



# Alabama Research Experiences for Undergraduates



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**Project Title:**

The Origin of Energetic Particles in Astrophysics

**Project Reference Code:**

UAH-Che

**Host Facility:**

The University of Alabama in Huntsville

**Host Facility Location:**

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

**Project Description:**

Besides gravity, magnetic field is one of the main free energy source stored in stars, pulsars, black holes and other astrophysical objects. The magnetic energy is released through violent explosive events, such as solar and stellar flares, flares in black hole accretion disks, and gamma-ray bursts. During these explosive processes, a large amount of charged particles are accelerated to GeV ( $10^9$  eV) even up to PeV ( $10^{15}$  eV) and escape their hosts and propagate in space. However, how these energetic particles are accelerated is not well understood. This project aims to help the students to understand the basic concept of astrophysical particle acceleration through a well-defined project, participate in cutting-edge research, and inspire students' curiosity in space and astrophysical science.

**Disciplines:**

Numerical Simulation, Astrophysics

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

No

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

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**Internship Coordinator/ HR manager:**

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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.