

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 2 (2B)

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RASHID ROVER: A SMALL ROVER WITH BIG SCIENCE GOALS

Abstract

The UAE announced its first of its kind mission to the lunar surface with a challenging deadline of 2024. Known as the Emirates Lunar Mission (ELM), the mission plans to develop a small class rover named as Rashid Rover in the range of 10 KG in order to explore a new location in the near side of the lunar surface. The missions' goal is to demonstrate and develop UAE's capabilities for planetary surface robotic missions, understand the geological and physical properties of the regolith and demonstrate technologies and materials for future lunar and Mars surface missions. The mission is planned to be operational for at least one lunar day. If successful, an experimental passive lunar survival method will allow Rashid Rover to continue its operations after its first lunar night. Through the utilization of a commercial lander, landing and operating Rashid Rover on the lunar surface will list UAE among the first nations to explore the lunar surface. Compared to its limited size and mass, Rashid Rover hosts an excellent suit of instruments and experiments that are first of its kind to be sent and conducted on the lunar surface. In addition, Rashid Rover uses two 4MP CMOS color cameras that will be used to generate high resolution imagery of the lunar surface which will be used for navigation, scientific investigations and public outreach purposes. The list of Rashid Rover scientific instruments includes Langmuir probe system, microscope imager and a thermal imager. In addition, a novel in-situ experiment related to materials interaction with the lunar regolith will be conducted onboard Rashid Rover under a subsystem called material adhesion determination (MAD). This paper presents the mission objectives and concept design of the ELM mission and its Rashid Rover along with high level details of different science instruments and experiments on board the rover.