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Project Title:	Habitability and Human Factors Assessment in CHAPEA (iSHORT, SHAQ and SHU)		
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Program/Discipline--Element/Subdiscipline:			
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HFBP**:Human Factors & Behavioral Performance (IRP Rev H)		
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Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Comments:			
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	The Crew Heath and Performance Exploration Analog (CHAPEA) study is a Mars habitat simulation in which we examine the human health and performance of crews living and working in isolation for a year with Mars realistic resource restrictions including a limited food system and communication delay with mission control. iSHORT (Space Habitability Observation Reporting Tool) was previously used to collect detailed data about habitability and human factors on the International Space Station (ISS) to inform NASA Standards (Greene, Thaxton, & Adolf, 2018, report to NASA Human Factors & Behavioral Performance (HFBP) Element) and to demonstrate the iSHORT tool. New data collected in CHAPEA will also inform human factors design and NASA Standards. CHAPEA data will be from three, 1-year missions in the same analog habitat. In the previous iSHORT study, only 1 of the 6 ISS subjects had a duration of 1-year; all other ISS and ground analog subjects had mission durations from 1 week up to 6 months. iSHORT will also include semi-structured prompts to elicit crewmembers' reflections on key concerns of Human Factors (HF) design		

Task Description:	and behavioral health. The data collected with the iSHORT tool will be compared to and complement data collected with the SHAQ (Subjective Habitability and Acceptability Questionnaire; Roma, Landon, et al., 2022) tool, which was developed by the Behavioral Health and Performance (BHP) Lab and will be deployed in CHAPEA. Additionally, this mission will allow Human Factor experts to field test a new tool, the Scale for Habitat Usability (SHU), which is the first step for transitioning to operations (ops). The SHU is a brief subjective scale which captures important elements of how habitat design impacts task performance. The aim of the Habitability and Human Factors Assessment (HHFA) in CHAPEA is to capture HF design concerns and related BHP impacts in a high-fidelity spaceflight analog. iSHORT captures crewmembers' thoughts, positive and negative, about different habitat points of interest (POI) (i.e., habitat areas, activities, key equipment). Crew will reflect on each habitat POIs multiple times during the mission, which enables better understanding of the change in acceptability over time. We will compare results between the 3 mission crews to understand how individual well-being and team dynamics may be related to human factors concerns over time.
Rationale for HRP Directed Research:	This proposal qualifies for a directed study due to the urgent, time-sensitive need to provide "standard measures" as the foundation to achieve consistent research measures and to meet the highly constrained, operationally focused data gathering and analysis that allows for greater consistency in the research methods that are very specific to NASA Human Research Program (HRP) standard measures development. The comparison and complementary understanding of the 3 habitability and human factors measures in this study will allow efficient implementation of the measures in analogs and/or spaceflight in near-term research. Additionally, the directed nature of this study also allows the BHP Laboratory and the Human Factors Engineering Laboratory to provide the unique research and support expertise required to integrate and manage the data from the various participating studies to achieve HRP's intent. Access to the BHP Laboratory's HFBP-Exploration Measures (EM) database and vetting of the evidence-based standards makes the solicitation process prohibitive.
Research Impact/Earth Benefits:	Information related to habitability in isolated, confined, extreme, and operational spaces over time can be used by Earth-oriented habitat designers to improve well-being, social relationships, and performance.
Task Progress:	Study Materials Creation A considerable preparation period during FY22 contributed to successful ingress and the beginning of data collection. Materials were generated by the research team, reviewed by the Institutional Review Board (IRB) or Crew Health and Performance Exploration Analog (CHAPE) team for acceptability and feasibility, tested extensively for potential IT issues and crew/Mission Control Center (MCC) usability issues, revised as needed, reviewed during Technical Readiness Reviews and other pre-mission review meetings, and approved for inclusion in the overall CHAPEA study package. Trainings Members of the research team created training materials and successfully trained the CHAPEA crew on how to complete the study activities and measures. We also trained the CHAPEA MCC and CHAPEA safety support MCC personnel to support the crew in completing the study activities and measures if needed, and how to save, protect, and deliver data. Data Yield Table 1. SHAQ Pre-Mission Baseline Data Collection Habitat Total n size Data Yield SHAQ Home n = 5 100% SHAQ Hotel n = 5 100%
Bibliography Type:	Description: (Last Updated: 12/11/2024)