



High Frequency Active Auroral Research Program

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HAARP is often confused with Project HARP, the High Altitude Research Project (a joint project of The Pentagon and the Canadian Department of National Defence).

The **High Frequency Active Auroral Research Program (HAARP)** is an investigation project to "*understand, simulate and control [ionospheric](#) processes that might alter the performance of communication and surveillance systems.*" Started in 1993, the project is proposed to last for a period of twenty years.

The project is jointly funded by the United States Air Force, the Navy, and the University of Alaska. Defense Advanced Research Projects Agency (DARPA). Although fears have been expressed that HAARP could be used as a nefarious global weapon, scientists involved in [aeronomy](#), space science, or [plasma physics](#) say these fears are unfounded.

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The HAARP site

The project site is near Gakona, Alaska (lat. 62.23° N, long 145.09° W), just West of the Wrangell-Saint Elias National Park. An environmental impact statement led to permission for an array of up to 180 antennas to be erected. The HAARP has been constructed at the previous site of an over-the-horizon radar installation. A large structure, built to house the OTH now houses the HAARP control room, kitchen, and offices. Several other small structures house various instruments. The Ionospheric Research Instrument (IRI) is the primary instrument at HAARP, which is a high-frequency (HF) transmitter system used to temporarily modify the ionosphere. Study of this modified volume yields important information for understanding natural ionospheric processes.

During active ionospheric research, the signal generated by the transmitter system is delivered to the antenna array, transmitted in an upward direction, and is partially absorbed, at an altitude between 100 to 350 km (depending on operating frequency), in a small volume a few hundred meters thick and a few tens of kilometers in diameter over the site. The intensity of the HF signal in the ionosphere is less than 3 $\mu\text{W}/\text{cm}^2$, tens of thousands of times less than the Sun's natural electromagnetic radiation reaching the earth and hundreds of times less than even the normal random variations in intensity

of the Sun's natural [ultraviolet](#) (UV) energy which creates the ionosphere. The small effects that are produced, however, can be observed with the sensitive scientific instruments installed at the HAARP facility and these observations can provide new information about the dynamics of [plasmas](#) and new insight into the processes of solar-terrestrial interactions. [2]

The HAARP site has been constructed in three distinct phases. The **Developmental Prototype** (DP) had 18 antenna elements, organized in three columns by six rows. It was fed with a total of 360 kilowatts (kW) combined transmitter output power. The DP transmitted just enough power for the most basic of ionospheric testing.

The **Filled Developmental Prototype** (FDP) had 48 antenna units arrayed in six columns by eight rows, with 960 kW of transmitter power. It was fairly comparable to other ionospheric heating facilities. This was used for a number of successful scientific experiments and ionospheric exploration campaigns over the years.

The **Final IRI** (FIRI) will be the final build of the IRI. It has 180 antenna units, organized in 15 columns by 12 rows, yielding a theoretical maximum gain of 31 dB. A total of 3600 kW (3.6 MW) of transmitter power will feed it. The total effective radiated power (ERP) will be 3,981 MW (96 dBW). As of the summer of 2005, all the antennas were in place, but the final quota of transmitters had not yet been installed. As of March 2007, the final phase was completed and the antenna array was undergoing testing aimed at fine-tuning its performance to comply with safety requirements required by regulatory agencies.

Each antenna element[3][4] consists of a crossed [dipole](#) that can be polarized for linear, [ordinary mode](#) (O-mode), or [extraordinary mode](#) (X-mode) transmission and reception. Each part of the two section crossed dipoles are individually fed from a custom built transmitter, that has been specially designed with very low distortion. The ERP of the IRI is limited by more than a factor of 10 at its lower operating frequencies. Much of this is due to higher antenna losses and a less efficient antenna pattern.

HAARP can transmit between 2.8 and 10 MHz. This frequency range lies above the AM radio broadcast band and well below Citizens' Band frequency allocations. The HAARP is only licensed to transmit in certain segments of this frequency range, however. When the IRI is transmitting, the bandwidth of the transmitted signal is 100 kHz or less. The IRI can transmit continuously (CW) or pulses as short as 100 microseconds (μ s). CW transmission is generally used for ionospheric modification, while short pulses are frequently repeated, and the IRI is used as a radar system. Researchers can run experiments that use both modes of transmission, modifying the ionosphere for a predetermined amount of time, then measuring the decay of modification effects with pulsed transmissions.

Ionospheric heating facilities

Comparison of the HAARP with other ionospheric facilities
(From the HAARP website, public use permitted if source cited)

The HAARP IRI is an ionospheric heater, one of many around the world. It is comparable in function and power to most of them.

Platteville

One of the earliest ionospheric heating facilities was at Platteville, Colorado, capable of radiating about 100 MW ERP. Early experiments included HF heater induced air-glow, heater-induced spread F, wide band heater-induced absorption, and heater-created field-aligned ionization. The Platteville heater operated from 1968 - 1984.

Current facilities

The United States has three ionospheric heating facilities: the [HAARP](#), the HIPAS, near Fairbanks, Alaska, and (currently offline for modifications) one at the Arecibo Observatory in Puerto Rico. The European Incoherent Scatter Scientific Association (EISCAT) operates an ionospheric heating facility, capable of transmitting over 1 GW [5] (1,000,000,000 watts) effective radiated power (ERP), near Tromsø in Norway. Russia has the [Sura ionospheric heating facility](#), in Vasil'sursk near Nizhny Novgorod, capable of transmitting 190 MW ERP.

HAARP management

The HAARP is currently being managed by Dr. Sheldon Meth of the Tactical Technology Office, which is one of the eight technical offices in DARPA, the Defense Advanced Research Projects Agency.

Diagnostic instrumentation

- VHF radar
- UHF radar
- Digisonde
 - A digisonde provides ionospheric profiles, allowing scientists to choose appropriate frequencies for IRI operation. The HAARP makes current and historic digisonde information available online.
- HF receivers
- Fluxgate magnetometer

- A fluxgate magnetometer, built by the University of Alaska Fairbanks Geophysical Institute is available to chart variations in the earth's magnetic field. Rapid and sharp changes may indicate a geomagnetic storm.
- Induction magnetometer
 - An induction magnetometer, provided by the University of Tokyo, measures the changing geomagnetic field in the ULF ([ultra low frequency](#)) range of 0-5 Hz.

Research at the HAARP

HAARP's main goal is basic science research of the uppermost portion of the atmosphere, known as the ionosphere. Essentially a transition between the atmosphere, and the magnetosphere, the ionosphere is where the atmosphere is thin enough that the sun's x-rays and UV rays can reach it, but thick enough that there are still enough molecules present to absorb those rays. Consequently, the ionosphere consists of a rapid increase in density of free electrons, beginning at ~70 km, reaching a peak at ~300 km, and then falling off again as the atmosphere disappears entirely by ~1000 km. Various aspects of HAARP can study all of the main layers of the ionosphere.

The profile of the ionosphere, however, is highly variable, showing variations by the minutes, diurnal changes, seasonal changes, and year-to-year changes. This becomes particularly complicated at high latitudes, where a host of physical processes (like auroral lights) are unlocked by the fact that the Earth's magnetic field is pointed nearly vertically.

On the other hand, the ionosphere is traditionally very difficult to measure. Balloons cannot reach it because the air is too thin, but satellites cannot orbit there because the air is still too thick. Hence, most experiments on the ionosphere give only small pieces of information. HAARP approaches the study of the ionosphere by following in the footsteps of an ionospheric heater called EISCAT near Tromsø, Norway. There, they pioneered exploration of the ionosphere by perturbing it with radio waves in the 2-10 kHz range, and studying how the ionosphere reacts. HAARP does many of the same things EISCAT does, but turns up the power a little bit more.

Some of the main scientific findings from HAARP include:

1. Generation of [very low frequency](#) by modulated heating of the auroral electrojet, useful because generating VLF waves ordinarily requires gigantic antennas.
2. Production of weak luminous glow (below what you can see with your eye, but measurable) from absorption of HAARP's signal.
3. Production of ultra low frequency waves in the 0.1 Hz range, which are next to impossible to produce any other way.
4. Generation of whistler-mode vlf signals which enter the magnetosphere, and propagate to the other hemisphere, interacting with Van Allen radiation belt particles along the way.
5. VLF remote sensing of the heated ionosphere.

Research at the HAARP includes:

1. Ionospheric heating
2. Plasma line observations
3. Stimulated electron emission observations
4. Gyro-frequency heating research
5. Spread F observations
6. Airglow observations
7. Heating induced scintillation observations
8. VLF and ELF generation observations
9. Radio observations of meteors
10. Polar mesospheric summer echoes: Polar mesospheric summer echoes (PMSE) have been studied using the IRI as a powerful radar, as well as with the 28 MHz radar, and the two VHF radars at 49 MHz and 139 MHz. The presence of multiple radars spanning both HF and [VHF](#) bands allows scientists to make comparative measurements that may someday lead to an understanding of the processes that form these elusive phenomenon.

Stated objectives

The HAARP project aims to direct a 3.6 MW signal, in the 2.8-10 [MHz](#) region of the [HF](#) band, into the ionosphere. The signal may be pulsed or continuous wave. Then effects of the transmission and any recovery period will be examined using associated instrumentation, including VHF and [UHF](#) radars, HF receivers, and optical cameras. According to the HAARP team, this will advance the study of basic natural processes that occur in the ionosphere under the natural but much stronger influence of solar interaction, as well as how the natural ionosphere affects radio signals. This will enable scientists to develop techniques to mitigate these effects in order to improve the reliability and/or performance of communication and navigation systems, which would have a wide range of applications in both the civilian and military sectors.

The project is funded by the Office of Naval Research and jointly managed by the ONR and Air Force Research Laboratory, with the principal involvement of the University of Alaska. Fourteen other universities and educational institutions have been involved in the development of the project and its instruments, namely the University of Alaska, Penn State University (ARL), Boston College, UCLA, Clemson University, Dartmouth College, Cornell University, Johns Hopkins University, University of Maryland, College Park, University of Massachusetts, MIT, Polytechnic University, Stanford University, and the University of Tulsa. The project's specifications were developed by the universities, which are continuing to play a major role in the design of future research efforts. There is both military and commercial interest in its

outcome, as many communications and navigation systems depend on signals being reflected from the ionosphere or passing through the ionosphere to satellites. Thanks to the more penetrating properties of [VLF](#) and [ELF](#), advancements in underwater and underground research and applications are now possible. This may lead to improved methods for submarine communication and the ability to remotely sense the mineral content of the terrestrial subsurface, among other things.

The HAARP project offers annual open days to permit the general public to visit the facility, and makes a public virtue of openness; according to the team, "there are no classified documents pertaining to the HAARP." Each summer, the HAARP holds a summer-school for visiting students, giving them an opportunity to do research with one of the world's foremost research instruments.

Weather Modification

According to HAARP campaigners, patents state:

"Weather modification is possible by, for example, altering [upper atmosphere](#) wind patterns by constructing one or more plumes of atmospheric particles which will act as a lens or focusing device... molecular modifications of the atmosphere can take place so that positive environmental effects can be achieved. Besides actually changing the molecular composition of an atmospheric region, a particular molecule or molecules can be chosen for increased presence. For example, [ozone](#), [nitrogen](#), etc., concentrations in the atmosphere could be artificially increased."^[*citation needed*]

HAARP controversy

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The HAARP's critics

Waste

The cost of building the HAARP has exceeded the dollar-adjusted cost of similar facilities around the world. HAARP was constructed at the site of an obsolete over-the-horizon radar facility for political reasons, but its location was less than ideal from a scientific perspective.^[*citation needed*] Some believe that it was constructed as a pork barrel project for Alaska by Senator Ted Stevens.^[*citation needed*]

Weapon

The objectives of the HAARP project became the subject of controversy in the mid-1990s, following claims that the antennas could be used as a weapon. A small group of American physicists aired complaints in scientific journals such as *Physics and Society*, charging that the HAARP could be seeking ways to destroy or disable enemy spacecraft^[*citation needed*] or disrupt communications over large portions of the planet. The physicist critics of the HAARP have had little complaint about the project's current stage, but have expressed fears that it could in future be expanded into an experimental weapon.

These concerns were amplified by Bernard Eastlund, a physicist who developed some of the concepts behind the HAARP in the 1980s and proposed using high-frequency radio waves to beam large amounts of power into the ionosphere, energizing its [electrons](#) and ions in order to disable incoming missiles and knock out enemy satellite communications. The US military became interested in the idea as an alternative to the laser-based Strategic Defense Initiative. However, Eastlund's ideas were eventually dropped as SDI itself mutated into the more limited National Missile Defense of today. The contractors selected to build HAARP have denied that any of Eastlund's patents were used in the development of the project.

After the physicists raised early concerns, the controversy was stoked by local activism. In September 1995, a book entitled *Angels Don't Play This HAARP: Advances in Tesla Technology* by the former teacher Nick Begich, Jr., son of the late Congressman Nick Begich, claimed that the project *in its present stage* could be used for "geophysical warfare." The HAARP has subsequently become a target for those who have suggested that it could be used to test the ability "[to deliver very large amount of energy](#), comparable to a nuclear bomb, anywhere on earth," changing weather patterns, blocking all global communications, disrupting human mental processes and mind control, causing earthquakes, and "x-raying" the earth. These claims are generally disregarded by scientists and those involved with the project as being completely baseless.

Russian Parliament

In August 2002, further support for those critical of HAARP technology came from the State Duma (parliament) of Russia. The Duma published a critical report on the HAARP written by the international affairs and defense committees, signed by 90 deputies and presented to President Vladimir Putin. The report claimed that "*the U.S. is creating new integral geophysical weapons that may influence the near-Earth medium with high-frequency radio waves ... The significance of*

this qualitative leap could be compared to the transition from cold steel to firearms, or from conventional weapons to nuclear weapons. This new type of weapons differs from previous types in that the near-Earth medium becomes at once an object of direct influence and its component." However, given the timing of the Russian intervention, it is possible that it was related to a controversy at the time concerning the US withdrawal in June 2002 from the Russian-American Anti-Ballistic Missile Treaty. This high level concern is paralleled in the April 1997 statement by the U.S. Secretary of Defense over the power of such electromagnetic weaponry. Russia owns and operates an aging and underfunded ionospheric heater system as powerful as the HAARP^[citation needed], called '[Sura](#),' which is located in central Russia, roughly 150 km from the city of Nizhny Novgorod.

HAARP's supporters

The critics' views have been rejected by the HAARP's defenders, who have pointed out that the amount of energy at the project's disposal is minuscule compared to the colossal energies dumped into the atmosphere by solar radiation and thunderstorms. A University of Alaska Fairbanks Geophysical Institute scientist has compared the HAARP to an "immersion heater in the Yukon River."

Since the ionosphere is inherently a chaotically turbulent region, HAARP's defenders state any artificially induced changes would be "swept clean" within seconds or minutes at the most. Ionospheric heating experiments performed at the Arecibo Observatory's ionospheric heater and incoherent scatter radar have shown that after periods of modification (up to an hour), the ionosphere returns to normal within about the same period of time it had been heated.

For instance, HAARP generates 3.6 megawatts (MW) of power. 3.6 MW is considered a minuscule percentage of the energy compared to all of the energy constantly injected into the Earth, and the ionosphere, by the sun.

Furthermore, supporters of HAARP argue that its activities have been, since its establishment, extremely open. All activities are logged and publicly available. Scientists without security clearances, even foreign national scientists, are routinely allowed on site. The HAARP facility regularly hosts open houses, during which time any civilian may tour the entire facility. Many people see this as a sign that the facility is not engaging in the type of extremely questionable research that is suggested by many critics.

See also

- *General:* [Plasma Physics](#) — Teleforce — Environmentalism — Conspiracy theories — Magnetometer — Psychotronics
 - *Atmosphere:* [Ionosphere](#) — Ionospheric heating — Ionosonde — Ionospheric reflection
 - *Frequencies and waves:* [High Frequency](#) (HF) — [Very Low Frequency](#) (VLF) — [Ultra Low Frequency](#) (ULF) — [Extremely Low Frequency](#) (ELF) — Longitudinal waves — Transverse waves
 - *Observatories:* Platteville Atmospheric Observatory — Arecibo Observatory
 - *Other facilities*
1. European Incoherent Scatter Scientific Association
 2. HIPAS-High Power Auroral Stimulation
 3. [Sura Ionospheric Heating Facility](#)
 4. SuperDARN It measures North and South pole ionospheric plasma eddy currents, sites in Kodiak, Iceland, Invercargill etc ...
 5. Poker Flat Research Range
- *People:* William E. Gordon — Nikola Tesla
 - Tin-foil hat

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- "BAE Systems (program and apparatus-owner of the HAARP facility, Railgun technology, electromagnetic armor, and, a sub-corporation partner with Raytheon via British Aerospace Corporation)
- "General Dynamics Robotics (owned by Raytheon Corp) - military contractor/manufacture of Unmanned Autonomous Vehicles (UAV) aircraft designed for "all-weather," computer-controlled weapons defense programs
- "Boeing, Lockheed Martin, BAE Systems, and Raytheon to create B2B exchange for the aerospace and defense industry, powered by Microsoft"

Other facilities and agencies

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- "the Weather Modification Operations and Research Board on Wiki"

Information

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- "To Understand HAARP: NWO's Scalar Electromagnetics: secret 20th century parallel tech path." Portland IMC. (This article is an assemblage of scalar electromagnetics information detailed by scientist Tom Bearden).
- www.ethericwarriors.com -- to learn how to neutralize HAARP facilities in your area.
- Ikerjimenez.com Completo Dossier sobre HAARP y otras transmisiones secretas.

Films and movies

- "HAARP: The secret HAARP of the US military?" informative video on HAARP (High Frequency Active Auroral Research Program)
- "HAARP: Holes in Heaven?" HAARP and Advances in Tesla Technology. Wednesday, Jun. 01, 2005
 - The 51 minute documentary features the authors who wrote the book "*Angels Don't Play this HAARP: Advances in Tesla Technology*" (ISBN 0-9648812-0-9), and interviews biologists, ecologists, and HAARP technologists directly associated with the project and its patents.
 - "VIDEO: "HAARP: Holes in Heaven" (alternative site); "Torrent Download"
- "Owning the Weather" Discovery Channel, 2005
 - Documentary covers traditional and modern forms of weather modification including a segment on HAARP.
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- Current and archived magnetometer data
- Induction Magnetometer data page
- Induction Magnetometer description page
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- Brendan Bombaci, "Weather Modification Exposed; media journals and notes for the independent film documentary" "Heaven & Earth," ongoing internet-based production as of 2007.

Coordinates: 62°23'30"N, 145°09'00"W

Category: [Plasma physics](#)

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