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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 1: <i>Basic Research</i>					R-1 Program Element (Number/Name) PE 0601103F / <i>University Research Initiatives</i>							
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	172.379	196.502	162.403	0.000	162.403	-	-	-	-	-	-
615094: <i>University Research Initiatives</i>	-	172.379	196.502	162.403	0.000	162.403	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program supports defense-related basic research in a wide range of scientific and engineering disciplines relevant to maintaining U.S. military technology superiority. Research topics include, but are not limited to, transformational and high priority technologies such as nanotechnology, sensor networks, artificial intelligence and information fusion, smart materials and structures, quantum materials and processes for sensing, communication and computing, efficient energy and power conversion, and high-energy materials for propulsion and control. The program also enhances and promotes the education of U.S. scientists and engineers in disciplines critical to maintaining, advancing, and enabling future U.S. defense technologies. For example, the National Defense Science and Engineering Graduate program awards fellowships to train U.S citizens in science and engineering disciplines of military importance under a joint tri-Service and Office of the Assistant Secretary of Defense for Research and Engineering competitive scholarship program. Finally, this program 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 inter-disciplinary efforts. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. The use of program funds in this PE would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 0602298F and 1206601SF.

Funds in this PE may be used to investigate specified science advancements in air, space and/or cyber domains.

This program is in Budget Activity 1, Basic Research because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.

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B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	178.859	161.861	165.083	0.000	165.083
Current President's Budget	172.379	196.502	162.403	0.000	162.403
Total Adjustments	-6.480	34.641	-2.680	0.000	-2.680
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	35.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-6.480	0.000			
• Other Adjustments	0.000	-0.359	-2.680	0.000	-2.680

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 615094: *University Research Initiatives*

Congressional Add: *Program Increase - Basic Research*

Congressional Add: *Program increase - university research initiatives*

Congressional Add: *Program increase - solar block research*

Congressional Add: *Program increase - hypersonic supply chain research*

Congressional Add: *Program increase - gigahertz - terahertz electronics and material research*

Congressional Add Subtotals for Project: 615094

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	19.488	-
	-	15.000
	-	5.000
	-	5.000
	-	10.000
Congressional Add Subtotals for Project: 615094	19.488	35.000
Congressional Add Totals for all Projects	19.488	35.000

Change Summary Explanation

Decrease in FY 2022 of \$0.077 million is due to civilian pay reprice adjustments and reduced emphasis in University Research Initiatives projects/efforts based on higher Department of Defense and Department of the Air Force priorities.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
Title: Multidisciplinary University Research Initiative	84.090	88.826	89.322
Description: Promote fundamental, multi- and interdisciplinary science and engineering research projects involving multiple principal investigators.			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>FY 2021 Plans: Fund competitive research grants at U.S. universities that focus on significantly expanding the basic knowledge of Department of the Air Force-relevant science and technology areas, not normally achievable in smaller funded, single investigator awards. Support and recognize superior academic researchers in the early stages of their careers through the Presidential Early Career Award for Scientists and Engineers program. Fund existing multi-year awards of multi-disciplinary programs.</p> <p>FY 2022 Plans: Enhance the program and continue funding competitive research grants at U.S. universities that focus on significantly expanding the basic knowledge of Department of the Air Force-relevant science and technology areas, not normally achievable in smaller funded, single investigator awards. Continue to support and recognize superior academic researchers in the early stages of their careers through the Presidential Early Career Award for Scientists and Engineers program. Continue funding of existing multi-year awards of multi-disciplinary programs.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 increased compared to FY 2021 by \$0.496 million. Funding increased due to added emphasis in Multidisciplinary University Research Initiative research.</p>				
<p>Title: Science and Engineering Education</p> <p>Description: Support post-graduate, graduate, and undergraduate education in science and engineering disciplines at U.S. universities.</p> <p>FY 2021 Plans: Award highly competitive National Defense Science and Engineering Graduate fellowships. Support competitive awards for graduate and undergraduate research experiences, including those established under the Awards to Stimulate and Support Undergraduate Research Experiences program. Fund awards initiated under prior year DoD programs.</p> <p>FY 2022 Plans: Enhance the program and continue to award highly competitive National Defense Science and Engineering Graduate fellowships. Continue to support competitive awards for graduate and undergraduate research experiences, including those established under the Awards to Stimulate and Support Undergraduate Research Experiences program. Continue funding for awards initiated under prior year DoD programs.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 increased compared to FY 2021 by \$0.315 million. Funding increased due to added emphasis in Science and Engineering Education research.</p>		53.512	56.526	56.841
<p>Title: Research Instrumentation</p>		15.289	16.150	16.240

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>Description: Enhance scientific and engineering research through advanced education infrastructure and instrumentation at U.S. universities.</p> <p>FY 2021 Plans: Award grants on a competitive basis under the Defense University Research Instrumentation Program to U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities.</p> <p>FY 2022 Plans: Enhance the program and continue to award grants on a competitive basis under the Defense University Research Instrumentation Program to U.S. universities to acquire state-of-the-art, high technology instrumentation and infrastructure to enhance research and educational capabilities.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 increased compared to FY 2021 by \$0.090 million. Funding increased due to added emphasis in Research Instrumentation research.</p>			
Accomplishments/Planned Programs Subtotals	152.891	161.502	162.403

	FY 2020	FY 2021
Congressional Add: Program Increase - Basic Research	19.488	-
FY 2020 Accomplishments: Conducted Congressionally directed effort		
Congressional Add: Program increase - university research initiatives	-	15.000
FY 2021 Plans: Conduct Congressionally directed effort		
Congressional Add: Program increase - solar block research	-	5.000
FY 2021 Plans: Conduct Congressionally directed effort		
Congressional Add: Program increase - hypersonic supply chain research	-	5.000
FY 2021 Plans: Conduct Congressionally directed effort		
Congressional Add: Program increase - gigahertz - terahertz electronics and material research	-	10.000
FY 2021 Plans: Conduct Congressionally directed effort		
Congressional Adds Subtotals	19.488	35.000

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D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A