

A pool of distant galaxies -- the deepest ultraviolet image of the universe yet

November 7 2008



The Chandra Deep Field South, observed in the U-, B-, and R-bands with ESO's VIMOS and WFI instruments. The U-band VIMOS observations were made over a period of 40 hours and constitute the deepest image ever taken from the ground in the U-band. The image covers a region of 14.1 x 21.6 arcmin on the sky and shows galaxies that are 1 billion times fainter than can be seen by the unaided eye. The VIMOS R-band image was assembled by the ESO/GOODS team from archival data, while the WFI B-band image was produced by the GABODS team. Credit: ESO/ Mario Nonino, Piero Rosati and the ESO GOODS Team



This uniquely beautiful patchwork image, with its myriad of brightly coloured galaxies, shows the Chandra Deep Field South (CDF-S), arguably the most observed and best studied region in the entire sky. The CDF-S is one of the two regions selected as part of the Great Observatories Origins Deep Survey (GOODS), an effort of the worldwide astronomical community that unites the deepest observations from ground- and space-based facilities at all wavelengths from X-ray to radio. Its primary purpose is to provide astronomers with the most sensitive census of the distant Universe to assist in their study of the formation and evolution of galaxies.

The new image released by ESO combines data obtained with the VIMOS instrument in the U- and R-bands, as well as data obtained in the B-band with the Wide-Field Imager (WFI) attached to the 2.2 m MPG/ESO telescope at La Silla, in the framework of the GABODS survey.

The newly released U-band image – the result of 40 hours of staring at the same region of the sky and just made ready by the GOODS team – is the deepest image ever taken from the ground in this wavelength domain. At these depths, the sky is almost completely covered by galaxies, each one, like our own galaxy, the Milky Way, home of hundreds of billions of stars.

Galaxies were detected that are a billion times fainter than the unaided eye can see and over a range of colours not directly observable by the eye. This deep image has been essential to the discovery of a large number of new galaxies that are so far away that they are seen as they were when the Universe was only 2 billion years old.

In this sea of galaxies – or island universes as they are sometimes called – only a very few stars belonging to the Milky Way are seen. One of them is so close that it moves very fast on the sky. This "high proper



motion star" is visible to the left of the second brightest star in the image. It appears as a funny elongated rainbow because the star moved while the data were being taken in the different filters over several years.

Source: ESO

Citation: A pool of distant galaxies -- the deepest ultraviolet image of the universe yet (2008, November 7) retrieved 27 April 2024 from <u>https://phys.org/news/2008-11-pool-distant-galaxies-deepest.html</u>

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