

## A NEW SUPERCLUSTER OF GALAXIES

A team of astronomers from South Africa, the Netherlands, Germany, and Australia announced on November 16 the discovery of a previously unknown major concentration of galaxies in direction to the southern constellation Vela. **They've dubbed it the Vela supercluster, and it's one of perhaps 10 million superclusters of galaxies – vast collections of galaxies – the largest structures we know in the universe.** The gravitational attraction from this newly found large mass concentration in our cosmic neighbourhood might have an important effect on the motion of our Local Group of galaxies including the Milky Way. It might also help to explain the direction and amplitude of our Local Group's peculiar velocity with respect to the Cosmic Microwave Background.

**Generally speaking, superclusters are vast clusters of galaxies spanning up to 200 million light-years across the sky. They're not isolated in space but exist together with many other smaller concentrations of galaxies, together forming parts of extensive walls of galaxies surrounding large voids in what astronomers call the cosmic web.**

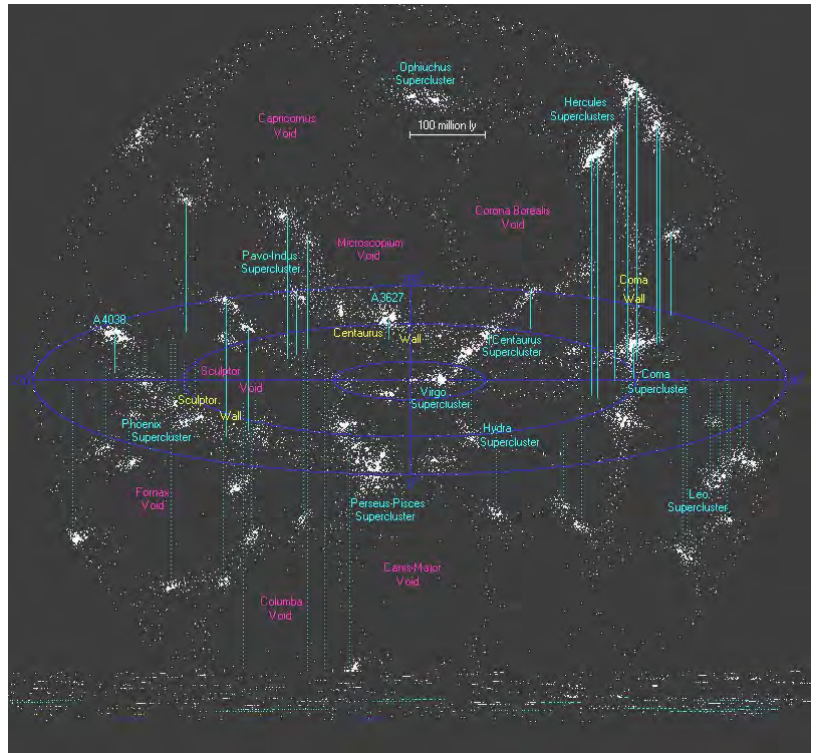
Superclusters aren't just big; they are also massive, meaning they have a powerful gravitational pull. They are the most massive known structures in our universe. A nearby supercluster famous for its great mass is the Shapley Supercluster, some 650 million light-years away containing two dozens of massive X-ray clusters for which thousands of galaxy velocities have been measured. It is believed to be the largest of its kind in our cosmic neighbourhood.

The new Vela supercluster is slightly farther away (800 million light-years) and covers an even larger sky area than Shapley. **The Vela supercluster had gone unnoticed due to its location behind the plane of the Milky Way, where dust and stars obscure background galaxies.** The team's results suggest the Vela supercluster might be as massive as Shapley, which indicates that its influence on local bulk flows is comparable to that of Shapley.

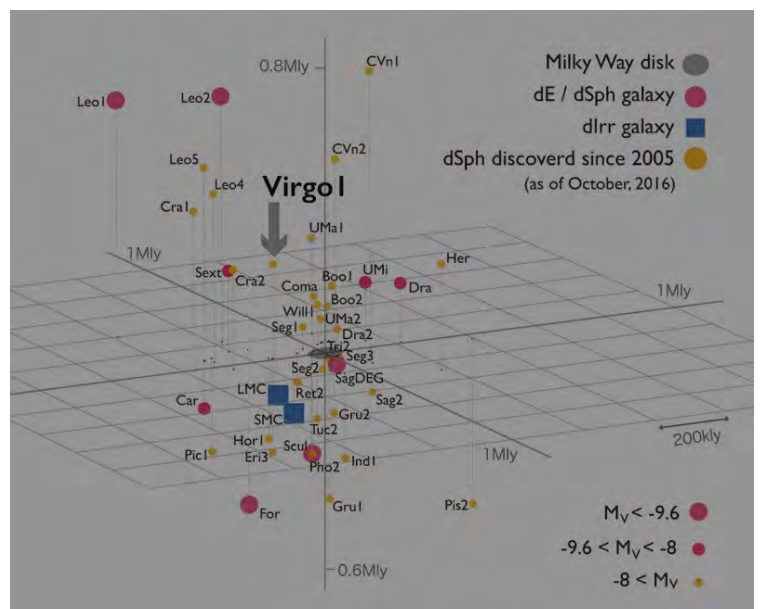
Subsequent spectroscopic observations with the Anglo-Australian Telescope in Australia provided thousands of galaxy redshifts and revealed the vast extent of this new structure.

This discovery shows that the Vela supercluster has a significantly higher matter density than average, making it a prominent large structure. Follow-up observations are needed to unveil the full extent, mass, and influence of the Vela supercluster. So far this region of the sky is sparsely sampled, while the part closest to the Milky Way has not been probed because dense star and dust layers block our view. Astronomers believe the early universe was nearly uniform as it expanded outward from the Big Bang. By a few billion years after the Big Bang, areas of slightly higher density had evolved to become galaxy clusters and groups, with sparsely populated regions devoid of galaxies in between.

AK, with EarthSky Notes



Superclusters near Earth. A map of the universe within 500 million light years shows most of the major galaxy superclusters that surround our Virgo supercluster. These superclusters form parts of extensive walls of galaxies surrounding large voids in space. The superclusters and voids together make up what astronomers call the cosmic web.



Satellite galaxies associated with the Milky Way, which is shown here as the gray oval in the centre of the diagram. Squares are the two Magellanic Clouds and circles are dwarf spheroidal galaxies.