LWA – The greatest discoveries in Space Physics & Astrophysics have accompanied technological innovations that opened new windows of the electromagnetic spectrum. One of the last poorly explored regions lies between 100 MHz and the ionospheric cutoff at ~10 MHz. Ionospheric variations have limited ground-based observations in the past to small (<5 km) apertures with resultant relatively primitive angular resolution and sensitivity. Ever-increasing computing power combined with new wide field-of-view imaging algorithms and self-calibration techniques make it possible to overcome these restrictions. The 74 MHz observing system at the VLA has elegantly demonstrated that connected element interferometry at low frequencies can provide high-precision, synoptic views of the ionosphere and solar weather events, and of a panoply of astrophysical phenomena. The LWA will provide major advances in sensitivity and angular resolution, together with refinements in calibration and new strategies for mitigation of interference at radio frequencies.

The LWA will have a very large aperture (400 km) and operate between 10 and 88 MHz. In addition to LWA1, new stations are coming on line at LWA-OVRO in California and LWA-SV in New Mexico.
LWA1 is a compact array radio telescope operating in the 10-88 MHz band, colocated with the VLA in central New Mexico. LWA1 currently consists of 257 dual-polarization active dipole antennas in a 100 m x 110 m elliptical footprint with an outlier dipole antenna located approximately 300-m east of the main array. Each dipole is individually digitized and then formed into 4 beams using a delay- and-sum technique. The beams can be pointed independently; thus LWA1 can be used similarly to 4 separate radio telescopes. The individual dipole signals can also be recorded. A subset of LWA1 science targets includes pulsars, astrophysical transients, the Sun, Jupiter, and the ionosphere, but innovative, technically feasible investigations of all kinds are welcomed. Support for operations and continuing development of the LWA1 is provided by the National Science Foundation under grants AST-1139974 and AST-1139963 of the University Radio Observatory program. We invite proposals from all individuals wishing to use this new instrument. For more information visit lwa.unm.edu.