

## **Antenna Concept for the Next-Generation Very Large Array**

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The Karl Jansky Very Large Array (VLA) has proven to be one of the most productive radio telescopes at centimeter wavelengths. The NRAO is now investigating the future of centimeter wavelength astronomy in the northern hemisphere, spanning the gap between thermal and non-thermal emission mechanisms, and bridging the capabilities of ALMA and SKA.

The scientific mission, specifications and technical concept of a next-generation VLA (ngVLA) are presently being developed. Preliminary goals for the ngVLA are to increase both the system sensitivity and angular resolution of the VLA and ALMA tenfold for frequencies spanning 1.2 GHz to 116 GHz. Specifications and costing for the ngVLA system, and major components such as the antennas, are in development in anticipation of the Astro2020 Decadal Survey and a facility design and construction proposal to the NSF.

The design of the antenna will be a major construction and operations cost driver for the facility. The antennas must have acceptable aperture efficiency and pointing for operation up to 116 GHz, with five to ten times the total collecting area of the VLA. Unblocked apertures are preferred, with wide subreflector subtended angles for compact feed and receiver packages. Improved reliability, and ease of access to the receiver and servo electronics packages, will be required to meet the operations cost requirement.

The focus of the presentation will be the current progress of high-level requirements for the antenna, the proposed antenna specifications and concept, and studies and design work under way to analyze parameter tradeoffs within the antenna specification. The presentation will also discuss areas of technical risk, where technical advances may be required for successful antenna production and assembly.