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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy	Date: May 2017
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 1: Basic Research</i>					R-1 Program Element (Number/Name) PE 0601103N / <i>University Research Initiatives</i>							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	0.000	140.998	101.714	118.130	-	118.130	120.233	118.388	118.397	120.765	Continuing	Continuing
0000: <i>University Research Initiatives</i>	0.000	112.033	101.714	118.130	-	118.130	120.233	118.388	118.397	120.765	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	28.965	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.965

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. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	146.196	101.714	120.481	-	120.481
Current President's Budget	140.998	101.714	118.130	-	118.130
Total Adjustments	-5.198	0.000	-2.351	-	-2.351
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.198	0.000			
• Program Adjustments	0.000	0.000	-2.351	-	-2.351
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

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<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u> Project: 9999: <i>Congressional Adds</i> Congressional Add: <i>Program Increase</i>	FY 2016	FY 2017
	28.965	0.000
Congressional Add Subtotals for Project: 9999	28.965	0.000
Congressional Add Totals for all Projects	28.965	0.000

Change Summary Explanation

The FY 2017 funding request was reduced by -\$12.4 million as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The funding increase from FY 2017 to FY 2018 reflects additional DURIP, MURI, and PECASE awards.

Technical: N/A

Schedule: N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy										Date: May 2017		
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0000: University Research Initiatives	0.000	112.033	101.714	118.130	-	118.130	120.233	118.388	118.397	120.765	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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: DEFENSE UNIVERSITY RESEARCH INSTRUMENTATION PROGRAM (DURIP)								21.317	20.557	23.022	0.000	23.022
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.												
The FY 2018 increase reflects an additional number of DURIP awards.												
FY 2016 Accomplishments: - Continued competition for research instrumentation awards to universities.												
FY 2017 Plans:												

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B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>- Continue all efforts of FY 2016.</p> <p>FY 2018 Base Plans: Continue to support university research infrastructure essential to high-quality naval-relevant research.</p> <p>FY 2018 OCO Plans: N/A</p>					
<p>Title: MULTIDISCIPLINARY UNIVERSITY RESEARCH INITIATIVE (MURI)</p> <p>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 S&T Strategic Plan. 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.</p> <p>The FY 2018 increase reflects an additional number of MURI awards.</p> <p>FY 2016 Accomplishments: - Continued 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. Approximately eight high priority research topics will be identified for publication in a BAA to solicit proposals. - Continued MURI projects begun in prior years.</p> <p>FY 2017 Plans: - Continue all efforts of FY 2016.</p> <p>FY 2018 Base Plans: Continue to support teams of researchers investigating high priority topics and opportunities that intersect more than one traditional technical discipline</p> <p>FY 2018 OCO Plans:</p>					
	82.039	73.416	86.438	0.000	86.438

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B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: PRESIDENTIAL EARLY CAREER AWARDS (PECASE) Description: 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. The FY 2018 increase is to provide additional funding to ongoing PECASE research awards. FY 2016 Accomplishments: - Selected six outstanding university researchers to receive the five-year PECASE research award to conduct research of importance to the Navy. - Continued PECASE programs begun in earlier years. FY 2017 Plans: - Continue all efforts of FY 2016, and award four new awards per OSD guidance. FY 2018 Base Plans: 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 FY 2018 OCO Plans: N/A	8.677	7.741	8.670	0.000	8.670
Accomplishments/Planned Programs Subtotals	112.033	101.714	118.130	0.000	118.130
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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E. Performance Metrics <p>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 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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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	28.965	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.965

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. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017
Congressional Add: Program Increase FY 2016 Accomplishments: - Expanded the competition for new Multidisciplinary University Research Initiative (MURI) awards to address selected high priority Naval S&T areas, transformational initiatives, and grand challenges, including strategically important DoD research areas. - Expanded the competition for new Defense University Research Instrumentation Program (DURIP) awards to universities. - Funded an outstanding university researcher in receiving the five-year Presidential Early Career Award for Scientists and Engineers (PECASE) research award to conduct research of importance to the Navy. FY 2017 Plans: N/A	28.965	0.000
Congressional Adds Subtotals	28.965	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.