

# UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Army DATE: April 2013

APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE							
2040: Research, Development, Test & Evaluation, Army BA 1: Basic Research					PE 0601103A: University Research Initiatives							
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	-	78.380	80.986	79.359	-	79.359	79.679	79.977	80.156	81.159	Continuing	Continuing
D55: University Research Initiative	-	75.149	77.650	76.021	-	76.021	76.339	76.637	76.759	77.701	Continuing	Continuing
V72: Minerva	-	3.231	3.336	3.338	-	3.338	3.340	3.340	3.397	3.458	Continuing	Continuing

<sup>#</sup> FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

<sup>##</sup> The FY 2014 OCO Request will be submitted at a later date

## A. Mission Description and Budget Item Justification

This program element (PE) supports Army basic research efforts in the Multidisciplinary University Research Initiative (MURI) program, the Defense University Research Instrumentation Program (DURIP) and the Presidential Early Career Awards for Scientists and Engineers (PECASE) program by funding basic research in a wide range of scientific and engineering disciplines pertinent to maintaining the U.S. land combat technology superiority. Army MURI program efforts involve teams of researchers investigating high-priority, transformational topics that intersect more than one traditional technical discipline (e.g., Intelligent Luminescence for Communication, Display, and Identification). For many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. The DURIP provides funds to acquire major research equipment to augment current, or devise new, research capabilities in support of Army transformational research. The PECASE program funds single-investigator research efforts performed by outstanding academic scientists and engineers early in their independent research careers.

Project support Minerva Research Initiative (MRI), a university based social science research project initiated by the Secretary of Defense in FY09.

Work in the PE provides a foundation for applied research initiatives at the Army laboratories and research, development and engineering centers.

The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering science and technology focus areas and the Army Modernization Strategy.

Work on this project is performed by the Army Research Laboratory (ARL), Research Triangle Park, NC.

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2040: Research, Development, Test & Evaluation, Army		PE 0601103A: University Research Initiatives			
BA 1: Basic Research					
B. Program Change Summary (\$ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	80.850	80.986	82.953	-	82.953
Current President's Budget	78.380	80.986	79.359	-	79.359
Total Adjustments	-2.470	0.000	-3.594	-	-3.594
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.470	-			
• Adjustments to Budget Years	-	-	-3.594	-	-3.594

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 1: Basic Research					R-1 ITEM NOMENCLATURE PE 0601103A: University Research Initiatives				PROJECT D55: University Research Initiative			
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
D55: University Research Initiative	-	75.149	77.650	76.021	-	76.021	76.339	76.637	76.759	77.701	Continuing	Continuing
# FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012												
## The FY 2014 OCO Request will be submitted at a later date												
Note Not applicable for this item.												
A. Mission Description and Budget Item Justification												
This project supports the Multidisciplinary University Research Initiative (MURI), the Defense University Research Instrumentation Program (DURIP) and the Presidential Early Career Awards for Scientists and Engineers (PECASE) program. The MURI program funds university based basic research in a wide range of scientific and engineering disciplines pertinent to maintaining US land combat technology superiority. Army MURI efforts involve teams of researchers investigating high-priority, transformational topics that intersect more than one traditional technical discipline (e.g. Intelligent Luminescence for Communication, Display, and Identification). For many complex problems, this multidisciplinary approach serves to accelerate research progress and expedite transition of results to application. The DURIP provides funds to acquire major research equipment to augment current, or devise new, research capabilities in support of Army transformational research. The PECASE program funds single-investigator research efforts performed by outstanding academic scientists and engineers early in their independent research careers.												
Work in this project provides a foundation for applied research initiatives at the Army laboratories and research, development and engineering centers.												
The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.												
Work on this project is performed by the Army Research Laboratory (ARL) located in Research Triangle Park, NC.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2012	FY 2013	FY 2014	
Title: Multidisciplinary University Research Initiative (MURI)									58.872	59.410	56.743	
Description: MURI programs are typically 5 years in length at a cost of \$1.25M/yr.												
FY 2012 Accomplishments: Supported MURI with 8 new awards that are critical to the Army's future operating capabilities. MURI topics and lead institutions were High-Resolution Quantum Control of Chemical Reactions (Yale Univ), The Physics of Surface States with Interactions												

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 1: Basic Research	R-1 ITEM NOMENCLATURE PE 0601103A: University Research Initiatives	PROJECT D55: University Research Initiative		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2012	FY 2013	FY 2014
mediated by Bulk Properties, Defects and Surface Chemistry (Princeton), Translating Biochemical Pathways to Non-Cellular Environments (Arizona State), Multivariate Heavy -Tail Phenomena: Modeling, Diagnostics, and Applications in Tactical Operations (Cornell), Imaging how a neuron computes (Columbia), Associating growth conditions with cellular composition in Gram-negative bacteria (UT-Austin), Coherent effects in hybrid nanostructures for lineshape engineering of electromagnetic media (Rice), and Evolution of Cultural Norms and Dynamics of Socio-Political Change (Univ Penn). <b>FY 2013 Plans:</b> Support MURI awards made in prior years and initiated 8 FY13 start MURI awards critical to future operating capabilities. Effective transition mechanisms include collaboration among principal investigators, participation by 6.2/6.3 program managers in MURI program reviews, and communication of the MURI research results to the Army Research Laboratory, the Research, Development, and Engineering Centers including Engineer Research and Development Center, U.S. Army Medical Research and Materiel Command, U.S. Army Research Institute, and industry. <b>FY 2014 Plans:</b> Will provide support for MURI awards made in prior years will continue and will start 7-8 new FY14 MURI awards critical to future operating capabilities. Effective transition mechanisms include collaboration among principal investigators, participation by 6.2/6.3 program managers in MURI program reviews, and communication of the MURI research results to the Army Research Laboratory, U.S. Army Research, Development and Engineering Command, the Research, Development, and Engineering Centers (RDECs) the Center of Excellences, including Engineer Research and Development Center (ERDC), U.S. Army Medical Research and Materiel Command, and the U.S. Army Research Institute, and industry.				
<b>Title:</b> Presidential Early Career Awards for Scientists and Engineers (PECASE) <b>Description:</b> Supports PECASE investigators started in prior years. <b>FY 2012 Accomplishments:</b> Continued support for prior year awardees and selected four new awards. <b>FY 2013 Plans:</b> Select four new awardees and supported prior year's awardees. <b>FY 2014 Plans:</b> Will continue support for prior year PECASE awards and select new FY14 PECASE awardees.		3.600	4.559	5.414
<b>Title:</b> Defense University Research Instrumentation Program (DURIP) <b>Description:</b> Supports basic research through competitive grants for research instrumentation. <b>FY 2012 Accomplishments:</b>		12.677	13.681	13.864

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<b>APPROPRIATION/BUDGET ACTIVITY</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army</i> BA 1: <i>Basic Research</i>		<b>R-1 ITEM NOMENCLATURE</b> PE 0601103A: <i>University Research Initiatives</i>	<b>PROJECT</b> D55: <i>University Research Initiative</i>
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2012</b>	<b>FY 2013</b>
Awarded competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research critical to Army transformation.			
<b>FY 2013 Plans:</b> Award competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research critical to Army transformation.			
<b>FY 2014 Plans:</b> Will award competitive grants for research instrumentation to enhance universities' capabilities to conduct world class research critical to Army transformation.			
<b>Accomplishments/Planned Programs Subtotals</b>		75.149	77.650
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b> N/A			
<b>E. Performance Metrics</b> Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.			

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 1: Basic Research					R-1 ITEM NOMENCLATURE PE 0601103A: University Research Initiatives				PROJECT V72: Minerva			
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
V72: Minerva	-	3.231	3.336	3.338	-	3.338	3.340	3.340	3.397	3.458	Continuing	Continuing
<sup>#</sup> FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012												
<sup>##</sup> The FY 2014 OCO Request will be submitted at a later date												
Note Not applicable for this item.												
A. Mission Description and Budget Item Justification This project supports the Minerva Research Initiative (MRI), a university-based social science research program initiated by the Secretary of Defense in FY09. It focuses on areas in the social sciences that are of strategic importance to U.S. national security policy which have not been substantially pursued in the past. The Minerva research effort will be performed to understand the internal military-political dynamics of repressive regimes, the vulnerabilities of regimes and institutions to various kinds of disruption and instability, the nature of crowd dynamics, group violence, community belief structures, the potential to influence public opinion and attitudes in diverse cultures, cultural effects on network security and military operations, the influence of technology on military capabilities of potential adversaries and allies, and other intersections of social-cultural issues with military activities and national security. Predictive models and other analysis tools will be developed. Leveraging the expertise in the social sciences within the academic community is needed to provide understanding of the roots of terrorist organizations and the challenges and opportunities for military operations in a culturally diverse environment. Better understanding at a fundamental level and new computational tools will provide a beneficial impact on war fighting capabilities at the national policy, military strategy, operational, and tactical levels, and will enhance the capabilities of intelligence activities at all levels. All research results are open source.  The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.  Work in this project is performed by the Army Research Office.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2012	FY 2013	FY 2014	
Title: Minerva Outreach and In-house Capability									0.033	0.000	0.000	
Description: Supports Minerva basic research projects and establishment of a Chairs program at principally military educational institutions.												
FY 2012 Accomplishments: This effort was transferred to the Office of the Secretary of Defense (OSD) in FY2012 and will be executed by OSD in FY2013												
Title: The Minerva Research Initiative (MRI)									3.198	3.336	3.338	

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2012</b>	<b>FY 2013</b>
<p><b>Description:</b> The MRI is a university-based social science research program initiated by the Secretary of Defense. It focuses on areas in the social sciences of strategic importance to U.S. national security policy. It seeks to increase the Department's intellectual capital in the social sciences and improve its ability to address future challenges and build bridges between the Department and the social science community. Minerva will bring together universities, research institutions, and individual scholars and support multidisciplinary and cross-institutional projects addressing specific topic areas determined by the Department.</p> <p><b>FY 2012 Accomplishments:</b> Continued large university consortium research projects which were initiated in FY09 to conduct studies of the relationship of technology and national security in China, the stability vulnerabilities of African states and institutions to environmental stress, and the internal dynamics of the Baathist regime from the Iraqi perspective. Support was provided to OSD in managing the program in social science studies related to strategy and policy via research chairs and fellowships at Service schools and universities, and directed by previous Congressional language on the Minerva program from authorization and appropriations committees.</p> <p><b>FY 2013 Plans:</b> Continue efforts on 3 existing projects described above and focused on social science and cultural issues affecting US military warfighting capabilities. Continue providing support to OSD in managing the program in social science studies related to strategy and policy via research chairs and fellowships at Service schools and universities. Validate predictive models developed in previous research with extensive field research and extended by new theoretical development. Collaborations with combatant commands, DoD policy staff, and governmental activities are being extended and strengthened. Increase the number of workshops and training courses for high level policy staff.</p> <p><b>FY 2014 Plans:</b> The 3 university consortium projects started in FY09 (and described in FY2012 above) will be completed. Funds will also support new and ongoing Minerva social science research of strategic importance to the Army and U.S. national security policy. Research efforts will focus on understanding group belief formation, factors causing or influencing social change and violence, societal resilience, theories of deterrence, and new approaches to conflict and cooperation.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>		3.231	3.336
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			

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<b>D. Acquisition Strategy</b> N/A		
<b>E. Performance Metrics</b> Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.		