



Fig. 2. The Hubble Telescope in orbit in 2009. Image courtesy of NASA.

In the public eye, some of the greatest achievements have been the high-resolution multicolor images captured. “Through the images secured by Hubble,” says science historian Robert Smith of the University of Alberta, “there has been a major shift in the way many members of the public, as well as astronomers, perceive the universe.” Although the telescope was almost decommissioned in 2005 because of a presidential budget request, Congress and NASA intervened after an upwelling of public support, including children sending in piggybanks of pennies to help keep Hubble going. Congress approved the funds for a final critical servicing mission that would extend Hubble’s

life. The telescope could be operable as late as 2020.

Beyond Hubble

Other space telescopes have already followed. The latest is the James Webb Space Telescope (JWST), scheduled to launch in October 2018. Hubble’s lessons-learned have informed the

JWST, from how to stage a large, expensive science project to how to secure Congressional approval and funding. Team members have routinely shared tools, infrastructure, and feedback. The telescopes have followed a similar trajectory, says Sembach. “Early on, people think it’ll be too ambitious, too costly, too difficult, take too long,” he says. “You have to convince the stakeholders that you mean what you say and you can do what you say.”

JWST will be situated much farther from Earth, near the stable L2 Lagrange point, which means it can orbit the Sun and the Earth using just one sun shield. This will keep the telescope sufficiently cool to perform infrared observations.

Although Hubble primarily observes optical wavelengths, the JWST will focus mostly on infrared light, which passes through gas and dust that can otherwise obscure distant objects. The JWST will be able to look to a farther distance, further back in time, and see some of the dimmest and coolest objects in the sky.

JWST promises to advance astronomy, astrophysics, and cosmology, just as Hubble has already done. “Hubble has shown us what is possible,” Sembach says, “but has also motivated us to reach even further into the depths of the universe to reveal what remains hidden. I think that’s something the public will want.”

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