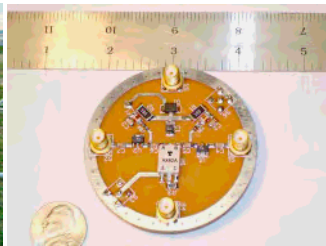


The Long-Wavelength Array – A New Window on the Universe
By Lee J Rickard, University of New Mexico

Abstract: The Long-Wavelength Array (LWA) is a joint project of the University of New Mexico, the Naval Research Laboratory, the University of Texas at Austin, the Los Alamos National Laboratory, Virginia Tech, and the University of Iowa. The LWA will be an interferometric telescope operating in the 10 – 88 MHz spectral region. This wavelength range has been poorly exploited in the past because of the difficulty of imaging through ionospheric turbulence. New methods make possible a kind of adaptive optics approach that promises to enable observations of a quality comparable with higher frequencies interferometers. These methods will provide simultaneous images of celestial scenes and solutions for the fine-scale structure of the ionosphere. As a result, it will be possible to do a wide range of astrophysical problems, relating to the earliest phases of the universe, the evolution of radio galaxies, the structure of our own galaxy, the occurrence of transient radio emitters, and the existence of exoplanets. It will also be possible to provide extremely precise structural information about the ionosphere on spatial and temporal scales not studied by current probes. In this presentation, we will discuss the broad scientific goals of the LWA, sketch out the technical plans for its implementation, and lay out some of the practical problems in executing the project.



Low frequency antenna



Low frequency balun



Long Wavelength Demonstrator Array

Biography: Lee J Rickard is the Executive Project Director for the Long Wavelength Array, working out of the Office of the Vice President for Research and Economic Development at the University of New Mexico. He received a BS in physics from the University of Miami, and a Ph. D. in astrophysics from the University of Chicago. He has worked at the National Radio Astronomy Observatory, Howard University, and the Naval Research Laboratory. His research areas have included the use of millimeter-wavelength spectroscopy and airborne infrared observations to study star formation in galaxies, the use of airborne and space-based optical and near-IR imaging spectroscopy to study the properties of coastal oceans, the use of ground-based and space-based optical interferometers for stellar astronomy, the feasibility of synthetic aperture lidar imaging, and the use of low-frequency radio interferometers for studies in astrophysics and space physics. Dr. Rickard is a member of the American Astronomical Society and the International Astronomical Union.