

James Webb Space Telescope

JWST is a space-based observatory designed to look deeper into space by detecting infrared waves. It will study the earliest records of the universe, how galaxies are assembled, exoplanets, and much more.

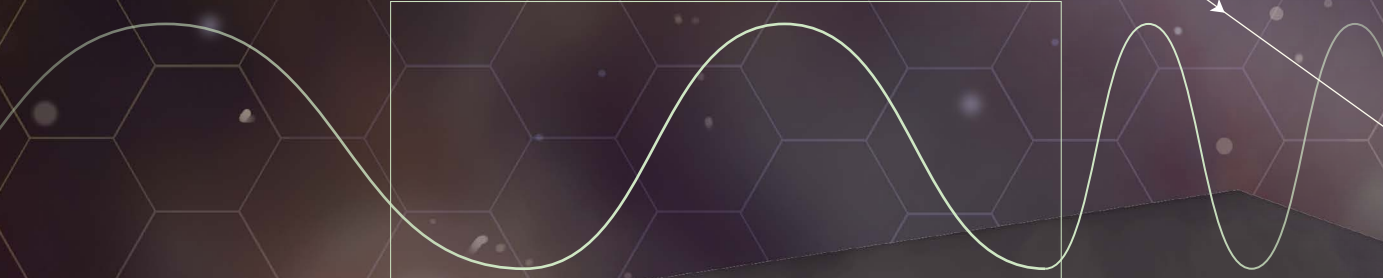
Radio

Microwave

Infrared

Visible

Ultraviolet



Infrared light is slightly longer than visible light. It cannot be seen by humans, but it can be felt as radiant heat.

Star and planet formation takes place inside dense and dusty clouds. Infrared light can be seen through the dust because the longer wavelength is able to escape dust clouds better than shorter, visible wavelengths.

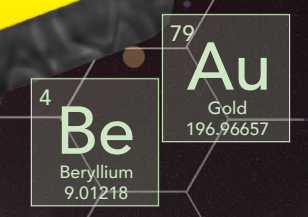
50 K
-223°C
-370°F

The five layers of sunshield block so much heat that you could almost boil water on the hot side, and you could freeze nitrogen on the cold side.

Infrared light from very faint objects would be swamped by light and heat of the Sun and Earth.

358 K
85°C
185°F

JWST always faces away from the Sun. Solar panels on the underside of the spacecraft convert sunlight into power to operate the instruments.



18 primary mirrors are made of beryllium coated in gold. Beryllium is light, durable, and is able to survive micrometeoroid impacts. Thin layer of gold maximizes the reflectivity of the mirrors for infrared light.

Sun

150,000,000 km

Mercury

Venus

Moon

Earth

L₂ Point

JWST will orbit around L₂, or second Sun-Earth Lagrange point. It is approximately 1,500,000 km away from Earth, or about 4x further away than the moon.