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Human Exploration of the Moon and Cislunar Space (1)

Author: Mr. SHREYANSH SHARMA

R.V.College of Engineering, India, shreyanshs.ae19@rvce.edu.in

Ms. Nithyaashree Giridharan

R V College of Engineering, Bengaluru, India, nithyaashreegiri@gmail.com

Mr. Adarsh chandra

R.V.College of Engineering, India, adarshchandra.cv19@rvce.edu.in

Mr. Kunal Bavikar

R V College of Engineering, Bengaluru, India, bavikarkunal@gmail.com

AARAMBH,THE FUTURISTIC LUNAR SURFACE VEHICLE

Abstract

The human dream to colonize the moon will be a reality soon. Colonization demands for an effective and reliable transport system. To enhance comfortable lunar surface travel, a novel vehicle design is proposed in this paper. The motivation for putting this idea on paper comes from the difficulties a conventional lunar rover poses like slow movement, heavy and stiff spacesuits of astronauts while operating. AARAMBH which means "Start " in Sanskrit, is the proposed vehicle having a chassis developed with the combination of Aluminium alloy and Aerogel.

Aluminium alloys are used due to their excellent pressure handling capability, structural stability, material reliability, and high strength to weight ratio. Aerogel which is used in the interior has good thermal insulation properties, which help in maintaining the optimum temperature of the vehicle. Iterations of brainstorming led the team to the finalisation of the vehicle's propulsion considering the constraints like efficiency, availability etc. Inexhaustible solar energy source will power the vehicle for its mechanical and electrical operations.

The challenge was to provide the optimum human body functioning environment inside the vehicle. Life support systems provided inside the vehicle ensures optimum pressure and temperature. A mix of active and passive thermal controls is proposed. Novel air control system will provide the oxygen from lunar soil. Safety mechanism for the passengers in the case of emergency is discussed. AARAMBH aims to provide an ideal vehicle design that will help the future colony to travel on the lunar surface with ease. This small vision can help in realization of the moon colonization dream of mankind.