

19th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Systems and Infrastructures to Implement Sustainable Space Development and Settlement - Systems (2A)

Author: Mr. Julian Mentasti Meza
University of British Columbia, CanadaROCKETNET: A HIGH-CAPACITY, LATENCY-INSENSITIVE, INTERPLANETARY DATA
DELIVERY SYSTEM**Abstract**

Humanity's data generation and consumption has been increasing every year. As we start moving towards long-term space missions to the Moon, Mars and farther than ever, it will be imperative to have communications systems that can fulfill our data transfer needs throughout the solar system. Currently, our approach to this problem has focused on improving long range radio and optical communication capabilities of existing space networks. However, it is very likely that future space settlements and scientific instruments will generate significant data demands that will overwhelm our long range wireless communication capabilities.

RocketNet is a new communication system designed to transfer vast amounts of non-latency-sensitive data between planets to reduce the network load on limited high-speed low-latency wireless networks. Data-vehicles will continually travel between planets, physically moving large amounts of data stored within the spacecraft. As the vehicle nears one of its target planets, it will communicate with the local ground and satellite communication systems. This will leverage existing high bandwidth short-range communication technology to quickly transfer between the data-vehicle's internal data storage and the planet's network. the vehicle will then use its internal propulsion systems and the planet's gravity to continue on course to other target planets with new data creating a reliable link between planets.

This paper will discuss the RocketNet system in greater detail, including its feasibility, and a comparison with conventional wireless interplanetary communication systems. The work further discusses how RocketNet could complement future space wireless networks in support of future space exploration and scientific research.