

SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FAR FUTURE (D4)
Novel Concepts and Technologies (1)

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AN EXAMINATION OF INTERSTELLAR STARSHIP DESIGNS

Abstract

Interstellar missions have been proposed as a priority for research into (1) the interstellar medium and any number of astrophysical studies which could be performed en-route, (2) astrophysical studies of a target star, or stars, if a multiple system is selected, (3) planetary science studies of any planets in the target system, including moons and large asteroids, and (4) astrobiological and exobiological studies of any habitable planets which may be found in a target system.

The primary challenges associated with any interstellar mission relate to the distances involved, and missions conducted on timescales of a human lifetime are not possible using conventional chemical propulsion. Numerous unique solutions have been proposed including; beamed energy propulsion, fission/fusion propulsion, antimatter propulsion, as well as more exotic ideas. In this talk a broad overview of the state-of-the-art in starship design is presented and a discussion of the merits and limitations of these is given. In addition, consideration of the technological maturity of the concepts and the possibility of their realization within a century is also provided.