SUBAURORAL GEOPHYSICAL OBSERVATORY (SAGO)

POLAR AERONOMY AND RADIO SCIENCE SUMMER SCHOOL (PARS)

ACTIVE EXPLORATION OF NEAR-EARTH SPACE

AUGUST 5–14, 2025 | FAIRBANKS & GAKONA, ALASKA

Empowering faculty, graduate, and advanced undergraduate students with insight into SAGO and the High-frequency Active Auroral Research Program (HAARP), PARS offers a unique learning experience. By pairing students with advisors, the program aims to impart hands-on knowledge of the upper atmosphere and ionosphere at polar latitudes, making the learning process both educational and practical.

APPLY HERE

Visit **https://haarp.gi.alaska.edu** to submit your application.

@UAFHAARP

 Funded by the National Science Foundation, Geospace Facilities Program, and organized by the University of Alaska Fairbanks Geophysical Institute.

HIGH FREQUENCY ACTIVE AURORAL RESEARCH PROGRAM
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2025 Polar Aeronomy and Radio Science Summer School (PARS)

The 2025 Polar Aeronomy and Radio Science (PARS) summer school will be held in person at the University of Alaska Fairbanks and the High-frequency Active Auroral Research Program (HAARP) from August 5 to 14, 2025. The summer school provides faculty, graduate students, and advanced undergraduate students with exposure to the National Science Foundation (NSF) Subauroral Geophysical Observatory (SAGO) for Space Physics and Radio Science and the HAARP research site in Gakona, Alaska.

The summer school aims to provide student and advisor mentor pairs with an opportunity to study the upper atmosphere and ionosphere at polar latitudes, integrating practical experience into the learning process. The first week will occur in the Fairbanks area, featuring lectures and tours of space physics research sites. The program will then shift to HAARP for active experiments and student presentations of initial results. Students will receive training in the theory and concepts of ionospheric heating, including an introduction to Ionospheric Research Instrument (IRI) experiment design, diagnostics, and analysis. All students can engage in one-on-one discussions with experienced scientists from various U.S. academic institutions. This year's theme is **Active Exploration of Near-Earth Space**.

As the centerpiece SAGO instrument and the world's most powerful and flexible ionospheric HF Transmitter, HAARP can push the envelope of radio frequency plasma interactions. The IRI can actively probe the sub-auroral D- and E-region ionosphere, while multiple diagnostic instruments characterize the resulting processes occurring in both the neutral and ionized atmosphere. Using a phased array of antennas, beams can be formed at multiple frequencies and slewed rapidly across the sky. The facility has sufficient power to explore nonlinear effects in the plasma - something no other active facility can address. The powerful capabilities of the HAARP ionospheric heater are expected to lead to groundbreaking new discoveries for decades to come.

The HAARP facility was built by the U.S. Department of Defense (DoD) starting in 1990 to address questions relevant to the DoD. After these investigations were completed, management of the facility was transferred to the University of Alaska Fairbanks (UAF) in 2015, aiming to allow the broader research community to benefit from its exceptional capabilities. PARS will strengthen the United States' research infrastructure by supporting the first wave of these investigations within the open NSF research community, creating a critical mass of researchers and ideas that will foster future applications and new research focus areas.

Funding:

PARS is funded by the NSF through the Geospace Facilities Program within the Geosciences Directorate and organized by the University of Alaska Fairbanks Geophysical Institute. For more information about both SAGO and HAARP, please refer to the HAARP public web page at https://haarp.gi.alaska.edu/.

Admission and Application:

Graduate and advanced undergraduate students are encouraged to apply, but space is limited. Selected candidates enrolled in U.S. universities or institutions will receive travel support and accommodations to attend this event. Students from institutions outside the U.S. are welcome to apply; however, they will not receive travel support.

Admission to the school is based on an application submitted by the student proposing an experiment to be conducted during the school. Applications are ranked according to the merit of the proposals provided. Credit is given for investigations with a clearly defined question to be answered and a proposal that presents a good chance of substantial results using the observations made during the school.

Application instructions here:

The application form may be accessed at: https://haarp.gi.alaska.edu/pars2025. The following information is required for your application:

- Name (first and last, as shown on ID)
- Gender
- Mailing address
- Email
- Phone number
- University, college, or academic institution name
- Institution affiliation (faculty, student, other)
- Names of collaborators on your project, and/or names of student/advisor pair
- Brief description of the proposed experiment or scientific question you plan to explore
- (optional) Supporting documents such as a CV, resume, or letters of support

The deadline for application submission is March 31, 2025. Notice of acceptance will be sent to participants by April 15, 2025.

For more information about the school, contact Evans Callis, Lead, HAARP Research Support Services at ehcallis@alaska.edu or 907-474-2641.

PARS summer school organizing committee:

HAARP Director: Jessica Matthews, University of Alaska Fairbanks
HAARP Chief Scientist: Paul Bernhardt, University of Alaska Fairbanks
HAARP Science Advisory Committee Chairman: Robb Moore, University of Florida

SAGO Science Team: Bob McCoy, University of Alaska Fairbanks; Peter Delamere, University of Alaska Fairbanks ; Donald Hampton, University of Alaska Fairbanks; Mark Conde, University of Alaska Fairbanks; Vikas Sonwalkar, University of Alaska Fairbanks; Amani Reddy, University of Alaska Fairbanks; Craig Heinselman, University of Alaska Fairbanks

HAARP Science Advisory Committee: Robb Moore, University of Florida; Paul Bernhardt, University of Alaska Fairbanks; David Hysell, Cornell; Jade Morton, University of Colorado Boulder; Mark Golkowski, University of Colorado Denver; Wayne Scales, Virginia Polytechnic University; James Sheerin, Eastern Michigan University; William Bristow, Pennsylvania State University; Whitham Reeve, Reeve Engineers; Morris Cohen, Georgia Tech; Xinzhao Chu, University of Colorado Boulder; Angeline Burrell, Office of Naval Research; Evgeny Mishin, Boston College

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