



II-VI Workshop 2024
September 30 – October 3, 2024
Drury Plaza Hotel River Walk, San Antonio, TX, US

PRELIMINARY PROGRAM

MONDAY, SEPTEMBER 30, 2024

Registration

5:00 PM - 7:00 PM / San Antonio I Pre-Function

Tutorials

5:00 PM - 6:00 PM / San Antonio II

Random Thoughts on the Physics of HgCdTe

Mike Kinch, DRS, Bolingbrook, IL, US

6:00 PM - 7:00 PM / San Antonio II

Analyzing Single Color Detector Test Data

David Rhiger, Raytheon Vision Systems, Goleta, CA, US

TUESDAY, OCTOBER 1, 2024

Registration

7:30 AM - 6:00 PM / San Antonio I Pre-Function

Continental Breakfast

7:30 AM - 9:30 AM / Mezzanine 2nd Floor

Welcoming Remarks

8:45 AM - 9:00 AM / San Antonio II

Keynote

9:00 AM - 9:30 AM / San Antonio II

K.1: TBD (9:00 AM)

Mike Groenert, US Army/C5ISR, Aberdeen, MD, US

Session 1: Industrial Overview I

Chair: TBD

9:30 AM - 10:30 AM / San Antonio II

1.1: **Invited Paper** (9:30 AM)

Fikri Aqariden, DRS, Bolingbrook, IL, US

1.2: **Invited Paper** (10:00 AM)

Oguz Altun, ASELSAN, Inc., Ankara, Turkey

BREAK (10:30 AM)

Session 2: Devices I

10:45 AM - 12:00 PM / San Antonio II

Chair: Silviu Velicu, EPIR

2.1: **Invited Paper: An Overview of LWIR HgCdTe Detector Performance for Astronomical Space Observatory Missions** (10:45 AM)

Borzoyeh Shojaei, Teledyne Imaging Sensors, Camarillo, CA, US

2.2: **Observation of Fundamental Defect Free Current Mechanisms in Mid-wavelength P+/n HgCdTe Arsenic Implanted Devices** (11:15 AM)

Priyalal Wijewarnasuriya, Teledyne Imaging Sensors, Camarillo, CA, US

2.3: **Impact of Al₂O₃ and HfO₂ Gate Dielectrics on Photoresponse of Graphene Channel Field-Effect MWIR Photodetectors with HgCdTe Absorber** (11:30 AM)

Md Fazle Rabbe, Virginia Commonwealth University, Richmond, VA, US

2.4: **Extraction of Traps Parameters in HgCdTe P/N and N/P MWIR Focal Plane Arrays Using Photocurrent Transients Induced by Optical Excitation** (11:45 AM)

Hugo Rousset, CEA-LETI, Grenoble, France

LUNCH (12:00 PM)

Session 3: Materials I

1:15 PM - 2:30 PM / San Antonio II

Chair: *Dan Lofgreen, Raytheon Technologies*

- 3.1: **Accelerated Crucible Rotation Growth of CdZnTe (1:15 PM)**
Santosh Swain, Washington State University, Pullman, WA, US
- 3.2: **Selective Area Epitaxy of In-Plane HgTe nanowires on CdTe(001) Substrate (1:30 PM)**
Philippe Ballet, CEA-LETI, Grenoble, France
- 3.3: **Growth Recipe Optimization for HgCdTe Molecular Beam Epitaxy Using Dual Autoencoder Architecture (1:45 PM)**
Zaheer Ahmad, EPIR, Bolingbrook, IL, US
- 3.4: **Etch Pit Density Determination in HgCdTe from Nomarski Microscope Images of As-Grown Layers (2:00 PM)**
Zaheer Ahmad, EPIR, Bolingbrook, IL, US
- 3.5: **Microstructural Evolution of and Nanostructure Formation on Epitaxial Hg_{1-x}Cd_xTe Surfaces Under Nonequilibrium Conditions- (2:15 PM)**
Borzoyeh Shojaei, Teledyne Imaging Sensors, Camarillo, CA, US

BREAK (2:30 PM)

Session 4: Modeling and Simulation

2:45 PM - 4:15 PM / San Antonio II

Chair: *TBD*

- 4.1: **High Operating Temperature SWIR HgCdTe APDs (2:45 PM)**
Johan Rothman, CEA-LETI, Grenoble, France
- 4.2: **Characterization of HgCdTe Avalanche Photodiodes formed by Plasma-induced Type Conversion for 2- μ m Wavelength Applications (3:00 PM)**
Gilberto Umana Membreno, The University of Western Australia, Perth, Australia
- 4.3: **The Effects of Focal Plane Parameters on eSWIR Imaging System Performance (3:15 PM)**
Angus Hendrick, University of Arizona, Tucson, AZ, US
- 4.4: **Noise Characterization of InGaAs/GaAsSb TWSL SWIR Detectors (3:30 PM)**
Armando Gil, University of Michigan, Ann Arbor, MI, US
- 4.5: **Design and Simulation of Metalens Arrays for Enhanced MWIR HgCdTe Infrared Detector Performance (3:45 PM)**
Wenwu Pan, The University of Western Australia, Perth, Australia
- 4.6: **Plasmonics: A Path Towards HOT Infrared Detectors (4:00 PM)**
Marco Vallone, Politecnico di Torino, Torino, Italy

TABLETOP EXHIBITS/WINE & CHEESE RECEPTION (4:30 – 6:00 PM)

WEDNESDAY, OCTOBER 2, 2024

Registration

7:30 AM - 4:30 PM / San Antonio I Pre-Function

Continental Breakfast

7:30 AM - 9:30 AM / Mezzanine 2nd Floor

Welcoming Remarks

8:45 AM - 9:00 AM / San Antonio II

Plenary Session

9:00 AM - 9:30 AM / San Antonio II

- P.1: **TBD (9:00 AM)**
Phil Perconti, DRS, Bolingbrook, IL, US

Session 5: Industrial Overview II

9:30 AM - 10:30 AM / San Antonio II

Chair: *Fikri Aqariden, DRS*

- 5.1: **Invited Paper (9:30 AM)**
Dan Lofgreen, Raytheon Technologies, Santa Maria, CA, US
- 5.2: **Invited Paper (10:00 AM)**
Michael Carmody, Teledyne Imaging Sensors, Camarillo, CA, US

BREAK (10:30 AM)

Session 6: Materials II

10:45 AM - 12:15 PM / San Antonio II

Chair: *Tony Almeida, U.S. Army CCDC C5ISR NVESD*

- 6.1: **Invited Paper (10:45 AM)**

- Dave Benson, US Army/C5ISR, Aberdeen, MD, US*
- 6.2: **A Computational Study of Radiation Damage in HgCdTe (11:15 AM)**
Jamal Mustafa, Raytheon Vision Systems, Goleta, CA, US
- 6.3: **Two-Photon Absorption Behavior of HgCdTe Material (11:30 AM)**
Yong Chang, EPIR Inc., Bolingbrook, IL, US
- 6.4: **Unsupervised Neural Network Model for Predictive Analytics in Semiconductor Manufacturing (11:45 AM)**
Zaheer Ahmad, EPIR Inc., Bolingbrook, IL, US
- 6.5: **First-Principles Study of the Electronic Properties of Strained and Unstrained HgCdTe and CdZnTe Alloys (12:00 PM)**
Fatimah Alowa, Boston University, Boston, MA, US

LUNCH (12:15 PM)

Session 7: Heteroepitaxy

1:30 PM - 2:45 PM / San Antonio II

Chair: *Eric Piquette, Teledyne Scientific & Imaging*

- 7.1: **Invited Paper (1:30 PM)**
Kevin Doyle, Raytheon Technologies, Santa Maria, CA, US
- 7.2: **Residual Compositional Inhomogeneities in MOCVD Grown HgCdTe Using Interdiffused Multilayer Process (2:00 PM)**
Jan Sobieski, Vigo Photonics, Ożarów Mazowiecki, Poland
- 7.3: **Epitaxy Solution of the III-V Antimonides/Arsenides Quantum Well Heterostructure for IR Detector Applications: TNL-EpiGrow Simulator (2:15 PM)**
Praveen Saxena, Tech Next Lab Pvt Ltd., Lucknow, India
- 7.4: **MOCVD Epitaxy Solution of HgCdTe Heterostructures for Infrared Detectors through An Innovative Simulation Technique (2:30 PM)**
Praveen Saxena, Tech Next Lab Pvt Ltd., Lucknow, India

BREAK (2:45 PM)

Session 8: Materials III

3:00 PM - 4:00 PM / San Antonio II

Chair: *TBD*

- 8.1: **An Electron Beam Induced Current study on Reactive Ion Etch Induced pn Junctions in Mercury Cadmium Telluride (3:00 PM)**
Daniel Morley, Transformative Meta-Optical Systems WA Node, Perth, Australia
- 8.2: **Atoms-to-Circuits Modeling of Radiation Damage in Infrared Photodetectors (3:15 PM)**
Anthony Ciani, Sivananthan Laboratories, Inc., Bolingbrook, IL, US
- 8.3: **Study of External Mechanical Stress on a FPA in the MWIR Spectral Range (3:30 PM)**
Antoine Claret, CEA Grenoble, Grenoble, France
- 8.4: **In-Situ Stress Analyzes of Alternative Substrates for HgCdTe Infrared Detector Applications (3:45 PM)**
Ergi Donercark, ASELSAN Inc. Ankara, Turkey

THURSDAY, OCTOBER 3, 2024

Registration

8:00 AM - 12:00 PM / Ballroom Foyer

Continental Breakfast

7:30 AM - 9:30 AM / Ballroom Foyer

Welcoming Remarks

8:45 AM - 9:00 AM / San Antonio II

Session 9: Devices III

9:00 AM – 10:00 AM / San Antonio II

Chair: *Priyatal Wijewarnasuriya, Teledyne Imaging Sensors*

- 9.1: **Invited Paper: Progress in HgCdTe APDs (9:00 AM)**
Pradip Mitra, Leonardo DRS, Dallas, TX, US
- 9.2: **Invited Paper: Current Advancements in Performance, Pitchsize and Format of MCT-based Bispectral Detectors at AIM (9:30 AM)**
Eric Reutter, AIM Infrarot-Module GmbH, Heilbronn, Germany

BREAK (10:00 AM)

Session 9: Devices III (cont.)

10:15 AM - 12:00 PM / San Antonio II

Chair: *Priyatal Wijewarnasuriya, Teledyne Imaging Sensors*

- 9.3: **Invited Paper: A New Generation of MCT-Based p-on-n Technology for Focal-Plane Arrays Ranging from SWIR to VLWIR (10:15 AM)**
Clement Lobre, CEA Grenoble, Grenoble, France
- 9.4: **Invited Paper: Low SWaP Solutions for Adaptive Multi-Spectral Infrared Imaging (10:45 AM)**
Lorenzo Faraone, The University of Western Australia, Perth, Australia
- 9.5: **Enhanced Quantum Efficiency of Colloidal Quantum Dot MWIR Photodiodes (11:15 AM)**

Matthew Ackerman, QDIR Inc., Chicago, IL, US

9.6: Understanding Thermo-mechanical Reliability of Packaging Assemblies for IRFPAs (11:30 AM)

Sushant Sonde, EPIR, Inc., Bolingbrook, IL, US

9.7: Assessment of Passivation Annealing Conditions on Arsenic Ion Implanted LWIR HgCdTe FPAs (11:45 AM)

Beril Ugur, ASELSAN Inc., Ankara, Turkey

CASSELMAN/SPICER BEST STUDENT PAPER AWARD (12:00 PM)