

Heavens Above - A Chronicle - 13 - August Nights

As mentioned in the Introduction Section, this is a collection of my columns that specifically relate to things best observed in the month of August. In most cases, they could also be observed in June and August at later or earlier times respectively.

CONTENTS LIST FOR AUGUST NIGHTS

1. Show Him Your Cross
2. The Milky Way
3. Time for a Pot of Tea
4. This Dolphin's No Fluke
5. Where Eagles Dare
6. Let's Find Uranus
7. Northern Kneeler
8. Scorpions and Tea Pots
9. Aquila, Nemesis of Prometheus
10. Celestial Music
11. An Olympic Altar

1. Show Him Your Cross

for 19th August 1998

Recently a friend of mine had visitors from England. They asked him to show them our famous Southern Cross.

After ages scanning the sky from his backyard, he had to admit defeat. Embarrassment! But could you step outside your house tonight and point to the Southern Cross? You can? Well done, but read on anyway.

Australians best know the Southern Cross as the stars on our national flag. The largest star on our flag, the Federation star, is not part of the Southern Cross.

Unlike the constellations in the Northern Hemisphere, the Southern Cross does not represent some part of Greek mythology. Seamen named it in the 16th century because of its resemblance to...well, a cross.

However, the Australian Aboriginals have a number of stories describing what the stars of the Southern Cross represent. These are every bit as fascinating as the Greek mythologies.

One story describes the brightest stars of the cross as the four daughters of Mulula, the leader of the Kanda tribe, and the brightest Pointer star as Mulula himself.

Another describes how Bunya, a member of the spirit world, was frightened by hunters and hid up a tree. For his cowardice, he was turned into a tree-lurking possum, represented by the stars of the Cross.

So where do we find the Southern Cross? Easy! Step outside this week about 7 pm and face south. Look up high and you'll see two bright stars sloping at about 45 degrees. They are the Pointers. Follow their line downwards and you will find the Southern Cross, which at this time and month is lying almost on its side.

On a dark night, you should see the Cross's four bright stars and a fainter fifth star between the left and bottom stars (as you look at it). This star is on our flag too.

Other times of the year the Cross is much lower in the sky. In December, it is so low, its reddish top star (the Cross is upside down then) almost touches the horizon.

Last Christmas, I was driving south late at night. It was spooky because for the whole three hour trip, ahead of me just above the horizon, the Southern Cross pointed like an arrow at the end of the long dark road. Who said astronomy wasn't romantic?

2. The Milky Way

for 25th August 1999

Most people in suburbia will have seen the Milky Way, looking like a smoky cloud strung out across the sky. However, in darker skies, it looks like a dazzling continuous band of white, actually hiding the better known bright constellation stars.

The amazing thing is that every part of that white band is made up of stars, so close together that you can't split them apart without a telescope.

What is the Milky Way?

Our star, the Sun, is just another star amongst 300 to 400 billion stars that make up our galaxy. Astronomers, with great imagination, call this The Galaxy, with a capital G. This is to distinguish it from the billions of other galaxies.

The Galaxy is a round flat disk shaped like a spinning Catherine Wheel firework. It has a large bulging central hub, with two spiral arms wrapping around it. Our Sun is located inside one of those spiral arms.

So, although all the stars we can see with the naked eye are part of the Galaxy, when we look at the Milky Way, we are looking along that flat plane of the Galaxy's disk where there are more stars to be seen. It's like looking along the ground into thick fog rather than looking up out of the fog.

By common usage, the name The Milky Way has become the name of the Galaxy.

How big is this catherine wheel? Unimaginably big. It is about 100,000 light years in diameter, and the flat disk is about 2,000 light years thick. This means light takes 100,000 years to travel from one side of the Galaxy to the other. Our Sun is about 20,000 light years from the outer edge.

If you want to find the heart of our Galaxy, go out a few kilometres into a really dark sky, find Sagittarius (the Teapot) and near the end of the spout - that's it - 30,000 light years away.

3. Time for a Pot of Tea

for 11th August 1999

“I'm a little teapot, short and stout, here is my handle, here is my spout...”

One of the most significant constellations in the sky, chock filled with objects of astronomical delight, is Sagittarius.

Sagittarius is a mythical character, half man, half horse, holding a bow with arrow, but this pattern is very difficult to pick.

However, the constellation is very easy to spot if you think... teapot!

This month about 8 or 9pm, Sagittarius is right overhead, to the east of Scorpius. The Teapot's triangular lid faces north, the handle points east and the triangular spout points west. The best way to find it is face south, look directly overhead, and you'll see the teapot shape. You'll also get a giant crick in the neck, so then turn around and face north. It's more comfortable.

The line from the tip of the spout to the star where the spout meets the teapot lid is the mythological arrow. It points at the giant red star, Antares, the heart of Scorpius.

Why is Sagittarius so special? For starters, the point in the sky just past the spout's tip is the direction of the star packed centre of our galaxy, the Milky Way. This part of the sky contains unbelievably rich star fields.

Also, Sagittarius is the home of fifteen Messier objects, the most for any one constellation. Scan Sagittarius with binoculars or even a small telescope and you will spy exotic objects with names such as Lagoon Nebula (M8), Horseshoe Nebula (M17), Trifid Nebula (M20) and the fantastic globular cluster M22.

You can imagine when amateur astronomers are exploring the Teapot, there are so many marvels to view that their cups runneth over.

4. This Dolphin's No Fluke

for 15th August 2000

You don't need to go to Nelson's Bay to see dolphins. You can see one from your yard in the northern sky this month.

About 30° above the horizon in the north-east, you will spot a very distinctive set of four faint stars in the shape of a parallelogram, or a cross, about 5 Moon diameters long. You'll need to let your eyes adjust to the dark first. These are the main stars of the constellation Delphinus which represents one of the dolphin messengers of Poseidon, the sea-god. It also depicts the dolphin which carried the Greek poet Arion on its back while rescuing him from his enemies.

It's a very pretty group to look at and fits neatly into the field of a pair of binoculars. Early Christians saw it as the cross of Christ, but it seems to have retained the name “Job's Coffin” for reasons totally unknown these days.

However, its greatest novelty is in the names of the group's two brightest stars. The top star is Rotanev while the left hand one is called Sualocin. Very unusual names, you'd agree. Now turn the letters around and you have Nicolaus Venator. You Latin students will of course recognise this as the latinised name of Niccolo Cacciatore. This gentleman was the brilliant assistant to the Astronomer at Palermo Observatory in the 1800s and obviously managed to get his name immortalised in the sky. Good luck to him. His cheek was later rewarded by being appointed Astronomer at Palermo.

Perhaps this just goes to prove that dolphins are lucky.

5. Where Eagles Dare

for 1st August 2000

Not all the constellations are distinctly shaped like their namesakes. Some you will have noticed but not known what it was. This is one such constellation.

Half way up the sky in the north-east is a very obvious trio of stars in a straight line, roughly equally separated. They stand out like the proverbial sag on a rock, pointing downwards from right to left. These are the centre stars of the constellation Aquila, the Eagle.

Aquila was named from Greek mythology by the ancient astronomers and represents the bird that Zeus, the king of the gods, used as a caddy to carry his thunderbolts, amongst other tasks. Aquila once got his jollies by pecking the liver from the side of the live Titan Prometheus, but that's another story.

The bright centre star is called Altair, meaning the 'flying eagle.' But to be different, the stars on each side of Altair have Arabic names which mean 'the balance.' So you can picture the trio as either part of a hunting bird or as a see-saw.

Altair is a very interesting star. Firstly, it is the twelfth brightest star in the sky, mostly because it is also very close, only 16 light years away. A white star about 1.5 times the size of our Sun, it is, so to speak, in our neighbourhood.

But secondly, it is very dear to older sci-fi fans as the star featured in that Leslie Nielson, Anne Francis and Walter Pidgeon film, 'Forbidden Planet', where we first met Robbie the Robot and the 'monster from the id.' A classic.

Aquila is a fine example of the optical illusion of space. Altair and its two companions give the impression of togetherness perched up there in their eyrie in the sky. But in fact Altair is close at 16 light years, the next brighter star, Alshain, is 49 light years and the fainter Tarazed is a whopping 270 light years away. Apparently so near and yet so far.

6. Let's Find Uranus

for 21st August 2001

This week we try a challenge. Uranus, the 7th planet from the Sun is up there and easy to see in binoculars, all you need is to be looking at the right spot.

First we find Capricornus, the Goat. To do that, look east of north and up about 40 degrees and find the three stars in a line pointing downwards from right to left. That's Altair and friends in Aquila. Follow their line upwards for about 300 and you will come to a large group of stars high in the sky looking like an inverted V, or a roof cap. That's Capricornus.

Find the two 3rd and 4th magnitude stars at the bottom eastern end of the V which are only 2 degrees apart (about 4 moon diameters.) These are Delta and Gamma Capricornus.

Imagine an upside-down equilateral triangle with Delta and Gamma as two points and the invisible third point below them. With binoculars, at that third point of the triangle, you will see a faint blue-green 'star', just beyond naked eye visibility. Congratulations, you have found Uranus. You can see that gas giant planet over 2.5 billion km away.

And the good part is that although it is moving slowly across the background of stars, you can come back and see it every night in the same general position, though it will have moved slightly each night to the west, along a line parallel to Delta and Gamma. Now you know how to find it, your only problem is to decide how to pronounce it.

(UPDATE: Since this was written in 2001, Uranus has moved a tad, but not too much. It's still very close to that position. See if you can access an up to date star chart to find it.)

7. Northern Kneeler

for 5th August 2003

If you venture out into the cold night this week, you will be able to see the constellation for that other brave person, Hercules, he of the 12 Labours. At around 8pm this week it will be directly north, from 20 to 40 degrees above the horizon.

The constellation takes the shape of a man in the act of kneeling with one arm above his head and the other held forward as if holding something. For some reason, we in the southern hemisphere actually see him upright, so we don't need to stand on our heads as we do to see Orion properly.

Hercules' stars are not very bright and the full constellation is difficult to identify. However, with patience you can pick some of its main stars out. First find the bright star Vega (in Lyra), also 20 degrees above the northern horizon. About one extended fist width distance above and to its left you will see a small group of stars like a squat Y. That's Hercules' outstretched hand.

Now if you extend your right arm with fingers spread and your little finger on Vega, your thumb should be within a large quadrangle (wide at bottom, narrower at top.) This is the pelvis of Hercules, called the Keystone.

If you have binoculars, start from the bottom left star of the Keystone and move one third way up to the top left star. You'll find a fuzzy patch about half the Moon's diameter. That is M13, the brightest globular cluster in the northern sky, with over 300,000 stars, and is over 25,000 light years away.

8. Scorpions and Tea Pots

for 10th August 2004

There's something dangerous lurking near the tea pot this month. If you face north and look directly overhead around 8pm, you'll see why.

There is a big scorpion, just lying there east to west, with its four star head, red throbbing heart, long curved spine and its 'barbed' tail imbedded in the rich star fields of the Milky Way. Immediately to the right, with its spout abutting the scorpion's tail, is an upside-down

tea pot.

What we are really seeing are the two great constellations, Scorpius and Sagittarius. Between the two of them, they contain some of the great binocular and telescope clusters and nebulae in the sky.

Sagittarius actually represents a fierce centaur wielding a bow and arrow. In Greek mythology (one of its many versions), this centaur is angry that his friend, Orion, was stung and killed by the scorpion, so shoots it with his bow. The bow is the front edge of the tea pot and the spout's top edge is the arrow. You will see that it is aimed straight at Antares, the red star that is the heart of the scorpion.

If you look between the scorpion's tail barb and the pot's tip, you might see two faint clusters of stars. Use binoculars and each becomes a beautiful set of stars with their own particular shape. These are plenty more if you want to cruise the area below the tea pot's lid. But don't get stung!

9. Aquila, Nemesis of Prometheus

for 24th August 2004

Half way up the sky in the north-east is a very obvious trio of stars in a straight line, roughly equally separated, pointing downwards from right to left. These are the centre stars of the constellation Aquila, the Eagle. Aquila was named from Greek mythology and represents the bird that Zeus used as a messenger and dirty deeds doer.

The bright centre star is called Altair, meaning the 'flying eagle'. It is the twelfth brightest star in the sky and only 16 light years away. The rest of the eagle is above to the left and right of these three stars.

This eagle was quite a piece of work. When Zeus became displeased with Prometheus, the Titan, for teaching the mere mortals art and medicine, not to mention bringing fire to them from the Sun after Zeus had put all their fires out, he had Prometheus chained to a rock high in the mountains. Then every morning he sent Aquila to visit Prometheus and peck out his liver. But Prometheus was immortal, and each night his liver was restored, so Aquila would arrive the next morning and peck away again. Eternal torment for Prometheus, eternal Prometheus Pate breakfast for Aquila.

Eventually, the brave Hercules struck a bargain with Zeus and arranged for Prometheus' freedom. Then Hercules hid behind a rock and awaited Aquila's arrival. All the eagle got for breakfast that day was an arrow, well done. We see that arrow as the small constellation Sagitta, immediately below Altair.

10. Celestial Music

for 7th August 2007

There's music in the sky this month but, being in space, we can't hear it. To the nor'nor'east, about 15 degrees above the horizon is the star Vega, 5th brightest in the sky. Vega is the alpha star of the constellation Lyra, the Lyre. We can see the lyre as a small parallelogram of fainter stars to the top right of Vega. Vega is called the 'Harp Star', a large blue-white star only 25 light years away.

The harp or lyre in question represents the stringed musical instrument which was given by Apollo to the mythologically famous Orpheus. As a member of the heroic Argonauts, Orpheus and his lyre playing saved the Argo and crew many times. His playing even charmed the newly built but overly heavy Argo into the water to start the great quest for the Golden Fleece.

This Lyre in the sky has inspired many poems, including this from Longfellow:

"...with its celestial keys,

Its chords of air, its frets of fire,

The Samian's great Aeolian lyre,

Rising through all its sevenfold bars,

From Earth into the fixed stars..."

Now, if you were to hear some of Orpheus's tunes he played on his harp, you might say they had a ring to them. And you'd be right. One of the astronomical gems hidden in Lyra is to be found half way between the two top stars of the parallelogram. It is the famous Ring Nebula, or M57, a quintessential planetary nebula 2,000 light years away. This is an easy target for a small (even better in a big) telescope, looking like a small smoke ring in the sky. Or perhaps an 'O' for Orpheus?

11. An Olympic Altar

for 26th August 2008.

We've spent the last 2 weeks worshipping Olympic athletes at the altar of sport in Beijing. Now let's look at the constellation Ara, the altar at which the Greek Olympic gods made sacrifices as they prepared for war with the Titans, a war that lasted ten years. This month Ara is high in the sky and has a lovely binocular object in it.

First find the giant Scorpius, directly overhead at around 7pm. If you face south, look up and find the scorpion's tail. About 10 degrees (the width of four fingers at arm's length) south of the tail is a collection of 3rd magnitude stars that, to me, resembles a child's high chair, with its legs towards south. That's Ara.

Prominent in the centre of Ara is a close pair of supergiant stars, one blue and the other orange. About 6 degrees north of them is a white star. Now if you use binoculars, mid-way between the white star and the supergiant pair, and about 3 degrees east, you will see a distinct fuzzy patch with a star-like concentrated centre. This is the globular cluster NGC 6397, one of the closest to us at 10,500 light years.

(WATCH THIS SPACE FOR FUTURE AUGUST NIGHTS ARTICLES)

