

**Project Title:**

Mapping Magnetic field lines of the Solar Wind

**Project Reference Code:**

UAH-Tasnim1

**Host Facility:**

The University of Alabama in Huntsville

**Host Facility Location:**

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

**Project Description:**

The solar wind is the expanding outer atmosphere of the Sun, which fills interplanetary space with heated ions and electrons. Studying the solar wind offers unique opportunities to understand space plasmas better and characterizing the solar wind's global three-dimensional (3D) structure is becoming increasingly important for space weather forecasting.

In this project, the students will learn to access and utilize data from the Wind and Parker Solar Probe spacecrafts for different solar rotation periods. The project will also help the students to learn and extend the current solar wind models of Tasnim & Cairns, 2016, Tasnim et al., 2018, and Tasnim et al., 2019 to predict the magnetic field as a function of position between the Sun and the Earth. Using this magnetic field vector ( $B$ ) and solar wind data, they will map magnetic field lines from the Sun to Earth, which is vital for predicting space weather caused by solar energetic particles (SEPs). To map the magnetic field, the student will combine the proposed solar wind model with the simple mapping algorithm of Li et al., 2016, and the Runge-Kutta method to predict magnetic field lines with the accelerating solar wind model.

**Disciplines:**

Physics, Math, Computer Science, Space Science

**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.

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

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Gary Zank ([gpz0001@uah.edu](mailto:gpz0001@uah.edu))

**Internship Coordinator/ HR manager:**

Dana Waller ([dsw0012@uah.edu](mailto:dsw0012@uah.edu))



## Alabama Plasma Internship Program



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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.