



Project Title:

Miniature Hall thruster using ceramic and iron impregnated 3D filaments for fast design and test

Project Reference Code:

UAH-Xu3

Host Facility:

The University of Alabama in Huntsville

Host Facility Location:

301 Sparkman Dr.
Huntsville, AL 35899
<https://www.uah.edu/>

Project Description:

The goal of this project is to determine if PLA filaments impregnated with ceramic powder and iron powder can function as the plasma discharge channel and magnetic flux guide for a miniature cylindrical Hall thruster at UAH. These filaments can be 3D printed using regular desktop 3D printers and have some of the same material properties like insulator and ferromagnetism. The plastic can also be baked out of the finished by in a kiln. The student will design and model the thruster using CAD and magnetic field modeling software, print the designs, measure the resulting field profile, and then test the thruster in the vacuum chamber.

Disciplines:

Engineering, Physics

Is U.S. citizenship required to participate in this project?

No

Internship Location and COVID-19 related Backup Plan

The internship location is the University of Alabama in Huntsville. Due to the COVID-19 pandemic, we are preparing multiple options to ensure that the internship will take place. We are looking at least at an in-person, hybrid, and fully virtual option. For any in-person component we will ensure that there is adequate physical spacing between workspaces, following all university cleaning protocols. If the student cannot be in the lab, they can work on the design and modeling of the thruster from home and staff can run the experiments in the lab.

Name(s) of Mentor(s) and contact information:

Gabe Xu (gabe.xu@uah.edu)

Internship Coordinator/ HR manager:

Dana Waller (dsw0012@uah.edu)

The name and contact information of personnel at the host facility is provided for further assistance with questions regarding the host facility or the project.

Interns will not enter into an employee/employer relationship with the host facility. No commitment with regard to later employment is implied or should be inferred.