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10,000 galaxies shine in Hubble mosaic

Survey produces space telescope's largest color picture

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ATLANTA - The newest camera on the Hubble Space Telescope has created an unprecedented image of a huge hunk of the sky, including at least 10,000 galaxies, which could help determine how our own Milky Way evolved, astronomers said on Thursday.

The new mosaic is the largest color image ever made by the orbiting telescope, covering an area of the sky about the apparent size of the full moon. This may not sound big, but it is 150 times the size of images made by an earlier survey of galaxies known as the Hubble Deep Field image.

In this case, the size of the picture is important, because narrow, if deep, images of the cosmos can give a misleading impression of what is out there.

“Galaxies are incredibly diverse creatures,” Shardha Jogee, an astronomer at the Space Telescope Science Institute in Baltimore, said at a news briefing. “You really need a large sample, otherwise your results get skewed.”

Patchwork of 63 squares

The new image, created with Hubble’s Advanced Camera for Surveys, is a patchwork of 63 squares showing the area around the constellation Fornax in the southern celestial hemisphere.

Looking closely with high resolution, scientists found detailed pictures of 10,000 galaxies, and expect there are thousands of other, fainter galaxies in the same field of view.

Presented at a meeting of the American Astronomical Society in Atlanta, this research by an international group of scientists is meant to study how galaxies form. This is particularly important for those studying the Milky Way galaxy, which contains our solar system, Jogee said.

Because earthly observers are sitting within the Milky Way, their vantage point is better for galaxies outside our own, which can be glimpsed in their entirety.

The international team chose to make a mosaic of the field around Fornax because they already knew the distances to the 10,000 galaxies.

By knowing the distances, astronomers could also determine how long light had taken to get from them to the Hubble’s camera, enabling them to see the galaxies as they were when the universe was about 4.5 billion years old. Scientists believe the universe is currently 13.7 billion years old.

Dominated by spirals

Jogee noted that most of the galaxies in the present-day universe — more than 70 percent — appear to be barred spiral galaxies like the Milky Way. These are pinwheel-shaped galaxies with elongated concentrations of stars that funnel gas to the center of the galaxy to fuel furious bursts of star formation.

There are also unbarred spiral galaxies and elliptical galaxies, which look smooth and round. The image also captured galactic mergers, in which stars experienced what astronomers call violent relaxation — a sort of “stellar amnesia” when stars forget where they were in a galaxy before the merger.

“By putting these different snapshots together, we could really piece together this big puzzle of galaxy evolution,” Jogee said.

The galaxy survey is known as GEMS, short for Galaxy Evolution from Morphology and Spectral Energy Distributions. Images are available online.

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