

Hubble Space Telescope Instruments

FGS

Hubble has three fine guidance sensors. Two are needed to point and lock the telescope on target, while the third can be used for astrometry, the precise measurement of stellar positions.

STIS

The Space Telescope Imaging Spectrograph (STIS) principally performs spectroscopy—the separation of light into its component colors (or wavelengths) to reveal information about an object's chemical content, temperature, density, and motion. STIS also performs imaging, however, covering most of the ultraviolet bands, the entire optical wavelength band, and some wavelengths extending into the near-infrared. STIS was repaired on orbit in 2009 by astronauts during Servicing Mission 4 (SM4).

COS

The most sensitive ultraviolet spectrograph ever flown, the Cosmic Origins Spectrograph measures the structure and composition of the ordinary matter concentrated in the “cosmic web.” It also studies how galaxies, stars, and planets formed and evolved, and is helping determine how the elements needed for life first formed.

NICMOS

The Near Infrared Camera and Multi-Object Spectrometer is an instrument for near-infrared imaging and spectroscopic observations of many types of astronomical targets. NICMOS is currently inactive.

ACS

The Advanced Camera for Surveys was designed primarily for wide-field imagery in visible wavelengths, although it can also detect ultraviolet and near-infrared light. Its wide-field and high-resolution channels failed in 2007, leaving only a “solar-blind” (ultraviolet) channel operational. During SM4, astronauts were able to repair the wide-field channel, restoring the telescope's capability to capture high-resolution, wide-field views.

WFC3

With panchromatic vision extending from the ultraviolet through the visible and into the infrared, the Wide Field Camera 3 (WFC3) enhances Hubble's capability not only by seeing deeper into the universe, but also by providing wide-field imagery in these three regions of the electromagnetic spectrum. WFC3 is used to study galactic evolution, stellar populations in nearby galaxies, dark energy, and dark matter.

