Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force											Date: February 2018	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 1: *Basic Research*					R-1 Program Element (Number/Name) PE 0601108F / *High Energy Laser 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**
Total Program Element	-	13.224	14.417	14.506	0.000	14.506	14.795	15.090	15.397	15.708	Continuing	Continuing
615097: *High Energy Laser Research Initiatves*	-	13.224	14.417	14.506	0.000	14.506	14.795	15.090	15.397	15.708	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense high energy laser systems through the Joint Directed Energy Transition Office. This program funds multi-disciplinary research institutes to conduct research on laser and beam control technologies. In addition, this program supports educational grants to stimulate student interest in high energy lasers and encourage graduate research in topics related to high energy lasers. These educational grants are used for educational tools, scholarships, and summer intern employees in military laboratories. 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, 0602601F, 0602602F, 0602605F, 0602788F, 1206601F, and 0602298F.

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.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	14.168	14.417	14.615	0.000	14.615
Current President's Budget	13.224	14.417	14.506	0.000	14.506
Total Adjustments	-0.944	0.000	-0.109	0.000	-0.109
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-0.425	0.000			
• SBIR/STTR Transfer	-0.519	0.000			
• Other Adjustments	0.000	0.000	-0.109	0.000	-0.109

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: High Energy Laser Sources and Devices	6.228	6.717	6.711

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Description: Improve the fundamental understanding of high energy laser sources and devices, to include solid state, fiber, and gas laser technologies. ***FY 2018 Plans:*** Investigate innovative laser technologies in diode-pumped alkali lasers, short-pulse, fiber, and solid state laser technologies. Continue overseas efforts to leverage international technology advancements. ***FY 2019 Plans:*** Continue investigations into innovative laser technologies in diode-pumped alkali lasers, short-pulse, fiber, and solid state laser technologies. Continue overseas efforts to leverage international technology advancements. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Fiscal year (FY) 2019 decreased compared to FY 2018 by $0.006 million. Justification for this increase is described in plans above.			
Title: High Energy Laser Beam Control ***Description:*** Improve the fundamental understanding of beam control technologies as they relate to High Energy Laser applications. Conduct research in atmospheric characterization, metrology, control systems, algorithms and beam control component technology. ***FY 2018 Plans:*** Continue research on innovative beam control architectures. Continue overseas efforts to leverage international technology advancements. ***FY 2019 Plans:*** Continue research on innovative beam control architectures. Continue overseas involvement to leverage research developments and technology advancements. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to FY 2018 by $0.045 million. Justification for this increase is described in plans above.	5.796	6.500	6.545
Title: High Energy Laser Education ***Description:*** Fund educational grants to stimulate student interest in high energy lasers. ***FY 2018 Plans:***	1.200	1.200	1.250

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Provide scholarships and internships to support college students studying in fields related to high energy lasers. Provide grants to Service Academies to stimulate studies related to high energy lasers among military cadets. Fund publication of journals and support continuing education for professionals in the high energy laser field. ***FY 2019 Plans:*** Continue to provide scholarships and internships to support college students studying in fields related to high energy lasers. Provide grants to Service Academies to stimulate studies related to high energy lasers among military cadets. Fund publication of journals and support continuing education for professionals in the high energy laser field. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Fiscal year (FY) 2019 increased compared to FY 2018 by $0.050 million. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	13.224	14.417	14.506

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.