



HIGH FREQUENCY ACTIVE AURORAL RESEARCH PROGRAM

University of Alaska Fairbanks
GEOPHYSICAL INSTITUTE

HAARP Program Office
University of Alaska Fairbanks
Geophysical Institute
2156 Koyukuk Drive
Fairbanks, Alaska 99775
UAF-GI-HAARP@alaska.edu
<https://haarp.gi.alaska.edu/>
Phone | 907-474-1100
www.facebook.com/pg/UAFHAARP
Twitter | @UAFHAARP

Date: October 20, 2022
To: Amateur Radio Community
From: HAARP Program Office
Subject: Notice of Transmission

The High-frequency Active Auroral Research Program (HAARP) will be conducting a research campaign from Oct. 19 to Oct. 28, with transmissions taking place between 1400-0600 UTC (see table below for details). Actual transmit days and times are highly variable based on real-time ionospheric conditions. All information is subject to change.

This campaign will be the most scientifically diverse ever conducted at HAARP; some particularly notable experiments include a first-of-its-kind attempt to bounce a signal off of Jupiter, investigation into possible causes of the airglow phenomenon known as STEVE (Strong Thermal Emission Velocity Enhancement), and testing the feasibility of using radio transmissions to measure the interiors of near-Earth asteroids. Experiments benefiting from amateur radio support or having citizen science applications are noted below, along with known frequency information.

Making the Invisible Visible (MIV) – Experiment using HAARP to test if hot electrons are capable of producing the continuum (white) emissions present in STEVE airglow. If successful, this experiment may provide new insights into the cause of the unique color of STEVE, a question that remains unanswered.

Moon Bounce – A NASA Jet Propulsion Laboratory project, in collaboration with Caltech's Owens Valley Radio Observatory (OVRO) and the University of New Mexico Long Wavelength Array (UNM-LWA), testing the potential use of HAARP/OVRO/UNM-LWA for interior sensing on near-Earth asteroids. This experiment will reflect HAARP transmissions off of the Moon, and the echo will be received by OVRO and UNM-LWA. Amateur radio enthusiasts are invited to listen to the transmissions/echos and submit reception reports to the HAARP facility at uaf-gi-haarp@alaska.edu, or by mailing a report to the address at the end of this document.

Ghosts In The Airglow (GITAG) – The second of a three part transmission art project, mixing audio and images at the boundary between Earth's atmosphere and outer space. Air glow and Luxembourg experiments will be paired with the AM modulation of Narrow Band Television (NBTv) video art, spoken word, and sound art created by Amanda Dawn Christie. As a citizen science experiment to learn more about propagation, shortwave listeners from around the world are invited to tune in and submit reception reports in exchange for QSL cards. Transmission frequencies will be listed on the project's new website www.ghostsintheairglow.space, and reception reports can be submitted using the online form which is also on the website. For those who do not have access to shortwave radio equipment, the project will also be streamed live on the home page of the project's website. There are frequently two frequencies transmitted simultaneously, and as such there are two videos embedded side by side (one for each frequency) that can be viewed simultaneously.

Interplanetary Ionosonde (Jupiter Bounce) – Testing the use of HAARP (in conjunction with the University of New Mexico Long Wavelength Array) as an interplanetary ionosonde to measure the ionosphere of Jupiter. HF transmissions from HAARP will be directed at Jupiter, and UNM-LWA will listen for an echo off of the Jovian ionosphere. *Ham radio operators note: please remain quiet!* On Oct. 24, 0830-1000 UTC, we will attempt the largest active remote sensing operation in history. Due to the distances involved, it is very important that we keep the noise floor in the 2.7-10 MHz range as low as possible for the duration of the experiment.

Naturally Inspiring.

Experiment	Dates/Times (UTC)	Frequency (MHz)	Notes
Moon Bounce	Oct. 19, 1630-1800 Oct. 20, 1730-1830 Oct. 21, 1830-1900	9.6 LFM, 0.5 Hz WRF, 30 kHz bandwidth	Reports recording lunar echo encouraged; demodulated recordings in .wav or .mp3 recommended
Making the Invisible Visible	Oct. 23, 0130-0330 Oct. 24, 0200-0230 Oct. 25, 0130-0300 Oct. 26-28, 0130-0230	~4.29, CW modulation	Exact frequency determined from ionogram
Ghosts in the Airglow	Oct. 23-24, 0530-0600 Oct. 25-26, 1630-1700	2.8, 3.3, 4.8, 4.85, 5.4, 5.9, 9.06, 9.45, 9.5, 9.56 AM audio, NBTV video	See GITAG website (link above) for report submissions/requirements
Interplanetary Ionosonde (Jupiter Bounce)	Oct. 24, 0700-0800	2.8, 3.25, 4.1, 4.8, 5.8, 6.8, 7.35, 8.05, 9.6 LFM, 10 kHz BW	<i>Please keep transmissions to a minimum on these frequencies from 0830-1000</i>
VLF Amplification	Oct. 22, 2100-2200 Oct. 24-27, 0300-0400, 2030-2200 Oct. 28, 0300-0400, 2100-2200	3.2, 4.2 AM and CW modulation	Transmitting at critical frequency, subject to real-time updates
HF Ocean Scatter (GIOS)	Oct. 22-28, 2200-2400 Oct. 23, 0330-0400 Oct. 24, 26, 0230-0300 Oct. 25, 0300-0330 Oct. 28, 0230-0300, 2030-2100	9.6 LFM, 50-100 Hz WRF, 12.5/25 kHz bandwidth	UTC time-stamps from GPS receivers appreciated for reports
AERA Radar	Oct. 23, Oct. 25-26, Oct. 28, 0000-0130	TBD (2.7-10)	
Artificial Periodic Inhomogeneity	Oct. 23, 2100-2200 Oct. 24, 1930-2030 Oct. 25-26, Oct. 28, 1830-2030	5.731 CW	Frequency subject to change; HAARP ionograms delayed during experiment
Satellite Instrument Calibration	Oct. 23-25, Oct. 28, 0400-0500 Oct. 24, 0000-0030 Oct. 27, 0000-0100	4.8, 5.8, 6.8, 7.35, 8.05, 9.6 LFM, 10 kHz BW	
Ionosphere-Satellite Interactions	Oct. 23-28, 0500-0530 Oct. 27, 0230-0300 Oct. 28, 1630-1700	F-layer critical frequency, CW modulation	UTC time-stamps from GPS receivers appreciated for reports
PFISR-HAARP Heating	Oct. 24, 0100-0200 Oct. 25-26, Oct. 28, 1700-1830 Oct. 27, 1830-2030	7.5, 8.0, 9.1 CW O-mode	Collaboration w/ Poker Flat Research Range
Wave-Mode Conversion	Oct. 23-24, 0530-0600 Oct. 24, 0030-0100 Oct. 27, 0100-0130	2.85 AM, CW	

For real-time ionospheric conditions in Gakona, please consult ionograms from the HAARP Diagnostic Suite: <https://haarp.gi.alaska.edu/diagnostic-suite>

To request a HAARP QSL card, send reception reports to:

HAARP

P.O. Box 271

Gakona, Alaska 99586

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