

Next Generation Very Large Array – An Overview

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When considering future radio-astronomical interferometers, there is a clear need for a telescope which covers mid-cm to mid-mm wavelengths, with sensitivity to thermal emission at masec resolution. The Next Generation Very Large Array (ngVLA) is designed to be just that telescope. Covering frequencies from 1.2 to 116 GHz, with 10 times the sensitivity of the current VLA, and with baselines out to a few hundred km, the ngVLA will be a powerful astronomical telescope which will cover a broad range of science areas. At these frequencies and resolutions, the ngVLA bridges the gap between the future Square Kilometer Array phase 1 (SKA-1) and the Atacama Large Millimeter/Submillimeter Array (ALMA).

There are many technical design considerations that remain to be worked out, in the areas of:

- Array configuration
- Antenna mechanical and optical design
- Feeds
- Antenna electronics, including receivers
- Data and Local Oscillator transport
- Central electronics, including correlator
- Computing
- RFI mitigation

among others. Of course many of these areas overlap and must be taken in combination when considering the design of the telescope. In addition, one of the key issues is minimizing the operating cost of the ngVLA, which in the current and future environment of ground-based telescopes at all wavelengths will be an important driving consideration.

We will present the current status of the design of the ngVLA in these areas, along with the near-term direction of the effort going forward.