

# ROMAN



SPACE TELESCOPE

## Set to Survey the Sky

Ranked as the highest scientific priority for a large space-based mission in the Astro2010 Decadal Survey, the Nancy Grace Roman Space Telescope will play a pivotal role in astrophysics in the 2020s. What can Roman do for you? Learn about its extraordinary scientific capabilities and opportunities.



Hubble-Like Resolution  $\sim 0.1''$   Near-Infrared Imaging and Spectroscopy  $0.48\text{--}2.3\ \mu\text{m}$   Expansive Field of View  $0.281\ \text{deg}^2$   All Data Nonproprietary  $\sim 4\ \text{PB/yr}$

Complementing Other Observatories HST, JWST, Rubin, Gaia, Euclid, TESS, and more  Propelling Future Discoveries All of Astrophysics

## Expand *Your View*



## Imagine Hubble-quality data with more than 100 times the field of view

The Roman Space Telescope will have the same sensitivity and resolution as NASA's Hubble Space Telescope. Each field of view will have a sub-arcsecond pixel scale on the 300-million-pixel camera. Roman's Wide Field Instrument (WFI) will operate in the  $0.5\text{--}2.3$  micron range, and include eight imaging filters, and a grism and prism for spectroscopic characterization.

The observatory will survey thousands of degrees of the sky, producing contiguous data sets at incredible speeds. This amount of data will redefine how we understand the cosmos, providing an unrivaled clarity into populations, environments, evolution, and demographics across the field of astrophysics.

## Explore *All of Astrophysics*



## Roman data will enrich all areas of astrophysics

The abundance of data from Roman will enable all researchers to pursue their areas of expertise with ease. The mission touches upon virtually every class of astronomical object, environment, and distance. Consider the possibilities:

- Planets by the thousands
- Galaxies by the millions
- Stars by the billions
- ... and the whole of fundamental physics

Substantial fractions of Roman's five-year prime mission will be devoted to multiple nonproprietary surveys: a large area, high latitude, imaging and spectroscopic survey; a time-domain deep field survey; and a time-domain survey of the Galactic bulge. While designed specifically for studies of dark energy and exoplanets, these surveys will enrich all areas of astrophysics. The specific implementation of these surveys will be competed and selected through peer review.

Approximately 25 percent of Roman's time will be dedicated to new observations and archival research programs. A single pointing of Roman will rival a Hubble Legacy Survey in size. These community-driven investigations will reveal new details about everything from our solar system to the edge of the observable universe.

## Democratize *Data Access*



## The Roman mission will provide open access and data analysis to all researchers

All of Roman's data will be nonproprietary and available to all through the Roman archive. To support data analysis, the mission will release cloud-based data products, including stacks, dithers, and mosaics, in addition to catalogs and other high level science products. These assets will make it easy to access and analyze parallel, contiguous, homogenous—and huge—data sets. The Roman mission will also partner with the astronomical community to create and release open-source data reduction and analysis tools.

The mission will fund programs to support archival researchers using the survey data to explore all facets of astrophysics. Compared to other missions, including Hubble, a larger portion of Roman's science funding will be dedicated to archival research.

## Complement *Other Observatories*

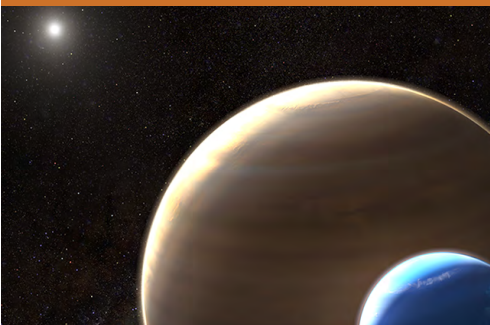


## Roman data will add depth and breadth to your research

After first light, the Roman Space Telescope will provide a unique window into astrophysics phenomena that is both unparalleled and complementary to other space- and ground-based projects. Roman complements:

- The Vera C. Rubin Observatory's Legacy Survey of Space and Time (LSST) by gathering high-resolution near-infrared images of large portions of the sky
- NASA's James Webb Space Telescope (JWST) by scouting targets for follow-up spectroscopy
- NASA's Transiting Exoplanet Survey Satellite (TESS) by providing detections of colder exoplanets through microlensing
- Current and future observatories for an array of targets

## Propel *Future Discoveries*



## Roman's instruments will help pave the way for future observatories

Roman was ranked as the highest scientific priority for a large space astrophysics mission in the Astro2010 Decadal Survey. Its Wide Field Instrument (WFI) will address the science of dark energy, exoplanets, and general astrophysics. Its Coronagraph Instrument will conduct a technology demonstration and, depending on its performance, may lead to the discovery and characterization of planets around carefully selected stars. This demonstration will also pave the way for many of the large space-based missions discussed in the Astro2020 Decadal Survey, helping scientists develop instruments that will directly image Earth-like exoplanets.



STScI

## Learn more about the Roman Space Telescope

STScI website: [www.stsci.edu/roman](http://www.stsci.edu/roman)

Mission/partner websites: [www.stsci.edu/roman/about.html#Partners](http://www.stsci.edu/roman/about.html#Partners)

For more about how Roman will explore the universe, see [www.stsci.edu/roman/documentation](http://www.stsci.edu/roman/documentation)