

A triumph of galaxies in three new images from the VLT Survey Telescope

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ESO 510-G13, a curious lenticular galaxy about 150 million light years from us, in the direction of the Hydra constellation. Credit: INAF/VST. M. Spavone (INAF), R. Calvi (INAF)

Distant galaxies, interacting galaxies, whose shape has been forged by the mutual gravitational influence, but also galaxies forming groups and clusters, kept together by gravity—they are the protagonists of three new images released by the VLT Survey Telescope (VST).

VST is an [optical telescope](#) with a 2.6 m diameter mirror, entirely built in Italy, that has been operating since 2011 at the European Southern Observatory's (ESO) Paranal Observatory in Chile. Since 2022, the telescope has been fully managed by INAF through the National Coordination Center for VST, based at the INAF premises in Naples.

VST is specialized in observing large areas of the sky thanks to its [wide field camera](#), OmegaCAM, an actual "cosmic wide-angle lens" able to capture, in each shot, one square degree of the sky, a portion of the celestial vault twice as large as the full moon's apparent diameter on each side.

Besides images for astrophysics research, spanning from stars to galaxies all the way to cosmology, in the past year the telescope has conducted a new program dedicated to the general public, observing nebulae, galaxies and other iconic objects during some full moon nights, when the brightness of our natural satellite disturbs the collection of scientific data. More images will be published in the coming months.

"Besides [scientific research](#), one of the goals of the VST Center is to disseminate scientific knowledge and to share the wonders of the universe with the general public. We especially wish that young people

can discover and nurture their interest in astrophysics through these amazing images," notes Enrichetta Iodice, INAF researcher in Naples and responsible for the national Coordination Center for VST.

One of the three new images portrays ESO 510-G13, a curious lenticular galaxy about 150 million [light years](#) from us, in the direction of the Hydra constellation. The central bulge of the galaxy stands out. The dark silhouette of the dust disk, seen from the edge, crosses the bulge, obscuring part of the light.

The disk's distorted shape, vaguely resembling an upside-down S, indicates the turbulent past of ESO 510-G13, which may have acquired its current appearance following a collision with another galaxy. In the lower right corner, among the many stars of the Milky Way scattered across the image, a pair of spiral galaxies about 250 million light years from us are also visible.

Zooming into the image, many more galaxies appear, even at greater distances, as small spots of light elongated among the many dots in the background.

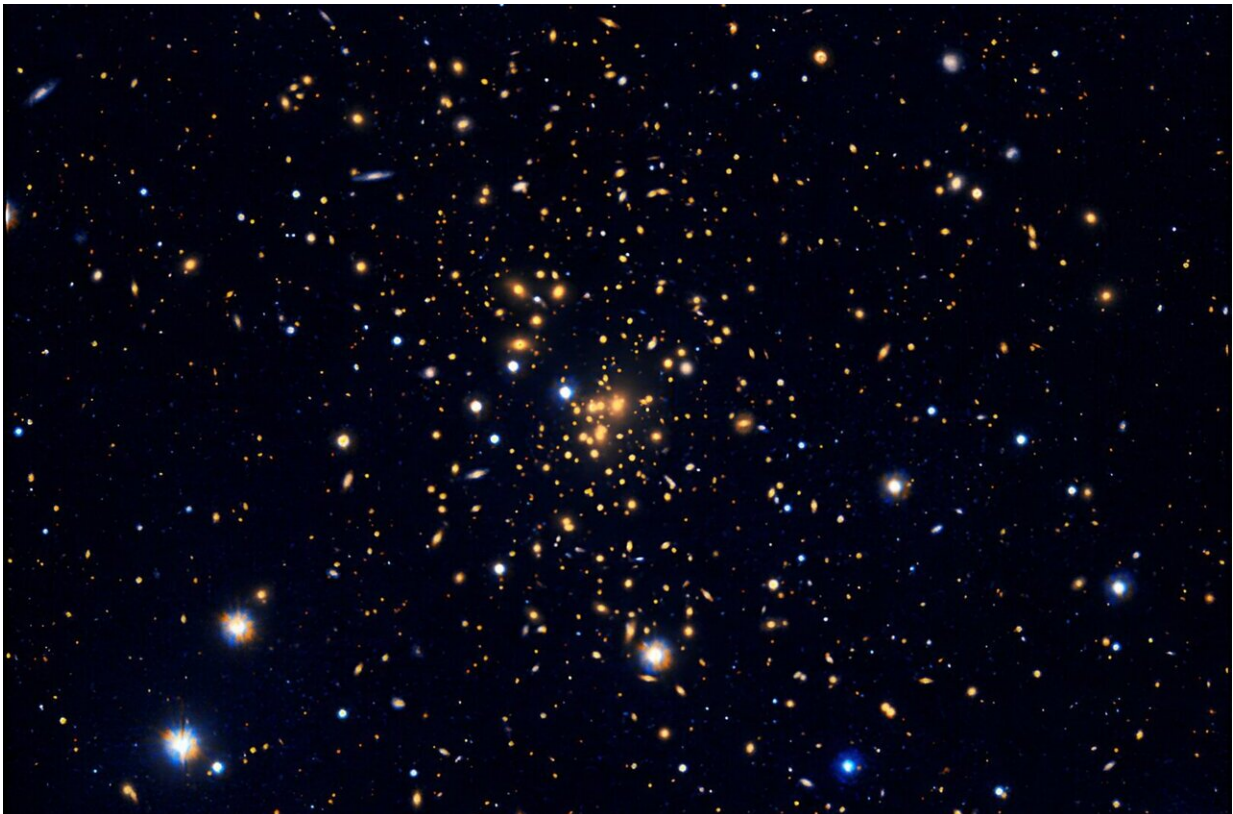


A small group of four galaxies, called Hickson Compact Group 90 (HGC 90), which is about 100 million light years away from Earth, towards the Piscis Austrinus constellation. Credit: INAF/VST/VEGAS, E. Iodice (INAF). M. Spavone (INAF), R. Calvi (INAF)

The second image shows a small group of four galaxies, called Hickson

Compact Group 90 (HGC 90), which is about 100 million light years away from Earth, towards the Piscis Austrinus constellation. The two round, bright spots near the image center are the elliptical galaxies NGC 7173 and NGC 7176. The bright streak that bifurcates and connects these two galaxies is the third member of the group, the spiral galaxy NGC 7174: its curious shape indicates the ongoing interaction between the three celestial bodies, which has stripped their stars and gas, mixing up their distribution. A halo of diffuse light envelops the three galaxies.

The fourth galaxy belonging to the group, NGC 7172, visible in the upper part of the image, does not seem to participate in this celestial dance: its core, crossed by dark clouds of dust, hides a supermassive black hole that has been actively devouring the surrounding material. The HGC 90 quartet of galaxies is embedded in a much larger structure, including dozens of galaxies, some of which are visible in this image.



The Abell 1689 galaxy cluster, which can be observed in the direction of the Virgo constellation. Credit: INAF/VST, M. Spavone (INAF), R. Calvi (INAF)

The third image shows a much richer and even more distant grouping of galaxies: the Abell 1689 galaxy cluster, which can be observed in the direction of the Virgo constellation.

Abell 1689 contains more than two hundred galaxies, mostly visible as yellow-orange blobs, whose light has traveled for about two billion years before reaching the VST. The enormous mass, including enormous quantities of hot gas and of the mysterious dark matter in addition to the galaxies, deforms space-time in the vicinity of the cluster.

Therefore, the cluster acts as a "gravitational lens" on more distant galaxies, amplifying their light and producing distorted images, much like what a magnifying glass does. Some of these [galaxies](#) can be spotted as dots and tiny, slightly curved lines, especially around the cluster's central regions.

Provided by Istituto Nazionale di Astrofisica

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