DOD Awards $149 Million in Research Funding

The Department of Defense (DOD) today announced it will issue 22 awards totaling $149 million over the next five year to academic institutions to perform multidisciplinary basic research. The Multidisciplinary University Research Initiative (MURI) program supports research by teams of investigators that intersect more than one traditional science and engineering discipline in order to accelerate research progress. Most of the program's efforts involve researchers from multiple academic institutions and academic departments. Based on the proposals selected in the fiscal year 2015 competition, a total of 55 academic institutions are expected to participate in these 22 research efforts.

The highly competitive MURI program complements other DOD basic research efforts that support traditional, single-investigator university research grants by supporting multidisciplinary teams with larger and longer awards, in carefully chosen research topics identified for their potential for significant and sustained progress. Like single investigator awards, MURI awards provide strong support for the education and training of graduate students in new, cutting edge research. In addition to university research, DOD also supports basic research at its laboratories and in industry.

Over the past 29 years, the DOD's MURI program has resulted in significant capabilities for our military forces and opened up entirely new lines of research. Examples include advances in laser frequency combs that have become the gold standard in frequency control for precision in navigation and targeting; atomic and molecular self-assembly projects that have opened new possibilities for nano-manufacturing; the field of spintronics emerged from a MURI award on magnetic materials and devices research. Recently the strategy to quickly leverage the basic research advances in MURI awards for new capabilities has focused on early engagement with industry through the annual Office of the Secretary of Defense MURI program reviews.

The Army Research Office, the Air Force Office of Scientific Research, and the Office of Naval Research solicited proposals in 19 topics important to DOD and the military services and received a total of 289 white papers, which were followed by 76 proposals. The awards were selected based on merit review by a panel of experts and are subject to successful negotiation between the institution and DOD. The awards announced today are for a five year period subject to availability of appropriations and satisfactory research progress.

This year for the first time, topical areas were identified for joint US / UK academic collaborative proposals, with the UK collaborators funded by the UK government. The competitive process resulted in two joint US-UK teams selected for awards.

The list of projects selected for fiscal year 2015 funding may be found below.

FY15 DOD Multidisciplinary University Research Initiative (MURI) Selections

MURI Topic 1: **Emulating the principles of Impulsive Biological Force**				
ARO	**Evolutionary Mechanics of Impulsive Biological Systems: Guiding Scalable Synthetic Design**	**Duke University** Stanford University Harvard University University of California-Irvine University of Maryland, College Park University of Massachusetts, Amherst	**Sheila Patek**	NC CA MA CA MD MA
MURI Topic 2: **Exploiting nitrogen vacancy diamonds for manipulation of biological transduction**				
ARO	**Imaging and Control of Biological Transduction using NV – Diamond**	**Harvard University** Massachusetts Institute of Technology	**Ronald Walsworth**	MA MA
MURI Topic 3: **Noncommutativity in Interdependent Multimodal Data Analysis**				
ARO	**Adaptive Exploitation of Noncommutative Multimodal Information Structure**	**University of Illinois, Urbana-Champaign** University of California, San Diego University of Michigan University of Wisconsin, Madison Stanford University Harvard University Princeton University	**Negar Kiyavash**	IL CA MI WI CA MA NJ
MURI Topic 4: **Multi – Scale Response for Adaptive Chemical and Material Systems**				
ARO	**Specifically Triggerable Multi – Scale Responses in Organized Assemblies**	**University of Massachusetts – Amherst** University of Wisconsin, Madison University of Chicago University of California, San Diego	**Sankaran Thayumanavan**	MA WI IL CA
MURI Topic 5: **New Regimes in Quantum Optics**				
ARO	**Engineering Exotic States of Light with Superconducting Circuits**	**Princeton University** University of Chicago University of Maryland, College Park University of Pittsburgh	**Andrew Houck**	NJ IL MD PA

(1) Member of US / UK MURI Collaboration, UK partners do not receive US MURI funds

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MURI Topic 6: **Fractional Order Methods for Sharp Interface Flows**				
ARO	**Fractional PDEs for Conservation Laws and Beyond: Theory, Numerics and Applications**	**Brown University** Columbia University Michigan State University Rice University University of South Carolina	**George Karniadakis**	RI NY MI TX SC
MURI Topic 7: **2 – Dimensional Organic Polymers**				
ARO	**Center for Advanced 2D Networks**	**Cornell University** University of California , Berkeley Georgia Institute of Technology	**William Dichtel**	NY CA GA
MURI Topic 8: **Network Science of Teams**				
ARO	**Quantitative Network – based Models of Adaptive Team Behavior**	**University of California, Santa Barbara** University of Illinois, Urbana Champaign University of Southern California Massachusetts Institute of Technology Northwestern University	**Ambuj Singh**	CA IL CA MA IL
MURI Topic 9**: Exploiting Biological Electromechanics: Using Electromagnetics Energy to Control Biological Systems**				
AFSOR	**Nanoelectropulse-induced electromechanical signaling and control of biological systems**	**The Old Dominion University** Massachusetts Institute of Technology Texas A&M University of Nevada School of Medicine	**Andrei Pakhomov**	VA MA TX NV
	Understanding and controlling the Coupled Electrical, Chemical & Mechanical Excitable Networks of Living System	**University of Maryland** Arizona State University John Hopkins University University of California, Davis	**Wolfgang Losert**	MD AZ MD CA

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MURI Topic 10: **Large Scale Nano-Architecture Formation**				
AFSOR	**A 4D Nanoprinter for Making and Manipulating Macroscopic Materials**	**Northwestern University** University of Miami University of California San Diego University of Maryland	**Chad A. Mirkin**	IL FL CA MD
MURI Topic 11: **Membrane-Based Electronics: Foldable & Adaptable Integrated Circuits**				
AFSOR	**Atomically-Thin Systems That Unfold, Interact and Communicate at the Cellular Scale**	**Cornell University** Stanford University John Hopkins University	**Jiwoong Park**	NY CA MD
	Foldable and Adaptive Two-Dimensional Electronics	**Massachusetts Institute of Technology** Harvard University University of Southern California	**Tomas Palacios**	MA MA CA
MURI Topic 12: **Semantics and Structures for Higher-level Quantum Programming Languages**				
AFSOR	**Semantics, Formal Reasoning, and Tool Support for Quantum Programming**	**Tulane University** Stanford University University of Pennsylvania	**Michael Mislove**	LA CA PA
MURI Topic 13: **Strong Field Laser Matter Interactions at Mid-Infrared Wavelengths**				
AFSOR	**Fundamental Strong-Field Interactions with Ultrafast, Mid-Infrared Laser**	**Ohio State University** University of Central Florida University of Texas, Austin University of Arizona Louisiana State University Imperial College (1)	**Louis DiMauro**	OH FL TX AZ LA UK
	Harnessing Strong-Field Mid-Infrared (IR) Lasers: Designer Beams of Relativistic Particles and THz-to-X-ray Light	**University of Colorado, Boulder** University of Michigan University of Arizona University of Maryland Columbia University	**Margaret Murnane**	CO MI AZ MD NY

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MURI Topic 14: **Visual Commonsense for Scene Understanding**				
ONR	**Understanding Scenes and Events through Joint Parsing, Cognitive Reasoning and Lifelong Learning**	**University of California, Los Angeles** Stanford University Carnegie Mellon University University of Illinois Massachusetts Institute of Technology Yale University University of Oxford (1) University of Glasgow (1) University of Birmingham (1) University of Reading (1)	**Song-Chun Zhu**	CA CA MI IL MA CT UK UK UK UK
MURI Topic 15: **Characterization and Prediction of Remotely Sensed Mesoscale Aerosols in Coastal and Maritime Atmospheric Boundary Layers for Electro-optical Propagation**				
ONR	**Advancing Littoral Zone Aerosol Prediction via Holistic Studies in Regime-Dependent Flows**	**Colorado State University** University of North Dakota University of Wisconsin-Madison University of Nebraska-Lincoln	**Steven Miller**	CO ND WI NE
MURI Topic 16: **Role of the Host Microbiome on Behavior/Resilience in Response to Stressors**				
ONR	**The microbiome and responsiveness to stress: Countermeasure strategies for improving resilience to sleep and circadian disruption**	**University of Colorado, Boulder** University of California, San Diego Northwestern University	**Kenneth Wright**	CO CA IL
MURI Topic 17: **Metalloid Cluster Networks**				
ONR	**Metalloid Cluster Building Blocks and Their Inclusion with Composite**	**John Hopkins University** University of Utah University of Maryland Naval Postgraduate school University of California, Berkeley	**Kit Bowen**	MD UT MD CA CA

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MURI Topic 18: **Computational and Experimental Methods Towards Understanding the Properties of Materials Above 2000°C**				
ONR	**The Science of Entropy Stabilized Ultra-High Temperature Materials**	**North Carolina State University** Duke University University of California, San Diego University of Virginia	**Donald Brenner**	NC NC CA VA
MURI Topic 19: **Quantum Optomechanics**				
ONR	**Quantum Opto-Mechanics with Atoms and Nanostructured Diamond**	**Harvard University** California Institute of Technology Massachusetts Institute of Technology Yale University Stanford University	**Marko Loncar**	MA CA MA CT CA

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