Toulouse, France*
³*IRnova, Kista, Sweden*
- 13:00 – 14:00 Lunch (Canteen of Badenova AG)**

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Session 7 GaSb-Based Lasers

- 14:00 – 14:30 **7.1 Invited Paper: Epitaxially Regrown GaSb-based PCSELS**
L. Shterengas
Stony Brook University, United States of America
- 14:30– 14:50 **7.2 Single-Frequency 2 μm GaSb-Based VECSEL**
S. Adler, P. Holl, E. Diwo-Emmer, A. Bächle, M. Rattunde
Fraunhofer IAF, Freiburg, Germany
- 14:50 – 15:10 **7.3 GaSb Based Ridge-Waveguide Laser Diodes Emitting at 2.X μm**
J. Gilly¹, D. Rapp¹, J. Neukum², M.T. Kelemen¹
¹*Coherent, Freiburg, Germany*
²*Coherent, Mainz, Germany*
- 15:10 – 15:30 **7.4 Structured Opto-THz Coherent Light Sources Based on III-V Semiconductor Laser Technology**
M. Nadrani¹, B. Chomet¹, N. Vigne¹, A. Bartolo^{1,3}, G. Beaudoin², M. Marconi³, L. Le Gratiet², K. Pantzas², A. Pénarier¹, P. Nouvel¹, G. Ducournau⁶, M. Jarrahi⁵, P. Lalanne⁴, M. Giudici³, I. Sagnes², S. Blin¹, A. Garnache¹
¹*IES Univ. Montpellier, France*
²*Univ. Paris-Saclay C2N-CNRS, France*
³*Univ. Cote d’Azur INPHYNI CNRS, France*
⁴*LP2N-IOGS-Bordeaux, France*
⁵*Univ. of California, Los Angeles, United States of America*
⁶*Univ. Lille, IEMN, CNRS UMR, Lille, France*
- 15:30 – 16:00 Coffee Break**

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Session 8 Advanced Photonics

- 16:00 – 16:30 **8.1 Invited Paper: Mid-IR Silicon Photonics**
M. Nedeljkovic
University of Southampton, United Kingdom
- 16:30 – 17:00 **8.2 Invited Paper: Metamaterial Unipolar Quantum Optoelectronics for Mid-Infrared Free-Space Communications**
C. Sirtori
l'École Normale Supérieure, Paris, France
- 17:00 – 17:20 **8.3 Asynchronous Laser Pulse Detection Integrated in a Multispectral SWIR/VIS Single Aperture 2-Chip Zoom Camera for Military Platforms**
S. Rahmann, M. Hübner
HENSOLDT Optronics, Oberkochen, Germany
- 17:20 – 17:30 Closing**