

**An MF/HF antenna array
for radio and radar imaging of the ionosphere**

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The Aguadilla Radio Array is being installed at the Interamerican University Aguadilla Campus, located in northwestern Puerto Rico. The array is intended for broadband medium and high-frequency (MF/HF, roughly 2 to 25 MHz) radio and bistatic radar observations of the ionosphere. The main array consists of 24 antenna elements, each of which is a single active (electrically short) crossed electric dipole. Nineteen of these elements will be arranged in a semi-random pattern providing a good distribution of baseline vectors, with 6-meter minimum spacing to eliminate spacial aliasing, and five will be arranged in a ring around the central core, providing a roughly five times expanded region in u-v space for improved imaging quality. A relocatable six-element array is also being developed, in which each element consists of a single crossed pair of active electric dipoles and all associated electronics for phase-coherent radio measurements. A primary scientific goal of the array is to create images of the region of ionospheric radio emissions stimulated by the new Arecibo Observatory high-power high-frequency radio transmitter. A second primary goal is the study of ionospheric structure and dynamics via coherent radar imaging of the ionosphere in collaboration with the University of Colorado / NOAA Versatile Interferometric Pulsed Ionospheric Radar (VIPIR), located at the USGS San Juan Observatory in Cayey, Puerto Rico. In addition to ionospheric research in collaboration with the Cayey and Arecibo Observatories, the goals of the project include the development of radio sounding, polarization, interferometry, and imaging techniques, and training of students at the university and high school levels.