Paper ID: 46339
student

21st IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (A5)
Human Exploration of the Moon and Cislunar Space (1)

Author: Mr. Ben Watts
University College London (UCL), United Kingdom, ben.watts1993@gmail.com

# THE UTILIZATION OF LAVA TUNNELS BENEATH THE LUNAR SURFACE AS HABITATIONS FOR HUMANS IN FUTURE MANNED MISSIONS TO THE MOON, OR INDEED AS PERMANENT LUNAR BASES.

**Abstract**

In the distant past of Lunar geologic activity, volcanic events of varying degrees of potency released mafic lava, leaving behind a trace in the surface geology - “channels.” Further activity caused lava to flow over such channels. Cooling action occurred and consequently roof structures were left behind, engineering permanent subsurface tube like structures. Lava tunnels have been found on Earth in locations such as Washington state USA, The Canary Islands, to give examples. Many of such tunnels are being and will be discovered in the future on the Moon and other planetary bodies. With new lava tubes being continually discovered in the subsurface geology of the Moon,and with both private publicly funded institutions setting their eyes on Lunar and Martian manned space travel within the relative near future, new ideas for the habitations of future human explorers scientists are being considered by the involved parties. This paper looks at the potential for human habitation of lunar lava tunnels as a constituent of future manned missions, and the implications of this on further exploration of the Solar System, including manned Martian missions. The structural integrity of the tunnels is a key issue from an engineering stand point, with drilling down at crater depressions a crucial idea in the set-up and construction. Technology transfer would thrive as a result of such an endeavor, as has been seen previously with missions such as Apollo. The rock that acts as the roof to many lava tunnels on the lunar surface acts as a natural defence towards the radiation that is found in space, and its negative effects on the human body. A sub surface habitation negates this threat.