Pacific Northwest
NATIONAL LABORATORY

MAaD Science
Materials Aging and Detection Science
@PNNL

10:00 a.m. PT
Wednesday, February 22
Virtual Seminar

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Robert Moses, Founder and Director of Innovations & Technology
Tamer Space, LLC

A PORTABLE HIGH-ENERGY DENSITY SOURCE TO POWER LUNAR AND PLANETARY HUMAN EXPLORATION MISSIONS

A new direct energy conversion concept called Nuclear Thermionic Avalanche Cell (NTAC) combined with a Metallic Junction Thermoelectric (MJ-TE) generator, both invented and patented by NASA, offers high specific power for portable applications. Estimates based on experimental results at NASA suggest superior performance compared to radioisotope thermoelectric generators (RTG) by up to two orders of magnitude for the NTAC and three to four times better for the MJ-TE generator for the same mass. The NTAC technology can use a variety of radioisotopes including nuclear waste to liberate a large number of intra-band (IB), inner shell electrons of atoms (10^5 C/cm^3) by gamma-ray photons (100 keV to MeV). In contrast, conventional power generation has poor specific power because they only utilize the valence band electrons (3 C/cm^3) of the semiconductor or free electrons (10^3 C/cm^3) of the conductor.

The Materials Aging and Detection (MAaD) Science Seminar Series at Pacific Northwest National Laboratory presents Tamer Space, LLC founder, Robert Moses at 10:00 a.m. PT on Wednesday, February 22, via Teams. The seminar is free and open to the public. Moses also serves as Tamer Space's director of innovation & technology, where he develops NTAC and other technologies aiming to fill the gap in capabilities needed on Earth and in space. Moses retired from NASA after 33 years as an exploration systems engineer where his work focused on solving the challenges for astronaut missions to Mars. Moses holds a BS in civil engineering from North Carolina State University, a MS in systems engineering from Virginia Polytechnic Institute and State University, a MS in mechanical engineering from Stanford University, and a PhD in aeronautics from Stanford University.

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