



Volume 14, Issue 6

June 2009

Inside this issue:

Secretary's Column	2
A note from the editor	3
Observing July 2009	4
Messiers #13, 92, 56 & 57)	6
Centaurus NGC Observations	7
Who Invented the Telescope?	10

MAS Committee

President

John Rombi

Vice President

Trevor Rhodes

Secretary

Roger Powell

Treasurer

Tony Law

Merchandising Officer

Stewart Grainger

Webmaster

Chris Malikoff

Committee Members

Lloyd Wright
Stewart Grainger
Ivan Fox

Patron

Professor Ragbir Bhathal

MAS Postal Address

P.O. Box 17
MINTO NSW 2566

Web: www.macastro.org.au

Prime Focus Editor

Geoff Young
editor@macastro.org.au

Presidents Report: John Rombi

Welcome to the June edition of Prime Focus.

We were very privileged to have as our guest speaker for May, the renowned radio astronomer Prof Bryan Gaensler. Bryan's presentation on "Magnets in the Sky" was delivered with a style that made it very easy to listen to and understand.

Bryan's compliment to all M.A.S members was not expressed lightly.

After our meeting, Bryan explained that he, and other astronomers, are constantly being asked to give presentations to other societies, but these requests are infrequently met.

He explained that M.A.S has always presented itself in a professional manner to him (and others) and that we are a very welcoming and challenging membership!! So dear members, remember the eyes are always watching!

(Continued on page 2)

Observing Dates

June

15/06/09 General Meeting
20/06/09 The Forest
27/06/09 Stargard

July

18/07/09 Stargard
20/07/09 General Meeting
25/07/09 The Forest

August

15/08/09 Stargard
17/08/09 General Meeting
22/08/09 The Forest

September

12/09/09 Stargard
19/09/09 The Forest
21/09/09 General Meeting

October

10/10/09 Stargard
17/10/09 The Forest
19/10/09 General Meeting

November

14/11/09 The Forest
16/11/09 General Meeting
21/11/09 Stargard

December

12/12/09 Stargard
19/12/09 The Forest
21/12/09 General Meeting



Presidents Report:

John Rombi

Bryan has agreed to pay us a visit again next year. Thanks you Bryan!

Bryan gave me the name of a colleague, Dr Tim Robishaw.

I have contacted Tim; his response was a BIG YES!

He will be our speaker in November.

Public Nights

We've just completed our third public night of this year (May30th). Unlike the first two, it was rained out unfortunately. Due to the rain the observing session was cancelled, and our backup plan took effect.

We met at Bldg21, room 6 with a plethora of scopes. Dr Ragbir Bhatl gave a talk on "Life on Mars" to the 50 members of the public that attended.

Afterwards we entertained the public with a demonstration on the use of a telescope.

Even though the rain ruined any chance of observing, it still was a successful night.

Thank you to all involved.

Tudor House, Moss Vale

M.A.S will be visiting Tudor House at Moss Vale on June 13th.

Bob Bee will be presenting a talk on Astronomy to the assembled children and adults, with an observing session afterwards.

They will be providing dinner for the visiting astronomers. More on this next issue.

Stargard & The Forest

Have been either cloudy or rained out lately, so nothing to report here.

Hopefully the weather will clear, so I can remember how to use my telescope.

What's on?

There are many more functions being held throughout the year, so please check out the website's "What's on" column.

Please let Roger or I know if you can attend.

Tonight.

I would like to welcome our "**GOLDEN TONSILS**" Bob Bee, his presentation will be on "Mapping the Constellations with Mythology".

Until next time,

Clear Skies, John Rombi

Secretary's Column:

Roger Powell

This issue of Prime Focus marks the end of Kate Johnston's tenure as Prime Focus Editor and the beginning of a new era under Geoff Young. Congratulations to Kate for being a fantastic Editor for the last couple of years - I am sure Geoff will build on your example.

Well done, also, to our resident cosmologist, Robert Zindler, for his well written ten-part series of articles "Black Holes Ain't Holes". Great reading, looking forward to the sequel.

Recently, a former member donated to the Society a set of mirror blanks and mirror grinding materials that were owned by her late husband. I thought that interest in DIY telescope building had completely disappeared, so I was expecting a long wait to dispose of the materials.

However, Chris Malikoff contacted me within minutes of the advertisement appearing, and I was glad to give it to

him, for a small donation to MAS. Keep an eye on the DIY section of the Forum as Chris will undoubtedly keep us up to date with progress on mirror grinding and telescope building.

On the subject of telescopes, the committee recently decided to seek expressions of interest from members of the public, to determine any interest in attending a 'beginners course' for telescope users. We are aware of the number of beginners telescopes being sold by local shops like Australian Geographic and Dick Smith, especially to young people.

There is a strong suspicion, with some anecdotal evidence, that a lot of these telescopes are bought but rarely used, due to a lack of understanding. Such fundamental issues as finderscope alignment, polar aligning, ra/dec, low power v high power, etc need to be under-

(Continued on page 3)



Secretary's Column:

Roger Powell

stood, along with an elementary introduction to sky charts and star wheels. Not that I'm an expert.

I am not sure whether our advertisement for this will reach the right people but I hope so, and if we get enough responses, then a course may be held as part of the MAS Public Outreach Programme. Understanding the use of telescopes is fundamental to successful amateur astronomy. Any comments on this approach would be welcomed.

Speaking of amateur astronomy, I have been wondering lately about the gulf between amateur and professional astronomy, which seems to be ever widening. We all know that professional astronomers no longer spend their working life gazing through an eyepiece or taking snaps of Saturn.

The recent talk to us by Professor Bryan Gaensler at our May meeting is a prime example. Bryan showed us the astonishing advances made over the last few years in magnetic astrophysics. Even after his previous talk last year about the 'Amazing Magnetars' aroused my interest, I was unprepared for his amazing conclusions this time.

As an electrical engineer, the concept of viewing remote magnetic fields (other than by using iron filings or a compass) startled me a bit. The ability to map the structure of cosmic magnetic fields, not only the Milky Way Galaxy - but also of entire remote galaxies - by measuring polarised electro-magnetic waves is an incredible achievement! For anyone who missed it, Chris has posted Bryan's presentation on the 'Articles' section of the web site.

There is only one aspect of Bryan's overall presentation on magnetism that I am not sure about. The revelation that the world's cattle population spends most of its time standing in a north/south alignment was a bit off-beat and has me wondering whether to start my own Google Earth survey to see if it is really so! At least that would be one aspect where an amateur could check a professional's work!

Bryan Gaensler appears to be one of the world leaders in the emerging cutting-edge field of astrophysical magnetic research. He is also a very effective science communicator. I sincerely hope that, whilst the amateur/professional gap remains so wide, people like Bryan will continue to inspire people like us with their talks about their astounding technological achievements. Come again soon, Bryan.

40

The number of years since the first astronauts, Neil Armstrong & Buzz Aldrin, set foot on the Moon. Apollo 11 reached the Moon on 20th July 1969. Watching this on tv, in the middle of the night from my home in North London, I would have given anything to be up there with them. I still would. Happy birthday, Apollo.

A Brief Note from the editor:

Geoff Young

Firstly, even though Roger has already made note of this, thank you to Kate for the work she has done while editor of Prime Focus. I know I was not fully aware of the time that Kate would have had to find to do this job as she did. If I were, I may have given second thoughts about accepting the position.

Besides producing each month's issue, Kate has also been digitising past issues of Prime Focus. This would have been a very time-consuming task, and something we should all appreciate.

Kate's work made the hand-over very easy. Daniel gave me a USB stick and that was it—no paper, no ageing, dusty stacks of past issues (and no silverfish!).

I notice some of our current members have been past editors of Prime Focus. Not ONE of them warned me that it was not a simple job—thanks guys!

I would also like to thank those members who have made suggestions regarding the layout of Prime Focus now that it is only available in digital format—Chris Malickoff, in particular, who provided much useful advice learnt from his years doing this sort of thing for a living. If other members have any additional constructive advice or comments, please tell me.

On the following two pages are Observing Lists for July, 2009. I used a computer program, SkyTools, to produce these. As a start, I have only included the planets and the brighter Deep-Sky objects. If there are other areas of interest that members would like to see included in future editions, please let me know. Obviously, these lists will change each month as the visibility of objects change. I have also selected Stargard as the location, but this could be The Forest or The Domes instead if sufficient members request a change.



OBSERVING JULY 2009

Sun, Moon and Planets Observing List, evening of 2009 Jul 18 at Stargard

Sunset 17:11, Twilight ends 18:36, Twilight begins 05:32, Sunrise 06:56,

Moon rise 03:53, Moon set 12:50

Completely dark from 18:36 to 03:53. Waning Crescent Moon. All times local.

Listing All Classes visible above the perfect horizon and in twilight or moonlight after 18:00 and before 03:02.

Primary ID	Con	Mag	Size	Distance	Rise	Transit	Set
Jupiter	Cap	-2.8	48"x 45"	4.1 AU	19:20	2:03	8:47
Neptune	Cap	7.8	2.3"	29.1 AU	19:23	2:04	8:46
Uranus	Psc	5.8	3.6"	19.6 AU	21:49	3:59	10:10
Saturn	Leo	1.1	17"x 15"	10.0 AU	9:42	15:32	21:19
Pluto	Sgr	13.9	0.1"	30.8 AU	15:23	22:18	5:12

And	Andromeda	Lac	Lacerta	Cir	Circinus	Pup	Puppis
Ant	Antlia	Leo	Leo	Col	Columba	Pyx	Pyxis
Aps	Apus	LMi	Leo Minor	Com	Coma Berenices	Ret	Reticulum
Aqr	Aquarius	Lep	Lepus	CrA	Corona Austrina	Sge	Sagitta
Aql	Aquila	Lib	Libra	CrB	Corona Borealis	Sgr	Sagittarius
Ara	Ara	Lup	Lupus	CrV	Corvus	Sco	Scorpius
Ari	Aries	Lyn	Lynx	Crt	Crater	Scl	Sculptor
Aur	Auriga	Lyr	Lyra	Cru	Crux	Sct	Scutum
Boo	Boötes	Men	Mensa	Cyg	Cygnus	Ser	Serpens
Cae	Caelum	Mic	Microscopium	Del	Delphinus	Sex	Sextans
Cam	Camelopardalis	Mon	Monoceros	Dor	Dorado	Tau	Taurus
Cnc	Cancer	Mus	Musca	Dra	Draco	Tel	Telescopium
CVn	Canes Venatici	Nor	Norma	Egu	Equuleus	Tri	Triangulum
CMa	Canis Major	Oph	Ophiuchus	Eri	Eridanus	TrA	Triangulum Australe
CMi	Canis Minor	Ori	Orion	For	Formax	Tuc	Tucana
Cap	Capricornus	Pav	Pavo	Gem	Gemini	UMa	Ursa Major
Car	Carina	Peg	Pegasus	Gru	Grus	UMi	Ursa Minor
Cas	Cassiopeia	Per	Perseus	Her	Hercules	Vel	Vela
Cen	Centaurus	Phe	Phoenix	Hor	Horologium	Vir	Virgo
Cep	Cepheus	Pic	Pictor	Hya	Hydra	Vol	Volans
Cet	Cetus	Psc	Pisces	Hyi	Hydrus	Vul	Vulpecula
Cha	Chamaeleon	PsA	Piscis Austrinus	Ind	Indus		

Best and Brightest 200 Observing List, evening of 2009 Jul 18 at Stargard, The Oaks, NSW

Sunset 17:11, Twilight ends 18:36, Twilight begins 05:32, Sunrise 06:56, Moon rise 03:53, Moon set 12:50

Completely dark from 18:36 to 03:53. Waning Crescent Moon. All times local (GMT+10).

Listing All Classes visible above the perfect horizon and in complete darkness after 18:26 and before 03:02.

The minimum visual difficulty is: detectable.

Class	Primary ID	Alternate ID	Con	Mag	Distance	Rise	Transit	Set	Difficulty
Open	NGC 2547	Collinder 177	Vel	5	1500 ly	2:40	12:24	22:04	detectable
Open	IC 2391	Collinder 191	Vel	2.6	570 ly	2:12	12:54	23:33	easy
Open	IC 2395	Collinder 192	Vel	4.6	2600 ly	3:25	12:56	22:24	easy
Open	NGC 2516	Collinder 172	Car	3.3	1300 ly	-	12:12	-	easy
PNe	Ghost of Jupiter	NGC 3242	Hya	8.6	2800 ly	7:37	14:38	21:36	easy
Open	Collinder 256	Melotte 111	Com	2.9	310 ly	11:46	16:38	21:27	detectable
Glob	NGC 2808		Car	6.2	26000 ly	-	13:26	-	detectable
Open	NGC 3228	Collinder 218	Vel	6.4	1800 ly	4:17	14:35	0:49	easy
PNe	Eight Burst	NGC 3132	Vel	8.2	3600 ly	5:48	14:21	22:50	easy
PNe	Eight Burst	NGC 3132	Vel	8.2	3600 ly	5:48	14:21	22:50	easy
Open	NGC 3114	Collinder 215	Car	4.5	3000 ly	-	14:16	-	easy
Open	IC 2581	Collinder 222	Car	5.3	8000 ly	-	14:41	-	obvious
Open	IC 2602	Collinder 229	Car	1.6	520 ly	-	14:56	-	obvious
Open	NGC 3766	Collinder 248	Cen	4.6	7200 ly	-	15:50	-	obvious
Open	NGC 3532	Collinder 238	Car	3.4	1600 ly	-	15:19	-	easy
Glob	M 68	NGC 4590	Hya	7.3	39000 ly	9:24	16:53	0:18	detectable
Gal	Sombrero Galaxy	M 104	Vir	9.1	60.0 Mly	10:13	16:53	23:30	detectable
Glob	NGC 4372		Mus	7.2	20000 ly	-	16:39	-	easy
Open	Jewel Box	NGC 4755	Cru	5.2	6400 ly	-	17:07	-	obvious
Glob	Omega Centauri	NGC 5139	Cen	3.9	16000 ly	8:14	17:40	3:02	easy
Gal	Centaurus A	NGC 5128	Cen	7.8	12.0 Mly	8:49	17:39	2:24	detectable
Gal	M 83	NGC 5236	Hya	7.8	15.0 Mly	10:09	17:50	1:28	detectable
Open	NGC 5460	Collinder 280	Cen	6.1	2200 ly	8:46	18:21	3:51	detectable
Glob	M 5	NGC 5904	Ser	5.7	29000 ly	13:32	19:32	1:31	detectable
Glob	NGC 5986		Lup	7.6	46000 ly	11:41	19:59	4:13	detectable
Open	NGC 6025	Collinder 296	TrA	6	2500 ly	-	20:16	-	easy
Open	NGC 6067	Collinder 298	Nor	6.5	4600 ly	9:09	20:26	7:40	easy
Glob	M 80	NGC 6093	Sco	7.3	36000 ly	13:18	20:30	3:42	detectable
Open	NGC 6124	Collinder 301	Sco	6.3	1700 ly	12:08	20:38	5:08	detectable
Open	NGC 6167	Harvard 11	Nor	6.6	3600 ly	10:58	20:48	6:34	easy



OBSERVING JULY 2009

Best and Brightest 200 Observing List, evening of 2009 Jul 18 at Stargard, The Oaks, NSW

Sunset 17:11, Twilight ends 18:36, Twilight begins 05:32, Sunrise 06:56, Moon rise 03:53, Moon set 12:50

Completely dark from 18:36 to 03:53. Waning Crescent Moon. All times local (GMT+10).

Listing All Classes visible above the perfect horizon and in complete darkness after 18:26 and before 03:02.

The minimum visual difficulty is: detectable.

Class	Primary ID	Alternate ID	Con	Mag	Distance	Rise	Transit	Set	Difficulty
PNe	Eight Burst	NGC 3132	Vel	8.2	3600 ly	5:48	14:21	22:50	easy
Open	NGC 3114	Collinder 215	Car	4.5	3000 ly	-	14:16	-	easy
Open	IC 2581	Collinder 222	Car	5.3	8000 ly	-	14:41	-	obvious
Open	IC 2602	Collinder 229	Car	1.6	520 ly	-	14:56	-	obvious
Open	NGC 3766	Collinder 248	Cen	4.6	7200 ly	-	15:50	-	obvious
Open	NGC 3532	Collinder 238	Car	3.4	1600 ly	-	15:19	-	easy
Glob	M 68	NGC 4590	Hya	7.3	39000 ly	9:24	16:53	0:18	detectable
Gal	Sombrero Galaxy	M 104	Vir	9.1	60.0 Mly	10:13	16:53	23:30	detectable
Glob	NGC 4372		Mus	7.2	20000 ly	-	16:39	-	easy
Open	Jewel Box	NGC 4755	Cru	5.2	6400 ly	-	17:07	-	obvious
Glob	Omega Centauri	NGC 5139	Cen	3.9	16000 ly	8:14	17:40	3:02	easy
Gal	Centaurus A	NGC 5128	Cen	7.8	12.0 Mly	8:49	17:39	2:24	detectable
Gal	M 83	NGC 5236	Hya	7.8	15.0 Mly	10:09	17:50	1:28	detectable
Open	NGC 5460	Collinder 280	Cen	6.1	2200 ly	8:46	18:21	3:51	detectable
Glob	M 5	NGC 5904	Ser	5.7	29000 ly	13:32	19:32	1:31	detectable
Glob	NGC 5986		Lup	7.6	46000 ly	11:41	19:59	4:13	detectable
Open	NGC 6025	Collinder 296	TrA	6	2500 ly	-	20:16	-	easy
Open	NGC 6067	Collinder 298	Nor	6.5	4600 ly	9:09	20:26	7:40	easy
Glob	M 80	NGC 6093	Sco	7.3	36000 ly	13:18	20:30	3:42	detectable
Open	NGC 6124	Collinder 301	Sco	6.3	1700 ly	12:08	20:38	5:08	detectable
Open	NGC 6167	Harvard 11	Nor	6.6	3600 ly	10:58	20:48	6:34	easy
Open	NGC 6178	Collinder 308	Sco	7.2	3300 ly	11:40	20:49	5:54	easy
Open	NGC 6193	Collinder 310	Ara	5.4	3800 ly	11:16	20:54	6:29	easy
Glob	M 12	NGC 6218	Oph	6.1	23000 ly	14:50	21:00	3:10	detectable
Glob	M 10	NGC 6254	Oph	6.6	23000 ly	14:54	21:10	3:26	detectable
Glob	M 62	NGC 6266	Oph	6.4	26000 ly	13:36	21:14	4:52	detectable
Glob	M 19	NGC 6273	Oph	6.8	23000 ly	13:52	21:15	4:39	detectable
Open	NGC 6322	Collinder 326	Sco	6.5	3200 ly	12:47	21:31	6:16	obvious
Open	NGC 6383	Collinder 335	Sco	5.4	3200 ly	13:59	21:48	5:36	easy
Glob	NGC 6388		Sco	6.8	42000 ly	12:51	21:49	6:47	detectable
Glob	M 14	NGC 6402	Oph	7.6	23000 ly	15:37	21:50	4:04	detectable
Glob	NGC 6397		Ara	5.3	6500 ly	10:55	21:54	8:48	detectable
Open	Butterfly Cluster	M 6	Sco	4.6	1600 ly	14:06	21:53	5:40	obvious
Open	M 7	NGC 6475	Sco	3.3	980 ly	14:08	22:07	6:05	easy
Open	M 23	NGC 6494	Sgr	5.9	2000 ly	15:11	22:10	5:08	detectable
Neb	Lagoon Nebula	M 8	Sgr	5	4100 ly	15:00	22:17	5:33	easy
Open	M 21	NGC 6531	Sgr	7.2	3900 ly	15:07	22:17	5:27	detectable
Open	M 20	NGC 6514	Sgr	5.2	2700 ly	15:03	22:15	5:27	easy
Glob	NGC 6541		CrA	6.3	13000 ly	13:31	22:21	7:11	detectable
PNe	Blue Racquetball	NGC 6572	Oph	8	3500 ly	16:39	22:25	4:11	obvious
Open	Star Queen	M 16	Ser	6.5	5700 ly	15:48	22:31	5:14	easy
Open	M 18	NGC 6613	Sgr	7.5	4200 ly	15:40	22:32	5:25	easy
Glob	M 28	NGC 6626	Sgr	6.9	16000 ly	15:19	22:37	5:55	detectable
Open	NGC 6633	Collinder 380	Oph	5.6	1200 ly	16:53	22:40	4:27	easy

These lists were produced using SkyTools v3. If members have any changes they would like made, please let me know at editor@macastro.org.au



Star Hopping to Messiers #13 and Lyra (M56 & M57)

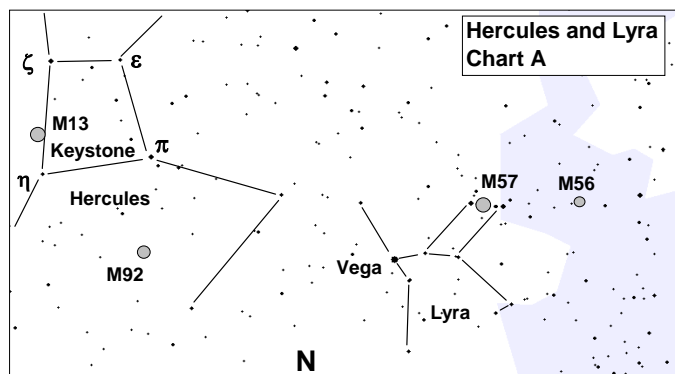
Hercules (M13 & M92) Bob Bee

This article is a bit ahead of its time – Hercules and Lyra are not viewable in June at ‘civilised times’ – you’ll need to wait till around 11pm. A more convenient 8pm-ish viewing time happens around July, August. But I wanted to keep those Prime Focus months for the Messier ‘royalty’ – Scorpius and Sagittarius. So use this article late at night in June or wait till July/August. But I wanted to get it out there now so as not to wait for next year, so here it is.

Hercules has two Messier objects – both globular clusters, **M13** and **M92**.

Messier	M13	M92
Type	GC	GG
Size (')	16.6	11.2
Mag.	5.9	6.5

The key to finding both (a relatively easy task) is to identify the Keystone of Hercules, that 4 star trapezium that represents his pelvis low to the north. **Chart A** below shows the general location of both Hercules’ and also Lyra’s Messier objects.

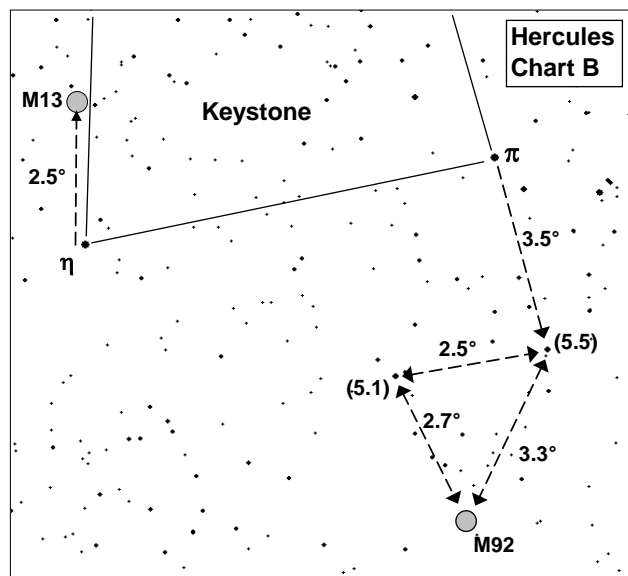


You can see immediately that M13, the brightest globular in the northern sky, lies almost on the line between the two left side stars of the keystone, η and ζ Her.

Let’s have a closer look at the star hopping to the Hercules Messiers, both of which in a dark sky are easily spotted in binoculars. See **Chart B** below.

M13 is easy. Just locate η Her. at the bottom left of the Keystone. Put it in the centre of your f/s view. M13 should lay near the edge of the FoV in the south direction, as it is only 2.5° away from η towards ζ Her. Move the f/s centre towards that point and check the main eye piece. Magnificent!

Now **M92**, which is both a bit fainter and smaller than M13. Locate the bottom right star of the Keystone, π Her. Now extend the line from the top right Keystone



star, ε , through π by 3.5° to a mag 5.5 star and place your f/s centre on that. 2.5° to the west of that star is a mag 5.1 star. From Chart B you can see that the 5.1 and 5.5 mag stars form a triangle with M92. All three objects should fit inside your f/s FoV. Using the mag 5.1 – 5.5 stars as a base, estimate the other triangle point and centre the f/s on it. Check your main eye piece – you should see M92 in it.

Lyra:

Lyra also has two Messier objects – **M56**, a globular cluster, and **M57**, the famous Ring Nebula (a planetary nebula).

They are both relatively easy to star hop to. Refer to **Lyra Chart C** below.

First, obviously, locate the constellation Lyra, low on the northern horizon, hanging above its bright star Vega. Then locate its famous parallelogram of stars above and to the right. Its two top stars are β and γ Lyr.

Messier	M56	M57
Type	GC	PN
Size (')	7.1	2.5
Mag.	8.3	8.6

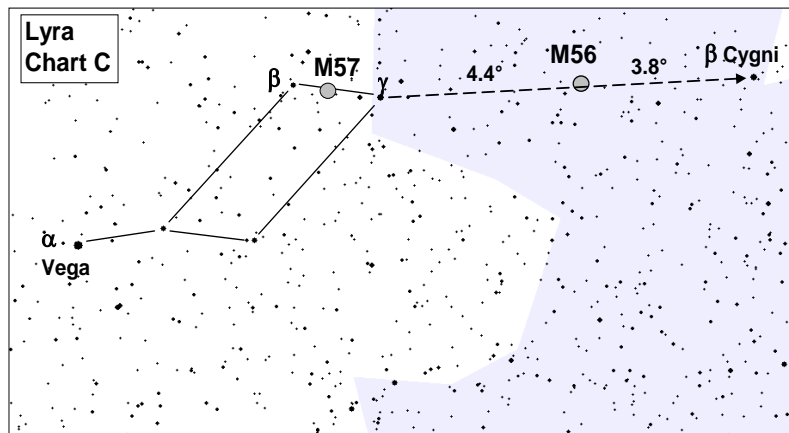
As shown, **M57** is found just under half way along the line from β to γ which are only 2° apart. (It’s actually about $4'$ above that line). So put β and γ in your f/s and centre the spot $3/8^{\text{th}}$ the way from β . There you have it. Donuts in the sky.

(Continued on page 7)



Star Hopping to Messiers #13 and Lyra (M56 & M57)

Hercules (M13 & M92) Bob Bee



To find **M56**, first identify the mag 3 star β Cygni, or Albireo just over 8° to the east of γ Lyr. It's a show piece binary worth looking at in its own right. M56 lies exactly on that line 4.4° from γ . So place your f/s on γ Lyr, and move towards Albireo. γ and M56 should both be in your f/s FoV, though you won't actually see M56. Estimate the 4.4° and move the f/s centre to there and check your main eye piece. Voila!

As mentioned in earlier articles, when referring to the charts here, you need to allow for any reversals or inversions of views in your finder scope. These charts show 'as in the sky' views.

Good Hopping.

Some Centaurus NGC Observations

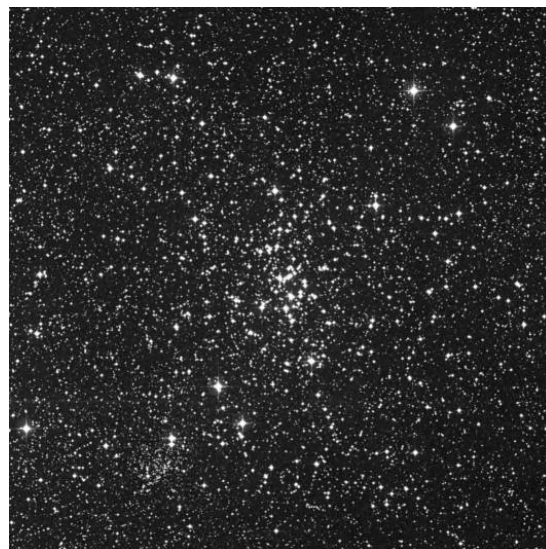
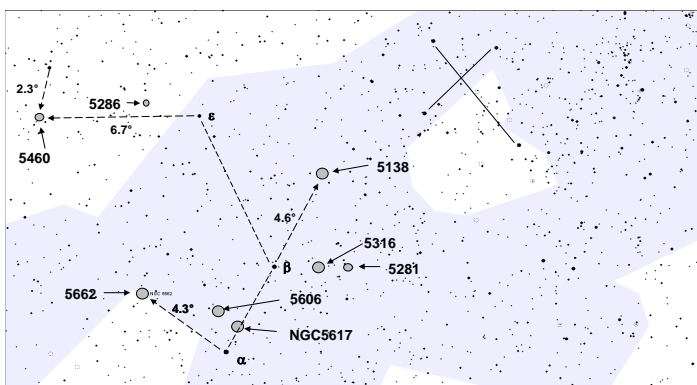
Bob Bee

After the MAS Stargard night was called off on 16th May, the wind dropped and there was a beautiful sky. Isn't it always the way? So I decided to do some observing from my Mt Annan back yard. I couldn't have asked for a better evening.

For reasons I don't remember, I decided to explore some lesser visited NGCs in Centaurus, mostly gathered around the area of the Pointers. I simply opened up my Starry Night program, highlighted NGC and picked 8 of them gathered in the Pointers area. I created the chart shown below, highlighting the locations and numbers of my targets for that night. I also added some helpful 'hopping' tips for my use.

book held on my lap under red light as I observed.

I started with **NGC5617**, nearest α Centauri. It was easy to locate as it is exactly $\frac{1}{4}$ the way from α to β . It appeared in low power (x40) as a delicate spray of faint stars. At x85, the stars resolved better. All were very faint and appeared the same colour (blue/white). I saw no distinctive pattern, just a random spread in a roughly oval shape about 10' diameter.



NGC5617

Then it was out to my back yard with my 254mm Dob. It was fun working my way through the list, objects (with the exception of two) I had never sought out before. Half the challenge was to convince myself that I was actually looking at the target cluster, not having checked prior to this the appearance of each object. The following details are basically a transcript from my scribbled notes in my

Next came **NGC5606**: This is 1.1° from 5617 at a bit over a right angle from the α - β line. It was easy to put my f/s centre on its position but when I checked the main

(Continued on page 8)



Some Centaurus NGC Observations

Bob Bee

eye piece, it took me a while to convince myself I actually had it. It just didn't look like a 'cluster'. It was very small, even at high mag. What I saw was a very small 'wedge' of stars, with others stretched out in a ragged string. I was sure it was in the right spot. (When I later checked the internet for an image, I found I was right. See image below). It is only 3' across. Still, an interesting little cluster.



NGC5606

I then moved out further to **NGC5662**. I have this one in my binocular astronomy book and thought I'd check it out in a scope. Even with the local neighbourhood light pollution, in binoculars I could still make out the faint hazy patch of stars. There appears to be a wide dark division down the middle. This impression is reinforced in the telescope view. It offers a nice smattering of clearly resolved stars, mostly whites and white/blues, but I did see some yellows and oranges to break the monotony. There is a definite clear path down the middle, to suggest a rough triangle shape of stars on one side and a squarish shape on the other. It's not a cluster to shout about, but interesting all the same. It's about 12' diameter.



NGC5662

brighter star at its centre. Is that part of the cluster or a foreground star? The cluster looks like an elongated string of stars at x40. I increased mag to 140 but didn't reveal much more. However, I could see that the stars had the appearance of small curving arcs away from the central bright star. Overall, it is small in size (5') but has character.



NGC5281

NGC5138: I star hopped 4.6° beyond β Cen. along the Pointer line. At low (x40) mag at first I thought there was nothing there but the odd star in an open field. Was I off target? But closer examination made me realise that there was actually a very faint open cluster in the middle of it all. (It turns out it is one of the faintest of that night's targets.) I upped the magnification and resolved more stars. Very faint, I estimated about 50+ of them. My highest mag (x140) made them more distinct. It was definitely a reasonable sized cluster but very faint. I was happy to have tracked it down and nailed it.



NGC5138

NGC5281: I found this by hopping from β past 5316 by an extra 1.3°. It appears as a small knot of stars with a

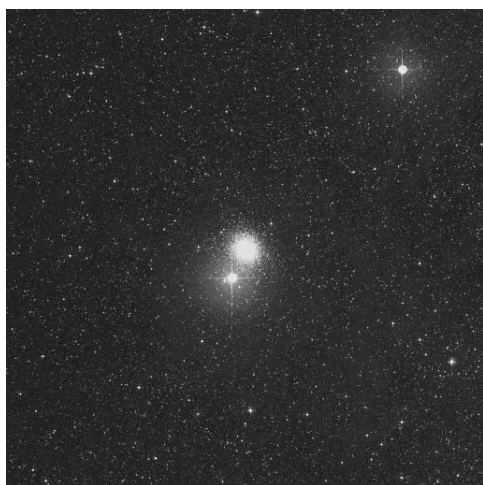
(Continued on page 9)



Some Centaurus NGC Observations

Bob Bee

NGC5286: I then went back to the eastern side of the Pointers. I hopped from β to ϵ Cen., then off at 45° for 2.2° or $\frac{1}{2}$ my f/s FoV (which was roughly the $\alpha - \beta$ distance). There, parked close to a bright foreground star, was (in low mag) a distinct smudge of a globular cluster. I then went to a higher mag (x140) and this gave a good view. The glob appeared to have a largish concentration (not a small highly concentrated centre) and the outer part was fairly evenly dispersed to a nice regular circular ball. It seemed to have a fairly distinct cut-off at its perimeter. I thought this was a nice catch.



NGC5286

NGC5460: It took me a while to nail this one (in the telescope) as there were not a lot of bright stars nearby to use a guides for my f/s. (I found it easily in my binoculars though, which is a bit ironic. It's in my book.) Actually, by locating it in my binoculars, I was able to map out a path from ϵ Cen. of fainter stars and look for those in my f/s. In binoculars (even in the local light pollution) it definitely looked like a faintish cloud of stars beside two 'brighter' foreground stars. I finally got my scope onto it.



NGC5460

In my scope on x40, it looked quite weird. There are a number of short chains of stars separated from each other but arranged in tiers. It gave me a spooky reminder of the multi-jawed creature from the movie Alien. All those teeth!

Here's a summary of the magnitudes and sizes of my night's targets.

NGC	5617	5606	5662	5316
Type	OC	OC	OC	OC
Size (')	10	3	12	14
Mag.	6.3	7.7	5.5	6.0

NGC	5281	5138	5286	5460
Type	OC	OC	GC	OC
Size (')	5	8	9	25
Mag.	5.9	7.6	7.6	5.6

So that completed my planned viewing for the night. I then indulged in observing Saturn, ω Centauri and the usual suspects. In all, it was a grand night out.

Pity about Stargard.



Prime Focus Article Submission

Deadline for article submissions for the July edition of Prime Focus is

Monday 13th July 2009

All Articles can be submitted via email editor@macastro.org.au

Or via snail mail to the MAS Postal address

**PLEASE NOTE THE CHANGE OF EMAIL ADDRESS
FOR SUBMISSIONS!!!**



Who Invented the Telescope?

David M Jones

So – who exactly did invent the telescope? I for one always assumed – wrongly as it turned out – that it was Galileo Galilei, the Italian physicist, mathematician, astronomer, and philosopher.

A little research reveals that Galileo's telescope was indeed the first to be used for astronomical purposes. Possibly, the most noteworthy contribution that Galileo Galilei made to science was the sighting of the four satellites around Jupiter; these are named in his honour. Galileo first detected the moons of Jupiter on January 7, 1610 through his homemade telescope. He first thought he saw only three stars near Jupiter, strung out in a line through the planet. The next evening, these stars seemed to have moved the wrong way, this caught his interest. Galileo continued to monitor the stars and Jupiter over the following week.



Galileo Galilei 1564-1642

On January 13, a fourth star seemingly emerged. After a few weeks, Galileo had observed that the four stars never left the locality of Jupiter and appeared to be carried along with the planet, and that they changed their place with respect to each other and Jupiter. Logically, Galileo reasoned that what he was studying were not stars, but planetary bodies in orbit around Jupiter. This discovery provided evidence in support of the Copernican system and showed that the heavens did not revolve around the Earth. (Baalke)

So – if Galileo Galilei didn't actually invent the telescope, who did? My reading indicates that the inventor of the telescope was in fact one Hans Lipperhey (or Lippershey depending on the reference)). Lipperhey was a German spectacle-maker. He was born in Wesel, Germany, but eventually relocated to Middleburg, a part of the Zeeland province in the Netherlands.



Hans Lipperhey 1570-1619

Legend would have us believe that Lipperhey's children 'invented' the telescope whilst playing with discarded lenses in Lipperhey's workshop. In fact, it seems well-documented that Hans Lipperhey's name is on the official patent application for the device. (Roby)

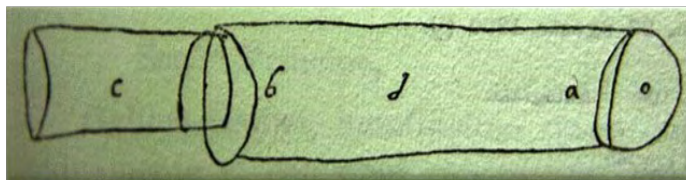
Legend would have us believe that Lipperhey's children

'invented' the telescope whilst playing with discarded lenses in Lipperhey's workshop. In fact, it seems well-documented that Hans Lipperhey's name is on the official patent application for the device. (Roby)

Human short-sightedness is once more highlighted when research reveals that Lipperhey's patent for his 'telescope' was refused! (Perhaps on the grounds that no one would ever find a use for such an implement).

In spite of the fact that his patent application had failed, he was, it seems, generously rewarded by the Dutch Government of the day for his design. Interestingly, the 'Dutch perspective glass' from which his 'telescope' was formed could only magnify 'thrice' (x3). The term 'Dutch perspective glass' refers to the actual discovery made by Lipperhey, ergo, aligning two lenses one in front of the other produced a larger than usual image.

Word of the method – or invention – eventually spread throughout Europe, reaching the ears of interested parties. The following year – 1609 – a professor at the University of Padua, Italy heard of the novel apparatus and assembled his own version. Rapid advances in technology are not confined to today's world it seems. After some experimentation, the good professor produced an apparatus that would magnify, not 'thrice' but ten times (x10). The name of that good professor was, of course, Galileo Galilei. (McDonald)



The earliest known illustration of a telescope. Giovanbattista della Porta included this sketch in a letter written in August 1609 - . <http://www.aip.org/history/cosmology/tools/pic-first-telescopes-portasketch.htm>

References:

Baalke, R. *The discovery of the galilean satellites* (Galileo Galilei Discoveries). Retrieved May 22, 2009, from <http://www2.jpl.nasa.gov/galileo/ganymede/discovery.html>.

McDonald, J. M. *Planetarium - Two small pieces of glass* (Lipperhey). Retrieved May 22, 2009, from <http://www.hastingsmuseum.org/planetarium/twosmall/index.htm>.

Roby, J. *Who invented the telescope* (Reference). Retrieved May 22, 2009, from Astronomy for Kids On-line: <http://www.astronomy-for-kids-online.com/whoinventedthetelescope.html>.