

James Webb Telescope to release more breathtaking cosmic views

July 12 2022

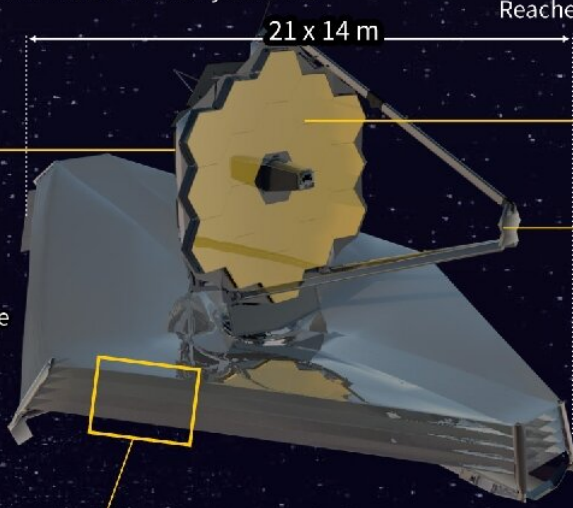
James Webb telescope

The most powerful space telescope* ever launched, successor to Hubble, to reveal its first images

MISSION GOALS (10 YEARS)

- Measure planetary systems and investigate for potential life
- Observe the formation of stars and evolution of galaxies
- Search for the first galaxies formed in the early universe

LAUNCHED on an Ariane 5 rocket on Dec 25, 2021
Fully deployed its sunshield on Jan 4, 2022
Reached destination Jan 24, 2022



21 x 14 m


Instruments: cameras and spectrographs must be kept very cold to detect extremely faint heat signals in the universe

Primary mirror
diameter: 6.5 m
18 segments

Secondary mirror:
0.74 m

Weight:
6.2 tonnes

SUNSHIELD
5 layers:
0.05-0.025 mm thick




Inner layer temp -235 °C (-390 °F)

Outer layer: 125 °C (260 °F)

Sunlight

ORBIT

In position 1.5 million kms from Earth




Earth Moon Webb's orbit

Sun

Not to scale

Source: NASA *Joint project by NASA, ESA and Canadian Space Agency

AFP 

Graphic of the James Webb space telescope, successor to Hubble.

After unveiling the clearest view yet of the distant cosmos, the James Webb Space Telescope has more to come.

The next wave of images on Tuesday will reveal details about the atmosphere of a faraway gas planet, a "[stellar nursery](#)" where stars form, a "quintet" of galaxies locked in a dance of close encounters, and the cloud of gas around a dying star.

They will be published starting from 10:30 am Eastern Time (1430 GMT), in an event live streamed from the NASA Goddard Space Flight Center, just outside Washington.

Targets include Carina Nebula, a stellar nursery, famous for its towering pillars that include "Mystic Mountain," a three-light-year-tall cosmic pinnacle captured in an iconic image by Hubble.

Webb has also carried out a spectroscopy—an analysis of light that reveals detailed information—on a gas giant planet called WASP-96 b, which was discovered in 2014.

Nearly 1,150 light-years from Earth, WASP-96 b is about half the mass of Jupiter and zips around its star in just 3.4 days.

On Monday, Webb revealed the clearest image to date of the early universe, going back 13 billion years, NASA said Monday.

The stunning shot, released in a White House briefing by President Joe Biden, is overflowing with thousands of galaxies and features some of the faintest objects observed.

Known as Webb's First Deep Field, it shows the galaxy cluster SMACS 0723, which acts as a gravitational lens, bending light from more distant galaxies behind it towards the observatory, in a cosmic magnification effect.

Launched in December 2021 from French Guiana on an Ariane 5 rocket, Webb is orbiting the Sun at a distance of a million miles (1.6 million kilometers) from Earth, in a region of space called the second Lagrange point.

Here, it remains in a fixed position relative to the Earth and Sun, with minimal fuel required for course corrections.

A wonder of engineering, the total project cost is estimated at \$10 billion, making it one of the most expensive scientific platforms ever built, comparable to the Large Hadron Collider at CERN.

Webb's [primary mirror](#) is over 21 feet (6.5 meters) wide and is made up of 18 gold-coated mirror segments. Like a camera held in one's hand, the structure must remain as stable as possible to achieve the best shots.

After the first images, astronomers around the globe will get shares of time on the telescope, with projects selected competitively through a process in which applicants and selectors don't know each other's identities, to minimize bias.

Thanks to an efficient launch, NASA estimates Webb has enough propellant for a 20-year life, as it works in concert with the Hubble and Spitzer space telescopes to answer fundamental questions about the cosmos.

Citation: James Webb Telescope to release more breathtaking cosmic views (2022, July 12)
retrieved 24 April 2024 from
<https://phys.org/news/2022-07-james-webb-telescope-breathtaking-cosmic.html>

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