

## **Department of Defense Announces Basic Research Awards**

The Department of Defense today announced 15 awards to academic institutions to perform multidisciplinary basic research. The awards, totaling \$105 million, are the result of the fiscal year 2013 competition conducted by the Army Research Office and the Office of Naval Research under the DoD Multidisciplinary University Research Initiative (MURI) Program.

The MURI program supports research by teams of investigators that intersect several traditional science and engineering disciplines 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 2013 competition, a total of 43 academic institutions are expected to participate in these 15 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. As with single investigator awards, MURI awards provide strong support for the education and training of graduate students in new, cutting edge research.

Over the past 25 years, DoD's MURI program has produced significant capabilities for U.S. 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; and the field of spintronics that emerged from a MURI award on magnetic materials and devices. DoD's strategy to quickly leverage the basic research advances in MURI awards for new capabilities has focused on early engagement with industry.

Army Research Office and the Office of Naval Research solicited proposals in 16 topics important to the Department and received a total of 193 white papers, which were followed by 43 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. Awards in six topic areas of interest to the Air Force will be announced at a later date.

The list of projects selected for fiscal 2013 funding may be found at the Defense Innovation Marketplace ([www.DefenseInnovationMarketplace.mil](http://www.DefenseInnovationMarketplace.mil)) website.

**FY2013 MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE (MURI) – SELECTED PROJECTS**

<b>MURI Topic: Random Lasers, Nano-Spasers, and Optical Rogue Waves</b>				
<b>ONR</b>	<b>Novel Nonlinear Optical Processes in Active, Random and Nanostructured Systems</b>	<b>Georgia State University</b> Purdue University University of Central Florida University of California at Berkeley Yale University Cornell University	<b>Mark Stockman</b>	<b>GA</b> IN FL CA CT NY
<b>MURI Topic: Free Space Optical Quantum Key Distribution (QKD)</b>				
<b>ONR</b>	<b>Fundamental Research on Wavelength-Agile High-rate Quantum Key Distribution (QKD) in a Marine Environment</b>	<b>University of Illinois at Urbana-Champaign</b> Duke University University of Arizona Boston University	<b>Paul Kwiat</b>	<b>IL</b> NC AZ MA
<b>MURI Topic: Integrated Nanophotonics</b>				
<b>ONR</b>	<b>Near-Field Nanophotonics for Energy Efficient Computing and Communication (NECom)</b>	<b>University of California at San Diego</b> University of California at Los Angeles University of California at Berkeley University of Arizona	<b>Yeshaiah Fainman</b>	<b>CA</b> CA CA AZ
<b>MURI Topic: Exploitation of Natural and Anthropogenic Noise for Ocean Exploration</b>				
<b>ONR</b>	<b>The Information Content of Ocean Noise: Theory and Experiment</b>	<b>University of California at San Diego</b> Duke University Georgia Institute of Technology Massachusetts Institute of Technology Portland State University	<b>William Kuperman</b>	<b>CA</b> NC GA MA OR

<b>MURI Topic: Rare Element Replacement Strategies</b>				
ONR	<b>Topological Decompositions and Spectral Sampling Algorithms for Elements Substitution in Critical Technologies</b>	<b>Duke University</b> Brigham Young University University of North Texas Central Michigan University University of Maryland, College Park	<b>Stefano Curtarolo</b>	<b>NC</b> UT TX MI MD
<b>MURI Topic: Acoustic Metamaterials</b>				
ONR	<b>Expanding the Limits of Acoustic Metamaterials</b>	<b>Duke University</b> Rutgers University University of California at Berkeley Massachusetts Institute of Technology University of Texas at Austin	<b>Stephen Cummer</b>	<b>NC</b> NJ CA MA TX
<b>MURI Topic: Cognitive Neuroscience of Memory Consolidation across Sleep Stages and Efficiency Learning</b>				
ONR	<b>Memory Consolidation during Sleep in Humans, Rodents and Computational Models</b>	<b>University of California at Riverside</b> University of Arizona Harvard University Medical School University of California at San Diego	<b>Maksim Bazhenov</b>	<b>CA</b> AZ MA CA
<b>MURI Topic: Computational Foundations of Moral Cognition</b>				
ONR	<b>Moral Competence in Computational Architectures for Robots: Foundations, Implementations and Demonstrations</b>	<b>Tufts University</b> Brown University Rensselaer Polytechnic Institute Georgetown University Yale University	<b>Matthias Scheutz</b>	<b>MA</b> RI NY DC CT

<b>MURI Topic: Artificial Cells for Novel Synthetic Biology Chassis</b>				
ARO	<b>Dynamic Artificial Cells Composed of Synthetic Biorthogonal Membranes</b>	<b>University of California at San Diego</b> Harvard University University of Colorado	<b>Neal Devaraj</b>	<b>CA</b> <b>MA</b> <b>CO</b>
<b>MURI Topic: Molecular Co-Crystal Design and Synthesis</b>				
ARO	<b>Theory and Experiment of Co-crystals: Principles, Synthesis, and Properties</b>	<b>University of Michigan</b> Kansas State University Georgia Institute of Technology Purdue University University of Delaware New York University	<b>Adam Matzger</b>	<b>MI</b> <b>KS</b> <b>GA</b> <b>IN</b> <b>DE</b> <b>NY</b>
<b>MURI Topic: Reduced Cyber-System Signature Observability by Intelligent and Stochastic Adaptation</b>				
ARO	<b>Adversarial and Uncertain Reasoning for Adaptive Cyber Defense: Building the Scientific Foundation</b>	<b>George Mason University</b> Dartmouth College Pennsylvania State University University of Michigan	<b>Sushil Jajodia</b>	<b>VA</b> <b>NH</b> <b>PA</b> <b>MI</b>

<b>MURI Topic: Non-Equilibrium Dynamics</b>				
ARO	<b>Fundamental Issues in Non-Equilibrium Dynamics</b>	<b>University of Chicago</b> Massachusetts Institute of Technology Ohio State University Rice University Cornell University Harvard University	<b>Cheng Chin</b>	<b>IL</b> MA OH TX NY MA
<b>MURI Topic: Materials with Spin Mediated Thermal Properties</b>				
ARO	<b>Materials with Extraordinary Spin / Heat Coupling</b>	<b>Ohio State University</b> University of California at Los Angeles University of Illinois at Urbana-Champaign University of Texas at Austin University of Chicago	<b>Roberto Myers</b>	<b>OH</b> CA IL TX IL
<b>MURI Topic: Transforming Information within Nonequilibrium Nanosystems</b>				
ARO	<b>Information Engines – Nanoscale Control, Computing, and Information Out of the Equilibrium</b>	<b>University of California at Davis</b> University of California at Berkeley Columbia University University of Maryland, College Park	<b>James Crutchfield</b>	<b>CA</b> CA NY MD
<b>MURI Topic: Controlling Collective Phenomena in Complex Networks</b>				
ARO	<b>Predicting and Controlling Systems of Interdependent Networks – Exploiting Interdependence for Control</b>	<b>University of California at Davis</b> Rice University University of Wisconsin University of Washington California Institute of Technology	<b>Raissa D'Souza</b>	<b>CA</b> TX WI WA CA

MURI Topic: <b>Physiochemical Determination of Cognition and Decision Making</b>				
ARO	<b>No Award Made</b>			