Fiscal Year:	FY 2007	**Task Last Updated:**	FY 05/29/2008
PI Name:	Newman, Dava J. Ph.D.		
Project Title:	Advanced EVA Biomedical & Energetics Performance and Space Suit Assessment		
Division Name:	Human Research		
Program/Discipline:	NSBRI Teams		
Program/Discipline--Element/Subdiscipline:	NSBRI Teams--Technology Development Team		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	None		
Human Research Program Risks:	(1) **EVA**:Risk of Injury and Compromised Performance Due to EVA Operations		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Cambridge	**State:**	MA
Zip Code:	02139-4301	**Congressional District:**	8
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	Directed Research
Start Date:	11/01/2006	**End Date:**	04/30/2008
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NSBRI
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NCC 9-58-TD00001		
Performance Goal No.:			
Performance Goal Text:			
	The primary aim of this advanced extravehicular activity (EVA) research effort is to collaborate with, support and leverage the ongoing EVA Crew Performance Project: Thermal and Physiological Support. The advanced EVA group at Massachusetts Institute of Technology (MIT) will analyze, model and perform human and spacesuit robotic testing to provide biomechanical and metabolic results to better understand human performance in partial gravity. There is a need to advance our understanding of locomotion and mobility requirements, EVA tasks (a day in the life of a lunar astronaut), and metabolic costs, all of which should drive the design of future EVA partial-gravity spacesuits. To support current advanced EVA biomedical and metabolic research and to provide modeling, data analysis and robotic spacesuit testing for partial-gravity exploration in support of human spaceflight, we will research in three related areas of our expertise to enhance our collective understanding of astronaut locomotion, human and robotic tools, and rigorous data analysis and modeling for exploration EVA.		

Task Description:	Specific Aims 1. Identify biomechanics and energetics knowledge gaps for EVA, provide data analysis support for ongoing NASA EVA experiments (underwater, pogo and parabolic flight), and perform enhanced MIT exoskeleton (EVA simulator) locomotion experiments. 2. Produce EVA dynamic analysis and modeling for partial gravity and simulated environments in collaboration with NASA Johnson Space Center (JSC). 3. Conduct human and robotic testing for advanced EVA motions utilizing the robotic spacesuit tester currently on loan to MIT from NASA, develop task-specific parametric analyses, and further EVA path planning capabilities by incorporating metabolic algorithms from JSC and enhancing the current MIT capability by incorporating numerous representative EVA tasks.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2007.
Bibliography Type:	Description: (Last Updated: 03/20/2019)