

Due to the lapse in federal government funding, NASA is not updating this website.



Explore Webb



About Webb

Webb is the premier observatory of the next decade, serving thousands of astronomers worldwide. It studies every phase in the history of our Universe, ranging from the first luminous glows after the Big Bang, to the formation of solar systems capable of supporting life on planets like Earth, to the evolution of our own Solar System.

KEY FACTS

Fact Sheet



Premiere Telescope of Next Decade
extending the tantalizing discoveries of the Hubble Space Telescope.



Folding Design
So big it has to fold origami-style to fit in the rocket and will unfold like a "Transformer" in space.



1.5 Million km
Webb orbits the Sun 1.5 million kilometers from the Earth. (Hubble orbits 560 kilometers above the Earth.)

Webb is an International Collaboration

including **NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA)**.

The NASA Goddard Space Flight Center managed the development effort. The main industrial partner is Northrop Grumman; the Space Telescope Science Institute operates Webb after launch. Thousands of scientists, engineers and technicians from 14 countries, 29 U.S. states, and Washington, D.C. contributed to the design, build, test, integration, launch, commissioning and operations of Webb.

The International Team



NASA's James Webb Space Telescope, or Webb, emerged from Chamber A at NASA's Johnson Space Center in Houston on Dec. 1, 2017.

NASA/Chris Gunn

Webb is a Time Machine

With unprecedented infrared sensitivity, it will peer back in time over 13.5 billion years to see the first galaxies born after the Big Bang.

Webb is the largest telescope ever placed in space.

100 times more powerful than Hubble.

Webb is designed to look deeper into space to see the earliest stars and galaxies that formed in the universe and to look deep into nearby dust clouds to study the formation of stars and planets.

Webb vs Hubble →



Webb Folds, Webb Unfolds

Webb is so big (nearly the size of a tennis court) it was designed to be folded origami-style to fit in the rocket and then unfolded like a “Transformer” in space into its operational configuration.

Launch and Orbit

Webb was launched on Dec 25, 2021 on from French Guiana on an Arianne 5 rocket. Webb orbits the Sun 1.5 million kilometers from the Earth.

Learn More 



Arianespace's Ariane 5 rocket launches with NASA's James Webb Space Telescope onboard, Saturday, Dec. 25, 2021, from the ELA-3 Launch Zone of Europe's Spaceport at the Guiana Space Centre in Kourou, French Guiana.

NASA/Bill Ingalls

Hot Side/ Cold Side

Webb's innovative 5 layer sunshield protects the telescope from the infrared radiation of the Sun, Earth, and Moon. Temperatures on the hot side can be as high as 185F (85C) while the cold side is approximately -388F (-233C) and the coldest instrument, MIRI, operates only several degrees above absolute zero at 7 K (-266° C or -447° F).

History

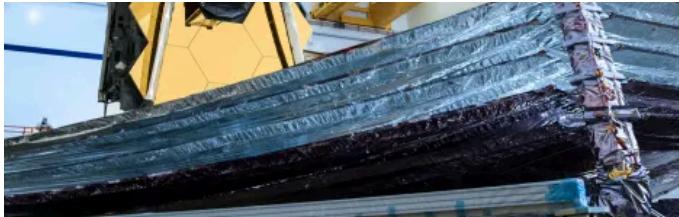
Who Is James Webb?

Webb was formerly known as the “Next Generation Space Telescope” (NGST); it was renamed in Sept. 2002 after a former NASA administrator.

Many believe that James E. Webb, who ran the fledgling NASA space agency from February 1961 to October 1968, did more for science than perhaps any other government official and that it is only fitting that the Next Generation Space Telescope would be named after him.

Learn More 





Innovative Technologies

Several innovative technologies were developed for Webb. These include a primary mirror made of 18 separate segments that unfold and adjust to shape after launch. The mirrors are made of ultra-lightweight beryllium. Webb's biggest feature is a tennis court sized five-layer sunshield that attenuates heat from the Sun more than a million times. The telescope's four instruments – cameras and spectrometers – have detectors that are able to record extremely faint signals. One instrument (NIRSpec) has programmable microshutters, which enable observation up to 100 objects simultaneously. Webb also has a cryocooler for cooling the mid-infrared detectors of another instrument (MIRI) to a very cold 7 K to operate properly.

Impacts and Benefits ↗

INNOVATION

Folding Deployable Mirrors

INNOVATION

5 layer Sunshield

INNOVATION

Backplane

INNOVATION

Microshutters

Webb Mission Overview 2023

A brief overview of the James Webb Space Telescope mission from its construction, launch, and complex unfolding, to the incredible science it achieves. Credit: NASA's Goddard Space Flight Center Producer: Michael McClare (KBRwyle)

James Webb Space Telescope Mission Overview (2023)



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Page Editor: **Stephen Sabia**

Responsible NASA Official for Science: **Diana Logreira**