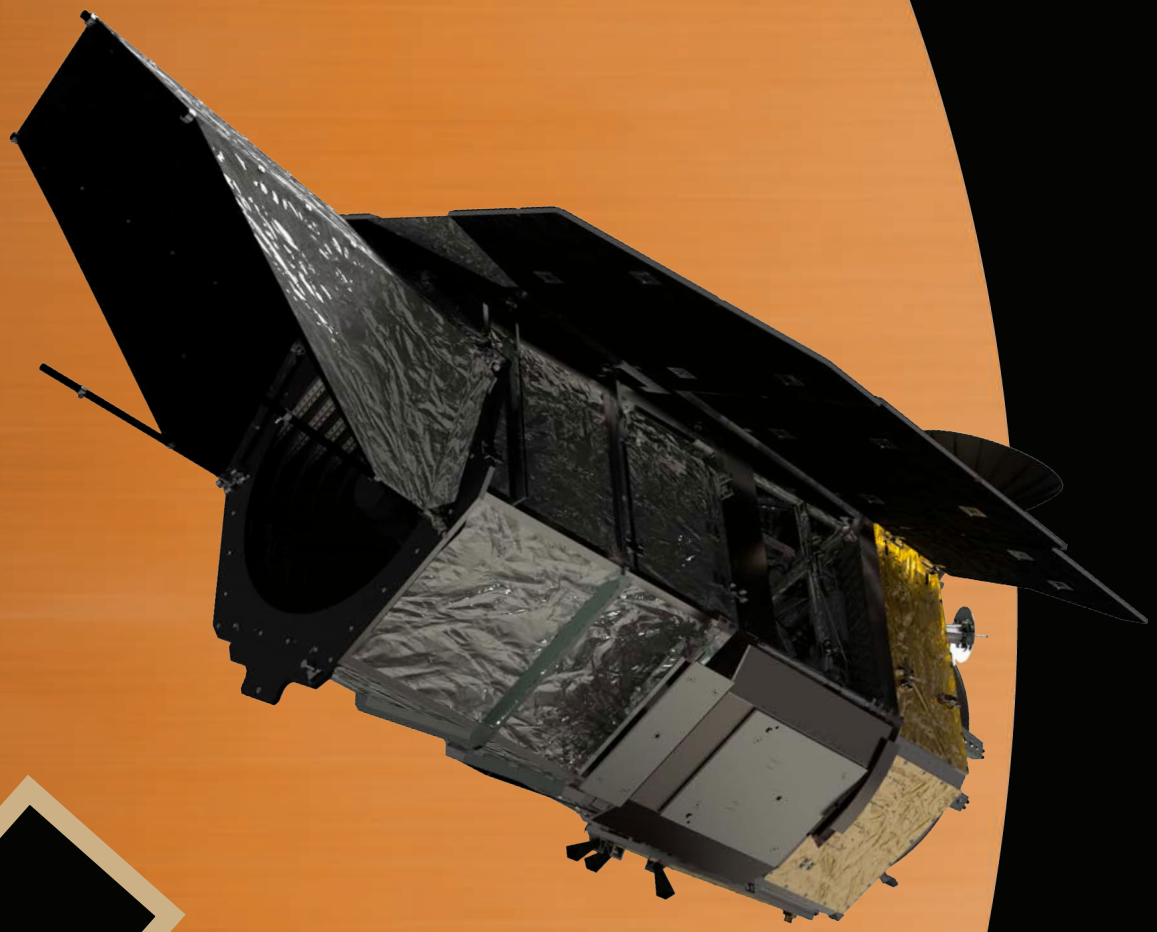
National Aeronautics and Space Administration

Dark Energy

Exoplanets

Astrophysics

Nancy Grace Roman Space Telescope



Expanding our view...

www.nasa.gov

Roman

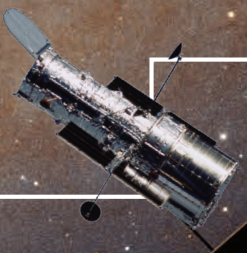
A Wider Look

With its small field of view (represented by the cut-out box), the Hubble Space Telescope made more than 400 observations to create this mosaic of the Andromeda Galaxy.

Roman's large field of view (white outline) could cover this entire area with just two observations.

Roman Field of View

Hubble Field of View



The NASA Nancy Grace Roman Space Telescope is a Hubble-sized telescope targeted for launch in the mid-2020s. It will revolutionize astronomy by building on the science discoveries and technological leaps of the Hubble and Webb space telescopes.

… to a panoramic vista 100 times larger than Hubble's.

Surveying Our Universe

Using a wide field instrument, Roman will survey billions of galaxies and catch the light of stellar explosions in a quest to solve the mystery of dark energy, which is causing the universe's expansion to speed up.

Roman's scans of the sky will uncover thousands of exoplanets beyond our solar system, including types of planets never surveyed before.

Beyond these two primary goals, Roman will probe a range of additional astrophysical topics such as stars in neighboring galaxies, supermassive black holes in faraway galaxies, cosmic nurseries where stars and planets come to life, and small bodies in our solar system.

Roman

Seeking answers

to some of our biggest questions

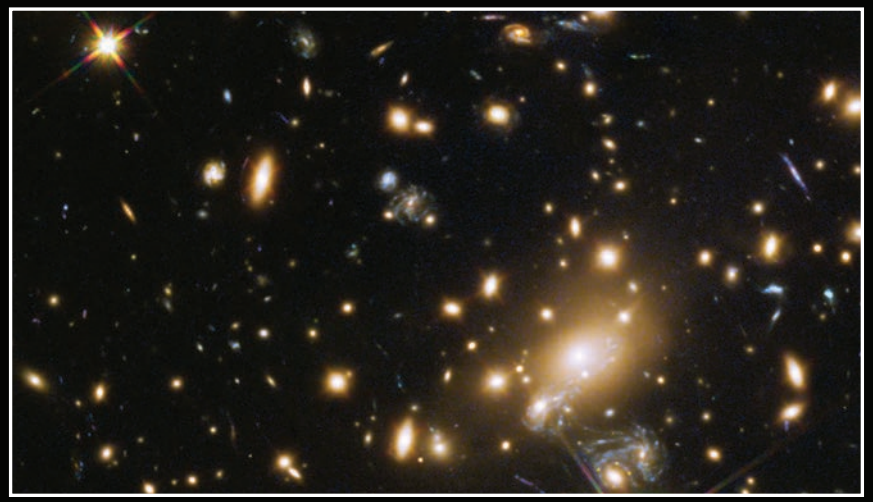


Image credit: NASA, ESA, and J. Lotz, M. Mountain, A. Koekemoer, and the HFF Team (STScI).

Measuring Dark Energy

No one knows what it is, but dark energy is pushing our universe apart, causing it to expand faster and faster.

Roman will delve into the mystery of dark energy by examining its effects over time. It will study how the galaxy distribution has changed throughout cosmic history and observe exploding stars called Type Ia supernovae, which are valuable tools for measuring accurate distances and clocking the universe's expansion.

National Aeronautics and Space Administration

Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771

www.nasa.gov

NP-2019-11-422-GSFC

Artwork credit: NASA, ESA, and G. Bacon (STScI).

Investigating Exoplanets

When an unseen planet outside our solar system drifts in front of a background star, the planet's gravity can act like a lens to make the star temporarily appear brighter. By observing such microlensing events, Roman will discover thousands of exoplanets, including some smaller than Earth, those in the outer parts of their solar systems, and perhaps free-floating planets that have no parent star at all.

Roman will also provide a technology demonstration of another technique called coronagraphy, which blocks the glaring light of exoplanet host stars to directly see planets and investigate their properties—possibly revealing whether these planets could be hospitable for life. Roman's advanced coronagraphic instrument will also expose planet-forming disks around young stars, helping us better understand how planets are born.

nasa.gov/roman

The Roman mission is managed by NASA's Goddard Space Flight Center with participation by the Jet Propulsion Laboratory, the Space Telescope Science Institute (STScI), the Infrared Processing and Analysis Center, several industrial partners, and science team members from research institutions across the U.S.