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

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## HIGH POWER MPD NUCLEAR ELECTRIC PROPULSION (NEP) FOR ARTIFICIAL GRAVITY HOPE MISSIONS TO CALLISTO AND EUROPA

## Abstract

The following paper presents the study on the prospect of sending humans and autonomous humanoid robots to Jupiter's moon's, Callisto and Europa, using an all Nuclear Electric Propulsion (NEP) space transportation system architecture with magnetoplasmadynamic arc (MPD) thrusters. The fission reactor system utilizes high temperature uranium dioxide (UO2) in tungsten (W) metal matrix "cermet" fuel and electricity is generated using advanced dynamic Brayton power conversion technology. The mission timeframe assumes on-going human Moon and Mars missions and existing space infrastructure to support launch of cargo and crewed spacecraft to Jupiter in 2041 and 2045, respectively.