

The Next-Generation Very Large Array Long Baseline Option

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As part of its mandate as a national observatory, the NRAO is looking toward the long range future of radio astronomy and fostering the long term growth of the US astronomical community. NRAO has sponsored a series of science and technical community meetings to consider the science mission and design of a next-generation Very Large Array (ngVLA), building on the legacies of the Atacama Large Millimeter/submillimeter Array (ALMA) and the Very Large Array (VLA).

The basic ngVLA design emerging from these discussions is an interferometric array with approximately ten times the sensitivity and ten times higher spatial resolution than the VLA and ALMA radio telescopes, optimized for operation in the wavelength range 0.3cm to 3cm. The ngVLA would open a new window on the Universe through ultra-sensitive imaging of thermal line and continuum emission down to milliarc-second resolution, as well as unprecedented broadband continuum polarimetric imaging of non-thermal processes. The specifications and concepts for major ngVLA system elements are rapidly converging.

We will present the current design of the ngVLA and the plan for the development activities. We will also present a long-baseline option, which would include integrating the VLBA into the ngVLA as a continental-scale array. This option includes replacing the existing VLBA antennas and infrastructure with ngVLA technology. This will increase the sensitivity of the VLBA as a standalone array and will facilitate integrating the VLBA as elements of an eVLBI network. Consideration is also being given to integrating the ngVLA and VLBA with the HSA and GMVA in a campaign mode.