

# 2020 Organic Materials Chemistry Virtual Program Review (vPR)

Dr. Kenneth Caster | July 13-16, 2020 | Virtual

0900 on Monday, July 13 through 1700 on Wednesday, July 15, 2020

Subarea	Topic	Speaker
Photonic Materials	Submillisecond-response Liquid Crystal Spatial Light Modulators	<b>Shin-Tson Wu</b> University of Central Florida
Photonic Materials	Solution-Processed Infrared Polymer Photodetectors	<b>Xiong Gong</b> University of Akron
Photonic Materials	Exploration of Carbon-Based Hybrid Nanoarchitectures as a Unique Platform for Managing Excited State Energies and Processes	<b>Ya-Ping Sun</b> Clemson University
Photonic Materials	Femtosecond Laser Induced Macro-Molecular Self-Assembly	<b>Aleks Rebane</b> Montana State University Bozeman
Photonic Materials	High Detectivity Organic Photodetectors with Ultrabroadband Spectral Response	<b>Bernard Kippelen</b> Georgia Tech
Photonic Materials	Grain and Interface Engineering for High Efficiency Hybrid Perovskite Solar Cells	<b>Jinsong Huang</b> University of North Carolina, Chapel Hill
Photonic Materials	(YIP) Nanoscale Exciton-Mechanical Systems (NEXMS)	<b>Parag Deotare</b> University of Michigan
Photonic Materials	(YIP) Structure-Photophysics-Function Relationship of Perovskite Materials	<b>He Wang</b> University of Miami
Photonic Materials	Modular Conjugated Polymers for Mid-Infrared Photonic Applications	<b>Jason Azoulay</b> University of Southern Mississippi
Photonic Materials	Molecular Engineering Hybrid Perovskite Quantum Wells for Nanophotonics	<b>Xiaodong Xu, Alex Jen</b> University of Washington
Photonic Materials	Effects of Redox, Molecular, and Ionic Dopants on the Structure and Electronic Behavior of Haloplumbate Perovskites	<b>Seth Marder; Henry Snaith</b> Georgia Tech ; University of Oxford
Photonic Materials	Structural Dimensionality Control of Organic-Inorganic Metal Halide Hybrids	<b>Biwu Ma; Theo Siegrist</b> Florida State University
Photonic Materials	Excited State Engineering in Organic and Hybrid Organic/Inorganic Heterojunctions	<b>Steve Forrest</b> University of Michigan
Photonic Materials	Gold Organometallics as Non-Linear Optical Materials	<b>Thomas Gray</b> Case Western Reserve University
Photonic Materials	Toward Electrically-Pumped Lasing in Organic-Inorganic Hybrid Perovskite Semiconductors	<b>Chris Giebink; Barry Rand</b> Pennsylvania State University; Princeton University

Photonic Materials	Semiconductor Nanocrystals as Triplet Sensitizers	<b>Phil Castellano</b> North Carolina State University
Photonic Materials	Polymer Nanocomposite Luminescent Spectrum Convertors For Photovoltaic Energy Harvesting	<b>Abdalla Darwish</b> Dillard University
Photonic Materials	(YIP) Hybrid Bottlebrush Block Polymer/Inorganic Nanostructures with Tunable Nonlinear Optical and Photonic Band Gap Properties	<b>Rob Hickey</b> Pennsylvania State University
Photonic Materials	Optimizing SOH and PSOH Chip-scale Integrated Electronic/Photonic Technology for Multiple Defense Applications by Nano-Engineering New OEO Materials	<b>Larry Dalton; Bruce Robinson</b> University of Washington
Photonic Materials	(Lab Task) Ceramic Nanolaminates for Electromagnetic Shielding: Understanding the RF Response of MXene-based Heterostructures	<b>Josh Kennedy; Dhriti Nepal</b> AFRL Materials & Manufacturing Directorate
Photonic Materials	(Lab Task) Novel Solid Nonlinear Materials	<b>Joy Haley</b> AFRL Materials & Manufacturing Directorate
Photonic Materials	Theory of Light-induced Structural Changes in Optoelectronic Organic Materials	<b>David Strubbe</b> University of California, Merced
Photonic Materials	Interactions of Light and Acoustic Waves in Statically and Dynamically Structured Liquid Crystalline Materials	<b>Hengky Chandralalim</b> Air Force Institute of Technology (AFIT)
Photonic Materials	Structural Chirality Derived from Polymer Stabilized Networks in Hierarchically Organized Liquid Crystal Phases	<b>Tim White</b> University of Colorado, Boulder
Photonic Materials	Materials for Nonlinear Chiral Polymer Photonics: Multi-scale-modeling-guided Design and Development	<b>Paras Prasad</b> University at Buffalo, SUNY
Photonic Materials	Control of Organic Matter with Strong Coupling	<b>Mikhail Noginov</b> Norfolk State University
Electronic Materials	Magnetic Field Effects on Temporal and Spatial Dynamics of Functional Nanostructures	<b>Dongho Kim</b> Yonsei University
Electronic Materials	Polymeric and Molecular Materials for Advanced Organic Electronics	<b>Tobin Marks; Antonio Facchetti</b> Northwestern University
Electronic Materials	Stretchable Polymer Semiconductors	<b>Zhenan Bao</b> Stanford University
Electronic Materials	Manipulating the Spatial, Charge Transfer, and Energetic Interactions of Open-Shell Moieties in Multifunctional, Low Glass Transition Temperature Radical Polymers	<b>Bryan Boudouris; Brett Savoie</b> Purdue University
Electronic Materials	(Lab Task) Enabling Soft Electronics	<b>Michael Durstock</b> AFRL Materials & Manufacturing Directorate
Electronic Materials	Effects of Ionizing Radiation Exposure in Organic Solar Cells: Insights from Frequency-Domain Vibrational and Electrical Spectroscopies and Imaging	<b>John Grey</b> University of New Mexico
Electronic Materials	Molecular Engineering for Mechanically Resilient and Stretchable Electronic Polymers and Composites	<b>Darren Lipomi</b> University of California, San Diego

Electronic Materials	Processing of Organic Semiconductors from High Dielectric Media	<b>Thuc-Quyen Nguyen; Gui Bazan</b> University of California, Santa Barbara
Electronic Materials	Optical Control of Charge and Energy Transfer in Molecular Wires	<b>Kirk Schanze</b> University of Texas, San Antonio
Novel Materials	Revealing Key Polarization, Spin, and Energy Parameters in Controlling Deeper Photovoltaic Processes in Perovskite Solar Cells By Using Unique Magneto-Optical Measurements (and Lasing)	<b>Bin Hu</b> University of Tennessee
Novel Materials	Exploring Topological Insulators for Flexible/Conformal Power Harvesters	<b>David Carroll</b> Wake Forest University
Novel Materials	Responsive Block Copolymers: Transformations in the Solid State	<b>Thomas Russell; Javid Rzayev</b> University of Massachusetts, Amherst; University at Buffalo, SUNY
Novel Materials	Polymer-grafted Nanoparticles (PGN) and PGN Arrays with Tailored Canopy Interactions	<b>Chris Ober</b> Cornell University
Novel Materials	Computational Design of Oligomers for use in High Contrast Black Electrochromic Polymers	<b>Aime'e Tomlinson</b> University of North Georgia
Novel Materials	(YIP) Photocontrolled Synthesis and Properties of $\pi$ -Conjugated Polymers	<b>Julia Kalow</b> Northwestern University
Novel Materials	(YIP) Regioselective, C-H Xanthylation as a Platform Technology Polyolefin Functionalization	<b>Frank Leibfarth</b> University of North Carolina, Chapel Hill
Novel Materials	Low Bandgap, Highly Polarizable, and Intrinsically Conductive Polymers	<b>Tim Swager</b> Massachusetts Institute of Technology
Novel Materials	High Contrast Black Electrochromic Polymers	<b>John Reynolds</b> Georgia Tech
Novel Materials	(Lab Task) Enhanced Reliability in Multifunctional Aerospace Materials through New Chemical Approaches to Controlling Catalytic Activity	<b>Kamran Ghiassi</b> AFRL Propulsion Directorate – Edwards AFB
Novel Materials	(Lab Task) Defect Engineering of Low-dimensional Materials using E-beam Chemistry and Their Device Applications	<b>Benji Maruyama</b> AFRL Materials & Manufacturing Directorate
Novel Materials	Compositionally Tunable Stimuli-Responsive Nanoparticles Having Uniform Sizes, Shapes, and Core-Shell Architectures	<b>T. Randall Lee</b> University of Houston
Novel Materials	Molecular Design of Viscoelasticity and Damping Properties in Vitrimers	<b>Chris Evans</b> University of Illinois, Urbana-Champaign
Novel Materials	Materials Chemistry of Bullvalene	<b>Will Gutekunst</b> Georgia Tech
Novel Materials	(Lab Task) Atomically-Thin, Hybrid Nanoparticles (ATHyNs) with Engineered Optical Response: Polymer-Grafted Transition Metal Dichalcogenides	<b>Rich Vaia</b> AFRL Materials & Manufacturing Directorate
Novel Materials	Soft Sensors with 2D Material/Polymer Heterostructures	<b>Nick Glavin; Luke Baldwin</b>

		AFRL Materials & Manufacturing Directorate
Novel Materials	The Design, Synthesis and Conversion of Preceramic Polymers using Modular Chemistry	<b>Tim Pruyn; Matt Dickerson</b> AFRL Materials & Manufacturing Directorate
Nanoscience	(MURI) Atomically-thin Systems that Unfold, Interact, and Communicate at the Cellular Scale	<b>Jiwoong Park</b> University of Chicago
Nanoscience	(MURI) Foldable and Adaptive Two-Dimensional Electronics	<b>Tomas Palacios</b> Massachusetts Institute of Technology
Nanoscience	Hybrid Semiconducting Polymer/Carbon Nanotube Superstructures for Optical, Electro-optic, and Spintronic Applications	<b>Michael Therien</b> Duke University
Nanoscience	(Lab Task) Aromatic Functionalization and Macromolecular Chemistry	<b>Loon Seng Tan</b> AFRL Materials & Manufacturing Directorate
Nanoscience	Multifunctional Organic-Inorganic Nanocomposites with Unprecedented Control Over Dimensions, Compositions and Architectures as well as Tailored Properties	<b>Zhiqin Lin</b> Georgia Tech
Nanoscience	Marriage of Top-Down Lithography to Bottom-Up Chemistry Edge Control in Graphene	<b>Jim Tour</b> Rice University
Nanoscience	(YIP) Processing Particle Assemblies into Functional Thin Films: Elucidating Mechanisms of Defect Formation	<b>Laura Bradley</b> University of Massachusetts, Amherst

See next page for ZoomGov agenda on July 16, 2020.

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**0900 – 1530 on Thursday, July 16, 2020**

Time	Topic	Discussion Leader
0830-0900	Zoom Login (must register on APAN for meeting prior to start)	
0900-0915	Welcome and Introductory Remarks	<b>Ken Caster</b> Air Force Office of Scientific Research (AFOSR)
0915-1015	Photonics Materials – presentations and forum	All
1015-1030	<b>BREAK</b>	
1030-1130	Electronic Materials – presentations and forum	<b>Darren Lipomi</b> University of California, San Diego
1130-1200	Organic Materials Chemistry – Q & A	<b>Ken Caster</b> Air Force Office of Scientific Research (AFOSR)
1200-1300	<b>LUNCH</b>	
1300-1400	Novel Materials and Properties – presentations and forum	All
1400-1415	<b>BREAK</b>	
1415-1500	Nanoscience – presentations and forum	All
1500-1510	Discussion Forum – OMC Teams	<b>Ken Caster</b> Air Force Office of Scientific Research (AFOSR)
1510-1520	Discussion Forum – Special Topics Sessions	<b>Ken Caster</b> Air Force Office of Scientific Research (AFOSR)
1520-1530	Concluding Remarks	<b>Ken Caster</b> Air Force Office of Scientific Research (AFOSR)
1530	<b>MEETING ADJOURN</b>	