

SPACE PROPULSION SYMPOSIUM (C4)
New Missions Enabled by New Propulsion Technology and Systems (6)

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DEFINING A NEAR-TERM INTERSTELLAR COLONY SHIP

Abstract

Current wisdom holds that interstellar colonization is generations off, because we need at least fusion rockets to attain a few percent of the speed of light. This paper presents a near-term alternative that uses beamed-laser-power from a Near Earth Asteroid (NEA) to boost a small colony ship using advanced ion-thrusters to achieve 2

The baseline for this study was a toroidal ship 300 meters in diameter with 300 original inhabitants. The thrust power was 6.5 Terawatts and the initial mass was 21,000 metric tons. The propulsion system was a four-grid Ion thruster consuming liquid hydrogen. and the power source is a concentrated photovoltaic array optimized for the laser wavelength. The NEA selected was an M type in an Apollo Orbit such that it was a stable laser platform during acceleration and was a huge heat sink at 160 K to assure good laser efficiency and to make the solar thermal power collection much more efficient. obviously, the NEA solar power plant and laser operate at perihelion.

The results of this study show that interstellar missions do not necessarily require exotic technologies, if an adequate space infrastructure is available.