

# Emerging Technologies: Bringing the *James Webb Space Telescope* to the World

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## Abstract

Like the rest of the Institute, excitement is building in the Office of Public Outreach (OPO) as the clock winds down for the launch of the *James Webb Space Telescope*. Our task is translating and sharing this excitement over groundbreaking engineering—and the scientific discoveries to come—with the public. The writers, visual artists, scientists, educators, producers, programmers, and website curators on the OPO team are creating innovative products and methods to engage the public in anticipation of *Webb's* launch, as well as *Hubble's* continuing, groundbreaking mission. Learn more about some of these projects below.

## Space Telescope Live

*Team:* Julie Imig (Space Astronomy Summer Program student; advised by *HST* Mission Office co-Lead Rachel Osten), Joel Green, Parissa Eggleston, Matthew Scilipoti, Elizabeth Wheatley, Christine Godfrey, Jeffrey Newman, Brandon Lawton, Bonnie Meinke, and Vonessa Schulze.

The *Hubble Space Telescope (HST)* has produced innumerable images that have pervaded popular culture. Members of the general public do not necessarily realize that all *Hubble* data and images are public domain. Likewise, there is an imperfect understanding of how *Hubble* chooses targets, and how many targets *Hubble* observes. Thus the *HST* Mission Office and OPO have introduced a paired Twitter account ([spacetelelive twitter feed](#)) and website ([spacetelescopelive.org](http://spacetelescopelive.org)) referred to collectively as Space Telescope Live.

The Twitter feed automatically showcases each *Hubble* observation, accompanied by an image from the Sloan Digital Sky Survey or the Digitized Sky Survey, with context and a link to the proposal summary. It also serves to highlight the diversity of *Hubble* investigators and *Hubble* science. A similar implementation is being considered for *Webb* after science operations commence.

## Space Telescope Augmented Reality

*Team:* Michael Gough, Joel Green, Brandon Lawton, Bonnie Meinke, Chad Smith, John Maple, and Leah Hustak.

Have you ever wished you could share space telescope science and engineering as easily as you share a business card? In OPO we are always looking to make the work at the Institute accessible, which is how the outreach team came up with the Space Telescope Augmented Reality (STAR) app. It is available for Android and iOS, allowing smartphone users to carry and share the *Hubble*, *Webb*, and the future *WFIRST* missions with them wherever they go. The 3-D models can be viewed from any angle within the app, and by printing out a small marker card or printing and folding a six-sided marker cube (a DIY experiment), users can bring these telescopes into “real world” scenes.

## **A *Webb* Virtual Museum at L2**

Team: Chad Smith, Joel Green, Tim Rhue, Bonnie Meinke, Alexandra Lockwood, Leah Hustak, Frank Summers, and Leah Ramsay.

The most immersive experience one can achieve without physical proximity to the *Webb Telescope* itself uses virtual reality (VR). The magic of VR allows us to simulate placing the user next to *Webb* at its eventual orbit location beyond the moon at *Lagrange Point 2* (L2), complete with a 3-D model of the Solar System, including a distant Earth one million miles away. The VR user can flip the telescope to any orientation and move around it completely to view any angle. There are also optional informational windows the user can open to obtain more information on the telescope and its function. The VR experience will soon be available to the public, with a focus on addressing four common questions:

- What does *Webb* look like?
- What are *Webb*'s dimensions and major parts?
- Where is *Webb* located/where is L2?
- How does *Webb* work?

Beyond these efforts, OPO is continuing to break ground on inspiring ways to bring the magic of space telescope science to the world. And as excited as we are for the future science discoveries *Hubble*, *Webb*, and *WFIRST* will facilitate, we also look forward to continuing to push the envelope in our efforts, as those new wonders demand more innovative means of outreach to the public.