

FY2014 MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE (MURI) – SELECTED PROJECTS

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MURI Topic: Attosecond Electron Dynamics				
ARO	Post-Born-Oppenheimer Dynamics using Isolated Attosecond Pulses	University of California, Berkeley University of California, Davis University of Arizona University of Central Florida	Stephen Leone	CA CA AZ FL
MURI Topic: Force-Activated Synthetic Biology				
ARO	Mechanisms of Force Sensing in Adherent Cells as Inspiration for New Materials	University of Chicago Yale University	Margaret Gardel	IL CT
MURI Topic: Nonlinear Dynamics of Energy Hypersurfaces Governing Reaction Networks				
ARO	New Theoretical and Experimental Methods for Predicting Fundamental Mechanisms of Complex Chemical Processes	University of Missouri - Columbia University of Massachusetts, Boston University of California, Berkeley University of California, Santa Barbara University of California, Merced Northwestern University	Donald Thompson	MO MA CA CA CA IL
MURI Topic: Strongly Linked Multiscale Models for Predicting Novel Functional Materials				
ARO	Multiscale Mathematical Modeling and Design Realization of Novel 2D Functional Materials	University of Minnesota Harvard University Northeastern University University of Delaware	Mitchell Luskin	MN MA MA DE

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).
2. Team members who are collaborating in a MURI but who are not receiving MURI funds are not listed in this table.

MURI Topic: Multistep Catalysis				
ARO	Bio-inspired Design of Adaptive Catalysis Cascades	University of Utah University of New Mexico Columbia University Michigan State University University of California, Riverside	Shelley Minteer	UT NM NY MI CA
MURI Topic: Innovation in Prokaryotic Evolution				
ARO	Mechanisms of Prokaryotic Evolution	Indiana University University of Chicago	Michael Lynch	IN IL
MURI Topic: Ultracold Molecular Ion Reactions				
ARO	Precision Chemical Dynamics and Quantum Control of Ultracold Molecular Ion Reactions	University of California, Los Angeles Emory University Georgia Institute of Technology Northwestern University Temple University University of Connecticut Wayne State University	Eric Hudson	CA GA GA IL PA CT MI
MURI Topic: The Skin-Microbe Interactome				
ARO	Understanding the Skin Microbiome through the Integration of Metagenomics, Bioinformatics, Spatial Ecology, and Synthetic Biology	Johns Hopkins University Duke University University of Maryland, College Park	David Karig	MD NC MD

MURI Topic: Time-Resolved Quantum Dynamics of Complex Systems				
AFOSR	Studying Ultrafast Electron Dynamics in Condensed Matter with Next Generation Attosecond X-ray Sources	University of Central Florida Ohio State University University of California, Berkeley Georgia State University	Zenghu Chang	FL OH CA GA
MURI Topic: Computational Foundation of Mathematics and Information				
AFOSR	Homotopy Type Theory: Unified Foundations of Mathematics and Computation	Carnegie Mellon University Wesleyan University University of San Diego Institute of Advanced Study	Steven Awody	PA CT CA NJ
MURI Topic: Transport and Utilization of Energy Using Plasmon-induced Processes				
AFOSR	Shedding Light on Plasmon-based Photochemical and Photophysical Processes	Rice University Columbia University Princeton University University of Minnesota	Naomi Halas	TX NY NJ MN
MURI Topic: Design Rules for Biobased and Bioinspired Materials				
AFOSR	Convergent Evolution to Engineering: Multiscale Structures and Mechanics in Damage Tolerant Functional Biocomposite and Biomimetic Materials	University of California, Riverside University of California, Berkeley Purdue University University of California, San Diego Northwestern University	David Kisailus	CA CA IN CA IL

MURI Topic: Control of Coherent Structures in Plasmas for Reconfigurable Metamaterial-Based Devices				
AFOSR	Plasma-based Reconfigurable Photonic Crystals and Metamaterials	Stanford University Tufts University Pennsylvania State University University of Texas, Austin University of Washington University of California, Los Angeles	Mark Cappelli	CA MA PA TX WA CA
AFOSR Topic: Multifunctional Quantum Transduction of Photons, Electrons, and Phonons				
AFOSR	Integrated Quantum Transduction with Photons, Phonons, and Spins	University of Chicago University of California, Santa Barbara Cornell University Yale University California Institute of Technology	David Awschalom	IL CA NY CT CA
AFOSR	Wiring Quantum Networks with Mechanical Transducers	University of Colorado, Boulder Yale University University of Maryland, College Park California Institute of Technology	Konrad Lehnert	CO CT MD CA
MURI Topic: Control of Light Propagation through Metasurfaces				
AFOSR	Active Metasurfaces for Advanced Wavefront Engineering and Waveguiding	Harvard University Columbia University Purdue University Stanford University University of Pennsylvania	Frederico Capasso	MA NY IN CA PA

MURI Topic: Goal-Driven, Multi-Source Algorithms for Complex Resilient Multi-Physics Systems				
AFOSR	A Unified and Algorithmic Framework for Managing Multiple Information Sources of Multi-Physics Systems	Massachusetts Institute of Technology Cornell University University of Michigan Arizona State University Texas A&M University	Karen Willcox	MA NY MI AZ TX
MURI Topic: Security Theory of Nano-Scale Devices				
AFOSR	Development of Universal Security Theory for Evaluation and Design of Nanoscale Devices	University of Connecticut University of Maryland, College Park Rice University	Mark Tehranipoor	CT MD TX
MURI Topic: Understanding Energy Harvesting Mechanisms in Polymer-Based Photovoltaics				
ONR	Center for Advanced Organic Photovoltaics	Georgia Institute of Technology University of California, Santa Barbara Stanford University	Jean-Luc Bredas	GA CA CA
MURI Topic: Role of Bidirectional Computation in Visual Scene Analysis				
ONR	Top-Down and Bottom-Up Visual Mechanisms at Multiple Spatial and Temporal Scales: Experimental Investigation and Computational Modeling	Stanford University Massachusetts Institute of Technology University of Illinois, Urbana-Champaign University of Arizona University of California, Berkeley	Fei-Fei Li	CA MA IL AZ CA

MURI Topic: Exploring the Atomic and Electronic Structure of Materials to Predict Functional Material Properties				
ONR	Understanding Atomic Scale Structure in Four Dimensions to Design and Control Corrosion Resistant Alloys	Northwestern University University of Akron University of California, Los Angeles University of Wisconsin, Madison Drexel University University of Virginia	Lawrence Marks	IL OH CA WI PA VA
MURI Topic: Optical Computing				
ONR	Optical and Optoelectronic Computing	University of Arizona University of California, Berkeley University of California, San Diego University of California, Los Angeles	Mark Neifeld	AZ CA CA CA
MURI Topic: Quantum Optomechanics				
ONR		No Award is Being Made in this Topic		
MURI Topic: Air-Sea Interaction and RF Propagation in Maritime Atmospheric Boundary Layers				
ONR	Coupled Air Sea Processes and EM Ducting Research	Naval Postgraduate School University of Notre Dame University of Minnesota University of California, Irvine Ohio State University Oregon State University	Qing Wang	CA IN MN CA OH OR

MURI Topic: Hydrodynamics of Non-Traditional Propulsion				
ONR	Bio-inspired Flexible Propulsors for Fast, Efficient Swimming: What Physics Are We Missing?	University of Virginia West Chester University Harvard University Princeton University Lehigh University	Hilary Bart-Smith	VA PA MA NJ PA