

PRIME FOCUS

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PRESIDENT
PHIL AINSWORTH

VICE PRESIDENT
NOEL SHARPE

SECRETARY
DAVID MCFEAN

TREASURER
ERIC BROWN

EDITOR
BOB BEE

MAS : Postal Address PO Box 17 MINTO 2566 Phone (02) 9605 6174

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PRESIDENT'S REPORT

Welcome to all our members and guests.. This issue is packed full of interesting articles from some of our society members. I'm sure you will agree our last guest speaker, Robert Evans, was fantastic. Thankyou to those who attended and a

special thanks to Bob and Ragbir for coming to the pre-meeting dinner at Sizzlers.

MAS is holding a star night on 30th May at Wilton. A map will be available tonight on how to get there. STAR NIGHTS ARE FOR MEMBERS AND THEIR IMMEDIATE FAMILIES.

IMPORTANT: NEXT MONTH'S MEETING WILL BE HELD IN BUILDING 21. ANDREW JAMES WILL BE SPEAKING TO US ABOUT PLANETARY NEBULAE.

MAS IMPORTANT DATES:

May 30th Camp Constellation at Wilton
June 22nd-- Andrew James (**Building 21**) Planetary Nebulae.

July 20th -- Ralph Buttigieg, President of BAA will talk about 'A mission to Mars'.
August 17th -- Peter Williams will speak and encourage our society to start looking for Variable stars.

September 21st -- Jonathon Nally of 'Sky and Space'.

October 19th -- Alan Vaughan ????

November 16th -- Phil Ainsworth on Life Support Systems. ??

These people have indicated they will come and talk to the Society. However, the dates they are coming may change and a few of the guest speakers are yet to be completely confirmed.

AUGUST 8th is MAS annual Star Party at UWS Macarthur. All members and visitors welcome. This event is free to all. Seth Shostak, our regular American SETI guest will be talking (entertaining us again.) He will also be promoting his new book. Stalls from various space shops and agencies plus a planetarium and many scopes to view to heavens. Noel will be contacting those who said on their application/renewal form they would like to assist in star nights. Any help will be appreciated.

Star nights throughout the year will be announced in the Prime Focus as they are arranged. It is hoped we will have Wilton every second month and Berrima each alternate.

Happy viewing and see you at the Camp.

Phil Ainsworth (Pres.) ■

A Pot Pourri from our President

THE BIG CRUNCH

Scientists recently have discovered that the Universe probably won't collapse in on itself and have a big crunch, but instead will go on expanding. The major factor in the Universe continuing is whether there is enough matter and energy to go on, or will it finally run out and gravity eventually pull all the galaxies back toward each other. Only time will tell.

Exciting news. Three previously unseen Solar Systems have been found. The first one is around a very young star HR4796

and is a mere 220 light years away. Other doughnut shaped disks of dust have been detected around the stars Formalhaut only 22 light years away and Vega – yes, the same star as in 'Contact' the movie and book by Carl Sagan. Let's hope these solar systems are confirmed as it is thought that one of the candidates may have a rocky world orbiting its Sun.

Astronomers will soon be able through improved and finer gravitational lensing and micro-lensing techniques be able to find smaller worlds orbiting stars like our Sun.

NASA is currently searching for life bearing planets. It is hoped within 20 years and more advanced ground based and space based telescopes, they will pick up these tiny worlds and then NASA can perform tests on its atmosphere and likely temperature and see if it is a habitable and Earth like planet.

Observer's Corner

I don't know if many of you realised, but at 4.am on Wednesday 23rd April your President stuck his out of the bedroom window to see Jupiter and Venus next to each other. However, to my disappointment it was raining. As I was not too tired I dragged myself downstairs and made a cup of hot Caro (mud as Eric calls it), and fell asleep on the lounge watching TV.

Sometime the following week when it eventually stopped raining I woke around 5.am and noticed Venus shining brightly just under Jupiter. As I had to get up for work in 45 minutes anyway I quickly ran down stairs and took my scope out for a look at these stunning celestial objects. As a bonus I also saw Mercury and a very low Saturn. It was a feast of planets for my now tired and very sore eyes.

At work I was asked how come I was so Jovial. After explaining what my mornings activities were they thought I was crazy

waking up early just to see some tiny dots in the sky.

LAUNCHES

The French have successfully launch two communication satellites into orbit via their reliable Adriane IV. Plus The Delta II has put into orbit four Globalstar satellites.

CASSINI UPDATE

The Cassini mission to Saturn has just fulfilled its first stage of its seven year journey. The spacecraft running on Plutonium has just completed a successful gravity assist around Venus and picked up 7km/sec in velocity. It will eventually reach Saturn by 2004 and will release a small probe into Titan which will hopefully land and take further tests on the weather down on this cold icy world. The temperature on a good day is said to reach -180C. I don't think I'll be going there for a holiday as I hate cold weather.

STS-90

This mission was known as a failure as many small baby lab rats died as their mother was unable to lactate and feed them. Some of the other experiments were also only partially successful. It is hoped that something can be learnt that humans are not meant to live in zero-G and will soon be looking into a rotating space station and spaceships to Mars which can give us humans our much needed stabilizing gravity.

STS-91

The last Mir-Shuttle docking mission is to take place on June 2nd. The main objective is to pick up long staying Australian/American Astronaut Andy Thomas and bring him back home to Terra-firma. Andy Thomas said he would now love to walk on the Moon and has little desire to live and work in the International Space Station Alpha.

LAST MINUTE NEWS

Mir is supposedly closing down in 1999, however, the latest news from Russia and America suggests it is now going to possibly be hoisted up into a higher orbit and be used as a commercially viable space station and for further research. It is also believed the Russians have sold the station to the French.

APOLLO 14.

January 31st, 1971 saw NASA successfully launch and land three astronauts on the Moon for only the second time. Alan Shephard, Stuart Roosa and Edgar Mitchell braved the cold and unmerciful climate of space and all the while dreading they were going to suffer the safe problems as Apollo 13 (see March Journal, pages 2&3.)

Shepherd and Mitchell were the two that were to walk on the Moon and named their LM *Antares*. Their friend and compatriot Roosa orbited the Moon in the CM until Shephard and Mitchell returned from the surface. It was Roosa's job to dock the two spacecraft so they could all go home. Whilst on the surface the astronauts brought along a new tool called a Modular Equipment transporter. The main use for this tool was to aid in keeping instruments in a safe place while on the surface. It also was used as a work bench. The two astronauts collected more Moon rocks and stayed on the surface for 33.5 hours (9 hrs outside, two surface EVA's).

During the voyage home Mitchell conducted some telepathy experiments with 4 people back on Earth. The results were no better or worse than random guessing.

The three astronauts splashed down into the Pacific Ocean on Feb 9th and rendezvoused with the recovery ship the New Orleans.

Phil Ainsworth (Pres.)



COSMOLOGY MODELS: FROM DEITIES TO THE BIG BANG, OR PLASMA CONTINUUM – PART 4

by John Casey

Another Model- Plasma Continuum

Another model of the universe, but one that has not been fully developed theoretically, is the Plasma Continuum. This model has been advocated by a small group of physicists and astronomers, led by the Swedish Nobel laureate Hannes Alfvén. In 1988 Alfvén presented his model of the universe, based upon the interactions of gravity, plasma, and electromagnetic radiation, to a conference of cosmologists at the Texas Symposium on Relativistic Astrophysics.

His approach is that of an experimental physics observer, rather than as a theoretician. He is critical of Big Bang theorists who ignore the discrepancies that have been found between theory and observation, and on their proposing mechanisms that cannot be tested, or ever observed. In contrast, his plasma theory is based on observation and experiment, using well understood electromagnetic phenomena. His theory is that space is permeated by plasma, charged ions or particles that have been stripped of their electrons by the high temperatures in stars, and radiated out into the universe like the Solar wind, which is the Solar System equivalent.

The Sun and other stars also generate high strength magnetic fields, and these force the flow of electrons away from the positively charged ions, so they are less able to recombine. He researched the origin of cosmic rays, and concluded that the isotropy of the cosmic rays [like the microwave background, cosmic rays appear to issue evenly from directions] could be explained by their interacting with such a plasma and magnetic field, so

even if they issued from only one source, the interaction would cause these charged particles of tremendous energy to spiral in a complex curve over a few light years of space, and scramble their initial direction. The field strength of the magnetic fields of galaxies would need to be only a few trillionths of a gauss to do this [the Earth's magnetic field at the surface is roughly 1 gauss]. Cosmic rays could be generated by double stars, where intense magnetic fields and plasma generation would result in currents of the order of billions of amps. This alone would then accelerate charged particles to a trillion electron volts, the energy of observed cosmic rays.

**...space is permeated by plasma,
charged ions or particles that have
been stripped of their electrons...**

Studies of the solar prominences as plasma events then helped to explain one of the puzzles of the solar system's origin- why the Sun has so little of the solar system's angular momentum. As with a skater who spins faster as she brings her arms in, the Sun should be spinning much faster if it retained its angular momentum during the contraction of the nebula as it was being formed. It should be rotating once every 13 hours but in fact is rotating 50 times slower than this [28 days]. Instead, Jupiter, with one thousandth the mass, has 70 %, and Saturn at 27% have most of the rest of this angular momentum. And the solar system itself is also spinning too slowly, considering the mass needed to cause ignition of the Sun's fusion of hydrogen. Somehow the angular momentum has been dissipated by a contracting nebula.

Alfvén proposed a mechanism to do this, where a rotating magnetic field in the Sun interacts with the plasma cloud as it radiates out into space, accelerating the plasma cloud and slightly redirecting it, and so transferring angular momentum from the Sun to low mass distant particles, conserving the total angular momentum of the whole system.

...forming huge power grids in space, and help to explain the superstrings of cosmic matter...

Interactions of the plasma and the planets then cause a loss of angular momentum of the cloud and a corresponding increase in angular momentum of the planets. Thus some of the Sun's angular momentum is transferred to the planets, according to their size [and therefore their ability to intercept the plasma] and the rest is radiated out into space as accelerated charged particles.

Supporting Evidence for Plasma Continuum

In 1950 he published a book, "Cosmic Electrodynamics", covering a broad range of phenomena associated with plasma, and explaining the plasma pinch effect, where, under high magnetic fields a plasma could be confined - as needed for fusion research in small nuclear reactors, as needed by the US navy for their submarines. Alfvén showed that filamentation that lead to homogeneities in plasma came about because electrons followed a force free path through plasma by following the magnetic lines of force. Those electrons in the centre of a filament follow a straight line, producing a spiralling magnetic field that the other outer electrons can follow. Together,

the electrons move in a complex pattern of helical paths with increasingly steep pitch as they pinch up to approach the filament's axis. Inhomogeneities produced by filamentary currents can be of varying scale - from millimetres to the ability to affect the universe as a whole, forming huge power grids in space, and help to explain the superstrings of cosmic matter. Because of the inherent interactions of the charged particles and the electromagnetic radiation that they are bathed in, considerable momentum and potential energy becomes tied up in these plasma filaments, and like any electrical circuit, non local charged particles affect the interaction of matter at a distant place. Thus the events can no longer be considered in isolation, but must be viewed as part of a huge electric circuit. Such matters were put into earthly use in power generation by electrohydrodynamics, where charged particles were injected into a hot gas cloud and bathed in a magnetic field, to directly generate electric power, as opposed to the turning of generator turbines and other less efficient means of conversion to electricity. This work is being pioneered by the Russians.

In 1939 Alfvén discovered that plasma had limits to the currents that they could carry due to the magnetic fields that they themselves generated. As a plasma shower of charged particles [say cosmic rays] travelled through space, they would pinch together to form filaments, as described above, but as the current density grew, so too would circular magnetic field that it formed - eventually causing the charged particles to also circle around, and tangling the filaments, preventing further growth of the current. This implies that the filaments do not have zero resistance. For such plasma

filaments their effective resistance is about 30 ohms - the electrical potential in volts is about 30 times the current in amps over huge distances.

Confirmation of Alfvén's theories came in 1979, when Voyager probes equipped with sophisticated plasma instrumentation did fly-bys of Jupiter, Saturn and Uranus. They showed the presence of twisted plasma vortices and filaments, huge homopolar generators and double layers as predicted by Alfvén. In 1977 Alfvén proposed the idea that the pinch effect of plasma could lead to the formation of proto galaxies by interacting with interstellar clouds. This was confirmed in 1989 when the rotation axes of all the stars in one such cloud were aligned with the local magnetic field. This theory also can explain the jet effects of quasars - as a natural but very large disk generator, where the entire galaxy spins in an intergalactic magnetic field and produces a jet of high energy charged particles along its axis of rotation.

...so the Big Bang and black holes become redundant...

In 1979, one of Alfvén's students, Anthony Peratt, experimented with Blackjack V, the world's biggest pulsed power generator at Maxwell Laboratories, a US defence contractor. With instantaneous power rates of ten trillion watts, five times the whole world's continuous rate, this power was fed into wires - and produced filamentary plasma and intense bursts of X-rays. What emerged was tight helix of plasma that formed into what looked like spiral galaxies. Computer simulations of plasma fields was simultaneously being developed by Oscar Buneman at Stanford University. This was called SPLASH, and was an

accurate three dimensional particle in cell approach that follows each electron or ion step by step, according to the forces acting on it. These showed galaxy like formations consistent with almost all the known types of galaxies that astronomers observe and can explain the "flat" rotation curves that previously were a mystery - why the outer stars are not rotating more quickly - they tend to have similar rotational velocities in the outer arms. This theory also explains the microwave background radiation and its isotropy - electrons trapped in a magnetic field will emit radio and microwaves. They can also absorb such radiation and re-emit it in randomly different directions so the background is then very uniform. Thus this theory, if correct, does away with the need to have black holes and other exotic mechanisms and can explain the expansion of the universe as well, so the Big Bang and black holes become redundant as mechanisms to model the universe.

The End, or The Beginning - or More of the Same

Is this the end of black holes and the Big Bang? Will plasma rule the universe? Only time, astronomers, and theoreticians will tell Don't hold your breath for the final definitive answer!

References

- 1 Book: "The Big Bang Never Happened"- Eric J. Lerner
 - 2 New Scientist, 6 Sept. 1997, pp24-29. "Into the Abyss".
 - 3 Book: Cambridge Atlas of Astronomy . First Edition
 - 4 Book: "Blinded by the Light" - John Gribbin
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THE CHALLENGE AHEAD

Due to completely unexpected and unplanned circumstances, I have relinquished some astronomical equipment, namely one Meade 8" Starfinder equatorial reflector.

Astronomy aside for one moment, it is to be known that equipment of the musical kind was also surrendered. Of course suitable payments were forthcoming in exchange for both instruments.

So, what happens now? Does one immediately purchase another scope, maybe one with increased aperture? A 16" Dobsonian? Or do we have a vaulting ambition for an apochromatic refractor with computer drives and automatic slewing!

...there is no such thing as the perfect scope...

Well, I'm prepared to say let's wait a while and settle things down. Let's take time to 'stop and smell the roses'. The long term can wait, but for now the following will apply in the short term:

1. Observations through the 80mm Orion Richfield refractor. I'm not completely scopeless as one should always carry a 'spare in the trunk' for emergencies.
2. Plan what to look for with sky charts, Astronomy 98 and Planispheres.
3. Observe through as many telescopes as possible. Find out what scopes do what best. ie deep sky or planetary work, and how different mounting systems work.
4. Do research into different brands of telescopes and prices. Even take a look at 2nd hand telescopes.

5. Come to terms with declination and right ascension, universal time and polar alignment.

As you can see, the main game plan is to improve knowledge. So I guess I have now arrived at the same point that several others are at right now.

ie What type of scope to buy? And is it affordable with cash in hand and a bankcard that's just dying for a serious workout?

It's time to shoot for the stars!

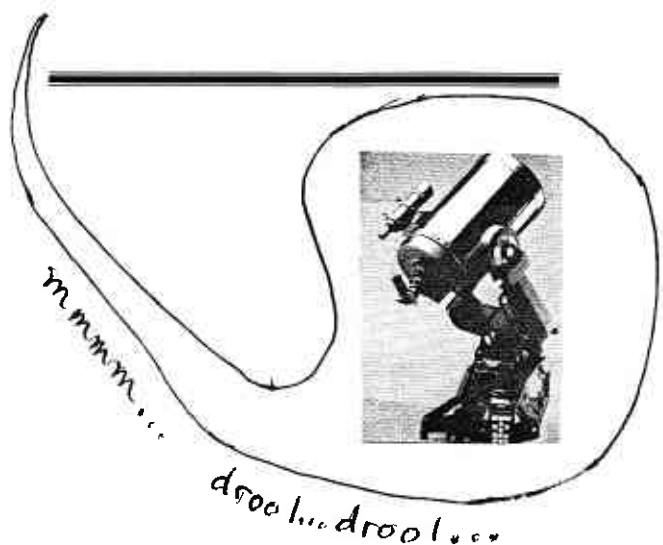
It's very tempting to rush out in excitement and purchase telescope #3. However, the initial research indicates a large choice of instrumentation and finding 'the right scope' will be difficult.

According to a close source of mine, there is no such thing as the perfect scope. Well, I'll leave you with my idea of a perfect scope. If anyone finds such an instrument at a reasonable price, let me know.

WANTED TO BUY!

"A 16 inch apochromatic Maksutov Schmidt Cassegrain Refractor with focal reducer with an upgraded Great Polaris mount (DX version) on fully height adjustable solid mahogany tripod with gold plated fittings and full electronics, including periodic error correction."

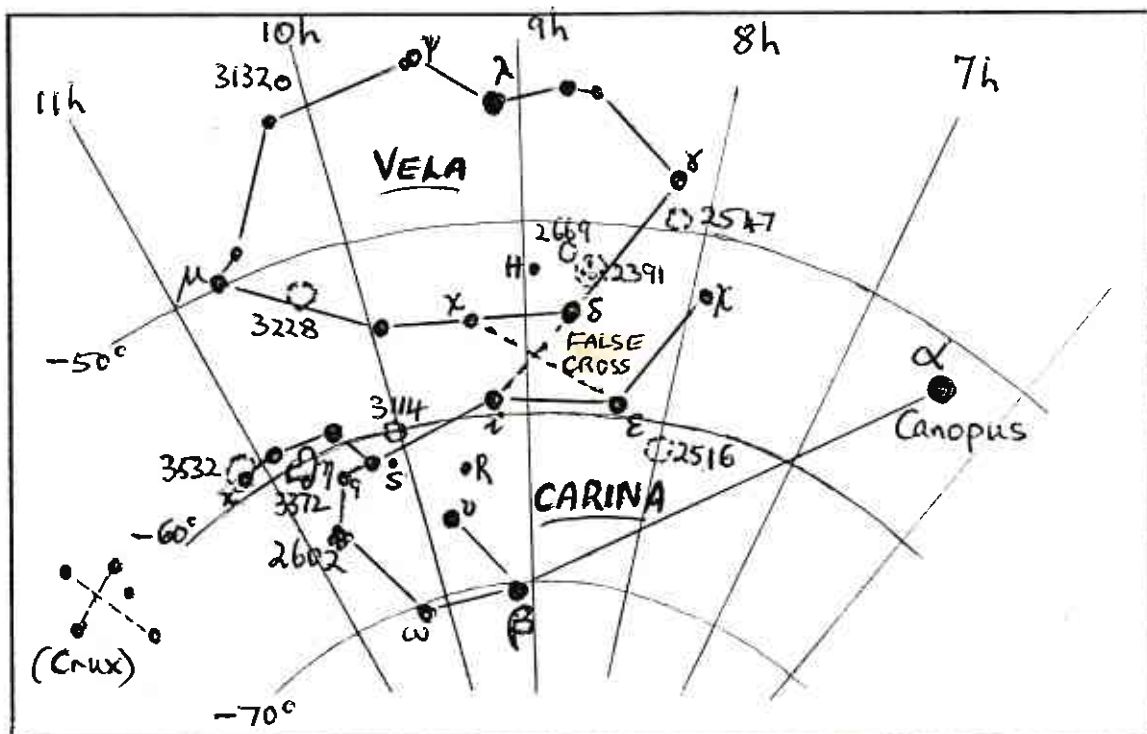
Noel Sharpe ■



CARINA (THE KEEL) AND VELA (THE SAILS)

The constellations Carina and Vela are the new manifestations of what was originally one massive constellation Argo Navis (the ship of the Argonauts, with gallant Captain Jason and his Golden Fleece hungry crew). It was split into two constellations in 1763. Each half has a fair number of objects of interest.

They are shown together in the diagram below. You'll notice that Vela has no stars labeled α or β . This is because it was divided after the Argo Navis stars were labeled. Apart from a common origin, Carina and Vela have something else in common – the False Cross. More about that later.



CARINA (THE KEEL)

The first thing you'll notice about Carina is that half of it lies smack dab in the Milky Way. That's one of its great joys. Stars everywhere!

α (Alpha) Carinae (Car.) is the well known Canopus. At mag. -0.72 , it's the 2nd brightest star in the sky. It's a type F0 white supergiant about 200 l.y. away. Canopus is a handy navigation guide for spacecraft, which is poetic as its name comes from the helmsman of Menelaus, the Greek King. (6h 24m, -53°)

β (Beta) Car. is Miaplacidus, a mag. 1.7 blue white star 55 l.y. away. (9h 13m, -70°)

ϵ (Epsilon) Car. is a mag. 1.9 yellow giant, very close at 29 l.y. (8h 23m, -60°)

η (Eta) Carinae is a star of some considerable reputation and an object of much viewing. Davis Malin devotes three pages of him "A View of the Universe" just to this star and its peculiar properties. The star is imbedded in the equally famous nebula NGC 3372. In fact, the name Eta Carinae is often used synonymously

with the Nebula, though not technically correct.

Back in 1843, Eta Car. went nova and temporarily became the second brightest star in the sky (at mag. -1.0), outshining (or rivaling Canopus). It has since settled down to about mag 6, mostly hidden behind the massive cloud of material it ejected. If it wasn't, it would be a fantastic sight. The star is known to be over 100 times more massive than our Sun, and is a staggering 3 million times more luminous. Even at about 7,000 l.y. distance, it would still be BRIGHT!

Eta Car. is considered a highly likely candidate to go supernova in the future. Watch That Nebula!
(10h 45m, -60°)

υ (Upsilon) Car. is a double made up of two white giants (mag. 3 and 6) 320 l.y. away. Small scopes should be able to split it. (9h 47m, -65°)

R Carinae and **S Carinae** are both red giants of the long period variable type. They vary from 4th to 10th mag. (309 days) and from 5th to 10th mag. (150 days) respectively.
(9h 32m, -63°, 10h 9m, -62°)

And The Clusters Are...

NGC 2516 – a naked eye and binocular cluster of about 80 stars is as large as the Moon. It is easily found about 5° below the False Cross. 1300 l.y. away, small scopes will show a red giant (mag. 5.2) near its centre, plus some 8th and 9th mag. double stars. This cluster has a special significance for members of MAS, to whom it is unofficially known as the 'Bugged If I Know' cluster. Ask Noel how it got this name.
(7h 58m, -61°)

NGC 3114 – also the size of the Moon, but fainter than 2516, this is a naked eye cluster 2900 l.y. away. Not as good as NGC 2516. (10h 3m, -60°)

NGC 3532. Almost twice the diameter of the Moon,, 150 stars of mag. 7 and fainter make up this fabulous elliptically shaped naked eye cluster 1300 l.y. away. Looks like a fuzzy mag. 3 star amid the star rich area of the Milky Way. Worth studying for its orange giants and chains of stars.
(11h 6m, -59°)

IC 2602 is a brilliant cluster of 60 stars 490 l.y. away located about θ (Theta) Carinae (mag. 3.0). Vaguely similar in shape to the Pleiades, its brightest stars are visible to the naked eye. The full cluster appears about 1° wide.
(10h 43m, -64°)

...NGC 2516 is unofficially known as the 'Bugged If I Know' cluster...

And The Nubula is...

NGC 3372 occupies a very 'cluttered' part of the Milky Way. It's a very well known diffuse nebula which surrounds the star η Carinae. It's a naked eye object, about four times the diameter of the Moon. ie it's BIG. There are young stars currently being born within the nebula and their light makes the nebula shine (ie an emission nebula).

It's very stunning in binoculars and also telescopes on low power. It's full of dark lanes, and gassy swirls, with knots of star clusters. There is a very famous dark patch (visible on photos) called 'The Keyhole' for obvious reasons when you see it.

The False Cross... is NOT an official constellation, just an easily recognised combination of stars which picked up a familiar name (familiar enough to be listed on the star charts etc). It comprises ι (iota) and ϵ (epsilon) Carinae and κ (kappa) and δ (delta) Velorum. This cross is often mistaken by amateurs for the Southern Cross. But not by YOU!

VELA (THE SAILS)

Even more so than Carina, Vela lies within the dense star areas of the Milky Way. But not only stars. There is nebulosity galore, by gum! This nebulosity is believed to be the remnant of one (or more) supernovae that happened in Vela, and was highlighted in 1952 by the Aussie astronomer Colin Gum. (So it's got nothing to do with eucalypt trees). Unfortunately, this nebulosity, pretty as it is, is only visible on photographs.

γ (**Gamma**) **Velorum** (Vel.) is multiple star consisting of two bright unrelated stars and two wider 8th and 9th mag. companions. Binoculars and small scopes reveal the two main mag. 1.8 and 4.3 blue-white components. The 1.8 mag. star is the brightest known star of the type called Wolf-Rayet which contain some of the hottest and most luminous stars known. They shed mass at an astonishing rate, in extreme examples up to one solar mass every few thousand years. Fewer than 200 are known in our galaxy. (Eta Carinae is another example of a Wolfe-Rayet.) (8h 9m, -47°)

δ (**Delta**) **Vel.** will split into mag. 2.0 (white) and mag. 5.1 double with 100mm or more aperture. 75 l.y. away. (8h 45m, -55°)

λ (**Lambda**) **Vel.** is a nice mag. 2.2 orange supergiant 300 l.y. away. (9h 8m, -43°)

H Vel. is a double at 520 l.y., and with components of mag. 4.8 and 7.4, the contrast of magnitudes makes the splitting (for smaller scopes) a bit tricky. (8h 56m, -53°)

And The Clusters Are...

NGC 2547 is a nice one for binoculars and just visible to the naked eye. It contains about 80 stars at mag 6.5 or fainter. 1300 l.y. away. (8h 11m, -49°)

NGC 3228 is a small cluster of 15 stars, best visible in binoculars and small telescopes. It's 1600 l.y. away. (10h 22m, -52°)

IC 2391 is a large naked eye cluster with 50 stars. At 590 l.y. they cluster around an interesting 3.6 mag. blue-white star \omicron (omicron) Velorum. \omicron Vel. is an example of Cepheid variable. (8h 40m, -53°)

There is nebulosity galore, by gum!

NGC 2669 is a binocular cluster found very close (about 1°) to IC 2391. Both IC 2391 and NGC 2669 are very close to δ Vel. which is the right hand star of the False Cross, so should be easy to find.

NGC 3132 is a planetary nebula. Though 8th mag, it's relatively bright and large. It has a 10th mag. central star (2600 l.y. away) and the nebula appears to be the size slightly larger than Jupiter.

Bob Bee ■

WHAT'S TO SEE THIS MONTH?

(18th May – 20th June)

It's still fairly quiet planet-wise. At least for 'civilised' evening viewing.

Did anyone catch the "Conjunction of the Year" on 23rd April? Venus and Jupiter were cheek to jowl (i.e. 0.3° apart) in the eastern dawn sky in Aquarius. Combine mag. -4.2 Venus and mag. -2.1 Jupiter and you get quite a sight, not to mention some UFO alarms. Miss it? So did I!

But all is not lost. We get an **encore** on 29th May, but Jupiter's part is played by Saturn. Again in the dawn sky, this time in Pisces, Saturn (mag. 0.4) and Venus (mag. -4.1) come within 0.3° . OK, not as bright as the earlier conjunction, but still very interesting. You should get the rings and crescent in one field of view. Definitely worth getting up at 5am to see.

Mercury: On 13th May, there was also a close encounter of Mercury and Saturn (0.8°) in the early morning sky. They've drifted apart by now, of course, but Mercury is still visible all through May (except the latter few days). Then it goes into superior conjunction (i.e. on the other side of the Sun from Earth) and we don't see it till it shows itself in the western evening sky in the latter part of June.

Venus is shining brightly at mag. -4.1 all of May and June in the early morning sky. As well as its brush with Saturn on 29th May (see earlier), it also comes within 1.5° of the Moon on 23rd May.

Mars is barred from our view during May and June (in conjunction with Sun).

Jupiter is high in the early morning sky all May and June. (Rises 1.30am on 18th May through to midnight on 20th June. Mag. Decreases from -2.2 to -2.4 in that period).

On 21st May, as a bonus, during daylight at about 10am (start looking a bit earlier to be safe), you should see Jupiter just skim past the Moon. (Yes, daylight!). **NOTE:** If you're using your binoculars or telescope, be extra careful not to accidentally point them anywhere near the Sun.

As to the constellations and the treasures of nebulae and clusters the month contains, refer to your faithful Star Wheel and Astronomy 98.

Canis Major, Cancer and Leo are heading over the western horizon earlier and earlier, but Scorpius and Sagittarius are fast rising to take their place.

Gentlemen... start your telescopes!

Bob Bee



Eta Cerina (Photo by D. Malin)

MACQUARIE STAR NIGHT :

A NEW EXPERIENCE by Daniel Ross

I was picked up on Saturday afternoon by our president and sat back, enjoying the drive as I plotted in our coordinates and navigated our course to Ryde.

We arrived early to ensure a good spot in the E block. We set up the MAS table decorating it with what we had at hand. We watched as other stands were set up, telescopes (big ones, well bigger than mine anyway!) were being assembled and posters being displayed. Phil and I fretted as we wondered 'Would the others arrive?', 'Would they forget MacDob?', 'Would they stop and get us McDonalds too?'

Before long people started to file at first, then pile into the block. People wandered past, stopped, stared, enquired, queried and pondered as we did our best to answer as many questions as possible. Then the lights went dim as Mr Watson of the AAT presented his lecture on large telescopes, anywhere up to ten metres in diameter!

Afterwards, I was given the opportunity to wander down to the observing area and was staggered by the people lined up to view the heavens through all the scopes, including our society's. Close to 11pm I was finally able to drag my 4 1/2" down to observe for myself. Guided by experts like Peter, Noel from the committee and the Macey's, I was able find some interesting points in the sky. My new eyepiece still amazes me, it is amazing what a decent eyepiece can do for your scope.

Overall, it was a great night for my first large star night. We hope to see you all at ours. ■

QUICK QUIZ

(Compiled by Geoffrey Mitchell)

(Answers next month)

1. How long does it take light to reach Earth from the Sun?
2. Name the nearest galaxy.
3. In what constellation can NGC3195 be found?
4. How many moons does Saturn have?
5. Other than Saturn and Uranus, what other planet has rings?
6. How many distinct bands make up Saturn's ring system?
7. The asteroid belt is between:
 - a) Earth and Mars; b) Mars and Jupiter
 - c) Jupiter and Saturn; d) Dad's trousers
8. On what date did man first land on the moon?
9. 'Mare' Crisium', meaning Sea of Crisis, can be found :
 - a) In the USA b) In Asia
 - c) On Saturn d) On the Moon
10. What does the word 'SEX' refer to in astronomy?
11. How many constellations are there?
12. Where is the Jewel Box found?
 - a) Orion; b) Scorpio; c) Crux
13. What month, year and by whom was NGC3195 discovered?
14. At what approx. angle does a space shuttle enter Earth's atmosphere?
15. In Apollo 8 mission:
 - a) What was the date of lift off?
 - b) How many crew members?
 - c) Name one of the crew members.
 - d) How long were they in space?
16. In 1596, Dutch mariner Pieter G Keyser catalogued most of the brighter stars (like me!) invisible from Europe, and divided them into a number of constellations. Name one.
17. Scherping's 1st Law: "The skies are never clear within 3 days of a new moon because..." Why?