

16th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND  
DEVELOPMENT (D3)Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development  
(2)

Author: Ms. Shivangi Chauhan

University of Petroleum and Energy Studies, India, shivangichauhan48@gmail.com

Dr. Ugur Guven

UN CSSTEAP, United States, drguven@live.com

Mr. Aditya Mishra

University of Petroleum and Energy Studies, India, oddmradityamishra@gmail.com

Mr. Shashank Pathak

Technical University of Berlin, Germany, shashank.hades21@gmail.com

Mr. Ankesh Shekhar

India, ankesh.shekhar19@gmail.com

## SPACE BASED ELECTRICITY SYSTEM BY USING MARTIAN DUST STORMS

**Abstract**

The human race has constantly held an overpowering desire to venture out into the unknown for the benefit of man, science, and civilization. Among extraterrestrial bodies in our solar system, the only planet which possesses all the raw materials required to support life and human civilization is Mars. Colonizing space is the next step for humanity that will cause significant advancement benefitting civilization as a whole. One of the main challenges for mars colonization is the Martian dust storms. Dust storm on Mars can originate in a matter of hours and can cover the entire planet within a few days. What causes dust storms? The rays from the Sun are responsible for this phenomenon. Solar heating warms the atmosphere of Mars and causes the air to move, lifting dust off the ground. Huge number of dust storms on the planet originates from one impact basin. One such deep crater is the Hellas Basin which was formed more than three billion years ago during the Late Bombardment Period when a large asteroid hit the surface of Mars. The temperatures at the lower surface of the crater is almost 10 degrees warmer than on the surface and due to this difference in temperature the wind action is affected. The wind so generated picks up the dust from the basin and emerges as a storm. These dust storms have always been a matter of concern for the probes that were sent to Mars. This paper aims at providing a solution in order to use these dust storms as an advantage. This can be done by using a filter and windmill arrangement. The filter will aim at settling the dust and then this filtered air will pass through the windmill which would further be helpful in producing electricity. Tracking of dust storms can be done by forecasts and this setup can be installed at areas from which they originate the most. Also, this paper will throw light on the future aspects of space based electricity in future space missions.