

# Framework for NASA's Roman spacecraft moves to Goddard clean room

April 26 2023, by Ashley Balzer

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Roman's primary structure hangs from cables as it moves into the big clean room at NASA's Goddard Space Flight Center. Alt text: A large, silver and gold metallic structure is suspended from the ceiling in a bright, spacious room. The structure is hollow, and is smooth and circular on the inside. Its exterior has six sides, each covered with a diamond-like pattern. The structure is about 14 feet (4.3 meters) long, 12 feet (3.7 meters) wide, and 6.5 feet (2 meters) tall and hangs from long yellow cables. Three people in bunny suits look on in the foreground. Hundreds of pale pink squares line a wall in the background. Credit:

NASA/Jolearra Tshiteya

The primary structure that will serve as the "bones" of NASA's Nancy Grace Roman Space Telescope has moved into the big clean room at NASA's Goddard Space Flight Center in Greenbelt, Maryland. The spacecraft bus, Roman's primary support element, will now be built upon this skeletal framework. When it launches by May 2027, Roman will help unravel the secrets of dark energy and dark matter, search for and image exoplanets, and explore many topics in infrared astrophysics.

"This is a [milestone](#) several years in the making," said Caroline Griffin, a [mechanical engineer](#) at Goddard. "The Roman team carefully assembled nearly 2,000 individual components, many of them custom-designed by Goddard engineers, to create this structure."

It's partly made up of a central cylinder with a top deck that will support most of the observatory. Each of its six sides has a compartment that will house key electronics and other hardware needed to operate the observatory. Major spacecraft elements, such as its power, [attitude control](#), and propulsion systems, will be housed within the primary structure. The [high-gain antenna](#) will be installed beneath it, and the lowermost part of the primary structure will attach the spacecraft to the rocket during launch.

The structure is mainly made of a special grade of aluminum that's strong, yet lightweight. To reduce the weight even further, most of its exterior is partly hollowed out in a triangular pattern called an isogrid. Even though it's large—about 14 feet (4.3 meters) long, 12 feet (3.7 meters) wide, and 6.5 feet (2 meters) tall—the primary structure weighs just 3,600 pounds (1,600 kilograms). Engineers applied a protective coating to protect it from the environment on Earth and provide the right

temperature profile in space. The team has also performed fit checks, ensuring all the components are precisely positioned so additional parts will connect together properly.

The primary structure has now been placed on the Pantheon—a large assembly platform built specifically for Roman. The team is lacing it with the harness, which serves as the spacecraft's nervous system, and will connect the electronics together in June of 2023.

Provided by NASA's Goddard Space Flight Center

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