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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2019 Navy	<b>Date:</b> February 2018
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<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 1: Basic Research</i>	<b>R-1 Program Element (Number/Name)</b> PE 0601103N / <i>University Research Initiatives</i>											
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	0.000	117.320	118.130	119.433	-	119.433	117.552	117.498	119.822	122.258	Continuing	Continuing
0000: <i>University Research Initiatives</i>	0.000	97.977	118.130	119.433	-	119.433	117.552	117.498	119.822	122.258	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	19.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.343

**A. Mission Description and Budget Item Justification**

This program includes support for multidisciplinary basic research in a wide range of scientific and engineering disciplines that enable the U.S. Navy to maintain technological superiority, and for university research infrastructure to acquire research instrumentation needed to maintain and improve the quality of university research important to the Navy. Multidisciplinary University Research Initiative (MURI) efforts involve teams of researchers investigating high priority topics and opportunities that intersect more than one traditional technical discipline. For many military problems this multidisciplinary approach serves to stimulate innovation, accelerate research progress and expedite transition of results into Naval applications. The Defense University Research Instrumentation Program (DURIP) supports university research infrastructure essential to high quality, Navy-relevant research. The instrumentation program complements other Navy research programs by supporting the purchase of high cost research instrumentation that is necessary to carry out cutting-edge research. The program supports Presidential Early Career Awards for Scientists and Engineers (PECASE), single investigator research efforts performed by outstanding academic scientists and engineers early in their research careers. This program provides the knowledge base, scientific concepts, and technological advances for the maintenance of Naval power and national security.

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>
Previous President's Budget	101.714	118.130	120.233	-	120.233
Current President's Budget	117.320	118.130	119.433	-	119.433
Total Adjustments	15.606	0.000	-0.800	-	-0.800
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.394	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.800	-	-0.800
• Congressional Add Adjustments	20.000	-	-	-	-

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<b>Congressional Add Details (\$ in Millions, and Includes General Reductions)</b>		<b>FY 2017</b>	<b>FY 2018</b>
<b>Project:</b> 9999: <i>Congressional Adds</i>			
Congressional Add: <i>Program Increase</i>		19.343	0.000
Congressional Add Subtotals for Project: 9999		19.343	0.000
Congressional Add Totals for all Projects		19.343	0.000
<b><u>Change Summary Explanation</u></b>			
The funding increase from FY 2018 to FY 2019 reflects additional DURIP, MURI, and PECASE awards.			
The FY 2019 funding request was reduced by \$0.443 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.			
Technical: N/A			
Schedule: N/A			

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Appropriation/Budget Activity 1319 / 1					R-1 Program Element (Number/Name) PE 0601103N / University Research Initiatives				Project (Number/Name) 0000 / University Research Initiatives			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0000: University Research Initiatives	0.000	97.977	118.130	119.433	-	119.433	117.552	117.498	119.822	122.258	Continuing	Continuing
A. Mission Description and Budget Item Justification												
This project includes support for multidisciplinary basic research in a wide range of scientific and engineering disciplines that are important for maintaining the technological superiority of the U.S. Navy, and for university research infrastructure to acquire instrumentation needed to maintain and improve the quality of university research important to the Navy. MURI efforts involve teams of researchers investigating high priority topics that intersect more than one traditional technical discipline. For many military problems this multidisciplinary approach serves to stimulate innovation, accelerate research progress, and expedite transition of results into Naval applications. The DURIP project supports university research infrastructure essential to high quality, Navy-relevant research. The instrumentation project complements other Navy research programs by supporting the purchase of high cost research instrumentation that is necessary to carry out cutting-edge research. The PECASE project supports single-investigator research efforts performed by outstanding academic scientists and engineers early in their research careers. This project provides the knowledge base, scientific concepts, and technological advances for the maintenance of Naval power and national security.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: DEFENSE UNIVERSITY RESEARCH INSTRUMENTATION PROGRAM (DURIP)								33.454	23.022	23.774	0.000	23.774
Description: DURIP funds are provided to universities to purchase relatively high cost research instrumentation that is normally not included in single-investigator type research grants. Individual grants range from \$50K to \$1.5M. The DURIP program is an Office of the Secretary of Defense (OSD) interest item and OSD directs that funding for the DURIP efforts be awarded after OSD announces the awardees, which typically takes place towards the second half of the fiscal year. In turn, universities need to purchase the instrumentation and take delivery before any billings are generated. It frequently takes several months for delivery and billing to be completed. DURIP is a one year program.												
FY 2018 Plans: Continue to support university research infrastructure essential to high-quality naval-relevant research.												
FY 2019 Base Plans: Continue to support university research infrastructure essential to high-quality naval-relevant research.												
FY 2019 OCO Plans:												

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Appropriation/Budget Activity 1319 / 1	R-1 Program Element (Number/Name) PE 0601103N / University Research Initiatives	Project (Number/Name) 0000 / University Research Initiatives				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A						
FY 2018 to FY 2019 Increase/Decrease Statement: There is no significant change between FY 2018 and FY 2019.						
Title: MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE (MURI)  Description: Research efforts include high priority topics that intersect more than one traditional discipline. MURI topics are selected to address Naval Science and Technology (S&T) Focus Areas as described in the Naval Research and Development Framework. The MURI program is an OSD interest item and OSD directs that funding for the MURI efforts be awarded after OSD announces the awardees, which typically takes place towards the second half of the fiscal year. Since the MURI program funds academic researchers, execution of the efforts typically ramps up during the summer academic break months. MURI projects make significant contributions to Navy and DoD objectives by; speeding up scientific programs by cross-fertilization of ideas, hastening the transition of basic research to practical applications, and training students in cross-disciplinary approaches to science and engineering research of importance to DoD. MURI is a five year program.  FY 2018 Plans: - Continued to support teams of researchers investigating high priority topics and opportunities thru competition for new MURI awards to address selected high priority Naval S&T areas, transformational initiatives, and grand challenges, including strategically important DoD research areas that intersect more than one traditional technical discipline.  FY 2019 Base Plans: - Continue to support teams of researchers investigating high priority topics and opportunities thru competition for new MURI awards to address selected high priority Naval S&T areas, transformational initiatives, and grand challenges, including strategically important DoD research areas that intersect more than one traditional technical discipline.  FY 2019 OCO Plans: N/A  FY 2018 to FY 2019 Increase/Decrease Statement: There is no significant change between FY 2018 and FY 2019.		60.435	86.438	86.706	0.000	86.706
Title: PRESIDENTIAL EARLY CAREER AWARDS (PECASE)		4.088	8.670	8.953	0.000	8.953

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>
<p><b>Description:</b> PECASE awards are made to academic scientists early in their research careers for extremely prestigious, single-investigator research in areas of vital importance to the Navy. Awards provide national recognition and research grants of up to \$200K per year for five years. OSD, with policy and oversight responsibility for the PECASE program, directed that the number of PECASE awards be set at four new awards per year. PECASE is a five year program.</p> <p><b>FY 2018 Plans:</b> Continue to award four new awards per OSD guidance for recognizing and honoring extraordinary achievements of young professionals at the outset of their independent research careers in Science and Technology</p> <p><b>FY 2019 Base Plans:</b> Continue to award four new awards per OSD guidance for recognizing and honoring extraordinary achievements of young professionals at the outset of their independent research careers in Science and Technology.</p> <p><b>FY 2019 OCO Plans:</b> N/A</p> <p><b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> There is no significant change between FY 2018 and FY 2019.</p>						
<b>Accomplishments/Planned Programs Subtotals</b>		97.977	118.130	119.433	0.000	119.433
<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> This University Research Initiative seeks to improve the quality of defense research conducted by universities and supports the education of engineers and scientists in disciplines critical to national defense needs. The initiative is a collection of specialized research programs performed by academic research institutions. Individual project metrics are tailored to the needs of specific applied research and advanced development programs. Example metrics include extending the life of Thermal Barrier Coatings for transition to the Enterprise and Platform Enablers Future Naval Capability program. It is projected that the life time of Thermal Barrier Coating on Turbine						

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<p>Blades can be doubled. The National Research Council of the National Academies of Science and Engineering's Congressionally directed "Assessment of Department of Defense Basic Research" concluded that the DoD is managing its basic research program effectively.</p>		

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<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
9999: Congressional Adds	0.000	19.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.343

**A. Mission Description and Budget Item Justification**  
 This congressional increase furthers the Navy's efforts to support multidisciplinary basic research in a wide range of scientific and engineering disciplines that enable the U.S. Navy to maintain technological superiority. Through this increase, additional Multidisciplinary University Research Initiative (MURI), Defense University Research Instrumentation Program (DURIP) and Presidential Early Career Awards for Scientists and Engineers (PECASE) will be selected and funded.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2017</b>	<b>FY 2018</b>
<b>Congressional Add:</b> Program Increase	19.343	0.000
<b>FY 2017 Accomplishments:</b> This increase in Congressional funding furthers the U. S. Navy's efforts to support multidisciplinary basic research in a wide range of scientific and engineering disciplines that enable the U.S. Navy to maintain its technological superiority. Through this increase, additional Multidisciplinary University Research Initiative (MURI) awards, Defense University Research Instrumentation Program (DURIP) awards, and Presidential Early Career Awards for Scientists and Engineers (PECASE) will be selected and funded.		
<b>FY 2018 Plans:</b> N/A		
<b>Congressional Adds Subtotals</b>	19.343	0.000

**C. Other Program Funding Summary (\$ in Millions)**  
 N/A

**Remarks**

**D. Acquisition Strategy**  
 N/A

**E. Performance Metrics**  
 This University Research Initiative seeks to improve the quality of defense research conducted by universities and supports the education of engineers and scientists in disciplines critical to national defense needs.