



## Her name is Virgo

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Late southern autumn is the best time to go galaxy-hunting. Not only is the Orion arm down in the west, but the Milky Way is still way down towards the east. The time slot gives us the opportunity for an intense look into the wide universe to observe the faint fuzzies, which are actually entire galaxies. You only need the use of a modest medium to larger telescope and dark skies. The constellation Virgo and most would agree, holds something mystical as it is filled with galaxies which are, in turn, also enveloped in a haze of unknown. Well, the truth is that the chaste young girl of the starry skies, so widely loved was regarded as the virgin daughter of Zeus.

In the Middle Ages Virgo was even known as the

Virgin Mary, mother of the child Jesus. Nevertheless, whichever name or myth you prefer, she holds in her lap a very rich harvest of a variety of galaxies that will keep you busy for quite some time.

So let us fire off into galaxy world with an all-time favourite, the versatile **NGC 4594** (Messier 104), better known as the Sombrero Galaxy, which was discovered in May 1781 by the Frenchman Pierre Mechain. Messier 104 is possibly one of the brightest and biggest galaxies in the Virgo-Coma Super Cluster of Galaxies and is situated virtually on the boundary between Virgo and the constellation Corvus. This relatively bright edge-on galaxy with a slight tilt of six degrees towards our point of view displays

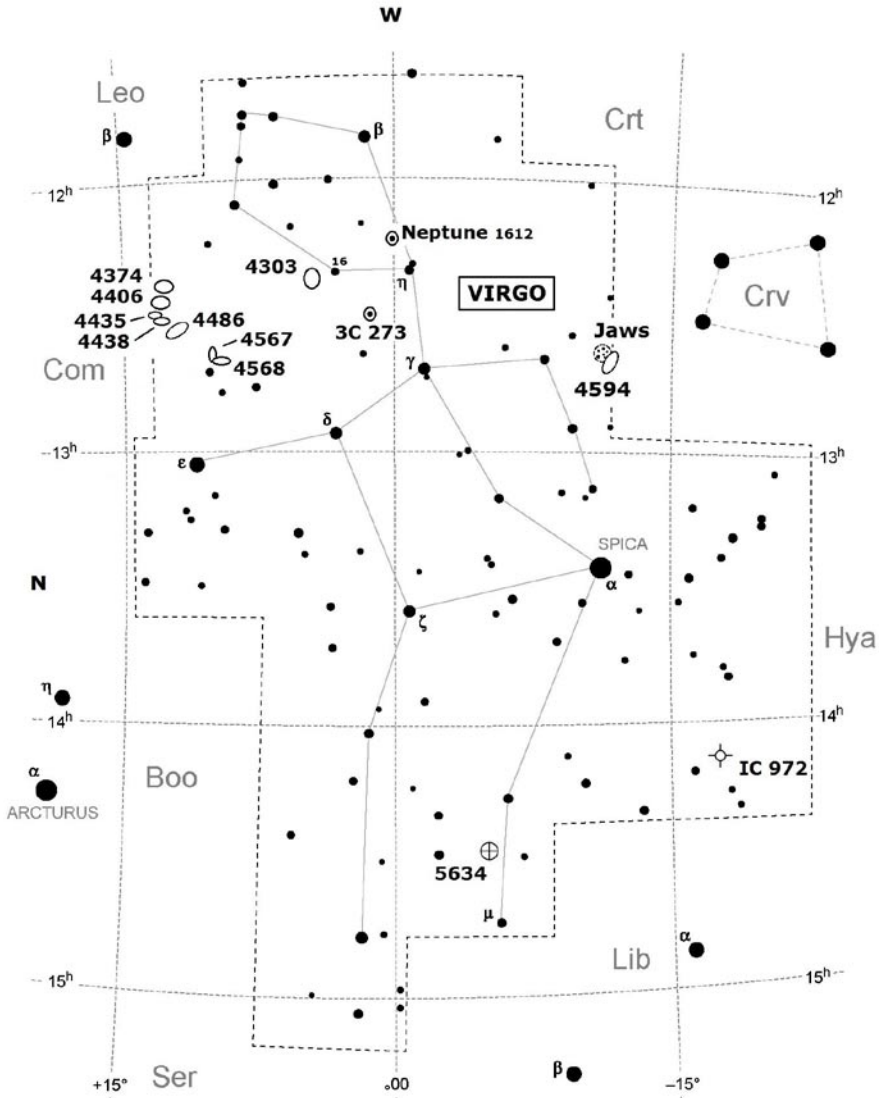


Image source: Stellarium.org

a prominent dark dust lane running through the major axis with a very prominent bulge. The galaxy appears to lie in an east-west direction with slightly pointed ends.

Steve O'Meara, a well-known amateur living in Hawaii, notes that the galaxy displays a brilliant core that seems to illuminate the surrounding oval shroud from within, like a distant bonfire seen through thick fog. The sharpness of the telltale dark lane reveals the edge of the Mexican hat's brim. He goes on to say that with averted

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vision the eastern portion of the Sombrero's brim breaks up and flares

into a wide brushstroke of light, which shines more brilliantly than the

western portion of the brim. Obviously Steve uses a large telescope

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with high magnification in favourable dark skies, but agrees with me that the galaxy could not be described better.

Not only is Messier 104 approximately 65 million light years away, it is also about 135 000 light years in diameter and plays host to many globular clusters – many more than our own Milky Way.

A very fascinating asterism called Jaws accompanies M104 only 25' towards the west. About nine colourful stars between magnitude 8 and 10 portray this impression quite truly. The main focus is the brighter stars towards the southern end of the star string. A more familiar asterism, however, can be spotted jumping the border into Corvus, barely a degree south-west of asterism Jaws. Known as Star-gate, it is an almost perfect equilateral triangle of stars nestling inside another almost perfect equilateral star triangle. It is an outstandingly defined composition of

stars between magnitude 6 and 9 against a bare star field. The two brightest stars in this breathtaking composition display a golden yellow colour.

Virgo is mostly popular for the Super Cluster of Galaxies situated mainly in the northern part of Virgo with the abundance overflowing into the constellation Coma Berenices. The heart of this unique area filled with several galaxies is without doubt the two elliptical star cities **NGC 4374** (Messier 84) and **NGC 4406** (Messier 86), which are only 15' apart. However, the giant galaxy M84 shines with an overwhelming round glow that is easy visible and situated only 25' from the Coma Berenices border. The galaxy displays a bright small nucleus and a snowy frosted edge and could be as far as 65 million light years distant.

At first M86 appears to be a twin to M84, with its apparently perfectly round shape, but closer scrutiny

reveals a slight oval in a north-west to south-east direction with a nearly stellar nucleus. Because M86's light is spread over a larger area, it appears slightly fainter than M84, but is, in fact slightly brighter. It houses a large population of faint globular clusters orbiting the galaxy which serve as standard candles to determining galactic distances. The galaxy is about 53 000 million light years away, perhaps slightly closer to us than M84.

Several other galaxies in the area, including M84 and M86, stretch from north-east to south-west and have collectively been referred to as Markarian's Chain. The chain was named by the Russian Benjamin Markarian, who first noted this formation.

A very special pair of galaxies is **NGC 4435** and **NGC 4438**, situated barely 20' further east of M86. I remember very well the first time I laid eyes on this unique pair of galaxies during a visit

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to the Kruger National Park. At the time, listening to all the animal sounds in the dark of night, I imagined the pair to be two eyes staring back at me through the telescope eyepiece, not withstand the lion's roars in the distant. The southern member NGC 4438 is slightly larger, with an even surface brightness and a very hazy edge. With higher magnification a broad central concentration can be glimpsed. Although the northern member, NGC 4435, is slightly smaller, it is a tad brighter, with an outstanding stellar nucleus. Both galaxies, nicknamed The Eyes, face in a north-eastern to south-western direction.

A much talked about galaxy and one hard to miss is **NGC 4486** (Messier 87), situated another degree further south-east (see picture). It is a lovely outstanding elliptical galaxy (also known as Virgo A) with a bright outstanding nucleus and is ranked as one of the largest

visible galaxies with a dominant population of old stars. The nucleus contains a super-massive black hole with a strong radio-active source. A curious straight ray lies in the frosted nebulosity and extends from the core at a position angle of 260 degrees. This thin stream of matter and dust contains high-energy particles racing from the galaxy nucleus at close to the speed of light. Obviously there is no chance even to glimpse this strange sight, but a Hubble picture shows it quite clearly. A few stars settle on the northern edge of M87, and in the immediate field of view many

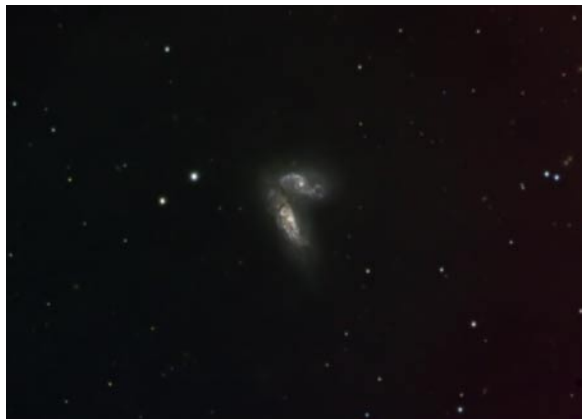
galaxies can be spotted that indicate, more or less, the centre of the Virgo Super Cluster.

Still on your way, another 2 degrees further south-east, the merging galaxies **NGC 4567** and **NGC 4568**, also known as the Siamese Twins, portray the vastness of the universe in a very special way (see picture by Dale Liebenberg). The American deep-sky author Leland S. Copeland dubbed it as such in 1955. NGC 4568 the eastern and larger member appears to be surrounded by a hazy envelope and faces north-south. It gets gradually brighter towards a relatively large



**M87-NGC4486 Virgo A, an elliptical galaxy. Dale Liebenberg.**

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**NGC 4567-8, the Siamese Twins. Dale Liebenberg.**

nucleus. NGC 4567, the slightly smaller galaxy in comparison, has a dense bright pin-point nucleus. The interacting spiral pair are gently joined at their north-eastern tips. Barely 10' towards the north is another spiral companion member, NGC 4564, in an east-west direction.

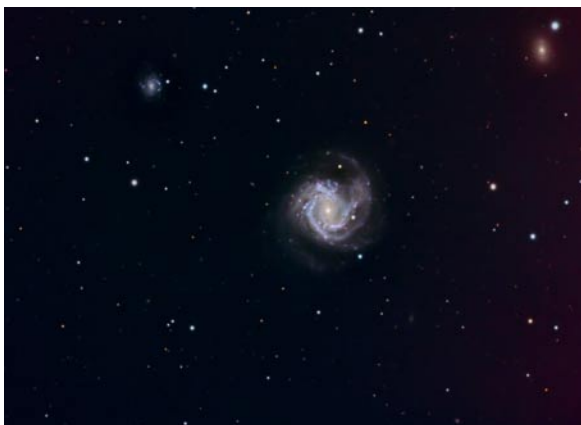
**NGC 4303** (Messier 61) is one of the largest spirals, and is situated a degree north of 16 Virginis and 5 degrees north of magnitude 3.8 eta Virginis. The galaxy displays a barred face-on in a north-east to south-west direction with a stellar core and hints of mottling on the surface

(see picture). With higher magnification and a relatively large telescope try to glimpse the dark streak between the eastern arm section and the nucleus. The galaxy is situated about 50 million light years

distant and to me is one of the most outstanding deep sky objects.

With so many galaxies to explore, a sequel to this article will be necessary. This is only the tip of the proverbial iceberg, yet even this leaves a stunning expression on the observer. Sometimes people shy away from observing galaxies, but careful map work and summaries of brightness will make observation considerably easier.

The planet Neptune was seen in Virgo about 20' east of the magnitude 6 star HD 105374, and 2 degrees west of eta Virginis,



**M61-NGC4303 barred galaxy. Dale Liebenberg.**

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by Galileo in December 1612. He also detected the motion, but probably could not believe it was a new planet. JG Galle of Berlin Observatory actually found and confirmed such a planet in the Aquarius constellation on 23 September 1846.

A very peculiar object is the quasar **3C 273**, the brightest example of its kind and situated about halfway between eta and gamma (Porrina) Virginis in a triangle towards north. The quasar is situated just 8' south of a pair of magnitude 10 and 11 stars and just 40' west of the galaxy IC 3474. The slightly bluish object appears brighter and hazier than the accompanying stars in the field of view. 3C 273 is a very luminous object with an enormous red shift discovered by Arp in 1966. With a magnitude of barely 13 it not easy to detect through ordinary telescopes.

On the night of 22 May 2002 I took part in an occultation of the star HIP 75185 by the asteroid (5) Astraea done by Albert

Brakel, from Australasia, and myself from South Africa. It was successful and the asteroid diameter came to 162 km x 96 km. I laid eyes on (5) Astraea again on the night of 7 May, 2008 when this main-belt asteroid was drifting through Virgo about a degree west of the lovely yellow gamma Virginis. (5) Astraea was accidentally discovered by Karl Hencke in December 1845 while he was searching for the asteroid Vesta.

In ancient times the importance of harvest time was reflected in the Virgo constellation, which is also referred to as the Maiden of the Harvest. The bright white magnitude one star alpha Virginis, better known as Spica, is said to represent the germ of the wheat grain. It is also a variable star that changes its light output every 4.1 days.

In the midst of the constellation domain we find **IC 972**, a lonely planetary nebula in the far south-eastern corner of Virgo. IC 972 could well be

a very faint galaxy by the looks of it, not at all easy to glimpse and probably, with a magnitude of fourteen, out of observational reach for most. Larger telescopes, however, and high magnification will reveal a slight defined edge around an out of focus star impression. IC 972 is the 37<sup>th</sup> entry in George Abell's catalogue with a nebulous structure.

Another surprise to be found is the globular cluster **NGC 5634** taking shelter at Virgo's feet half way between magnitude 3.8 mu and magnitude 4 iota Virginis. This globular cluster, the only one in Virgo as far as I know, is relatively easy to observe, and displays a soft glow that grows gradually brighter towards a very compressed unresolved broad centre. Towards the eastern periphery a magnitude 8 orange-coloured star dominates which changes it slightly to an uneven shape. A few faint star outliers, barely seen on the northern and southern edges, spiral out into the field of view. A

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spaced triangle of stars can be seen towards the southern edge in the field of view (see picture by Dale Liebenberg).

Dress up snugly and warmly, make yourself a flask of coffee and sit down with the lady Virgo to seek out those faint, misty “clouds” that are, in fact – almost unbelievably – entire galaxies. ☆



NGC 5634 sheltering in Virgo's feet. Dale Liebenberg.

Object	Type	RA (J2000.0)	Dec	Mag	Size
NGC 4303 (M 61)	Galaxy	12 <sup>h</sup> 21 <sup>m</sup> 9	+04°28	9.7	6.5'x5.8'
NGC 4374 (M 84)	Galaxy	12 25 1	+12 53	10	6.5'x5.6'
NGC 4406 (M 86)	Galaxy	12 26 2	+12 57	9.7	8.9'x5.8'
NGC 4435	Galaxy	12 27 7	+13 01	10.8	3.2'x2.0'
NGC 4438	Galaxy	12 27 8	+13 01	10.2	8.9'x3.6'
3C 273	Quasar	12 29 1	+02 03	12.8	0.158"
NGC 4486 (M 87)	Galaxy	12 30 8	+12 23	9.5	8.3'x6.6'
NGC 4567	Galaxy	12 36 5	+11 15	11.3	3.1'x2.3'
NGC 4568	Galaxy	12 36 6	+11 14	10.8	4.6'x2.2'
Jaws	Asterism	12 38 5	+11 30	8.8	20'
NGC 4594 (M 104)	Galaxy	12 39 8	-11 37	9.2	7.1'x4.4'
IC 972	Planetary Nebula	14 04 4	-17 15	14.3	0.43"
NGC 5634	Globular Cluster	14 29 6	-05 59	9.4	4.9'

## Errata

The image on page 13 of *MNASSA* Vol. 72 Nos 1 & 2, February 2013 has an incorrect caption. It should read: “The Pretoria Moonwatch team (Station 8575) which was set up on the roof of a building in the CSIR grounds. Source: Roy Smith.”

The Editor apologizes for the error.