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National Science Foundation Award #2054361
Establishing a Subauroral Geophysical Observatory (SAGO) for
Space Physics and Radio Science at Gakona, Alaska

Start Date: April 1, 2021

End Date: March 31, 2026

Award Abstract:

This project supports the NSF space physics and aeronomy community in their effort to observe and actively probe Earth's upper atmosphere and geospace environment, in the subauroral and auroral zones. Instruments and infrastructure for these studies are already established, and together comprise a world class year-round observatory that is located at Gakona, Alaska, at an L-value of roughly five. The centerpiece of this observatory is the High-Frequency Active Auroral Research Program (HAARP), the most capable and powerful HF transmitter in the world.

The location in Gakona, Alaska - at 62°23'N (63.44° magnetic N), 145°09'W, and about 2.5° south of Fairbanks - is southward of the auroral zone most of the time, but frequently is directly under the active aurora. The location is ideal for ionospheric modification studies of the generation of ELF and VLF radio emissions by modulating the auroral electrojet, and for studies of the injection of these waves into the magnetosphere to observe their interaction with energetic particles in the radiation-belts.

This Subauroral Geophysical Observatory (SAGO) will be operated as a community research facility with routine operation of scientific diagnostic instrumentation and with the HAARP transmitters running in campaign mode periodically for a few days at a time. Support is requested here for a baseline of 200 hours of HAARP operation per year, with unrestricted additional time available for externally funded studies.