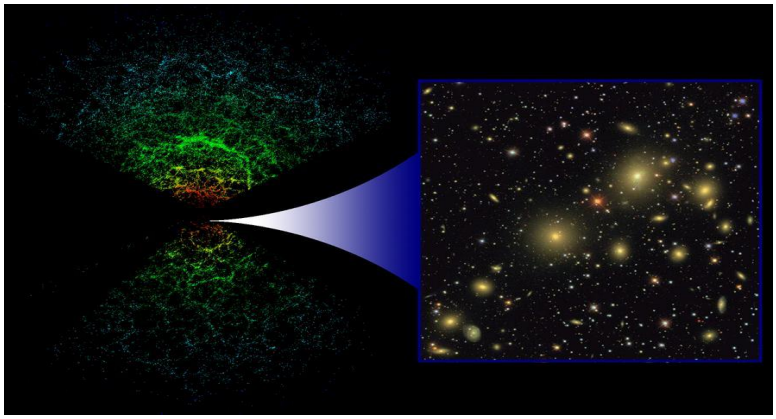
“Beyond the Local Group”

Current scientific instruments enable us to see the sky beyond the limits of our Local Group and discover that billions of other galaxies exist. These aren’t uniformly distributed in the Universe, they form a structure similar to a sponge. So we can find regions with thousands of galaxies concentrated in relatively small spaces and areas which are completely empty.

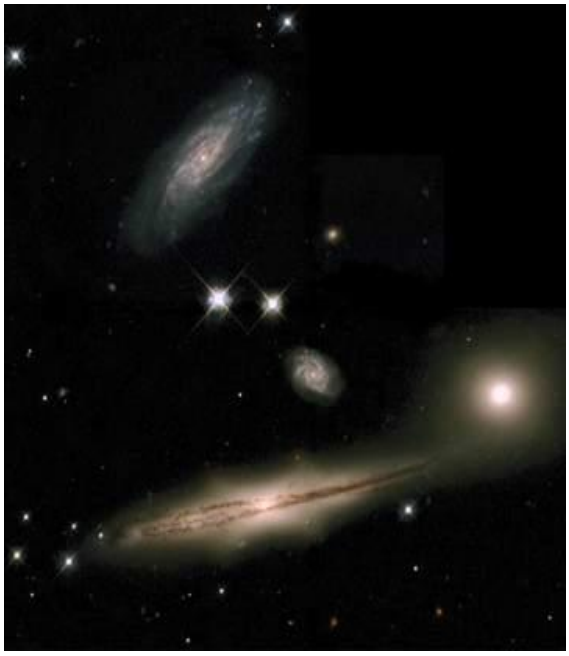


(This was astronomy picture of the day October 28 2003.) The SDSS is two separate surveys in one: galaxies are identified in 2D images (right), then have their distance determined from their spectrum to create a 2 billion lightyears deep 3D map (left) where each galaxy is shown as a single point, the color representing the luminosity - this shows only those 66,976 our of 205,443 galaxies in the map that lie near the plane of Earth's equator.

There are intermediate structures that contain about ten galaxies.

Clusters of galaxies take a variety of forms: they can be spherical and symmetrical, or ragged with no particular shape; they may contain a handful of galaxies or thousands; They can or cannot have a concentration towards the centre. Regular clusters appear to be populated mainly by elliptical galaxies, while irregular clusters tend to include all galaxy types.

Spiral galaxies like the Milky Way can be isolated or in groups, such as the Local Group to which we belong. In general, galaxies which are rich in gases aren’t found in dense environments, like the central regions of open clusters, where elliptic galaxies abound.



Hickson Compact Group 87 or HCG 87 *is a compact group of four galaxies bound together by their mutual gravitational attraction some 400 million light years distant toward the constellation Capricornus..*

The Coma Cluster of Galaxies *pictured above is one of the densest clusters known - it contains thousands of galaxies. Each of these galaxies houses billions of stars.* NASA photo.

The reasons for this effect remain partly unclear. However, we know that gas is a fundamental ingredient for the continuous birth of new stars and so for the formation of the heaviest chemical elements, necessary to life.