

Galaxy History Revealed in this Hubble View

This close-up view reveals the rich variety of galaxies in the distant universe. The galaxies in the image range from the large, mature spirals and ellipticals in the foreground, to smaller, fainter, irregularly shaped galaxies. Most of those distorted galaxies are farther away, and therefore existed farther back in time. The puny galaxies are considered the building blocks of the larger galaxies we see today. They built themselves up through collisions and mergers.

The image combines a broad range of colors, from ultraviolet, to visible light, and into the near-infrared. Such a detailed multi-color view of the universe has never before been assembled in such a combination of color, clarity, accuracy, and depth.

Hubble's sharp resolution and new color versatility, produced by combining images from two Hubble cameras, are allowing astronomers to sort out the various stages of galaxy formation.

Ultraviolet light shows the blue glow of hot, young stars in galaxies teeming with star birth. The orange light reveals the final buildup of massive galaxies about 8 billion to 10 billion years ago. The near-infrared light displays the red glow of very distant galaxies whose light has been stretched, like a toy Slinky, from ultraviolet light to longer-wavelength infrared light due to the expansion of the universe.

Astronomers combined observations taken by Hubble's Wide Field Camera 3 and data taken by the Advanced Camera for Surveys to make this mosaic. The Wide Field Camera 3 observations were taken in September and October 2009; the Advanced Camera for Surveys observations were made in 2004. The view covers a portion of the southern field of a large galaxy census called the Great Observatories Origins Deep Survey (known by the acronym, GOODS), which is a deep-sky study by several observatories to trace the evolution of galaxies.

The image is part of a much larger photograph taken by NASA's Hubble Space Telescope. The full

field reveals 7,500 galaxies in various stages of assembly and stretching back through most of the universe's history.

**For more information on Tactile Astronomy projects from the Space Telescope Science Institute in Baltimore, Maryland, go to the following page at the Web site, Amazing Space:
<http://amazing-space.stsci.edu/tactile-astronomy/>**