

16th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
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Author: Mr. Aditya Mishra
University of Petroleum and Energy Studies, India

Dr. Ugur Guven
UN CSSTEAP, United States
Ms. Shivangi Chauhan
University of Petroleum and Energy Studies, India
Mr. Shashank Pathak
Technical University of Berlin, Germany
Mr. Ankesh Shekhar
India

STRATEGY FOR SETTING UP A DEEP SPACE NETWORK IN SPACE FOR EFFECTIVE SPACE
COMMUNICATION**Abstract**

Every year, humans send information gathering missions into space. As the missions turn out to be progressively modern, the measure of information they can assemble and need to send to Earth is rapidly rising. Exchanging radio signals between spacecraft in deep space is easier compared with getting those signals back to Earth, especially when the spacecraft is 120 billion miles away. Despite the fact that we've sent spacecrafts billions of miles into space and rovers are gathering illuminating data about the planets, moons, and even asteroids, radio communication in space still remains the new wilderness. While the missions themselves are a marvel of technical wizardry, so too is the Herculean feat of not simply conveying between spacecrafts but rather sending signals back to Earth. Man's greatest achievement in this regard is the Voyager spacecraft, that 38 years later is still communicating with Earth from more than 120 billion miles away, and has outlived even the most optimistic projections of longevity. NASA recently celebrated the 25th anniversary of the last time Voyager sent its last images to Earth. Soon, it will be time when the Voyagers and other interstellar probes will send their last signal and will be lost in the intergalactic space. The deep space data collected and sent back to Earth by the interstellar probes is extremely essential to mankind and possesses the ability to answer questions that humans have been asking since decades. As more scientific questions arise, the ability to answer them requires more sophisticated instruments that generate even more data which requires a productive space communication arrangement which can be utilized by mankind for the upcoming years. Earth has its own telecommunication network, analogous to which, this paper will provide an all-inclusive strategy to set up a communication network in space to survey our planetary system constantly, provide a more effective network for our existing and future space missions and increase the efficiency of deep space communication. This paper will provide a strategy for a telecommunication probe network and reasonable locations of the probes in and around our solar system which will assist humankind in breaking down and observing the solar system constantly and send signals back to earth more effectively. Also, this paper will throw light on how this strategy can support future space missions and increase the time for which our probes such as Voyager I II will return signals back to earth.