MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal



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PRIME FOCUS

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President's Report

For Tonight

Welcome to all members and guests, tonight is our Annual General Meeting and as such we will be attending to the formalities that are required on these occasions.

After the proceedings Ian Cook will be giving us a presentation on Double Stars, Ian is one of our societies most experienced observers, I know that Ian has a real passion for double stars, thanks Ian.

March Just Gone

Our special guest speaker last month was Professor Mike Dopita from the Australian National University Canberra. Professor Dopita's talk was on star formation. Michael's talk was very entertaining and professionally presented, he covered such subjects as Black Holes, the detection of alcohol and methane in Molecular Clouds and the odd colliding galaxy or two. On behalf of the society I thank Michael for coming up from Canberra to visit us here at MAS.

Bob Bee ran a successful night out at the Mt Annan Botanical Gardens as part of his regular dinner and the stars night. That was on the 31st of March, well done Bob. Also we had a great Campbelltown Rotary Observatory night on Friday March 24, plenty of eager stargazers turned up and enjoyed a reasonably good night sky.

In April Now

Quite a few members made their way to the girl Guides camp at Tara, at Silverdale for the "Keep The stars Shining Family Camp". Unfortunately we got off to a slow start courtesy of a thick blanket of cloud. As it has happens more times than not the sky cleared when Bob Bee decided to call it a night and departed homeward. (My gift to the girl guides. Ed) The guides and various club leaders from all over Sydney were treated to many fine sights in the sky and were very impressed by the array of different telescopes on offer. It was a great night overall (after a cloudy start) and I thank John Rombi for organising the night. Off course everyone thanks Bob (and Ian) for taking the cloud with him.

The Dates

As advised previously it's only short list, although a little longer than last month. From experience things can and do change so please check either with myself or anyone from the committee before heading out, but for the near future they should all be ok. June is looking a bit thin on the ground due to lunar conditions, so we might have some scope to put on an extra night somewhere, maybe at the Airfield.

22/04/06 Stargard Field 29/04/06 The Forest 12/05/06 Campbelltown Rotary Observatory 15/05/06 General Meeting 20/05/06 Stargard Field 27/05/06 The Forest 24/06/06 The Forest 01/07/06 The Oaks Airfield 22/07/06 Magellan Observatory

About Stargard Field

As you would have noticed we have now included some dates for Stargard Field. For those who are not aware, the location of the field lies a small distance behind the Dudley Chesham Sportsground at The Oaks. The sportsground is where we have our public open nights, of which we are planning some later this year.

Over a period a time I have alluded to the field as the "Secret Garden". I know quite a few members have heard me mention this in the past. I have a long held vision and desire for our society to not only observe from this field but eventually build our own observatory and clubhouse in it. Please be aware that I have no fistful of money and no guarantees to fund this idea, just a vision and enthusiasm. Having said that my plan is to seek a grant, donation or hold fundraising activities in order to make the dream a reality, suffice to say it will be a long term project with no guarantees.

Having said that I have extended an invitation to the mayor of Wollondilly, Phil Costa to attend either of these two nights at Stargard. He has accepted and this is very appreciated, also he may bring with him other councillors or maybe a government local member. Ideally if the stars are out and we have lots of members and scopes on the ground then that might enable me to promote our vision of the observatory and clubhouse to those who are influential. This is not a public night, these will be held later. Of course all members and guests are invited for these two nights, your attendance with or without a telescope would be most welcomed.

Please arrive before just dark if you can. I am planning to have the gates open so just drive through to the field. If you are unfamiliar about the site than I will arrange to have either myself or someone stationed near the front of the field to show directions. Remember that when you drive into the sportsground go left, then straight to the end of the sports field.

A while back John Rombi and I previously met up with Pat Farmer, Federal member for Macarthur and I will invite him as well to the

Stargard night. Both Phil Costa and Pat are strong supporters of our society and I most certainly appreciated their interest.

It's a really big dream but it has to start somewhere, the first thing to do is to give the field a really good workout. We have previously taken a quick look and it got the thumbs up. The field is large and flat, mostly tree lined to block stray light and car parking for the public is not a problem at all. I even think the public could drive to the parking area with their car lights on as the trees will block the light from reaching us.

One of the main considerations is actually finding a place where we can call home, a place where we have long term tenure and a formal arrangement to hold our activities and build our own facility. A council sportsground fits that bill, councils all over Sydney support community organisations like the football clubs, netball, cricket clubs and even skaters to name but a few, so why not an Astronomy club that promotes science, knowledge and education about the wonders of the night sky to not only its own members but also to the wider community.

Just to recap a little, the name Stargard derives from the property which was granted to the first Government Astronomer of NSW, namely Carl Ludwig Rumker. This was around the early 1820,s. He built his Observatory on this property on one of its highest points, Reservoir Hill which overlooks Picton township. The name Stargard carries significant historical interest and Rumker was one of the astronomers associated with the then Parramatta Observatory. It's my opinion that it and would suit the society well to adopt Stargard as a name for this field and our planned observatory. Picton, The Oaks Airfield, the Sportsground and the Stargard Field are all in the Wollondilly Council area. I have been having ongoing discussions with the mayor of the council Phil Costa, the sportsground manager and several others over getting permission to use the field. This of course has now been confirmed.

I am most happy to provide further information at any time if so please email me at astrosharpe@bigpond.com.au if required.

Important Matters

Has everyone renewed their membership? I know I have. Please confirm with Dick Everett but if you have not paid before the end of this month then you maybe unfinancial and there will be a joining fee to pay if you want to continue being a member. We have a great opportunity to stargaze down at the Magellan Observatory in July, see John Rombi for details about those nights. My thanks to John for organising our Magellan visit.

Space Cadets will be meeting this Thursday so if you know of anyone aged 9 to 18 who would be interest please get them to come along to the Campbelltown Library. 5.30 to 6.30 pm, or give them my email address for further information.

Well that's about for this report, in closing I wish to thank everyone for all your fantastic support over the years, it's very appreciated.

Regards Noel Sharpe President

President's AGM Report

The Annual general Meeting gives us an opportunity to report to the members about the activities that the society has engaged in over a 12 month period. It's also a time when elections will be held for the various positions within the society.

I might at the outset pass on a very sincere and heartfelt thankyou to all members who have contributed to making this society so enjoyable to belong to. Unfortunately it's been a mixed year on the weather front with many planned activities cancelled or deferred sometimes at the last possible momentl. I am crossing my fingers that this year things will be a little kinder and rain on the days when we have nothing planned!

Without doubt this would have to be one of our finest years for guest speakers, previously it has been one of my main duties to organise and secure speakers for our club and I thank everyone who has provided suggestions and advice in this area.

John Rombi has enthusiastically taken over the role of inviting guest speakers from me for the year ahead. I am very thankful for this as this gives me time to concentrate on Space Cadets and Stargard. Hopefully by the time you are reading this these projects might have progressed beyond the drawing board.

Guest Speakers

16/05/05 Zane Hammond, Director Magellan Observatory and farm stay, his talk featured astrophotography and promotion of the observatory. **26/06/05** Bernard Kornfield, excellent presentation on Globular Clusters, Bernard is one of our members who was completing an internet astronomy course.

18/07/05 DVD presentation on the Apollo missions, courtesy John Rombi

15/08/05 Dr Miroslav Filopvic, Miroslav is a professional astronomer who was a key scientist for NASA's Deep Impact space probe.

19/09/05 Dr Enno Middleberg, professional astronomer from the Australian National Telescope Facility, subject was unlocking the mysteries of the universe using Radio Astronomy, Enno has placed a webcam at The Parkes Radio Telescope, so take a peek on the net.

17/10/05 Glenn Dawes, founder and author of the astronomy yearbooks, his talk gave us insights on the early years of the yearbook up to the current astronomy 2006, which is just fantastic.

21/11/05 Bishop Chris Toohey. Bishop Toohey's invitation was courtesy of John Rombi, his talk was on focal ratios of telescopes and historical aspects of Galileo's life and discoveries, also his relationship with the church. A great night.

16/02/06 Astrophotography presentation by members Martin Felito and Ned Pastor, included photos of the solar system and deep space objects, excellent presentation.

20/02/06 Dr Fred Watson, astronomer in charge of the Anglo-Australian Observatory at Siding Springs. Fred's talk was on gravity and featured Albert Einstein, the man and his equations, an amazing night by all accounts.

20/03/06 Dr Michael Dopita from the Australian National University and Mt Stromlo, his talk was on Star Formation, invitation courtesy of John Rombi

Special Events

14/05/05 MacAstro star night at Dudley Chesham Sportsground 04/06/05 Magellan Observatory 10/06/05 Campbelltown Rotary Observatory 18/06/05 Rotary Club Observing night at Wedderburn 06/08/05 International House overseas students night at the Forest 10/11/05 Mount Carmel High school night 24/03/06 Campbelltown Rotary Observatory 01/04/06 Keep the Stars Shining night Girl Guides at Tara

The society was invited to attend the Mary Magdalene High School for a stargazing night. This was back in either August or September last year, it was a great night however the actual date alludes me at present, my apologies. We also had other events planned however the weather was not kind and several cancellations took place. I hope we have better luck this year.

Field Nights

We held many Forest nights, again the weather was a factor which led to great conversations with friends inside the cabin. When clear the sky as always was spectacular. Also The Oaks Airfield proved again what an excellent place it is for us to observe from and many excellent nights were held there. Just to recap to The Forest, I acknowledge the great support given to our club by International House. For those who don't know this is the Alumni association of Sydney University. International House grant us the use of the grounds down at the Forest as well as the log cabin. The cabin is fully equipped with a modern kitchen with all appliances, bunk beds, dining area and toilets.

Its very nice and the hire fee is a modest \$8 per overnight stay per member. I might say that we are the only outside organisation to enjoy these facilities.

Appreciations and Thankyous.

Without doubt I believe that the outgoing committee has served the society very well. When it is all said and done we are a small society with limited resources. Certainly in comparison with the NSW Astronomical Society with 400 plus members and I would imagine substantial resources at their disposal. Sutherland Astronomical Society have about 140 members and have been going for 45 years, they also have their own Observatory at Green Point.

In saying that it's a real testament to us here at MAS that we can proudly hold our heads up high in the Astronomical community. This is confirmed by the way we receive fantastic support from our professional guest speakers. Indeed we are certainly on the map so to speak and I never get a comment such as, "and who are you guys?"

In my discussions with many members I can say that we have a strong feeling as to how we want to be as a club, friendly and supportive without taking ourselves too seriously, perhaps sometimes even a little

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informal and laid back as well. Many times I have received comments back that this is a great club to not only visit but belong to.

I have to ask the question, Why is this so? Well I believe it comes about from the efforts, friendship and creativity of not only our committee people but also to all members who help out and support the club in anyway big or small.

For example something like informing someone you know about the club, they come along and enjoy their time with us and become an enthusiastic member as well. How good is that! It could be organising a school night and taking a telescope along to show the wonders of the night sky.

It could be donating some equipment to the club, showing someone how to use a particular eyepiece or even giving someone a lift to a meeting. I believe that all contributions are important and without in anyway diminishing what I have said I do need to make some particular mentions.

To John Rombi, who has been a fantastic Vice President, opening meetings and arranging guest speakers, John sends out the Critical MAS emails to keep everyone informed. John also has organised the dates for this year including the upcoming Magellan visit. These are just a few of the many things that John has done on behalf of the society. I sincerely thank John for everything.

To Martin, your work on the website is greatly appreciated, not only does it convey information it also looks good and is fun to use, a very valuable asset to the society. Martin also helps out with our star nights and enthusiastically promotes the society at every opportunity

lan Cook. Ian time and time again shows his enthusiasm in showing the public the night sky. Ian has spent considerable time and effort in writing the "Wot I See this Month" articles in our journal, well done and thankyou.

Ned Pastor and Lloyd Wright, your assistance in running our Forest nights is greatly appreciated, duties include picking up and delivering the keys, preparing the cabin, the next morning tidy up, great work.

Daniel Ross, thanks for your technical expertise with the computers, preparing name badges and for the year ahead with Kate's assistance the tea and coffee. Thanks.

Ragbir Bhathal, With Ragbir's help we have been able to secure our meeting rooms at the university without charge, recently we moved to a new room with better facilities and easier access for all. We also have held some very successful Observatory nights. The weather however was not kind to us last year at all with several nights cancelled including the Siemens Science School night. Thanks Ragbir

Dick Everett, thankyou for handling the finances and treasury duties and for regularly discussing various items at our monthly meetings. The treasurer is a vital part of any organisation and I thank you for handling this task with great enthusiasm, as attested to by the desk out the front and receipt book in hand at meetings, Dick is always available to receive your money, on behalf of the society! Bob Bee, Thanks Bob for all the great work with our journal. Bob enjoys a high profile in the community with his articles in the Chronicle newspaper and nights at the Botanical Gardens. He regularly fields enquiries on behalf of the club and has just released his book on Binocular viewing. Thanks Bob.

Frank Kish, Last year Frank donated to the club a Maxim DL imaging software package and an Argo Navis digital pointing system. Over the years Frank has been a contributor of articles for Prime Focus and also has also been a strong supporter of our club, thankyou Frank.

Peter Hubert, Thanks for all you help with our star nights for the public. Peter has now taken upon himself to set up a lap top computer showing wonderful images of the night sky at the public nights, went down a treat at the last observatory night. Keep up the good work and thanks.

Ursula Braatz, Ursula enjoys her astronomy very much and contributes to our journal with stories about her holidays and adventures, sometimes with a telescope in hand, thanks Ursula.

I know I have forgotten someone, if so please accept my sincere apologies. The society operates as a collective of very talented people. It's my opinion that our society should be successful and move forward with new ideas and visions without sacrificing all the hard work that we have done, definitely we should retain those things give the Macarthur Astronomical Society such a strong identity not only in astronomical circles but also in the wider general community. At this point I will close this report. All I can say is that I sincerely thank everyone for all the support over the last year. It certainly has made my time as President of this society very satisfying and rewarding.

Kind Regards Noel

Dr Mike Dopita – Star Formation Throughout Cosmic Time

At our March meeting we enjoyed a lecture from Mike Dopita. It was certainly a detailed and entertaining talk on star and galaxy formation, as well as the inter-stellar medium which is Dr Dopita's (or Mike's) specialty.



It is almost impossible to summarise (in any comprehensible way without the PowerPoint images) Mike's talk but I'll try.

He started with how did galaxies get the way they are? Old elliptical galaxies star formation shut down 100s of millions of years ago – they are "red and dead'.

Spiral galaxies are loaded with star formation and also remarkably flat.

But, he said, the 'fireworks' are nearly over. Showing us the Lilly-Madau Plot (you had to

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be there) we could see the star formation history of the Universe which quite clearly (?) showed that star formation is currently slowing down.

He discussed what conditions are needed for star formation – regions of interstellar gas, turbulence of the inter-stellar medium (ISM), density structure of the ISM, molecular cooling.

Then he talked about what actually triggers star formation. The earlier massive stars that blew up very quickly, shock waves from explosions lead to compression of the gas cloud and ultimately to new stars.

Then came galactic mergers, tidal arms, tidal tails (e.g. the Antennae Galaxies, the Stephens Quintet). We saw stacks of images of merging galaxies with star formation from the shock waves. Also computer simulations of the mergers happening – it was so surreal to see objects over 100,000 light years across moving about, distorting and merging like clouds on the wall. But... these will be the last of the merging galaxies.

He talked about the massive black holes at the centres of galaxies, as large as billions of Sun masses.

Then he discussed (and showed supercomputer time lapse simulations) of radio galaxy outbursts, jets of ultra fast radio plasma. It was all happening before our eyes. (And he gets paid to have all this fun.)

Thank you Dr Dopita for such a fascinating talk – and your PowerPoint skills are very impressive.

RB 🔳

The Ten Commandments for Amateur Astronomers (by Anon)

I. Thou shalt have no white light before thee, behind thee, or to the side of thee whilst sharing the night sky with thy fellow stargazers.

II. Thou shalt not love thy telescope more than thy spouse or thy children; as much as, maybe, but not more.

III. Thou shalt not covet thy neighbour's telescope, unless it exceeds in aperture or electronics twice that of thy wildest dreams.

IV.Thou shalt not read "Astronomy" or "Sky & Telescope" on company time, for thine employer makes it possible to continue thine astronomical hobby.

V.Thou shalt have at least two telescopes so as to keep thy spouse interested when the same accompanies thee under the night sky or on eclipse expeditions to strange lands where exotic wild animals doth roam freely.

- VI.Thou shalt not allow either thy sons or thy daughters to get married during the Holy Days of Starfest.
- VII. Thou shalt not reveal to thy spouse the true cost of thy telescope collection; only the individual components and that shall be done with great infrequency.
- VIII. Thou shalt not buy thy spouse any lenses, filters, dew shields, maps, charts, or any other necessities for Christmas, anniversaries, or birthdays unless thy spouse needs them for their own telescope.

IX. Thou shalt not deceive thy spouse into thinking that ye are taking them for a romantic Saturday night drive when indeed thou art heading for a dark sky site.

X.Thou shalt not store thy telescope in thy living room, dining room, or bedroom, lest thou be sleeping with it full time.

Wot IC This Month

April 17 - May 14 2006

Bright Stars at 8.00 pm

Canopus rides high looking south, Puppis will make your neck ache directly overhead, then Regor and the False Cross climbing up from the southeast followed by Alpha Crux, the Pointers in Centaurus with his spear stabbed into Lupus and the head of Scorpius rising from the east later.

North - Orion hastens away to the west before Scorpius rises from the east, Sirius blazes down directly overhead, with Procyon, Castor, Pollux, Regulus in the Sickle of Leo and Spica in Virgo directly north. Libra and Arcturus appear from the northeast.

Moon Diary

24th April Last Quarter 28th April New Moon 5th May First Quarter 13th May Full Moon

Evening Planets

Mars rises during the afternoon in Gemini becoming visible at dusk near M35. During late April it travels underneath Orion passing a crescent Moon on May 5, to set around 9pm May 14 near Pollux, the Boxer star.

Saturn rises in Cancer and appears as dusk falls just to the right of M44, the Beehive Cluster. This month the planet resumes its westward motion back through the Beehive. It will set before midnight after passing a quarter Moon in early May.

Jupiter rises at 6.30 pm in the Scales of Libra to the northeast. At opposition it will be at its

brightest and visible all through the night hours. On 12th May the full Moon will give some fierce competition to the giant planet.

Neptune in Capricornus rises about 11 pm and rides calmly into the morning hours.

Morning Planets

Venus rises in Capricornus around 2.45 am very close to Uranus. On 18th April less than 1° will separate the two before Venus drops away into Pisces for May. One hour before sunrise on the 25th April a thin crescent Moon will be below the planet with Mercury lower down.

Mercury rises two hours before the dawn just past its maximum distance from the Sun. Each day it will gradually lower in the sky leading to conjunction late in May. On 27th April a thin crescent of the old Moon will be placed just above and to the left as dawn lights the sky.

Meteors

The **Pi-Puppids** have their maximum on the 23rd April although the hourly rate is low. They are noted for their very slow speed, their brightness and persistent trails.

Comets

Astronomy 2006 has a couple of reasonably bright comets noted for this month.

Portraits in the Sky

Coma Berenices – The Hair of Berenice

This is an ancient story but the constellation is relatively new, being introduced by Tycho Brahe (1546-1601). Ptolemy III of Egypt had waged a long war on the Assyrians, because they had killed his sister. As Ptolemy returned in glory from the war, his wife Berenice had her beautiful tresses clipped and laid out on the temple altar as a gift to Aphrodite, the goddess of love.

Later that night during the grand banquet the clipped hair disappeared and a great furore started. The priests of the temple were to be put to death if the queen's hair couldn't be found. However a visiting astronomer Conon of Samos came to their rescue - proclaiming that Aphrodite had accepted the gift of Berenice's hair, which now shone brightly in the heavens next to Leo.

There are several fine binaries, eight Messier objects and the Coma Star cluster which is not included in Messier's list, a fine sight in binoculars,.

Alpha Comae is found about midway from the tail of Leo to Arcturus. The three main stars form a right hand L half of a nearly perfect square with the large open cluster at the left hand point.

Beta Comae is the brightest star in the constellation, and certainly the closest in light years. Similar in size to our Sun.

Gamma Comae is an orange star in the same region as the Coma Star Cluster, but not a member of that group.

Double stars in Coma Berenices:

Alpha Comae, called *Diadem* is a rapid binary of two equal stars; 5.0, 5.0 with a current separation too close for amateur scopes. The orbit to us is perfectly edge-on, so the two stars seem to move back and forth on a straight line. 62 light years away it has the same diameter as our Sun

Zeta Comae is a fixed binary: 6.0, 7.5; separation 3.6".

17 *Comae* is a member of the Coma Star Cluster. Shining white and a soft blue: 5.4, 6.7; separation 145" they are an easy double. From *gamma Comae* follow the slight arc of stars south that bend to the east. First comes 14 Comae, then 16, and finally 17.

24 Comae is even more spectacular: a fixed binary with an orange primary and emerald component. 5.5, 7.0; separation 20.3". Located 8° west of alpha Comae and 1° north.

35 *Comae* is a slow double 5.1, 7.2; separation 1.02". *35 Comae* is in a fairly barren part of the sky, found 5° northwest of alpha Comae.

Struve 1633 is a pleasant binary for telescopes: 7.0, 7.1; separation 9.0". You will find it 1° to the west of 14 Comae

Struve 1639 is a close binary: 6.8, 7.8; sep 1.7". It can be found in the Star Cluster bright stars near *Gamma*. Start at 14 Comae and pan south 30' to 16 Comae. Less than 1° to the southwest is 13 Comae. Immediately southwest, is 12 Comae. Struve 1639 is between and to the southeast making the third point in an equal triangle.

Deep Sky Objects:

The 'Coma Star Cluster' also called Melotte 111, is a scattered group of 40-50 stars extending south from *gamma Com* (which is not, a member). Once known as the tuft of Leo's tail it is spread out over a 5° area, and is one of the closest to our solar system. The brightest members form a noticeable Vshape. 12, 13 and 14 Comae and other fourth-magnitude and other fainter stars make this one of the loveliest sights in the heavens.

Messier Objects

M53 is a globular cluster 1° from *alpha Comae*. The brightest Messier in the constellation (7.7), it tends to be most impressive with larger telescopes.



M53

M64, the Black Eye Galaxy, is a bright (8.5) compact spiral 1° east-northeast of 35 Comae. The "black eye" can best be seen under ideal conditions with large telescopes.



M64

M85 is a bright spiral galaxy and part of the Virgo Galaxy Cluster, most of which is about 5° further south.

M88 is a many-armed spiral galaxy some forty million light years away. Quite bright (9.5), it's a favourite with many Messier observers.





M91 is another faint spiral galaxy 10.2 mag.

M98 is a faint 10.1 mag. spiral seen practically edge-on, just 1/2° west of 6 Comae.



M98

M99 is an open spiral seen face on, just under 1° east-southeast of 6 Comae. It has a brightness of 9.8 and several arms are visible in large scopes.

M100 is ½° further than the last of three 5/6th mag stars in-line beginning with 6 Comae. It's seen face on with a brightness of 9.4, and is the largest of these spiral galaxies, although difficult to appreciate in small telescopes.



M100

NGC 4565 is a well-known edge-on spiral with a highly visible dust lane from end to end. The largest galaxy of its type it has a visual magnitude of 9.6. The galaxy is 1° due east of 17 Comae.



This is a fertile part of the sky to investigate. Enjoy the sparkle of Berenice's Hair as the evenings grow clearer, colder and longer.

Staying in the northern hemisphere move along to the east to:

Corona Borealis – The Northern Crown.

This story is connected to a long complicated myth of Theseus and the Minotaur.

Every year a tribute of seven young men and seven maidens was sent from Athens to be served up to the flesh eating Minotaur on Crete.

One year Theseus, the son of Poseidon and heir to the Athenian throne was included as one of the seven young men. Acclaimed as a hero in his home town Theseus rightly concluded that he was being set up as the fall guy!

Arriving in Crete, Theseus was met by King Minos, who immediately challenged him to prove he was really the son of Poseidon by retrieving a gold ring that he threw into deep water.

Diving into the sea Theseus grabbed the ring and was met by dolphins, which escorted him to the palace of the Nereids or sea nymphs. One of the Nereid sisters gave him a wonderful jewelled crown made underwater by Hephaestus the supreme goldsmith. Surfacing with not only the ring but a crown as well Theseus placed them at the feet of Minos the king.

This feat got him introduced to Ariadne, the king's daughter, who fell in love with him

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immediately, and plots with him to defeat the Minotaur. He promised to marry her and take her back to Athens.

The Minotaur is kept at the centre of a labyrinth to stop victims finding their way out. Ariadne, clever girl that she is, has a magic ball of string that unrolls behind Theseus so he can follow it back along the path from the centre of the labyrinth.

Theseus was sent into the labyrinth and promptly killed the Minotaur. All goes to plan as he followed the string safely out again to marry Ariadne and give her the jewelled crown as a wedding present. However on the way to Athens, Theseus is revealed to be a cad, for while stopping at the isle of Naxos he abandoned her and disappeared. But she keeps the crown!

However the story isn't quite finished as Dionysus who was also visiting Naxos, falls in love with Ariadne and takes her for his bride placing the jewelled crown of Hephaestus on her head.

They raised four sons and 'lived happily ever after'. When Ariadne died Dionysus took the wedding crown and placed it in the heavens between Hercules and Bootes.

The constellation is found nearly midway between Arcturus and Vega, north from Serpens Caput. From Arcturus move down to Izar (Epsilon Bootis) and then east 15° to Alpha CrB.

The seven stars that make up the crown are not bright, except for **Gemma** or **Alphecca** (Alpha Coronae Borealis), which is a 2.2 magnitude star 75 light years away. The other stars vary from three to six magnitude.

Double Stars in CrB.

Zeta² and Zeta¹ CrB (Struve 1965) are a pleasant pair of blue-white stars with 5.0 and 6.0 mag. separation 6.3". Just over a minute (1') to the east you can find another couple of 8th mag stars separeated by 30 arc seconds (30").

Sigma CrB (Struve 2032) is a slow binary, with a period of a thousand years. Separation of the companion is 7.0".

Nu¹, Nu² CrB form a very wide unrelated pair of orange giants separated by 72". Binoculars will find them easily.

Right, now let's away to the South Celestial Pole for a bit of Paradise

Apus-The Bird of Paradise.

Apus, was invented in the early 1500s by Dutch, Portuguese or English navigators.

Johan Bayer first published diagrams of Apus in 1604, but he gave credit to Peter Theodore, Corsalis and Fred Houtman who observed from Sumatra in the 1590s for its invention.

It is clear the bird in question is the native Bird of Paradise in the Papuan islands. The poet John Keats wrote of "legless birds of paradise" referring to the island custom of removing the ugly legs before giving the bird as a gift, but then again maybe he was talking about the drunken English sailors. The Chinese called this figure the Curious Sparrow or Little Wonder Bird.

Located south of Triangulum Australe and Musca which is immediately south of The Cross, the asterism is faint with few bright stars. There are two globular clusters and a few galaxies but very faint and small.

There are four orange giant stars that stand out brightly. $\beta \gamma$ and δ are in a V shape with δ Apodi a very pretty double.

 α Apodi, to the right of the V shape, is a good starting point to find polar alignment.

IC4491 is a 10th mag GC which should show up well in those big scopes some are getting now. You will find it 3° directly south of Alpha Apodi

NGC6101 located between Tri Aust and α Apodi, is another mag 10.0 globular cluster visible in 10 cm better in 20 cm but small. Start from Alpha Tri Aust move south 4' and west 1'.

IC4433 is a 10^{th} magnitude galaxy 3'x4' size 2.5' east from Beta Apodi.

Golden hair, a jeweled crown and Paradise, now that sounds like a rich feast.

Good Seeing IC

This will be the last Wot IC that I write for our journal. Five years ago I took this up to relieve Bob of some of the burden of writing for Prime Focus.

The first three years were a challenge I was happy to meet but more recently the monthly deadline and the time and energy given to research for Portraits in the Sky has become more of a chore than I wish to continue.

I have put my own stamp on the format and style but if anyone feels the urge to volunteer to do it differently, please talk to Bob. I am willing to pass on my thoughts and direct you to some of the aids I have used over the years. Ian C. ■

I would like to express my sincere thanks and admiration to lan who has done such an excellent job in writing these articles every month for the past 5 years. It certainly has made my job as editor much easier and I personally have gained a lot of astronomical (and mythological) information from them. His contribution will be sorely missed. As suggested by lan, I urge someone out there to take up the challenge to continue these articles, but certainly applying their own style to the task. RB (Ed.) ■

The Universe and the Big Bang.

The NASA space probe captured the "Cosmic Growth Spurt" which started less than a trillionth second after the big bang. But what was before the big bang? Was there complete nothing before the universe grew from sub-microscopic to an astronomical size in less then a blink of an eye? I think there should have been something there, like dark matter or a dense dark cloud. Suddenly, there may have been a spark in this cloud, which made an explosion, what we call the 'big bang'. Like when a match is put to petrol, so the universe was first a huge fireball. The fireball would have cooled down, turned into a cosmic soup, then looked like curdled cheese before stars and galaxies were formed. We

don't know if the universe is expanding into an empty space or if there are old stars, galaxies or dark matter from a universe before. No space probe could ever see 13.7 billion light years back. Before the big bang, I think there would be only darkness, the edge of the visible universe or universes. There could have been another big bang 20, 30, or more billion light years back. Which would belong to the invisible universe or universes. Would somebody like to discuss all about this with me?

Ursula Braatz

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Cosmology Rules!

Little Boy Lost

The other night I got lost in the Universe Not lost like a little boy at the Easter Show But totally absorbed lost, submerged in awe Struggling in a racing tide of realization Of the immensity yet the tinyness Of this incomprehensible thing We glibly call "the Universe".

One lecture, one mind opening presentation By a man who knows the bigger picture Was all it took

For my mind, my tiny non-PHD'd mind To be reeling, recoiling, then rallying With horror and delight

A dichotomy of states, like a light photon in a quantum world.

Is our immense, untraversable universe Really that big, and yet

At the same time so insignificant? What would God say about it? Or did he write the script and Is sitting back watching the play unfold? Our Universe, the observable Universe A few tens of billions light years across, The mind boggles, tries, but fails, to grasp Such insurmountable distances. One vainly claims it can be imagined, But can it? Really? Like an ant trying to imagine a continent Or a grain of sand imagining a planet? But then, with one sentence from the man who knew. I was lost, absorbed in previously unconsidered possibilities, Bewildered, then comforted by understanding, comprehension, Then awed by the implications. Our Universe, the sum of all things So unimaginably huge, is but a small observable part of the real universe Born in the fiery tumult of the Big Bang, Flung far and wide at impossible superrelativistic speed For an infinitesimal instant Exponentially expanding Taking our tiny part of existence with it, Like a speck of flour in An elephant sized lump of expanding dough. So here we sit, Billions of light years to our horizons, But beyond that, in all directions, Immensity, mind boggling immensity, Making googles seem puny, There are not enough noughts to describe it. What does it all mean? Do the other mes out there. All oblivious of each other as I to them. Feel the same as I feel now? In wondrous awe Lost? (Robert Bee)

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So, where did that poem spring from? I have been working my way through a set of DVDs that Lloyd loaned me called "Understanding the Universe – What's New in Astronomy" with lectures by Professor Alex Filippenko at University of California, Berkeley. Rivetting stuff.

In Lecture 16 ("Our Universe, One of Many?") after discussing the Inflation period of the Big Bang model and the implications this has to the size of the *entire* universe as compared to our *observable* universe (the bit we can see back to as far as 13.7 billion light years, having an effective 'diameter' of around 30 billion light years if you want to think of it in those simplistic terms), he went on to explain that cosmologists have estimated that the ratio of the entire: observable universe is of the order of the ratio of the observable universe: a single proton.

Try and get your brain around that. That's a ratio of over 10^{41} – and that's only the comparative radius. If you think volume, it works out at over 10^{124} , or 10^{24} googles, where a google is 10^{100} .

I just sat there and thought – WOW! I had never thought of the universe in those terms before. If you think about it too much, your mind just goes numb, and you're tempted to say "oh well, one infinity is as big as another." But it does humble you, and you start playing all kinds of philosophical games about what might be happening in the rest of the Universe (that we can NEVER observe) that we have no idea about. It opens up all kinds of worms.

Anyhow, after that, for reasons I can't really explain I sat down and penned the poem above. Think about it. RB ■

A Gallery of Globulars

As you are aware, there is a swarm of around 150 – 200 globular clusters haloed around our Milky Way galaxy. Here is just a sample of them – check out the differences in compactness and complexity.

