

# Program Overview

Room /Time	Canyon/Sugarloaf
SuA	PCSI-1SuA: 2D Heterostructure Design PCSI-2SuA: Epitaxial Growth of Quantum Materials and Structures
SuE	PCSI-SuE: Single Photon Detectors
MoM	PCSI-1MoM: Oxides PCSI-2MoM: Hybrid Materials
MoA	PCSI-1MoA: Catalysis/Nanowires PCSI-2MoA: Dopants in Semiconductors
MoE	PCSI-MoE: Superconductivity I
TuM	PCSI-1TuM: Magnetism PCSI-2TuM: Superconductivity II
TuE	PCSI-TuE: The Future of PV
WeM	PCSI-1WeM: Optical Properties of 2D Materials PCSI-2WeM: Material Modification and Self Assembly
WeA	PCSI-1WeA: Devices and Contacts PCSI-2WeA: Synthesis of Materials for Devices
ThM	PCSI-1ThM: 2D Materials - Strain and Heterostructures

# Special Events Sunday

## Special Events Sunday

6:00 PM Welcome Reception/Century

# Sunday Afternoon, January 19, 2020

Room Canyon/Sugarloaf		
2:30pm		<b>PCSI</b> <b>Session PCSI-1SuA</b> <b>2D Heterostructure Design</b> <b>Moderator:</b> Edward Yu, The University of Texas at Austin
2:35pm	<b>INVITED: PCSI-1SuA-2</b> Optical Properties of Semiconducting Moiré Crystals, <i>Xiaoqin Elaine Li</i> , Univ of Texas at Austin	
2:40pm	Invited talk continues.	
2:45pm	Invited talk continues.	
2:50pm	Invited talk continues.	
2:55pm	Invited talk continues.	
3:00pm	Invited talk continues.	
3:05pm	Invited talk continues.	
3:10pm	Invited talk continues.	
3:15pm	<b>INVITED: PCSI-1SuA-10</b> Berryogenesis: Spontaneous Out-of-Equilibrium Plasmonic Magnetism, <i>Justin Song</i> , Nanyang Technological University Singapore, Singapore	
3:20pm	Invited talk continues.	
3:25pm	Invited talk continues.	
3:30pm	Invited talk continues.	
3:35pm	Invited talk continues.	
3:40pm	Invited talk continues.	
3:45pm	Invited talk continues.	
3:50pm	Invited talk continues.	
3:55pm	<b>PCSI-1SuA-18 UPGRADED:</b> Investigation of Graphene/Ge(110) Interface, <i>Miriam Galbiati</i> , Technical University of Denmark, Denmark	<b>PCSI</b> <b>Session PCSI-2SuA</b> <b>Epitaxial Growth of Quantum Materials and Structures</b> <b>Moderator:</b> Seung Sae Hong, Stanford University
4:00pm	Talk continues.	
4:05pm	Talk continues.	
4:10pm	Talk continues.	
4:15pm	<b>Break</b>	
4:20pm	<b>Break</b>	
4:25pm	<b>Break</b>	
4:30pm	<b>PCSI-2SuA-25 UPGRADED:</b> Epitaxial Growth and Electronic Characterization of GdSb, <i>Hadass Inbar</i> , <i>S Chatterjee</i> , <i>M Pendharkar</i> , <i>Y Chang</i> , <i>M Bocheff</i> , <i>T Guo</i> , <i>T Brown-Heft</i> , University of California, Santa Barbara; <i>A Fedorov</i> , Lawrence Livermore National Laboratory; <i>D Read</i> , Cardiff University; <i>C Palmstrom</i> , University of California, Santa Barbara	
4:35pm	Talk continues.	
4:40pm	Talk continues.	
4:45pm	Talk continues.	
4:50pm	<b>PCSI-2SuA-29</b> MBE Growth of Zn <sub>x</sub> Cd <sub>1-x</sub> Te on Cd <sub>3</sub> As <sub>2</sub> , <i>Anthony Rice</i> , <i>K Alberi</i> , National Renewable Energy Laboratory	
4:55pm	<b>PCSI-2SuA-30</b> Interfaces and Growth of NbTiN-AlN Heterostructures on Sapphire as Epitaxial Josephson Junctions, <i>Chris Richardson</i> , <i>A Thomas</i> , <i>A Alexander</i> , <i>C Weddle</i> , Laboratory for Physical Sciences; <i>B Arey</i> , <i>M Olszta</i> , PNNL	
5:00pm	<b>PCSI-2SuA-31</b> Growth of AlN Barriers in Al/AlN/Al SIS Josephson Junctions by Low Temperature Atomic Layer Epitaxy, <i>Charles R. Eddy, Jr.</i> , U.S. Naval Research Laboratory; <i>D Pennachio</i> , <i>J Lee</i> , <i>A McFadden</i> , University of California, Santa Barbara; <i>S Rosenberg</i> , U.S. Naval Research Laboratory; <i>Y Chang</i> , <i>C Palmstrom</i> , University of California, Santa Barbara	

# Sunday Evening, January 19, 2020

<p><b>PCSI</b>  <b>Room Canyon/Sugarloaf - Session PSCI-SuE</b>  <b>Single Photon Detectors</b>  <b>Moderator:</b> Christopher Palmstrom, University of California, Santa Barbara</p>		
7:30pm	<p><b>INVITED: PSCI-SuE-1</b> Theory of Single Photon Detection by a Photoreceptive Molecule and a Quantum Coherent Spin Center, <i>N Harmon</i>, University of Evansville; <b>Michael Flatté</b>, University of Iowa</p>	
7:35pm	Invited talk continues.	
7:40pm	Invited talk continues.	
7:45pm	Invited talk continues.	
7:50pm	Invited talk continues.	
7:55pm	Invited talk continues.	
8:00pm	Invited talk continues.	
8:05pm	Invited talk continues.	
8:10pm	<p><b>INVITED: PSCI-SuE-9</b> From Dark Matter Detection to Artificial Intelligence: Uses for Superconducting Nanowire Single Photon Detectors, <b>Sae Woo Nam</b>, National Institute of Standards and Technology, UUSA</p>	
8:15pm	Invited talk continues.	
8:20pm	Invited talk continues.	
8:25pm	Invited talk continues.	
8:30pm	Invited talk continues.	
8:35pm	Invited talk continues.	
8:40pm	Invited talk continues.	
8:45pm	Invited talk continues.	

# Special Events Monday

## Special Events Monday

7:30 AM Continental Breakfast/Flagstaff/Trail Ridge  
10:00 AM Coffee Break and Poster Viewing/Flagstaff/Trail Ridge  
12:00 PM Lunch and Poster Viewing/Century/Millennium  
3:15 PM Coffee Break and Poster Viewing/Flagstaff/Trail Ridge  
6:00 PM Dinner/Century/Millennium

# Monday Morning, January 20, 2020

<b>Room Canyon/Sugarloaf</b>	
8:30am	<b>INVITED: PCSI-1MoM-1</b> MOCVD Epitaxy and Doping for $\beta$ -Ga <sub>2</sub> O <sub>3</sub> and (Al <sub>x</sub> Ga <sub>1-x</sub> ) <sub>2</sub> O <sub>3</sub> , <i>Hongping Zhao</i> , The Ohio State University
8:35am	Invited talk continues.
8:40am	Invited talk continues.
8:45am	Invited talk continues.
8:50am	Invited talk continues.
8:55am	Invited talk continues.
9:00am	Invited talk continues.
9:05am	Invited talk continues.
9:10am	<b>PCSI-1MoM-9</b> Atomic Structure and Electronic Properties of the Non-Polar In <sub>2</sub> O <sub>3</sub> and $\beta$ -Ga <sub>2</sub> O <sub>3</sub> (100) Surfaces, <i>C Schulze, R Zielinski, J Hofmann, C Bruckmann</i> , Technische Universität Berlin, Germany; <i>Z Galazka</i> , Leibniz-Institut für Kristallzüchtung Berlin, Germany; <i>Holger Eisele</i> , Technische Universität Berlin, Germany
9:15am	<b>PCSI-1MoM-10</b> Growth and Structures of Metal Dopant-Ceria Mixed Oxide Interfaces, <i>E Ginting, L Du, Jing Zhou</i> , University of Wyoming
9:20am	<b>INVITED: PCSI-1MoM-11</b> Freestanding Crystalline Oxide Membranes and Heterostructures, <i>Seung Sae Hong</i> , Stanford University
9:25am	Invited talk continues.
9:30am	Invited talk continues.
9:35am	Invited talk continues.
9:40am	Invited talk continues.
9:45am	Invited talk continues.
9:50am	Invited talk continues.
9:55am	Invited talk continues.
10:00am	<b>PCSI-1MoM-19</b> Effects of Annealing on Electronic Defects in $\beta$ -Ga <sub>2</sub> O <sub>3</sub> Revealed by Linearly-Polarized Photoluminescence (LPPL), <i>R Sun, Y Ooi, P Ranga</i> , University of Utah; <i>M Saleh, K Lynn</i> , Washington State University; <i>S Krishnamoorthy, Mike A. Scarpulla</i> , University of Utah
10:05am	<b>Coffee Break &amp; Poster Viewing</b>
10:10am	<b>Coffee Break &amp; Poster Viewing</b>
10:15am	<b>Coffee Break &amp; Poster Viewing</b>
10:20am	<b>Coffee Break &amp; Poster Viewing</b>
10:25am	<b>Coffee Break &amp; Poster Viewing</b>
10:30am	<b>Coffee Break &amp; Poster Viewing</b>
10:35am	<b>Coffee Break &amp; Poster Viewing</b>
10:40am	<b>Coffee Break &amp; Poster Viewing</b>
10:45am	<b>Coffee Break &amp; Poster Viewing</b>
10:50am	<b>Coffee Break &amp; Poster Viewing</b>
10:55am	<b>Coffee Break &amp; Poster Viewing</b>
11:00am	<b>INVITED: PCSI-2MoM-31</b> Hybrid Perovskite-Based High Energy Photon Detectors, <i>Wanyi Nie</i> , Los Alamos National Laboratory
11:05am	Invited talk continues.
11:10am	Invited talk continues.
11:15am	Invited talk continues.
11:20am	Invited talk continues.
11:25am	Invited talk continues.
11:30am	Invited talk continues.
11:35am	Invited talk continues.
11:40am	<b>PCSI-2MoM-39</b> Pb-based Metal-Organic Frameworks for Efficient Perovskites Light-emitting Diodes Applications, <i>Hsinhan Tsai, W Nie</i> , Los Alamos National Laboratory
11:45am	<b>PCSI-2MoM-40</b> Arrangement and Electronic Properties of Cobalt Phthalocyanine Molecules on B-Si(111)- $\sqrt{3} \times \sqrt{3} R 30^\circ$ , <i>Susi Lindner, M Franz, M Kubicki, S Appelfeller, M Dähne, H Eisele</i> , Technische Universität Berlin, Germany
11:50am	<b>PCSI-2MoM-41</b> Amino-Acids Detection with Modulation Doped and Surface Nanoengineered GaAs Schottky Diodes, <i>T Alkhidir, M Abi Jaoude</i> , KUST, United Arab Emirates; <i>D Gater</i> , University College London, United Kingdom; <i>C Alpha</i> , Cornell University; <i>Abdel Isakovic</i> , Colgate University
11:55am	<b>PCSI-2MoM-42</b> Carrier Collection and Transport at Interface of Lead-Free Halide Perovskites (FA,MA)SnI <sub>3</sub> Solar Cells, <i>William Jo</i> , Ewha Womans University, Republic of Korea

**PCSI**  
**Session PCSI-1MoM**  
**Oxides**  
**Moderator:** Tohru Honda, Kogakuin University

**PCSI**  
**Session PCSI-2MoM**  
**Hybrid Materials**  
**Moderator:** Joseph Berry, National Renewable Energy Laboratory

# Monday Afternoon, January 20, 2020

Room Canyon/Sugarloaf		
2:00pm	<b>INVITED: PCSI-1MoA-1</b> Engineering Active and Stable Semiconductor Photoelectrodes by Atomic Layer Deposition, <i>Ian Sharp</i> , Walter Schottky Institut/Technische Universität München, Germany	<b>PCSI</b> <b>Session PCSI-1MoA</b> <b>Catalysis/Nanowires</b> <b>Moderators:</b> Charles R. Eddy, Jr., U.S. Naval Research Laboratory, Hongping Zhao, The Ohio State University
2:05pm	Invited talk continues.	
2:10pm	Invited talk continues.	
2:15pm	Invited talk continues.	
2:20pm	Invited talk continues.	
2:25pm	Invited talk continues.	
2:30pm	Invited talk continues.	
2:35pm	Invited talk continues.	
2:40pm	<b>PCSI-1MoA-9</b> Surface States Induced Catalyst-free CO Sensing at GaN and AlGaIn/GaN Heterostructures, <i>Monu Mishra</i> , Indian Institute of Technology Delhi; <i>G Gupta</i> , National Physical Laboratory, India	
2:45pm	<b>PCSI-1MoA-10</b> Cu <sub>2</sub> O Nanoparticles for Enhancing Gas Phase Photocatalysis over Metal Oxide Semiconductor Nanostructures, <i>Hikaru Masegi</i> , Keio University, Japan	
2:50pm	<b>PCSI-1MoA-11</b> UPGRADED: Self-Selective Formation of 1D and 2D GaBi Structures on GaAs, <i>Y Liu</i> , Lund University, Sweden; <i>S Benter</i> , <i>J Knutsson</i> , <i>S Lehmann</i> , Lund University; <i>E Young</i> , <i>N Wilson</i> , <i>C Palmstrom</i> , University of California, Santa Barbara; <i>A Mikkelsen</i> , <i>Rainer Timm</i> , Lund University, Sweden	
2:55pm	Talk continues.	
3:00pm	Talk continues.	
3:05pm	Talk continues.	
3:10pm	<b>PCSI-1MoA-15</b> Iuliacumite: A Novel Two-Dimensional Chemical Short Range Order in a Wurtzite Single Monolayer InAs <sub>1-x</sub> Sb <sub>x</sub> Shell on InAs Nanowires, <i>Michael Schneider</i> , Forschungszentrum Jülich, Germany; <i>T Xu</i> , <i>J Lefebvre</i> , <i>J Nys</i> , Université Lille, CNRS, Centrale Lille, ISEN, Université Valenciennes, France; <i>S Plissard</i> , Université Lille, CNRS, Centrale Lille, ISEN, Université Valenciennes, Germany; <i>M Berthe</i> , Université Lille, CNRS, Centrale Lille, ISEN, Université Valenciennes, France; <i>H Eisele</i> , Technische Universität Berlin, Germany; <i>R Dunin-Borkowski</i> , <i>P Ebert</i> , Forschungszentrum Jülich, Germany; <i>B Grandidier</i> , Université Lille, CNRS, Centrale Lille, ISEN, Université Valenciennes, France	
3:15pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:20pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:25pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:30pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:35pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:40pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:45pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:50pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:55pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:00pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:05pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:10pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:15pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:20pm	<b>INVITED: PCSI-2MoA-29</b> Control of Spin-Orbit Coupling in Single Acceptor States in Silicon, <i>Sven Rogge</i> , University of New South Wales, Australia	
4:25pm	Invited talk continues.	
4:30pm	Invited talk continues.	
4:35pm	Invited talk continues.	
4:40pm	Invited talk continues.	
4:45pm	Invited talk continues.	
4:50pm	Invited talk continues.	

# Monday Afternoon, January 20, 2020

4:55pm	Invited talk continues.	
5:00pm	<b>PCSI-2MoA-37</b> UPGRADED: Low-Temperature Epitaxial Silicon Growth and Confinement of Delta Doped Si:P Nanostructures, <i>Scott Schmucker, E Anderson, J Lucero, E Bussmann, P Lu, A Katzenmeyer, T Luk, T Beechem, L Tracy, T Lu, A Grine, D Ward, D Campbell, P Gamache, M Gunter, S Misra</i> , Sandia National Laboratories	
5:05pm	Talk continues.	
5:10pm	Talk continues.	
5:15pm	Talk continues.	
5:20pm	<b>INVITED: PCSI-2MoA-41</b> The Electronic Bandstructure of Atomically Sharp Dopant Structures in Silicon, <i>Justin Wells</i> , Norwegian University of Science and Technology, Norway	
5:25pm	Invited talk continues.	
5:30pm	Invited talk continues.	
5:35pm	Invited talk continues.	
5:40pm	Invited talk continues.	
5:45pm	Invited talk continues.	
5:50pm	Invited talk continues.	
5:55pm	Invited talk continues.	



# Monday Evening, January 20, 2020

<b>PCSI</b> <b>Room Canyon/Sugarloaf - Session PCSI-MoE</b> <b>Superconductivity I</b> <b>Moderator:</b> David Pappas, National Institute of Technology	
7:30pm	<b>INVITED: PCSI-MoE-1</b> Fluctuating High Temperature Superconductivity in Monolayer FeSe / SrTiO <sub>3</sub> , <i>Kyle Shen, B Faeth, S Yang, D Schlom</i> , Cornell University
7:35pm	Invited talk continues.
7:40pm	Invited talk continues.
7:45pm	Invited talk continues.
7:50pm	Invited talk continues.
7:55pm	Invited talk continues.
8:00pm	Invited talk continues.
8:05pm	Invited talk continues.
8:10pm	<b>PCSI-MoE-9</b> Advances and Possibilities of the Materials Innovation Platform with Examples from Spin-ARPES, <i>Daniel Beaton</i> , Scienta Omicron Inc.
8:15pm	<b>INVITED: PCSI-MoE-10</b> Superconductivity at Surfaces Studied by Scanning Tunneling Microscopy, <i>Yukio Hasegawa</i> , The University of Tokyo, Japan
8:20pm	Invited talk continues.
8:25pm	Invited talk continues.
8:30pm	Invited talk continues.
8:35pm	Invited talk continues.
8:40pm	Invited talk continues.
8:45pm	Invited talk continues.
8:50pm	Invited talk continues.

# Special Events Tuesday

## Special Events Tuesday

- 7:30 AM Continental Breakfast/Flagstaff/Trail Ridge
- 10:05 AM Coffee Break and Poster Viewing/Flagstaff/Trail Ridge

# Tuesday Morning, January 21, 2020

<b>Room Canyon/Sugarloaf</b>	
8:30am	<b>INVITED: PCSI-1TuM-1</b> Quantum Microscopy of Nanoscale Materials and Devices, <i>Christian Degen</i> , ETH Zurich, Switzerland
8:35am	Invited talk continues.
8:40am	Invited talk continues.
8:45am	Invited talk continues.
8:50am	Invited talk continues.
8:55am	Invited talk continues.
9:00am	Invited talk continues.
9:05am	Invited talk continues.
9:10am	<b>PCSI-1TuM-9</b> UPGRADED: Mechanical Control of Valley Magnetization and Berry Curvature Dipole in Monolayer MoS <sub>2</sub> , <i>Joolee Son</i> , Ajou University, Republic of Korea; <i>K Kim</i> , Pohang University of Science and Technology, Republic of Korea; <i>Y Ahn</i> , Ajou University, Republic of Korea; <i>H Lee</i> , Pohang University of Science and Technology, Republic of Korea; <i>J Lee</i> , Ajou University, Republic of Korea
9:15am	Talk continues.
9:20am	Talk continues.
9:25am	Talk continues.
9:30am	<b>PCSI-1TuM-13</b> Room Temperature Ferromagnetic Monolayer MnGaN-2D Investigated by Spin-polarized Scanning Tunneling Microscopy/ Spectroscopy and First-principles Density Functional Theory, <i>Y Ma</i> , <i>T Erickson</i> , Nanoscale & Quantum Phenomena Institute; <i>K Meng</i> , <i>F Yang</i> , The Ohio State University; <i>D Hunt</i> , <i>A Barral</i> , <i>V Ferrari</i> , CAC-CNEA, Argentina; <b>A.R. Smith</b> , Nanoscale & Quantum Phenomena Institute
9:35am	<b>PCSI-1TuM-14</b> UPGRADED: Local Exchange Resonance in DC Magnetoresistance of Spin-Polarized Current Through a Dopant, <b>Stephen McMillan</b> , University of Iowa; <i>N Harmon</i> , University of Evansville; <i>M Flatté</i> , University of Iowa
9:40am	Talk continues.
9:45am	Talk continues.
9:50am	Talk continues.
9:55am	<b>PCSI-1TuM-18</b> Room Temperature Ferromagnetism in GaSb Thin Films Doped with Mn, <i>A Pulzara Mora</i> , <b>Camilo Andres Pulzara Mora</b> , Universidad Nacional de Colombia, Colombia
10:00am	<b>PCSI-1TuM-19</b> Magnetotransport Studies in Hybrid 2D/0D Nanostructures, <i>Ethel Perez-Hoyos</i> , <i>Y Luo</i> , <i>A Dehankar</i> , <i>J Xu</i> , <i>D Pharis</i> , <i>J Winter</i> , <i>R Kawakami</i> , <i>E Johnston-Halperin</i> , The Ohio State University
10:05am	<b>Coffee Break &amp; Poster Viewing</b>
10:10am	<b>Coffee Break &amp; Poster Viewing</b>
10:15am	<b>Coffee Break &amp; Poster Viewing</b>
10:20am	<b>Coffee Break &amp; Poster Viewing</b>
10:25am	<b>Coffee Break &amp; Poster Viewing</b>
10:30am	<b>Coffee Break &amp; Poster Viewing</b>
10:35am	<b>Coffee Break &amp; Poster Viewing</b>
10:40am	<b>Coffee Break &amp; Poster Viewing</b>
10:45am	<b>Coffee Break &amp; Poster Viewing</b>
10:50am	<b>Coffee Break &amp; Poster Viewing</b>
10:55am	<b>Coffee Break &amp; Poster Viewing</b>
11:00am	<b>INVITED: PCSI-2TuM-31</b> Fabrication of High Coherence Superconducting Qubits, <i>J Long</i> , <i>H Ku</i> , <i>X Wu</i> , NIST; <i>R Lake</i> , BlueFors; <b>David Pappas</b> , NIST
11:05am	Invited talk continues.
11:10am	Invited talk continues.
11:15am	Invited talk continues.
11:20am	Invited talk continues.
11:25am	Invited talk continues.
11:30am	Invited talk continues.
11:35am	Invited talk continues.
11:40am	<b>PCSI-2TuM-39</b> UPGRADED: Interface Chemistry and Decoherence Processes in Superconducting Quantum Circuits, <b>D. Frank Ogletree</b> , Lawrence Berkeley National Lab; <i>V Altoe</i> , <i>X Liu</i> , <i>A Minor</i> , <i>S Cabrini</i> , <i>S Griffin</i> , Molecular Foundry, LBNL; <i>A Bannerjee</i> , Lawrence Berkeley National Lab; <i>J Kriekebaum</i> , <i>I Siddiqi</i> , University of California, Berkeley

**PCSI**  
**Session PCSI-1TuM**  
**Magnetism**  
**Moderator:** Michael Flatté, University of Iowa

**PCSI**  
**Session PCSI-2TuM**  
**Superconductivity II**  
**Moderator:** Kyle Shen, Cornell University

# Tuesday Evening, January 21, 2020

<b>PCSI</b> <b>Room Canyon/Sugarloaf - Session PCSI-TuE</b> <b>The Future of PV</b> <b>Moderator:</b> Kirstin Alberi, National Renewable Energy Laboratory		
7:00pm	<b>INVITED: PCSI-TuE-1</b> Progress in Hybrid Perovskite Photovoltaics and Optoelectronics, <i>Joseph Berry</i> , National Renewable Energy Laboratory	
7:05pm	Invited talk continues.	
7:10pm	Invited talk continues.	
7:15pm	Invited talk continues.	
7:20pm	Invited talk continues.	
7:25pm	Invited talk continues.	
7:30pm	Invited talk continues.	
7:35pm	Invited talk continues.	
7:40pm	<b>INVITED: PCSI-TuE-9</b> On the Path Towards Tandem Junction Nanowire Based Solar Cells, <i>Magnus Borgström</i> , Lund University, Sweden	
7:45pm	Invited talk continues.	
7:50pm	Invited talk continues.	
7:55pm	Invited talk continues.	
8:00pm	Invited talk continues.	
8:05pm	Invited talk continues.	
8:10pm	Invited talk continues.	
8:15pm	Invited talk continues.	

# Special Events Wednesday

## Special Events Wednesday

- 7:30 AM Continental Breakfast/Flagstaff/Trail Ridge
- 9:45 AM Coffee Break and Poster Viewing/Flagstaff/Trail Ridge
- 12:00 PM Lunch and Poster Viewing/Century/Millennium
- 3:25 PM Coffee Break and Poster Viewing/Flagstaff/Trail Ridge
- 6:30 PM Conference Banquet Dinner/Century/Millennium

# Wednesday Morning, January 22, 2020

Room Canyon/Sugarloaf		
8:30am	<b>INVITED: PCSI-1WeM-1</b> Metals at the Atomic Limit, <i>Joshua Robinson</i> , Penn State University	<b>PCSI</b> <b>Session PCSI-1WeM</b> <b>Optical Properties of 2D Materials</b> <b>Moderator: Wanyi Nie, Los Alamos National Laboratory</b>
8:35am	Invited talk continues.	
8:40am	Invited talk continues.	
8:45am	Invited talk continues.	
8:50am	Invited talk continues.	
8:55am	Invited talk continues.	
9:00am	Invited talk continues.	
9:05am	Invited talk continues.	
9:10am	<b>PCSI-1WeM-9</b> Tuning the Spontaneous Emission of Monolayer Wse <sub>2</sub> by Optical Environment Control – Cavity Coupling and Substrate Manipulation, <i>J Lee, Hyunseung Lee</i> , Ajou University, Republic of Korea	
9:15am	<b>PCSI-1WeM-10</b> First Principles Study on Optical Properties of Monolayer Bismuthene under an Electric Field, <i>Wei-Chieh Liu, L Xu, M Lin</i> , Hanyang University, South Korea; <i>T Leung, H Hsu</i> , National Taipei University of Technology, Republic of China	
9:20am	<b>PCSI-1WeM-11</b> Formation of Coherent Phase Domain Heterojunctions in Single Layer MoS <sub>2</sub> on Au(111), <i>Fanglue Wu, Z Liu</i> , Texas A&M University; <i>M Chandross</i> , Sandia National Laboratories; <i>Q Moore</i> , Texas A&M University; <i>N Argibay, J Curry</i> , Sandia National Laboratories; <i>J Batteas</i> , Texas A&M University	
9:25am	<b>PCSI-1WeM-12</b> UPGRADED: Effects of Electromechanical Coupling in Locally Strained Monolayer MoS <sub>2</sub> , <i>Alex De Palma, G Cossio, K Jones, J Quan</i> , The University of Texas at Austin; <i>X Li</i> , Univ of Texas at Austin; <i>E Yu</i> , The University of Texas at Austin	
9:30am	Talk continues.	
9:35am	Talk continues.	
9:40am	Talk continues.	
9:45am	<b>Coffee Break &amp; Poster Viewing</b>	
9:50am	<b>Coffee Break &amp; Poster Viewing</b>	
9:55am	<b>Coffee Break &amp; Poster Viewing</b>	
10:00am	<b>Coffee Break &amp; Poster Viewing</b>	
10:05am	<b>Coffee Break &amp; Poster Viewing</b>	
10:10am	<b>Coffee Break &amp; Poster Viewing</b>	
10:15am	<b>Coffee Break &amp; Poster Viewing</b>	
10:20am	<b>Coffee Break &amp; Poster Viewing</b>	
10:25am	<b>Coffee Break &amp; Poster Viewing</b>	
10:30am	<b>Coffee Break &amp; Poster Viewing</b>	
10:35am	<b>Coffee Break &amp; Poster Viewing</b>	
10:40am	<b>Coffee Break &amp; Poster Viewing</b>	
10:45am	<b>Coffee Break &amp; Poster Viewing</b>	
10:50am	<b>Coffee Break &amp; Poster Viewing</b>	
10:55am	<b>Coffee Break &amp; Poster Viewing</b>	
11:00am	<b>INVITED: PCSI-2WeM-31</b> Neuromorphic Computing with the Redox Transistor, <i>Alec Talin</i> , Sandia National Laboratories	<b>PCSI</b> <b>Session PCSI-2WeM</b> <b>Material Modification and Self Assembly</b> <b>Moderator: Sven Rogge, University of New South Wales, Australia</b>
11:05am	Invited talk continues.	
11:10am	Invited talk continues.	
11:15am	Invited talk continues.	
11:20am	Invited talk continues.	
11:25am	Invited talk continues.	
11:30am	Invited talk continues.	
11:35am	Invited talk continues.	

# Wednesday Morning, January 22, 2020

11:40am	<b>PCSI-2WeM-39</b> Kinetically-Driven Assembly of TaS <sub>2</sub> -SnS Heterostructures with Flexible Stacking Architectures, <b>Dennice Roberts</b> , National Renewable Energy Laboratory; <i>D Bardgett</i> , University of Oregon; <i>B Gorman</i> , Colorado School of Mines; <i>J Perkins</i> , <i>A Zakutayev</i> , <i>S Bauers</i> , National Renewable Energy Laboratory	
11:45am	<b>PCSI-2WeM-40</b> Globally Aligned Single-Wall Carbon Nanotube Films through Electrostatic Ordering, <b>Joshua Walker</b> , University of Wyoming; <i>J Fagan</i> , <i>A Biacchi</i> , National Institute of Standards and Technology; <i>V Kuehl</i> , University of Wyoming; <i>T Searles</i> , Howard University; <i>A Hight Walker</i> , National Institute of Standards and Technology; <i>W Rice</i> , University of Wyoming	
11:50am	<b>PCSI-2WeM-41</b> Defining Insulating Regions on TiO <sub>2</sub> Thin Films by Laser Heating, <i>S Ahmed</i> , <i>J Ritter</i> , <b>Matt McCluskey</b> , Washington State University	
11:55am	<b>PCSI-2WeM-42</b> Towards Mask Free Direct Write fabrication of Micro- and Nanoscale Architectures on Different Substrates via Aqueous Ink Precursors and CVD Synthesis, <b>Irma Kuljanishvili</b> , <i>D Alameri</i> , <i>D Karbach</i> , <i>R Dong</i> , <i>L Moore</i> , Saint Louis University; <i>R Divan</i> , <i>Y Liu</i> , Argonne National Laboratory	

# Wednesday Afternoon, January 22, 2020

Room Canyon/Sugarloaf		
2:00pm	<b>INVITED: PCSI-1WeA-1</b> Towards Fermi Level De-pinning at Contacts, <i>John Robertson</i> , Cambridge University, UK; <i>Y Guo</i> , Wuhan University, China; <i>Z Zhang</i> , Cambridge University, UK	<b>PCSI</b> <b>Session PCSI-1WeA</b> <b>Devices and Contacts</b> <b>Moderator:</b> Alex Demkov, The University of Texas
2:05pm	Invited talk continues.	
2:10pm	Invited talk continues.	
2:15pm	Invited talk continues.	
2:20pm	Invited talk continues.	
2:25pm	Invited talk continues.	
2:30pm	Invited talk continues.	
2:35pm	Invited talk continues.	
2:40pm	<b>PCSI-1WeA-9</b> Observation, Characterization, and Mitigation of the Internal <i>p-n</i> Junction in Pyrite FeS <sub>2</sub> , a Potential Low-cost Solar Absorber, <i>Bryan Voigt</i> , <i>W Moore</i> , <i>J Walter</i> , <i>B Das</i> , <i>M Maiti</i> , <i>M Manno</i> , University of Minnesota; <i>E Aydil</i> , New York University; <i>C Leighton</i> , University of Minnesota	
2:45pm	<b>PCSI-1WeA-10</b> UPGRADED: Photo-Driven Dipole Reordering: Key to Carrier Separation in Metalorganic Halide Perovskites, <i>Philipp Ebert</i> , Forschungszentrum Jülich, Germany; <i>H Hsu</i> , National Taiwan University, Republic of China; <i>B Huang</i> , Academia Sinica, Republic of China; <i>S Chin</i> , National Taiwan University, Republic of China; <i>C Hsing</i> , <i>D Nguyen</i> , Academia Sinica, Republic of China; <i>M Schnedler</i> , Forschungszentrum Jülich, Germany; <i>R Sankar</i> , Academia Sinica, Republic of China; <i>R Dunin-Borkowski</i> , Forschungszentrum Jülich, Germany; <i>C Wei</i> , Academia Sinica, Republic of China; <i>C Chen</i> , <i>Y Chiu</i> , National Taiwan University, Republic of China	
2:50pm	Talk continues.	
2:55pm	Talk continues.	
3:00pm	Talk continues.	
3:05pm	<b>PCSI-1WeA-14</b> First Principles Study on Electronic Properties of Graphene Nanostructures for High Current Density Cathode, <i>Nan Zhao</i> , <i>L Xu</i> , <i>M Lin</i> , Hanyang University, South Korea; <i>T Leung</i> , National Chung Cheng University, Republic of China; <i>H Hsu</i> , National Taipei University of Technology, Republic of China	
3:10pm	<b>PCSI-1WeA-15</b> Band Offset Modulation in Si-EuO Heterostructures via Controlled Interface Formation, <i>W Li</i> , <i>A Posadas</i> , The University of Texas at Austin; <b>Alex Demkov</b> , The University of Texas	
3:15pm	<b>PCSI-1WeA-16</b> First Principles Study on Electronic Properties of Magnetite for Spin Polarized Emission under an Electric Field, <i>Liang liang Xu</i> , <i>N Zhao</i> , <i>M Lin</i> , Hanyang University, South Korea; <i>T Leung</i> , National Chung Cheng University, Republic of China; <i>H Hsu</i> , National Taipei University of Technology, Republic of China	
3:20pm	<b>PCSI-1WeA-17</b> Work Functions of Alkali and Alkaline Earth Metal Surfaces under Electric Fields based on First-Principles Calculations, <i>Y Wang</i> , <i>L Xu</i> , <b>Ming-Chieh Lin</b> , Hanyang University, South Korea; <i>T Leung</i> , National Chung Cheng University, Republic of China; <i>H Hsu</i> , National Taipei University of Technology, Republic of China	
3:25pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:30pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:35pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:40pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:45pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:50pm	<b>Coffee Break &amp; Poster Viewing</b>	
3:55pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:00pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:05pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:10pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:15pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:20pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:25pm	<b>Coffee Break &amp; Poster Viewing</b>	
4:30pm	<b>INVITED: PCSI-2WeA-31</b> Nitrogen Doping of Gallium Oxide by Ion Implantation and its Application to Vertical Transistors, <i>Masataka Higashiwaki</i> , National Institute of Information and Communications Technology, Japan; <i>M Wong</i> , National Institute of Information and Communications Technology; <i>K Goto</i> , <i>H Murakami</i> , <i>Y Kumagai</i> , Tokyo University of Agriculture and Technology, Japan	<b>PCSI</b> <b>Session PCSI-2WeA</b> <b>Synthesis of Materials for Devices</b>



# Wednesday Afternoon, January 22, 2020

4:35pm	Invited talk continues.	<b>Moderator:</b> Alec Talin, Sandia National Laboratories
4:40pm	Invited talk continues.	
4:45pm	Invited talk continues.	
4:50pm	Invited talk continues.	
4:55pm	Invited talk continues.	
5:00pm	Invited talk continues.	
5:05pm	Invited talk continues.	
5:10pm	<b>PCSI-2WeA-39</b> Studying the Nucleation of GaP on v-Grooved Si for III-V/Si Device Integration, <i>Emily Warren</i> , National Renewable Energy Laboratory; <i>T Saenz</i> , Colorado School of Mines; <i>A Norman</i> , National Renewable Energy Laboratory; <i>J Zimmerman</i> , Colorado School of Mines	
5:15pm	<b>PCSI-2WeA-40</b> Improving Heterointerfaces in Rapidly Grown III-V Electronic Devices using Dynamic Hydride Vapor Phase Epitaxy (D-HVPE), <i>Dennice Roberts</i> , <i>J Simon</i> , <i>K Schulte</i> , <i>A Ptak</i> , National Renewable Energy Laboratory	
5:20pm	<b>PCSI-2WeA-41</b> Real-Time Optical Monitoring of the Epitaxial Growth of Zincblende Semiconductors, <i>Alfonso Lastras-Martinez</i> , Universidad Autónoma de San Luis Potosi, México	
5:25pm	<b>PCSI-2WeA-42</b> Pulsed Laser Deposition of Epitaxial $\text{Sr}_3\text{Al}_2\text{O}_6$ as a Water-Soluble Sacrificial Layer for GaAs Deposition, <i>Imran Khan</i> , <i>B McMahon</i> , <i>A Norman</i> , <i>A Zakutayev</i> , National Renewable Energy Laboratory	
5:30pm		
5:35pm	<b>PCSI-2WeA-44</b> Epitaxial Relationship of $\text{Cu}_3\text{N}$ Grown on YSZ(001) Substrate by Mist CVD Method, <i>Nao Wakabayashi</i> , Kogakuin University, Japan	
5:40pm	<b>PCSI-2WeA-45</b> UPGRADED: Halogen Surface Chemistries for Atomically Precise Manufacturing on Si(100), <i>Kevin Dwyer</i> , <i>M Dreyer</i> , <i>K Gaskell</i> , University of Maryland; <i>R Butera</i> , Laboratory for Physical Sciences	
5:45pm	Talk continues.	
5:50pm	Talk continues.	
5:55pm	Talk continues.	
6:00pm	<b>PCSI-2WeA-49</b> Novel Growth Mechanisms in van der Waals Epitaxy: 3D Morphologies of $\text{Bi}_2\text{Se}_3$ , <i>Theresa Ginley</i> , <i>S Law</i> , University of Delaware	

# Special Events Thursday

## Special Events Thursday

7:30 AM Continental Breakfast/Flagstaff/Trail Ridge

# Thursday Morning, January 23, 2020

<b>PCSI</b> <b>Room Canyon/Sugarloaf - Session PCSI-1ThM</b> <b>2D Materials - Strain and Heterostructures</b> <b>Moderator:</b> Joshua Robinson, The Pennsylvania State University	
8:30am	<b>INVITED: PCSI-1ThM-1</b> Electron Transport in Strain-Engineered Graphene, <i>Nadya Mason</i> , University of Illinois at Urbana Champaign
8:35am	Invited talk continues.
8:40am	Invited talk continues.
8:45am	Invited talk continues.
8:50am	Invited talk continues.
8:55am	Invited talk continues.
9:00am	Invited talk continues.
9:05am	Invited talk continues.
9:10am	<b>PCSI-1ThM-9 UPGRADED:</b> Revealing Exciton Masses and Dielectric Properties of Monolayer Semiconductors with High Magnetic Fields, <i>Mateusz Goryca, J Li, A Stier</i> , Los Alamos National Laboratory; <i>T Taniguchi, K Watanabe</i> , National Institute for Materials Science, Japan; <i>E Courtade, S Shree, C Robert, B Urbaszek, X Marie</i> , Universite de Toulouse, INSA-CNRS-UPS, LPCNO, France; <i>S Crooker</i> , Los Alamos National Laboratory
9:15am	Talk continues.
9:20am	Talk continues.
9:25am	Talk continues.
9:30am	<b>PCSI-1ThM-13</b> Optical Determination of Ice-Induced Interfacial Strain on Single-Layer Graphene, <i>Subash Kattel, J Murphy, S Pasco, J Ackerman, V Alvarado, W Rice</i> , University of Wyoming
9:35am	<b>PCSI-1ThM-14 UPGRADED:</b> Electron Pairing by Remote-Phonon Scattering in Oxide-Supported Graphene, <i>D Shin</i> , The University of Texas; <i>M Fischetti</i> , The University of Texas at Dallas; <i>Alex Demkov</i> , The University of Texas
9:40am	Talk continues.
9:45am	Talk continues.
9:50am	Talk continues.
9:55am	<b>INVITED: PCSI-1ThM-18</b> Modeling of Interfaces in All-Solid-State Li-ion Batteries, <i>Yue Qi</i> , Michigan State University
10:00am	Invited talk continues.
10:05am	Invited talk continues.
10:10am	Invited talk continues.
10:15am	Invited talk continues.
10:20am	Invited talk continues.
10:25am	Invited talk continues.
10:30am	Invited talk continues.

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