Fiscal Year:	FY 2008	**Task Last Updated:**	FY 06/02/2008
PI Name:	Moore, Steven T. Ph.D.		
Project Title:	Galvanic Vestibular Stimulation (GVS) as an analogue of post-flight sensorimotor dysfunction		
Division Name:	Human Research		
Program/Discipline:	NSBRI		
Program/Discipline--Element/Subdiscipline:	NSBRI--Sensorimotor Adaptation Team		
Joint Agency Name:		**TechPort:**	Yes
Human Research Program Elements:	(1) **HHC**:Human Health Countermeasures		
Human Research Program Risks:	(1) **Sensorimotor**:Risk of Altered Sensorimotor/Vestibular Function Impacting Critical Mission Tasks		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	10029	**Congressional District:**	14
Comments:	NOTE: PI moved to Central Queensland University, Australia, July 2016.		
Project Type:	Ground	**Solicitation / Funding Source:**	2007 Crew Health NNJ07ZSA002N
Start Date:	05/01/2008	**End Date:**	04/30/2012
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):	Curthoys, Ian S. (University of Sydney) Bloomberg, Jacob (NASA Johnson Space Center)		
Grant/Contract No.:	NCC 9-58-SA01603		
Performance Goal No.:			
Performance Goal Text:			

The recent NASA Small Assessment Team (SAT) and the NASA Human Research Program (HRP) Integrated Research Plan evaluated sensorimotor risks for future exploration-class missions. A high priority was placed on the development and validation of ground-based operational tests to determine the effects of long-term microgravity exposure on sensorimotor performance, particularly manned control or supervision of spacecraft during docking and landing maneuvers. Head-down bed rest was suggested as the ground-based analog with which to conduct these tests. However, our recent artificial gravity study has demonstrated that head-down bed rest does not reproduce sensorimotor deficits observed following spaceflight.

There is currently no operational analog of post-flight sensorimotor effects, and the primary aim of this project is to deliver such a system to facilitate the sensorimotor risk assessment mandated by the NASA HRP, as well as for crew training and countermeasure development. To this end, we have developed a prototype ambulatory system that generates

Task Description:	a reversible sensorimotor deficit. The system uses Galvanic vestibular stimulation (GVS), which modulates afferent vestibular input with a pseudorandom current delivered via surface electrodes placed on the skin behind each ear. The GVS analog has been designed such that sensorimotor perturbation delivered accurately reproduces postural, locomotor, gaze and perceptual deficits observed in astronauts following short- and long-duration missions, without inducing significant motion sickness symptoms. In this project, we aim to bring the GVS sensorimotor analog to operational readiness by answering the following critical questions: 1. What are the optimal parameters for a single exposure to the GVS analog? 2. What is the long-term response to GVS? 3. How well does the GVS analog reproduce post-flight deficits in shuttle landing performance?
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2008.
Bibliography Type:	Description: (Last Updated: 09/07/2020)