PCSI-50 Program Overview

Room /Time	Keahou I
SuA	PCSI-SuA1: Materials for Novel Information Systems PCSI-SuA2: Semiconductor Heterostructures: Growth, Nanostructures, & Interfaces I
SuE	PCSI-SuE1: Organic and Hybrid Semiconductor Materials PCSI-SuE2: Wide Bandgap Materials I
MoM	PCSI1-MoM1: Characterization of Interfaces and Devices (Transport, Optical, & Electronic) PCSI-MoM2: High-k Dielectrics and Ferroelectrics
MoA	PCSI-MoA1: Superconducting Qubits PCSI-MoA2: 2D Materials and Graphene I PCSI-MoA3: Magnetic Materials (2D, Monolayers, & Heterostructures
MoE	PCSI-MoE: STM Controlled Surface "Lego" and Panel Discussion
TuM	PCSI-TuM1: Oxide Semiconductor Materials I PCSI-TuM2: Wide Bandgap Materials II
TuE	PCSI-TuE: Rump Session: Quantum Computation Materials and Devices and Panel Discussion
WeM	PCSI-WeM1: Point Defects (for Quantum Information Applications) I PCSI-WeM2: Point Defects (for Quantum Information Applications) II PCSI-WeM3: Photoemission Spectroscopy
WeA	PCSI-WeA1: Semiconductor Heterostructures: Growth, Nanostructures, & Interfaces II PCSI-WeA2: Materials for Catalysis, Energy Storage, and Energy Harvesting PCSI-WeA3: Spin Transport and Spintronics PCSI-WeA4: 2D Materials and Graphene II
ThM	PCSI-ThM1: Topological Materials PCSI-ThM2: Oxide Semiconductor Materials II

Sunday Afternoon, January 19, 2025

	Room Keahou I	
2:30pm	**INVITED: PCSI-SuA1-1** Interfacing Biomolecules with Coherent Quantum Sensors, ***Peter Maurer,*** University of Chicago	**PCSI** **Session PCSI-SuA1** **Materials for Novel Information Systems** **Moderator:** **Michelle Simmons**, UNSW, Australia
3:10pm	**INVITED: PCSI-SuA1-9** Magnetoresistance Spectroscopy of Near-Surface Defects in Semiconducting Hosts, ***Stephen McMillan,*** Donostia International Physics Center, Spain	
3:50pm	**PCSI-SuA1-17** Development of 'Artificial' Memristive Synapses Using Various Sp2 C (Graphene-Like) -Sp3 C (Diamond) Heterojunctions as Neuromorphic Devices, ***Sanju Gupta,*** Gdansk University of technology and Penn State University*; R. Bogdanowicz,* Gdansk University of Technology, Poland	
3:55pm	**PCSI-SuA1-18** In-Situ Transmission Electron Microscopy of Hafnium Zirconium Oxide for Phase Identification in Memristor Devices, ***Krishnamurthy Mahalingam,*** BlueHalo-UES Inc*; S. Asapu,* Department of Electrical and Computer Engineering, University of Massachusetts*; L. Blank,* ARCTOS Technology Solutions*; D. Winner,* University of Dayton*; C. Bowers,* Blue Halo-UES Inc*; S. Ganguli, A. Roy,* Air Force Research Laboratory, Materials and Manufacturing Directorate, USA*; J. Yang,* Department of Electrical and Computer Engineering, University of Southern California	
4:00pm	**PCSI-SuA1-19** Quantum Sensing Using Two-dimensional Hexagonal Boron Nitride, ***Hailong Wang,*** Georgia Institute of Technology, USA	
4:05pm	**BREAK**	
4:20pm	**INVITED: PCSI-SuA2-23** Correct Treatment of Spontaneous Polarization at Polar Wurtzite Interfaces, ***Chris Van de Walle,*** University of California Santa Barbara	**PCSI** **Session PCSI-SuA2** **Semiconductor Heterostructures: Growth, Nanostructures, & Interfaces I** **Moderator:** **Kirstin Alberi,** National Renewable Energy Laboratory
5:00pm	**PCSI-SuA2-31** Subsurface Nitrogen in Diamond (001)-2×1-H Studied by Density Functional Theory, ***Shicai Wang,*** Technion Israel Institute of Technology, China*; K. Huang,* Technion Israel Institute of Technology, Canada	
5:05pm	**PCSI-SuA2-32** Decay Dynamics of a Monolayer Silver Film on Si(001), ***Xiaohang Huang,*** Guangdong Technion - Israel Institute of Technology, China*; K. Huang,* Guangdong Technion - Israel Institute of Technology, Canada	
5:10pm	**PCSI-SuA2-33** Temperature-Dependent Recombination Rate Analysis of the Minority Carrier Lifetimes in Mid-Wave Infrared Antimonide based Materials, ***Haley B. Woolf,*** New Mexico State University*; R. Carrasco, P. Weber, A. Newell, A. Duchane, C. Morath, D. Maestas,* Air Force Research Laboratory	

Room Keahou I

7:30pm	**INVITED: PCSI-SuE1-1** A Study of Stereochemical Recognition of Chiral Molecules Investigated by STM-Based Techniques, ***Yuji Kuwahara,*** Osaka University, Japan77	**PCSI** **Session PCSI-SuE1** **Organic and Hybrid Semiconductor Materials** **Moderator:** **Ingmar Swart**, University of Utrecht, Netherlands
8:10pm	**PCSI-SuE1-9** N-Heterocyclic Carbene and Olefin Monolayers on Silicon, ***Martin Franz,*** Technische Universität Berlin, Germany*; M. Das,* Universität Münster, Germany*; C. Hogan,* Istituto di Struttura della Materia-CNR (ISM-CNR), Italy*; A. Das,* Universität Münster, Germany*; R. Zielinski, M. Kubicki,* Technische Universität Berlin, Germany*; M. Koy,* Universität Münster, Germany*; S. Chandola,* Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany*; M. Freitag,* Universität Münster, Germany*; U. Gerstmann,* Universität Paderborn, Germany*; C. Kosbab,* Technische Universität Berlin, Germany*; S. Brozzesi,* Università di Roma Tor Vergata, Italy*; M. Nehring, D. Liebig, V. Balfanz, J. Brühne,* Technische Universität Berlin, Germany*; W. Schmidt,* Universität Paderborn, Germany*; N. Esser, F. Glorius, M. Dähne,* Technische Universität Berlin, Germany	
8:15pm	**PCSI-SuE1-10** On Surface Synthesis of Graphite-N-Doped Molecular Graphene Nanostructures, ***Dong Wang,*** Institute of Chemistry, CAS, China	
8:20pm	**PCSI-SuE1-11** Importance of Molecular Dipole Alignment and Surface Compensation in P-V Hysteresis of $MAPbBr_3$(001), *L. Freter,* Forschungszentrum Jülich GmbH, Germany*; H. Hsu,* National Taiwan University, Taiwan*; R. Sankar,* Academia Sinica, Taiwan*; C. Chen,* National Taiwan University, Taiwan*; R. Dunin-Borkowski, P. Ebert,* Forschungszentrum Jülich GmbH, Germany*; Y. Chiu,* National Taiwan University, Taiwan*;* ***Michael Schnedler,*** Forschungszentrum Jülich GmbH, Germany	
8:25pm	**PCSI-SuE1-12** A Rare Earth Modified Silicon Surface as a Template for Ordered Organic Growth, *M. Kubicki,* ***Martin Franz****, M. Dähne,* Technische Universität Berlin, Germany	
8:30pm	**INVITED: PCSI-SuE2-13** Invited Paper, ***Debdeep Jena,*** Cornell University	**PCSI** **Session PCSI-SuE2** **Wide Bandgap Materials I** **Moderator:** **Alex Demkov**, The University of Texas
9:10pm	**PCSI-SuE2-21** "High Throughput" Exploration of Oxide MBE Growth Space through Cyclical in situ Growth and Etching, *S. Schaefer, D. Fébba, M. Smeaton, K. Egbo, G. Teeter, S. Hasan, W. Callahan, A. Zakutayev,* ***Brooks Tellekamp,*** National Renewable Energy Laboratory	
9:15pm	**PCSI-SuE2-22** Stability of Interface Morphology and Thermal Boundary Conductance of Direct Wafer Bonded GaN|Si Heterojunction Interfaces Annealed at Growth and Annealing Temperatures, *K. Huynh, M. Liao,* University of California Los Angeles*; X. Yan,* University of California Irvine*; J. Tomko, T. Pfeifer,* University of Virginia*; V. Dragoi, N. Razek,* EV Group, Austria*; E. Guiot, R. Caulmilone,* Soitec, France*; X. Pan,* University of Irvine*; P. Hopkins,* University of Virginia*;* ***Mark Goorsky,*** University of California Los Angeles	
9:20pm	**PCSI-SuE2-23** Plasma Deposition of GaN Thin Films on Silicon Substrates at Low Temperature, *L. Hussey, J. Maurice, P. Roca I. Cabarrocas,* ***Karim Ouaras,*** Ecole Polytechnique, France	

Monday Morning, January 20, 2025

Room Keahou I

8:30am	**INVITED: PCSI1-MoM1-1** Atomic Scale Insights into Layered 2D Materials Epitaxy, Dopants and Defects, ***Jamie Warner,*** The University of Texas at Austin	**PCSI** **Session PCSI1-MoM1** **Characterization of Interfaces and Devices (Transport, Optical, & Electronic)** **Moderator:** **Roman Engel-Herbert**, Paul-Drude Institute for Solid State Electronics, Germany
9:10am	**PCSI1-MoM1-9** Beyond Chemical Composition: How Surface Science Can Measure Electronic Properties, *J. Johns,* ***Sarah Zaccarine****, J. Mann, K. Artyushkova,* Physical Electronics	
9:15am	**PCSI1-MoM1-10** Enhancing Interface and Retention Characteristics in NAND Flash Memory by Increasing Poly-Si Thickness to Prevent Pin-Hole Formation, ***Chansung PARK****, B. Choi,* Sungkyunkwan University, Korea	
9:20am	**PCSI1-MoM1-11** Relation Ship between Defect Density and Photoreflectance Spectroscopy for $InAs_XP_{1-X}$ Metamorphic Buffer Layer, *J. Kim,* ***Gyoung Du Park****, G. Kim, T. Kang,* Yeungnam University, Republic of Korea*; S. Lee, D. Kim,* Korea Research Instutue of Standards and Science (KRISS), Republic of Korea	
9:25am	**PCSI1-MoM1-12** UPGRADED: Imaging Light-Matter Interactions using Low Kinetic Energy Photoelectrons, *A. Kim, A. Boehm, M. Berg,* ***Taisuke Ohta****, C. Doiron,* Sandia National Laboratories*; F. Vega,* Purdue University*; J. Yu, J. Klesko, S. Gennaro,* Sandia National Laboratories*; F. Liu,* los Alamos National Laboratory*; S. Smith, G. Copeland,* Sandia National Laboratories*; C. Chan,* University of Colorado at Boulder*; A. Mohite,* Rice University*; A. Cerjan,* Sandia National Laboratories*; T. Beechem,* Purdue University*; M. Sinclair, I. Brener, R. Sarma,* Sandia National Laboratories	
9:45am	**PCSI1-MoM1-16** Examining Radiation Effects on the Electronic Structure and Defect Density of 1L WS2 through in-situ Photoemission Spectroscopy, ***Christopher Smyth****, A. Boehm,* Sandia National Laboratories*; K. Burns,* University of Virginia*; A. Kim, T. Ohta,* Sandia National Laboratories	
9:50am	**PCSI1-MoM1-17** Scalable Synthesis of One-Dimensional Quantum Matter, ***Ruhin Chowdhury****, E. Renteria,* The University of New Mexico*; S. Addamane,* Sandia National Laboratories, USA*; D. Shima, D. Prakash, J. Neely,* University of New Mexico*; F. Cavallo,* The University of New Mexico	
9:55am	**PCSI1-MoM1-18** Structural Phase Transition and Electronic Structure of Epitaxial VO_2 Thin Films Prepared on a-Al_2O_3 Substrate, ***Manish Kumar****, S. Rani, H. Lee,* Pohang Accelerator Laboratory, POSTECH, Republic of Korea	
10:00am	**PCSI1-MoM1-19** MBE-Grown Germanium Quantum Well Planar Josephson Junction, ***Joshua Thompson****, C. Gaspe, R. Card, J. Dong, K. Sardashti,* Laboratory for Physical Sciences*; S. Davari, H. Churchill,* University of Arkansas*; K. Serniak, T. Hazard,* MIT Lincoln Laboratory*; C. Richardson,* Laboratory for Physical Sciences	
10:05am	**PCSI1-MoM1-20** Neutron Reflectometry Studies of Interfacial Phenomena in Actinide and Actinide Related Thin Films, *I. Kruk, P. Wang,* Los Alamos National Laboratory*; D. Allred,* Brigham You*; K. Rector,* Los Alamos National Laboratory*;* ***Jaroslaw Majewski****,* Los Alamos National Laboratory, National Science Foundation	
10:10am	**PCSI1-MoM1-21** Current Characteristics Depending on the Doping Concentration of the Barrier in the GaSb Based Unipolar Detector, *J. Kim,* ***Jong Hun Lee****, G. Kim, T. Kang,* Yeungnam University, Republic of Korea*; S. Lee, D. Kim,* Korea Research Instutue of Standards and Science (KRISS), Republic of Korea	
10:15am	**Coffee Break & Poster Viewing**	
11:10am	**INVITED: PCSI-MoM2-33** Non-Volatile Optical Phase Shifters on Si Photonics Platform, ***Mitsuru Takenaka****, Y. Miyatake, R. Tang, K. Taki, N. Sekine, K. Watanabe, T. Akazawa, H. Sakumoto, D. Bhardwaj, M. Fujita, H. Tang,* The University of Tokyo, Japan*; K. Makino, J. Tominaga, N. Miyata, M. Okano,* National Institute of Advanced Industrial Science and Technology (AIST), Japan*; K. Toprasertpong, S. Takagi,* The University of Tokyo, Japan	**PCSI** **Session PCSI-MoM2** **High-k Dielectrics and Ferroelectrics** **Moderator:** **Peter Maurer**, University of Chicago
11:50am	**PCSI-MoM2-41** In-Situ Analytical Study on Atomic Layer Deposition of Metal Silicate Thin Films Using Hexachlorodisilane and Water, *G. Kim, E. Lee,* ***Yo-Sep Min****,* Konkuk University, Republic of Korea	
11:55am	**PCSI-MoM2-42** Enhanced Dielectric Properties of HfO_2 Thin Films Produced via Novel Catalytic Atomic Layer Deposition Process, ***Sara Harris****, M. Weimer, A. Dameron, D. Lindblad, A. Wang,* Forge Nano	
12:00pm	**PCSI-MoM2-43** Improving Hot Electron-Induced Punchthrough (Heip) via Dual Sti Sidewall Process in Dram, ***Jaehyeon Jeon****,* Sungkyunkwan University, Korea*; B. Choi,* Sungkyunkwan University (SKKU), Republic of Korea	

Monday Afternoon, January 20, 2025

	Room Keahou I	
2:00pm	**INVITED: PCSI-MoA1-1** Novel Josephson Effects in Superconductor-Semiconductor Systems, *M. Gupta, G. Graziano, C. Riggert, L. Shani, G. Menning,* University of Minnesota, USA*; M. Pendharkar,* Stanford University*; C. Dempsey, J. Dong,* University of California at Santa Barbara*; P. Lueb, J. Jung,* Eindhoven University of Technology, The Netherlands*; R. Mélin,* Institut Néel, CNRS/UGA, Grenoble, France*; E. Bakkers,* Eindhoven University of Technology, The Netherlands*; C. Palmstrøm,* University of California at Santa Barbara*; **Vlad S. Pribiag**,* University of Minnesota, USA	**PCSI** **Session PCSI-MoA1** **Superconducting Qubits** **Moderator:** **Chunhui (Rita) Du**, Georgia Institute of Technology
2:40pm	**PCSI-MoA1-9** UPGRADED: First-Principles Studies of Schottky Barriers and Tunneling Properties at Al(111)/Si(111) and CoSi2(111)/Si(111) Interfaces, ***Johannes Kevin Nangoi**, C. Palmstrøm, C. Van de Walle,* University of California, Santa Barbara	
3:00pm	**PCSI-MoA1-13** Epitaxial Niobium Titanium Nitride Thin Films for Superconducting Quantum Circuits, ***Christopher Richardson**, A. Thomas,* Laboratory for Physical Sciences*; E. Supple, B. Gorman,* Colorado School of Mines	
3:05pm	**PCSI-MoA1-14** Interface-Sensitive Microwave Loss in Tantalum Films Grown on C-Plane Sapphire for Quantum Information Applications, ***Anthony McFadden**, T. Larson, S. Gill, A. Dixit,* NIST-Boulder*; J. Oh, L. Zhou,* Ames Laboratory*; F. Lecocq, R. Simmonds,* NIST-Boulder	
3:10pm	**PCSI-MoA1-15** Cryogenically Grown a-Ta on Inas for 2DEG-Based Josephson Junctions, ***Teun van Schijndel**, J. Dong,* UC Santa Barbara*; Y. Gul,* University College London, UK*; D. Vera,* University of San Diego*; W. Yánez-Parreño, S. Chatterjee, C. Palmstrøm,* UC Santa Barbara	
3:15pm	**PCSI-MoA1-16** Low Temperature Deposition of Superconducting Aluminum Films for Quantum Information Applications, ***Wilson J. Yánez-Parreño**, T. van Schijndel,* University of California at Santa Barbara*; A. McFadden, R. Simmonds,* NIST-Boulder*; C. Palmstrom,* University of California at Santa Barbara	
3:20pm	**PCSI-MoA1-17** Strong Photon-Magnon Coupling Using a Lithographically Defined Organic Ferrimagnet, *Q. Xu, H. Cheung,* Cornell University*; D. Cormode,* The Ohio State University*; T. Puel,* University of Iowa*; S. Pal,* Cornell University*; H. Yusuf,* The Ohio State University*; M. Chilcote,* Cornell University*; M. Flatté,* University of Iowa*; **Ezekiel Johnston-Halperin**,* The Ohio State University*; G. Fuchs,* Cornell University	
3:25pm	**Coffee Break & Poster Viewing**	
4:20pm	**INVITED: PCSI-MoA2-29** Dielectric Tensor and Coupled Excitations in Layered (Magnetic) Semiconductors, ***Ursula Wurstbauer**,* University of Muenster, Germany	**PCSI** **Session PCSI-MoA2** **2D Materials and Graphene I** **Moderator:** **Nitin Samarth**, Penn State University
5:00pm	**PCSI-MoA2-37** Above Room Temperature Ferromagnetism in Epitaxially Grown Films of the 2D Magnets Fe_5GeTe_2 and Fe_3GaTe_2, *H. Lv, T. Shinwari, K. I. A. Khan, M. Hanke, A. Trampert, J. Herfort, R. Engel-Herbert, **Joao Marcelo J. Lopes**,* Paul-Drude-Institute for Solid State Electronics, 10117 Berlin, Germany	
5:05pm	**PCSI-MoA2-38** Electrical Side-Gate Control of Magnetic Anisotropy in a Composite Multiferroic, ***Katherine Johnson**,* Ohio State University*; K. Collins, M. Newburger, M. Page,* Air Force Research Laboratory*; R. Kawakami,* Ohio State University	
5:10pm		
5:15pm		
5:20pm	**PCSI-MoA3-41** UPGRADED: Molecular Beam Epitaxy Growth and Stoichiometry-Induced Ferromagnetism in Altermagnetic Candidate MnTe, ***Matthew Brahlek**,* Oak Ridge National Laboratory, USA	**PCSI** **Session PCSI-MoA3** **Magnetic Materials (2D, Monolayers, & Heterostructures** **Moderator: Debdeep Jena**, Cornell University
5:40pm	**PCSI-MoA3-45** Imaging and Writing Chiral Antiferromagnetic Domains in the 2D Triangular Antiferromagnet $Co_{1/3}NbS_2$, ***Scott Crooker**,* Los Alamos National Laboratory	
5:45pm	**PCSI-MoA3-46** Electrostatic Extension of Magnetic Proximity Effect in $La_{0.7}Sr_{0.4}MnO_3$, *Q. Lan, M. Schnedler, L. Freter,* Forschungszentrum Jülich GmbH, Germany*; C. Wang,* Southern University of Science and Technology, China*; K. Fischer,* National Institute of Technology, Japan*; R. Dunin-Borkowski, **Philipp Ebert**,* Forschungszentrum Jülich GmbH, Germany	
5:50pm	**PCSI-MoA3-47** Toward a First-Principles Theory of Rare-Earth Ions in Crystals, *Y. Lee, Z. Ning,* Ames National Laboratory*; R. Flint,* Ames Laboratory*; R. McQueeney,* Ames National Laboratory & Iowa State University*; I. Mazin,* George Mason University*; **Liqin Ke**,* Ames National Laboratory	
5:55pm	**PCSI-MoA3-48** Defect Mediated Helical Phase Reorientation by Uniaxial Stress, *T. Kim, H. Zhao, L. Ke,* Ames National Laboratory*; **Lin Zhou**,* Iowa State University	

Monday Evening, January 20, 2025

	Room Keahou I	
7:45pm	**INVITED: PCSI-MoE-1** Engineering Qubits in Silicon with Atomic Precision, ***Michelle Simmons,*** UNSW, Australia	**PCSI** **Session PCSI-MoE** **STM Controlled Surface "Lego" and Panel Discussion** **Moderator: Paul M. Koenraad**, Eindhoven University of Technology, Netherlands
8:25pm	**INVITED: PCSI-MoE-9** Local Probe Investigations of Topological States of Matter, ***Ingmar Swart,*** University of Utrecht, Netherlands	
9:05pm	**PCSI-MoE-17** Panel Discussion	

Tuesday Morning, January 21, 2025

Room Keahou I

8:30am	**INVITED: PCSI-TuM1-1** Atomistic Simulations for Understanding the Behavior of Dopants and Impurities in Ga2O3 and Related Alloys, ***Joel Varley,*** Lawrence Livermore National Laboratory	**PCSI** **Session PCSI-TuM1** **Oxide Semiconductor Materials I** **Moderator:** **Bharat Jalan**, University of Minnesota
9:10am	**PCSI-TuM1-9** UPGRADED: What Happens When a Dopant Doesn'T Go Where You Expect It to Go? The Case of MBE-Grown Yb-Doped $SrTiO_3$ on Si(001), ***Scott Chambers,*** Pacific Northwest National Laboratory; *E. Ramerez, D. Guragain, J. Ngai,* University of Texas at Arlington; *P. Sushko, K. Koirala, Y. Du, N. Govind, M. Bowden,* Pacific Northwest National Laboratory; *D. Biswas, T. Lee,* Diamond Light Source, UK; *C. Weiland,* National Institute of Standards and Technology (NIST); *J. Woicik,* National Institute for Science and Technology (NIST)	
9:30am	**PCSI-TuM1-13** Thickness-Dependent Optical Constants of SnO_2 Thin Films on Si Grown by Atomic Layer Deposition, ***Yoshitha Hettige,*** *S. Zollner,* New Mexico State University; *A. Pratap Singh, B. Dutta, S. Chattopadhyay,* Indian Institute of Technology Indore, India	
9:35am	**PCSI-TuM1-14** Regulating the Phase Transition of Vanadium Dioxide Thin Films, ***Manish Kumar,*** *S. Rani, H. Lee,* Pohang Accelerator Laboratory, POSTECH, Republic of Korea	
9:40am	**PCSI-TuM1-15** Formation of Transparent and Conductive SWCNT/SiO2 Composite Thin-Films on Pet Substrates Using Molecular Precursor Method, ***Hiroki Nagai,*** *K. Igarashi, M. Sato,* Kogakuin University, Japan	
9:45am	**PCSI-TuM1-16** Phototransistor Array Based on Plasma-Engineered Amorphous Metal Oxide Semiconductors with Ferroelectric Dielectrics, ***Uisik Jeong,*** *S. Kim,* Sungkyunkwan University (SKKU), Republic of Korea	
9:50am	**PCSI-TuM1-17** Improvement of Electrical Properties and Low-Temperature Development of Sol-gel Processed In-Ga-Zn-O Thin-Film Transistors Using UV-DI, ***Giyoong Chung,*** *y. kim,* Sungkyunkwan University (SKKU), Republic of Korea	
9:55am	**PCSI-TuM1-18** A Study on the Impact of Thin Metal Films on Contact Resistance in IGZO FET, ***Juseong Min,*** Sungkyunkwan University, Samsung Electronics, Republic of Korea	
10:00am	**PCSI-TuM1-19** Exploration of VO_2 Thin Films with Oxygen Deficiency, ***SUNITA RANI,*** *M. KUMAR, H. LEE,* Pohang Accelerator Laboratory, POSTECH, Republic of Korea	
10:05am	**Coffee Break & Poster Viewing**	
11:00am	**INVITED: PCSI-TuM2-31** Diamond High Power and Voltage MOSFETs: Inch-Sized Wafer Growth, Doping, Static and Dynamic Characteristics, ***MAKOTO KASU,*** *N. Saha,* Saga University, Japan	**PCSI** **Session PCSI-TuM2** **Wide Bandgap Materials II** **Moderator:** **Joel Varley**, Lawrence Livermore National Laboratory,
11:40am	**PCSI-TuM2-39** Adsorption and Thermal Evolution of Nitrogen Species on Diamond Surfaces, ***Kai Huang,*** Guangdong Technion-Israel Institute of Technology, China	
11:45am	**PCSI-TuM2-40** Atomic and Electronic Structure Prediction for Heterostructural Interfaces with Ultra-Wide Gap Materials , ***Stephan Lany,*** *S. Mahatara,* 15013 Denver West Pkwy	
11:50am	**PCSI-TuM2-41** Si Diffusion Into Self-Organized GaN Nanocolumns Grown on Si(111) by RF-MBE, ***Tohru HONDA,*** *N. GOTO, Y. HOSOYA, T. ONUMA, T. YAMAGUCHI,* Kogakuin University, Japan	
11:55am	**PCSI-TuM2-42** Realization of Smooth Surface and Interface in Mist CVD Growth of Rocksalt structured-MgZnO/MgO MQWs, ***Hiroyuki Aichi,*** *T. Onuma,* Kogakuin University, Japan	
12:00pm	**PCSI-TuM2-43** Si-Integrated Epitaxial $BaTiO_3$ for Ultra-Low Loss, Efficient Modulators in Silicon Photonics, ***Alex A. Demkov,*** *A. Posadas, A. Raju, D. Wasserman,* The University of Texas at Austin	

Tuesday Evening, January 21, 2025

	Room Keahou I	
7:00pm	**PCSI-TuE-1** Challenges & Opportunities for Developing Superconducting Quantum Information Systems, ***Raymond Simmonds***, National Institute of Standards and Technology, Boulder	**PCSI** **Session PCSI-TuE** **Rump Session: Quantum Computation Materials and Devices and Panel Discussion** **Moderator:** **Christopher Palmstrøm**, University of California, Santa Barbara
7:30pm	**INVITED: PCSI-TuE-7** Spin-Orbit Qubits with Holes in Silicon and Germanium, ***Dominik Zumbuhl***, University of Basel, Switzerland	
8:00pm	**INVITED: PCSI-TuE-13** The Critical Role of Interfaces in Si/SiGe Quantum Dot Qubits: Valley Splitting and Radiation Impacts, ***Mark Eriksson***, University of Wisconsin-Madison	
8:30pm	**PCSI-TuE-19** Panel Discussion	

Wednesday Morning, January 22, 2025

	Room Keahou I	
8:30am	**INVITED: PCSI-WeM1-1** Room Temperature Optically Detected Magnetic Resonance of Single Spins in GaN, ***Gregory Fuchs,*** Cornell University	**PCSI** **Session PCSI-WeM1** **Point Defects (for Quantum Information Applications) I** **Moderator:** **Kai-Mei Fu**, University of Washington
9:10am	**PCSI-WeM1-9** UPGRADED: Er Sites in Si for Quantum Information Processing, ***Sven Rogge,*** UNSW, Australia	
9:30am	**PCSI-WeM1-13** Simulating X-STM Images of Iso-Electronic Dopants in Semiconductors Using DFT, ***Thomas Verstijnen****, D. Tjeertes, E. Banfi, P. Koenraad,* Eindhoven University of Technology, Netherlands	
9:35am	**PCSI-WeM1-14** GaAsGe Ternary Alloys Studied by Cross-sectional Scanning Tunneling Microscopy, ***Aurelia Trevisan****, W. van Lierop,* Eindhoven University of Technology, Netherlands*; J. Ripalda,* Spanish National Research Council (CSIC), Instituto de Microelectrónica de Madrid, Spain*; Y. González,* Spanish National Research Council (CSIC) · Instituto de Microelectrónica de Madrid, Spain*; P. Caño, E. Navarro,* Spanish National Research Council (CSIC), Instituto de Microelectrónica de Madrid, Spain*; R. Juluri, A. Sanchez,* University of Warwick, UK*; P. Koenraad,* Eindhoven University of Technology, Netherlands	
9:40am	**PCSI-WeM1-15** Imaging Rare-Earth Dopant Clusters in SiC in 3D Using Multislice Electron Ptychography, ***Shake Karapetyan****, M. Thomas,* Cornell University*; U. Kaiser, J. Biskupek,* Ulm University, Germany*; D. Muller,* Cornell University	
9:45am	**PCSI-WeM1-16** Controlling with External Fields the Quantum-Mechanical Core-Hole Manganese Spin in III-V Semiconductors, ***Julian Zanon,*** Eindhoven University of Technology, Netherlands*; M. E. Flatté,* University of Iowa	
9:50am	**Coffee Break & Poster Viewing**	
11:00am	**INVITED: PCSI-WeM2-31** Quantum Point Defects in Wide Band Gap Semiconductors: Donor Properties in ZnO and Charge States of Diamond, *X. Wang, E. Hansen, V. Niaouris, C. Pederson, N. Yama,* University of Washington*; L. Vines,* University of Oslo, Norway*;* ***Kai-Mei Fu,*** University of Washington	**PCSI** **Session PCSI-WeM2** **Point Defects (for Quantum Information Applications) II** **Moderator:** **Gregory Fuchs**, Cornell University
11:40am	**PCSI-WeM3-39** Surface and Interface Effects on the Electronic and Magnetic Properties of $NiCo_2O_4$ Thin Films, ***Arjun Subedi****, B. Giri, D. Yang,* University of Nebraska–Lincoln*; A. N'Diaye,* Advanced Light Source, Lawrence Berkeley National Laboratory*; T. Komesu, X. Xu, P. Dowben,* University of Nebraska–Lincoln	**PCSI** **Session PCSI-WeM3** **Photoemission Spectroscopy** **Moderator:** **Gregory Fuchs**, Cornell University
11:45am	**PCSI-WeM3-40** Spectroscopic Calculations for Trivalent Lanthanide Ions, ***Tharnier O. Puel,*** University of Iowa*; J. Lizarazo-Ferro, R. Zia,* Brown University*; M. E. Flatté,* University of Iowa	
11:50am	**PCSI-WeM3-41** Brillouin-Zone-Selection Effects in Angle-Resolved Photoemission Spectroscopy of Silicon, ***Niels van Venrooij,*** University of Iowa, Netherlands*; P. Constantinou, T. Stock,* University College London, UK*; V. Strocov,* Paul Scherrer Institut, Switzerland*; G. Aeppli,* ETH Zurich, Switzerland*; N. Curson, S. Schofield,* University College London, UK*; M. Flatté,* University of Iowa	
11:55am	**PCSI-WeM3-42** A Topological Superconductor Tuned by Electronic Correlations, ***Haoran Lin,*** University of Chicago*; C. Jacobs,* West Virginia University*; C. Yan,* University of Chicago*; G. Nolan,* University of Illinois at Urbana-Champaign*; P. Singleton, Y. Bai, Q. Gao, G. Berruto, D. Nguyen,* University of Chicago*; X. Wu,* Chinese Academy of Sciences, China*; C. Liu,* Penn State University*; N. Guisinger,* Argonne National Laboratory*; P. Huang,* University of Illinois at Urbana-Champaign*; S. Mandal,* West Virginia University*; S. Yang,* University of Chicago	

Wednesday Afternoon, January 22, 2025

	Room Keahou I	
1:30pm	**INVITED: PCSI-WeA1-1** Atomic Layer Deposition: Surface Processes Unlocking Advanced Materials in the Semiconductor Industry, ***Erwin Kessels***, *A. Mackus, B. Macco,* Eindhoven University of Technology, Netherlands	**PCSI** **Session PCSI-WeA1** **Semiconductor Heterostructures: Growth, Nanostructures, & Interfaces II** **Moderator:** **Karen Kavanagh**, Simon Fraser University, Canada
2:10pm	**PCSI-WeA1-9** Characteristics of Electrochemically Deposited Lightly-doped Co(P) Film on a Self-Assembled Monolayer-Sealed NiSi Substrate as an Interconnect Material for Nanoscale Device, ***Jau-Shiung Fang***, National Formosa University, Taiwan	
2:15pm	**PCSI-WeA1-10** Low Temperature Ge/Si Heterojunction by DC Sputtering, ***Yi-Jhen Wang***, *H. Huang, Y. Lai, C. Lin,* Tatung University, Taiwan	
2:20pm	**PCSI-WeA1-11** Optical and Structural Properties of Group-IV Oxides Produced by Rapid Thermal Oxidation, *D. Ortega,* ***Danissa Ortega***, *H. Woolf, A. Moses, C. Armenta, J. Love, S. Yadav, S. Zollner,* New Mexico State University*; M. Mircovich,* Arizona State University	
2:25pm	**PCSI-WeA1-12** Growth Evaluation and Electrochemical Properties of Lab6 Thin Films Deposited by HiPIMS, ***César D. Rivera Tello***, *J. Pérez Alvarez, M. Flores, L. Huerta,* Universidad de Guadalajara, Mexico	
2:30pm	**PCSI-WeA1-13** Facile and Inexpensive Development of Nano-Structured Polymer Layers for Surface Enhanced Raman Spectroscopy Applications, ***L. Jiang***, Tuskegee University*; N. Korivi,* Oregon Institute of Technology	
2:35pm	**PCSI-WeA2-14** Scalable Si-Based Metal-Insulator-Semiconductor Photoanodes for Water Oxidation Fabricated Using Nanosphere Lithography and Thin Film Reaction, *E. Yu,* ***Yunho Choi***, *S. Wu, J. Risberg, S. Kim,* University of Texas at Austin	**PCSI** **Session PCSI-WeA2** **Materials for Catalysis, Energy Storage, and Energy Harvesting** **Moderator:** **Mitsuru Takenaka**, The University of Tokyo, Japan
2:40pm	**PCSI-WeA2-15** Development of Bi_2Te_3-based Thermoelectric Thin Films Using Advanced Pulsed Laser Deposition System, ***Yakubu Sani Wudil***, King Fahd University, Saudi Arabia	
2:45pm	**PCSI-WeA2-16** Molecularly Engineered Siloxane Binders: Elevating Lfp Cathode Efficiency Under High Active Mass Loading, ***Asuman Celik-Kucuk***, *T. Abe,* Kyoto University, Japan	
2:50pm	**PCSI-WeA2-17** Minimizing Ion/Electron Pathways Through Ultrathin Conformal Holey Graphene Encapsulation in Li- and Mn-Rich Layered Oxide Cathodes for High-Performance Lithium-Ion Batteries, ***Heejoon Ahn***, 222 Wangsimni-ro, Seongdong-gu, Republic of Korea*; S. Kim,* Hanyang University, Korea	
2:55pm	**PCSI-WeA2-18** The Interplay between Gaseous Water and Surface Hydroxyl on Diamond(001) via Hydrogen Bonding, ***Huiqun Xiao***, *K. Huang,* Guangdong Technion Israel Institute of Technology, China	
3:00pm	**PCSI-WeA2-19** Development of High-Performance Hydrogen Generation Catalyst Based on Fluorine-Doped Tin Oxide Aerogel, ***Hyung-Ho Park***, Yonsei University, Korea	
3:05pm	**PCSI-WeA2-20** In Situ X-Ray Absorption Spectroscopy (XAS) Study of CeO_2-Based Catalysts for CO_2 to Methane Conversion, ***Irene Barba-Nieto***, *Y. Wang, J. Moncada, J. Jimenez,* Brookhaven National Laboratory*; M. Fernández-García,* Instituto de Catálisis y Petroleoquímica (CSIC), Spain*; J. Rodriguez,* Brookhaven National Laboratory	
3:10pm	**PCSI-WeA2-21** Properties of Spongy Structured $BaTiO_3$ Prepared by R.F. Magnetron Sputtering for Energy Harvester, *S. Kim,* Department of Energy Materials & Chemical Engineering, Kyungpook National University, Republic of Korea*;* ***Sang-Shik Park***, 1Department of Energy Materials & Chemical Engineering, Kyungpook National University, Republic of Korea	
3:15pm	**Coffee Break & Poster Viewing**	
4:00pm	**INVITED: PCSI-WeA3-31** Quantum Sensing of Moiré Magnetism, ***Chunhui (Rita) Du***, Georgia Institute of Technology, USA	**PCSI** **Session PCSI-WeA3** **Spin Transport and Spintronics** **Moderator:** **Michael Flatté**, University of Iowa
4:40pm	**PCSI-WeA3-39** Strong on-Chip Microwave Photon-Magnon Coupling Using Ultralow-Damping Epitaxial $Y_3Fe_5O_{12}$ Films, *S. Guo, D. Russell, J. Lanier, H. Da, C. Hammel,* ***Fengyuan Yang***, The Ohio State University	
4:45pm	**PCSI-WeA3-40** Device Architectures for Characterizing Spin Transport Through Chiral Defects in Semiconductors, ***Jordan Neely***, *F. Haines, E. Renteria, R. Chowdhury, D. Prakash, D. Shima, F. Cavallo,* University of New Mexico	
4:50pm	**PCSI-WeA3-41** Orbital Hall Effect and Orbitronics in Magnetic Multilayers, *I. Lyalin, Y. Zhu,* ***Roland Kawakami***, The Ohio State University	
4:55pm	**PCSI-WeA4-42** UPGRADED: Topotaxy in 2D Materials: Towards Synthesis of Novel 2D Materials by Surface Reactions, ***Matthias Batzill***, University of South Florida	**PCSI** **Session PCSI-WeA4** **2D Materials and Graphene II** **Moderator:** **Scott Crooker**, Los Alamos National Laboratory
5:15pm	**PCSI-WeA4-46** Thickness Calculation of HBN and Graphene Using RGB Colors, ***Gabriel Ruiz***, New Mexico State University*; B. Xie,* University of California Santa Barbara	

5:20pm	**PCSI-WeA4-47** Optoelectronic Properties of MoS2/Graphene Heterostructures Prepared by Dry Transfer Method for Light-induced Energy Harvesting Applications, ***Sanju Gupta,*** Penn State University and Gdansk University of technology	
5:25pm	**PCSI-WeA4-48** The Case of the Missing Sulfur, *M. Fawzy,* Dept. of Physics, Simon Fraser University, Canada*; M. Mohammadzadehb, A. Abnavi, T. de Silva, R. Ahmadi, H. Ghanbari, F. Kabir, A. Hasani, M. Adachi,* School of Engineering Science, Simon Fraser University, Canada*;* ***Karen Kavanagh,*** Dept. of Physics, Simon Fraser University, Canada	
5:30pm	**PCSI-WeA4-49** Formation of Twin-Free Single Phase β-in_2Se_3 Layers via Selenium Diffusion Into InP(111)B Substrate, ***Kaushini Wickramasinghe****, C. Forrester,* City College of New York, City University of New York*; M. McCartney, D. Smith,* Arizona State University*; M. Tamargo,* City College of New York, City University of New York	
5:35pm	**PCSI-WeA4-50** Interface-Induced and Tunable Electron-Phonon Scattering in Hexagonal Boron Nitride, ***Håkon Røst,*** University of Bergen, Norway*; A. Skarpeid, S. Cooil,* University of Oslo, Norway*; A. Åsland,* Norwegian University of Science and Technology (NTNU), Norway*; A. Generalov, A. Preobrajenski, C. Polley, T. Balasubramanian,* MAX IV Laboratory, Sweden*; J. Wells,* University of Oslo, Norway	
5:40pm	**PCSI-WeA4-51** Investigating Modulation of Coulomb Interaction in Graphene on a High-k Dielectric, ***Rubi Km,*** Los Alamos National Laboratory*; J. Hu,* National University of Singapore*; M. Bal,* Radboud University Nijmegen, Netherlands*; M. Chan,* Los Alamos National Laboratory*; A. Ariando,* National University of Singapore*; U. Zeitler,* Radboud University Nijmegen, Netherlands*; N. Harrison,* Los Alamos National Laboratory	
5:45pm	**PCSI-WeA4-52** MBE Growth of Transition Metal Dichalcogenides, ***Matthew Swann****, Z. Li,* The Ohio State University*; C. Helton,* Columbus State Community College*; R. Kawakami,* The Ohio State University	
5:50pm	**PCSI-WeA4-53** Improvement of HfO_2 on TMDCs using Thermal Expansion Coefficient difference with Substrate, ***Sukheyon Eom****, J. Park,* Sungkyunkwan University (SKKU), Republic of Korea	

Room Keahou I

8:30am	**INVITED: PCSI-ThM1-1** Chirality, Spin and Orbital in Dna-Type Chiral Materials, ***Binghai Yan,*** Pennsylvania State University	**PCSI** **Session PCSI-ThM1** **Topological Materials** **Moderators:** **Sven Rogge**, University of New South Wales, Australia,
9:10am	**PCSI-ThM1-9** Distinguishing Surface and Bulk Electromagnetism via Their Dynamics in an Intrinsic Magnetic Topological Insulator, ***Khanh Duy Nguyen,*** *W. Lee,* University of Chicago*; J. Dang, T. Woo,* University of Florida*; G. Berruto, C. Yan, C. Ip, H. Lin, Q. Gao,* University of Chicago*; S. Lee,* Penn State University*; B. Yan,* Weizmann Institute of Science, Israel*; C. Liu, Z. Mao,* Penn State University*; X. Zhang,* University of Florida*; S. Yang,* University of Chicago	
9:15am	**PCSI-ThM1-10** Infrared Absorption of α-Sn, ***Jaden R. Love,*** *C. Armenta, A. Moses, S. Zollner,* New Mexico State University*; A. Engel,* University of California Santa Barbara*; C. Palmstrom,* University of California at Santa Barbara	
9:20am	**PCSI-ThM1-11** Coulomb Disorder in Cd_3As_2 Thin Films, ***Ian Leahy,*** *A. Rice, J. Nelson,* National Renewable Energy Laboratory*; H. Ness,* King's College London, UK*; M. van Schilfgaarde, K. Alberi,* National Renewable Energy Laboratory	
9:25am	**PCSI-ThM1-12** Gate-Tunable Ferromagnetism in Epitaxially Grown Semimetal-Ferromagnetic Semiconductor Heterostructures, ***Emma Steinebronn,*** *S. Islam,* Penn State University*; A. Grutter, C. Jensen, J. Borchers,* NIST*; W. Yanez-Parreno,* Penn State University*; S. Ghosh,* University of Minnesota*; J. Chamorro, T. McQueen,* Johns Hopkins University*; C. Liu,* Penn State University*; A. Mkhoyan,* University of Minnesota*; N. Samarth,* Penn State University	
9:30am	**PCSI-ThM1-13** Growth of Cd_3As_2 on GaAs(110) Substrates, ***Anthony Rice,*** *I. Leahy, A. Norman, K. Alberi,* National Renewable Energy Laboratory	
9:35am	**Coffee Break & Poster Viewing**	
10:00am	**INVITED: PCSI-ThM2-19** Opportunities and Challenges of Complex Oxide Membranes, ***Bharat Jalan,*** University of Minnesota, USA	**PCSI** **Session PCSI-ThM2** **Oxide Semiconductor Materials II** **Moderator:** **Erwin Kessels**, Eindhoven University of Technology, Netherlands
10:40am	**PCSI-ThM2-27** UPGRADED: The Thermal Decomposition Process of Metalorganic Precursors Used in Hybrid Molecular Beam Epitaxy, *B. Fazlioglu Yalcin,* The Pennsylvania State University*; C. Sanga, I. Erpay,* Istanbul Technical University, Turkey*; D. Yilmaz, A. van Duin,* The Pennsylvania State University*; N. Nayir,* Istanbul Technical University, Turkey*; **Roman Engel-Herbert,*** Paul-Drude Institute for Solid State Electronics, Germany	

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