

NAMBE 2022 Program Overview

Room /Time	Swan A & Sandpiper	Swan BC
MoM		NM-MoM1: Nitrides GD-MoM2: Devices
MoA		ST-MoA1: MBE Technology NM-MoA2: Chalcogenides
MoP	POSTER SESSIONS	
TuM		NM-TuM1: Novel Materials NM-TuM2: Infrared Materials
TuA		NM-TuA1: Bismuthides NM-TuA2: Heterogenous Integration
WeM		NM-WeM1: Quantum-confined Structures NM-WeM2: Topological Insulators

Monday Morning, September 19, 2022

Room Swan BC		
7:45am	NM-MoM1-1 Welcome, Introductions and Sponsor Thank Yous	Novel Materials Session NM-MoM1 Nitrides Moderator: Bharat Jalan, University of Minnesota
8:00am	INVITED: NM-MoM1-2 MBE Growth and Properties of Ultra-wide Bandgap Oxide Layers Spanning 5.0 - 9.0 eV Energy Gaps, <i>Debbeep Jena</i> , Cornell University	
8:30am	NM-MoM1-4 Demonstration of $\text{Sc}_{0.2}\text{Al}_{0.8}\text{N}$ HEMT Structures with a Sheet Resistance of $150 \Omega/\square$ and a Sheet Charge of $5.9 \times 10^{13} \text{ cm}^{-2}$ with Phase Pure, Metal Rich Growth, <i>Zachary Engel, K. Motoki, W. Doolittle</i> , Georgia Institute of Technology	
8:45am	NM-MoM1-5 Influence of Nucleation Schemes on Crystal Quality of Heteroepitaxial $\text{Sc}_{0.4}\text{Al}_{0.6}\text{N}$, <i>Matthew Hardy, A. Lang, E. Jin, N. Nepal, S. Katzer, V. Wheeler</i> , U.S. Naval Research Laboratory	
9:00am	NM-MoM1-6 Realization of AlN Homojunction PN Diodes, <i>Christopher M. Matthews</i> , Georgia Institute of Technology; <i>H. Ahmad</i> , Georgia Institute of Technology, Pakistan; <i>Z. Engel, K. Motoki, S. Lee, W. Doolittle</i> , Georgia Institute of Technology	
9:15am	NM-MoM1-7 MBE AlScN/GaN Heterostructures Showing High-K, Ferroelectricity, and High Mobility 2DEGs, <i>Joseph Casamento, H. Lee, V. Gund, T. Maeda, K. Nomoto</i> , Cornell University; <i>S. Mu</i> , University of California, Santa Barbara; <i>W. Turner</i> , University of Notre Dame; <i>L. van Deurzen, Y. Shao, T. Nguyen, B. Davaji, M. Javadi Asadi, J. Wright</i> , Cornell University; <i>P. Fay</i> , University of Notre Dame; <i>C. Van de Walle</i> , University of California, Santa Barbara; <i>A. Lal, D. Muller, H. Xing, D. Jena</i> , Cornell	
9:30am	NM-MoM1-8 Realizing GaN/AlN Short Period Superlattices (SPSLs) Through Ga Surfactant Enhanced MME Growth of AlN, <i>Alexander Chaney</i> , Azimuth Corporation; <i>C. Bowers</i> , UES; <i>K. Mahalingam</i> , UES; <i>S. Mou</i> , Materials and Manufacturing Directorate, Air Force Research Laboratory; <i>K. Averett</i> , Materials and Manufacturing Directorate, Air Force Research Laboratory	
9:45am	NM-MoM1-9 Cubic Boron Nitride Grown by Mg-Catalyzed MBE, <i>David Storm, S. Maximenko, A. Lang, N. Nepal, T. Feygelson, B. Pate, D. Meyer</i> , U.S. Naval Research Laboratory	
10:00am	BREAK & EXHIBITS	
10:30am	GD-MoM2-12 High Equivalent Quantum Efficiency InAs Avalanche Photodiode with Lattice Matched AlAsSb Layer, <i>Nathan Gajowski, M. Muduli, S. Lee, H. Jung</i> , The Ohio State University; <i>T. Basko, E. Cho</i> , SK Infrared; <i>D. Hollingshead</i> , The Ohio State University; <i>E. Fuller</i> , SK Infrared; <i>S. Krishna</i> , The Ohio State University	
10:45am	GD-MoM2-13 A High-Performance Epitaxial Transparent Oxide Thin-Film Transistor Fabricated at Back-End-of-Line Temperature (< 450 °C) by Suboxide Molecular-Beam Epitaxy, <i>Felix V.E. Hensling, J. Park, P. Vogt</i> , Cornell University; <i>D. Schlom</i> , Cornell University / Kavli Institute at Cornell for Nanoscale Science / Leibniz-Institut für Kristallzüchtung	
11:00am	GD-MoM2-14 Low Temperature Crack Formation in III-V Quantum Dot Lasers Epitaxially Grown on Silicon, <i>Rosalyn Koscica, C. Shang, K. Parto, G. Moody, J. Bowers</i> , University of California, Santa Barbara	
11:15am	GD-MoM2-15 Thin Film Engineering in Er-Doped CeO_2 for Quantum Memory, <i>K. Sautter, Gregory Grant</i> , Argonne National Laboratory; Pritzker School of Molecular Engineering, University of Chicago; <i>S. Sullivan</i> , Argonne National Laboratory; <i>P. Nittala, C. Ji, M. Singh, F. Heremans, S. Guha</i> , Argonne National Laboratory; Pritzker School of Molecular Engineering, University of Chicago	
11:30am	GD-MoM2-16 Hybrid MBE Growth of Metastable SrNbO_3 for High Mobility 2DEGs, <i>S. Thapa</i> , Auburn University, Department of Physics; <i>S. Mahatara</i> , Department of Physics, New Mexico State University; <i>P. Gempeline</i> , Department of Physics, Auburn University; <i>B. Kiefer</i> , Department of Physics, New Mexico State University; <i>Ryan Comes</i> , Auburn University, Department of Physics	
11:45am	GD-MoM2-17 Vertical AlGaN Deep-UV LEDs Grown on Si Using Nanowire-Assisted AlN Template by Molecular Beam Epitaxy, <i>Qihua Zhang, H. Parimoo, S. Zhao</i> , McGill University, Canada	
12:00pm	GD-MoM2-18 Long Lifetime Mid-Wave InGaAs/InAsSb Superlattice Photodetectors with a 2x Reduction in Proton Radiation Induced Quantum Efficiency Degradation, <i>A. Newell, G. Balakrishnan</i> , Center for High Technology Materials, University of New Mexico; <i>R. Carrasco</i> , Air Force Research Laboratory, Space Vehicles Directorate; <i>Z. Alsaad</i> , A-Tech, LLC, a BlueHalo company (ATA BlueHalo); <i>J. Logan, C. Morath</i> , Air Force Research Laboratory, Space Vehicles Directorate; <i>C. Hains, M. Milosavljevic</i> , A-Tech, LLC, a BlueHalo company (ATA BlueHalo); <i>S. Johnson</i> , Center for Photonics Innovation & Electrical, Computer, and Energy Engineering, Arizona State University; <i>J. Duran, G. Ariyawansa</i> , Air Force Research Laboratory, Sensors Directorate; <i>D. Maestas, Preston T. Webster</i> , Air Force Research Laboratory, Space Vehicles	

Monday Afternoon, September 19, 2022

Room Swan BC		
1:30pm	INVITED: ST-MoA1-1 NAMBE Innovator Awardee Talk: Physics and Technology of Antimonide Based Short Wave Infrared Avalanche Photodiodes on InP Substrates, <i>Sanjay Krishna</i> ¹ , Ohio State University	Science and Technology of MBE Session ST-MoA1 MBE Technology Moderator: Paul Simmonds, Boise State University
2:00pm	ST-MoA1-3 Overview of Virtual Substrate Technologies for 6.3 Angstrom Lattice Constant, <i>S. Svensson</i> , Army Research Laboratory; <i>N. Mahadik</i> , Naval Research Laboratory; <i>G. Kipshidze</i> , <i>Dmitri Donetski</i> , <i>G. Belenky</i> , SUNY at Stony Brook	
2:15pm	ST-MoA1-4 Measurement of Low Semiconductor Substrate Temperatures Using Reflectance Tracking of High Energy Critical Points, <i>Kevin Grossklous</i> , <i>J. McElearney</i> , <i>A. Lemire</i> , <i>T. Vandervelde</i> , Tufts University	
2:30pm	ST-MoA1-5 Perovskite Hetero-Chalco-Epitaxy Enabled by Self-Assembled Surface Passivation and Gas-Source MBE, <i>Ida Sadeghi</i> , <i>R. Jaramillo</i> , MIT	
2:45pm	ST-MoA1-6 Molecular Beam Epitaxy of Monocrystalline GaAs on Water Soluble NaCl Thin Films, <i>Brelon May</i> , National Renewable Energy Laboratory; <i>J. Kim</i> , Shell International Exploration and Production; <i>H. Moutinho</i> , <i>P. Walker</i> , <i>W. McMahon</i> , <i>A. Ptak</i> , <i>D. Young</i> , National Renewable Energy Laboratory	
3:00pm	ST-MoA1-7 Thermal Laser Epitaxy of Refractory Metals, <i>Lena Nadine Majer</i> , <i>H. Wang</i> , <i>W. Braun</i> , <i>P. van Aken</i> , <i>J. Mannhart</i> , <i>S. Smink</i> , Max Planck Institute for Solid State Research, Germany	
3:15pm	BREAK & EXHIBITS	
3:30pm	NM-MoA2-9 Growth of Ultrathin PtSe ₂ using Molecular Beam Epitaxy, <i>Maria Hilse</i> , <i>K. Wang</i> , The Pennsylvania State University; <i>R. Engel-Herbert</i> , Paul-Drude-Institut für Festkörperelektronik, Germany	Novel Materials Session NM-MoA2 Chalcogenides Moderator: Maria Tamargo, City College of New York
3:45pm	NM-MoA2-10 Ultra-thin Bi ₂ Se ₃ Films Grown by Molecular Beam Epitaxy, <i>Saadia Nasir</i> , <i>S. Law</i> , University of Delaware	
4:00pm	NM-MoA2-11 Molecular Beam Epitaxy Growth of Site-determined Wavelength-tunable Quantum Emitters in Atomically-thin Semiconductors, <i>Mingyu Yu</i> , <i>S. Law</i> , University of Delaware	
4:15pm	NM-MoA2-12 Epitaxial Growth of PbSnSe Ternary Alloys on III-V Substrates, <i>Pooja Reddy</i> , Stanford University; <i>B. Haidet</i> , University of California Santa Barbara; <i>K. Mukherjee</i> , <i>L. Nordin</i> , Stanford University	
4:30pm	NM-MoA2-13 Bi ₂ Se ₃ Growth on III-V Substrates, <i>Yongchen Liu</i> , <i>W. Acuna</i> , University of Delaware; <i>H. Zhang</i> , National Institute for Science and Technology (NIST); <i>D. Ho</i> , <i>R. Hu</i> , <i>Z. Wang</i> , <i>A. Janotti</i> , University of Delaware; <i>G. Bryant</i> , <i>A. Davydov</i> , National Institute for Science and Technology (NIST); <i>J. Zide</i> , <i>S. Law</i> , University of Delaware	
4:45pm	NM-MoA2-14 Structural and Optical Properties of CdSe Grown on InAs, <i>Zheng Ju</i> , <i>S. Schaefer</i> , <i>A. McMinn</i> , <i>X. Qi</i> , <i>D. Smith</i> , <i>Y. Zhang</i> , Arizona State University; <i>S. Grover</i> , First Solar, Inc.	
5:00pm	NM-MoA2-15 Measuring and Then Eliminating Twin Domains in SnSe Thin Films Using a Fast Optical Metrology and Molecular Beam Epitaxy, <i>Wouter Mortelmans</i> , MIT; <i>M. Hilse</i> , Penn State University; <i>Q. Song</i> , <i>S. Jo</i> , <i>K. Ye</i> , MIT; <i>D. Liu</i> , <i>N. Samarth</i> , Penn State University; <i>R. Jaramillo</i> , MIT	

MBE-Grown Devices

Room Swan A & Sandpiper - Session GD-MoP

MBE-Grown Devices Poster Session

5:15pm

GD-MoP-1 High Power Sb-Based Mid-Wave Infrared Diode Laser Arrays, **Andy Lu**, C. Yang, Air Force Research Laboratory

GD-MoP-2 High Performance Diluted III-V Multijunction Solar Cell Grown by MBE for Space Application, **Prashant Tyagi**, Orbit Engineering, LLC, India; **M. Sheldon**, Orbit Engineering, LLC; **T. Tabbakh**, A. Albadri, King Abdulaziz City for Science and Technology, Saudi Arabia

GD-MoP-3 Annealing Effect on the Magnetic Anisotropy of P Composition Graded GaMnAsP Layers, **Seul-Ki Bac**, Korea University; **S. Lee**, Korea University, Republic of Korea; **X. Liu**, **M. Dobrowolska**, Physics Department; **J. Furdyna**, Physics department

Novel Materials

Room Swan A & Sandpiper - Session NM-MoP

Novel Materials Poster Session

5:15pm

NM-MoP-1 Slow Photoluminescence Lifetime of Heavily Be-doped GaAsN, **Takashi Tsukasaki**, Waseda Univ., Japan; **H. Sumikura**, NTT Basic Laboratories, Nippon Telegraph and Telephone Corp., Japan; **T. Fujimoto**, Waseda Univ., Japan; **M. Fujita**, NIT Ichinoseki College, Japan; **T. Makimoto**, Waseda Univ., Japan

NM-MoP-2 A Route Towards Actinide Heterostructure Synthesis and Science, **Brelon May**, K. Vallejo, C. Dennett, Idaho National Laboratory; **P. Simmonds**, Boise State University; **D. Hurley**, K. Gofryk, Idaho National Laboratory

NM-MoP-3 Epitaxial Growth of Antimony Selenide on Bismuth Selenide, **Zhengtianye Wang**, S. Law, University of Delaware

NM-MoP-4 Defect Free IngaAs/InAlAs Superlattice on a Inp(111)B Substrate, **Ida Sadeghi**, MIT; **A. Pofelski**, Brookhaven National Laboratory; **H. Farkhondeh**, A. Tam, K. Leung, University of Waterloo, Canada; **G. Botton**, McMaster University, Canada; **Z. Wasilewski**, University of Waterloo, Canada

NM-MoP-5 Site-Controlled InAs Quantum Dot Columns for Templating Self-Assembled Quantum Dots, **L.N. McCabe**, **Nazifa T. Arony**, **J. Zide**, University of Delaware

NM-MoP-6 Characterizing SiGeSn Stability by Temperature Varying Spectroscopic Ellipsometry, **Amanda Lemire**, K. Grossklau, T. Vandervelde, Tufts University

NM-MoP-7 Band Structure and Strain Distribution of InAs Quantum Dots Encapsulated in (Al)GaAs Asymmetric Matrixes, **Pablo Olvera Enriquez**, C. Mercado Ornelas, Center for the Innovation and Application of Science and technology, UASLP, Mexico; **L. Espinoza Vega**, Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP). Center for the Innovation and Application of Science and technology, UASLP, Mexico; **I. Cortes Mestizo**, CONACYT-Center for the Innovation and Application of Science and technology, UASLP, Mexico; **F. Perea Parrales**, A. Belio Manzano, Center for the Innovation and Application of Science and technology, UASLP, Mexico; **C. Yee Rendón**, Facultad de Ciencias Físico-Matemáticas, Universidad Autónoma de Sinaloa, Mexico; **V. Méndez García**, Center for the Innovation and Application of Science and technology, UASLP. Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP), Mexico

NM-MoP-8 High Temperature Growth of Thick AlN on Si, **Rohith Allaparthi**, M. Ware, University of Arkansas; **C. Taylor**, H. Edwards, Texas Instruments; **Y. Mazur**, F. Maia de Oliveira, M. Refaei, University of Arkansas

NM-MoP-9 Correlating Charge Carrier Profiles and Elemental Compositions in MBE-grown GaN/AlGaIn Stacks, **Stefan Schmult**, TU Dresden, Germany; **P. Appelt**, C. Silva, A. Großer, A. Wachowiak, NaMLab gGmbH, Germany; **T. Mikolajick**, TU Dresden, Germany

NM-MoP-10 Thin-film Growth of ζ -Mn₂N on MgO (001) Using Molecular Beam Epitaxy, **Ashok Shrestha**, A. Smith, Ohio University

NM-MoP-11 Impurity Doping of β -Ga₂O₃ Thin Films, **Neeraj Nepal**, . Downey, V. Wheeler, D. Katzer, E. Jin, . Hardy, V. Gokhale, T. Growden, US Naval Research Laboratory; **K. Chabak**, Air Force Research Laboratory; **D. Meyer**, US Naval Research Laboratory

NM-MoP-12 MBE Synthesis of Single-Crystal LiMn₂O₄ Thin Films as Li-Ion Battery Cathode Model Systems, **B. KC**, University of Illinois - Chicago; **G. Evmenenko**, B. Buchholz, Northwestern University; **Robert Klie**, University of Illinois - Chicago

NM-MoP-13 Tunable Electronic States and Instabilities in PbSnTe Heterostructures, **A. Al-Tawhid**, **A. Gonzalez**, **S. Poage**, NCSU; **Kaveh Ahadi**, NC State University

NM-MoP-15 Controlling the Size and Density of InN QDs formed on Sapphire Substrate by Droplet Epitaxy, **Malak Refaei**, **A. Kuchuk**, **R. Allaparthid**, **M. Sarollahiad**, **M. Maruf**, **M. Ware**, University of Arkansas

NM-MoP-16 Selective-area Growth of GaN and AlGaIn Nanowires on N-polar GaN Template with 4° Miscut by Plasma-assisted Molecular Beam Epitaxy, **Kamruzzaman Khan**, **A. Jian**, University of Michigan, Ann Arbor; **J. Li**, University of California at Santa Barbara; **E. Ahmadi**, University of Michigan, Ann Arbor

NM-MoP-17 Molecular Beam Epitaxy Grown Group-IV Alloys: Ideal Candidate for Momentum(k)-Space Carrier Separation Photodetectors, **Tyler McCarthy**, **Z. Ju**, **S. Schaefer**, **X. Qi**, **A. McMinn**, Arizona State University; **S. Yu**, University of Arkansas; **Y. Zhang**, Arizona State University

Science and Technology of MBE

Room Swan A & Sandpiper - Session ST-MoP

Science and Technology of MBE Poster Session

5:15pm

ST-MoP-1 Cryo-MBE: Ultra Low (<20k) Growth Temperatures for High Quality Metal Epitaxy, **Nils-Eike Weber**, Scienta Omicron, Germany; **D. Beaton**, Scienta Omicron; **M. Heiss**, Scienta Omicron, Germany

ST-MoP-2 Vertical Cation Segregation in During A_xB_{1-x}N Epitaxy, **Christopher M. Matthews**, **Z. Engel**, **W. Doolittle**, Georgia Institute of Technology

ST-MoP-3 Non-amphoteric N-type Doping with Sn of GaAs(631) Layers Grown by Molecular Beam Epitaxy, **Alan Cano Rico**, Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP), Mexico; **L. Espinosa Vega**, Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP). Center for the Innovation and Application of Science and technology, UASLP, Mexico; **I. Cortes Mestizo**, CONACYT-Center for the Innovation and Application of Science and technology, UASLP, Mexico; **R. Pinson Ortega**, Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP), Mexico; **F. Perea Parrales**, Center for the Innovation and Application of Science and technology, UASLP, Mexico; **P. Olvera Enriquez**, Center for the Innovation and Application of Science and technology, UASLP, Mexico; **M. Villareal Faz**, Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP), Mexico; **L. Hernández Gaytán**, A. Belio Manzano, Center for the Innovation and Application of Science and technology, UASLP, Mexico; **V. Méndez García**, Center for the Innovation and Application of Science and technology, UASLP. Facultad de Ciencias, Universidad Autónoma de San Luis Potosí (UASLP), Mexico

ST-MoP-4 Uniformity: A Phenomenon That Arises from Anisotropy and De-Relaxation During Growth, **Felipe Perea Parrales**, **C. Mercado Ornelas**, **A. Belio Manzano**, Center for the Innovation and Application of Science and technology, Universidad Autónoma de San Luis Potosí (UASLP), Mexico; **I. Cortes Mestizo**, CONACYT-Center for the Innovation and Application of Science and technology, Universidad Autónoma de San Luis Potosí (UASLP), Mexico; **L. Vega Espinosa**, Center for the Innovation and Application of Science and technology, Universidad Autónoma de San Luis Potosí (UASLP), Mexico; **D. Valdez Perez**, Instituto de Física, Universidad Autónoma de San Luis Potosí, Instituto Politécnico Nacional, UPALM, Mexico; **C. Yee Rendón**, Facultad de Ciencias Físico-Matemáticas, Universidad Autónoma de Sinaloa, Mexico; **A. Cano Rico**, Facultad de Ciencias, Autonomous University of San Luis Potosí, Mexico; **V. Mendez Garcia**, Center for the Innovation and Application of Science and technology, Universidad Autónoma de San Luis Potosí (UASLP), Facultad de Ciencias, Autonomous University of San Luis Potosí, Mexico

ST-MoP-5 Feature-Independent Molecular Beam Epitaxy Selective Area Regrowth Towards Embedding High Aspect Ratio Microstructures, **Ashlee Garcia**, **A. Skipper**, **D. Ironside**, **S. Bank**, University of Texas at Austin

Tuesday Morning, September 20, 2022

Room Swan BC		
8:00am	INVITED: NM-TuM1-1 Navigating MBE Growth of Atomically Precise Complex Oxides of Stubborn Metals Using Source Chemistry, Bharat Jalan , University of Minnesota, USA	Novel Materials Session NM-TuM1 Novel Materials Moderator: Debdeep Jena , Cornell University
8:30am	NM-TuM1-3 Pinhole-Seeded Lateral Epitaxy and Exfoliation on Graphene-Terminated Surfaces, Sebastian Manzo , P. Strohhoben, University of Wisconsin - Madison; Z. Lim, University of Wisconsin - Madison, Malaysia; V. Saraswat, University of Wisconsin - Madison, India; D. Du, S. Xu, University of Wisconsin - Madison, China; N. Pokharel, University of Wisconsin - Madison, Nepal; K. Su, L. Mawst, M. Arnold, J. Kawasaki, University of Wisconsin - Madison	
8:45am	NM-TuM1-4 Molecular Beam Epitaxial Growth of Cr-Sn Thin Films on Al ₂ O ₃ , Tyler Erickson , S. Upadhyay, A. Abbas, D. Ingram, A. Smith, Ohio University	
9:00am	NM-TuM1-5 Growth of Mn ₃ Sn on Sapphire Using Molecular Beam Epitaxy, Sneha Upadhyay , Ohio University; T. Erickson, D. Ingram, Ohio University; K. Sun, University of Michigan, Ann Arbor; A. Smith, Ohio University	
9:15am	NM-TuM1-6 Relaxed Epitaxial Constraints for Semi-freestanding Shape Memory Alloy Ni ₂ MnGa Films Grown on Graphene/MgO, Zachary LaDuca , S. Manzo, D. Du, K. Su, M. Arnold, J. Kawasaki, University of Wisconsin - Madison	
9:30am	NM-TuM1-7 Ferroelectricity at 900 °C in a 1 Unit-Cell-Thick Film, Yilin Evan Li , R. Steinhart, Cornell University; M. Holtz, Cornell University; P. Silva, University of California, Berkeley; Z. Xiao, Lawrence Berkeley National Laboratory; R. Ozgur, University of California, Berkeley; C. Brooks, Cornell University; D. Tenne, Boise State University; D. Muller, Cornell University; P. Shafer, E. Arenholz, Lawrence Berkeley National Laboratory; J. Mundy, Cornell University; R. Ramesh, University of California, Berkeley, Lawrence Berkeley National Laboratory; D. Schlom, Cornell University, USA, Leibniz-Institut für Kristallzüchtung, Berlin, Germany	
9:45am	NM-TuM1-8 Strange Metal YbRh ₂ Si ₂ Grown by Molecular Beam Epitaxy, Stefania Isceri , Institute of Solid State Electronics, Technische Universität Wien, Austria; M. Giparakis, Institute of Solid-State Electronics, Technische Universität Wien, Austria; E. Bakali, Institute of Solid-State Physics, Technische Universität Wien, Austria; R. Svagera, Institute of Solid-State Physics, Technische Universität Wien, Austria; M. Waas, Institute of Solid State Physics, Technische Universität Wien, Austria; D. Nguyen, Institute of Solid-State Physics, Technische Universität Wien, Austria; H. Detz, W. Schrenk, Institute of Solid State Electronics, Technische Universität Wien, Austria; S. Buehler-Paschen, Institute of Solid-State Physics, Technische Universität Wien, Austria; G. Strasser, A. Andrews, Institute of Solid-State Electronics, Technische Universität Wien, Austria	
10:00am	BREAK & EXHIBITS	
10:30am	NM-TuM2-11 Strain-Engineered MBE Growth of InAs Quantum Dots Emitting at Telecom Wavelengths, Bianca Scaparra , A. Ajay, H. Riedl, G. Koblmüller, J. Finley, K. Mueller, Walter Schottky Institut, Technische Universität München, Germany	
10:45am	NM-TuM2-12 InP-based InAs Quantum Dot/dash Lasers Emitting in the O-band, Sadhvikas Addamane , Center for Integrated Nanotechnologies, Sandia National Laboratories; S. Seth, Center for High Technology Materials, University of New Mexico; S. Hawkins, N. Collins, Sandia National Laboratories; C. Shang, Y. Wan, University of California Santa Barbara; G. Balakrishnan, Center for High Technology Materials, University of New Mexico; J. Klem, Sandia National Laboratories; R. Venables, Intel Corp.; J. Bowers, University of California Santa Barbara	
11:00am	NM-TuM2-13 Photonic Crystal Surface Emitting Lasers (PCSEs) grown by Molecular Beam Epitaxy, Thomas J Rotter , S. Seth, K. Reilly, F. Ince, University of New Mexico; A. Kalapala, Z. Liu, W. Zhou, University of Texas at Arlington; G. Balakrishnan, University of New Mexico	
11:15am	NM-TuM2-14 Low Growth Temperature Epitaxial PbSe for Heterogeneous Mid-Infrared Emitters, Leland Nordin , J. Meyer, P. Reddy, K. Mukherjee, Stanford University	
11:30am	NM-TuM2-15 Structural Properties of MBE-grown PbSnSe on GaAs (001) Films for Mid-infrared Optoelectronics Investigated by X-ray Diffraction, Jarod Meyer , Stanford University; E. Hughes, University of California at Santa Barbara; L. Nordin, K. Mukherjee, Stanford University	
11:45am	NM-TuM2-16 MBE Growth and Characterization of an InAs/AlAs _{0.16} Sb _{0.84} Quantum Cascade Detector at 2.7 μm, M. Giparakis, H. Knötig, S. Isceri, M. Beiser, H. Detz, W. Schrenk, B. Schwarz, G. Strasser, Aaron Maxwell Andrews , Technische Universität Wien, Austria	
12:00pm	NM-TuM2-17 Substrate Preparation and MBE Growth of High Quality α-Sn Topological Insulator Thin Films on InSb(001) Surfaces, Aaron Engel , C. Dempsey, University of California, Santa Barbara; S. Nishihaya, Y. Chang, University of California, Santa Barbara; M. Hashimoto, D. Lu, Stanford Synchrotron Radiation Lightsource; C. Palmstrøm, University of California, Santa Barbara	

Tuesday Afternoon, September 20, 2022

Room Swan BC		
1:30pm	INVITED: NM-TuA1-1 NAMBE Young Investigator Awardee Talk: Why do we Bother Using Costly MBE for Semiconductor Nanowires? , <i>Songrui Zhao</i> ¹ , McGill University, Canada	Novel Materials Session NM-TuA1 Bismuthides Moderator: Kevin Grossklau, Tufts University
2:00pm	NM-TuA1-3 Electrical Characterization of Doped GaSbBi Films Using High Resistivity AlGaSb Underlayers, <i>John McElearney, K. Grossklau, T. Vandervelde</i> , Tufts University	
2:15pm	NM-TuA1-4 Influence of Growth Conditions on InAlBiAs Morphology and Electrical Properties, <i>James Bork, W. Acuna, J. Zide</i> , University of Delaware	
2:30pm	NM-TuA1-5 ErAs:InGaAlBiAs materials for 1.55 μm -pumped Terahertz Photoconductive Switches, <i>Wilder Acuna, J. Bork, J. Avenoso, L. Gundlach, J. Zide</i> , University of Delaware	
2:45pm	NM-TuA1-6 Impact of Bi Surface Coverage During Growth on GaAsBi Diode Performance, <i>Robert Richards, N. Bailey, T. Rockett, M. Carr</i> , University of Sheffield, UK; <i>S. Hasegawa, H. Kawata, H. Nishinaka, M. Yoshimoto</i> , Kyoto Institute of Technology, Japan; <i>J. David</i> , University of Sheffield, UK	
3:00pm	NM-TuA1-7 Towards Lattice-Matched Narrow Bandgap InAs _y Sb _{1-x-y} Bi _x Photodetectors, <i>Corey White, M. Bergthold</i> , The University of Texas at Austin; <i>I. Okoro</i> , Texas State University; <i>Y. Wang</i> , The University of Texas at Austin; <i>L. Nordin</i> , Stanford University; <i>A. Muhowski</i> , Sandia National Laboratories; <i>D. Wasserman, S. Bank</i> , The University of Texas at Austin	
3:15pm	BREAK & EXHIBITS	
3:45pm	NM-TuA2-10 sub-Monolayer Surface Termination Control of Charge Transfer and Band Alignment Across a Semiconductor-Crystalline Oxide Heterojunction, <i>M. Chrysler</i> , University of Texas-Arlington; <i>T. Lee, J. Gabel</i> , Diamond Light Source, UK; <i>Z. Zhu, P. Sushko, S. Chambers</i> , Pacific Northwest National Lab; <i>Joseph Ngai</i> , University of Texas-Arlington	Novel Materials Session NM-TuA2 Heterogenous Integration Moderator: Vladimir Vladimirovich Protasenko, Cornell University
4:00pm	NM-TuA2-11 Heteroepitaxial Growth of (111)-oriented Sr _{1-x} Ca _x TiO ₃ Thin Films on III-Nitride Semiconductors, <i>Eric Jin, B. Downey, V. Gokhale, J. Roussos, M. Hardy, N. Nepal, D. Katzer, J. Calame, V. Wheeler, D. Meyer</i> , U.S. Naval Research Laboratory	
4:15pm	NM-TuA2-12 MBE Growth and Electronic Properties of Epitaxial SrNiO ₃ -based Heterostructures, <i>Le Wang, P. Sushko, S. Spurgeon, Y. Du, S. Chambers</i> , Pacific Northwest National Laboratory	
4:30pm	NM-TuA2-13 Controlling Dislocation Formation and Dynamics in GaAs-Based Films on Silicon via Indium Alloying, <i>Eamonn Hughes, M. Dumont, J. Selvidge, J. Norman</i> , University of California, Santa Barbara; <i>Y. Hu</i> , Hewlett-Packard Labs; <i>C. Shang, D. Jung, A. Taylor, M. Kennedy</i> , University of California, Santa Barbara; <i>R. Herrick</i> , Intel Corporation; <i>D. Liang, R. Beausoleil</i> , Hewlett-Packard Labs; <i>J. Bowers</i> , University of California, Santa Barbara; <i>K. Mukherjee</i> , Stanford University	
4:45pm	NM-TuA2-14 Grafted Si/GaN, AlN/Si, and GaAs/GeSn PN Junctions with Epitaxy-Like Interface Qualities, <i>Jie Zhou</i> , University of Wisconsin - Madison; <i>P. Wang, D. Wang</i> , University of Michigan, Ann Arbor; <i>T. Ng</i> , King Abdullah University of Science and Technology, Saudi Arabia; <i>H. Wang, S. Xu</i> , National University of Singapore; <i>S. Ojo</i> , University of Arkansas; <i>Z. Mi</i> , University of Michigan, Ann Arbor; <i>B. Ooi</i> , King Abdullah University of Science and Technology, Saudi Arabia; <i>X. Gong</i> , National University of Singapore; <i>S. Yu</i> , University of Arkansas; <i>T. Grotjohn</i> , Michigan State University; <i>Z. Ma</i> , University of Wisconsin - Madison	
5:00pm	NM-TuA2-15 Integrating GaSb-Based Infrared Detectors with Si Substrates via Interfacial Misfit Arrays, <i>Trent Garrett, M. Drake</i> , Boise State University; <i>P. Reddy</i> , Stanford University; <i>K. Mukherjee</i> , Stanford University; <i>K. Grossklau</i> , Tufts University; <i>S. Maimon</i> , Netz Vision; <i>P. Simmonds</i> , Boise State University	
5:15pm	NM-TuA2-16 Epitaxial Growth of Highly Mismatched Antimonide-Based Alloys Using Imf and Defect Filter Layers, <i>Fatih Ince, T. Rotter, A. Mansoori</i> , University of New Mexico; <i>S. Addamane</i> , Sandia National Laboratories; <i>D. Shima, G. Balakrishnan</i> , University of New Mexico	
5:30pm	NM-TuA2-17 Controlling the Balance between Remote, Pinhole, and van der Waals Epitaxy of Heusler Films on Graphene/Sapphire, <i>D. Du, S. Manzo, T. Jung, X. Zheng, M. Arnold, Jason Kawasaki</i> , University of Wisconsin - Madison	
5:45pm	NM-TuA2-18 Improved-Quality of 3D Semiconductors at Low Temperature Using Intermediate 2D Materials, <i>Guanyu Zhou, R. Younas, T. Sun, G. Harden, Y. Li, A. Hoffman, C. Hinkle</i> , University of Notre Dame	

¹ NAMBE Young Investigator Award

Wednesday Morning, September 21, 2022

Room Swan BC		
8:00am	NM-WeM1-1 Ultra-Strong Light-Matter Coupling in the THz with Continuously Graded Al _x Ga _{1-x} As Parabolic Quantum Wells, <i>Chris Deimert</i> , University of Waterloo (currently at National Research Council Canada), Canada; <i>P. Goulain, M. Jeannin</i> , CNRS, Université Paris-Saclay, France; <i>W. Pasek</i> , University of Waterloo (currently at University of Campinas), Canada; <i>A. Bousseksou, R. Colombelli, J. Manceau</i> , CNRS, Université Paris-Saclay, France; <i>Z. Wasilewski</i> , University of Waterloo, Canada	Novel Materials Session NM-WeM1 Quantum-confined Structures Moderator: Joseph Ngai , University of Texas-Arlington
8:15am	NM-WeM1-2 Molecular Beam Epitaxy and Characterization of Bi ₂ Se ₃ and Sb ₂ Te ₃ on In ₂ Se ₃ Layers via Selenium Passivation of InP(111)B Substrates, <i>Kaushini Wickramasinghe, C. Forrester, I. Levy, M. Tamargo</i> , City University of New York	
8:30am	NM-WeM1-3 Structural and Optical Properties of GaNAs Highly Mismatched Alloys Multi-Quantum Well Heterostructures., <i>Rolando Pinson Ortega</i> , Universidad Autónoma de San Luis Potosí, Mexico; <i>L. Espinosa Vega, E. Espinoza Figueroa, A. Belio Manzano, P. Olvera Enríquez, M. Villareal Faz, L. Hernández Gaytán, F. Perea Parrales</i> , Universidad Autónoma de San Luis Potosí (UASLP), Mexico; <i>C. Yee Rendón</i> , Universidad Autónoma de Sinaloa, Mexico; <i>I. Cortes Mestizo</i> , Universidad Autónoma de San Luis Potosí (UASLP), Mexico; <i>V. Méndez García</i> , Universidad Autónoma de San Luis Potosí (UASLP), Mexico	
8:45am	NM-WeM1-4 Strained Ge Quantum Wells by Molecular Beam Epitaxy for Superconducting Quantum Circuits, <i>Patrick Strohbeen, M. Hatefipour, W. Strickland, I. Levy, J. Shabani</i> , New York University	
9:00am	NM-WeM1-5 Vertical Transport in Bulk InAsSb and InAs/InAsSb and InGaAs/InAsSb Superlattices Grown on GaSb is Investigated using Photoluminescence Spectroscopy and Compared to Magnetoresistance Measurements, <i>Marko Milosavljevic</i> , Arizona State Univ.; <i>R. Carrasco, A. Newell</i> , Air Force Research Lab, USA; <i>J. Love</i> , New Mexico State Univ.; <i>S. Zollner</i> , Univ. of New Mexico; <i>C. Morath, P. Webster</i> , Air Force Research Lab, USA; <i>S. Johnson</i> , Arizona State Univ	
9:15am	NM-WeM1-6 Tensile-Strained InGaAs Quantum Dots With Interband Emission in the Mid-Infrared, <i>Kevin Vallejo</i> , Idaho National Laboratory; <i>T. Garrett</i> , Boise State University; <i>C. Cabrerara-Perdomo</i> , Autonomous University of the State of Morelos, Mexico; <i>M. Drake</i> , Boise State University; <i>B. Liang</i> , University of California, Los Angeles; <i>K. Grossklau</i> , Tufts University; <i>P. Simonds</i> , Boise State University	
9:30am	NM-WeM1-7 High Quality Quantum Dot Formation on 300 Mm Si Photonic Wafers for Monolithic on-Chip Light Source, <i>Chen Shang, E. Hughes</i> , UC Santa Barbara; <i>A. Clark</i> , IQE Inc.; <i>R. Koszica, K. Feng</i> , UC Santa Barbara; <i>G. Leake, D. Harama</i> , SUNY Polytechnic Institute; <i>J. Bowers</i> , UC Santa Barbara	
9:45am	NM-WeM1-8 Manipulating Surface Diffusion for InAs Quantum Emitters at Telecommunication Wavelengths by Droplet Epitaxy, <i>Margaret Stevens</i> , NRC Postdoctoral Fellow residing at the Naval Research Laboratory; <i>W. McKenzie, G. Baumgartner</i> , Laboratory for Telecommunication Sciences; <i>J. Grim, S. Carter, A. Bracker</i> , Naval Research Laboratory	
10:00am		
10:15am	BREAK	
10:30am	NM-WeM2-11 Structure-Property Relationship of the Magnetic Properties of Molecular Beam Epitaxy Grown (Sb ₂ Te ₃) _{1-x} (Mnsb ₂ Te ₄) _x Magnetic Topological Insulators, <i>Ido Levy</i> , City College of New York, City University of New York; <i>C. Forrester</i> , Graduate Center of CUNY and City College of New York and Lehman College; <i>X. Ding, K. Wickramasinghe</i> , City College of New York; <i>C. Testelin</i> , Sorbonne Université, CNRS; <i>D. Smith</i> , Arizona State University; <i>L. Krusin-Elbaum</i> , City College of New York, City University of New York; <i>M. Tamargo</i> , City College of New York	Novel Materials Session NM-WeM2 Topological Insulators Moderator: Kunal Mukherjee , Stanford University
10:45am	NM-WeM2-12 High Curie Temperature (Mnsb ₂ Te ₄) _x (Sb ₂ Te ₃) _{1-x} Magnetic Topological Insulator Structures Growth by Molecular Beam Epitaxy, <i>Candice Forrester</i> , The Graduate Center (CUNY), The City College of New York, Lehman College; <i>I. Levy</i> , The Graduate Center (CUNY), The City College of New York; <i>G. Lopez-Morales</i> , The Graduate Center (CUNY), Lehman College; <i>X. Ding, K. Wickramasinghe</i> , The City College of New York; <i>C. Testelin</i> , Sorbonne Université, CNRS, Institut des NanoSciences de Paris; <i>D. Smith</i> , Arizona State University; <i>G. Lopez</i> , The Graduate Center (CUNY), Lehman College; <i>M. Tamargo</i> , The Graduate Center (CUNY), The City College of New York	
11:00am	NM-WeM2-13 Structural and Magnetotransport Properties of MnBi ₂ Te ₄ -based Heterostructure Grown by Molecular Beam Epitaxy, <i>Seul-Ki Bac, K. Koller, J. Wang, L. Riney, M. Zhukovskiy, T. Orlova, X. Liu, B. Assaf</i> , University of Notre Dame	
11:15am	NM-WeM2-14 MBE Growth and Thermo-/Magneto-Transport Properties of Ternary (Bi,Sb) ₂ (Te,Se) ₃ Films with High Mobility, <i>Patrick Taylor</i> , US Army Research Laboratory; <i>H. Chi</i> , Massachusetts Institute of Technology; <i>B. Wooten, J. Heremans</i> , Ohio State University; <i>H. Hier, O. Vail</i> , US Army Research Laboratory; <i>J. Moodera</i> , Massachusetts Institute of Technology	
11:30am	NM-WeM2-15 MBE Growth of High Mobility Topological Crystalline Insulators in Proximity with a Magnetic Insulator, <i>J. Wang</i> , University of Notre Dame; <i>M. Ozerov</i> , National High Magnetic Fields Lab; <i>T. Wang, M. Zhukovskiy, T. Orlova</i> , University of Notre Dame; <i>D. Smirnov</i> , National High Magnetic Fields Lab; <i>V. Lauter</i> , Oak Ridge National Laboratory; <i>X. Liu, Badih Assaf</i> , University of Notre Dame	
11:45am	NM-WeM2-16 Closing Remarks and Thank You	
12:00pm		

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