Area of Research:  
Space Human Factors

NASA Program:  
Advanced Human Support Technology

NASA Field Center:  
Johnson Space Center, Houston, Texas  77058

Abstract:

With a permanent human presence onboard the International Space Station (ISS), astronauts are living and working in microgravity for long durations, facing novel situations for which there is inadequate knowledge of human capabilities. In addition to weightlessness, the confined and isolated nature of a spacecraft environment results in human factors challenges in habitability, workload and human performance. Thus, determining the appropriate set of human factors engineering requirements and identifying critical factors and level of impacts on habitability, workload and human performance are crucial to astronauts’ well-being and productivity. In order to achieve this goal, the primary research areas include:

- Human performance modeling and analysis
- Tools and methods for quantifying and monitoring habitability
- Human-system design considerations
- Human-computer interaction (e.g., interfaces for computer-based training, payload displays)
- Anthropometrics and biomechanics
- Lighting modeling and analysis

The Space Human Factors Laboratory (SHFL) at Johnson Space Center supports applied human factors activities for Space Shuttle, ISS and future flight missions. In addition, the laboratory personnel conduct research funded through the NASA Research Announcements and space human factors technology development project announcements. The Laboratory consists of facilities for usability testing, human-computer and human-workstation interface assessments, human modeling, anthropometric and biomechanical analysis, and lighting evaluations. These facilities have access to simulated analog environments such as NASA’s Reduced gravity aircraft, neutral buoyancy laboratory and astronaut training facilities.