



# What is the James Webb Space Telescope?

The James Webb Space Telescope, also called Webb or JWST, is a large, space-based observatory, optimized for infrared wavelengths, which complements and extends the discoveries of the Hubble Space Telescope. Webb launched on December 25, 2021, and its first full-color images and data were released to the world on July 12, 2022. It covers longer wavelengths of light than Hubble and has greatly improved sensitivity. The longer wavelengths enable Webb to look further back in time to see the first galaxies that formed in the early universe, and to peer inside dust clouds where stars and planetary systems are forming today.



\*James Webb telescope's 18-segmented gold mirror is specially designed to capture infrared light from the first galaxies that formed in the early universe.

Webb 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. Webb launched on Dec. 25th 2021. It does not orbit around the Earth like the Hubble Space Telescope, it orbits the Sun 1.5 million kilometers (1 million miles) away from the Earth at what is called the second Lagrange point or L2.

## How does it differ compared to the famous Hubble Space Telescope?

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. In order to do this, Webb has a much larger primary mirror than Hubble (2.5 times



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larger in diameter, or about 6 times larger in area), giving it more light-gathering power. It also has infrared instruments with longer wavelength coverage and greatly improved sensitivity than Hubble. Finally, Webb is operating much farther from Earth, maintaining its extremely cold operating temperature, stable pointing and higher observing efficiency than the Earth-orbiting Hubble.

This website was created for CS 420 during Winter 2024 at the University of Oregon.

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Clearly the sky isn't the limit

NebulaNet

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This project envisions a website dedicated to provide the latest observations and discoveries captured by the James Webb Space Telescope (JWST), sourced directly from the Mikulski Archive for Space Telescopes (MAST) database. It aims to serve as an interactive and educational portal where users can explore high definition visuals of galaxies, stars, planets, and other celestial phenomena. Each image will be accompanied by detailed information, including the scientific insights it provides, the specific JWST instruments involved in its capture, and other technical data.

