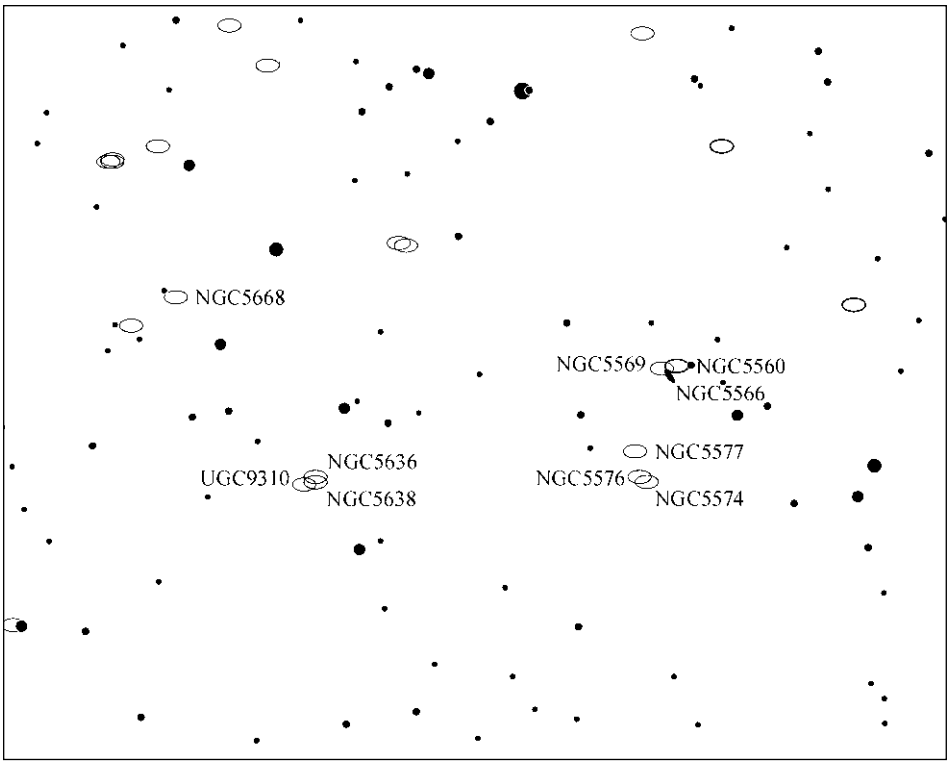
Virgo Cluster Suburbs

by Mark Bratton, Montreal Centre (mbratton@generation.net)

Examination of Chart 14 of *Sky Atlas 2000.0* places the densest concentration of the Virgo Cluster in the top right-hand corner of the page, in the area bounded by right ascensions 12^h00 and 13^h00 and by declinations 0° and +20°. Many more galaxies can be seen in an arc which curves south and east from that position, quite obviously an extension of the main cluster itself. Further to the east of the cluster's central region, however, the number of bright galaxies falls off rather quickly and only a handful of galaxies are plotted in that area. Are these galaxies truly isolated and unrelated to the Virgo cluster proper?

Not if we are to take into consideration the recessional velocities of these isolated field galaxies. Generally speaking, most Virgo cluster galaxies have recession velocities ranging from 800 to 1,200 km s^{-1}. Surprisingly, some well-accepted members of the cluster have velocities far lower than the group as a whole, including NGC 4526 (355 km s^{-1}), M91 (403 km s^{-1}), M89 (165 km s^{-1}), and M86 which is actually *approaching* our galaxy at the rate of 419 km s^{-1}. Meanwhile, the large, bright spiral galaxy M88 shows a rather high recession velocity of 1,990 km s^{-1}. Of course, one must take gravitational interaction between cluster members into consideration, as this would cause some of the galaxies to be approaching the Milky Way and appear to cancel out the general expansion of the universe.

The galaxies discussed in the present article, located well to the east of the Virgo Cluster, nevertheless show recessional velocities similar to the cluster as a whole, ranging from 1,100 to 1,700 km s^{-1}. These galaxies are likely 15 to 20 million light-years from the centre of the cluster, about the same distance that both they and the Virgo Cluster are from the Milky Way. We are, in all likelihood, seeing suburbs of Virgo's great city of galaxies.



A five-degree-high chart of many of the mentioned galaxies centred at $14^h25.5^m$ and +3° 53′ and showing stars to about 9th magnitude (ECU Chart by Dave Lane).

The following observations were made in 1995 and 1997 from Sutton, Quebec, one of the darkest sites in southern Quebec that is within an easy drive of Montreal. Most of the following galaxies occur in pairs or triplets and are interesting studies in contrast. All observations were made with a 15-inch reflector using magnifications of 146× and 272×.

Working from west to east, the first targets are the two brightest members of a loose grouping of seven galaxies that all made it into the *New General Catalogue*. NGC 5363 and NGC 5364 are both brighter than magnitude 11, so they can be detected even in small telescopes. NGC 5363 is the brighter of the two, an elliptical galaxy appearing slightly elongated northwest-southeast, the outer shell being intermittently visible with averted vision. The core is bright and appears very slightly extended almost east-west. An eighth-magnitude field star is located close to the northeast. NGC 5364 is bright though quite diffuse with poorly-defined extremities, a sure tip-off that this is a spiral galaxy. The core is only slightly brighter to the middle and a faint thirteenth-magnitude star is visible to

the northwest.

A very nice triplet, visible in a medium-power eyepiece, is next. NGC 5574, 5576, and 5577 show up well in a 15-inch refractor; in smaller telescopes NGC 5576 may be the only galaxy easily visible. It is the brightest, appearing quite round, sharply concentrated to a bright core. The outer edges are quite well defined and a magnitude 12 field star is visible immediately northwest. NGC 5574, located to the southwest, is the next brightest. It is a thin sliver, oriented roughly east-west with as slightly brighter core. Although fainter and quite diffuse, NGC 5577 is quite prominent in the field and appears to be the largest of the three galaxies, much elongated east-northeast/west-southwest.

Another triplet is located less than a degree to the northwest, though I was only able to note the two brightest galaxies when I observed them in 1995. NGC 5566 is an intensely bright galaxy, direct vision revealing a round, very opaque core with a bright stellar nucleus. Averted vision brings out hints of a faint, outer envelope oriented north-south. Its companion, NGC 5560 is fainter but quite prominent, a smooth elongated and fairly well-defined galaxy with a magnitude 14 star visible to the northwest. The third member of the triplet, NGC 5569, is very faint being magnitude 14.9. It is probably not visible in a 15-inch telescope under anything less than the best conditions.

Two degrees east of NGC 5574 one finds NGC 5636 and NGC 5638, a sharply contrasting pair. NGC 5638 is bright and easy in a 15-inch scope, featuring a bright, round core surrounded by a faint, secondary glow. Located 1.5 arcminutes almost due north, NGC 5636 is quite a challenge, a spiral galaxy shining feebly with a photographic magnitude of 14.6. I found it quite difficult to detect, a faint patch of light with a slightly brighter core. There is a third galaxy in the field, UGC 9310, but it is fainter than magnitude 15 and it was completely undetectable.

The last galaxy on this suburban tour is a diffuse Sc-type spiral, NGC 5668. Although moderately bright, there is little seen of the galaxy's faint, weak spiral structure. The core was quite visible, oval in shape with hints of patchy concentrations in the outer envelope. The galaxy appeared a little brighter in the southwest and a faint field star was visible in contact to the northeast.

This region of the sky, located east of central Virgo, is not often explored owing to the lack of bright field stars to help guide the way. After the crowded galaxy fields of early spring, coming to this section of the sky encourages slow and leisurely exploration and quiet contemplation of the universe beyond our Milky Way.

Mark Bratton, who is also a member of the Webb Society, has never met a deep sky object he did not like. He is one of the authors of Night Sky: An Explore Your World Handbook.