

Dialing Home From Mars – A Martian Telecommunications Network

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Abstract



The coming decade of Mars exploration will involve a diverse set of robotic science missions, including high-resolution remote sensing orbiters, mobile *in situ* landers, and innovative scout-class missions. The fidelity of our understanding of the red planet will in many ways be defined by the telecommunications bandwidth we can offer to these robotic explorers. By utilizing on-orbit spacecraft to provide telecommunications relay services to assets on the Martian surface, several orders-of-magnitude improvements in data return can be achieved relative to conventional direct-to-Earth links. We will present an overview of the currently planned program of Mars exploration, describe the program strategies to increase telecommunications capability via an evolving network of Mars relay orbiters, and examine several specific mission application scenarios.