FY 2007 MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE -- WINNERS OF TECHNICAL COMPETITION

Lead Institution * Team Member Institutions [1]	State	Principal Investigator (PI)	Project Title	Funding Agency
Topic #1: Exploiting Nonlinear Dynamics for Novel Devices				
University of Maryland–College Park * Duke University [1]	MD NC	Edward Ott	Exploiting Nonlinear Dynamics for Novel Sensor Networks	ONR
University of California–San Diego * California Institute of Technology [1] * University of Pittsburgh [1]	CA CA PA	H. Abarbanel	Chemical Discrimination and Localization Using Biologically Based Olfactory Processing	ONR
Topic #2: Towards Trust Management in Service Oriented Architectures				
University of Pennsylvania * Columbia University [1] * Georgia Institute of Technology [1]	PA NY GA	Sampath Kannan	Foundational and Systems Support for Quantitative Trust Management	ONR
State University of New York–Stony Brook	NY	Scott D. Stoller	A Framework for Analyzing and Ensuring Trust in Service-Oriented Architectures	ONR
Topic #3: Disparate Sensor Network Based Situation Understanding				
Stanford University * Carnegie Mellon University [1]	CA PA	Andrew Y. Ng	From Individuals to Populations: Biologically-Informed Multi-Modal Situation Understanding with Sensor Networks	ONR
Topic #4: Underwater Acoustic Communications				
Woods Hole Oceanographic Institution * Massachusetts Institute of Technology [1] * University of California–Scripps Institution of Oceanography [1] * University of Rhode Island [1] * University of Illinois–Urbana-Champaign [1]	MA MA CA RI IL	J.C. Preisig	Underwater Acoustic Propagation and Communications: A Coupled Research Program	ONR
University of California–Scripps Institution of Oceanography * Arizona State University [1] * University of Washington–Applied Physics Laboratory [1] * University of Delaware [1]	CA AZ WA DE	W.S. Hodgkiss	Impact of Oceanographic Variability on Acoustic Communications	ONR

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Topic #5: Radiation Belt Dynamics and Energetics				
University of Maryland–College Park * Stanford University [1] * University of California–Los Angeles [1] * Dartmouth College [1] * Virginia Polytechnic Institute and State University [1] * Boston College [1]	MD CA CA NH VA MA	Dennis Papadopoulos	Fundamental Physics Issues on Radiation Belt Dynamics and Remediation	ONR
Topic #6: Thermal Management for Advanced Electrical Systems				
University of Virginia * Arizona State University [1] * University of California–Berkeley [1] * University of Illinois–Urbana-Champaign [1] * Rensselaer Polytechnic Institute [1]	VA AZ CA IL NY	P.M. Norris	System-Level Approach for Multi-Phase, Nanotechnology-Enhanced Cooling of High-Power Microelectronic Systems	ONR
Topic #7: Light Cellular Structures for Force Protection				
University of Virginia * Massachusetts Institute of Technology [1] * University of California–Santa Barbara [1] * Harvard University [1]	VA MA CA MA	H. Wadley	An Integrated Cellular Materials Approach to Force Protection	ONR
Topic #8: Human-Robot Interaction in Littoral and Urban Military Domains: Human-Unmanned Systems Interactions				
Massachusetts Institute of Technology * University of Massachusetts–Amherst [1] * University of Washington [1] * Stanford University [1] * Vanderbilt University [1]	MA MA WA CA TN	Cynthia Breazeal	Cognitively Compatible and Collaboratively Balanced Human-Robot Teaming in Urban Military Domains	ONR
University of Notre Dame * Arizona State University [1] * Stanford University [1]	IN AZ CA	Matthia Scheutz	Effective Human-Robot Interaction under Time Pressure through Robust Natural Language Dialogue and Dynamic Autonomy	ONR

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Topic #9: Exploiting the Documented Plasticity of the Adult Brain to Create Superior Warfighters in Fast-Paced Close Quarters Combat				
University of Illinois–Urbana-Champaign * Massachusetts Institute of Technology [1] * University of Minnesota [1] * Pennsylvania State University [1]	IL MA MN PA	A. F. Kramer	Capitalizing on Research on Animal and Human Brain Plasticity to Enhance Warfighter Training and Performance	ONR
University of Rochester * University of Minnesota [1] * University of California–San Diego [1] * Massachusetts Institute of Technology * Carnegie Mellon University [1] * Rensselaer Polytechnic Institute [1]	NY MN CA MA PA NY	D. Bavelier	Complex Learning and Skill Transfer with Video Games	ONR
Topic #10: Reactive Material Dynamic Response and Energy Release for MOUT Applications				
University of California–San Diego * Georgia Institute of Technology [1] * Johns Hopkins University [1]	CA GA MD	Vitali Nesterenko	Tailoring Multiscale Processes and Mechanisms to Control Energy Release of Energetic Materials	ONR
Topic #11: Processing and Production Science for Next Generation Fuel Cells				
University of Texas–Austin * Stanford University [1]	TX CA	Arumugam Manthiram	Materials and Manufacturing Science and Engineering of Direct Methanol Fuel Cells	ONR
Topic #12: Science-Based Design of Fuel-Flexible Chemical Propulsion/Energy Conversion Systems				
Princeton University * University of Illinois–Chicago [1] * Pennsylvania State University [1] * Case Western Reserve University [1]	NJ IL PA OH	Frederick L. Dryer	Generation of Comprehensive Surrogate Kinetic Models and Validation Databases for Simulating Large Molecular Weight Hydrocarbon Fuels	AFOSR
Topic #13: Enterprise Health: Self-Regenerative Incorruptible Enterprise				
George Mason University * Columbia University [1] * Pennsylvania State University [1]	VA NY PA	Anup K. Ghosh	Autonomic Recovery of Enterprise-Wide Systems After Attack or Failure with Forward Correction	AFOSR
University of Virginia * University of California–Davis [1] * University of California–Santa Barbara [1] * University of New Mexico [1]	VA CA CA NM	John C. Knight	Helix: A Self-Regenerative Architecture for the Incorruptible Enterprise	AFOSR

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Topic #14: Atmospheric Neutral Density Prediction				
University of Colorado * University of Alabama–Huntsville [1] * University of New Hampshire [1] * University of Texas–San Antonio [1] * United States Air Force Academy [1]	CO AL NH TX CO	Jeffrey M. Forbes	Neutral Atmosphere Density Interdisciplinary Research	AFOSR
Topic #15: Building Bridges between Neuroscience, Cognition, and Human Decision Making				
Stanford University * Princeton University [1] * Carnegie Mellon University [1]	CA NJ PA	James L. McClelland	Dynamic Decision Making in Complex Task Environments: Principles and Neural Mechanisms	AFOSR
Topic #16: Behavior of Systems with Humans and Unmanned Vehicles				
Boston University * Princeton University [1] * University of Washington [1] * University of California–Santa Barbara [1]	MA NJ WA CA	John Baillieul	Behavioral Dynamics in the Cooperative Control of Mixed Human/Robotic Teams	AFOSR
Topic #17: Biologically-Inspired Flight for Micro Air Vehicles (MAVs)				
Brown University * Oregon State University [1] * Massachusetts Institute of Technology [1] * University of Maryland–College Park [1]	RI OR MA MD	Kenneth Breuer	Biologically-Inspired Flight for Micro Air Vehicles	AFOSR
University of Michigan * University of Florida [1] * University of Maryland–College Park [1] * California Institute of Technology [1]	MI FL MD CA	Wei Shyy	Biologically-Inspired, Anisotropic Flexible Wing for Optimal Flapping Flight	AFOSR
Topic #18: Quantum Simulations of Condensed Matter Systems using Ultra-Cold Atomic Gases				
Harvard University * Massachusetts Institute of Technology [1] * University of Michigan [1] * Stanford University [1]	MA MA MI CA	Markus Greiner	Quantum Simulations of Condensed Matter Systems Using Ultra-Cold Atomic Gases	AFOSR
Topic #19: Bioinspired Supramolecular Enzymes				
Northwestern University * University of California–Los Angeles [1]	IL CA	Chad A. Mirkin	Bioinspired Supramolecular Enzymatic Systems	AFOSR
Topic #20: Biologically Synthesized Quantum Electronic Systems				

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University of Minnesota * New York University [1] * University of Texas–Austin [1] * University of California–Los Angeles [1] * Columbia University [1]	MN NY TX CA NY	Richard Kiehl	Biologically Assembled Quantum Electronic Arrays	ARO
Topic #21: Attosecond Subwavelength Optical Pulses				
Kansas State University * Texas A&M University [1] * University of Ottawa [2]	KS TX --	Zenghu Chang	Attosecond Optical Technology Based on Recollision and Gating	ARO
Topic #22: Designing and Prescribing an Efficient Natural-like Language for Bots				
University of Pennsylvania * University of Massachusetts–Amherst [1] * University of Massachusetts–Lowell [1]	PA MA MA	Mitchell Marcus	Situation Understanding Bot through Language and Environment	ARO
Topic #23: Ionic Liquid Containing Polymeric Materials				
Virginia Polytechnic Institute and State University * Pennsylvania State University [1] * University of Pennsylvania [1] * Drexel University [1]	VA PA PA PA	Timothy Long	Ionic Liquids in Electro-Active Devices	ARO
Topic #24: Self-healing Polymer Composites through Mechanochemical Transduction				
University of Illinois–Urbana-Champaign * University of Texas–Austin [1] * Duke University [1]	IL TX NC	Jeffrey S. Moore	Mechanochemically-Active Polymer Composites	ARO
Topic #25: Engineering of Phase Transforming EMO Materials				
California Institute of Technology * University of Minnesota [1] * University of Washington [1] * University of California–Santa Barbara [1] * Rutgers University [1] * University of Maryland–College Park [1]	CA MN WA CA NJ MD	Kaushik Bhattacharya	Materials on the Brink: Unprecedented Transforming Materials	ARO
Topic #26: Robust and Resilient Tactical MANETs				
University of California–Davis * Brigham Young University [1]	CA UT PA	Prasant Mohapatra	ARSENAL: A Cross Layer Architecture for Secure Resilient Tactical Mobile ad hoc Networks	ARO

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* University of Pittsburgh [1] * University of California–Riverside [1] * University of California–Santa Cruz [1] * University of Utah [1] * Pennsylvania State University [1]	CA CA UT PA			
University of Maryland–College Park * Carnegie Mellon University [1] * University of Illinois–Urbana-Champaign [1] * University of Washington [1]	MD PA IL WA	Virgil Gligor	Designing Reliable and Secure Tactical MANETs	ARO
Topic #27: Urban Sensor Network Structure for Data Fusion				
Pennsylvania State University * Harvard University [1] * Duke University [1] * Ohio State University [1] * University of British Columbia [2]	PA MA NC OH --	Shashi Phoha	Engineering of Sensor Network Structure for Dependable Fusion	ARO
Topic #28: Dynamic Modeling of 3D Urban Terrain				
University of South Carolina * University of California–Los Angeles [1] * Virginia Polytechnic Institute and State University [1] * University of California–Irvine [1] * University of Texas–Austin [1] * Texas A&M University [1] * Princeton University [1] * Rice University [1]	SC CA VA CA TX TX NJ TX	Ronald DeVore	Model Classes, Approximation, and Metrics for Dynamic Processing of Urban Terrain Data	ARO

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