



**The Hubble Space Telescope**

## AN 'EYE' ON THE UNIVERSE

A decade before the first artificial satellite was launched into orbit, a young American scientist named Lyman Spitzer, Jr., proposed placing a large telescope in space. By rising above the absorption and blurring effects of Earth's atmosphere, a space telescope would have an unprecedented crystal-clear view of the universe and would be able to detect a wide range of wavelengths of light.

More than 40 years later, on April 24, 1990, Spitzer saw his dream realized when NASA's space shuttle Discovery launched the Hubble Space Telescope into orbit hundreds of miles above Earth.

Named for the American astronomer Edwin P. Hubble, the Hubble Space Telescope has revolutionized astronomy. Not only is it the first major visible-light telescope to be located in space, it is also the first one designed to be repaired and upgraded by astronauts. With more than a million observations of tens of thousands of celestial objects, Hubble is one of the most prolific astronomical instruments ever built.

Among its many achievements, Hubble has expanded our understanding of how stars and planets form, has helped characterize the atmospheres of planets around other stars, has uncovered evidence of supermassive black holes, has revealed galaxies back to nearly the birth of the cosmos, and has helped astronomers determine that the expansion of the universe is accelerating. Astronomers are now using Hubble to understand what is driving that acceleration.

Hubble's remarkable productivity derives from its use by the entire astronomical community. Researchers worldwide submit proposals and request time on the telescope. Once observations are completed, astronomers have up to six months to pursue their work before the data become publicly available in the Hubble archive. This constantly growing collection of Hubble images and data is a unique scientific resource for current and future astronomers. Researchers continually mine the Hubble archive, unearthing new discoveries that are outside the scope of the original observations.

Hubble will continue to be our "eye" on the universe, helping astronomers investigate a wide range of compelling questions and uncover intriguing mysteries across space and time.

### VOCABULARY

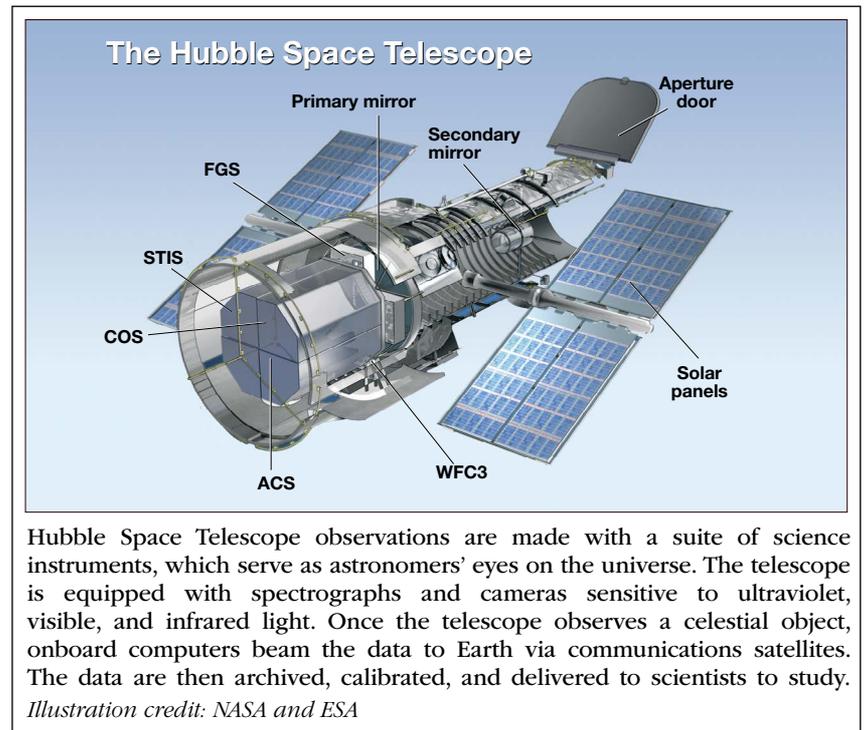
**Astronomer:** A scientist who studies the universe and the celestial bodies residing in it, including their composition, history, location, and motion.

**Spectrograph:** An instrument that spreads light into its component colors for detailed study.

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Hubble Space Telescope observations are made with a suite of science instruments, which serve as astronomers' eyes on the universe. The telescope is equipped with spectrographs and cameras sensitive to ultraviolet, visible, and infrared light. Once the telescope observes a celestial object, onboard computers beam the data to Earth via communications satellites. The data are then archived, calibrated, and delivered to scientists to study.

*Illustration credit: NASA and ESA*

### FAST FACTS

#### Telescope Statistics

Length: 43.5 feet (13.3 meters)

Primary mirror diameter: 94.5 inches (2.4 meters)

Orbit: About 350 miles (564 kilometers)

#### Active Instruments

- Wide Field Camera 3 (WFC3)
- Cosmic Origins Spectrograph (COS)
- Space Telescope Imaging Spectrograph (STIS)
- Advanced Camera for Surveys (ACS)
- Fine Guidance Sensors (FGS)

*Credit for Hubble image: NASA and ESA*

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