

| | | | |
|---|--|---------------------------------------|-------------------|
| Fiscal Year: | FY 2023 | Task Last Updated: | FY 12/06/2022 |
| PI Name: | Bell, Suzanne Ph.D. | | |
| Project Title: | Human Factors Behavioral Performance Risk Characterization Research for Artemis II | | |
| 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 Behavioral Conditions and Psychiatric Disorders (2) HSIA :Risk of Adverse Outcome Due to Inadequate Human Systems Integration Architecture (IRP Rev L) (3) Sleep :Risk of Performance Decrements and Adverse Health Outcomes Resulting from Sleep Loss, Circadian Desynchronization, and Work Overload (IRP Rev F) (4) Team :Risk of Performance and Behavioral Health Decrements Due to Inadequate Cooperation, Coordination, Communication, and Psychosocial Adaptation within a Team (IRP Rev F) | | |
| Space Biology Element: | None | | |
| Space Biology Cross-Element Discipline: | None | | |
| Space Biology Special Category: | None | | |
| PI Email: | suzanne.t.bell@nasa.gov | Fax: | FY |
| PI Organization Type: | NASA CENTER | Phone: | |
| Organization Name: | NASA Johnson Space Center | | |
| PI Address 1: | 2101 E NASA Pkwy | | |
| PI Address 2: | SK311 | | |
| PI Web Page: | | | |
| City: | Houston | State: | TX |
| Zip Code: | 77058 | Congressional District: | 36 |
| Comments: | NOTE: PI at NASA Johnson Space Center as of January 2021; previously at DePaul University | | |
| Project Type: | FLIGHT | Solicitation / Funding Source: | Directed Research |
| Start Date: | 10/03/2022 | End Date: | 10/03/2025 |
| 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: | Whitmire, Alexandra | Contact Phone: | |
| Contact Email: | alexandra.m.whitmire@nasa.gov | | |
| Flight Program: | | | |
| Flight Assignment: | | | |
| Key Personnel Changes/Previous PI: | | | |
| COI Name (Institution): | Vera, Alonso Ph.D. (NASA Ames Research Center) Flynn-Evans, Erin Ph.D. (NASA Ames Research Center) Young, Millennia Ph.D. (NASA Johnson Space Center) Stephenson, Jerri M.S. (NASA Johnson Space Center) Whiting, Sara Ph.D. (KBR/NASA Johnson Space Center) Dev, Sheena Ph.D. (KBR/NASA Johnson Space Center) Landon, Lauren Ph.D. (KBR/NASA Johnson Space Center) | | |
| Grant/Contract No.: | Directed Research | | |
| Performance Goal No.: | | | |
| Performance Goal Text: | | | |

| | |
|---|--|
| Task Description: | <p>Artemis II will mark the first time NASA astronauts go beyond low-Earth orbit (LEO) since the Apollo era, and the first astronauts heading into space in the Orion vehicle. As such, it provides a critical opportunity to refine our understanding of the likelihood and consequences associated with the Behavioral Medicine (BMed), Team, Human System Integration Architecture (HSIA), and Sleep Risks, and prepare for future Moon and Mars missions. The overarching goal of our research is to utilize Artemis II data to further define the likelihood and consequences of these risks, and to create a research infrastructure that can be expanded to include future Artemis missions. We propose a 3-phase research effort. In Phase I, we will use summaries of existing research (e.g., evidence books and Directed Acyclic Graphs/DAGs), literature reviews, and subject matter expert (SME) input to identify and conceptualize key performance metrics, contributing factors, and BMed, Team, HSIA, and Sleep risk constructs related to performance decrements. We will describe how the constructs are expected to arise in spaceflight, and conduct a review that summarizes how metrics (e.g., behaviors and trace data, words and linguistics, and physiological data) derived from data streams available in Artemis II (e.g., audiovisual data) can serve as indicators of these constructs for in-mission measurement during Artemis. The Phase I effort will result in a finalized pre- and post-mission protocol for Artemis II, along with a measurement and coding scheme for in-mission Artemis II data. Phase II includes data collection from the Artemis II mission. Phase III will include data processing, data analysis under a Bayesian framework, coding, depiction, analysis, and report writing.</p> |
| Rationale for HRP Directed Research: | <p>This research is directed because it contains highly constrained research. Artemis II provides a critical opportunity to refine our understanding of the likelihood and consequences associated with BMed, Team, HSIA, and Sleep Risks, and prepare for future Moon and Mars missions.</p> <p>Two significant constraints shape the research methodology. First, there is currently no in-mission crew time available to complete measures. In-mission data will need to be collected unobtrusively from available data streams (e.g., audiovisual, existing records such as schedules, and actigraphy). Second, Artemis II is anticipated to be a crew of 4 astronauts in flight for 10 days followed by additional crewed Artemis missions. This creates a scenario where there is important data for understanding risk characterization; however, there will be a small sample size from Artemis II, and risk characterization will need to be updated over time as additional crews fly in later Artemis missions.</p> |
| Research Impact/Earth Benefits: | |
| Task Progress: | New project for FY2023. |
| Bibliography Type: | Description: (Last Updated: 01/19/2023) |