
ECE/NE/PHYSICS 922
Seminar in Plasma Physics
Mondays
12noon – 1610 Engineering Hall

Sept 18 - Dr. Royce James, US Coast Guard
“Rising Tides Lift all Boats: Fusion Energy Science, Plasma, Diversity, Equity, Inclusion, & Accessibility (DEIA) - the Intersectionality of a Healthy to Innovative Spaces and a ‘People Centered’ Focus to Drive Outcomes and Discovery”

Abstract

Our Plasma community of physicists, engineers, technicians, and supporting professionals stand poised to create a healthy climate of diversity, equity and inclusion critical to solving the challenges we face in our field. Institutional practices, tropes, and policies have caused and propagated harm to marginalized members, potential members, and majority members. Fundamentally improving the climate for everyone is vital to restoring our community evidenced in issues like recruiting and retention deficits. Systemic obstacles like gatekeeping, othering, grant and award criteria, Principal Investigator/Research Group accountability, and closed-source data management are prime opportunities to reimagine systems that elevate everyone. Stakeholders must create inclusive climates to support plasma and plasma adjacent careers (from undergraduates to senior management); especially for those racialized and members from other marginalized communities currently left out. At the U.S. Coast Guard Academy’s Plasma Lab (CGAPL), we have leveraged these intersections of DEIA , plasma physics and plasma adjacent pathways in a small CubeSat collaboration in near earth orbit between the U. S. Coast Guard Academy (CGA), Navy Research Lab (NRL), the U. S. Naval Academy (USNA), Old Dominion University (ODU), and the and the Air Force Institute of Technology (AFIT) have initiated scientific and engineering spacebased experiments. We have constructed an impedance probe payload for launch in Spring 2024 to measure plasma electron density from the 3U CubeSat with an innovative surface mounted dipole antenna to document required sheath-plasma and plasma resonance data. Additionally, at CGAPL the small Helicon Plasma Experiment (HPX), continues to progress toward utilizing the reputed high densities (1013 cm⁻³ and higher) at low pressure (.01 T) of helicons, for eventual high temperature and density diagnostic development in future laboratory investigations. HPX has installed an Impedans Langmuir probe in an RF-shielded triple probe experimental mode to compare the plasma’s density, temperature, and behavior during experiments. Our 2.5 J YAG laser Thomson Scattering system operates at its first and second harmonic, 532 and 1064 nm respectively. At 1064 nm, a new polychromator has been procured from General Atomics optimized for TS measurements of $5 \text{ eV} < T_e < 2000 \text{ eV}$ over a 109-degree scattering angle, among other diagnostics. Updates on the intersection, impacts, and benefits of DEIA and our lab research - supported by our national plasma professional society (American Physical Society’s Division of Plasma Physics), DOE, DOD, DHS, and others will be reported.

Biography

Prior to joining the Coast Guard, Dr. James served with AmeriCorps*National Civilian Community Corps (NCCC) as a Team Leader, then graduated from US Coast Guard Boot Camp class Y-149 in 1996. CAPT James attended New Mexico State University under the Coast Guard’s College Student Pre-Commissioning Initiative (CSPI) program. While at NMSU, he held Internships at the National Aeronautics & Space Administration (NASA) Goddard Space

Flight Facility and at the National Science Foundation (NSF), and served as a regional Rape Crisis Advocate for Doña Aña county, NM.

CAPT James worked as a Project Engineer at the Command and Control Engineering Center (C2CEN) and from there was selected for the Academy Instructor Masters program. Dr. James earned a Master's of Science Degree from Columbia University, and began teaching at the academy in 2004. CAPT James completed his Doctorate in Plasma Physics at Columbia's Plasma Physics Lab through Steven's Institute of Technology in December 2008. Since then he has been the PI of the Coast Guard Academy Plasma Lab (CGAPL), Department Equity Officer, Science Lecture Coordinator, Internship Coordinator, Co-founder/Director for CGA's Science Partnership for Innovation in Learning (Project SPIL), Genesis & Spectrum Council (CGA's Black and Gay Student Unions) and the Science Department Diversity & Inclusion Officer.

CAPT James, a 2019 Black Engineer of the Year Award (BEYA) winner for Professional Achievement in Government, is a founding member of the Black Lives of Unitarian Universalist's Organizing Collective, is the co-founder of the New London Freedom School, is a co-founder and Chair of the American Physical Society Division of Plasma Physics's (APS DPP) Diversity Equity and Inclusion Organizing Collective Committee (DEI-OCC), co founder of the Coast Guard Spectrum Affinity Group, founding Science Technology and Mathematics Magnet School Board Member, and Member of the Nuclear Energy Advisory Council for the state of CT (currently on leave of absence) and Thea Energy Board of Advisors.

Recently, CAPT James served as the Air Force Institute of Technology's inaugural Chief Diversity Officer and Visiting Professor in the Engineering Physics Department with research primarily in fusion energy, laboratory and space based magnetized plasmas, plasma interactions with electromagnetic radiation (with emphasis on high energy lasers), CubeSat payload and spacecraft development, and plasma water treatment. CAPT James returned to the Coast Guard Academy faculty this summer as a full professor, remains the PI of CGAPL, and is the Collaboration for Space & Energy lead. Dr. James' family, three daughters, son, and wife, the Reverend Jessica James, a Unitarian Universalist Minister, currently live in New Haven, CT with their two dogs Ebi and Levi.