| | | | |
|---|---|---|---|
| **Fiscal Year:** | FY 2016 | **Task Last Updated:** | FY 09/06/2016 |
| **PI Name:** | Binsted, Kim Ph.D. | | |
| **Project Title:** | Using Analog Missions to Develop Effective Team Composition Strategies for Long Duration Space Exploration | | |
| **Division Name:** | Human Research | | |
| **Program/Discipline:** | | | |
| **Program/Discipline--Element/Subdiscipline:** | HUMAN RESEARCH--Behavior and performance | | |
| **Joint Agency Name:** | | **TechPort:** | No |
| **Human Research Program Elements:** | (1) **HFBP**:Human Factors & Behavioral Performance (IRP Rev H) | | |
| **Human Research Program Risks:** | (1) **Team**:Risk of Performance and Behavioral Health Decrements Due to Inadequate Cooperation, Coordination, Communication, and Psychosocial Adaptation within a Team | | |
| **Space Biology Element:** | None | | |
| **Space Biology Cross-Element Discipline:** | None | | |
| **Space Biology Special Category:** | None | | |
| **PI Email:** | binsted@hawaii.edu | **Fax:** | FY |
| **PI Organization Type:** | UNIVERSITY | **Phone:** | 808-398-1300 |
| **Organization Name:** | University of Hawaii | | |
| **PI Address 1:** | Hawaii Hall 202, 2500 Campus Rd | | |
| **PI Address 2:** | | | |
| **PI Web Page:** | | | |
| **City:** | Honolulu | **State:** | HI |
| **Zip Code:** | 96822-2217 | **Congressional District:** | 1 |
| **Comments:** | | | |
| **Project Type:** | GROUND | **Solicitation / Funding Source:** | 2014-15 HERO NNJ14ZSA001N-Crew Health (FLAGSHIP & NSBRI) |
| **Start Date:** | 07/01/2015 | **End Date:** | 06/30/2018 |
| **No. of Post Docs:** | | **No. of PhD Degrees:** | |
| **No. of PhD Candidates:** | 1 | **No. of Master' Degrees:** | |
| **No. of Master's Candidates:** | | **No. of Bachelor's Degrees:** | |
| **No. of Bachelor's Candidates:** | 1 | **Monitoring Center:** | NASA JSC |
| **Contact Monitor:** | Williams, Thomas | **Contact Phone:** | 281-483-8773 |
| **Contact Email:** | thomas.j.will1@nasa.gov | | |
| **Flight Program:** | | | |
| **Flight Assignment:** | NOTE: Element change to Human Factors & Behavioral Performance; previously Behavioral Health & Performance (Ed., 1/17/17) | | |
| **Key Personnel Changes/Previous PI:** | | | |
| **COI Name (Institution):** | Bedwell, Wendy Ph.D. ( University of South Florida, Tampa )<br>Bishop, Sheryl Ph.D. ( University of Texas, Galveston )<br>Hunter, Jean Ph.D. ( Cornell University )<br>Kozlowski, Steve Ph.D. ( Michigan State University )<br>Miller, Christopher Ph.D. ( Smart Information Flow Technologies, LLC )<br>Roma, Peter Ph.D. ( Institutes for Behavior Resources, Inc )<br>Wu, Peggy B.S. ( Smart Information Flow Technologies, LLC ) | | |
| **Grant/Contract No.:** | NNX15AN05G | | |
| **Performance Goal No.:** | | | |
| **Performance Goal Text:** | | | |

| | |
|---|---|
| **Task Description:** | Astronaut crews for long-duration multi-national missions will endure many physical challenges and psychological stressors, some largely predictable in type and timing and others unpredictable. Crews are likely to be diverse with respect to educational background, skill set, ethnicity, gender, leadership/followership styles etc., yet they must form a cohesive team, and continue to function together at a high level of objective performance and remain responsive to mission support over the duration of the mission. Crew cohesion will be more fragile at times of high stress and fatigue, yet those are the times when performance must be unimpaired if the crew is to succeed. Adding to the challenge, the pool from which crews must be selected may be significantly constrained by other factors, such as past radiation exposure.<br>For these reasons, it is essential that we understand how best to compose and support crews for long-duration space missions, and that we develop a set of validated tools to this end.<br><br>In order to enable and advance long duration human space exploration, we are investigating individual and crew characteristics that may affect crew function and performance, by measuring both characteristics and performance on a range of simulated missions in analog environments. Based on the correlations found, we will develop a predictive model of the relationship between crew composition and performance. We will validate and enhance this model via data collected on two 8-month Hawai'i Space Exploration Analog and Simulation (HI-SEAS) missions, and use the results to provide NASA with a set of tools to optimize its crew composition strategies. |
| **Rationale for HRP Directed Research:** | |
| **Research Impact/Earth Benefits:** | The objective of this investigation is to provide data and recommendations to inform crew composition for long-duration space missions, and to enable the implementation of countermeasures for problems related to crew behavioral health and performance.<br>This ground-based investigation will:<br><br>1. Collect, develop and verify a set of individual, dyad, and crew characteristics that we expect (based on past investigations) to be relevant to crew composition.<br><br>2. Identify correlations, if any, between those characteristics and crew function/performance, using data from a series of simulated missions of various lengths at analog sites.<br><br>3. Build a predictive model based on these correlations.<br><br>4. Validate that model over two 8-month simulated missions at the HI-SEAS analog.<br><br>5. Develop a set of tools (e.g., rubric, implemented model, best practices) NASA can use to optimize crew composition. |
| **Task Progress:** | The first nine months of this grant have been spent primarily on planning, staffing, setting up sub-awards (e.g., to the Mars Society, which runs the Mars Desert Research Station, or MDRS), institutional review, and the first MDRS mission. We are now ready for the next two MDRS seasons, and have begun recruitment for the two 8-month HI-SEAS missions. |
| **Bibliography Type:** | Description: (Last Updated: 09/09/2022) |