
F. Life Sciences as Related to Space

Sub-Commission F1 on Gravitational and Space Biology

Sub-Commission F2 on Radiation Environment, Biology and Health

Sub-Commission F3 on Astrobiology

Sub-Commission F4 on Natural and Artificial Ecosystems

Sub-Commission F5 on Gravitational Physiology in Space

(1) Effects of extraterrestrial environments on living systems including: (a) biological effects of changes in gravitational forces and/or of the radiation environment in space, especially of the heavy ions of cosmic radiation; (b) biological and medical studies of human beings in spaceflight, life support systems, radiation risk estimations, and nutritional problems in space; and (c) Earth-based studies of effects of extreme environments on biological systems.

2) Origin and evolution of life, including: (a) chemical precursors of life, its evolution and present state within the solar system and beyond; (b) search for extraterrestrial intelligence, for life in the solar system beyond the terrestrial biosphere, and for molecules of biological significance in space. Biological interchange, including: (a) possible effects of contamination of planets other than the Earth, and of planetary satellites within the solar system by terrestrial organisms; and (b) contamination of the Earth by materials returned from outer space carrying potential extraterrestrial organisms that have been exposed to space environments.

(3) Mechanisms and dynamics of ecosystems, including: (a) the natural ecosystem on Earth as it can be observed, charted and analyzed from space; and (b) artificial ecosystems, which are being developed for use in human life support in space or on other celestial bodies, such as Moon or Mars.

- Gravity Perception and Response in Plants and Fungi: Ground and Space Studies
- Biological Effects of Space Radiation: a Controllable Challenge for Long-term Human Space Missions
- Space Radiation Risk, Quality of Radiation and Countermeasures: Physical and Biophysical Mechanisms, Modelling and Simulations
- Space Radiation: Dosimetric Measurements and Related Models, Radiation Detector Developments and their Ground-Based Characterization
- Genetic, Epigenetic and Metabolic Changes in Spaceflight and Simulated Spaceflight Environment
- Simulating the Deep Space Radiation Environment on a Journey to Mars-The NASA Galactic Cosmic Ray Simulator Project and Approaches to Risk Modelling and Mitigation
- Chemical Evolution and Origin of Life
- Astrobiology: Laboratory Experiments, Field Studies in Analogue Environments and Space Experiments in Low Earth Orbit
- Habitability in the Solar System and Beyond
- Biosignatures and Biomarkers--Searching for Traces of Prebiotic Organic Compounds or Forms of Past or Present Life in the Solar System
- Pre-biotic and Complex Molecules in the Universe: Observational, Laboratory, and Computational Perspectives on the Evolution of Molecular Complexity
- Climate and Astrobiological Potential of Icy Deposits on Mars
- Bioregenerative Life Support – Past–Present–Future / Outlook and Ecological Aspects
- Advanced Life Support Test Beds and Facilities
- Influence of Spaceflight Environments on Biological Systems
- Modelling and Control to Support Closure of Manmade Ecosystems and Biospheres
- Space Food and Nutrition
- Molecular, Cellular and Physiological Changes in Response to Spaceflight and Ground-based Analogues
- "There and Back Again - An Astronaut's Tale: NASA "'Red"' Risks to Human Health and Performance for a Martian Journey"