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LIFE (Living Interplanetary Flight Experiment)

Can life naturally transfer from planet to planet?

The Planetary Society is trying to find out!

The Planetary Society, with seed funding from Mark Gelfand and with donations from Society Members worldwide, developed a two-phase project called LIFE – Living Interplanetary Flight Experiment – to investigate the “transpermia” hypothesis.

The project is designed to test of one aspect of the hypothesis –- the possibility that life can travel from planet to planet inside rocks blasted off one planetary surface by impact, to land on another planetary surface. For example, if a rock on Earth contained life and were blasted off Earth, could it survive until it reached Mars? Or, if life existed on Mars, could it have been transported to Earth? The Planetary Society experiment will test the ability of life to survive the interplanetary voyage by flying organisms for several years through interplanetary space in a simulated meteoroid.

Phase One: Shuttle LIFE

Over 14 days, Shuttle LIFE tested the effects of low-Earth orbit spaceflight on five diverse species of microorganisms packed in tiny, heat-sealed, Delrin plastic sample tubes. Once the microbes have been tested -- back here on Earth -- they were planned to provide a baseline comparison and a “dress rehearsal” for our upcoming Phobos LIFE experiment that was set to go to Mars's moon Phobos and back.

The eight-legged water bears made the trip aboard Shuttle LIFE with 4 other bacterium packed into six sample tubes, which were contained in two wells inside a shuttle experiment payload.

We just had the chance to test the survivability of our hardy organisms during space travel by flying LIFE on Space Shuttle flight STS-134, which returned on June 1, 2011. The very last flight of Shuttle Endeavour!

Success…Our micro-passengers are back on Earth now awaiting the results of our testing!

Phobos LIFE

In an ambitious initiative with seed funding from Mark Gelfand and Planetary Society Members around the world, the Society attempted to send a collection of living organisms on a three-year trip to the Martian moon Phobos and back to Earth. The experiment -- called LIFE (Living Interplanetary Flight Experiment) – was planned to help scientists better understand the nature of life, its robustness, and its ability -- or not -- to move between planets.

In January 2012, the LIFE biomodule was launched aboard Russia's Phobos Sample Return mission. Unfortunately, Phobos-Grunt, carrying our Phobos LIFE biomodule, fell into the Pacific Ocean 17:45 UT today.

We applaud our members, supporters, and the scientists and engineers involved with this mission. Rest assured that, with your continued support, The Planetary Society will press forward and seek answers to those deep questions: Where did we come from, and are we alone?

The Phobos LIFE Plan

The Russian space agency planned to launch the Phobos Sample Return mission nicknamed "Phobos-Grunt" to the Martian moon Phobos. The spacecraft would land on Phobos, collect dirt and rocks from its surface, and then head back home. As it swooped back by Earth, the spacecraft would release a capsule containing all the samples gathered on Phobos, to land on Earth.

Attached to the capsule for the entire 34 months of the journey would be a small, flat cylinder containing a collection of microbes carefully selected and sealed before launch. In its flight, the cylinder would be, in effect, a simulated space rock, subject to the same extreme conditions as a Martian meteoroid traveling to Earth. It is The Planetary Society's LIFE experiment.

Carefully packed and sealed with multiple seals, the LIFE samples would spend a full 34 months in space, before returning to Earth. Here it would be opened and its contents examined by waiting scientists.

Would some of the microbes survive the brutal space environment for this long? We will have to wait for the next sample return mission and see.