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THE MARS OCEAN ANALOG PROGRAM: A STARSHIP AMIDST THE SEAS

Abstract

Mars analog stations are environments that provide a set of circumstances where several crucial factors for the manned mission to Mars can be studied and tested. A tremendous amount of effort is spent on the technology to send humans to Mars, nevertheless there is still much to explore concerning humans and the physiological and psychological effects of living in confinement, in a high-performance, high-risk environment with a multinational crew, isolated for prolonged periods of time.

Sailing in a small vessel nonstop for extended periods of time in the high seas, presents similarities with the Mars human spaceflight that are valuable to be approach as an analog with an innovative approach. The Mars Ocean Analog (MOA) is new sea-based Mars analog program that consists in 3-week missions sailing voyages through the North Atlantic Ocean. MOA is focused on exploring the effects of confinement, isolation, and an extreme environment in psychology and human factors. These include: group dynamics, cognitive abilities, conflict coping, leadership, sleep disturbance, waste management, team performance, team work, dietary studies, circadian rhythm, organization and management, and more. Furthermore, the versatility of the analog, permits multidisciplinary researches: including environmental and oceanic studies, power generation, communications, educational and outreach projects, etc.

The first demo mission, took place in January 2021, sailing the 85-foot schooner Anne from Wilmington, North Carolina to West Palm Beach, Florida. The initial proof of concept was key to develop of the research program and the adequation of the ship for the international missions that would take place in the next months.

The Mars Ocean Analogs provides a novel and valuable platform for psychology and human factors studies that will contribute to the human mission to Mars. This paper will present the analog ship design, the research program and operations, a review on the first crews, and the future prospects of the program.