Fiscal Year:	FY 2019	**Task Last Updated:**	FY 10/30/2018
PI Name:	Dorneich, Michael Ph.D.		
Project Title:	Adaptive Stress Training for Hazardous Conditions		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HFBP**:Human Factors & Behavioral Performance (IRP Rev H)		
Human Research Program Risks:	(1) **BMed**:Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders (2) **HSIA**:Risk of Adverse Outcomes Due to Inadequate Human Systems Integration Architecture (3) **Medical Conditions**:Risk of Adverse Health Outcomes and Decrements in Performance Due to Medical Conditions that occur in Mission, as well as Long Term Health Outcomes Due to Mission Exposures		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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PI Organization Type:	UNIVERSITY	**Phone:**	515-294-8018
Organization Name:	Iowa State University, Ames		
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City:	Ames	**State:**	IA
Zip Code:	50011-2103	**Congressional District:**	4
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2017 HERO 80JSC017N0001-Crew Health and Performance (FLAGSHIP1, OMNIBUS). Appendix A-Flagship1, Appendix B-Omnibus
Start Date:	10/01/2018	**End Date:**	09/30/2019
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:**	NASA JSC
Contact Monitor:	Williams, Thomas	**Contact Phone:**	281-483-8773
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Franke, Warren Ph.D. (Iowa State University, Ames) Keren, Nir Ph.D. (Iowa State University, Ames) Vardeman, Stephen Ph.D. (Iowa State University, Ames)		
Grant/Contract No.:	80NSSC18K1572		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	On long duration spaceflights, astronauts will be responsible for remedying emergency situations. These situations may be life-threatening and highly stressful. Acute stress can have detrimental effects on attention, memory, perceptual-motor performance, judgement, and decision-making. The Human Research Program roadmap gap BMed1 calls for "...countermeasures that promote individual behavioral health and performance during exploratory class missions." While traditional emergency training practices are focused on performance outcomes, research into countermeasures should investigate stress-training techniques for acute stress in life-threatening situations to prevent adverse behavior and performance degradation. Recent advances in virtual reality (VR) environments provide the capability to simulate stressors over multiple sessions in a realistic task setting, until realistic stress levels are achieved. A virtual reality training system that is able to adapt based on the crew member's stress response may help foster resilience. By measuring participant's physiological and performance metrics, the adaptive system would allow graduated exposure of stress levels within a suitable biometric and performance ranges. Activating the stress response, while simultaneously assuring the crew member is not overwhelmed, may facilitate inoculation to the stress. Further, the automated training would be beneficial during long duration missions where ground support and training resources are limited or unavailable. This research aims at measuring physiological stress response and in-training performance, while evaluating adaptation rules and triggers. By using stress training to familiarize and prepare crew members for future stressors, a reduced state of anxiety and increased cognitive resources enabling enhanced performance are expected.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2019.
Bibliography Type:	Description: (Last Updated: 04/05/2023)