

2012 MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE (MURI) – SELECTED PROJECTS

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MURI TOPIC #1: Quantized Chemical Reactions of Ultracold Molecules				
ARO	High-Resolution Quantum Control of Chemical Reactions	Yale University Harvard University Massachusetts Institute of Technology Stanford University University of California, Los Angeles University of Colorado University of Connecticut University of Washington	David DeMille	CT MA MA CA CA CO CT WA
MURI TOPIC #2: 3D Topological Insulators with Interactions				
ARO	The Physics of Surface States with Interactions mediated by Bulk Properties, Defects and Surface Chemistry	Princeton University Pennsylvania State University University of California, Berkeley	Robert Cava	NJ PA CA
MURI TOPIC #3: Translating Biochemical Pathways to Non-Cellular Environments				
ARO	Translating Biochemical Pathways to Non-Cellular Environments	Arizona State University Massachusetts Institute of Technology Harvard Medical School University of Michigan	Hao Yan	AZ MA MA MI

1. Team member institutions are those included in the lead institution's research proposal. They are subject to change at the discretion of the lead institution (e.g., if the final negotiated amount of the award is less than the amount proposed).

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MURI TOPIC #4: Multivariate Heavy-Tailed Statistics: Foundations and Modeling				
ARO	Multivariate Heavy -Tail Phenomena: Modeling and Diagnostics	Cornell University University of Massachusetts Columbia University American University Ohio State University University of Illinois University of Minnesota	Sidney Resnick	NY MA NY DC OH IL MN
MURI TOPIC #5: Simultaneous Multi-Synaptic Imaging of Interneuron				
ARO	Imaging how a neuron computes	Columbia University Harvard University Massachusetts Institute of Technology	Rafael Yuste	NY MA MA
MURI TOPIC #6: Revolutionizing High-Dimensional Microbial Data Integration				
ARO	Title: Associating growth conditions with cellular composition in Gram-negative bacteria	University of Texas at Austin Boston University Harvard University	Claus O. Wilke	TX MA MA
MURI TOPIC #7: Novel Nanostructures for the Controlled Propagation of Electromagnetic Energy				
ARO	Coherent effects in hybrid nanostructures for lineshape engineering of electromagnetic media	Rice University University of Michigan University of Minnesota Ohio State University	Naomi J. Halas	TX MI MN OH

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MURI TOPIC #8: Predictive Models of Cultural and Behavioral Effects on Societal Stability				
ARO	Evolution of Cultural Norms and Dynamics of Socio-Political Change	University of Pennsylvania Cornell University Massachusetts Institute of Technology Stanford University Georgia Institute of Technology	Ali Jadbabaie	PA NY MA CA GA
MURI TOPIC #9: Directional Eutectic Structures: Self-Assembly for Metamaterials and Photonics				
AFOSR	Template-Directed Directionally Solidified Eutectic Metamaterials	University of Illinois at Urbana-Champaign Stanford University University of Michigan University of Tennessee	Paul V. Braun	IL CA MI TN
MURI TOPIC #10: Smart, Functional, Nanoenergetics Design from the Atomistic/Molecular Scale through the Mesoscale				
AFOSR	Smart Functional Nanoenergetic Materials	Pennsylvania State University University of Maryland, College Park Princeton University Purdue University Georgia Institute of Technology	Richard A. Yetter	PA MD NJ IN GA

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MURI TOPIC #11: Managing Informational Complexity in Predictive Materials Science				
AFOSR	Managing the Mosaic of Microstructure	Carnegie Mellon University California Institute of Technology Drexel University University of Michigan University of Minnesota Northwestern University Purdue University	Marc De Graef	PA CA PA MI MN IL IN
MURI TOPIC #12: Deep Atmospheric Optical Turbulence Physics and Predictive Modeling				
AFOSR	Wave Optics of Deep Atmospheric Turbulence: From Underlying Physics towards Predictive Modeling, Mitigation and Exploitation	University of Dayton Air Force Institute of Technology Michigan Technological University North Carolina State University New Mexico State University University of Miami	Mikhail A. Vorontsov	OH CO MI NC NM FL
MURI TOPIC #13: Quantum Metaphotonics/Metamaterials				
AFOSR	Quantum Metaphotonics and Metamaterials: From Single Emitters to Strongly Correlated Systems	Brown University California Institute of Technology University of Texas, Austin Stanford University University of Pennsylvania Massachusetts Institute of Technology University of California, Berkeley	Rashid Zia	RI CA TX CA PA MA CA

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MURI TOPIC #14: High Power, Low-Loss, Artificial Materials for Transformational Electromagnetics				
AFOSR	Innovative use of Metamaterials in Confining, Controlling, and Radiating Intense Microwave Pulses	University of New Mexico Massachusetts Institute of Technology Ohio State University University of California, Irvine Louisiana State University	Edl Schamiloglu	NM MA OH CA LA
MURI TOPIC #15: Morphable Dynamic Information Processing				
ONR	Dynamics of Multifunction Brain Networks	University of California, San Diego University of California, Berkeley University of Chicago	Henry Abarbanel	CA CA IL
MURI TOPIC #16: Extended-Range Environmental Prediction Using Low-Dimensional Dynamic Modes				
ONR	Physics Constrained Stochastic-Statistical Models for Extended Range Environmental Prediction	New York University North Carolina State University University of Wisconsin, Madison University of California, Los Angeles	Andrew Majda	NY NC WI CA

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MURI TOPIC #16: Extended-Range Environmental Prediction Using Low-Dimensional Dynamic Modes				
ONR	Extended-Range Prediction with Low-Dimensional, Stochastic-Dynamic Models: A Data-driven Approach	University of California, Los Angeles Columbia University	Michael Ghil	CA NY
MURI TOPIC #17: A New Way to Dissipate Shock Wave Energy from Detonations				
ONR	Shock Wave Energy Dissipation by Mechanochemically-active Nanoporous Materials	University of Illinois at Urbana-Champaign Stanford University Purdue University	Dana Dlott	IL CA IN
MURI TOPIC #18: Programming Biology to Attain Non-Natural Functions				
ONR	Next-generation Devices; Model-guided Discovery and Optimization of Cell-based Sensors	Massachusetts Institute of Technology Pennsylvania State University Rice University Rutgers University California Institute of Technology University of Minnesota	Christopher Voigt	MA PA TX NJ CA MN
MURI TOPIC #19: Predicting the Behavior of Complex, Non-Deterministic Autonomous Systems and Mixed Autonomous/Manned Teams under Realistic Assumptions				
ONR	Embedded Humans: Provably Correct Decision Making for Networks of Humans and Unmanned Systems	University of California, Berkeley Stanford University University of California, Los Angeles	S. Shankar Sastry	CA CA CA

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MURI TOPIC #20: Extreme Electron Concentration Materials and Devices				
ONR	Extreme Electron Concentration Oxide Devices	University of California, Santa Barbara Ohio State University University Notre Dame Stanford University Yale University	Susanne Stemmer	CA OH IN CA CT
MURI TOPIC #21: Super-hydrophobic Surface for Skin Friction Drag Reduction in High Reynolds Number Turbulent Flow				
ONR	Passive & Active Friction Drag Reduction of Turbulent Flows Over Super-Hydrophobic Surfaces	Naval Architectural & Marine Engineering University of Michigan John Hopkins Massachusetts Institute of Technology Stanford University University of Minnesota University of Texas at Dallas	Steven L. Ceccio	MI MD MA CA MN TX
ONR	Slippery Liquid-Infused Porous Surfaces for Turbulent Drag Reduction at High Reynolds Number	Princeton University Harvard University University of Puerto Rico at Mayaguez	Alexander Smits	NJ MA PR