



Wednesday
April 9, 2025
3:10 pm
Room 1003 EECS

Dr. Marcel Georgin

U.S. Naval Research Laboratory

RF Plasma Cathodes and Other Research Activities in the Plasma Propulsion Group at NRL

This talk discusses recent work on RF plasma cathodes, propellant agnostic electron sources for electric propulsion systems that enable new deep space exploration mission architectures such as in-situ resource utilization. We develop the fundamental theory for these devices and demonstrate its effectiveness at determining I-V characteristics and performance. From our measurements and model, we project thruster performance and discuss the consequences for space exploration. Then we dive into non-ideal behavior that can be exhibited in these cathodes including sheath expansion and mode transitions. The remainder of the discussion will overview other plasma-related research activities in the NRL propulsion group.

About the Speaker: Dr. Marcel Georgin is an Aerospace Engineer at the Naval Research Laboratory in Washington, D.C. He earned his bachelor's degree in physics from McGill University in Montreal, Canada, and his Ph.D. in applied physics from the University of Michigan where he studied plasma instabilities in electron sources for electric propulsion systems. His research interests are at the intersection of plasma physics and engineering, with a strong focus on space propulsion. He is currently working on a variety of plasma-related topics, including propellant agnostic electron sources, hypersonics environmental simulation, advanced thermionic cathodes, and more.