



Call for Volunteers for V-ERAS 2014

The Italian Mars Society is seeking four volunteers to participate as members of the crew of the Virtual European MaRs Analogue Station (V-ERAS) during a simulation of human Mars exploration operations. The mission will take place in Madonna di Campiglio, Trento, Italy from December 7, 2014 through December 14, 2014

As currently planned, the crew will consist of four individuals chosen primarily for their skills as scientists and technologists in areas including psychology, physiology, medicine, mission operations, human factors and habitability. Considering that this is the startup phase of the project and the need to strongly interact with the IMS engineering team, proficiency in areas such as Computer Science, Software Engineering, Physics Simulation Engines will be considered strong assets. Applicants should have either a four-year college degree or equivalent experience.

Crew members will only be required to pay for their own transportation to/from Trento, Italy. The living expenses will be covered by IMS and by [Dolomites Astronomical Observatory / Carlo Magno Hotel](#), who is sponsoring the initiative.

Volunteers should send their applications to: v-eras@marssociety.it by September 30, 2014 in order to be considered. Both volunteer investigators who bring with them a proposed program of research of their own compatible with the objectives of the Mission Science Agenda (see below), and those simply wishing to participate as members of the crew supporting the ongoing investigations, will be considered. Both individual applications and group applications of up to an entire crew (4 people) will also be considered.

Applications to V-ERAS should include:

- Your full name
- Full contact information (home/work address, telephone numbers, email address(es))
- A copy of your resume
- The crew position (engineer, , etc.) that you are seeking
- Experience in leading teams if you wish to be considered for the position of crew commander

- Research project(s) for your rotation. Proposing a research project well in line with the V-ERAS Science Agenda will be a strong advantage.

For 7 days, these four crew members will conduct a sustained program of immersive virtual reality simulation (See Mission Science Agenda). Each accepted crewmember will be required to read and sign the V-ERAS crew application documents including a Waiver, Release and Indemnity.

For further information about the ERAS project, please visit our website at: www.erasproject.org.

For enquiries about this call please contact: v-eras@marssociety.it

Mission Science Agenda

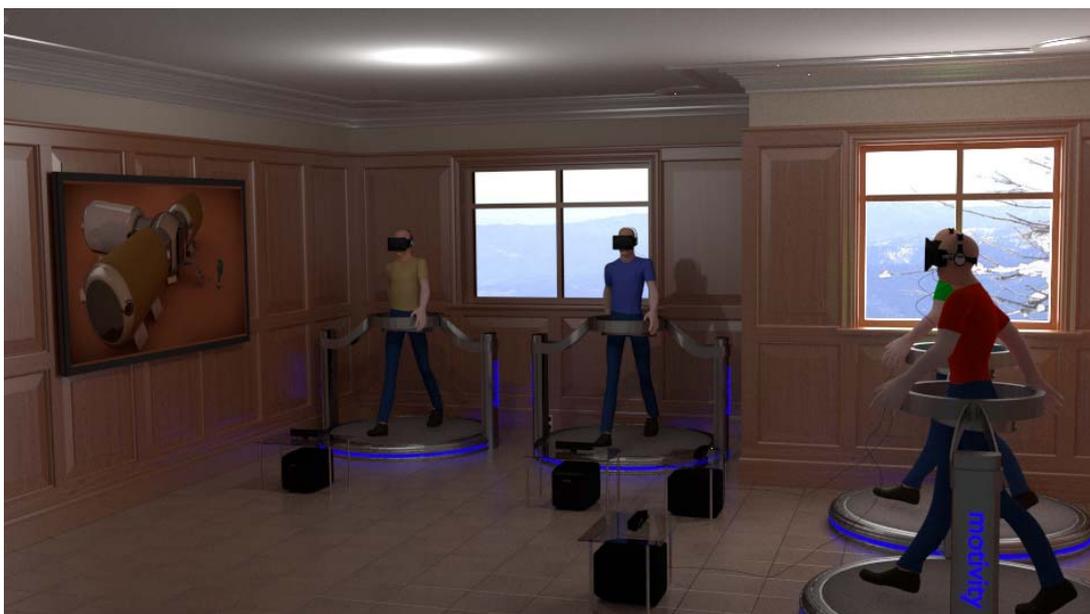
The European MaRs Analogue Station for Advanced Technologies Integration (ERAS) is a program spearheaded by the Italian Mars Society (IMS), whose main goal is to provide an effective test bed for field operation studies in preparation for human missions to Mars.

Preliminarily to its construction, IMS has started the development of an immersive Virtual Reality (VR) simulation of the ERAS Station (V-ERAS). The major advantage of such virtualization is that it will be possible to undertake training sessions with a crew that can interact with its future environment before the actual station is built. This way a more effective design of the station and associated missions, and strong cost reductions can be achieved. The main objective of this activity will be the simulation and validation of the data obtained during the training sessions so that they can be used for the design of the station itself. Many ergonomics and human factors will be considered in the virtual model in order to be verified and validated before the actual ERAS habitat construction.

The initial V-ERAS setup will be based on the following key elements:

- ERAS Station simulation using an appropriate game engine supporting a virtual reality headset
- Full body and hand gesture tracking
- Integration of an omnidirectional treadmill
- Support for crewmembers' health monitoring
- Multiplayer Support

The following figure is a depiction of the V-ERAS classroom setup with the four V-ERAS stations, as currently conceived.



Examples of science activities for the first V-ERAS Crew rotation include (but are not limited to):

- **Habitat Design Review:** For this first rotation, the ERAS habitat design will still be in a prototyping stage. We are very interested in the expertise on space habitat design that the selected crew can bring onboard for the definition of a more refined design. We are convinced that the VR technology is the most appropriate for an effective transfer of such expertise into the design.
- **Reduced Gravity Simulation:** We intend to explore the possibility to simulate Martian reduced gravity environments via extensions of the omnidirectional treadmill currently being developed by IMS.
- **Crew Health Monitoring:** Considering its critical importance, we are embedding crew health monitoring in V-ERAS from its inception. Continuous monitoring of crewmembers' health is key in anticipating any issues and developing appropriate countermeasures. The availability of a crew health monitoring will be instrumental in the V-ERAS crew rotations for the establishment of the knowledge, methods, and standards for the design of an integrated, autonomous, crew health management system. For this first rotation we will be using a full set of biometric devices. Also in this case we are very much interested in expertise on the medical field for the best use of those capabilities.
- **Physics Engine:** We intend to validate and extend the physics engine utilization made within the V-ERAS simulations.
- **Scientific missions planning / Crew training:** In terms of scientific mission planning / crew training we intend to focus on some specific scenarios centered on human-robot collaboration. In this context we intend to profit of the parallel development on advanced robotics ongoing in ERAS. In particular, simulated Extravehicular Activities (EVA) missions will be attempted with crewmembers, real and simulated robots operating on the Martian surface and supported by advanced Human Machine Interfaces (HMI) such as voice commanding.
- **Outreach:** V-ERAS will be unique to other Mars Analogues in that it will be highly accessible to the public, thereby increasing the outreach effectiveness. During the first rotation, outreach/educational events will be held, such as Mars exploration dedicated conferences. Everything will be organized in order to limit the impact on scientific activities, but crewmembers should be ready to dedicate a little part of their time to outreach activities such as interaction with visitors or interviews. The Waiver, Release and Indemnity document to be signed will also specifically cover those outreach activities.