WEG & NAMBE 2024 Program Key

NAMBE NAMBE

WEG Workshop on Epitaxial Growth of Infrared Materials

WEG & NAMBE 2024 Program Overview

Room /Time	Cummings Ballroom	Cummings Lobby
SaM	WEG-SaM: Workshop on Epitaxial Growth of Infrared Materials: Industry Perspectives	
SaA	WEG-SaA: Workshop on Epitaxial Growth of Infrared Materials: IR Devices and Applications	
SaP		Poster Sessions
SuM	WEG1-SuM: Workshop on Epitaxial Growth of Infrared Materials: IR Superlattices I WEG-SuM2: Workshop on Epitaxial Growth of Infrared Materials: IR Superlattices II	
MoM	NAMBE1-MoM: Low Dimensional Materials NAMBE2-MoM: III-Vs	
MoA	NAMBE1-MoA: Small Bandgap Materials: Bismuthides and SiGeSn NAMBE2-MoA: Advances in In Situ Characterization NAMBE3-MoA: Late News I	
MoP		Poster Sessions
TuM	NAMBE1-TuM: Magnetism, Superconductivity, and Quantum Computing NAMBE2-TuM: Chalcogenides and Topological Materials	
TuA	NAMBE1-TuA: Oxides I NAMBE2-TuA: Oxides II	
WeM	NAMBE1-WeM: Nitrides NAMBE2-WeM: IR Materials and Devices (and SiGeSn)	
WeA	NAMBE1-WeA: Heterogeneous Integration NAMBE2-WeA: Late News II	

Saturday Morning, July 20, 2024

Workshop on Epitaxial Growth of Infrared Materials
Room Cummings Ballroom - Session WEG-SaM
Workshop on Epitaxial Growth of Infrared Materials: Industry Perspectives
Moderator: Chadwick Canedy, Naval Research Laboratory

9:45am	**WEG-SaM-1** Welcome & Sponsor Thank Yous,	
10:00am	**INVITED: WEG-SaM-2** Antimonide-based Infrared Materials: Needs, Challenges and Recent Progress, ***Minh Nguyen***, HRL Laboratories	
10:15am		
10:30am	**INVITED: WEG-SaM-4** MBE Growth of GaSb- and InP-based Infrared Epitaxial Structures at IQE, ***Amy Liu***, *J. Fastenau, D. Lubyshev, S. Nelson, M. Fetters, S. Cramb, W. Black,* IQE Inc.	
10:45am		
11:00am	**INVITED: WEG-SaM-6** MBE HgCdTe: The Material Leading to High Performance Infrared Imaging Sensors, ***Aristo Yulius***, Teledyne Imaging Sensors	
11:15am		
11:30am	**INVITED: WEG-SaM-8** Status of Production MBE Capabilities for Infrared Applications at IntelliEPI, ***Paul Pinsukanjana***, *J. Li, E. Fraser, J. Shao, S. Hill, M. Debnath, J. Middlebrooks, C. Chen, W. Li, K. Vargason, P. Chin, Y. Kao,* Intelligent Epitaxy Technology, Inc.	
11:45am		

Saturday Afternoon, July 20, 2024

Workshop on Epitaxial Growth of Infrared Materials
Room Cummings Ballroom - Session WEG-SaA
Workshop on Epitaxial Growth of Infrared Materials: IR Devices and Applications
Moderator: Minh Nguyen, HRL Laboratories

1:30pm	**INVITED: WEG-SaA-1** The Quantum Cascade Laser Pumped Molecular Laser: A Widely Tunable THz Source, ***Federico Capasso***, Harvard University	
1:45pm		
2:00pm	**INVITED: WEG-SaA-3** MBE Growth of Midwave and Longwave Infrared Materials, ***Chadwick Canedy***, *S. Tomasulo, C. Kim,* Naval Research Laboratory, USA*; M. Kim,* Jacobs Technologies Inc*; J. Massengale, A. Grede,* NRC Postdoctorate Residing at NRL*; W. Bewley, I. Vurgaftman, J. Meyer,* Naval Research Laboratory, USA	
2:15pm		
2:30pm	**INVITED: WEG-SaA-5** MBE Digital Alloying for IR Avalanche Photodiodes, ***Seth Bank***, University of Texas at Austin	
2:45pm		
3:00pm	**INVITED: WEG-SaA-7** Epitaxial Quantum Dots for Infrared Emitters, ***Sadhvikas Addamane***, *P. Iyer,* Sandia National Laboratories, USA*; S. Seth,* University of New Mexico*; O. Mitrofanov,* University College London, UK*; D. Shima,* University of New Mexico*; I. Brener,* Sandia National Laboratories*; G. Balakrishnan,* University of New Mexico	
3:15pm		

Workshop on Epitaxial Growth of Infrared Materials
Room Cummings Lobby - Session WEG-SaP
Workshop on Epitaxial Growth of Infrared Materials Poster Session
4:00 – 6:00 pm

WEG-SaP-1 Thermoradiative Diodes: A Novel Application of Mid-Infrared Materials, ***Stephen Bremner***, *M. Zlatinov, M. Nielsen, M. Sazzad, P. Reece, N. Ekin-Daukes,* UNSW Sydney, Australia

WEG-SaP-2 Low-temperature Epitaxial Growth of ZnTe and CdTe for Passivation of MWIR and LWIR Detectors, ***Oleg Maksimov***, *H. Bhandari,* Radiation Monitoring Devices

WEG-SaP-3 CdTe/InSb(211) Virtual Substrates for IR Detector Application, ***Tyler McCarthy***, *Z. Ju, A. McMinn,* Arizona State University; *R. Kodama, F. Aqariden, P. Liao, P. Mitra,* Leonardo DRS; *Y. zhang,* Arizona State University

Sunday Morning, July 21, 2024

	Room Cummings Ballroom	
8:45am	**WEG1-SuM-1** Welcome & Sponsor Thank Yous	**Workshop on Epitaxial Growth of Infrared Materials** **Session WEG1-SuM** **Workshop on Epitaxial Growth of Infrared Materials: IR Superlattices I** **Moderator:** **Stephanie Tomasulo**, U.S. Naval Research Laboratory
9:00am	**INVITED: WEG1-SuM-2** A Brief Review of InAs/InAsSb Type-II Superlattice: Its Electronic Properties and Applications in IR Photodetectors, ***Yong-Hang Zhang***, Arizona State University	
9:15am		
9:30am	**INVITED: WEG1-SuM-4** MBE Based Superlattice Photodetectors, ***Philip Klipstein***, Semiconductor Devices, Israel	
9:45am		
10:00am	**BREAK**	
10:15am		
10:30am	**INVITED: WEG-SuM2-8** Antimonide Superlattices and Avalanche Photodiodes: Paving the Way for the 4th Gen of Infrared Detectors?, ***Sanjay Krishna***, Ohio State University	**Workshop on Epitaxial Growth of Infrared Materials** **Session WEG-SuM2** **Workshop on Epitaxial Growth of Infrared Materials: IR Superlattices II** **Moderator:** **Philip Klipstein**, Semiconductor Devices, Israel
10:45am		
11:00am	**INVITED: WEG-SuM2-10** Molecular Beam Epitaxy of Antimonides for Mid-to-Long Wavelength Infrared Sensing, ***Stephanie Tomasulo***, *M. Twigg, A. Grede, W. Bewley, J. Massengale, I. Vurgatman,* U.S. Naval Research Laboratory; *J. Nolde,* U.S. Naval Research Lab	
11:15am		
11:30am	**WEG-SuM2-12** Panel Discussion	
11:45am		
12:00pm		
12:15pm	**WEG-SuM2-15** Closing Remarks & Sponsor Thank Yous	

Monday Morning, July 22, 2024

	Room Cummings Ballroom	
8:00am	**NAMBE1-MoM-1** Welcome & Sponsor Thank Yous	**NAMBE** **Session NAMBE1-MoM** **Low Dimensional Materials** **Moderator:** **Badih A. Assaf**, University of Notre Dame
8:15am	**INVITED: NAMBE1-MoM-2** Art Gossard MBE Innovator Awardee Talk: How MBE Enabled Polarization Doping in Ultrawide Bandgap Semiconductor Heterostructures for Photonics and Electronics, ***Debdeep Jena,*** Cornell University	
8:30am		
8:45am	**NAMBE1-MoM-4** Site-Templated MBE Grown InAs/GaAs Quantum Dot Platforms with Spectral Homogeneity and Tunability, ***Nazifa Tasnim Arony***, University of Delaware*; L. McCabe,* University of Delaware (Now working at Yale University)*; J. Rajagopal, L. Murray, L. Mai, P. Ramesh, T. Long, M. Doty, J. Zide,* University of Delaware	
9:00am	**NAMBE1-MoM-5** Site Controlled InAs/GaAs Quantum Dots for Photonic Integration, ***Ian Farrer****, C. Chan, A. Verma, A. Trapalis, C. Ovenden, D. Hallett, E. Clarke, M. Skolnick, J. Heffernan,* University of Sheffield, UK	
9:15am	**NAMBE1-MoM-6** Commercializing Nanowire LEDs, ***David Laleyan****, B. Le, G. Frolov,* NS Nanotech Canada*; M. Stevenson, S. Coe-Sullivan,* NS Nanotech	
9:30am	**NAMBE1-MoM-7** Epitaxial Ge Membranes Detachment via Porous Ge Layer and Adhesion Force Engineering, ***Ahmed Ayari****, T. Hanuš, N. Paupy, F. Zouaghi,* 1-Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 2-Laboratoire Nanotechnologies Nanosystèmes (LN2)-IRL3463, CNRS, Université de Sherbrooke., Canada*; B. Ilahi,* 1-Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 2-Laboratoire Nanotechnologies Nanosystèmes (LN2)-IRL3463, CNRS, Université de Sherbrooke., Canada 3-DistriQ - Zone d'Innovation Quantique, Canada*; J. Cho, K. Dessein,* Umicore Electro-Optic Materials, Belgium*; D. Machon,* 1-Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 2-Laboratoire Nanotechnologies Nanosystèmes (LN2)-IRL3463, CNRS, Université de Sherbrooke., Canada 3-Université de Lyon, INSA Lyon, CNRS., Canada*; A. Boucherif,* 1-Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 2-Laboratoire Nanotechnologies Nanosystèmes (LN2)-IRL3463, CNRS, Université de Sherbrooke., Canada	
9:45am	**NAMBE1-MoM-8** Synthesis of InSe Thin Films on Sapphire using Molecular Beam Epitaxy, ***Emily Toph****, C. Voigt,* Georgia Institute of Technology*; B. Wagner,* Georgia Tech Research Institute*; E. Vogel,* Georgia Institute of Technology	
10:00am	**BREAK & EXHIBITS**	
10:15am		
10:30am	**NAMBE2-MoM-11** Exploring MBE Growth Parameters and Material Quality of III-V Topological Insulators Grown on GaSb(111)A Substrates, ***James R Rushing****, L. Qui,* Tufts University*; X. Xie,* tufts University*; T. Menasuta, J. Mcelearney, P. Simmonds,* Tufts University	**NAMBE** **Session NAMBE2-MoM** **III-Vs** **Moderator:** **Eric Jin**, Naval Research Laboratory
10:45am	**NAMBE2-MoM-12** Molecular Beam Epitaxy Growth and Regrowth of InAs/Al Heterostructures, ***Ido Levy****,* New York University*; J. Issokson,* New york University*; A. Danilenko, P. Strohbeen, T. Cowan,* new york University*; W. Strickland,* New York University*; L. Baker, M. Mikalsen, J. Shabani,* new york University	
11:00am	**NAMBE2-MoM-13** Engineering MBE Structures for Ultraclean 2D Hole Systems with Mobilities Exceeding 10^7 cm^2/Vs, ***Adbhut Gupta****, C. Wang, S. Singh, K. Baldwin,* Princeton University*; R. Winkler,* Northern Illinois University*; M. Shayegan, L. Pfeiffer,* Princeton University	
11:15am	**NAMBE2-MoM-14** Selective Area Regrowth of High Aspect Ratio Microstructures for Mid-Infrared Optoelectronics, ***Ashlee Garcia****, B. Aguilar, W. Doyle,* University of Texas at Austin*; Y. Wang,* University of Illinois at Urbana-Champaign*; D. Ironside, A. Skipper, M. Bergthold,* University of Texas at Austin*; M. Lee,* University of Illinois at Urbana-Champaign*; D. Wasserman, S. Bank,* University of Texas at Austin	
11:30am	**NAMBE2-MoM-15** Shadow Mask Molecular Beam Epitaxy, *S. Mukherjee, R. Sitaram, X. Wang,* University of Delaware*;* ***Stephanie Law****,* Penn State University	
11:45am	**NAMBE2-MoM-16** Electron Microscopy Characterization of GaSb islands on Silicon substrates grown via Molecular Beam Epitaxy, ***Mega Frost****, S. Seth, F. Ince,* University of New Mexico*; N. Arony, L. Mai,* University of Delaware*; D. Shima, T. Rotter,* University of New Mexico*; M. Doty, J. Zide,* University of Delaware*; G. Balakrishnan,* University of New Mexico	

	Room Cummings Ballroom	
1:30pm	**NAMBE1-MoA-1** Determination of the Temperature Dependent Complex Refractive Index of GaSbBi Films by Variable Angle Spectroscopic Ellipsometry, ***John McElearney**, K. Grossklaus, T. Vandervelde,* Tufts University	**NAMBE** **Session NAMBE1-MoA** **Small Bandgap Materials: Bismuthides and SiGeSn** **Moderator:** **Kevin A. Grossklaus**, MIT Lincoln Laboratory
1:45pm	**NAMBE1-MoA-2** Interplay of Al and Bi Incorporation in AlInSbBi, ***Amberly Ricks**, R. White,* University of Texas at Austin*; H. Hijazi,* Rutgers University*; S. Bank,* University of Texas at Austin	
2:00pm	**NAMBE1-MoA-3** Growth of GaBi Thin Films via Molecular Beam Epitaxy, ***Molly McDonough**, S. Law,* Pennsylvania State University	
2:15pm	**NAMBE1-MoA-4** Long-Wave Infrared Sensing via InSb-Based Dilute-Bismide Alloys, ***Corey White**, M. Bergthold, A. Ricks, F. Estévez, D. Wasserman, S. Bank,* The University of Texas at Austin	
2:30pm	**NAMBE1-MoA-5** GePb Alloys Grown using Molecular Beam Epitaxy for Infrared Photodetector Applications, ***Tyler McCarthy**, A. McMinn,* Arizona State University*; X. Liu, R. Hossain, X. Qi,* arizona state University*; Z. Ju,* Arizona State University*; Y. Zhang,* arizona state University	
2:45pm	**NAMBE1-MoA-6** Temperature Dependent Optical Constants of Germanium-Tin Alloys, ***Amanda Lemire**,* Tufts University*; K. Grossklaus,* MIT Lincoln Laboratory*; T. Vandervelde,* Tufts University	
3:00pm	**BREAK & EXHIBITS**	
3:15pm		
3:30pm	**NAMBE2-MoA-9** Principal Component Analysis of Rheed as an Indicator of Process Change During Molecular Beam Epitaxial Growth, ***Kurt Eyink**, Y. Zhang, K. Mahalingam, R. Bedford,* Air Force Research Laboratory, Materials and Manufacturing Directorate, USA	**NAMBE** **Session NAMBE2-MoA** **Advances in In Situ Characterization** **Moderator:** **Zachary LaDuca**, University of Wisconsin - Madison
3:45pm	**NAMBE2-MoA-10** Automated Machine Learning of in-Situ RHEED Data Provides Real-Time Guidance for Materials Growth Optimization, ***Christopher Price**, J. Munro,* Atomic Data Sciences*; G. Zhou, Y. Li, C. Hinkle,* University of Notre Dame	
4:00pm	**NAMBE2-MoA-11** On-the-Fly Analysis of RHEED Images During Deposition Using Artificial Intelligence, ***Tiffany Kaspar**,* Pacific Northwest National Lab*; J. Pope, S. Akers, H. Sprueill, A. Ter-Petrosyan, D. Hopkins,* Pacific Northwest National Laboratory	
4:15pm	**NAMBE2-MoA-12** The Development of Order and Interfaces During Oxide MBE Growth: Real Time X-Ray Diffraction Measurements, ***Hawoong Hong**, D. Fong, A. Bhattacharya,* Argonne National Laboratory	
4:30pm	**NAMBE3-MoA-13** James S. Harris James S. Harris MBE Scientific Discovery Awardee Talk: MBE Growth of GaN: From Novel Growth to Record Performance Materials and Devices, ***James Speck,*** University of California, Santa Barbara	**NAMBE** **Session NAMBE3-MoA** **Late News I** **Moderator:** **John McElearney**, Tufts University
4:45pm		
5:00pm	**NAMBE3-MoA-15** Interfacial Misfit Arrays in Ternary III-V Compounds for Virtual Substrates on Si with Arbitrary Lattice Constant, ***Trent Garrett**,* Boise State University*; J. Rushing,* Tufts University*; J. Tenorio,* Boise State University*; P. Simmonds,* Tufts University	

NAMBE
Room Cummings Lobby - Session NAMBE-MoP
NAMBE Poster Session
5:15 – 7:00 pm

NAMBE-MoP-1 Synthesis and Characterization of Molybdate Pyrochlore Thin Films, ***Kyeong-Yoon Baek****, M. Anderson, C. Brooks, J. Mundy,* Harvard University

NAMBE-MoP-2 Growth of InGaBiAs for Extended Short Wave Infrared Photodetectors, ***Mrudul Parasnis****, J. Bork, M. Islam, A. Razi, N. Babikir, J. Phillips, J. Zide,* University of Delaware

NAMBE-MoP-3 Investigating the Influence of Bismuth Surfactant on InSb Thin Films for Mid-Infrared Devices Applications, ***Pan Menasuta****, J. McElearney,* Tufts University*; K. Grossklaus,* Lincoln Lab*; T. Vandervelde,* Tufts University

NAMBE-MoP-5 Si / TiN Backside Thermal Absorbers for MBEGrowth on Transparent Substrates, ***D. Scott Katzer****, M. Hardy, N. Nepal, E. Jin, D. Meyer, V. Wheeler,* US Naval Research Laboratory

NAMBE-MoP-6 Verification of Epitaxially Grown InAs/GaInSb Topological Insulators using Spectroscopic Ellipsometry, ***Lawrence Qiu****, P. Simmonds, J. Rushing, X. Xie,* Tufts University

NAMBE-MoP-7 Investigation of Tunable Parameters Influence in InAs/GaInSb Quantum Wells Heterostructure, ***Xikai Xie****, P. Simmonds,* Tufts University

NAMBE-MoP-8 Exploring In situ Aluminum Deposition Kinetics on InSb Substrates for Hybrid Superconductor/Semiconductor Materials Systems, *A.Elbaroudy*, ***Alan Tamm,*** University of Waterloo, Canada

NAMBE-MoP-9 Phases Control of Epitaxial MnTe through Buffer Layers, ***Yuxing Ren****, H. Huang, L. Tai, Q. Tao, K. Wang,* University of California at Los Angeles

NAMBE-MoP-10 Self-Bias Bi-Directional Photocurrent Switching Effect in Epitaxial GaN-NWn, ***PARGAM VASHISHTHA****,* RMIT University, Australia*; G. Gupta,* CSIR-National Physical Laboratory, India*; S. Walia,* RMIT University, Australia

NAMBE-MoP-11 Systematic Study on Synthesis of High Quality SnTe Layers by Molecular Beam Epitaxy, ***Qihua Zhang****, M. Hilse, J. Gray, M. Stanley, N. Samarth, S. Law,* Pennsylvania State University

NAMBE-MoP-14 In Situ Curvature Measurement: A Great Breakthrough for MBE Growth Monitoring, ***Romain Bruder****, Y. Rousseau,* RIBER, France

NAMBE-MoP-15 Synthesis and Transport Properties of Doped Samarium Nitride Thin Films, ***Kevin Vallejo****, Z. Cresswell, B. May, V. Buturlim, S. Regmi, K. Gofryk,* Idaho National Laboratory

NAMBE-MoP-16 Tunable Ordering of 2D Tin on Silicon, ***Caitlin McCowan****, S. Misra,* Sandia National Laboratories

NAMBE-MoP-17 Continuous Wave Lasing from Individual InAs Nanowires, ***Steffen Meder****,* Technical University Munich, Germany

NAMBE-MoP-18 Impact of Growth Temperature on the Formation of AlGaN During the MME Growth of AlN/AlGaN Short Period Superlattice Structures, ***Alexander Chaney****, S. Mou, K. Averett, T. Asel,* Air Force Research Laboratory, Materials and Manufacturing Directorate, USA

NAMBE-MoP-19 Buffer Layer Approach for Smooth GaSe Epitaxial Films on GaAs (111) B, ***Joshua Eickhoff****,* University of Wisconsin*; M. Yu, M. Hilse, S. Law,* Penn State University*; D. Rhodes, J. Kawasaki,* University of Wisconsin - Madison

NAMBE-MoP-20 Incorporating ErAs Into InGaAlBiAs Material by Interrupted Growth: Effects on Optical and Electronic Properties Targeting Terahertz Pulse Emitters and Detectors for Telecom Wavelength Excitation, ***Wilder Acuna****, W. Wu, J. Bork, M. Doty, M. Jungfleisch, L. Gundlach, J. Zide,* University of Delaware

NAMBE-MoP-21 Ferromagnetic Nanostructures Formation by Metal Modulated Epitaxy of AlN:Mn, ***Jesús Fernando Fabian Jocobi****, S. Gallardo Hernández, A. Conde Gallardo,* CINVESTAV, Mexico*; D. Olguin Melo,* CINVESTAV-Queretaro, Mexico*; Y. Casallas Moreno,* UPIITA - Unidad Profesional Interdisciplinaria en Ingeniería y Tecnologías Avanzadas IPN, Mexico*; M. Zambrano Serrano, M. López López,* CINVESTAV, Mexico

NAMBE-MoP-22 Ultralow Threshold Surface Emitting Ultraviolet Lasing by Low-Temperature Selective Area Epitaxy of GaN Nanowires, *M.F. Vafadar*, ***Songrui Zhao,*** McGill University, Canada

NAMBE-MoP-23 Trade-Off between Hall Sensitivity and Frequency Limit of Two-Dimensional Electron Gas Iii-Nitride Hall Effect Sensor, ***Satish Shetty****,* Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, AR, 72701, USA*; A. Hassan,* Department of Electrical Engineering, University of Arkansas, Fayetteville, AR, 72701, USA*; Y. Mazur,* Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, AR, 72701, USA*; H. Mantooth,* Department of Electrical Engineering, University of Arkansas, Fayetteville, AR, 72701, USA*; G. Salamo,* Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, AR, 72701, USA

NAMBE-MoP-24 Photonic Crystal Surface Emitting Lasers (PCSELs) based on InAs Quantum Dots-in-a-Well, ***Thomas J Rotter****, S. Seth, K. Reilly, F. Ince,* Center for High Technology Materials, The University of New Mexico, Albuquerque, NM*; A. Kalapala, C. Gautam, Z. Liu,* Department of Electrical Engineering, The University of Texas at Arlington, Arlington, TX*; S. Addamane,* Center for Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, NM*; W. Zhou,* Department of Electrical Engineering, The University of Texas at Arlington, Arlington, TX*; G. Balakrishnan,* Center for High Technology Materials, The University of New Mexico, Albuquerque, NM

NAMBE-MoP-25 Determination of Optical Properties and Band Structure Parameters of MBE-grown InAs and InAsSb Bulk and InAs/InAsSb and InGaAs/InAsSb Superlattices from Photoluminescence Lineshape, ***Marko Milosavljevic****,* Arizona State University*; P. Webster,* Air Force Research Lab*; S. Johnson,* Arizona State University

NAMBE-MoP-27 Mbe Epitaxy Solution of the Quantum Well Heterostructure: Atomistic Tnl-Epigrow Simulator, ***Praveen Kumar Saxena****,* Tech Next Lab, Lucknow, India*; P. Srivastava, A. Srivastava,* Tech Next Lab, India

NAMBE-MoP-28 Room Temperature Extended Shortwave Infrared Light Emitting Diode, *M. Benker,* Applied NanoFemto Technologies LLC*; G. Gu,* Stonehill College*;* ***Xuejun Lu****,* University of Massachusetts - Lowell

NAMBE-MoP-29 Infrared Plasmon-Polariton Modes in Hyperbolic Metamaterials Made from Patterned Doped/Undoped InAs Multilayers, *E. Caudill,* University of Oklahoma*; M. Lloyd,* US Naval Research Laboratory*; K. Arledge, T. Mishima, C. Cailide,* University of Oklahoma*; J. Nolde, C. Ellis,* US Naval Research Laboratory*; P. Weerasinghe, T. Golding,* Amethyst Research Inc*; J. Murphy,* US Naval Research Laboratory*;* ***Michael Santos****, J. Tischler,* University of Oklahoma

NAMBE-MoP-30 Impact Ionization Coefficients in $Al_{0.9}Ga_{0.1}as_{0.08}Sb_{0.92}$ Lattice Matched to Gasb, ***Jingze Zhao****, E. Portyankin, L. Sheterengas, D. Donetski, G. Kipshidze, G. Belenky,* Stony Brook University/Brookhaven National Laboratory

NAMBE-MoP-31 High-Mobility III-V Core-Shell Nanowire Heterostructures for Thermoelectric Energy Conversion, ***Genet Bacha Hirpessa****,* Technical University of Munich, Germany*; S. Fust, R. Maier,* Technical University Munich, Germany*; F. Del Guidice, J. Finley,* Technical University of Munich, Germany*; G. Koblmüller,* Technical University Munich, Germany

NAMBE-MoP-32 Wafer Scale GaAs/AlGaAs Core-Shell Nanowires on 2-inch Si Substrate Showing Efficient Light Emission/Absorption with High Thermal Stability, ***Keisuke Minehisa****, H. Hashimoto, K. Nakama,* Research Center for Integrated Quantum Electronics, Hokkaido University, Japan*; H. Kise, S. Sato, J. Takayama, S. Hiura, A. Murayama, F. Ishikawa,* Faculty of Information Science and Technology, Hokkaido University, Japan

NAMBE-MoP-33 Optimizing Growth on GaAs (111)B for Enhanced Parametric Downconversion Efficiency in Quantum Optical Metasurfaces, ***Trevor Blaikie****,* University of Waterloo, Canada*; S. Stich,* Walter Schottky Institut, Technische Universität München, Germany*; M. Tam,* University of Waterloo, Canada*; M. Belkin,* Walter Schottky Institut, Technische Universität München, Germany*; M. Chekhova,* Max-Planck-Institut für die Physik des Lichts, Germany*; Z. Wasilewski,* University of Waterloo, Canada

NAMBE-MoP-34 Magnetization Switching Behavior in Anisotropy Gradient GaMnAsP Film Grown by Molecular Beam Epitaxy, ***Kyung Jae Lee****,* Korea University, Canada*; S. Lee,* Korea University, Germany*; X. Liu,* University of Notre Dame, Canada*; M. Dobrowolska, J. Furdyna,* University of Notre Dame, Germany

NAMBE-MoP-35 Growth, Electrical and Optical Properties of $SrMoO_3$ Grown by Suboxide Molecular Beam Epitaxy, ***Roman Engel-Herbert****,* Paul -Drude-Institute for Solid State Electronics, Leibniz Institute within the Forschungsverbund Berlin, Germany*; T. Kuznetsova, J. Roth, J. Lapano, A. Pogrebnyakov,* Penn State University

NAMBE-MoP-36 Modeling and Characterization of GaAsSb/InGaAs 'W'-Quantum Wells with GaAsP Strain Compensated Layers, *Z. Li, T. Lo,* ***Charles W. Tu,*** National Chung Hsing University, Taiwan

Tuesday Morning, July 23, 2024

	Room Cummings Ballroom	
8:15am	**NAMBE1-TuM-1** Welcome & Sponsor Thank Yous	**NAMBE** **Session NAMBE1-TuM** **Magnetism, Superconductivity, and Quantum Computing** **Moderator:** **Patrick Strohbeen**, New York University
8:30am	**INVITED: NAMBE1-TuM-2** NAMBE Young Investigator Awardee Talk: Epitaxial Integration of Dissimilar Semiconductors for Infrared Optoelectronics, **Kunal Mukherjee,** Stanford University	
8:45am		
9:00am	**NAMBE1-TuM-4** MBE Synthesis of Altermagnetic MnTe Exhibiting an Anomalous Hall Effect, *S. Bey, X. Liu,* University of Notre Dame*; A. Ievlev,* Oak Ridge National Laboratory*; S. Bennett,* Naval Research Laboratory*; M. Zhukovskyi, T. Orlova,* ***Badih A. Assaf****,* University of Notre Dame	
9:15am	**NAMBE1-TuM-5** Lateral Strain and Magnetism Patterning in Flexomagnetic GdAuGe Thin Films via Helium Ion Implantation*,* ***Zachary LaDuca****, T. Samanta, T. Jung,* University of Wisconsin - Madison*; M. Brahlek, T. Ward, A. Chen,* Oak Ridge Natinal Laboratory*; N. Hagopain, F. Fei, T. Xi, K. Su, M. Arnold, P. Voyles, J. Xiao, J. Kawasaki,* University of Wisconsin - Madison	
9:30am	**NAMBE1-TuM-6** Synthesis and Fabrication of Superconducting Germanium Alloys for Quantum Information*,* ***Patrick Strohbeen****, J. van Dijk, I. Levy, M. Mikalsen, A. Danilenko, W. Schiela, J. Shabani,* New York University	
9:45am	**NAMBE1-TuM-7** Molecular Beam Epitaxy Growth of Al and Ta Multilayers for Superconducting Qubits*,* ***Kevin A. Grossklaus****, D. Miller, L. Burkhart, A. Sabbah, M. Gingras, B. Nidezielski, C. O'Connell, H. Stickler, D. Calawa, A. Melville,* MIT Lincoln Laboratory*; A. Goswami,* Massachusetts Institute of Technology*; D. Kim, J. Yoder, M. Schwartz,* MIT Lincoln Laboratory*; W. Oliver,* Massachusetts Institute of Technology*; K. Serniak,* MIT Lincoln Laboratory	
10:00am	**NAMBE1-TuM-8** Electrical, Magnetic, and Thermoelectric Characterizations of Strange Metallicity in Epitaxial Thin Film Kagome Intermetallics*,* ***Minyong Han****, C. John, J. Zheng, S. Fang, J. Checkelsky,* Massachusetts Institute of Technology	
10:15am	**BREAK & EXHIBITS**	
10:30am		
10:45am	**NAMBE2-TuM-11** Rhombohedral-to-Cubic Phase Transition in $Ge_{1-x}In_xTe$ Thin Films Grown by MBE*,* ***Xinyu Liu****, K. Yoshimura, S. Bey, M. Abdu Karim, J. Wang, L. Riney, M. Zhukovskyi, T. Orlova, B. Assaf,* University of Notre Dame	**NAMBE** **Session NAMBE2-TuM** **Chalcogenides and Topological Materials** **Moderator:** **Stephanie Law**, Penn State University
11:00am	**NAMBE2-TuM-12** Coherent strain through quasi van der Waals Epitaxy of magnetic topological insulators Cr: $(Bi_xSb_{1-x})_2Te_3$ on a GaAs (111) substrate and the influence from growth windows*,* ***Yuxing Ren****, K. Pan, Y. Chen, J. Kang, B. Regan, C. Wong, M. Goorsky, K. Wang,* University of California at Los Angeles	
11:15am	**NAMBE2-TuM-13** Epitaxial Hexagonal $BaZrSe_3$ Thin Films with Strong Birefringence in-Plane*,* ***Ida Sadeghi****, V. Kamboj,* MIT*; T. Simonian,* College Green, Ireland*; J. Van Sambeek, M. Xu,* MIT*; V. Nicolosi,* College Green, Ireland*; J. LeBeau, R. Jaramillo,* MIT	
11:30am	**NAMBE2-TuM-14** Quasi-Van Der Waals Epitaxial Growth of Thin γ'-Gase Films*,* ***Mingyu Yu****,* University of Delaware*; S. Law,* Pennsylvania State University	
11:45am	**NAMBE2-TuM-15** Response of Topologically Protected Helical Modes in Monolayer WTe2 to Band-gap Tuning*,* ***Yulia Maximenko****,* Colorado State University*; Y. Chang,* Rutgers University*; M. Hirsbrunner, L. Wagner, V. Madhavan, T. Hughes,* University of Illinois at Urbana Champaign	
12:00pm	**NAMBE2-TuM-16** Phase-selective Growth of the Topological Insulators Bi_2Te_3 and Bi_4Te_3 for Integration with the Superconductor Fe(Te,Se)*,* ***Matthew Brahlek****, J. Chen, J. Lu,* Oak Ridge National Laboratory*; R. Moore,* Oak Ridge Natinal Laboratory	
12:15pm	**NAMBE2-TuM-17** Origin of the high Curie Temperature in $(Sb_2Te_3)_{1-x}(MnSb_2Te_4)_x$ structures grown by molecular beam epitaxy*,* ***Candice Forrester****,* The Graduate Center (CUNY)*; C. Testelin,* CNRS, France*; K. Wickramasinghe,* City College of New York, City University of New York*; S. Mohammadi,* The Graduate Center (CUNY)*; M. Tamargo,* City College of New York, City University of New York	

	Room Cummings Ballroom	
2:00pm	**NAMBE1-TuA-1** Plasma Assisted Molecular Beam Epitaxial Growth of β-ga2o3 (100) Thin Films on Mgo(100) Substrates, ***Seth Hibbert***, *R. Reeves, M. Allen,* University of Canterbury, New Zealand	**NAMBE** **Session NAMBE1-TuA** **Oxides I** **Moderator:** **Matthew Brahlek**, Oak Ridge National Laboratory
2:15pm	**NAMBE1-TuA-2** Progresses Towards Production-Worthy Epitaxy of $BaTiO_3$ and $SrTiO_3$ Perovskites on Si(001) Substrates, ***Mark O'Steen***, Veeco Instruments Inc.*; M. Baryshnikova, G. Croes,* IMEC, Belgium*; Y. Wang, S. Farrell, G. Sundaram,* Veeco Instruments Inc.*; C. Merckling,* IMEC, Belgium	
2:30pm	**NAMBE1-TuA-3** Epitaxial Growth of Si-doped $(Al, Ga)_2O_3$ Films by Hybrid MBE, ***Zhuoqun Wen***, *E. Ahmadi,* University of Michigan	
2:45pm	**NAMBE1-TuA-4** Correlated Phase Diagram Tunable by Structural Layering in Square-Planar Nickelates, ***Grace Pan***, *D. Ferenc Segedin, S. TenHuisen,* Harvard University*; L. Bhatt,* Cornell University*; H. LaBollita,* Arizona State University*; A. Jiang,* Harvard University*; Q. Song,* Cornell University*; A. Turkiewicz,* Harvard University*; H. Paik,* University of Oklahoma*; C. Brooks, M. Mitrano,* Harvard University*; B. Goodge,* Max Planck Institute for Chemical Physics of Solids*; A. Botana,* Arizona State University*; J. Mundy,* Harvard University	
3:00pm	**NAMBE1-TuA-5** Synthesis of Layered Square-planar Lanthanum Nickelate Thin Films, $La_{n+1}Ni_nO_{2n+2}$, ***Dan Ferenc Segedin***, *G. Pan, A. Turkiewicz, A. Jiang, C. Brooks, J. Mundy,* Harvard University	
3:15pm	**BREAK & EXHIBITS**	
3:30pm		
3:45pm	**NAMBE2-TuA-8** Signatures of Bosonic Coupling in Superconducting $LiTi_2O_4$ Thin Films, ***Zubia Hasan***, *G. Pan,* Harvard University*; M. Barone,* Cornell University*; C. Brooks,* Harvard University*; A. Kaczmarek,* Cornell University*; S. Sung,* Harvard University*; E. Mercer,* Northeastern University*; S. Sharma,* Arizona State University*; I. El Baggari,* Harvard University*; K. Nowack,* Cornell University*; A. Botana,* Arizona State University*; B. Faeth,* Cornell University*; A. De La Torre Duran,* Northeastern University*; J. Mundy,* Harvard University	**NAMBE** **Session NAMBE2-TuA** **Oxides II** **Moderator:** **Zach Cresswell**, Idaho National Laboratory
4:00pm	**NAMBE2-TuA-9** Defect Engineering in Thin Films of the Pyrochlore Frustrated Magnet $Tb_2Ti_2O_7$, ***Margaret Anderson***, *I. El Baggari, C. Brooks, T. Powell,* Harvard University*; C. Lygouras,* Johns Hopkins University*; A. N'diaye,* Lawrence Berkeley National Laboratory*; S. Koohpayeh,* Johns Hopkins University*; J. Nordlander,* Paul Drude Institute, Germany*; J. Mundy,* Harvard University	
4:15pm	**NAMBE2-TuA-10** Soft Chemical Manipulation of MBE-Synthesized Ruddlesden-Popper Nickelates, ***Abigail Jiang***, *A. Turkiewicz, G. Pan, D. Ferenc Segedin, C. Brooks, J. Mason, J. Mundy,* Harvard University	
4:30pm	**NAMBE2-TuA-11** $BaTiO_3$ Films for Integrated Electro-Optics, ***Larissa Little***, *B. Fazlioglu-Yalcin, A. Cavanagh, N. Sinclair, T. Zulu, K. Powell, C. Brooks, R. Westervelt, M. Loncar,* Harvard University*; D. Barton,* Northwestern University*; J. Mundy,* Harvard University	
4:45pm	**NAMBE2-TuA-12** Exploration of Erbium-Doped Oxide Thin Films on Silicon for Quantum Memory-Oriented Nanophotonics Development, ***Ignas Masiulionis***, University of Chicago/Argonne National Laboratory*; G. Grant,* University of Chicago*; R. Chebrolu,* University of Chicago / Argonne National Laboratory*; A. Dibos, J. Zhang, F. Heremans, S. Guha,* Argonne National Lab	
5:00pm	**NAMBE2-TuA-13** Simultaneous Optical and Microstructural Characterization of Er-Doped CeO_2 on Silicon, ***Gregory Grant***, University of Chicago*; J. Zhang,* Argonne National Laboratory*; I. Masiulionis,* University of Chicago*; S. Chattaraj, K. Sautter,* Argonne National Laboratory*; S. Sullivan,* memQ*; R. Chebrolu,* University of Chicago*; Y. Liu, J. Martins, J. Niklas, A. Dibos,* Argonne National Laboratory*; S. Kewalramani,* Northwestern University*; J. Freeland, J. Wen, O. Poluektov, F. Heremans,* Argonne National Laboratory*; D. Awschalom,* University of Chicago*; S. Guha,* Argonne National Laboratory	

Wednesday Morning, July 24, 2024

	Room Cummings Ballroom	
8:15am	**NAMBE1-WeM-1** Welcome & Sponsor Thank Yous	**NAMBE** **Session NAMBE1-WeM** **Nitrides** **Moderator:** **Kevin Vallejo**, Idaho National Laboratory
8:30am	**NAMBE1-WeM-2** Tunnel Junction Engineered MBE-grown Nanowires: Toward Self-Powered, Dual-Wavelength Photoelectrochemical Photodetectors for Secure and Efficient Underwater Wireless Sensors Networks, *S. Zhao,* ***Milad Fathabadi,*** McGill University, Canada	
8:45am	**NAMBE1-WeM-3** MBE Growth of n-type AlN and Defect Characterization Using Deep UV Photoluminescence, ***Neeraj Nepal****, M. Hardy, A. Lang, B. Downey, D. Katzer, E. Jin, V. Gokhale, T. Growden, D. Meyer, V. Wheeler,* Naval Research Laboratory	
9:00am	**NAMBE1-WeM-4** Evolution of AlN: from 1 nm Nitridation to 2 µm by Molecular Beam Epitaxy, *M. Liao, D. Luccioni, K. Huynh, Y. Wang, L. Matto,* University of California Los Angeles*; H. Ahmad,* Georgia Institute of Technology*; Z. Zhang*, Argonne National Laboratory*; W. Doolittle,* Georgia Institute of Technology*;* ***Mark Goorsky****,* University of California Los Angeles	
9:15am	**NAMBE1-WeM-5** Addressing the High Coercive Field of $Sc_xAl_{1-x}N$ via Magnesium Doping in Molecular Beam Epitaxy, ***Samuel Yang****, D. Wang, D. Wang, Z. Mi,* University of Michigan, Ann Arbor	
9:30am		
9:45am	**NAMBE1-WeM-7** Epitaxial Integration of Transition-Metal Nitrides with Cubic Gallium Nitride, ***Zach Cresswell****, N. Fessler, T. Garrett, K. Vallejo, B. May,* Idaho National Laboratory	
10:00am	**NAMBE1-WeM-8** Epitaxial Growth of High ScN Fraction ScAlN on (111) Si, ***Matthew Hardy****, E. Jin, N. Nepal, B. Downey, V. Gokhale, D. Katzer, V. Wheeler, V. Wheeler,* U.S. Naval Research Laboratory	
10:15am	**BREAK**	
10:30am		
10:45am	**NAMBE2-WeM-11** Characterization of Random Alloy $Al_{0.85}Ga_{0.15}As_{0.07}Sb_{0.93}$ for Mid-Wave Infrared Avalanche Photodiodes, ***Nathan Gajowski****, M. Muduli, T. Ronningen, S. Krishna,* Ohio State University	**NAMBE** **Session NAMBE2-WeM** **IR Materials and Devices (and SiGeSn)** **Moderator:** **Carolina Adamo**, Northrop Grumman
11:00am	**NAMBE2-WeM-12** Comparison Study of InAs/InAsSb and InAs/GaSb Type-II Superlattices, ***Allison McMinn****, Z. Ju, X. Liu, Y. Zhang,* Arizona State University	
11:15am	**NAMBE2-WeM-13** Use of Hydrogen Plasma to Increase Minority Carrier Lifetime in $InAs_xSb_yBi_{1-x-y}$, *F. Estevez Hilario, M. Bergthold,* University of Texas at Austin*;* ***Oleg Maksimov****, H. Bhandari,* Radiation Monitoring Devices*; C. Morath, A. Duchane, P. Webster,* Air Force Research Laboratory*; D. Wasserman,* University of Texas at Austin	
11:30am	**NAMBE2-WeM-14** Micro-Transfer Printing of Gasb-Based Infrared Devices Grown by Molecular Beam Epitaxy, ***Margaret A. Stevens****,* US Naval Research Laboratory*; A. Grede, J. Murphy,* NRC Postdoctoral Fellow at the US Naval Research Laboratory*; S. Mack,* US Naval Research Laboratory*; K. Schmieder,* Formerly US Naval Research Laboratory*; J. Nolde,* US Naval Research Laboratory	
11:45am	**NAMBE2-WeM-15** The InAsSb-based SACM APD with Hole-Initiated Multiplication, ***Egor Portiankin****, L. Shterengas, G. Kipshidze, J. Zhao, D. Donetski,* Stony Brook University/Brookhaven National Laboratory	

Wednesday Afternoon, July 24, 2024

	Room Cummings Ballroom	
1:30pm	**NAMBE1-WeA-1** Enhanced Performance of High-Density GaAsSb Nanowire Ensemble Photodetectors with NIP Axial-Core Shell Structure on Graphene for Near-Infrared Detection, ***Hirandeep Reddy Kuchorr***, *Y. Deshmukh,* North Carolina A&T State University, India	**NAMBE** **Session NAMBE1-WeA** **Heterogeneous Integration** **Moderators: Rafael Jaramillo**, Massachusetts Institute of Technology, **John McElearney**, Tufts University
1:45pm	**NAMBE1-WeA-2** Superconducting (001) and (111) Metal Nitrides on GaN, ***Brelon May***, *Z. Cresswell, S. Regmi, V. Buturlim, K. Vallejo, K. Gofryk, D. Hurley,* Idaho National Laboratory	
2:00pm	**NAMBE1-WeA-3** Epitaxial Growth of (111) $BaTiO_3$ Thin Films on AlGaN/GaN Heterostructures, ***Eric Jin***, Naval Research Laboratory*; J. Hart,* NOVA Research*; A. Lang, M. Hardy, N. Nepal, D. Katzer, V. Wheeler,* Naval Research Laboratory	
2:15pm	**NAMBE1-WeA-4** Selective Area Growth for Monolithically Integrated Quantum Dot Lasers, ***Alec Skipper***, *K. Feng,* University of California at Santa Barbara*; G. Leake, J. Herman,* SUNY Poly*; C. Shang, R. Koscica,* University of California at Santa Barbara*; D. Harame,* SUNY Poly*; J. Bowers,* University of California at Santa Barbara	
2:30pm	**NAMBE1-WeA-5** Influence of Number of Graphene Layers on Epitaxy of GdAuGe on /6H-SiC, ***Taehwan Jung***, University of Wisconsin - Madison, Republic of Korea*; N. Hagopian,* University of Wisconsin - Madison*; C. Dong, J. Robinson,* Penn State University*; P. Voyles, J. Kawasaki,* University of Wisconsin - Madison	
2:45pm	**BREAK**	
3:00pm		
3:15pm	**NAMBE2-WeA-8** Growth and Properties of InSe Thin Films on GaAs(111)B and Si(111), ***Maria Hilse***, *D. Liu, J. Rodriguez, J. Gray, J. Yao, S. Ding,* Penn State University*; M. Li, J. Young,* New Jersey Institute of Technology*; Y. Liu,* Penn State University*; R. Engel-Herbert,* Paul-Drude Institute for Solid State Electronics*; A. Lupini,* Oak Ridge Natinal Laboratory*; J. Redwing,* Penn State University	**NAMBE** **Session NAMBE2-WeA** **Late News II** **Moderator:** **John McElearney**, Tufts University
3:30pm	**NAMBE2-WeA-9** Investigation of the Indium-flush Technique on InAs/InAlGaAs/InP (001) Quantum Dots for 1.55 µm Laser Applications, ***Calum Dear***, *J. Yuan, H. Jia, J. Park,* University College London, UK*; Y. Hou,* Swansea University, UK*; K. El Hajraoui,* University of York, UK*; H. Zeng, H. Deng, M. Tang,* University College London, UK*; Q. Ramasse,* University of Leeds, UK*; H. Liu,* University College London, UK	
3:45pm	**NAMBE2-WeA-10** MBE Growth of Ge and GaAs on (111)-faceted V-groove Silicon, ***Makhayeni Mtunzi***, *H. Jia,* University College London, UK*; Y. Hou,* Swansea University, UK*; L. Bao,* University of Southampton, UK*; M. Masteghin,* University of Surrey, UK*; H. Deng, X. Yu, H. Zeng, J. Park, Y. Wang,* University College London, UK*; W. Li, A. Li,* Beijing University of Technology, China*; K. El Hajraoui,* York University, UK*; Q. Ramasse,* University of Leeds, UK*; I. Skandalos, F. Gardes,* University of Southampton, UK*; M. Tang, S. Chen, A. Seeds, H. Liu,* University College London, UK	
4:00pm	**NAMBE2-WeA-11** Closing Remarks and Sponsor Thank Yous	

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