



The Next-Generation Very Large Array – Project Update

Tony Beasley*⁽¹⁾, Eric J. Murphy⁽¹⁾, Rob Selina⁽¹⁾, Willem Esterhuyse⁽¹⁾ William Hojnowski⁽¹⁾

(1) National Radio Astronomy Observatory; email: tbeasley@nrao.edu; emurphy@nrao.edu; rselina@nrao.edu; westerhu@nrao.edu; whojnows@nrao.edu;

Over the past decade, the National Radio Astronomy Observatory (NRAO) has engaged the scientific and technical communities in the design of a next-generation Very Large Array [1] (ngVLA), a large-scale research infrastructure project under development for the National Science Foundation Astronomical Sciences Division (NSF-AST) through a cooperative agreement with Associated Universities, Inc. The ngVLA is being designed as an interferometric array with ten times greater sensitivity and spatial resolution than the current VLA and ALMA, operating in the frequency range of 1.2 - 116 GHz.

The ngVLA will be optimized for observations in the spectral region between the superb performance of ALMA at sub-mm wavelengths, and the future Phase I Square Kilometer Array (SKA-1) at decimeter and longer wavelengths, thus lending itself to be highly complementary with these facilities and a key element of a global suite of transformational radio capabilities to be utilized by the entire astronomical community. New international partnerships are contributing new technologies and approaches to address some of the ngVLA's challenges. The ngVLA will unveil the formation of Solar System analogs on terrestrial scales; probe the initial conditions for planetary systems and life with astrochemistry; chart the assembly, structure, and evolution of galaxies from the first billion years to the present; use pulsars in the Galactic Center as fundamental tests of gravity; and understand the formation and evolution of stellar and supermassive black holes in the era of multi-messenger astronomy.

In this talk we will provide an overview of the ngVLA partnership project and science case, and discuss complementarity with other astronomical instruments and facilities (existing and planned). The rapid progress towards construction of a prototype ngVLA antenna in Socorro, NM will be reviewed.

References

[1] ngVLA.nrao.edu