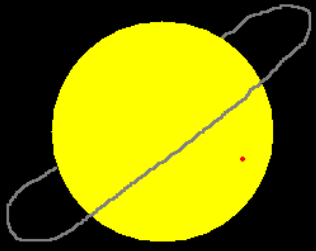


# SOLAR & SPACE E-ZINE



**Summer 2007**

**Volume 2: Issue 2**

**<http://solarandspace.tripod.com>**

**Made in Bristol, England.**

**On the Cover: June has a blue moon. Read more inside.**

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# Editorial

Surely most people have a telescope, or have at least owned one! As children we may have been bought one as a present. But we then proceed outside and look at the Moon. Although the Moon is a beautiful sight we want more. More means looking at Saturn, seeing nebulae, Galaxies and an alien civilisation. However the scopes are too small for most of the above to be seen. They then occupy a space in the loft for the rest of their lives. Yes many a scope ends up in this sad state. How do you stop it? Well when a scope is given to an amateur some help on being guided round the sky is necessary. Whether this comes from a sky atlas or expert tuition doesn't matter. Maybe joining a club is worth a look. So if you have a lonely scope in your loft, go up get it and say sorry! Even the smallest scope will show you the universe's wonders!

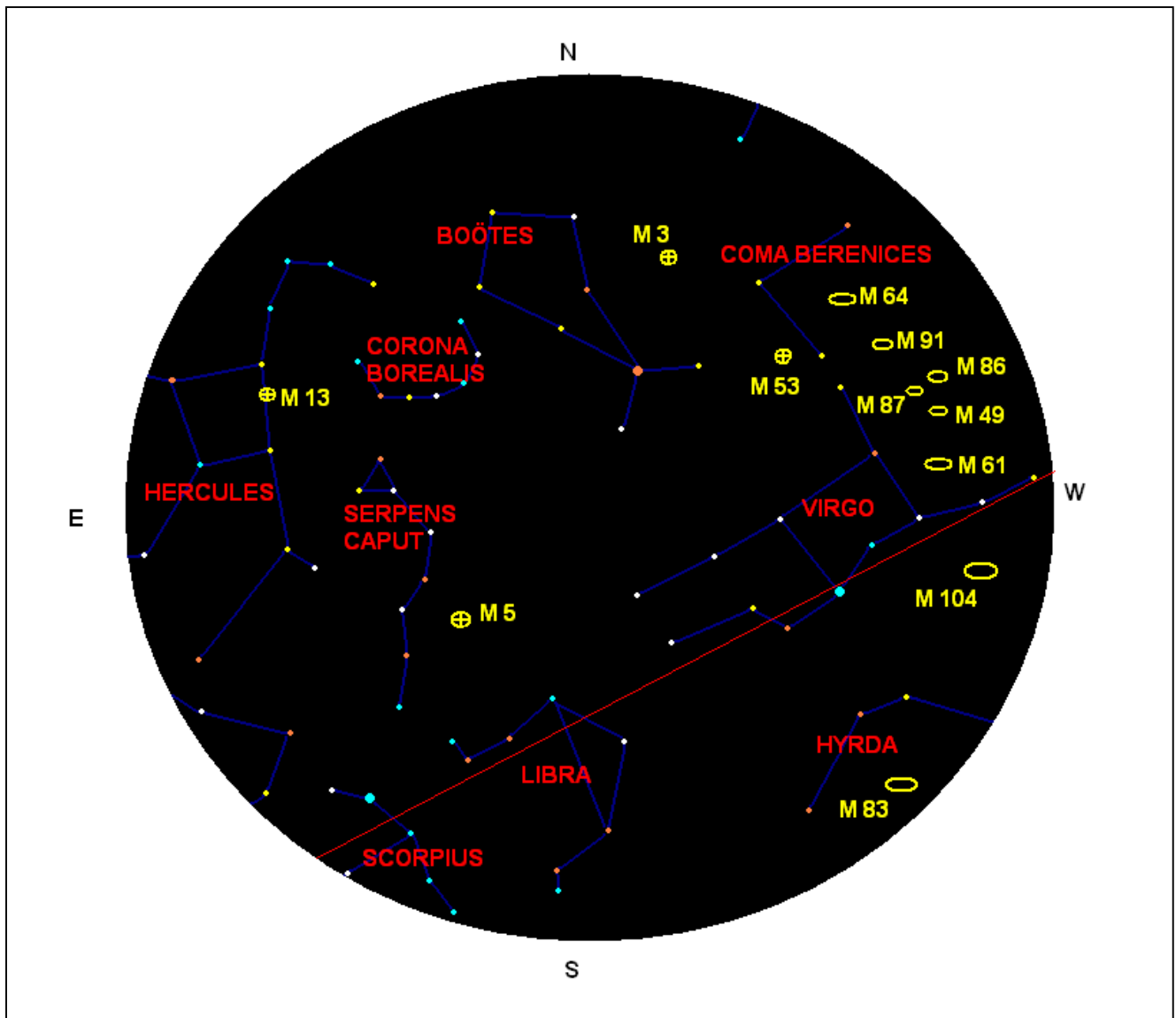


Oliver Tunnah  
Editor

Got any questions, pictures, comments or even an article for Solar & Space e-zine?

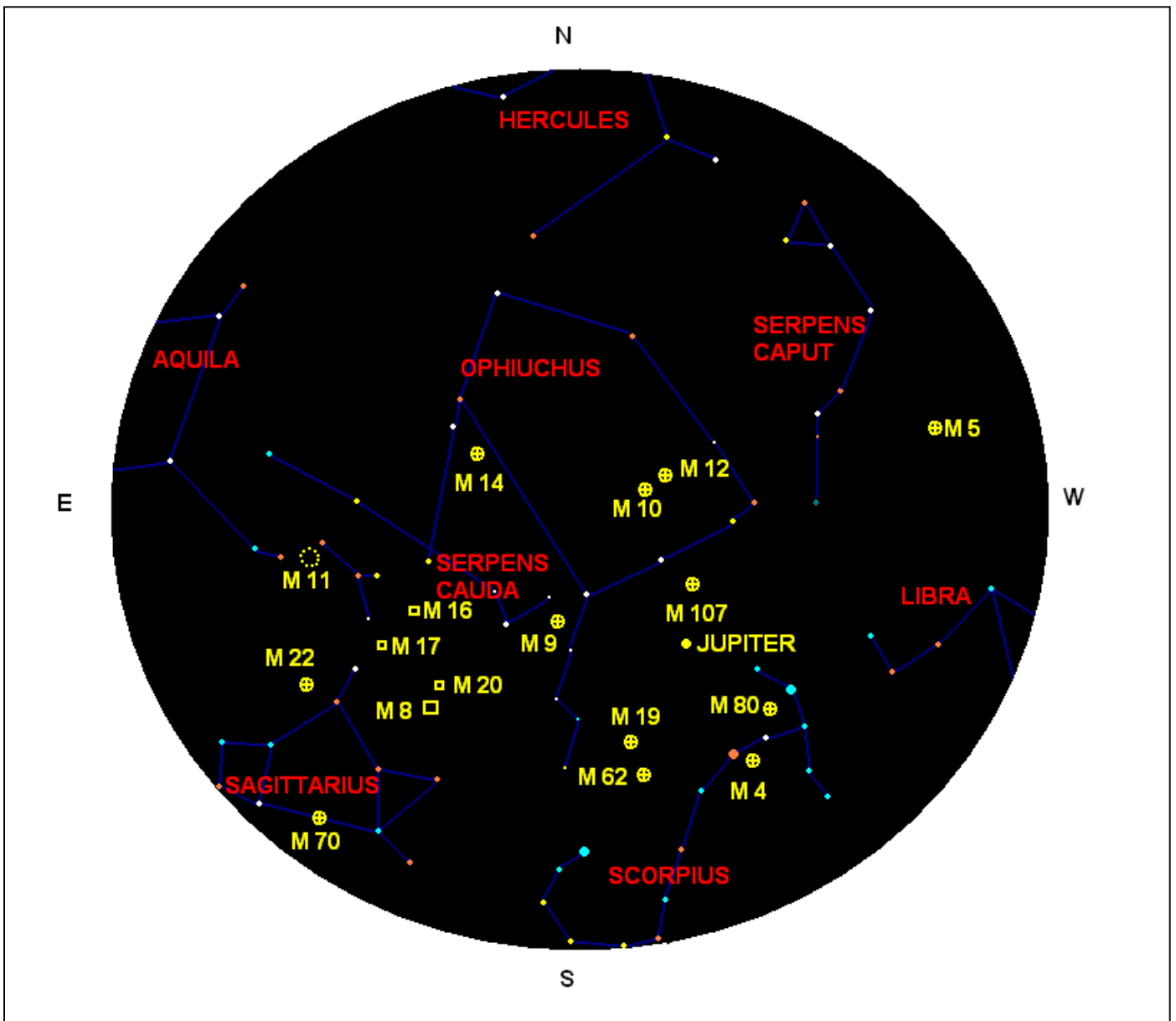
Send them to [olivertunnah@gmail.com](mailto:olivertunnah@gmail.com) By August 1st 2007 please. (The earlier date takes into account our family holiday!)

# The Sky This Season.



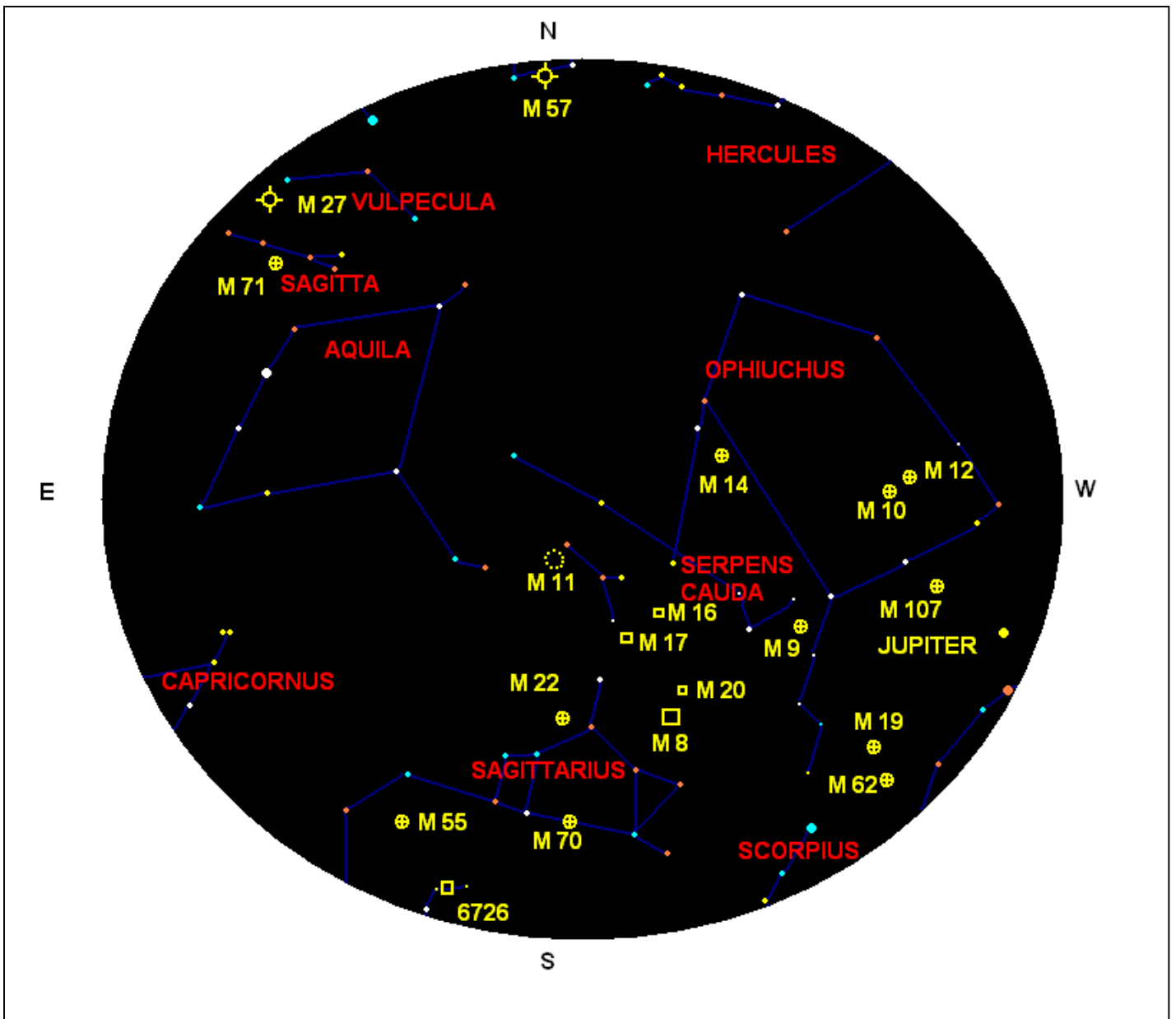
The view in June around 10:00PM looking south.

The galaxy rich spring constellations are setting in the western sky. The Milky Way summer constellations are rising. Check out the 3 Globulars on this map. M3 and M5 are real treats, but M13 is often described as the northern hemispheres best. Small scopes show fuzzy knots of light but scopes around 6" will start to resolve them.



The view in July around 10:00PM looking south.

The Milky Way has returned, all rejoice! This means Nebulae and star clusters abound. But why the over abundance here? Well Sagittarius and Scorpius is the direct centre of our galaxy. Somewhere in the direction of Sagittarius lies a supermassive black hole. A strong x-ray source called Sagittarius A\*. This marks the exact centre of the Galaxy and is around 4AU across. (Almost the distance between Jupiter and the Sun.) Globular clusters hang around above and below the galaxy's core that explains the abundance. However some do inhabit the halo, but they are younger. Some of the best ones are M4 (Resolved in a 4"), M22 & M5.



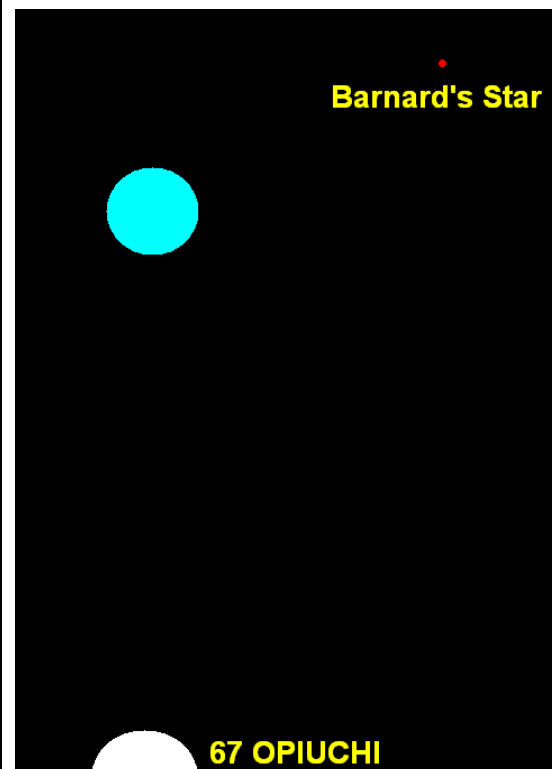
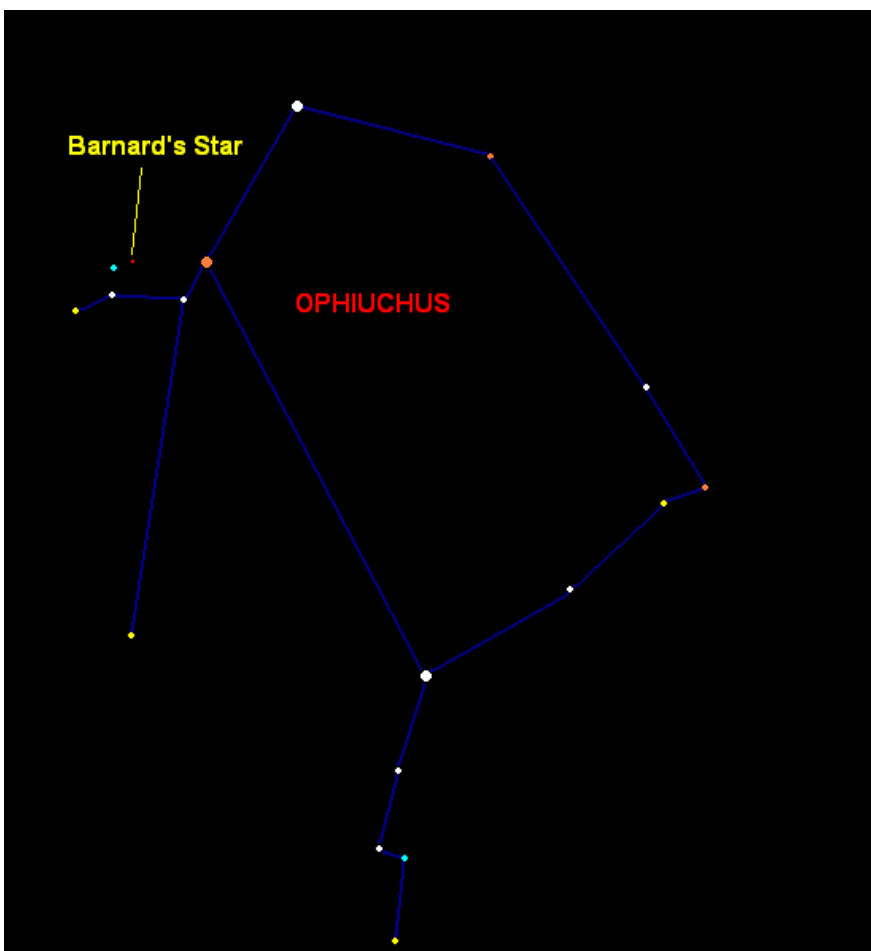
The view in August around 10:00PM looking south.

As we look a little more northwards we see another globular. M71 is loose and would be a very compact open cluster. But this means it is resolved better, but don't give up on it. Messier's objects are some of the best DSO's around. 2 planetary nebulae are also northward near the zenith. M27 is the dumbell and as it is close is also the brightest. It can be seen with binos, use a scope to see the dumbell shape. M57 is really famous and easy to find. Scopes of 3" will show the ring shape. But then again so did my 2" in my back garden. Next season it's the turn of galaxies again.

# Eye On The Sky

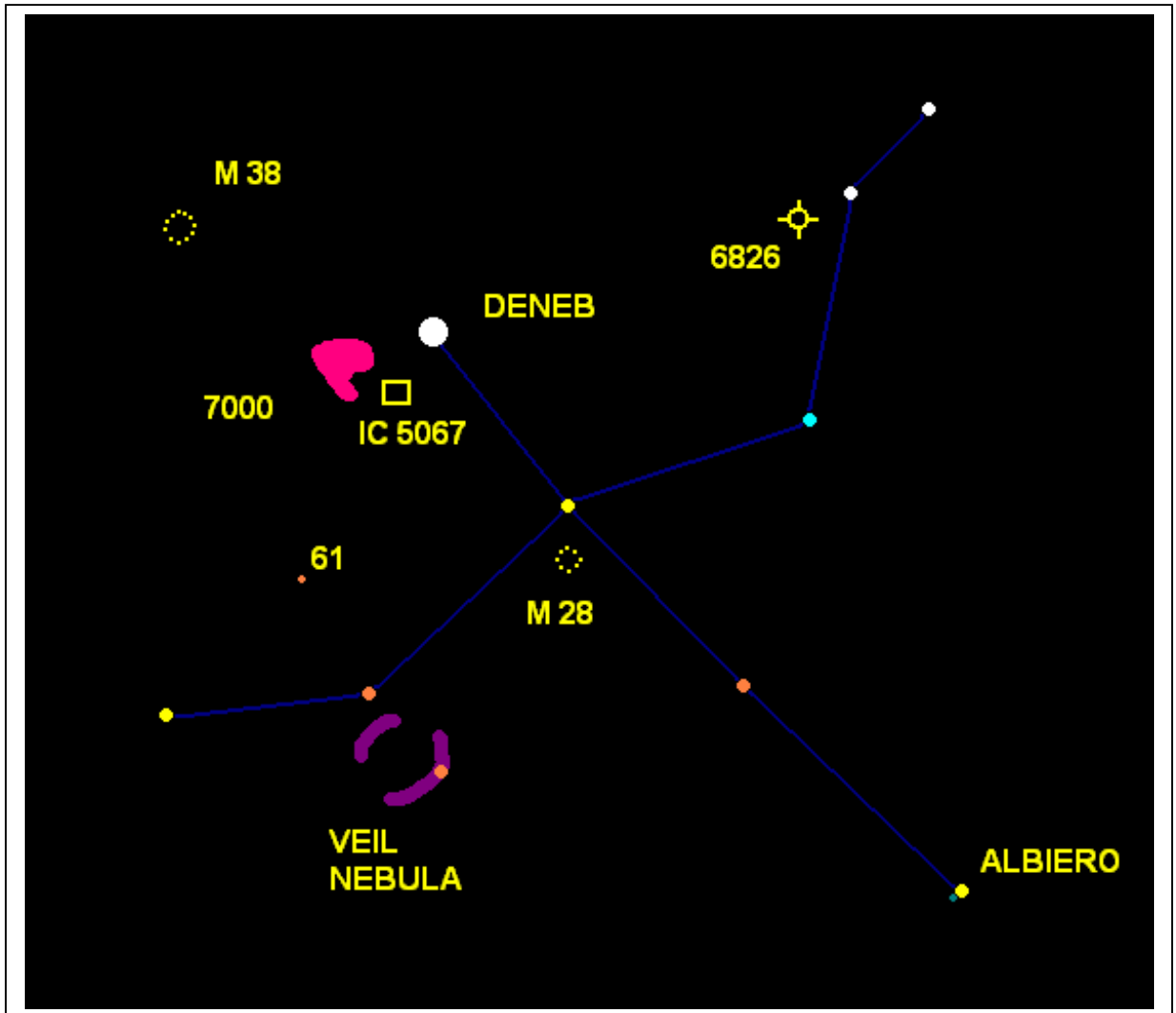
Ophiuchus defiantly isn't the brightest constellation! But it's big, the 11th biggest. One star within its borders is special.

Barnard's star. E. E. Barnard discovered it in 1916. Barnard was famous for discovering many dark nebulae. It lies only 6 light years away so is the second furthest star after the Alpha Centauri system. Barnard's Star is a red dwarf and has the biggest proper motion of any star. Proper motion is the stars natural drifting against the background stars which though do move, just very slowly. It is magnitude 9 and will need a telescope to be seen. Though a dark sky will show it in very small scopes. When you look at the star, why not sketch the view. Or take a picture. Why? Come back in a year and Barnard's Star has moved 10.4 arc seconds. Sketch or take a pic of this view. Compare. The little dwarf has taken a new position. You can say to your friends i've seen the stars move! Use the charts below to find Barnard's Star.



# Constellation Look.

This season the Swan flies high. We take a look at the sights within Cygnus.



Deneb: The 19th brightest star, the 15th from Britain or the States. Mag. 1.25 lying some 1,500 light years away. It's bright because it's so luminous, around 25 times more massive and 60,000 times more luminous than the Sun.

Albiero: This double star is easily separated in any telescope. The components are a Yellow primary with a sapphire secondary. 34 arc seconds separate the two.

NGC 7000: Also called the North American nebula. The name comes from the shape. Though it can be seen with



the naked eye from a dark sky it is very difficult to see. This is due to the size. Photos show the USA shape but the eye doesn't unless you're lucky.

IC 5067: Right next to NGC 7000. The pelican nebula is also a difficult one to see. If your having trouble seeing them then try a OIII filter. Hand holding it has positive results.

Veil Nebula: An old supernova remnant. Again try using a OIII filter and a 6" scope with a wide field of view. This nebula looks stunning. One part contains an unrelated orange star. This makes it better to find but harder to see. The different parts have different nicknames, such as The Witch's Broom!

M38 & M28: These two open clusters are best seen with binos and look pretty scattered against the Milky Way.

NGC 6826: The blinking nebula. This planetary nebula does blink. Use a scope smaller than 6" and look at the central star. Then shift your vision and the star disappears.

Swallowed in 6826's nebulosity.

61 Cygni: Just like Barnard's star it has a large proper motion. But to notice this move you have to wait at least a decade between sketches or pictures. However it is a pretty double split by small scopes. The stars have unseen objects revolving around them. They are large planets around 5 - 10 times the mass of Jupiter.

Finally if you're at a dark sky site look at the milky way in Cygnus. It splits into two. This is called the Cygnus rift and is a huge dust cloud obscuring our view.

# Top Ten Nebulae Sights of Summer.

Last season I profiled my top Galaxies of Spring. This season it's the turn of Nebulae.

10: Rho Ophiuchi (IC 4604)  
Surrounding the star Rho Ophiuchi. This reflection nebula reaches as far south as Antares. It can be difficult to see. It will be best seen in a wide field eyepiece. Nebula filters don't enhance the view because it is reflected star light. For best CCD imaging, take a longer blue exposure.



Jason Ware

9: NGC 6543 The Cat's Eye Nebula.  
This planetary Nebula lies in Draco. Any telescope will reveal the nebula. It makes you wonder how Messier missed it. A 16" scope will reveal an extended disk. Its colour should be greeny blue.  
Easy to find. It lies around midway between Delta & Zeta Draconis.



Hubble Space Telescope

8: M57 The Ring Nebula. It's a bit overrated. But the fact remains it's one of the brightest planetary nebulae in the sky. A small scope will show you the ring shape. Bigger scopes will reveal the red colour. Perhaps one of the easiest Messier objects to find also. Between

Gamma and Beta Lyrae. Why overrated? Well there are better ring shaped planetary nebulae, but as it's bright, it's over used.



Brad Ehrhorn

7: M27 The Dumbbell isn't exactly round, but as its name suggests Dumbbell shape. (Or Diablo) The two lobes of ejected gas show up really well in telescopes. However the Nebula is mag. 7, it will be seen in binos. The nebula is green with red ends on the lobes.



Adam Block /NOAO

6: NGC 6334 The Cat's Paw. This nebula shows 5 distinct patches of nebulosity. They are conveniently arranged to look like a Cat's Paw. You can see it in medium sized scopes. Hydrogen Alpha filters help see emission nebulae. NGC 6357 lies near to the north. But it's fainter and less of the complex is seen.



Jerry Lodriguss

5: M17 Many names for this one. Omega, Swan, Horseshoe and Checkmark. Binoculars will reveal the object. It's big so scopes will show only parts. It lies at the very top of Sagittarius. Wide field eyepieces are recommended.



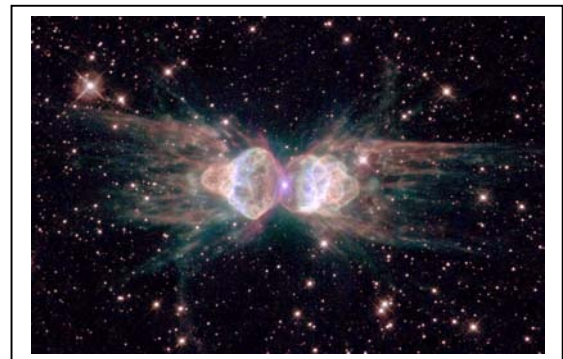
Giovanni Benintende

4: NGC 6726/7/9 Below Sagittarius there lies a crown, Corona Australis. The Southern Crown. Between the Gamma & Epsilon stars is the reflection nebula of NGC 6726/7/9. Medium to big scopes are needed for this one. However it is a beautiful sight so is worth a look.



Florenaud.free.fr

3: Menzel 3 Three Menzel nebulae lie in Norma. Menzel 3 is the pick. This planetary nebula shows 2 lobes. How it got the nickname Ant nebula is beyond me. But big scopes should pick up the nebula, which lies only 3000 light years away. Norma lies between Lupus and Scorpius.

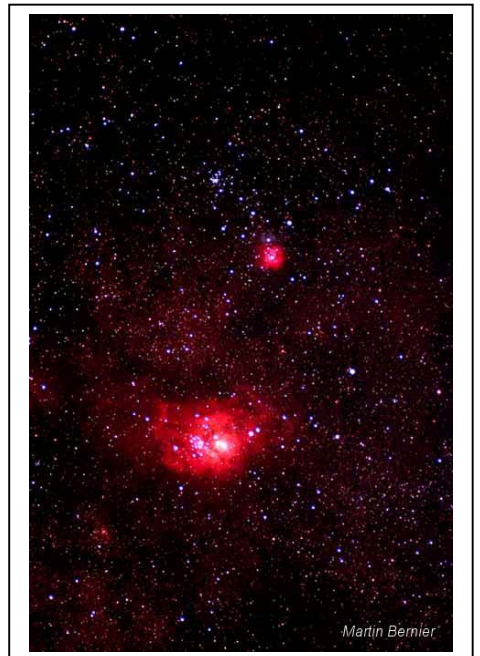


Hubble Space Telescope

2: M8 & M20 These two nebulae lie in the same binocular field. M8 is bigger and brighter. It should be seen with the naked eye from a dark sky.

M20 contains three nebulae types. It is emission, with a bit of reflection and has dark nebulae criss crossing it.

M8 contains an open cluster. Which is visible to all but the naked eye.

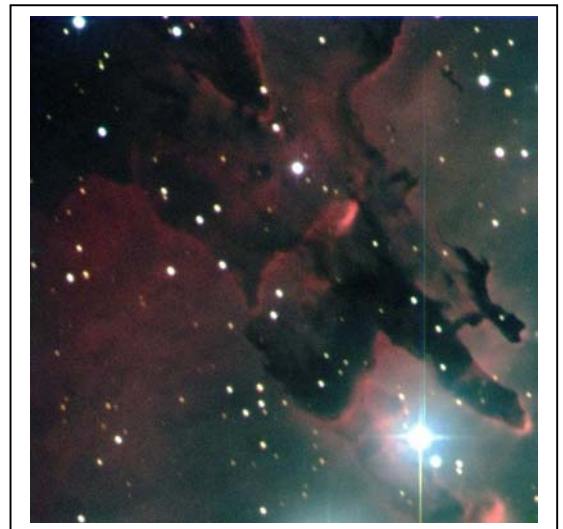


Martin Bernier

1: M16 The Eagle Nebula. Hubble made this famous. Small scopes will show the related open cluster, and reveal hints of nebulosity. An 8" will show the whole extent.

However the open cluster is still enjoyable. The Pillars of Creation are in the centre of the nebula.

Recently this year it was discovered that a supernova has scorched and destroyed the pillars of creation. We have around 1000 years to enjoy them, so make sure you do!



If you live above 50° then Cephus is visible all year and not just the autumn. 2 great nebulae are available to medium scopes. First is the IC 1396 complex. This contains a few cometary nebulae as well. Mu Cephei marks the northern edge. Mu is very red so you'll know when you see it. The Iris Nebula is a beautiful reflection

nebula near Beta. Its well worth finding in scopes over 6".  
CCD images of this object do it justice.

There are loads of Nebulae in the Summer sky. The reason is the galaxies centre. We are looking down the spiral arm and it is concentrated so we get loads of nebulae and clusters. Also we see more planetary nebulae.

# The King.

Not Elvis! Rather Jupiter. The king of the planets is on good show throughout Summer. Opposition is on June 5th.

Some Jovian Facts.

Jupiter is 11.2 times bigger than Earth.

The planet contains the most number of satellites. 63 in total.

Jupiter's biggest Satellite Ganymede is the biggest in the Solar System. It's bigger than Pluto, Eris, Sedna and Mercury.

Jupiter has a core of rock and an atmosphere of frozen Hydrogen, Helium, Methane and Ammonia. Yup it's a smelly planet! The Gases are solid near the core due to pressure. The rest is liquid.

Jupiter's most famous feature the Great Red Spot. It's may have been seen by Robert Hook in 1664. Its colour varies from year to year. Recently it's been loosing most of its redness. Last year Oval BA or Red Spot Junior grazed the GRS.

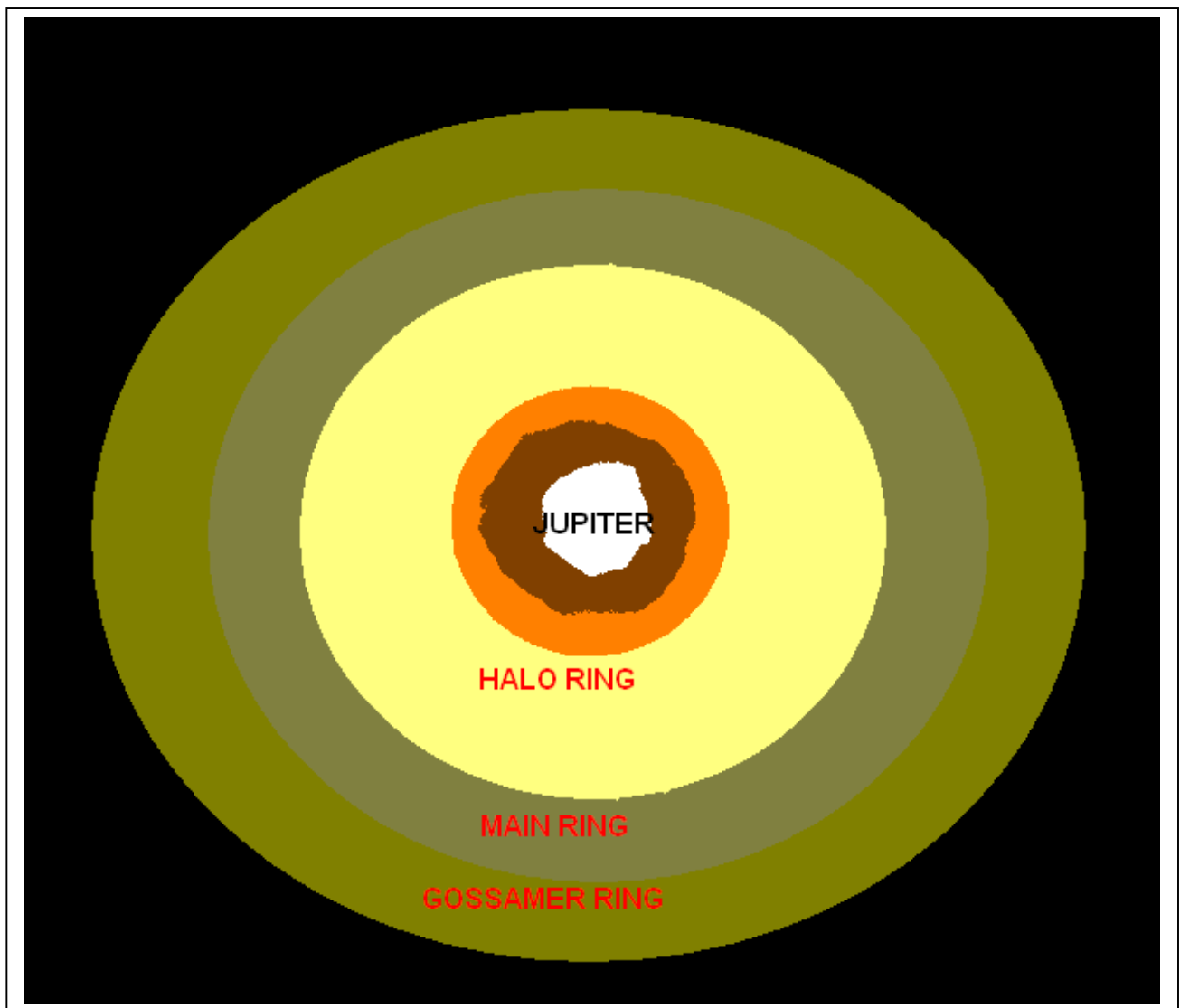
Jupiter has 3 rings: Halo, Main & Gossamer.

Observing Jupiter.

Binos will show the Galilean Satellites, Io, Europa, Ganymede & Callisto.

Watch them move from night to night.

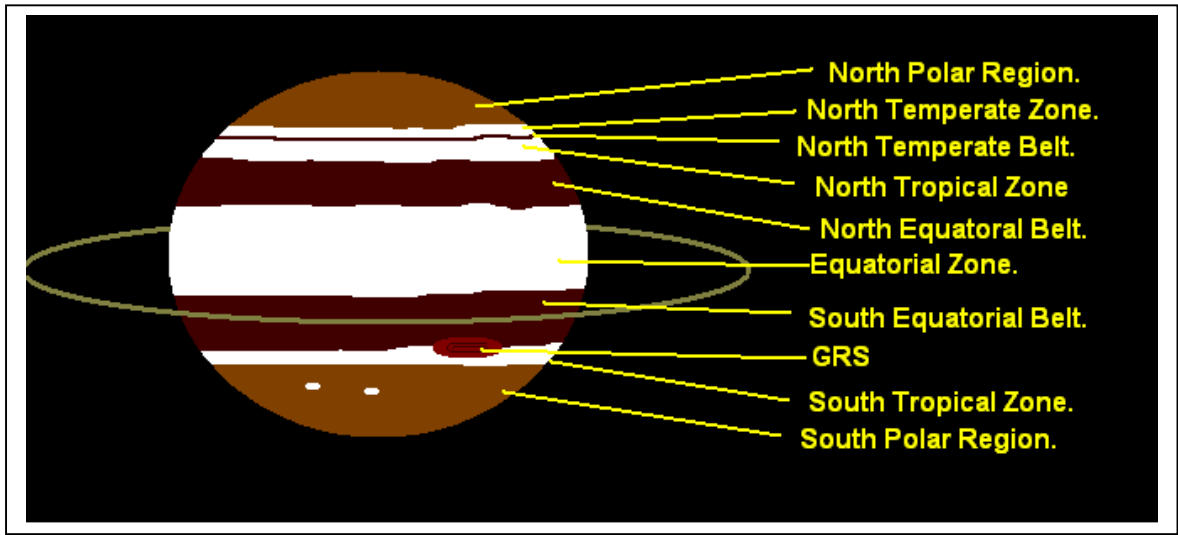
A small telescope will show the North and south Equatorial belts. Look at Jupiter for a few minutes. More features will come to the eye. Medium scopes will show more Satellites and features.



Jupiter's three rings. The Halo ring extends to the planet. The main ring is the brightest, and contains the biggest material. The Gossamer ring is faint and extends some 214.2 thousand Km away from the centre of the planet. Jupiter's surface is divided into Belts and Zones. White ovals may appear in the south Polar Regions. The White zones are upwelling gases. (I know it sounds nasty!) The Dark belts are areas of descent. This is similar to Earth's atmospheric convection currents. Ovals are areas of Storm.

The GRS is an Anticyclonic storm. It's some 25,000 miles wide. It spins anticlockwise and is similar to a Hurricane. However it differs by two things. Tropical storms are cyclonic and don't contain Phosphorus. (Thought to give it the red colour.)





Jupiter excites all. You can't miss the planet. The bright yellow star is much brighter than anything else in the region. So take a look tonight!

# The Goddess

Whilst Jupiter is good to look at Venus is brighter and also puts on a good show.

Venus is Earth's sister planet. Only around 600Km smaller.

However the two planets couldn't be different. Venus is a hot primordial world. Suffocated with a runaway greenhouse effect. The atmosphere is mainly CO<sub>2</sub>. It's the hottest planet at a staggering 750K (477°C)

Venus is the only rocky planet to show retrograde rotation. There are no Venutian satellites.

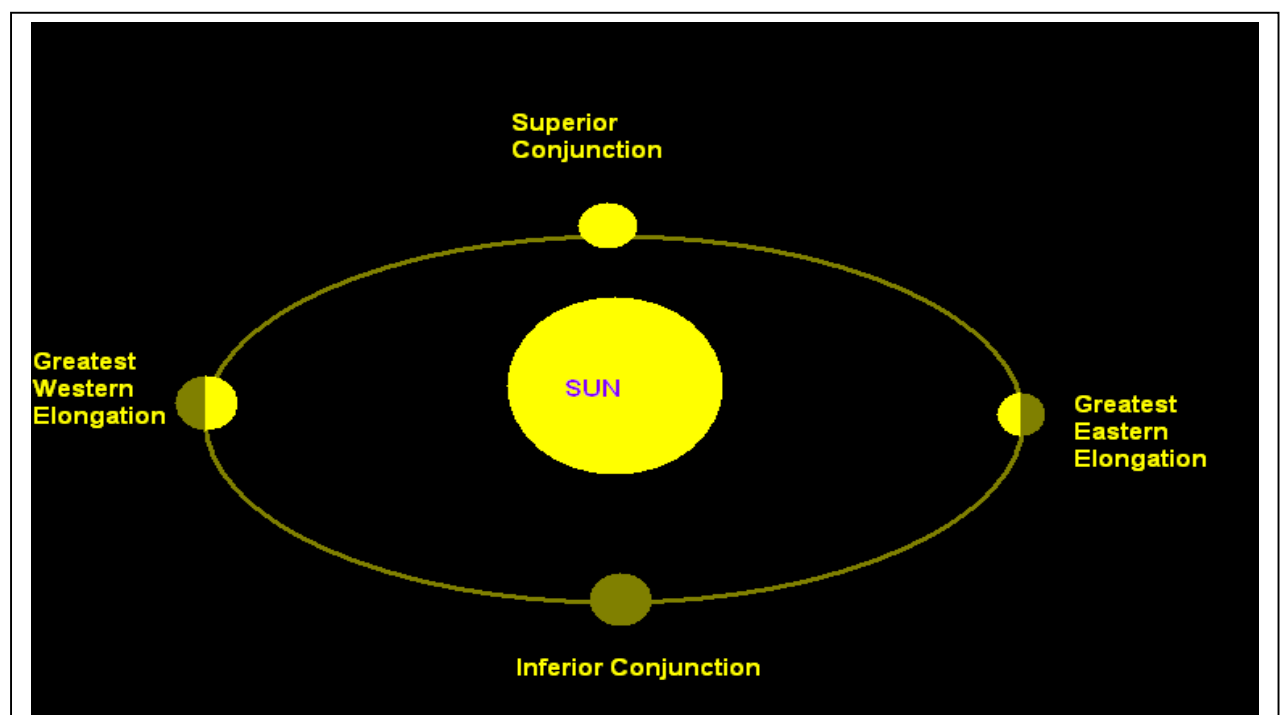
Venus reaches greatest Elongation on June 8th. Look in the evening twilight after the sun has set. In the southeast a very bright yellow star will be seen.

Look through binos or a telescope. You be mistaken for saying 'It's a mini moon!'

Venus shows phases just like our satellite, but for different reasons. On June 8th Venus will look like a half moon.

The reason for Venus' phases are that the planet lies between us and the Sun.

We never see the planet in new or full phases. The planet lies within the suns glare.



Throughout July the planet shows a crescent phase. On August 17/18th the planet reaches inferior conjunction. Don't worry the planet will return for the early birds as the bright morning star.

At June's end Venus lies  $1^\circ$  away from Saturn. Get your cameras out for that event. Unless you want to take one on June 18th. Though there is  $9^\circ$  between them the moon is also in the vicinity.

Don't even bother with looking for detail. There is none to be seen from Terran scopes. Only orbiting Satellites have shown us cloud detail.

Let the goddess dazzle you. Venus is a planet worth seeing.

## For The North.

Ophiuchus contains many globular clusters. There are 7 Messier clusters within its borders. They can all be seen in small scopes and binos. They are all different so you can compare and decide which is your favourite. Why look at globulars? Well I think seeing Millions of stars squished into less than a hundred light year spacing is quite a natural marvel.

Lets start north with M12. M12 is very nice, but a little loose. Its around mag 6.7 and 16,000 light years away. There are plenty of red stars in M12 which shows its age well.

Just Down and to the left is M10. M10 is more rich and bigger. Lying closer at 14,300 light years is slightly brighter at Mag 6.6. This probably means there are less stars in M10. However its big and bright. However its less easy to resolve than M12 because of its central condensation.

M14 lies East of M12 and M10. Look for it about 10 degrees south of Beta. M14 is richer and Looks more condensed. However it is a full magnitude fainter than M10 at 7.6. This means its 250 times fainter. However its still bright and well worth a look.

In the southern reaches of the constellation lie more clusters. However mostly they will rarely reach more than 15 degrees above the horizon and needs latitudes near 30 degrees to be appreciated. However M9 is the best in Ophiuchus. M9 is mag 7.9 and very rich. M107 is just brighter at 7.8 and is middling. M62 is bright at 6.6 but weak. M62 is a little irregular. Ophiuchus has some NGC clusters in the southern reaches also. So sweeping this part might be a good idea.

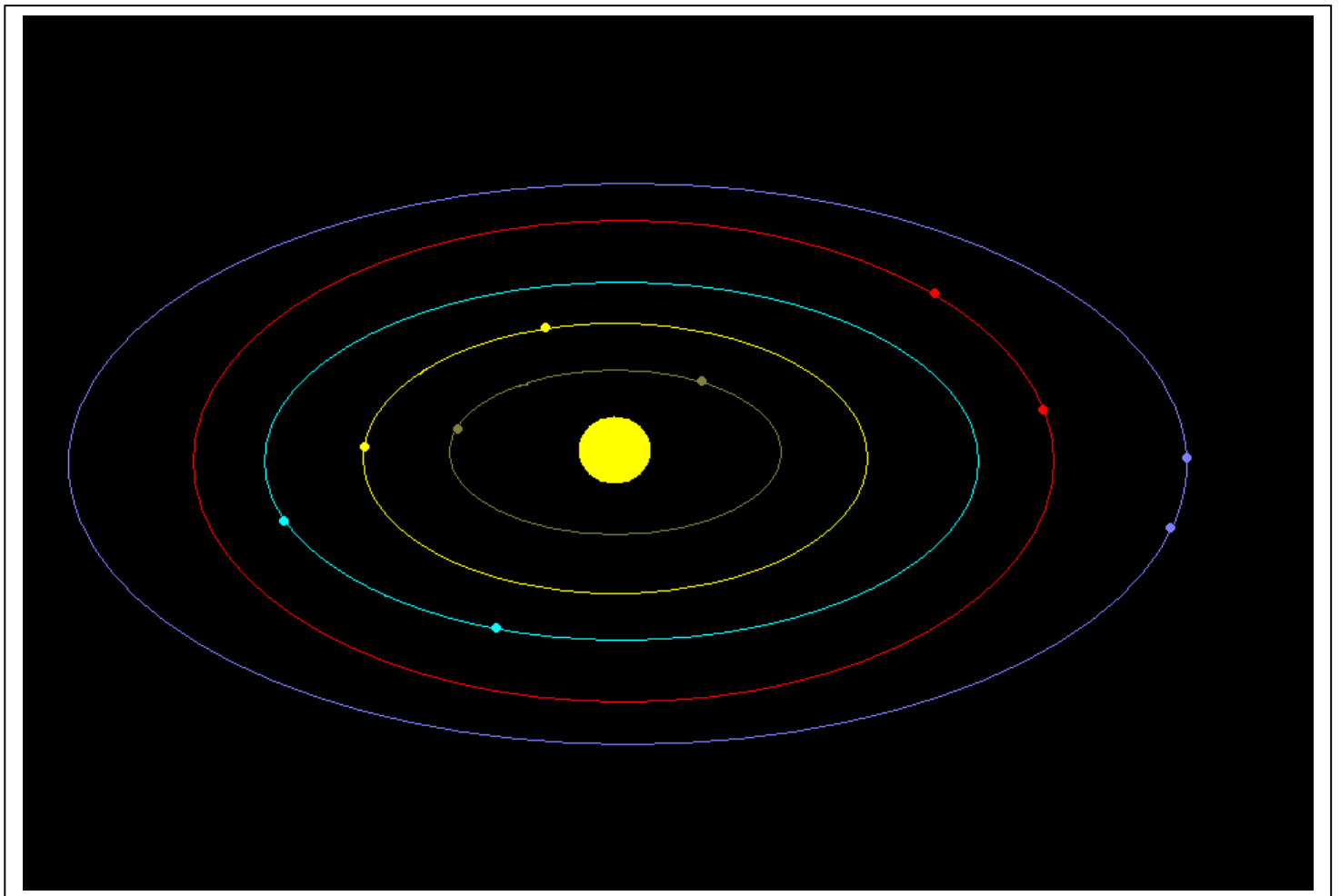
## For The South.

The Milky Way in the southern hemisphere is very crowded with DSO's. Star clusters especially. Let's start with the brightest star in this region, it's also famous. Alpha Centauri. It's the third brightest as seen from Earth. At mag. -0.29. It's the Sun's twin, apart from one fact. Alpha Centauri has two companions. Alpha Centauri B is cooler and orange. Proxima Centauri lies around two degrees away and is a red dwarf. Proxima lies closer to us than Alpha and revolves around the other two. To the eye Alpha is one bright yellow star. Through any telescope the star is split into two. A larger scope is needed to see the mag. 10 Proxima. Moving eastwards to Ara we encounter NGC 6397. This is a naked eye object from dark skies. (Only under good conditions.) This globular is perhaps the closest to us. To find Ara find Scorpius, then Ara is the constellation under the tail. The first star you come to is Alpha (Blue). It forms a 90-degree angle with Theta (Blue) and Beta (Orange). 6397 is between Theta and Beta. Next head back westwards to Musca, which is just below Crux. NGC 4372 lies near Gamma Muscae. Gamma is the southern of 3 blue stars in a row from Crux. Whilst NGC 4372 isn't condensed it is moderately bright and is resolved in smaller scopes. Bigger apertures show more fainter stars. Hop to the red star of delta. Just north of that lies NGC 4833. A four inch will resolve some stars of this cluster. It's five magnitudes brighter and more condensed. Northwards into Crux. We see the coal sack. The dark patch just to the east of Crux. It is cold dust that hasn't yet formed stars, so isn't lit by any. Finally sail westwards to Carina. The eta Carinae nebula is well worth a look and can be seen with binos. The biggest visible from Earth and maybe the Milky Way's biggest. Look for the Keyhole nebula, a dark nebula superimposed on the bright nebula.

# The Planets.

This season the planet Ceres is included in the inner Solar System.

The dots show the planets positions at the start and end of the season. Planets move anticlockwise.



**Mercury:** The planet reaches greatest eastern elongation on June 2nd. Look for the pink star after sunset. A telescope will show phases like Venus. However the disk is smaller and less bright. For best viewing look 30 mins after sunset.

**Venus:** Venus starts the season west of Saturn in Cancer. See the above article for viewing tips.

**Mars:** Earth is starting to catch Mars up. Its motion starts to slow. Look for Mars in the morning sky. The red planet has no treats for telescopes. The red disk is small and faint.

**Ceres:** The former asteroid lies in Aquarius and moves towards Pisces. The planet moves quite quickly against the background stars and shows no detail.

**Jupiter:** The planet puts up a good show in summer. Opposition is in June and the planet lies in Ophiuchus. The retrograde motion will make Jupiter move towards Scorpius. By the season close the planet is tracking east again.

**Saturn:** Saturn is visible in the evening glow. Soon the planet sets along with Venus. In late August Saturn will disappear in to the sun.

**Uranus:** The green planet lies in the early morning sky and lies in Aquarius still. However the planet has moved further away from Lambda. However still look around the star for the green disk. At Uranus' distance no features are seen.

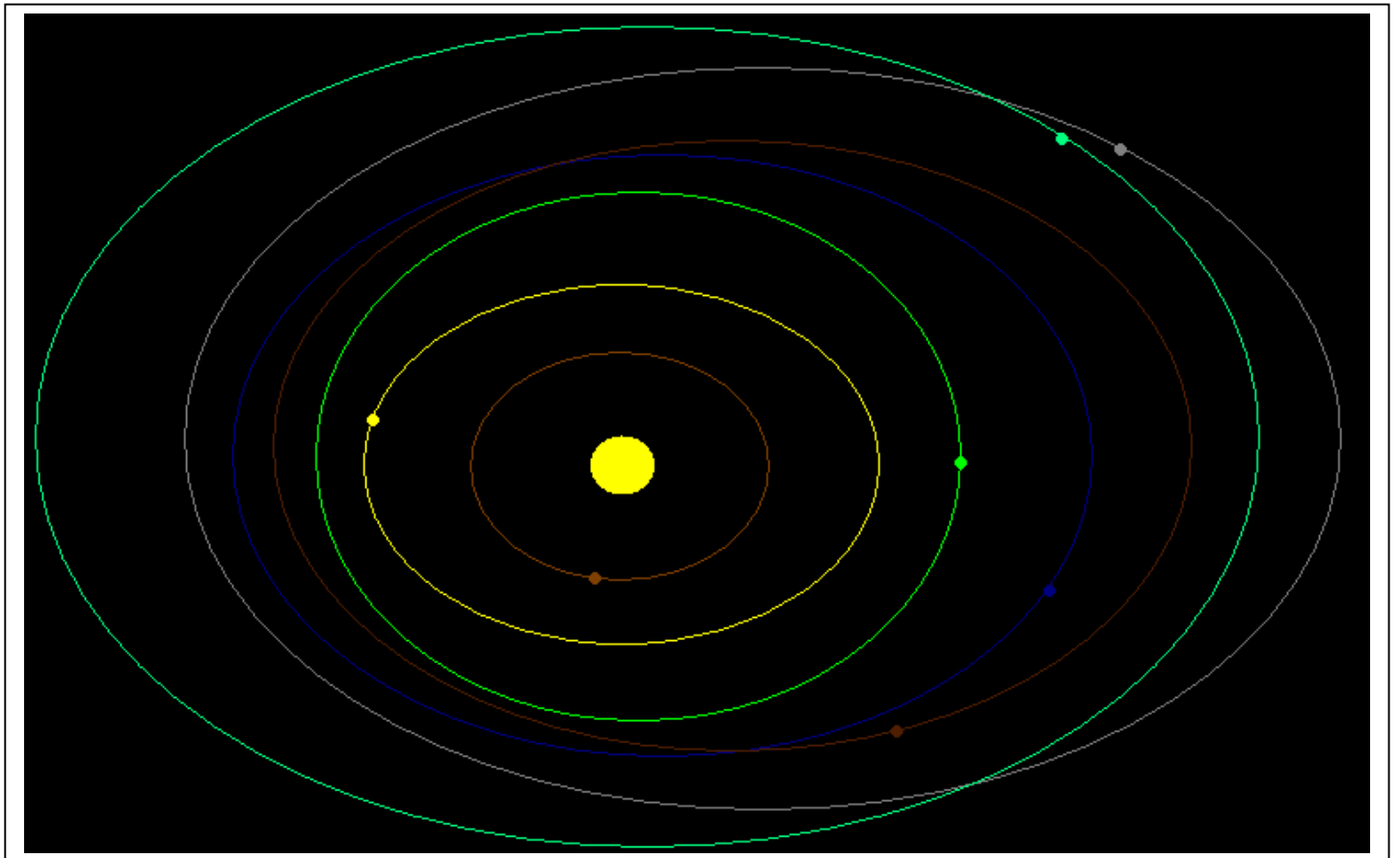
**Neptune:** lies in Capricornus and will reach opposition next season. The blue disk is smaller than Uranus' and will look whiter than blue. Large instruments will show colour. Neptune hangs around west of Delta and Gamma Capricorni.

**Pluto:** The 9th planet also reaches opposition this season. June 19th. This is the time to observe it. The planet will reach mag. 13 and be in range of 10" scopes, or 8" from dark skies. Track the planets movements over a few nights to be sure it is Pluto.

**Eris:** The planet still hangs out in Cetus. Like Pluto watch it over a few days.

**Sedna:** This planet lies near Eris but more northwards in Pisces. Like Eris and Pluto nightly observation will betray the planet.

The outer Solar System this season. The dots show the planets positions this season.





# **Next Season.**

The first of a new series: Astronomy 101.  
This guide for beginners starts by looking at different scope types and their attributes.

The Twine Planets. Uranus and Neptune observing guides.

Death of the bird! Eagles demise.

M31 and friends. We look at the bright galaxies of autumn.

Out on 30<sup>th</sup> August.