HSLSPO Research Performance Goals

Relationship to NASA and HEDS Strategic Plans

Agency Missions	The Enterprise	Enterprise Goals	Microgravity Research Performance Goals
To advance & communicate scientific knowledge & understanding of Earth, the solar system, the universe. To advance human exploration, use and development of space. To research, develop, verify and transfer advanced aeronautics, space and related technologies	Human Exploration and Development of Space	Expand the space frontier	**2.1** Improve and experimentally test radiation transport codes needed to develop a cost and mission effective radiation shielding material/concept to protect a crew for one year in transit to/from and on the surface of the moon/Mars. **2.2** Identify materials processing issues and propose/test processing strategies to enable human operations on the surface of the moon/Mars using In Situ Resource Utilization (ISRU) concepts. **2.4** Develop methods, databases, and validating tests for material flammability, characterization, hazard reduction, and fire detection/suppression strategies for spacecraft and extraterrestrial habitats. **2.5** Advance the state of knowledge sufficiently to enable dust control technologies and bulk materials handling for extraterrestrial habitats and/or In Situ Resource Utilization. (ISRU) **2.6** Advance the state of knowledge sufficiently to allow development of reliable and efficient heat transfer technology for space and extraterrestrial operations. **2.7** Advance the state of knowledge sufficiently to allow development of effective fluid management technology for space and extraterrestrial and industrial operations. **2.8** Establish the knowledge base required to design chemical process systems for exploration missions. **2.9** Determine the potential use of bioreactors to provide biological materials supporting long-duration space travel. **2.10** Develop new probe technologies which use living cells or subcellular components to survey the impacts of extreme environments on terrestrial life. **2.11** Adapt precision measurement and control technologies developed by fundamental physics research activities to solve needs of the human and robotic exploration of space.
		Enable and establish a permanent and productive human presence in Earth orbit.	
		Expand scientific knowledge	**1.21** Sustain a leading biotechnology research program which will assure continued scientific and technical leadership. **1.22** Enable increased combustion system efficiency, reduced pollution, and mitigation of fire risks through insights and data bases obtainable only through microgravity experiments. **1.23** Pursue ground-breaking basic research in fluid physics and transport phenomena to provide fundamental understanding of natural phenomena affected by gravity for increased efficiency and effectiveness of space-based and industrial processes. **1.24** Explore the frontiers of physics and unlock mysteries of the universe obscured by Earth's gravity. **1.25** Use microgravity to establish and improve quantitative and predictive relationships between the structure, processing, and properties of materials. **1.9** Successfully test a fundamental tenet of general relativity by completing and internationally-funded satellite test of the Equivalence Principle (STEP) Project.
		Expand the commercial development of space.	**4.2** Exploit microgravity research results and technologies through creation of innovative applications.
		Share the experience and discovery of human space flight.	**4.1** Involve Americans in the adventure of space exploration by sharing discoveries and expand educational opportunities by opening participation in NASA's Microgravity Research Program.

NASA Strategic Plan