

Pack a Space Telescope

Space Telescope Perintables

Mirror Array

Sunshield



Rocket Cover

Images from National Informal STEM Education Network:

www.nisenet.org/catalog/exploring-universe-pack-space-telescope-2018

Space Telescopes

Telescopes are scientific tools that collect light so that we can see distant and faint objects better. Ground-based telescopes can be effective tools, but NASA also uses telescopes based in space. Earth's atmosphere distorts light, making images less clear. Space telescopes help scientists gather clearer images of distant objects.

Putting a telescope into outer space is an engineering challenge. A telescope needs to fold up to be launched in a rocket. When it reaches space it must automatically unfold, since no humans will be around to help once it reaches orbit. NASA engineers were inspired by origami, the Japanese art of paper folding, while designing a telescope to fold into a compartment on a rocket.

Left: Mirror array on the James Webb Space Telescope (NASA/ESA/CSA/The Space Telescope Science Institute)
Right: Ariane 5 rocket (Arianespace).

The Hubble Space Telescope was launched in 1990, and since then has made more than 1.4 million observations. Among other achievements, it has watched a comet collide with Jupiter, discovered moons around Pluto, found stellar nurseries throughout the Milky Way, and studied the atmospheres of planets that orbit other stars.

Left to Right: Jupiter, Aurora, Hubble Space Telescope, galaxy (the Southern Pinwheel). Images: NASA/ESA.

See more images from the Hubble Space Telescope:
www.nasa.gov/mission_pages/hubble/multimedia

Parts of a Space Telescope

The James Webb Space Telescope is scheduled to be launched in 2021. It will be the largest, most powerful, and complex space telescope ever built. One of its goals is to measure the physical and chemical properties of planetary systems, including our own Solar System, and investigate the potential for life in those systems.

Artist's conception of the JWST
Image: Northrop Grumman

The James Webb Space Telescope is made up of several key parts:

The mirror array gathers the light coming from space. The bigger the mirror is, the more light can be collected, and the better distant objects can be seen.

The sunshield protects the telescope's instruments from the heat and light of the Sun.

The Integrated Science Instrument Module houses all of the cameras and scientific instruments.

The antenna sends science data back to Earth.

[Image: NASA.](#)

The solar panel array gathers energy to power the telescope.

The spacecraft bus contains the telescope's computer, power system, altitude and steering systems, and communication instruments.

The star trackers observe the telescope's position in space.

Build a paper model of the James Webb Space Telescope:

www.jwst.nasa.gov/content/features/educational/paperModel/paperModel.html