

2018 AFOSR Natural Materials, Systems and Extremophiles Annual Program Review

Dr. J. Aura Gimm | December 3-6, 2018 | Niceville, FL

Shangri La Auditorium, Doolittle Institute
Niceville, FL 32578

Day 1 | Monday, December 3, 2018

Time	Title of Project	Speaker
0800-0830	Registration	
0830-0845	Welcome, Introduction and Background	J. Aura Gimm Air Force Office of Scientific Research
0845-0935	Theory-based design of synthetic genetic circuits incorporating biophysical models, stochastic dynamics, and evolutionary robustness	Hal Alper University of Texas-Austin
0935-1025	Electrochemical Imaging and Mechanistic Studies on the Nanometer Scale	Henry White University of Utah
1025-1055	BREAK	
1055-1130	Active, Multi-functional Biopolymer Interfacial Constructs-Beyond Structural Nanocomposites	Vladimir Tsukruk Georgia Tech
1130-1205	Reconfigurable Matter from Programmable Atom Equivalents	Chad Mirkin Northwestern University
1205-1210	Brief intro of a New YIP Project	Masha Kamenetska Boston University
1210-1400	LUNCH/SIDEBAR	
1400-1435	Examination of Key Enablers of Polyurethane Biodeterioration Under AF-Relevant Conditions	Wendy Goodson / John Russell Air Force Research Laboratory / Naval Research Laboratory
1435-1510	Optical, Biochemical, and Molecular Characterization of New Light Producing Systems from Marine and Terrestrial Organisms, with Emphasis on Violet/Blue	Dimitri Deheyn University of California-San Diego
1510-1540	BREAK	
1540-1615	Mapping Molecular-Level Dynamics to Mesoscale Mechanics in Composite DNA-based Biomaterials	Rae Robertson-Anderson University of California San Diego
1615-1650	Development and Characterization of Novel Bioluminescence Sources	Bruce Branchini Connecticut College
	ADJOURNED FOR THE DAY	

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Day 2 | Tuesday, December 4, 2018

Time	Title of Project	Speaker
0800-0815	Registration	
0815-0905	Convergent Evolution to Engineering- Multiscale Structures and Mechanics in Damage Tolerant Functional Biocomposite and Biomimetic Materials	David Kisailus / Pablo Zavattieri University of California-Riverside / Purdue
0905-0955	A 4D Nanoprinter for Making and Manipulating Macroscopic Material	Chad Mirkin Northwestern University
0955-1020	BREAK	
1020-1055	Biomimetic Lipid Nanoparticles- Bio-Sensing and Bio-Functional Applications	Shad Thaxton Northwestern University
1055-1130	Structural Studies to Elucidate the Mechanisms of Biobased Nanoparticle Synthesis	Brent Nannenga Arizona State University
1130-1205	Synthetic Biology Approaches for Exploiting Sensing and Amplification Functionality of Cells and their Components	Jorge Chavez-Benavides Air Force Research Laboratory
1205-1330	LUNCH	
1330-1405	Regulatory Mechanisms of Radioresistance under Differential Levels of Ionizing Irradiation	Lydia Contreras University of Texas-Austin
1405-1440	Silk Modifications for Tunable Materials	David Kaplan Tufts University
1440-1515	The Molecular Mechanisms Responsible for the Assembly of Spider Silk Fibers	Gregory Holland San Diego State University
1515-1545	BREAK	
1545-1620	Biophysical Investigations on Additive Manufactured Nanoscale Biosensors and Biological Materials	Shashank Priya Penn State University
1620-1655	Towards Advanced Functional Biopolymer Materials	Paul Trulove Naval Academy
ADJOURNED FOR THE DAY		

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Day 3 | Wednesday, December 5, 2018

Time	Title of Project	Speaker
0800-0815	Registration	
0815-0905	Unraveling the Biology, Chemistry and Nanoscience of Natural and Synthetic Melanins	Nathan Gianneschi / Matthew Shawkey Northwestern University / University of Gent
0905-0940	Probing Mechanisms of Biological-Material interaction; Towards Realizing Biomimetic Materials By Understanding Molecular-Level Interactions	Carole Perry Nottingham Trent University
0940-1015	Macromolecular Modeling of Biomimetic Assembly	Murugapan Muthukumar University of Mass-Amherst
1015-1045	BREAK	
1045-1120	Exploitation of Natural Processes and Materials – Understanding Biointerfacial Properties and Structure-Function Studies of Biopolymers	Patrick Dennis Air Force Research Laboratory
1120-1155	Carbohydrate Materials Discovery- Towards a Post-Cellulosic Future	Adam Braunschweig City University of New York
1155-1230	Interphase Dynamics in Bio-Nanocomposites	Jeffrey Gilman National Institute of Standards and Technology
1230-1400	LUNCH/SIDEBAR	
1400-1435	PNA-Driven Remote Actuation of DNA Nanospring Strain Sensors	Rebecca Taylor Carnegie Mellon University
1435-1510	DNA-Programmed Epitaxy of Nanoparticle Superlattices	Robert MacFarlane Massachusetts Institute of Technology
1510-1540	BREAK	
1540-1615	Peptide-DNA Tiles as Building Blocks for Complex Nanostructures	Nicholas Stephanopoulos Arizona State University
1615-1650	Biomechanics of Hierarchically-Structured Enamel in Grinding Dentitions: An Evolutionary-Guided Route to Designing Damage Tolerant Materials	Siddhartha Pathak University of Nevada-Reno
	ADJOURNED FOR THE DAY	

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Day 4 | Thursday, December 6, 2018

Time	Title of Project	Speaker
0800-0815	Registration	
0815-0850	New Sensing Modalities Based on Designed Self-Assembling Protein Nanomaterials	David Baker University of Washington
0850-0925	Self-Assembled Biomimetic Conductive Fibers as a Novel Functional Materials Platform	Allon Hochbaum University of California-Irvine
0925-1000	Engineering Biosystems for Aromatic Nitration	Yousong Ding University of Florida-Gainesville
1000-1030	BREAK	
1030-1105	S-Layer Directed Nanoscale Fluid Mechanics	Dietmar Pum Zentrum fuer Nanobiotechnologie
1105-1140	Bio-inspired Assembly at Two Length Scales: Bridging Intermolecular Peptide Self-Assembly and Particle Phase Behavior in Two-Dimensions	Raymond Tu City University of New York
1140-1215	Controlled Assembly and Patterning of Multifunctional Biomaterials on Ultrastable Protein Scaffolds	Dominic Glover University of New South Wales
1215-1345	LUNCH	
1345-1420	Novel Stress Resistance Mechanisms in Extremely Thermoacidophilic Archaea	Kelly Robert North Carolina State University
1420-1455	Peptide-driven Exfoliation and Organization of Multi-compositional 2D Nanomaterial	Marc Knecht University of Miami
1455-1530	Probing Biotic/Abiotic Interfaces at the Nanoscale using Limited Proteolysis and Chiral Plasmonics	Srikanth Singamaneni Washington University
1530-1550	BREAK	
1550-1620	Silk: Reconstitution and Novel 3D Composite	Fritz Vollrath Oxford University
1620-1650	Damage Tolerance of Biomaterials for Bio-Inspired Composites	Katherine Brown Cambridge University
	MEETING ADJORNED	