Galaxy Evolution Explorer Mission Celebrates Sixth Anniversary

April 28 2009

In these side-by-side images of M33, the ultraviolet image on the left was taken by the Galaxy Evolution Explorer, while the ultraviolet and infrared image on the right is a blend of the mission's M33 image and another taken by NASA's Spitzer Space Telescope. Image credit: NASA JPL

(PhysOrg.com) -- NASA's Galaxy Evolution Explorer Mission marks its sixth anniversary studying galaxies beyond our Milky Way through its sensitive ultraviolet telescope, the only such far-ultraviolet detector in space.

The mission studies the shape, brightness, size and distance of galaxies across 10 billion years of cosmic history, giving scientists a wealth of data to help us better understand the origins of the universe. One such object is pictured here, the galaxy NGC598, more commonly known as M33.

In these side-by-side images of M33, the ultraviolet image on the left was taken by the Galaxy Evolution Explorer, while the ultraviolet and infrared image on the right is a blend of the mission's M33 image and another taken by NASA's Spitzer Space Telescope. M33, one of our closest galactic neighbors, is about 2.9 million light-years away in the constellation Triangulum, part of what's known as our Local Group of galaxies.

The Galaxy Evolution Explorer has two detectors: one in far-ultraviolet, which reveals stars younger than about 10 million years old, and another in near-ultraviolet, which detects stars younger than about 100 million years old. The left ultraviolet image shows a map of the recent star formation history of M33. The bright blue and white areas are where star formation has been extremely active over the past few million years. The patches of yellow and gold are regions where star formation was more active around 100 million years ago.

The ultraviolet image highlights the most massive young stars in M33. These stars burn their large supply of hydrogen fuel quickly, burning hot and bright while emitting most of their energy at ultraviolet wavelengths. Compared with low-mass stars like our sun, which live for billions of years, these massive stars never reach old age, having a lifespan as short as a few million years.

Together, the Galaxy Evolution Explorer and Spitzer can see a larger range of the full spectrum of the sky. Spitzer, for example, can detect mid-infrared radiation from dust that has absorbed young stars' ultraviolet light. That's something the Galaxy Evolution Explorer cannot see. The combined image on the right shows in amazing detail the beautiful and complicated interlacing of hot dust and young stars. In some regions of M33, dust gathers where there is very little far-ultraviolet light, suggesting that the young stars are obscured or that stars farther away are heating the dust. In some of the outer regions of the galaxy, just the opposite is true: There are plenty of young stars and very little dust.

In the combined image, far-ultraviolet light from young stars glimmers blue, near-ultraviolet light from intermediate age stars glows green, near-infrared light from old stars burns yellow and orange, and dust rich in organic molecules burns red. The small blue flecks outside the spiral disk of M33 are most likely distant background galaxies. This image is a four-band composite that, in addition to the two ultraviolet bands, includes near infrared as yellow/orange and far infrared as red.

Since its launch from a Pegasus rocket on April 28, 2003, the Galaxy Evolution Explorer has imaged more than a half-billion objects across two-thirds of the sky. Highlights over the past six years include detecting star formation in unexpected regions of the universe and spotting Mira, a fast-moving older star called a red giant. Astronomers say that studying Mira's gargantuan cosmic tail is helping us learn how stars like our sun die and ultimately seed new solar systems.

Provided by JPL/NASA (news : web)

Citation: Galaxy Evolution Explorer Mission Celebrates Sixth Anniversary (2009, April 28) retrieved 25 April 2024 from https://phys.org/news/2009-04-galaxy-evolution-explorer-mission-celebrates.html