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Modernizing Hubble Space Telescope for the Next Millennium

Dr. David Leckrone

Abstract

In December 1993, NASA carried out an extremely ambitious mission to Hubble Space Telescope (HST) to correct the spherical aberration causing HST's blurred vision. The unqualified success of this mission proved that we could service HST safely and effectively. In February 1997, in the first of three servicing missions to upgrade HST's science capability, astronauts returned to HST and fitted the telescope with a near-infrared camera (NICMOS) and a much more powerful spectrograph (STIS). In 1999, a crew will again visit HST to install the Advanced Camera for Surveys (ACS), a high resolution, wide field camera with 10 times the discovery efficiency of HST's current Wide Field and Planetary Camera (WFPC2). Finally, in 2002, HST will be serviced and upgraded one last time, allowing it to remain healthy for the duration of its mission, which is expected to last until 2010. During this last servicing mission, we will fit HST with its most sensitive spectrograph, the Cosmic Origins Spectrometer (COS). We are also considering the possibility of replacing the aging WFPC2 on this final mission with a new, low cost, highly sensitive wide field camera (WFC-3), created from components of the first WFPC1, returned from orbit in 1993, and from spare CCD detectors from the ACS.