

Lunar Exploration (2)  
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INTERNATIONAL MOONBASE ALLIANCE CAMPAIGNS AT HI-SEAS

**Abstract**

The Hawaii Space Exploration Analog and Simulation (HI-SEAS) habitat is a lunar and Martian analog research station located on the active volcano Mauna Loa in Hawaii. Missions that take place at HI-SEAS are open to space agencies, organizations and companies worldwide to take part in, provided their research and technology testing will help contribute to the exploration of the Moon and Mars. The International MoonBase Alliance (IMA) has been organizing regular simulated missions to the Moon and Mars at the HI-SEAS habitat since 2018. Mission crews are supported by a Mission Control Center based on the Big Island of Hawaii as well. The surroundings of the HI-SEAS habitat are covered in lava and they contain very interesting geological features from a planetary science perspective, such as lava tubes. Crews and researchers have been collaborating with scientists at NASA Goddard, for instance, on performing biochemical and geophysical studies on some of the lava tubes. Research at HI-SEAS is thus focused on geological, astrobiological and architectural projects relevant to living and working on the Moon and Mars; as well as technological tests using drones, 3Dprinters and rovers; and performing outreach and educational projects. These missions last from several weeks to several months. During this time, the crew is isolated within the HI-SEAS habitat, which they cannot leave without performing EVAs (Extra-Vehicular Activities) in analog spacesuits and with the per-mission of Mission Control. A series of EuroMoonMars IMA HI-SEAS (EMMIHS) missions have been taking place at HI-SEAS since 2019. These missions bring together researchers from the European Space Agency (ESA), IMA, the International Lunar Exploration Working Group (ILEWG), European Space Research and Technology Centre (ESTEC), VU Amsterdam and many other international organizations. The EMMIHS campaigns aim to increase the awareness about the research and technology testing that can be performed in analogue environments, in order to help humans become a multiplanetary species. Future missions at HI-SEAS include more EMMIHS campaigns, collaborative missions with ESA, NASA, University of Hawaii and with companies, such as SIFT and Ketone Technologies. The HI-SEAS mission organizers' primary goal over the last few years has been to open up the facility to people from all over the world and make it become a much more accessible, inclusive and diverse research environment.