



Analogue research performed at the HI-SEAS research station in Hawaii

Michaela Musilova (1,3,4), Henk Rogers (1,2), Bernard Foing (5,6,7)

(1) International Moonbase Alliance, United States (musilova@moonbasealliance.com), (2) Blue Planet Foundation, Hawai'i, United States, (3) Institute of Nuclear and Physical Engineering, Faculty of Electrical Engineering and Information Technology STU in Bratislava, Slovakia (michaela.musilova@stuba.sk), (4) Slovak Organisation for Space Activities (SOSA), Bratislava, Slovakia (musilova@sosa.sk), (5) ESTEC, ESA, Noordwijk, Netherlands (Bernard.Foing@esa.int), (6) ILEWG, Noordwijk, Netherlands (Bernard.Foing@esa.int), (7) VU Amsterdam, Amsterdam, Netherlands (Bernard.Foing@esa.int)

The Hawaii - Space Exploration Analog and Simulation (HI-SEAS) habitat is located at 8,200' (2,500 meters) in elevation on the largest mountain in the world, Mauna Loa, on the Big Island of Hawai'i. HI-SEAS has been the home to five successful long duration (4 to 12 month) NASA Mars simulation missions since 2013. A HI-SEAS Mars mission involved six person crews being isolated from the rest of humanity for long periods of time. While in the simulation, communications with "Earth" were delayed by up to 20 minutes each way to simulate Mars being on other side of the Sun from Earth. When the crew left the HI-SEAS habitat, they wore analog space-suits and they went through full extra vehicular activity (EVA) protocols to perform their research in the simulated Martian terrain. HI-SEAS has also been used to perform multiple shorter duration lunar simulated missions, in collaboration with diverse organisations and companies worldwide. As of 2018, the International Moonbase Alliance (IMA), an organization dedicated to building sustainable settlements on the Moon, has been organising regular simulated missions to the Moon, Mars or other planetary bodies at HI-SEAS. The constraints for these missions depend on which planetary body the mission is simulating to be on. For instance, for lunar missions the time delay in communications is only of a few seconds, which is nearly negligible for EVAs and other activities. The research and technological experiments conducted at HI-SEAS are going to be used to help build a Moonbase in Hawai'i, and ultimately to create an actual Moonbase on the Moon. Future missions at HI-SEAS include collaborative missions with the European Space Agency, NASA's Johnson Space Center, University of South Florida and companies such as SIFT and Ketone Technologies.