**The James Webb Space Telescope (JWST)**

The James Webb Space Telescope (JWST) is a space telescope primarily designed for infrared astronomy. The National Aeronautics and Space Administration (NASA) of the United States led the telescope's development[8], in collaboration with the European Space Agency (ESA) and the Canadian Space Agency (CSA). The JWST was launched on an ESA Ariane 5 rocket from Kourou, French Guiana on December 25, 2021, and is intended to succeed the Hubble Space Telescope as NASA's flagship mission in astrophysics. The telescope is named after James E. Webb, who served as NASA administrator from 1961 to 1968, overseeing the Mercury, Gemini, and Apollo programs.

Its greatly improved infrared resolution and sensitivity will allow it to see objects that are too old and distant for Hubble to see—some up to 100 times fainter. This is expected to enable a wide range of astronomical and cosmological investigations, such as observations of first stars and the formation of first galaxies, as well as detailed atmospheric characterization of potentially habitable exoplanets.

JWST's primary mirror, the Optical Telescope Element, consists of 18 hexagonal mirror segments made of gold-plated beryllium which combine to create a 6.5-meter (21 ft) diameter mirror, compared to Hubble's 2.4 m (7.9 ft). This gives the Webb telescope about 6.25 times the light collecting area of Hubble: Webb's collecting area is 25.37 square meters compared to Hubble's 4.0. Unlike Hubble, which observes in the near ultraviolet, visible, and near infrared (0.1–1.0 m) spectra, JWST will observe in the long-wavelength visible light (red) to mid-infrared (0.6–28.3 m). To observe faint infrared signals without interference from other sources of warmth, the telescope must be kept extremely cold, below 50 K (223 °C; 370 °F). It's in a solar orbit near the Sun–Earth L2 Lagrange point, about 1.5 million kilometers (930,000 miles) from Earth, where its five-layer kite-shaped sunshield protects it from the Sun, Earth, and Moon.