Nancy Grace Roman Space Telescope

Roman

The Nancy Grace Roman Space Telescope (Roman) will enable advances in astrophysics by providing survey capabilities in infrared wavelengths, helping further our knowledge of the universe, the physics of our galaxy and the demographics of exoplanets. BAE Systems was proud to partner with NASA on Roman to provide the Wide Field Instrument (WFI) Opto-Mechanical Assembly.



Roman element wheel installation

BAE SYSTEMS

Overview

The Nancy Grace Roman Space Telescope (Roman), NASA's next flagship astrophysics observatory, will enable advances in astrophysics by providing a large-scale survey capability in infrared wavelengths. The observatory is designed to capture data that will allow astronomers to answer high-priority scientific questions related to the evolution of the universe and the habitability of planets around other stars.

Using a 2.4m (7.9 ft) primary mirror, Roman will capture equivalent quality images to NASA's Hubble Space Telescope (Hubble), but with more than 100 times the field of view, enabling the observatory to conduct comprehensive and efficient surveys of the infrared sky. Able to capture patches of the sky that are approximately the same size as the full moon, scientists estimate Roman has the potential to examine a billion galaxies over the course of its mission. Roman will be complimentary to the James Webb Space Telescope (Webb) and Hubble, which are highly capable in terms of image quality but have small fields of view compared to Roman. Slated to launch August 2026, Roman's large area surveys will provide scientists around the world, who will all have access to the observatory's data, with a treasure trove of information.

Like NASA's other large astrophysics missions, Roman is a top mission priority of the 2010 astrophysics decadal survey. This National Academy of Sciences report, published every 10 years, establishes a community assessment of the most important science questions and missions.

Our Role

BAE Systems designed and developed the Wide Field Instrument (WFI) Opto-Mechanical Assembly for the Roman mission. The Opto-Mechanical Assembly provides the stable structure and thermal environment that enables the wide field, high quality observations of WFI. It includes the optical bench, thermal control system, precision mechanisms, optics, and electronics. In addition, BAE Systems supported the assembly, integration and test of WFI at our facilities.

BAE Systems played a major role in all four of NASA's Great Observatories. Building on our expertise in precision alignment systems developed for the James Webb Space Telescope, we successfully refined this technology for Roman. We continue to advance ultra-stable solutions for NASA's next Astrophysics Flagship mission, the Habitable Worlds Observatory through research and development efforts with the Ultra-Stable Large Telescope Research and Analysis (ULTRA) programs.

Quick Facts

- The telescope was renamed after Nancy Grace Roman in recognition of the former NASA Chief of Astronomy's foundational role in the field of space astronomy
- Nancy Grace Roman was nicknamed "Mother of Hubble" because she helped develop the Hubble Space Telescope
- Our BAE Systems-build actuators will align the detector directly, eliminating the need for mirrors on the instrument – a key BAE Systems design innovation!
- Roman has more than 100 times the field of view than the Hubble Space Telescope, surveying the sky up to 1,000 times faster
- Scientists estimate the Roman Space Telescope has the potential to examine a billion galaxies over the course of its mission
- Roman will discover exoplanets through a technique known as microlensing
- Launch Mass: 4,166 kg (9,184 lb)
- Dry Mass: 4,059 kg (8,949 lb)
- Payload Mass: 2,191 kg (4,830 lb)
- Power: 2500 watts
- Launch Date: August 2026
- Telescope Type: Three-mirror anastigmat



Roman team next to integrated the Wide Field Instrument

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