



The Taurus Giants

by Magda Streicher

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Image source: www.stellarium.org

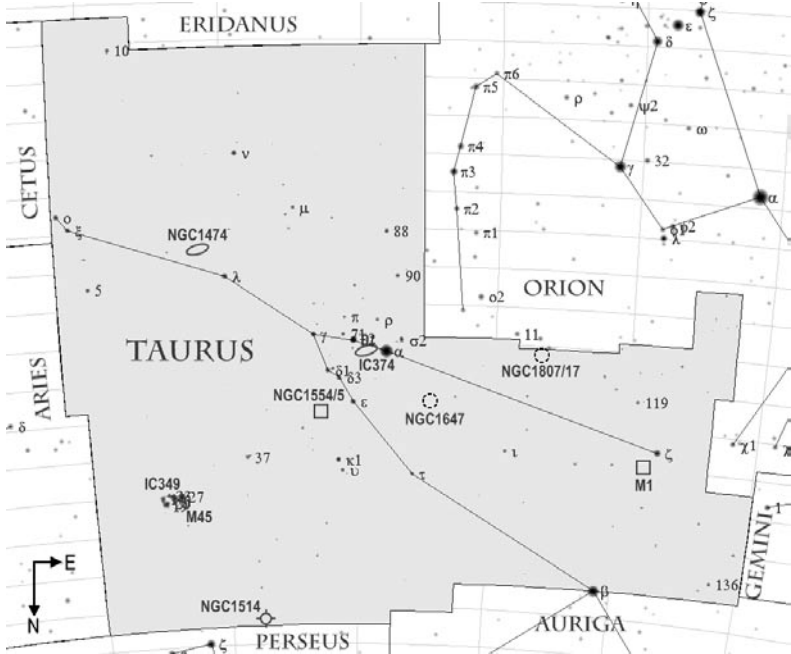
The constellation of Taurus, the celestial Bull, one of the oldest to have been designated, is easily recognisable against the northern night sky during the southern hemisphere summer. The Germans call this constellation ‘der Stier’. It was also known for being rich in maidens, referring to the Hyades and Pleiades, the daughters of Atlas. As an ancient zodiacal constellation it was also referred to as the Cock, or Hen, recalling the Hen and Chickens of the Pleiades.

The constellation Taurus enriches our insight into space with a few exceptional and unique giants. Alpha Tauri or Aldebaran (magnitude 0.3) conveniently indicates the Bull’s red fiery eye. The name comes from Al Babaran, the “Follower” of the Pleiades, the best known open cluster in the night sky, also in Taurus. Although Aldebaran appears in the Hyades star cluster, it is actually a foreground star, only 68 light years distant. The naked eye Hyades star grouping represents the Bull’s head and is 150 light years distant. The Taurids Meteor shower radiates every year around early November from a point north of, and preceding Aldebaran. These meteors are slow but can sport a few fireballs.

The galaxy **IC 374**, not actually classified as one of this constellation’s giants, is situated 50’ west of Aldebaran. It is a faint object which becomes slightly brighter towards the middle. It is something of a challenge to spot its weak glow against the glare of bright Aldebaran. Although faint, it is quite something for this galaxy to have such a famous and wonderful star as its neighbour.

The western ‘eye’ of the Bull is represented by magnitude 3.5 epsilon Tauri or, Oculus Boreus. Continue 1.5 degrees further west to locate one of the most famous reflection emission nebulae in the night sky. Variable stars are not uncommon but here we have one, accompanied by a very special object: **NGC 1554/55** possesses a variable nebula that makes the combination outstanding. Russell Hind, who discovered the phenomenon, was an English astronomer employed at George Bishop’s Observatory. On 11 October 1852, during a routine observation, he saw a glow situated close to a

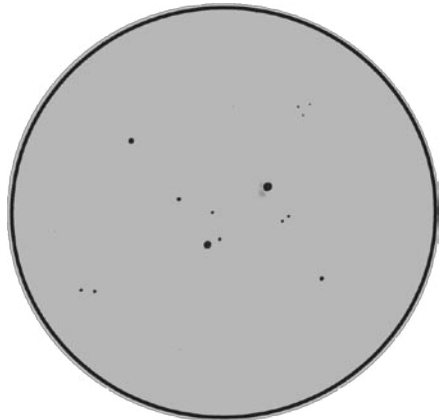
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Skymap produced using Cartes du Ciel

magnitude 9.8 star in the north-eastern part of Taurus. It was in fact a variable star and variable nebula, now known as Hind's Variable Nebula, and possibly in the region of 5 million years old. Tau Tauri's starlight illuminates the gas and dust surrounding the nebula, which varies between magnitude 9 and 13.5. Inside this gentle haze two dusty parts correspond to NGC 1554 and NGC 1555, with NGC 1555 a tad brighter. My notes of a year ago indicate an extremely faint, gentle north-south wispy arc of nebulosity, barely magnitude 12, close to Tau Tauri's western side.

While the Taurus constellation does not contain any bright galaxies, all can be



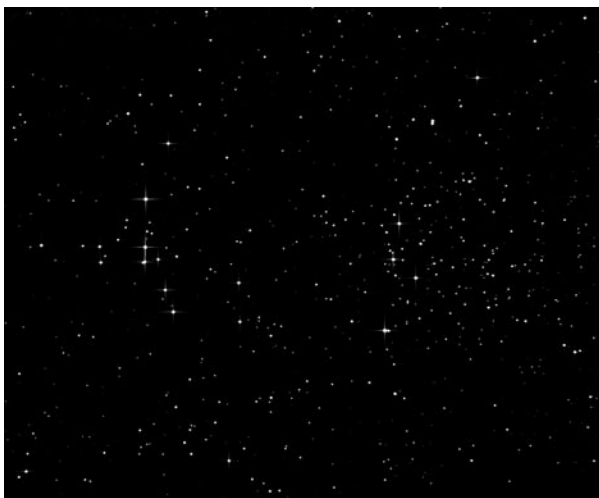
Sketch of the reflection and variable nebulae NGC 1554/5 using my 16-inch telescope at 290 power. North is up and west to the left.

forgiven because there is no shortage of magnificent objects within the boundaries of this constellation. The galaxy **NGC 1474** nestles in the far south of the constellation, just 2.2 degrees south-west of the magnitude 3.4 Lambda Tauri. The galaxy can be glimpsed in the eastern part inside a crescent-shaped arc of a few magnitude 10 stars. This soft glow displays a round haze which gets slightly brighter towards the middle.

Returning once more to the giant star Aldebaran, about 3.5 degrees north-east of it we find **NGC 1647**. This beautiful open cluster is a star grouping with a difference. Also called the Crab Cluster (not to be confused with the Crab Nebula), it displays a whole collection of approximately 50 stars of similar brightness. It is a very loose and widely spaced grouping with long strings of stars. The cluster members, slightly extended southwards from a somewhat denser middle part, also display a few double stars in its midst. Auke Slotegraaf, our Deep-sky Section Director, says the two curving rows of stars toward the west and north-west suggest the pincers of the crab, four shorter, but slightly brighter outliers marking the tips of the legs, and the clump of stars in the

middle form its body. Do you agree with him? Tell us what you think.

Around 6.5 degrees south-east, a twin cluster can be seen in a field of view with radius a mere 30'. The brighter of the two parts is the southern, **NGC 1807**, which stands out well against the background night sky. The cluster is home to about 30 stars that appear magnificent in combination and pointy in composition. The galaxy PGC 16865 is situated within the southern boundary of NGC 1807. I will certainly not try, nor recommend, searching for this extremely faint haze. **NGC 1817**, situated only 25' north-east of NGC 1807, appears much fainter, but larger and more concentrated. What caught my attention was the chain of stars running from north to south through NGC 1817.



Lucas Ferreira easily squeezed both NGC 1807 (left) and NGC 1817 into the same field. For this picture he stacked 15 x 20-sec exposures using Deepskystacker.

Most people have admired and marvelled at the prominent, bright, naked-eye star cluster commonly known as the Seven Sisters which adorns the night sky. Lately only six members can be seen with the naked eye due to the slight fading from view of one of the sisters, Celaeno. This relatively young star cluster, also named the Pleiades, or **Messier 45**, is of course home to many more stars which cannot be easily seen with the naked eye [as first noted by Galileo in his 1610 book *Sidereus Nuncius* (ed)]. The fact that it is enveloped in a soft haze has given rise to a general belief that the haze was partly responsible for this young developing star cluster. However, the Pleiades are busy moving through the gas nebula and the two are not at all related. The soft glow enfolding the cluster was discovered by E.E. Barnard in 1890. The brightest part of the nebula snuggles up against magnitude 4.1 Merope, the brightest southern member, also known as the star 23 Tauri. In old books this nebula was once referred to as Barnard's Merope Nebula, but it is now known as **IC 349**. Take a look and search out these faint tendrils in the Pleiades star cluster. The Pleiades also host an extremely faint galaxy, UGC 2838, which is 20' west of Pleiade member, Electra. I took up the challenge and sketched the area at high magnification (346x) to reveal many faint stars. Checking over and over again I decided that a faint spot close to the indicated position of RA: 03h43m44.7 DEC: +24°03'40" could well be the elusive edge-on galaxy.

The beautiful double star **Phi** (or **52 Tauri**) can be seen around 8 degrees east of the Pleiades cluster. The magnitude 5.0 primary displays a deep yellow colour, with a magnitude 8.4 yellow to slightly blue companion. With a separation of 52.1" and PA (position angle) of 250° it is an easy binocular target.

Now extend your view about 4 degrees north to catch a glimpse of one of Taurus' hidden jewels. The planetary nebula **NGC 1514** is one of my personal favourites. Also known as the Crystal Ball nebula, its overwhelming central star (magnitude 9.5) dominates the surrounding gas. The nebula itself shows up as a halo containing faint wisps when viewed through an oxygen filter at 346x. The SW-NE edges of the nebula are slightly fainter, giving it something of a dumbbell shape. A challenge is to spot the magnitude 13 star just off the northern edge of the nebulosity.

On 13 March 1781, while working his way through Taurus, William Herschel noticed an object that did not look like a star. He increased magnification and found that the size of the object also increased, unlike a star which remains a point of light even under high magnification. Herschel suspected he had discovered a comet in the eastern part of Taurus, not far from the Crab Nebula. It turned out not to be a comet at all, but in fact the planet Uranus. It had actually been noticed for the first time on 23 December 1690 by Flamsteed, who catalogued it as star 34 Tauri, more than 90 years before Herschel's discovery!

In all probability, on the evening Herschel discovered Uranus, he also observed one of the largest and best known nebulae in the night sky. On the morning of 4 July 1054, Chinese observers sighted a new star close to the magnitude 3 Zeta Tauri, the Bull's southern-most horn, which remained visible until early in the year 1056. The star, which formed in the wake of a supernova explosion, could be seen during the daytime for almost 20 days, even rivalling Venus at the time. The comet hunter Charles Messier happened to stumble upon this nebula in Taurus on the evening of 12 September 1758. It became **Messier 1** in his famous catalogue of nebulous objects, a place of honour well deserved. No matter how hard I might try to share my observations with you, there will always remain countless wonderful ways to describe it.

Known as the Crab Nebula, it displays a soft large oval (NW-SE) cloud which is quite pleasing to the eye. The soft, hazy, diffuse glow is around 6'x4' in diameter and stands out quite well against a busy star field. Really high-power observations through the telescope, carried out with care, reveal an uneven edge with irregular patches on an otherwise relatively even surface. At magnitude 9 the Crab nebula is probably too dim to see with binoculars, but is clearly visible through modest telescopes. It was identified as a radio source in 1963 and in X-ray wavelengths during the year 1964. In 1968 it was discovered to be one of the Milky Way's supernova remnants, containing a spinning pulsar more or less the mass of the Sun but only 10 km in diameter. The nebula is around 6500 light years distant and is 11 light years in diameter.



This picture, taken two years ago when I visited Bath, UK, is of William Herschel's garden where he set up his telescope and discovered the planet Uranus, then in Taurus.

On a few nights in January 2003 mother nature positioned the planet Saturn on the spot where this exploded star appeared in the year 1054. I can clearly recall glancing towards Taurus, pretending Saturn was the naked eye supernova. And through my telescope, on the night of 3 January 2003, the contrasting, well-defined planet and diffuse nebula glowed in the same field of view

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(96x). This will always remain one of my greatest and most precious observing memories.

Taurus is indeed a constellation liberally strewn with large, well-known and outstanding deep-sky objects. With this in mind, the term ‘large’, in whatever dimension, struck me once again during my last visit to the Kruger National Park. Respect is commanded when Earth’s largest land animal, the elephant, suddenly appears right in front of you, as if from nowhere, in the road you have to travel on! I could just stare in amazement at this unique and massive animal. Now I find myself wondering why Nicolas Louis de Lacaille, who designated 14 new constellations during his 1752 visit to the Cape of Good Hope, didn’t come up with the Elephant for one of them. Sitting all by myself at the campfire that evening, the sun set over



M1 photographed by Lucas Ferreira by stacking 24 x 30-sec exposures taken with an 8-inch Sky-Watcher Reflector with a Pentax K110D digital SLR Camera at Newtonian focus. Lucas found M1 to be quite a challenging object to photograph because of its low surface brightness.

the bush with a red heavenly glow and stretched out its hand, as it were, towards the stars to swear loyalty. Every nocturnal sound knows its place; the bush is alive, but also emits a silence that brings with it a great deep inner peace. ☆

Object	Type	RA (J2000.0)	Dec	Mag	Size
IC 349	Nebula	03 ^h 46.3	+23°56'	4	26"
Messier 45	Open Cluster	03 47.0	+24 07	1.2	110'
NGC 1474	Galaxy	03 54.2	+10 24	12-13	1.1'x1.0'
NGC 1514	Planetary Neb	04 09.2	+30 47	10.9	114"
Phi ^{1&2} or 52 Tauri	Double Star	04 20.4	+27 21	5.0 & 8.4	sep. 52.1'
NGC 1554/5	Reflection Neb	04 21.8	+19 32	Var. 8-13	30"
IC 374	Galaxy	04 32.5	+16 38	12.7	0.8'x0.4'
NGC 1647	Open Cluster	04 46.0	+19 04	6.4	45'
NGC 1807	Open Cluster	05 10.7	+16 32	7.0	17'
NGC 1817	Open Cluster	05 12.1	+16 42	7.7	15'
Messier 1	S/N Remnant	05 34.5	+22 01	8.4	6'x4'