



# Alabama Research Experiences for Undergraduates (ALREU)

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**Project Title:**

Intermittent structures in the solar wind plasma

**Project Reference Code:**

UAH-Li

**Hosting Institution:**

The University of Alabama in Huntsville

**Hosting Institution Location:**

Huntsville, AL

**Project Description:**

Solar wind is an ideal place to study a variety of processes in plasma. Comparing to laboratory experiments, it offers a unique opportunity to systematically examine the solar wind MHD turbulence. The turbulence nature of the solar wind can be understood since many forms of MHD waves exist in the solar wind. As the solar wind expands, these waves evolve, interact, cascade and dissipate. In-situ observations of plasma and magnetic field by multiple spacecraft have revealed many characteristics of these waves. Often these measurements are made at 1 AU. However, with the launch of Parker Probe Plus, one can now perform analyses at different heliocentric distances. This allows one to examine how these waves (therefore the solar wind MHD turbulence) evolve in the solar wind. In this project, the student will learn how to perform some fundamental analyses of solar wind MHD turbulence. S/he will learn wavelet analysis, PVI analyses, spectrum analysis, etc., which will be used to identify various structures in the solar wind. Data from multiple spacecraft will be used, including Parker Probe Plus (if data is available). Students will be involved with state-of-the-art research under the direction of Dr. Li (and his postdoc/graduate students). Continuation of the project beyond the summer with partial supports is also possible.

**Disciplines:**

Physics, Math, Computer Science, Space Science

**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 hosting is provided for further assistance with questions regarding the hosting institution or the project.

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