

Hubble paints picture of the evolving universe

August 16 2018, by Karl Hille



Astronomers have just assembled one of the most comprehensive portraits yet of the universe's evolutionary history, based on a broad spectrum of observations by

the Hubble Space Telescope and other space and ground-based telescopes. In particular, Hubble's ultraviolet vision opens a new window on the evolving universe, tracking the birth of stars over the last 11 billion years back to the cosmos' busiest star-forming period, about 3 billion years after the big bang. This photo encompasses a sea of approximately 15,000 galaxies -- 12,000 of which are star-forming -- widely distributed in time and space. This mosaic is 14 times the area of the Hubble Ultra Violet Ultra Deep Field released in 2014. Credit: NASA, ESA, P. Oesch (University of Geneva), and M. Montes (University of New South Wales)

Astronomers using the ultraviolet vision of NASA's Hubble Space Telescope have captured one of the largest panoramic views of the fire and fury of star birth in the distant universe. The field features approximately 15,000 galaxies, about 12,000 of which are forming stars. Hubble's ultraviolet vision opens a new window on the evolving universe, tracking the birth of stars over the last 11 billion years back to the cosmos' busiest star-forming period, which happened about 3 billion years after the big bang.

Ultraviolet light has been the missing piece to the cosmic puzzle. Now, combined with infrared and visible-light data from Hubble and other space and ground-based telescopes, astronomers have assembled one of the most comprehensive portraits yet of the universe's evolutionary history.

The image straddles the gap between the very distant galaxies, which can only be viewed in infrared light, and closer galaxies, which can be seen across a broad spectrum. The light from distant star-forming regions in remote galaxies started out as ultraviolet. However, the expansion of the universe has shifted the light into infrared wavelengths. By comparing images of star formation in the distant and nearby universe, astronomers glean a better understanding of how nearby galaxies grew from small

clumps of hot, young stars long ago.

Because Earth's atmosphere filters most [ultraviolet light](#), Hubble can provide some of the most sensitive space-based ultraviolet observations possible.

The program, called the Hubble Deep UV (HDUV) Legacy Survey, extends and builds on the previous Hubble multi-wavelength data in the CANDELS-Deep (Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey) fields within the central part of the GOODS (The Great Observatories Origins Deep Survey) fields. This mosaic is 14 times the area of the Hubble Ultra Violet Ultra Deep Field released in 2014.

This image is a portion of the GOODS-North field, which is located in the northern constellation Ursa Major.

Provided by NASA's Goddard Space Flight Center

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