

## SPACE EXPLORATION SYMPOSIUM (A3)

## Poster Session (P)

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## CONCEPT OF MOBILE HABITAT MODULE FOR HUMAN HABITATION ON THE RED PLANET

**Abstract**

The ongoing robotic exploration of Mars and the prospective ambition of Manned Mission to the Red Planet require the development of technologies to allow safe and comfortable human habitation on the Red Planet. Survival on Mars is a challenging task considering the various known and unknown dangers including extreme cold environment, solar radiation and absence of life supporting elements. Considering the fact that habitation on the Red Planet could be very different than that on Earth due to various threats on the Red Planet including the strong dust winds, highly dangerous Carbon-Di-Oxide so for a safe and comfortable stay on Mars and perform scientific experiments humans will need highly structured bases to survive in the Martian conditions. Establishing fixed bases on Mars can't be a good solution during the early phase of the mission when only few humans will be landing on Mars as any danger like arrival of strong dust winds which can completely destroy the fixed bases leaving the humans homeless. So the idea of fixed bases might not be as much reliable and safe. In this direction development of a novel concept of MOBILE HABITAT MODULE can be a potential solution towards this problem. MOBILE HABITAT MODULE is a concept vehicle which can serve both objectives, performing scientific experiments as well as a habitat base on the Red Planet. The vehicle consists of two major parts:- 1- Lab module, to perform scientific experiments on the Red Planet, 2- The Habitat module, where humans will perform daily living activities including cooking and sleeping. The humans can easily drive the vehicle to a safer location in case of any danger something which might not be possible in case of fixed base. Since Oxygen is not available in Martian atmosphere so it is provided by installing a novel system "Recyclable Respiration System" in the Mobile Vehicle which continuously provides fresh oxygen to the humans by recycling the exhaled Carbon-Di-Oxide. The Power supply to the Vehicle is mainly provided by the use of Multi-Mission Radioisotope Thermoelectric Generator (MMRTG) as well as the Solar Panels are used as a back up support to produce electricity for various applications inside the Lab Module and Habitat Module. The concept can be a great success in not only for safe shelter but greater scientific objectives can also be achieved by allowing the humans to move from one location to another and explore the Martian features at different places.