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Jennifer Wiseman Talk Abstract

Title:

The Hubble Space Telescope at 35: Eyeing the Future

Abstract:

Thirty-five years ago, the Hubble Space Telescope was deployed by Space Shuttle astronauts into low Earth orbit, starting a revolution in astronomy that has forever transformed humanity's understanding of the universe. Thanks to five servicing missions, a phenomenal team of technical experts on the ground, scientist users from around the world, and the enthusiastic public, Hubble continues as possibly the most successful scientific platform ever known. Its many "firsts" range from precision measurements of the expansion rate of the universe to the recent imaging of an exoplanet in the process of forming. Looking to the future, Hubble's unique ultraviolet-optical capabilities will be critical for addressing the highest priorities in astrophysics and will be unmatched until a potential future mission, the Habitable Worlds Observatory. That future is already being forged by the first-time principal investigators leading 30% of Hubble's new science programs. Many new science advances are fostered by the synergy between Hubble, Webb, Chandra, ALMA, and other observatories in space and on the ground. Their complementary wavelength coverage is now enabling broad spectral analysis of exoplanet atmospheres, the interstellar and intergalactic medium, and galaxy evolution over a broad range of redshifts. Time-domain discoveries in our dynamic solar system and beyond are being enabled by Hubble's rich long-term archive. As new survey telescopes like Rubin open the floodgates of transient detections, Hubble's UV capabilities will be crucial for discerning the nature of those transients. Hubble is also a pioneer in honing fair science selection processes, leading to the latest record number of science publications. The technical challenges of an aging observatory have inspired innovations in pointing control, onboard computing, calibration, and science instrument usage, with important lessons for future missions. Hubble's effective public engagement is fostering strong public enthusiasm for a broad range of astronomy, observatories, and scientific exploration. The Hubble Space Telescope is poised to serve as a key component of the current and future powerful suite of astronomical observatories, continuing to open our eyes to beauty and incredible wonders in the universe.