Profound Questions, New Answers

The next generation Very Large Array

The next generation Very Large Array (ngVLA) will supercharge our research—both through its unique individual capabilities and through synergistically bolstering the power of current and future next-generation telescopes, taking our understanding of the universe to new heights.

The ngVLA has the potential to uncover answers in key cases, including...

- CAPTURING THE FORMATION OF ROCKY PLANETS
  Will transform what we know about planet formation by showing how solar systems evolve
  - From static image to movie
  - Into a science of place and time

- PROBING THE EVENTS THAT MAKE THE UNIVERSE SHAKE
  The best way of understanding merging neutron stars—the densest normal matter in the universe—and other powerful events
  - Combining the “what” with the “how” and “what’s next”
    - What: Gravitational waves that shake the cosmos when massive objects collide
    - How: By studying their telltale glow
    - What’s next: Tracking the evolution of their surroundings

- DEEPER EXPLORATION TO FIND DOZENS OF MOLECULES INTRINSIC TO STAR FORMATION AND POTENTIALLY IMPORTANT FOR LIFE
  Studying in detail the chemistry of dense clouds surrounding baby stars
  A better understanding of the potential habitability of other worlds

- STUDYING IN DETAIL THE CHEMISTRY OF DENSI
  A better understanding of the potential habitability of other worlds

- DISCOVERING THE CONDITIONS THAT GIVE RISE TO LIFE IN OTHER STAR SYSTEMS
  The intersection of biology, chemistry, and astronomy
  More information as to...
  - What, how, and where life may form
  - The kinds of star systems where life has a better chance to emerge

- IDENTIFYING HOW MUCH STAR-FORMING FUEL EXISTS THROUGHOUT THE HISTORY OF GALAXIES
  The ngVLA will be able to reveal:
  - The amount of star-forming material a galaxy is born with
  - Whether the fuel for star formation gets replenished in galaxies as they age

- TRACKING BLACK HOLES, OF ALL MASSES, IN MOTION IN OUR GALAXY
  Studying these phenomena more thoroughly
  Deep exploration to find dozens of molecules intrinsic to star formation and potentially important for life
  Studying in detail the chemistry of dense clouds surrounding baby stars
  A better understanding of the potential habitability of other worlds

- WITH THE ngVLA AS PART OF OUR ASTRONOMICAL OBSERVATORY ECOSYSTEM, WE’LL LEARN ABOUT THESE COSMIC MYSTERIES—AND SO MUCH MORE.
  - More information as to...
    - What, how, and where life may form
    - The kinds of star systems where life has a better chance to emerge

- WHAT WILL YOU LOOK FOR?
  Keep exploring with us. Learn more: http://ngvla.nrao.edu/