

# 2024 2-D Materials and Devices Research Program Review

Dr. Kenneth Goretta | January 29-30, 2024 | Arlington, VA -hybrid

Basic Research Innovation Collaboration Center (BRICC)  
4100 N Fairfax Drive, Suite 450 | Arlington, VA 2203

## Agenda Day 1 | Monday, January 29, 2024

Time	Topic	Speaker
8.30-8.45	Registration	
8.45- 9:00	Welcome and introductions	
9.00-9.20	Solution Processed Two-Dimensional Structures for Application	Dr. Pulickel Ajayan, Rice University
9.20-9.40	Synthesis of 2D Material Inks for Aerosol Jet 3D Printing, Including Development of the Printing Chemistry	Dr. Rahul Panat, Carnegie Mellon University
9.40-10.00	Functionalization MXenes with Organosilanes to Increase Shelf Life for Effective Ink Formulation	Dr. Alfred Addo-Menshah, Texas A&M International University
10.00-10.20	Scalable Synthesis of Traditional Metal Dichalcogenides Engineered by the Pulsed Laser Ablation in Liquids Technique for 3D Printed Architectures	Dr. Kelly Nash, University of Texas San Antonio
10.20-10.40	<b>BREAK</b>	
10.40-11.00	Remote Epitaxy of Metals and Dielectrics for Van der Waals Nanoelectronics	Dr. Bharat Jalan, University of Minnesota
11.00-11.20	Investigation of Atomic Switches at 6G/THz Frequencies	Dr. Deji Akinwande, University of Texas Austin
11.20-11.40	Synthesis and Characterization of Transition Metal Dichalcogenide Layers and Heterostructures	Dr. Joan Redwing and Dr. Mauricio Terrones, Pennsylvania State University
11.40-12.00	Controlling Properties of 2D Materials using Ferroelectric Thin Films	Dr. Mukti Rana, Delaware State University
12.00-1.30	<b>LUNCH</b>	
1.30-1.50	2D Layered Materials and their Heterostructures for TeraHertz Applications – Synthesis, Characterization, and Modeling	Dr. Ajit Kelkar, Dr. Ram Mohan, Dr. Shyam Aravamudan, North Carolina A&T State University
1.50-2.10	Synthesis, Properties, and Applications of Titanium base MAX Phases and MXene Alloys	Dr. Viktor Hadjiev and Dr. Jim Meen, University of Houston Dr. Robert Vajtai and Dr. Baburaj, Rice University
2.10-2.30	Synthesis of 2D Graphene Sheets and Fabrication of 3D Printed Polymer Composites	Dr. Vijaya Rangari, Tuskegee University

<b>2.30-2.50</b>	Hybrid 2D Material Foams and its Composites	Dr. Arvind Agarwal, Florida International University
<b>2.50-3.10</b>	<b>BREAK</b>	
<b>3.10-3.30</b>	Fabrication, Functionalization, and Characterization of Low-Cost Flexible Nanocomposite Materials as Electronic Components	Dr. Jacob Wei, Texas Southern University
<b>3.30-3.50</b>	2D super conductors	Dr. Sanfeng Wu, Princeton University
<b>3.50-4.10</b>	2D optoelectronic properties	Dr. Sufei Shi, Rensselaer Polytechnic Institute
<b>4.10-4.30</b>	2D semiconductor-Nitride Ferroelectric interfaces: What is new and what can we do?	Dr. Deep Jariwala, University of Pennsylvania
<b>4.30-4.40</b>	CLOSING REMARKS	
	<b>Review Adjourn</b>	

<b>Agenda Day 2   Tuesday, January 30, 2024</b>		
<b>Time</b>	<b>Topic</b>	<b>Speaker</b>
<b>8.45-9.00</b>	<b>Registration</b>	
<b>9.00-9.20</b>	Hybrid-Materials Valley Optoelectronics for Photon Spin Communication	Dr. Ramesh Ramamoorthy, University of California, Berkeley
<b>9.20-9.40</b>	Exploration and Characterization of the Electric, Magnetic and Thermal, Properties of 2D Layered Materials	Dr. Kevin Storr, Prairie View A&M University
<b>9.40-10.00</b>	Nanoscale Helical Ribbons for Efficient Generation of THz Radiation	Dr. Francesca Cavallo, University of New Mexic
<b>10.00-10.20</b>	Computational Study of 2D heterostructures for Device Application	Dr. Pedro Derosa, Louisiana Tech University
<b>10.20-10.40</b>	<b>BREAK</b>	
<b>10.40-11.00</b>	AI assisted imaging for 2D crystals	Dr. Ming Tang, Rice University
<b>11.00-11.20</b>	Formation of Complex 3D Metal Architecture using 3D Printed Polymers as Electroplating Scaffolds	Dr. Fareed Dawan, Southern University and A&M College
<b>11.20-11.40</b>	Magnetic van der Waals Heterostructure PhotoSpintronics	Dr. Xiaodong Xu, University of Washington

<b>11.40-12.00</b>	Synthesis and Exfoliation of 2D Transition Metal Dichalcogenides	Dr. Byron Freelon, University of Houston
<b>12.00-1.30</b>	<b>LUNCH</b>	
<b>1.30-1.50</b>	Materials Intelligence through Data Analytics and Structure-Property Research	Dr. Helen Turner, Chaminade University
<b>1.50-2.10</b>	Viscous Electronics in 2D Materials: Microscopic Insight into Electron Hydrodynamics from First Principles Calculations	Dr. Marco Bernardi, California Institute of Technology
<b>2.10-2.30</b>	2D heterostructured magnets	Dr. Liuyan Zhao, University of Michigan
<b>2.30-2.50</b>	2D Semiconducting and Quantum Materials for Electronics and Sensors on Bendable and Rigid Platforms	Dr. Anupama Kaul, University of North Texas
<b>2.50-3.10</b>	Engineered Mixed Dimensional 2D Heterostructures and Interfaces	Dr. Nick Glavin and Dr. Mike Snure, AFRL
<b>3.10-3.30</b>	Developing Controlled Layering in SnSe for Piezoelectric and Electronic Applications	Dr. Lauren Garten, Georgia Institute of Technology
<b>3.30-3.50</b>	Spin-on Molecular Chemistries for Wafer Scale 3D Integration of 2D Semiconductors	Dr. Zakaria Al Balushi, University of California Berkeley
<b>3.50-4.00</b>	CLOSING REMARKS	
	<b>Review Adjourn</b>	