

**AEROSPACE ENGINEERING
ENGINEERING****RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students****APPLICATION DEADLINE: April 29, 2024****PROJECT TITLE: Development of a Helmholtz cage to simulate earth magnet field for testing CubeSat****Physical Requirement : Need to work in the lab for most time because of the nature of hardware experiment****Project's Technical Skills Requirement : EE or AE student****Project's Available Positions : 1****Dr. Ou Ma****Aerospace Engineering and Engineering
Mechanics****720 Rhodes Hall - ML0070****Tel.: (513)556-3747; Email: ou.ma@uc.edu****<https://irasatuc.github.io>****Project Description**

The student is expected to develop a PID control software for an already existing Helmholtz cage which is a 5ft x 5ft x 5ft cube frame with coils in all X, Y and Z axes for simulating 3D earth orbital magnet field. The control software allows the device to track the 3D magnetic field generated by computer-simulated earth magnet model for testing magnet-based attitude control methods of a small satellite. It requires a student having some knowledge of electromagnetics and PID control. This is a hands-on learning opportunity involving both software and hardware work and will be working with the mentor and other student researchers in the state-of-the-art Intelligent Robotics and Autonomous Systems (IRAS) Lab - see the second figure in

<https://irasatuc.github.io/>

The project is funded by aerospace company Sierra Lobo for testing a remote-sensing CubeSat currently being developed by the company and will be launched by NASA in September 2025. Therefore, you will be working with a real satellite to be launched to the space.