

<b>Fiscal Year:</b>	FY 2008	<b>Task Last Updated:</b>	FY 07/09/2008
<b>PI Name:</b>	Li, Rongxing (Ron) Ph.D.		
<b>Project Title:</b>	Enhancement of Spatial Orientation Capability of Astronauts on the Lunar Surface		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>	NSBRI		
<b>Program/Discipline--Element/Subdiscipline:</b>	NSBRI--Sensorimotor Adaptation Team		
<b>Joint Agency Name:</b>	<b>TechPort:</b>	Yes	
<b>Human Research Program Elements:</b>	(1) <b>SHFH</b> :Space Human Factors & Habitability (archival in 2017)		
<b>Human Research Program Risks:</b>	(1) <b>HSIA</b> :Risk of Adverse Outcomes Due to Inadequate Human Systems Integration Architecture		
<b>Space Biology Element:</b>	None		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	None		
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<b>Zip Code:</b>	43210	<b>Congressional District:</b>	15
<b>Comments:</b>			
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	2007 Crew Health NNJ07ZSA002N
<b>Start Date:</b>	08/01/2008	<b>End Date:</b>	07/31/2011
<b>No. of Post Docs:</b>	<b>No. of PhD Degrees:</b>		
<b>No. of PhD Candidates:</b>	<b>No. of Master' Degrees:</b>		
<b>No. of Master's Candidates:</b>	<b>No. of Bachelor's Degrees:</b>		
<b>No. of Bachelor's Candidates:</b>	<b>Monitoring Center:</b> NSBRI		
<b>Contact Monitor:</b>	<b>Contact Phone:</b>		
<b>Contact Email:</b>			
<b>Flight Program:</b>			
<b>Flight Assignment:</b>			
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Banks, Martin ( UC Berkeley ) Bhasin, Kul ( NASA Glenn Research Center ) Yilmaz, Alper ( The Ohio State University ) Di, Kaichang ( The Ohio State University )		
<b>Grant/Contract No.:</b>	NCC 9-58-SA01602		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>	<p>The scientific goal of this proposed project is to develop a Lunar Astronaut Spatial Orientation and Information System (LASOIS) that will enhance astronauts spatial orientation capability and reduce sensorimotor risks during manned and landed lunar mission operations. The main objectives of this project are:</p> <p>(1) To investigate methods for removal and/or alleviation of astronaut disorientation in a lunar surface operations setting by using integrated information technology, and psychological and cognitive research on spatial orientation and navigation;</p> <p>(2) To develop the Lunar Astronaut Spatial Orientation and Information System; and</p>		

<b>Task Description:</b>	<p>(3) To train astronauts to enhance their spatial orientation capability in a LASOIS-supported simulated lunar environment.</p> <p>Supported by LASOIS, astronauts will be capable of overcoming disorientation in lunar surface operations caused by microgravity and the altered visual environment through spatial information provided by the Earth control center and collected by a coordinated group of sensors from lunar orbit, descending path, and ground. The developed spatial orientation strategy, system and training will allow astronauts to have a systematic preparation for complex mission scenarios where spatial operations and efficient interactions and communications are required among the Earth-based control center, lander(s), lunar vehicle(s), outposts, and astronauts. This capability is extremely important for lunar operations that will have an extensive traversing region (around 100km).</p> <p>This project fits well into NSBRI's Sensorimotor Adaptation Team Strategic Plan. In particular, it directly supports the first sensorimotor risk area "Disorientation and Manual Control" by providing the advanced LASOIS to reduce/remove the disorientation risk. Risks 44 and 45 defined in the Advanced Human Support Technologies (AHST) and Risks 24 and 26 defined in the BHP (Behavioral Health and Performance) roadmap crosscutting area can be significantly reduced by improving the spatial orientation capability through use of the proposed LASOIS system.</p>
	<b>Rationale for HRP Directed Research:</b>
	<b>Research Impact/Earth Benefits:</b>
	<b>Task Progress:</b> New project for FY2008.
<b>Bibliography Type:</b>	Description: (Last Updated: 09/07/2020)