

Image: NASA's Webb Telescope NIRSpec instrument

September 3 2014, by Rob Gutro



Credit: NASA/Chris Gunn

(Phys.org) —A NASA photographer recently captured a "NIRSpec-tacular" photo of an instrument that will fly aboard NASA's James Webb Space Telescope when it launches in 2018.

Access into a clean room to get a close-up view of a complicated, high-value scientific instrument is carefully controlled, but NASA photographers get such exclusive entry all the time. Photographer Chris Gunn took this image of the NIRSpec [instrument](#) inside the giant cleanroom at NASA's Goddard Space Flight Center in Greenbelt, Maryland.

The Near-Infrared Spectrograph or NIRSpec is a multi-object [spectrograph](#), which is a tool for observing many objects in the cosmos simultaneously. The NIRSpec takes in light from around 100 distant objects and records their spectra (band of colors produced when sunlight is passed through a prism), separating the light into its components using prisms and other optical devices.

The NIRSpec will join three other Webb science instruments that will be mounted on the Integrated Science Instrument Module (ISIM). The ISIM structure is like the frame of a car providing support for the engine and other components.

In the photo, the NIRSpec is the large silver mass on the right-hand side. The silver frame-like object on the left side is part of the ISIM structure.

The NIRSpec can gather data on over 100 objects at the same time over a 9-square-arcminute field of view (the sun seen from Earth is about 32 arcminutes across). The NIRSpec will be the first spectrograph in space that has this remarkable multi-object technology. To make it possible, Goddard scientists and engineers had to invent a new device using a microshutter system to control how light enters the NIRSpec.

NIRSpec weighs about 430 pounds (195 kg), about as much as an upright piano. It is one of four instruments that will fly aboard the Webb telescope. The other instruments include the Near-Infrared Camera (NIRCam), the Mid-Infrared Instrument (MIRI) and the Fine Guidance

Sensor/ Near InfraRed Imager and Slitless Spectrograph (FGS/NIRISS).

The ISIM and NIRSpec are now in a months-long cryo-vacuum test. This test duplicates the vacuum and extreme temperatures of [space](#) to ensure that the ISIM and the NIRSpec can function properly in those conditions.

Provided by NASA

Citation: Image: NASA's Webb Telescope NIRSpec instrument (2014, September 3) retrieved 25 April 2024 from <https://phys.org/news/2014-09-image-nasa-webb-telescope-nirspec.html>

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