Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy												Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 1: *Basic Research*					R-1 Program Element (Number/Name) PE 0601103N *I University Research Initiatives*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	169.965	147.376	96.355	-	96.355	100.308	104.480	108.780	112.940	Continuing	Continuing
0000: *University Research Initiatives*	0.000	114.506	90.076	96.355	-	96.355	100.308	104.480	108.780	112.940	Continuing	Continuing
9999: *Congressional Adds*	0.000	55.459	57.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	112.759

A. Mission Description and Budget Item Justification

The Office of Naval Research's (ONR) mission is to ensure the technological advantage of U.S. Naval forces. ONR fosters scientific research necessary for the discovery, development and delivery of new technologies. Often this research is done in partnership with academia. This program includes support for multidisciplinary basic research in a wide range of naval relevant scientific and engineering disciplines that enables the U.S. Navy to maintain technological superiority, for the university research infrastructure to acquire the research instrumentation needed to maintain and improve the quality of university research important to the Navy, and for the graduate students and postdoctoral fellows who will lead DON S&T efforts in the future. 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 lay the foundations for 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. This program supports Presidential Early Career Awards for Scientists and Engineers (PECASE) which are 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. The ONR Graduate Student and Postdoctoral Fellow Support project supports the participation of graduate students and postdoctoral fellows in DON-related research. These graduate students and postdoctoral fellows will be the future leaders in areas of science, technology, engineering and mathematics (STEM) critical to DON, DOD and national security.

The missions of today's Sailors and Marines are enabled by the results of naval Science and Technology (S&T). Since 1946, the Office of Naval Research (ONR) has fostered scientific research related to the maintenance of maritime superiority and national defense. ONR manages the Department of the Navy's (DON) portfolio of naval Basic and Applied research, and Advanced Technology Development investments to ensure naval forces can effectively deter conflict, but when called upon, fight, win and come home safe. Current investments hedge against uncertainty, providing solutions to commanders today, and options for the future. The Naval S&T budget supports higher guidance defined by the National Defense Strategy, and responds to requirements identified by the Secretary of the Navy through research priorities set by the Chief of Naval Research, coordinated across the Naval Research Enterprise (NRE), and outlined in the Naval R&D Framework.

This Program Element (PE) funds Basic Research, typically defined as systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. The work in this PE can be classified between Technology Readiness Level (TRL) 1 (basic principles observed and reported) and TRL 2 (technology concept and/or application formulation).

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601103N *I University Research Initiatives*

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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	174.898	90.076	122.489	-	122.489
Current President's Budget	169.965	147.376	96.355	-	96.355
Total Adjustments	-4.933	57.300	-26.134	-	-26.134
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	57.300			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.006	0.000			
• SBIR/STTR Transfer	-4.933	0.000			
• Program Adjustments	0.000	0.000	-26.134	-	-26.134
• Rate/Misc Adjustments	0.006	0.000	0.000	-	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 9999: *Congressional Adds*		
Congressional Add: *Defense University Research Instrumentation Program*	33.787	30.000
Congressional Add: *University research initiatives*	9.654	0.000
Congressional Add: *Coastal adapt. Res. for imp. coastal comm. and NWS earle military install. Resil*	0.434	0.000
Congressional Add: *Navy aircraft fleet readiness and sustainment*	7.723	0.000
Congressional Add: *Biocoherent energy transfer research*	3.861	0.000
Congressional Add: *All digitall arrays for long-distance application power maximization*	0.000	9.800
Congressional Add: *Artificial intelligence maritime maneuvering*	0.000	5.000
Congressional Add: *Enhancing installation resiliency at NWS Earle*	0.000	2.500
Congressional Add: *Defense research initiatives*	0.000	10.000
Congressional Add Subtotals for Project: 9999	55.459	57.300
Congressional Add Totals for all Projects	55.459	57.300

Change Summary Explanation

Funding: $26.134M decrease for S&T compliance to the Defense Planning Guidance

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601103N *I University Research Initiatives*

Technical: No significant change

Schedule: No significant change

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy											Date: March 2023	
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 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
0000: *University Research Initiatives*	0.000	114.506	90.076	96.355	-	96.355	100.308	104.480	108.780	112.940	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Office of Naval Research's (ONR) mission is to ensure the technological advantage of U.S. Naval forces. ONR fosters scientific research necessary for the discovery, development and delivery of new technologies. Often this research is done in partnership with academia. This program includes support for multidisciplinary basic research in a wide range of naval relevant scientific and engineering disciplines that enables the U.S. Navy to maintain technological superiority and for the university research infrastructure to acquire the 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 lay the foundation for transition of results into Naval applications. The Defense University Research Instrumentation Program (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. The ONR Graduate Student and Postdoctoral Fellow Support project supports the participation of graduate students and postdoctoral fellows in DON-related research. These graduate students and postdoctoral fellows will be the future leaders in areas of science, technology, engineering and mathematics (STEM) critical to DON, DOD 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. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Defense University Research Instrumentation Program (DURIP)	23.079	17.989	17.478	0.000	17.478
Description: DURIP funds are awarded to universities to purchase relatively high cost research instrumentation that is normally not included in single-investigator research grants. Individual grants range from $50K to $1.5M. Funding for DURIP efforts is awarded after the Office of the Secretary of Defense (OSD) selects and 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 billing occurs. It frequently takes several months for delivery and billing to be completed. DURIP is a one-year program, so awards are notionally initiated and completed within the same fiscal year.					
FY 2023 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Funds will be awarded to support purchase or development of instrumentation to enhance Basic Research in various technical areas such as Micro-3-dimensional Printed Ion Traps, Networked Sensors for Observing the Air-Sea Interface, Atomic and Molecular Investigation of Corrosion for Prevention and Control, Atomic and Molecular Investigation of Corrosion for Prevention and Control, Versatile Legged Robots for Open-World Human-Robot Interaction in Mixed Initiative Teams, Interactions of Supersonic Projectiles with Large Droplets and Aerosol-laden Flows ***FY 2024 Base Plans:*** Continue to fund awards to support purchase or development of instrumentation to enhance ONR basic research efforts across the S&T spectrum, to include workforce development of students and postdoctoral fellows. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding decrease from FY23 to FY24 reflects reduced demand for DURIP grants resulting from delayed university execution to prior awards. Fewer FY24 new DURIP awards are anticipated.					
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) Framework Priorities as described in the Naval Research and Development Framework. Funding for MURI efforts is awarded after Office of the Secretary of Defense (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 ramp up during the summer months. MURI projects make significant contributions to Navy and Department of Defense (DOD) objectives by speeding up scientific programs, by cross-fertilization of ideas, by hastening the transition of basic research to practical applications, and by training students in cross-disciplinary approaches to science and engineering research of importance to DoD. MURI projects are five-year programs. ***FY 2023 Plans:*** Continue to support research grants initiated in FY22 in the areas of Topologically-Protected Quantum Information, Molecular Doping of Organic Electronic Materials, Learning from Hearing, Hydrodynamics of Fish Schooling, Self-learning for Real-world Perception, Fundamental Non-equilibrium Processes in Weakly Ionized Hypersonic Flows, Understanding of Detonation Based Combustion in Multiphase Mixtures, Bioinspired Design	80.098	63.257	75.000	0.000	75.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
of Energy-Self Sufficient Multi-functional Soft Material Systems, Systems-Level Foundations for Agile, Dynamic, and Ad Hoc Human Autonomy Teams, Environmental DNA-based Monitoring of the Marine Environment Continue to support multidisciplinary research in areas such as molecular qubits, computer vision, ocean dynamics off rocky coasts, thermal transport, super-hard materials, social cyber-attack in social media, control theory of safe, cognitive, and learning systems. ***FY 2024 Base Plans:*** Continue conducting research activities within forty-seven on-going multidisciplinary topic areas. Complete planned research efforts in the following thirteen multidisciplinary topic areas: - Self-assessment and Understanding of Competence and Conditions to Ensure System Success - Blueprint for design and assembly of multifunctional, adaptive materials using nanocrystals - Leveraging a New Theoretical Paradigm to Enhance Interfacial Thermal Transport In Wide Bandgap Power - Rationalization of Liquid/Solid and Solid/Solid Interphase Instabilities During Thermal-Mechanical Transients of Metal Additive Manufacturing - Livtronics Living Electronics for Biologically-Enhanced Sensing, Computing, and Signal Transmission - Photomechanical Material Systems From Molecules to Devices - Synthesis Planning and Reaction Discovery For Photochemistry and Chemistry in Novel Environments - Theoretical Foundations of Deep Learning - Classical Entanglement in Structured Optical Fields - Integrated Foundations of Sensing, Modeling, and Data Assimilation for Sea Ice Prediction - Specialization of neural processing during active acoustic sensing in marine mammals and humans - Informatics-Driven Design of Resilient and Deploymerizable Polymers - Identifying Adverse Modes via Human-Machine Cybernetic Modeling Initiate twelve new multidisciplinary research efforts. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The increase from FY23 to FY24 supports initiation of twelve multidisciplinary efforts.					
Title: Presidential Early Career Awards (PECASE)	8.693	6.775	2.090	0.000	2.090

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
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, awards a minimum of four new awards per year. PECASE is a five year program. ***FY 2023 Plans:*** - Continue to fund new basic research projects in Naval priority areas. - Continue to support previous year ongoing basic research projects performed by early career investigators. ***FY 2024 Base Plans:*** Continue full support of early career scientists and engineers showing exceptional potential for leadership at the frontiers of scientific knowledge. - Continue funding of new basic research projects in Naval priority areas. - Continued commitment to support twelve previous year basic research projects being conducted by early career investigators. - Initiate two new PECASE awards. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Decrease from FY23 to FY24 is a reflection of a reduced number of PECASE awardees. All PECASE awardees are approved by the Office of the Secretary of Defense and the White House Office of Science and Technology Policy (OSTP).					
Title: Minerva Research Initiative (MRI) (Social Science Networking) ***Description:*** The Minerva Research Initiative is funded in partnership with the Office of the Secretary of Defense to support basic social science and multi-disciplinary research aimed at improving national security and international stability. The goals of this program are to enhance connections between DoD and academia and	2.636	2.055	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
build cultural and foreign area knowledge on topics ranging from the mechanisms of radicalization to geopolitical power projection strategies in a multi-polar world. ***FY 2023 Plans:*** Complete: Create novel techniques (e.g., social network analysis, social computational models, and, artificial Intelligence) that will enable the detection and source attribution of cyber malware incursions on large networked computer systems more quickly and accurately than is possible based on current manual approaches. Continue: Research large-data analytic techniques to detect and mitigate the occurrence of disinformation in social network systems more quickly and effectively than is currently possible. Techniques are sought that scale up to very large social networks and have the robustness to quickly adapt to emerging disinformation techniques. Discover mechanisms of crowd manipulation, social hysteria, rumor and propaganda. Initiate: Efforts to address novel conflict problems such as water security, malware, ransomware, social shifts relevant to national security issues, hybrid warfare and other novel conflict problems. This will include influence operations and social media threat vectors for information operations, recruitment and training issues and identity management. ***FY 2024 Base Plans:*** All Activities funded under the Minerva Research Initiative will be moved to Defense Research Sciences PE 0601153N starting in FY 2024. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Decrease from FY23 to FY24 reflects the transfer of requirements and associated funding for the Minerva Research Initiative to the Defense Research Sciences PE 0601153N / Project 0000 in FY 2024. This transfer better represents the Basic Research focus and objectives of the Minerva Research Initiative.					
Title: Graduate Student and Postdoctoral Researcher Support ***Description:*** The Graduate Student and Postdoctoral Researcher Support Program helps to ensure the quality, vitality and diversity of the future DoN scientific and engineering workforce. The program supports graduate students and postdoctoral fellows engaged in DoN-related research activities in high priority naval science,	0.000	0.000	1.787	0.000	1.787

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
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 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
technology, engineering and mathematics (STEM) disciplines at U.S. institutions, its territories, or possessions, or the Commonwealth of Puerto Rico. ***FY 2023 Plans:*** N/A ***FY 2024 Base Plans:*** Initiate Graduate Student and Postdoctoral Researcher support in the following priority naval mission areas: - Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting - Ocean Battlespace Sensing - Sea Warfare and Weapons - Warfighter Performance - Air Warfare and Weapons ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** The FY23 to FY24 increase reflects Naval leadership commitment and priority to the continued development, diversity, vitality and quality of the future naval research and engineering workforce.					
Accomplishments/Planned Programs Subtotals	114.506	90.076	96.355	0.000	96.355

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 1	R-1 Program Element (Number/Name) PE 0601103N / *University Research Initiatives*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	55.459	57.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	112.759

A. Mission Description and Budget Item Justification

Congressional Interest Items not included in other Projects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
Congressional Add: Defense University Research Instrumentation Program ***FY 2022 Accomplishments:*** Purchase instrumentation and equipment used to enhance university research in the areas of photonics; materials included high-temperature materials, soft multi-material structures, and photomechanical materials; autonomous and robotic systems; optical quantum information; oceanography; electronics; atmospheric turbulence; and distributed energy. ***FY 2023 Plans:*** Purchase instrumentation and equipment used to enhance university research in the areas of photonics; materials included high-temperature materials, soft multi-material structures, and photomechanical materials; autonomous and robotic systems; optical quantum information; oceanography; electronics; atmospheric turbulence; and distributed energy.	33.787	30.000
Congressional Add: University research initiatives ***FY 2022 Accomplishments:*** Support collaborative university research into the understanding, detection, and prevention of Traumatic Brain Injuries. Also, support grants to purchase instrumentation and equipment to enhance university basic research. ***FY 2023 Plans:*** N/A	9.654	0.000
Congressional Add: Coastal adapt. Res. for imp. coastal comm. and NWS earle military install. Resil ***FY 2022 Accomplishments:*** The funding will be used by Monmouth university, in conjunction with Naval Weapons Station Earle, to advance coastal community resilience projects identified in the Raritan/Sandy Hook Bay Coastal Resilience Planning Study - a joint study conducted by Naval Weapons Station Earle, Monmouth County Division of Planning, Monmouth University, and eight coastal communities.	0.434	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 1	**R-1 Program Element (Number/Name)** PE 0601103N / *University Research Initiatives*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023
Accomplishments: Conduct a joint study between Naval Weapons Station Earle, Monmouth County Division of Planning, Monmouth University, and eight coastal communities to advance coastal community resilience projects identified in the Raritan/Sandy Hook Bay Coastal Resilience Planning Study. ***FY 2023 Plans:*** N/A		
Congressional Add: Navy aircraft fleet readiness and sustainment ***FY 2022 Accomplishments:*** Navy aircraft fleet readiness and sustainment basic research ***FY 2023 Plans:*** N/A	7.723	0.000
Congressional Add: Biocoherent energy transfer research ***FY 2022 Accomplishments:*** Conduct Biocoherent energy transfer basic research ***FY 2023 Plans:*** N/A	3.861	0.000
Congressional Add: All digitall arrays for long-distance application power maximization ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Conduct research in all digital arrays for long-distance application power maximization.	0.000	9.800
Congressional Add: Artificial intelligence maritime maneuvering ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Conduct research in artificial intelligence maritime maneuvering.	0.000	5.000
Congressional Add: Enhancing installation resiliency at NWS Earle ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Conduct research in enhancing installation resiliency.	0.000	2.500
Congressional Add: Defense research initiatives ***FY 2022 Accomplishments:*** N/A ***FY 2023 Plans:*** Conduct basic research in new areas through defense research initiatives.	0.000	10.000
Congressional Adds Subtotals	55.459	57.300

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 1	**R-1 Program Element (Number/Name)** PE 0601103N / *University Research Initiatives*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A