

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
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## GROUND SYSTEM REQUIREMENTS FOR OPTICAL COMMUNICATION

**Abstract**

There is a necessity in advancement of technology, so that the communication system of a spacecraft would not become a constraint in planning and executing future science and exploration missions. There are innovative methods that could be used to implement in order to increase the efficiency of the communication system of a spacecraft. One of the ways that is been investigated is Optical Communication that utilizes a laser beam to transmit and receive data. Even though there is ongoing research in developing Optical Communication systems for the purpose of using in future exploration and science missions, the ground segment of the communication system is largely based on high quality optical telescopes. These optical collectors are mainly developed for astronomical observations which are fine tuned to absorb certain types of wavelengths. The needs of the optical communication systems are very different that high quality optics is not critical for the system functionality.

The goal of the project is to conduct research which explores the specific ground system requirements for Optical Communication. The results of the project include an understanding of the true requirements for the ground segment of the Optical Communication and their differences with respect to astronomical systems. Another outcome of this project would be a development of a prototype ground system based on the requirements that would identified through research.