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CUBEHAB - A MINIATURE LUNAR ECOSYSTEM

Abstract

The Moon is a perfect test area in space conditions to demonstrate the long term sustainability of artificial ecosystems in space, starting with "simple" habitats and eco cycles. Inspired by CubeSat concepts a miniature habitat, CubeHab, would present on of the first steps in bringing life back on the moon. In the spirit of the new space revolution, CubeHab is the opportunity of a small, nimble and affordable way to bring back life to the moon. CubeHab utilizes modular structures and off-the-shelf parts wherever possible. This also makes it easy and affordable to reproduce CubeHabs for ground experiments for research on e.g. particular aspect of ecology or biology. They can also be used for education to inspire a rising generation of students to excel in science and technology. CubeHab is a modular miniature habitat, operating self-sustained for a given time period in the order of several weeks. The habitat harbours animals and plants that are part of ecological cycles. Five major subsystems consisting of power supply and thermal control as well as illumination, nutrient supply and data handling and control support the inhabitants of CubeHab. The approach of CubeHab is simplicity instead of complexity. On this notion, the ecosystem of CubeHab is devised as simple as possible to maintain its balance as long as possible. However, it has to be remarked that CubeHab will not be designed to utilize in-situ resources other than solar light. Intended as secondary or hosted payload CubeHab is ferried to the moon as part of a larger lunar mission. Several landing areas on the near side of the Moon are suitable for CubeHab. Conceivable sites include low and mid-latitudes as well as peaks of "eternal light" at the lunar South Pole. CubeHab is equipped with a camera system to deliver high quality imagery of the habitat while on the Moon not only for research purposes by also for the public. The pictures, videos and maybe from time to time live feeds are accessible in social media networks to revive public interest in bringing back life on the Moon.