



Habitat for Mars: a new conceptual design

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On the 14th of January 2004, the President of the United States announced the new space exploration vision for NASA, which encompasses a human establishment on to the Moon by the year of 2020. The establishment will act as a test bed and a launching point for manned missions beyond the Moon. The next natural target beyond the Moon is Mars. However, many technical difficulties must yet be overcome in order for humans to safely make the long journey to Mars and back again.

Some of the complexities that need to be solved involve exposure to radiation, micro-gravity and meteorites. Launch, orbit capture, entry and landing, and all manoeuvring activities, are also techniques which need to be developed further. One of the missing keys has been a launcher, capable of lifting the required mass needed for a manned mission. Recently NASA announced that they will develop the Ares V rocket, which will be a derivative of the shuttle's rockets for the upcoming Moon missions. With the development of this new rocket, a manned mission to Mars appears to be within grasp of human reach. Ares V and other new technologies will put constraints on the conceptual design of a manned surface habitat for Mars.

In this study we have analyzed some of the new techniques, which will enable and facilitate a surface habitat. We have identified the most important habitat elements which are needed for a long surface stay, and discussed the different solutions pending on current available techniques.