Paper ID: 17079
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SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Part 1 (3A)

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ROBOTIC SAMPLE RETURN MISSION TO MARS- A NOVEL CONCEPT TO EXTRACT AND TRANSPORT MARTIAN SAMPLES

Abstract

The ongoing exploration of Mars in search of signs of life for prospective human habitation on the Red Planet reflects the uttermost need of development of new technologies for future exploration of Mars. Manned Mission and prospective human habitation on the Red Planet remains the long term goals. The recent discoveries about the presence of life supporting features on Mars are great but still there are unanswered theories about Martian life which must be answered to ensure human survival on Mars. In order to get better understandings about those features, there is urgent need of studying the Martian rocks and soils physically on Earth not by the Rovers and Landers on Mars. The results obtained in an experiment done 245 Millions Miles away from Earth on Martian surface in a virtual way and the experiments done physically here on Earth can vary a lot. Since humans can touch and see those samples in a physical environment here on Earth hence they can study them in a better way than the analysis done by the Rovers and Landers. The lack of potential technology at present is putting a break in our efforts to transport them to Earth. In this regard the development of a novel concept to transport Martian samples can be very effective in search for Martian secrets. The concept "ROBOTIC SAMPLE RETURN MISSION TO MARS- A NOVEL CONCEPT TO EXTRACT AND TRANSPORT MARTIAN SAMPLES" can be very effective to bring the Martian samples for their physical analysis on Earth. The system can be designed in this way that it consists of a ROBOTIC ROVER to extract the Martian soils and rocks and a RETURN SPACECRAFT to bring back the Rover to Earth. The Rover Compartment designed inside the Spacecraft carries the Rover to Mars for extracting the samples and after completing its task the Rover moves back into the Rover Compartment inside the Spacecraft for the return journey. The samples extracted by the Rover are stored in its piggy back Sample Storage Compartment designed on the backside of the Rover. The Martian soil brought back by the mission can be experimented to grow plants on Earth in order to check about the ability of the Martian soil to support plant growth. This experiment can play a crucial role in exploring about the possibility of vegetation growth to provide life support to the humans on Mars in future.