

# 2020 Aerospace Composite Materials Program Review

Dr. Ming-Jen Pan | August 11-13, 2020 | Virtual

## Agenda Day 1 | Tuesday, August 11, 2020

| Time          | Topic  | Speaker                                      |
|---------------|--|--|
| 11:45 - 12:10 | Virtual Review Login   |  |
| 12:10 - 12:30 | Welcome Remarks  | Dr. Ming-Jen Pan<br>AFOSR                    |
| 12:30 - 1:00  | High Performance Aerospace Matrix Resins for Advanced Manufacturing of Light Weight Structures with Programmable Melt Rheology and Cure Chemistry                  | Dr. Hilmar Koerner<br>AFRL/RX                |
| 1:00 - 1:30   | Characterization of Nanostructured Polymer Films   | Dr. Rodney Priestley<br>Princeton University |
| 1:30 - 2:00   | Forming True Blends: Developing New Processing Routes for Polymer-Based Nano-Composites  | Dr. Marilyn Minus<br>Northeastern University |
| 2:00 - 2:30   | <b>BREAK</b>   |  |
| 2:30 - 3:00   | Nanoporous Carbon Fiber Based on Polyacrylonitrile-Containing Block Copolymers   | Dr. Guoliang "Greg" Liu<br>Virginia Tech     |
| 3:00 - 3:30   | An Experimental-Computational Study of Length-scale Based Toughness Enhancement in Graphene/Epoxy Nanocomposites for Structural Light-weighting                    | Dr. Samit Roy<br>University of Alabama       |
| 3:30 - 4:00   | Elucidating the Influence of Interfacial Interactions on the Structure and Properties of Pre-ceramic Polymer-Based Hairy Nanoparticles and Their Derived Materials | Dr. Matthew Dickerson<br>AFRL/RX             |
| 4:00 - 4:30   | Multiscale Characterization of Molecular Damage Evolution and Toughening Mechanisms in Polymer Matrix Composites   | Dr. Drhiti Nepal<br>AFRL/RX                  |
| 4:30          | <b>MEETING ADJOURN FOR THE DAY</b>   |  |

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## Agenda Day 2 | Wednesday, August 12, 2020

| Time          | Topic   | Speaker  |
|---------------|---|--|
| 11:45 - 12:00 | Virtual Review Login  |  |
| 12:00 - 12:15 | Programmatic Matter / Q&A   | Dr. Ming-Jen Pan<br>AFOSR                        |
| 12:15 - 1:00  | Stochastic Self-Consistent Clustering Theory for Composite Performance Prediction: from extreme value microstructure attributes to design of interphase for toughness   | Dr. Cate Brinson<br>Duke University              |
| 1:00 - 1:30   | Fundamentals of Strengthening Mechanisms in Carbon nanotube (CNT)/ Graphene Nanoplatelet (GNP) reinforced Metal Matrix Composites for Aerospace Structural Applications | Dr. Tushar Bokar<br>Cleveland State University   |
| 1:30 - 2:00   | Understanding Enhancement of Strength in CNT/GNP-based Structural Composites  | Dr. Gary Seidel<br>Virginia Tech                 |
| 2:00 - 2:30   | <b>BREAK</b>  |  |
| 2:30 - 3:00   | Self-healable Lightweight Cellular Structures: Additive Manufacturing and Multifunctionality  | Dr. Qiming Wang<br>USC                           |
| 3:00 - 3:30   | Microtexture Development in Additive-Manufactured Hybrid Materials  | Dr. Charles Brown<br>University of Dayton        |
| 3:30 - 4:00   | Design of Lightweight Cellular Glass: Lessons from Nature   | Dr. Ling Li<br>Virginia Tech                     |
| 4:00 - 4:30   | Lightweight, elastic inorganic metamaterials: controlling flexibility and fracture toughness through hierarchical nano-architectures                                    | Dr. Xiaoyu "Rayne" Zheng<br>Virginia Tech / UCLA |
| 4:30          | <b>MEETING ADJOURN FOR THE DAY</b>  |  |

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## Agenda Day 3 | Thursday, August 13, 2020

| Time          | Topic  | Speaker                                       |
|---------------|--|---|
| 11:45 - 12:00 | Virtual Review Login   |   |
| 12:00 - 12:15 | Programmatic Matter / Q&A  | Dr. Ming-Jen Pan<br>AFOSR                     |
| 12:15 - 12:45 | Understanding Carbon Nanotube Synthesis via Autonomous Research Systems  | Dr. Benji Maruyama<br>AFRL/RX                 |
| 12:45 - 1:30  | Synthesis, Purification, Characterization, and Liquid Phases of BNNTs as Lightweight Multi-functional Precursor for Aerospace Fibers and Films | Dr. Matteo Pasquali<br>Rice University        |
| 1:30 - 2:00   | Robust Nanoporous Materials Morphology Design  | Dr. Ajit Roy<br>AFRL/RX                       |
| 2:00 - 2:30   | <b>BREAK</b>   |   |
| 2:30 - 3:00   | Nanotube assemblies for structural applications: modeling the key behaviors and emergent nanostructures  | Dr. Boris Yokobson<br>Rice University         |
| 3:00 - 3:30   | Mechanisms and Properties of Molecular Self-assembly and Load Transfer in Large-scale CNT Assemblages and CNT/ Carbon Fiber Hybrid Materials   | Dr. Richard Liang<br>Florida State University |
| 3:30 - 4:00   | Reaction-Induced Sintering for Fabrication of Bulk Nanoporous and Composite Metals   | Dr. Matthew McDowell<br>Georgia Tech          |
| 4:00 - 4:30   | High-Temperature Measurement of Single Crystal Elastic Moduli on Polycrystalline Engineering Alloys Using $\mu$ -RUS Techniques                | Dr. Matthew Cherry<br>AFRL/RX                 |
| 4:30          | <b>MEETING ADJOURN</b>   |   |