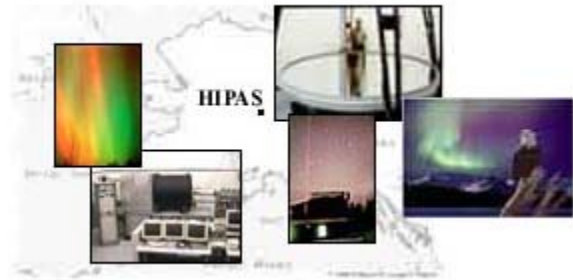



HIPAS Observatory

High Power Auroral Stimulation



<ul style="list-style-type: none"> ■ Research Opportunities ■ Application deadlines ■ Required application ■ Additional Activities ■ Application Process ■ Application Form ■ Reference Form ■ Eligibility ■ Program ■ Material 	<div style="text-align: center;">  <h2 style="color: red; text-decoration: underline;">National Science Foundation</h2> </div> <div style="text-align: center; background-color: #e0e0e0; padding: 5px;"> <h3>Research Experience for Undergraduates</h3> </div> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div data-bbox="430 1113 998 1375" style="width: 45%;"> </div> <div data-bbox="1006 1113 1429 1396" style="width: 50%;"> <h4>Proposed Project Summary</h4> <p>This REU site is to provide opportunities for undergraduates to conduct outdoor experiments on the environment using facilities in HIPAS Observatory.</p> <p>A number of students have expressed interest in the application of physical principles to understand and to measure the environmental parameters around them. The theme is to introduce students to the problems in the environment and show how they can find solutions using physics and chemistry. The specific environment is the atmosphere in the Arctic region. The major field of study is environmental physics.</p> <p>Our planet earth can be considered as being surrounded by different ?mantles? or ?layers?. The outermost is the Ionosphere, which connects to the Magnetosphere. The lower atmosphere contains a Sodium layer and Noctilucent Clouds. Still lower in altitude, the stratosphere contains the Ozone layer. All these layers can be probed or altered by electromagnetic waves, some at HF frequencies and others at laser frequencies.</p> <p>The objective then is to introduce the students to methods of measurements of the spatial and temporal variations of these mantles the ionosphere, the metallic layer, the Noctilucent cloud layer and the Ozone layer. The focus of</p> </div> </div>
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the student will be to learn about the outdoor atmosphere and to learn how to collect data using the various instruments, such as the digital ionosonde, the Doppler radar, the optical spectrometer and the Lidar.

They will learn computer programs, such as, LabView and MATLAB, for control and data analysis and to plot data. They will also learn about plasma physics, both experimental and theoretical, using well-tested textbooks. Most important of all they will acquire hands-on experience. Today's undergraduate is strong in computer skills but generally weak in hardware systems. As a result there is a lack of technical persons in all areas where devices or equipment have to be fabricated. They will learn how to combine theory, laboratory experiments, computer modeling and outdoor experiments together, to treat one or several particular topics.

Students accepted will be sophomore to seniors in small Alaskan or other colleges which do not have extensive research laboratories, but have a keen interest in the environment. They should have some computer skills in Fortran, C+ and MATLAB. We want enthusiastic, creative, resourceful students, preferably with some outdoor experience. Applicants will be judged holistically and not just on grade point average.

Dr. Glenn Rosenthal (310-825-3097; grosenthal@physics.ucla.edu) will be the point of contact, and a web site will be established (www.hipas.alaska.edu/reu) to provide REU site information. Ten students will be recruited each year for an 8-week summer session. Students will be drawn from several small colleges including Alaska Pacific University, Palmer, AK; Edgewood College, Madison, WI; Eastern Michigan University, Ypsilanti, MI; and similar institutions. Students will be allowed to continue accessing the experiments throughout the regular school year, using tools such as pcANYWHERE.

The host institution is the Hipas Observatory. The Principal Investigator is Professor Alfred Wong. Support will be provided by Dr. Joe Kan of the University of Alaska, Fairbanks, Geophysical Institute, and by Dr. Mike Kelley of Cornell University.

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