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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 1: Basic Research</i>	R-1 Program Element (Number/Name) PE 0601103F / <i>University Research Initiatives</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	178.083	187.403	171.192	0.000	171.192	173.509	147.513	124.889	132.547	Continuing	Continuing
615094: <i>University Research Initiatives</i>	-	178.083	187.403	171.192	0.000	171.192	173.509	147.513	124.889	132.547	Continuing	Continuing

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 and technology capabilities. The use of program funds in this PE would be in addition to the civilian pay expenses budgeted in program elements 0602020F, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 1206601SF, and 0602298F.

Funds in this program element 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	196.502	162.403	0.000	0.000	0.000
Current President's Budget	178.083	187.403	171.192	0.000	171.192
Total Adjustments	-18.419	25.000	171.192	0.000	171.192
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	25.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-10.674	0.000			
• SBIR/STTR Transfer	-1.271	0.000			
• Other Adjustments	-6.474	0.000	171.192	0.000	171.192

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

Project: 615094: *University Research Initiatives*

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: *Program increase: Defense university research instrumentation program*

Congressional Add Subtotals for Project: 615094

Congressional Add Totals for all Projects

	FY 2021	FY 2022
Congressional Add: <i>Program increase - university research initiatives</i>	14.456	-
Congressional Add: <i>Program increase - solar block research</i>	4.818	-
Congressional Add: <i>Program increase - hypersonic supply chain research</i>	4.818	-
Congressional Add: <i>Program increase - gigahertz - terahertz electronics and material research</i>	9.637	-
Congressional Add: <i>Program increase: Defense university research instrumentation program</i>	0.000	25.000
Congressional Add Subtotals for Project: 615094	33.729	25.000
Congressional Add Totals for all Projects	33.729	25.000

Change Summary Explanation

Decrease in FY 2021 reflects adjustments and reprogramming to support Research and Development Projects, 10 U.S.C. Section 2363, an amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B).

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Multidisciplinary University Research Initiative	79.218	89.322	92.444

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Promote fundamental, multi- and interdisciplinary science and engineering research projects involving multiple principal investigators.</p> <p>FY 2022 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 2023 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 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased compared to FY 2022 by \$3.122 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 2022 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 2023 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 2022 to FY 2023 Increase/Decrease Statement:</p>		50.412	56.841	61.629

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 increased compared to FY 2022 by \$4.788 million. Funding increased due to added emphasis in Science and Engineering Education.			
Title: Research Instrumentation	14.724	16.240	17.119
Description: Enhance scientific and engineering research through advanced education infrastructure and instrumentation at U.S. universities.			
FY 2022 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.			
FY 2023 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.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increased compared to FY 2022 by 0.879 million. Funding increased due to added emphasis in Research Instrumentation.			
Accomplishments/Planned Programs Subtotals	144.354	162.403	171.192

	FY 2021	FY 2022
Congressional Add: Program increase - university research initiatives	14.456	-
FY 2021 Accomplishments: Conducted Congressionally directed effort		
Congressional Add: Program increase - solar block research	4.818	-
FY 2021 Accomplishments: Conducted Congressionally directed effort.		
Congressional Add: Program increase - hypersonic supply chain research	4.818	-
FY 2021 Accomplishments: Conducted Congressionally directed effort		
Congressional Add: Program increase - gigahertz - terahertz electronics and material research	9.637	-
FY 2021 Accomplishments: Conducted Congressionally directed effort		
Congressional Add: Program increase: Defense university research instrumentation program	0.000	25.000

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	FY 2021	FY 2022
FY 2021 Accomplishments: Not Applicable		
FY 2022 Plans: Conducted Congressionally directed effort		
Congressional Adds Subtotals	33.729	25.000

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

N/A

Remarks

E. Acquisition Strategy

Not Applicable