

Long Live Hubble

Data from the space telescope will yield discoveries long after the instrument is kaput

With luck, the Hubble Space Telescope will yield more stareries such as nebulae and distant galaxies. "The legacy is a treatling images of the cosmos for years. But because NASA is no sure trove of data that can be mined in the future," says Arfon longer servicing the telescope, it is expected to give up the ghost Smith, who leads a new data-science initiative at Hubble's sometime after 2020. That does not mean that the Hubble dishome, the Space Telescope Science Institute. "The data are incredibly valuable and still ridiculously useful." The coveries will stop, however. NASA maintains an archive of data gathered over Hubble's lifetime-the telescope archive is a testament to the enduring value of big, went live in 1991-and makes it available to the pubbasic science research—the data can pay off in ways lic for free. The archive has already yielded discovastronomers cannot yet imagine. -Katie Peek Hubble's earliest observations still yield results 26 years later. — How to Read It Age of the Each dot represents a Hubble observation observation referenced in Observations—when Hubble points a published paper. at an object and collects data-can be beautiful and useful. This image of the Whirlpool galaxy from 2005 helped astronomers identify which star exploded as a supernova in 2011. Blue dots (nearly 14,000) relate to Hubble's archive: instead of asking for new observations, the researcher answered a question using existing images. Orange dots (nearly 9,000) relate to new data: a researcher makes a specific observation request to answer a question. A single important observation can yield many results. The multiple uses appear here as a diagonal stripe. The Hubble Deep Field—a single An additional 10,000 refer-100-hour image revealing ences to Hubble observa-Temporary maintenance many distant galaxies-has tions appeared in papers shutdowns result in fewer produced nearly 200 papers using a mix of the teleobservations. This diagonal since it was captured in 1995. scope's new and archival gap corresponds to an astroimages. Data are current as naut servicing mission in 2009. of early December 2016. **Publication date:** 2000 2005 2010 2015 After Hubble's eventual 1,000 Total observations referenced in papers per year demise, results based on new data (orange) 500 will disappear, but those based on the archives 500 (blue) will continue.

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