

Heavens Above - A Chronicle - 12 - July 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 July. In most cases, they could also be observed in June and August at later or earlier times respectively.

CONTENTS LIST FOR JULY NIGHTS

1. The Messier The Better
2. Fly Away Fame
3. Scorpion's Clusters
4. Scorpion's Giant Heart
5. Holy Hipsters Hercules
6. Twinkle Twinkle Like a Candle
7. Arcturus Bears All
8. A Jewel in the Crown

1. The Messier The Better

For 14th July 1999

Astronomy, like life, is full of little ironies. A constant reminder of this is the existence of a well known catalogue of 110 deep space objects which are popular viewing for professional and amateur astronomers alike. These are called the 'Messier objects' and are given a number from 1 to 110 with the prefix M.

Nothing pleases an amateur astronomer more than to scan the dark sky, point to the tail of Scorpius and exclaim "there's M6 and M7." Or point binoculars at the sword of Orion and see M42, the Orion Nebula, in its glowing glory.

They are everywhere. Some open star clusters, like M6 and M7, are visible to the naked eye. In fact you can see them tonight as fuzzy blurs nestled beside the barb of Scorpius's tail. Some are visible in binoculars, like the Orion Nebula, or M4, a globular cluster just next to the red star Antares in Scorpius. Others are visible in small telescopes as smudges of light like M1, the Crab Nebula in Taurus, or M22, a magnificent globular cluster in Sagittarius, the Tea Pot.

Why is this all so ironic? Well Charles Messier was an astronomer in the 18th century French court, and his passion was to discover comets. Lots of them. He found 21 comets in his illustrious career. But he kept on finding these fuzzy objects in the sky which first raised his hopes but then turned out not to be comets.

To make sure he wasn't fooled by them again, he catalogued their positions in the sky and published it, effectively saying "don't waste your time on these." That list became the Messier Catalogue.

The irony is that nobody remembers any of Messier's 21 comets, but his name is famous world wide for his 110 'useless' objects. Such is life!

2. Fly Away Fame

for 18th July 2000

There is an insignificant constellation in the sky that is very close to my heart, for a reason I will share later. Backyard astronomically, it has only one interesting object, a fairly large globular cluster.

I have known this constellation, Musca (meaning, The Fly) since I was a child. I discovered it at the same time I discovered the Southern Cross, which is not unexpected as Musca hangs directly beneath the Cross.

If you look at the Southern Cross and trace its long axis downwards about one cross length, you will come to four fainter stars in the shape of a trapezium, narrow at the top, wider at the bottom. These are the four brightest stars in Musca - the Fly, named by Dutch navigators in the late 16th century. Since it is so close to Centaurus, the half-man half-horse, I often wonder if they were having a private joke.

There are other stars in Musca which, seen from darker skies away from city lights, help make up the vague shape of that nuisance insect.

But the four trapezium stars are very distinctive beneath the Cross and easily found. If you have binoculars, look at the bottom star on the eastern side. Just above it on a dark night, you should see the fuzzy patch of a globular cluster called NGC 4833. This vast island of old stars is 18,000 light years away.

Why am I so fond of Musca? Well, it seems Musca wasn't its original name. Because its name was being confused with another constellation, Apus (the Bird of Paradise), astronomers changed it. But for one bright fleeting moment, that group of stars was called... Apis - the Bee.

3. Scorpion's Clusters

for 16th July 2002

Now is a great time to view Scorpius, the scorpion. If you face north or east around 7 to 8pm, directly overhead you'll see it, with its head nearest the north.

Scorpius is a delight to stare at. It is so big, just hanging there, with its four star head, long curved spine and its 'barbed' tail imbedded in the rich star fields of the Milky Way to the south.

At the scorpion's 'heart' is a bright red supergiant star, Antares, which means 'rival of Mars' because it looks like the Red Planet.

At the dangerous end of Scorpius, just to the north of the wicked barb, are two attractive clusters, visible to the naked eye as fuzzy patches and ideal viewing in binoculars as distinctively shaped groups of stars. The ancients called them 'the cloudy ones which follow the sting.' We call them Open Clusters M6 and M7, each with about 80 young stars (about 100 million years old), travelling through space together like a school of small fish. If you look long enough through binoculars, you can see patterns in the stars.

Some people say M7, nearest the barb and only 800 light years away, looks like an X inside a triangular Christmas tree. 3 degrees north of M7 is M6, the 'Butterfly' cluster. It's 2,000 light years distant. What patterns do you see?

4. Scorpion's Giant Heart

for 30th July 2002

Try to imagine that our Sun is the size of a small grape, only 1 cm in diameter, in the centre of the cricket pitch at Sydney Cricket Ground.

Where would the Earth be? It would be the size of a grain of sand, orbiting 1 metre from the grape (the Sun). Where would Jupiter be? It would be one tenth the size of the grape, orbiting half way down the pitch from the grape, while Saturn orbits at the distance of the stumps. And what about Pluto, at the edge of our solar system? It would be at about the start of Brett Lee's run up, half-way to the boundary rope.

Now go out after sunset and look straight up to Scorpius. See that bright reddish star in the middle of the scorpion's spine? That's Antares, the "rival of Mars," also the "heart of the scorpion."

Now take your imagined cricket pitch solar system, remove the grape (our sun, Sol) and replace it with this supergiant Antares. What would it look like now?

Try to imagine an immense red Lotto ball 7 metres in diameter in the centre of the cricket pitch. Where would Mercury, Venus, Earth and Mars be? Inside the ball, burnt to a crisp. Our solar system would now contain only a very warm Jupiter, barely out of Antares's reach, Saturn, Uranus, Neptune and poor puny Pluto. Imagine that while you're watching Antares. No wonder they call it a supergiant.

5. Holy Hipsters Hercules

for 27th July 2004

There's an oft overlooked constellation dead to the north this month. Overlooked because it is relatively faint, but it holds a wealth of fascinating binocular and telescope objects. It is Hercules, the mythological character who we remember for his famous "12 Labours of..."

If you look low on the northern horizon, you'll see the very bright star Vega, in the constellation Lyra. Immediately to the left of and just slightly above Vega, you should see a set of faint stars which looks like a man kneeling with one arm raised above his head, maybe with a weapon. In the center of that group, there is a distinct quadrilateral of stars (as big as the Southern Cross) representing his pelvis. These four stars are called The Keystone.

Now if you have binoculars, here's a treat. Locate the left hand vertical side of the Keystone. About one third the way up from the bottom star is a faint fuzzy naked eye star which, in binoculars, turns into a large fuzzy ball about half the diameter of the Moon. This is M13, the Great Globular Cluster in Hercules, the finest in the northern half of the sky. It has between 300,000 to 500,000 stars and is over 28,000 light years away. Though discovered by the famous Halley of that comet fame, it is remembered by its title Messier 13, given by the other frustrated comet hunter, Charles Messier. Cruel, but then no-one remembers any of Messier's comets.

6. Twinkle Twinkle Like a Candle

for 1st July 2008.

There's a bright star this week that has an interesting tale to tell. Arcturus, the brightest star in the northern sky and 4th brightest overall, means "The Guardian of the Bear" and is in the constellation Bootes, the Herdsman. It is the bright yellow-orange star about 40 degrees above the northern horizon. Arcturus is an orange giant 37 light years away and is about 25 times the diameter of our Sun.

What is interesting is that astronomers have actually measured the heat received on Earth from this star and found that it equals that of a single candle at a distance of 8 kilometres. Makes you feel warm, doesn't it?

Even more interesting is that in 1933 at the Chicago "Century of Progress" Exposition, telescopes focused the light from Arcturus onto photoelectric cells which provided enough electrical current to move a switch which then turned on all the floodlights at the Exposition. Neat trick.

Arcturus has a mass about four times larger than our Sun's and it is believed that our Sun will swell up to be a red giant similar to Arcturus about 5 billion years from now. Now that will make you feel warm.

7. Arcturus Bears All

for 7th July 2009

Have you noticed that very bright orange star hanging low over the northern horizon lately? No, it's not a UFO, nor is it Jupiter (which rises in the east this month around 8pm). It's the star Arcturus, the alpha star in the constellation Boötes, the Herdsman.

Arcturus is the 4th brightest star in the entire sky and the brightest in the northern half. It is a very interesting star, being an orange giant 27 times the diameter and the same mass of our Sun and only 37 light years away. You'll have noticed its very ruddy colour, typical of a star in its dying phase. Sometime soon (next ten million years or so) it will grow even larger, turn red then throw off its outer layer to become a doughnut shaped planetary nebula and leave a very hot dense white dwarf star at its centre. This is what our Sun will look like in about 5 billion years time.

The name Arcturus means 'bear-keeper' in Greek and is the herdsman depicted in the constellation Boötes (hanging below Arcturus) which depicts a man herding a bear (Ursa Major) around the sky.

8. A Jewel in the Crown

for 21st July 2009

Directly to the North this week about 30 degrees above the horizon, is a small but interesting constellation, Corona Borealis. It means the Northern Crown. You will find it midway between the orange star Arcturus and the constellation Hercules to its east. It looks like a 7 degree wide semi-circle with one 2nd magnitude and six 4th magnitude stars, the open side facing the horizon.

According to Greek mythology, it represents the jewelled crown given to Ariadne, daughter of King Minos of Crete, by Theseus when he married her after she helped him defeat the dreaded Minotaur in the labyrinth and find his way out using a length of string. Sadly, Theseus later left Ariadne. The god Bacchus fell in love with her and they married. When Ariadne died, Bacchus threw the crown into the stars so she would be remembered forever. (Aaaahhh!)

Though you can't see them, this apparently insignificant constellation contains a very famous cluster of over 400 galaxies (a 'super-galaxy') more than a billion light years away. They are receding from us at a fantastic rate, about 1/14th the speed of light. They're the jewel in the Crown.

(WATCH THIS SPACE FOR FUTURE JULY NIGHTS ARTICLES)
