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 years 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

<table>
<thead>
<tr>
<th>MURI Topic 1: Emulating the principles of Impulsive Biological Force</th>
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<tr>
<th>MURI Topic 2: Exploiting nitrogen vacancy diamonds for manipulation of biological transduction</th>
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*(1) Member of US / UK MURI Collaboration, UK partners do not receive US MURI funds*
# FY15 DOD Multidisciplinary University Research Initiative (MURI) Selections

## MURI Topic 6: Fractional Order Methods for Sharp Interface Flows

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<thead>
<tr>
<th>ARO</th>
<th>Fractional PDEs for Conservation Laws and Beyond: Theory, Numerics and Applications</th>
<th>Brown University</th>
<th>George Karniadakis</th>
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## MURI Topic 7: 2 – Dimensional Organic Polymers

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<th>Center for Advanced 2D Networks</th>
<th>Cornell University</th>
<th>William Dichtel</th>
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## MURI Topic 8: Network Science of Teams

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<th>ARO</th>
<th>Quantitative Network – based Models of Adaptive Team Behavior</th>
<th>University of California, Santa Barbara</th>
<th>Ambuj Singh</th>
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## MURI Topic 9: Exploiting Biological Electromechanics: Using Electromagnetics Energy to Control Biological Systems

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<tr>
<th>AFSOR</th>
<th>Nanoelectropulse-induced electromechanical signaling and control of biological systems</th>
<th>The Old Dominion University</th>
<th>Andrei Pakhomov</th>
<th>VA</th>
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<th>Understanding and controlling the Coupled Electrical, Chemical &amp; Mechanical Excitable Networks of Living System</th>
<th>University of Maryland</th>
<th>Wolfgang Losert</th>
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### FY15 DOD Multidisciplinary University Research Initiative (MURI) Selections

#### MURI Topic 10: Large Scale Nano-Architecture Formation

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<tr>
<th>AFSOR</th>
<th>Large Scale Nano-Architecture Formation</th>
<th>Northwestern University</th>
<th>Chad A. Mirkin</th>
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<td>A 4D Nanoprinter for Making and Manipulating Macroscopic Materials</td>
<td>University of Miami</td>
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#### MURI Topic 11: Membrane-Based Electronics: Foldable & Adaptable Integrated Circuits

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<tr>
<th>AFSOR</th>
<th>Membrane-Based Electronics: Foldable &amp; Adaptable Integrated Circuits</th>
<th>Cornell University</th>
<th>Jiwoong Park</th>
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<td>Atomically-Thin Systems That Unfold, Interact and Communicate at the Cellular Scale</td>
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<td>Foldable and Adaptive Two-Dimensional Electronics</td>
<td>Massachusetts Institute of Technology</td>
<td>Tomas Palacios</td>
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#### MURI Topic 12: Semantics and Structures for Higher-level Quantum Programming Languages

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<th>AFSOR</th>
<th>Semantics and Structures for Higher-level Quantum Programming Languages</th>
<th>Tulane University</th>
<th>Michael Mislove</th>
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<td>Semantics, Formal Reasoning, and Tool Support for Quantum Programming</td>
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#### MURI Topic 13: Strong Field Laser Matter Interactions at Mid-Infrared Wavelengths

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<tr>
<th>AFSOR</th>
<th>Strong Field Laser Matter Interactions at Mid-Infrared Wavelengths</th>
<th>Ohio State University</th>
<th>Louis DiMauro</th>
<th>OH FL TX AZ LA UK</th>
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<td>Fundamental Strong-Field Interactions with Ultrafast, Mid-Infrared Laser</td>
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<td>Harnessing Strong-Field Mid-Infrared (IR) Lasers: Designer Beams of Relativistic Particles and THz-to-X-ray Light</td>
<td>University of Colorado, Boulder</td>
<td>Margaret Murnane</td>
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# FY15 DOD Multidisciplinary University Research Initiative (MURI) Selections

## MURI Topic 14: Visual Commonsense for Scene Understanding

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<tr>
<th>ONR</th>
<th>Understanding Scenes and Events through Joint Parsing, Cognitive Reasoning and Lifelong Learning</th>
<th>University of California, Los Angeles</th>
<th>Song-Chun Zhu</th>
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## MURI Topic 15: Characterization and Prediction of Remotely Sensed Mesoscale Aerosols in Coastal and Maritime Atmospheric Boundary Layers for Electro-optical Propagation

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<tr>
<th>ONR</th>
<th>Advancing Littoral Zone Aerosol Prediction via Holistic Studies in Regime-Dependent Flows</th>
<th>Colorado State University</th>
<th>Steven Miller</th>
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## MURI Topic 16: Role of the Host Microbiome on Behavior/Resilience in Response to Stressors

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<tr>
<th>ONR</th>
<th>The microbiome and responsiveness to stress: Countermeasure strategies for improving resilience to sleep and circadian disruption</th>
<th>University of Colorado, Boulder</th>
<th>Kenneth Wright</th>
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## MURI Topic 17: Metalloid Cluster Networks

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<th>ONR</th>
<th>Metalloid Cluster Building Blocks and Their Inclusion with Composite</th>
<th>John Hopkins University</th>
<th>Kit Bowen</th>
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