

## UNCLASSIFIED

PE NUMBER: 0601103F

PE TITLE: University Research Initiatives

## Exhibit R-2, RDT&amp;E Budget Item Justification

DATE

February 2005

BUDGET ACTIVITY

01 Basic Research

PE NUMBER AND TITLE

0601103F University Research Initiatives

Cost (\$ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	103.981	118.985	105.029	106.353	106.333	115.421	118.103	120.114	Continuing	TBD
5094 University Research Initiatives	103.981	118.985	105.029	106.353	106.333	115.421	118.103	120.114	Continuing	TBD

Note: In FY 2004, the Office of the Secretary of Defense devolved a portion of the Department of Defense University Research Initiative program to this program in the Air Force.

(U) **A. Mission Description and Budget Item Justification**

This program supports defense-related basic research in a wide range of scientific and engineering disciplines pertinent to maintaining U.S. military technology superiority; enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies; and assists universities in establishing superior instrumentation capabilities needed to improve the quality of defense-related research and education. A fundamental component of this program is the recognition that future technologies and technology exploitations require highly coordinated and concerted multi- and interdisciplinary efforts. Note: In FY 2005, Congress added \$1.1 million for 21st Century Information Operations Workforce; \$1.5 million for Agile Response Chameleon Coatings; \$3.0 million for Bio/Nanotechnology Infrastructure and Technology Oriented Research; \$1.0 million for Griffith Observatory Programming; \$1.6 million for Information Security Solutions; \$2.5 million for Science, Math and Research for Transformation (SMART) Defense Scholarship Pilot Program (subsequently transferred to an OSD PE ); and \$1.0 million for The Logistics Institute. This program is in Budget Activity 1, Basic Research, because it funds scientific study and experimentation. Through this program, the Air Force invests in research directed toward increasing knowledge and understanding in those fields of science and engineering related to long-term national security needs.

(U) **B. Program Change Summary (\$ in Millions)**

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Previous President's Budget	106.313	115.865	110.092	110.273
(U) Current PBR/President's Budget	103.981	118.985	105.029	106.353
(U) Total Adjustments	-2.332	3.120		
(U) Congressional Program Reductions		-5.000		
Congressional Rescissions		-1.080		
Congressional Increases		11.700		
Reprogrammings	-0.020	-2.500		
SBIR/STTR Transfer	-2.312			

(U) **Significant Program Changes:**

Not Applicable.

## C. Performance Metrics

(U) Under Development.

## Exhibit R-2a, RDT&amp;E Project Justification

DATE

February 2005

BUDGET ACTIVITY 01 Basic Research					PE NUMBER AND TITLE 0601103F University Research Initiatives			PROJECT NUMBER AND TITLE 5094 University Research Initiatives		
Cost (\$ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
5094 University Research Initiatives	103.981	118.985	105.029	106.353	106.333	115.421	118.103	120.114	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

Note: In FY 2004, the Office of the Secretary of Defense devolved a portion of the Department of Defense University Research Initiative program to this program in the Air Force.

(U) **A. Mission Description and Budget Item Justification**

This program supports defense-related basic research in a wide range of scientific and engineering disciplines pertinent to maintaining U.S. military technology superiority; enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies; and assists universities in establishing superior instrumentation capabilities needed to improve the quality of defense-related research and education. A fundamental component of this program is the recognition that future technologies and technology exploitations require highly coordinated and concerted multi- and interdisciplinary efforts. Note: In FY 2005, Congress added \$1.1 million for 21st Century Information Operations Workforce; \$1.5 million for Agile Response Chameleon Coatings; \$3.0 million for Bio/Nanotechnology Infrastructure and Technology Oriented Research; \$1.0 million for Griffith Observatory Programming; \$1.6 million for Information Security Solutions; \$2.5 million for Science, Math and Research for Transformation (SMART) Defense Scholarship Pilot Program (subsequently transferred to an OSD PE ); and \$1.0 million for The Logistics Institute. This program is in Budget Activity 1, Basic Research, because it funds scientific study and experimentation. Through this program, the Air Force invests in research directed toward increasing knowledge and understanding in those fields of science and engineering related to long-term national security needs.

(U) **B. Accomplishments/Planned Program (\$ in Millions)**

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) MAJOR THRUST: Promote fundamental, multi- and interdisciplinary science and engineering research projects. Topics will be selected in scientific research areas related to transformational and high priority technologies, such as nanotechnology, sensor networks, intelligence information fusion, smart materials and structures, efficient energy and power conversion, high energy materials for propulsion and control, and enhancing human performance.	51.577	61.693	57.291	54.758
(U) In FY 2004: Issued competitive research awards to universities focused on enabling Air Force-related technologies usually not achievable through single investigator awards. Funded multi-disciplinary programs begun in prior years.				
(U) In FY 2005: Fund competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Continue funding of multi-disciplinary programs begun in prior years.				
(U) In FY 2006: Fund competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Support superior academic research the Presidential Early Career Award for Scientists and Engineers (PECASE). Continue funding of multi-disciplinary programs begun in prior years.				

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification				DATE February 2005	
BUDGET ACTIVITY 01 Basic Research		PE NUMBER AND TITLE 0601103F University Research Initiatives		PROJECT NUMBER AND TITLE 5094 University Research Initiatives	
(U)	In FY 2007: Continue funding competitive research awards at U.S. universities to focus on underpinning Air Force-related technologies usually not achievable through typical single investigator awards. Support superior academic research the PECASE. Continue funding of multi-disciplinary programs begun in prior years.				
(U)					
(U)	MAJOR THRUST: Support post-graduate, graduate, and undergraduate education in science and engineering disciplines at U.S. universities. National Defense Science and Engineering Graduate Program (NDSEG) Fellowships are awarded under a joint tri-Service and Office of the Director of Defense Research and Engineering competition.	34.652	35.151	35.499	40.161
(U)	In FY 2004: Awarded approximately 170 highly competitive NDSEG fellowships. Supported competitive awards for graduate and undergraduate research experiences including those established under the Awards to Stimulate and Support Undergraduate Research Education program. Promoted and advanced recognition of superior academic research under Federal programs such as the PECASE. Funded awards made under prior year Department of Defense programs.				
(U)	In FY 2005: Award highly competitive NDSEG fellowships. Support competitive awards for graduate and undergraduate research experiences including those established under the Awards to Stimulate and Support Undergraduate Research Education program. Stimulate and recognize superior academic research under Federal programs such as the PECASE. Continue funding for awards made under prior year Department of Defense programs.				
(U)	In FY 2006: Award highly competitive NDSEG fellowships. Support competitive awards for graduate and undergraduate research experiences including those established under the Awards to Stimulate and Support Undergraduate Research Education program. Continue funding for awards made under prior year Department of Defense programs. (Note: In FY 2006, PECASE efforts will be move to the multi-and interdisciplinary science and engineering research since this Major Thrust is not an educational effort.)				
(U)	In FY 2007: Award highly competitive NDSEG fellowships. Support competitive awards for graduate and undergraduate research experiences including those established under the Awards to Stimulate and Support Undergraduate Research Education program. Continue funding for awards made under prior year Department of Defense programs.				
(U)					
(U)	MAJOR THRUST: Enhance the scientific and engineering research and education infrastructure and instrumentation at U.S. universities.	15.806	13.021	12.239	11.434
(U)	In FY 2004: Conducted the competition for U.S. universities to establish unique capability, high technology instrumentation and infrastructure under the Defense University Research Instrumentation				
Project 5094					
R-1 Shopping List - Item No. 2-4 of 2-7					
Exhibit R-2a (PE 0601103F)					

## UNCLASSIFIED

Exhibit R-2a, RDT&E Project Justification			DATE	
			February 2005	
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE		
01 Basic Research	0601103F University Research Initiatives	5094 University Research Initiatives		
Program.				
(U) In FY 2005: Conduct the competition for U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities under the Defense University Research Instrumentation Program.				
(U) In FY 2006: Conduct the competition for U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities under the Defense University Research Instrumentation Program.				
(U) In FY 2007: Conduct the competition for U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities under the Defense University Research Instrumentation Program.				
(U)				
(U) CONGRESSIONAL ADD: Network and Information Space Security Center.		0.973	0.000	0.000 0.000
(U) In FY 2004: Conducted fundamental multidisciplinary scientific research associated with network and information efforts.				
(U) In FY 2005: Not Applicable.				
(U) In FY 2006: Not Applicable.				
(U) In FY 2007: Not Applicable.				
(U)				
(U) CONGRESSIONAL ADD: Kelly Material Science and Engineering Laboratory.		0.973	0.000	0.000 0.000
(U) In FY 2004: Conducted fundamental multidisciplinary scientific research at Kelly Material Science and Engineering Laboratory.				
(U) In FY 2005: Not Applicable.				
(U) In FY 2006: Not Applicable.				
(U) In FY 2007: Not Applicable.				
(U)				
(U) CONGRESSIONAL ADD: 21st Century Information Operation Workforce.		0.000	1.091	0.000 0.000
(U) In FY 2004: Not Applicable.				
(U) In FY 2005: To support an Information Operations curriculum to educate graduates and undergraduates in the field of intelligence.				
(U) In FY 2006: Not Applicable.				
(U) In FY 2007: Not Applicable.				
(U)				
(U) CONGRESSIONAL ADD: Agile Response Chameleon Coating.		0.000	1.486	0.000 0.000
(U) In FY 2004: Not Applicable.				
Project 5094				
R-1 Shopping List - Item No. 2-5 of 2-7				
Exhibit R-2a (PE 0601103F)				

## UNCLASSIFIED

## Exhibit R-2a, RDT&amp;E Project Justification

DATE

February 2005

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT NUMBER AND TITLE			
<b>01 Basic Research</b>	<b>0601103F University Research Initiatives</b>	<b>5094 University Research Initiatives</b>			
(U) In FY 2005: Conduct meta-materials research into aircraft coating systems that allow for stealth capabilities and advanced sensing capabilities.					
(U) In FY 2006: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U)					
(U) CONGRESSIONAL ADD: Bio/Nanotechnology Infrastructure and Technology Oriented Research.	0.000	2.974	0.000	0.000	
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: To conduct functionalized carbon nanotubes research and determine the feasibility of transferring information on the surface of photosensitive proteins at the single-molecule level.					
(U) In FY 2006: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U)					
(U) CONGRESSIONAL ADD: Griffith Observatory Programming.	0.000	0.991	0.000	0.000	
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: To support educational programming and exhibits which demonstrate the application of defense technology and research at Griffith Observatory Planetarium.					
(U) In FY 2006: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U)					
(U) CONGRESSIONAL ADD: Information Security Solution.	0.000	1.587	0.000	0.000	
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: Conduct research to the security issues in information technology architectures and components.					
(U) In FY 2006: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U)					
(U) CONGRESSIONAL ADD: The Logistics Institute.	0.000	0.991	0.000	0.000	
(U) In FY 2004: Not Applicable.					
(U) In FY 2005: To continue the research and support of the Air Force crew systems personnel protection program.					
(U) In FY 2006: Not Applicable.					
(U) In FY 2007: Not Applicable.					
(U) Total Cost	103.981	118.985	105.029	106.353	

Project 5094

R-1 Shopping List - Item No. 2-6 of 2-7

Exhibit R-2a (PE 0601103F)

## Exhibit R-2a, RDT&amp;E Project Justification

DATE

February 2005

BUDGET ACTIVITY

01 Basic Research

PE NUMBER AND TITLE

0601103F University Research  
Initiatives

PROJECT NUMBER AND TITLE

5094 University Research Initiatives

(U) C. Other Program Funding Summary (\$ in Millions)

<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>Cost to</u>	<u>Total Cost</u>
<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	

(U) Related Activities:

PE 0601102F, Defense Research Sciences.

(U) D. Acquisition Strategy

Not Applicable.