

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
Advanced Satellite Services (5)

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## POTENTIAL FUTURE DEEP SPACE COMMUNICATION TECHNOLOGIES

**Abstract****Abstract**

Every mission has a communication system to support the functionality of the spacecraft by performing telemetry, tracking, command functions and to return scientific data from the spacecraft to Earth. As majority of the deep space missions never return to Earth, thus, after launch, a spacecraft's tracking and communications systems are the only means available to interact with the spacecraft. In addition, any issues with the spacecraft can only be diagnosed, repaired, or mitigated via the communications system. If it's a manned mission, then the importance of communication systems becomes inevitable. Without a consistently effective and efficient communications system, a successful mission would be impossible. However, in terms of deep space exploration, distance plays a major role. Interstellar distances increase the probability of information being lost. This paper discusses the challenges faced by communication system with the present technology in use and possible future solutions which can overcome such challenges and increase the success rate for deep space exploration.