Application of Radioisotope Power Systems in the Exploration of the Solar System

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Venue: Baldwin Hall 544

ABSTRACT:

For over fifty years Radioisotope Power Systems (RPS) have been a key technology for increasing our understanding of the solar system. RPS have been employed on a number of planetary space missions to the outer planets (i.e. Jupiter/Galileo, Saturn/Cassini, Pluto/New Horizons [2015]), and are currently providing all of the electrical power for the rover Curiosity on the surface of Mars. Current nuclear based thermal to electrical power systems utilize the decay heat from the radioisotope 238-plutonium which is converted via thermoelectric modules into electrical power. The RPS powering Curiosity is called a MMRTG (Multi-Mission Radioisotope Thermoelectric Generator) and produces ~110 We from the ~2000 Wth released from the ~5 kg of its 238Pu fuel. The development of RPS technology started in Ohio and its application in the exploration of the solar system will be discussed.

BIO:

Dr. Kramer is a Professor in the Chemical and Materials Engineering Department at the University of Dayton and a Distinguished Research Engineer at the University of Dayton Research Institute. He earned graduate degrees in Ceramics from both M.I.T. and Rutgers University. His current research endeavors are mainly focused on supporting the United States development and application of space Radioisotope Power Systems. He has over 100 technical publications and 13 U.S. patents based on his research.