macarthur astronomical society

prime focus

monthly journal of the M.A.S.

Volume 15, Issue 1 January 2010

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President's Report: John Rombi

Presidents Report

Welcome to the first 2010 edition of *Prime Focus*.
With the end of The IYA, I would like to again thank YOU the members of MAS for your dedication and generosity in promoting Astronomy & MAS to the masses.

In November

I would like to thank Dr Tim Robishaw for his fascinating presentation "Magnetic Fields Near and Far"

(Continued on page 2)

MAS Committee

MAS Dates 2010

January 2010		**July 2010**	
09/1/10	Stargard	10/7/10	The Forest
16/1/10	The Forest	17/7/10	Stargard
181/10	General Meeting	19/7/10	General Meeting
February 2010		**August 2010**	
06/02/10	Stargard	07/8/10	The Forest
13/02/10	The Forest	14/8/10	Stargard
15/02/10	General Meeting	16/8/10	General Meeting
March 2010		**September 2010**	
13/3/10	Stargard	04/9/10	Stargard
15/3/10	General Meeting	11/9/10	The Forest
20/3/10	The Forest	20/9/10	General Meeting
April 2010		**October 2010**	
10/4/10	Stargard	02/10/10	Stargard
12/4/10	General Meeting	09/10/10	The Forest
17/4/10	The Forest	18/10/10	General Meeting
May 2010		30/10/10	Stargard
08/5/10	Stargard		
15/5/10	The Forest	**November 2010**	
17/5/10	General Meeting	06/11/10	The Forest
		15/11/10	General Meeting
June 2010			
05/6/10	Stargard	**December 2010**	
12/6/10	The Forest	04/12/10	The Forest
21/6/10	General Meeting	11/12/10	Stargard

President's Report: John Rombi

Tim has also shown interest in joining us at The Forest throughout 2010.

It has been many years since Tim has *"looked"* through a telescope, so he is keen for a good look at our dark sky site.

I have supplied our observing dates to Tim.

Members private Observing Nights

I hope that our observing nights will be cloud free this year, unlike 2009, that should be renamed International year of the Cloud!!

I hope to see as many of you on the field as possible.

Public Nights

There will be only two open nights this year.

With the 10th Anniversary of The Domes being celebrated this year, UWS has asked if we could hold nights to celebrate this milestone.

Roger and I are to meet UWS Provost Anne Cusick in the next few weeks, I will inform her that MAS will be available for two nights.

In keeping with the celebration of the occasion, UWS has offered to MAS our meeting room for 2010, free of charge.

This is a very generous offer, and helps strengthen the bond between us.

Event with Campbelltown Council

Tentative arrangements have been made with the council to hold our event from Oct 5th-9th inclusive.

The dates are dependant on MAS acquiring a speaker for the Saturday finale.

I will keep you informed of our progress.

I hope to see as many of you on the field this year as possible.

Clear Skies, John Rombi.

Secretary's Column: Roger Powell

One of the oddest statistics about MAS in the year just ended was that we had such excellent weather conditions for most of the public observing events, whilst our members observing sessions were all too frequently ruined or cancelled by cloudy conditions.

It is anyone's guess why there was such a discrepancy between weather conditions at private and public observing events, although an unsubstaniated theory has been mooted by some members that there is a scientific correlation between the New Moon and cloudy skies!

By my reckoning, out of twenty-five scheduled 'new moon' Members Observing nights at Stargard and Belanglo Forest, only twelve could be regarded as a success. That's a very disappointing success rate of only 48%! Hanging around on a Saturday afternoon fretting about whether the sky will be clearing or not is not much fun. Nor is turning up on the night with all the gear without getting to see anything worthwhile.

On pages 6 and 7 in this issue of *Prime Focus* is a table of our public events organised for the International Year of Astronomy. Just two Public Outreach observing sessions out of sixteen were cancelled during the year – a success rate of 87.5%. Of the fourteen succesful public nights, I recall one was at The Domes under relatively clear skies whilst a raging thunderstorm only forty kilometres away was causing tremendous flooding in Sydney's eastern suburbs. We certainly got lucky that night.

At least we can be happy that when the clouds do leave, we have the good fortune of some great skies at The Forest and Stargard. The same cannot be said for our public nights at The Domes, because whilst the skies there have been generally cloud free, the light pollution there is deteriorating.

If we add up all of the observing nights, (public and private) and general meetings, we had fifty-two scheduled members events in 2009. Committee members had another twelve. It is a great tribute to John's organising skills that MAS was able to hold and/or participate in so many events during the year and also to the many members who turned out so often to support them.

Particular mention also to Bob Bee who gave a number of public lectures and - on one memorable day in April - gave three lectures in the space of about ten hours.

Our public activities will be continued during 2010 but are expected to be less numerous. We have also had an invitation to return to Tudor House School and are expecting to hold one big event in collaboration with Camp-

Secretary's Column: Roger Powell

belltown City Council.

Despite the poor success rate for observing nights, the December night at Stargard was a spectacular success, with clear skies enjoyed by the attendance of twenty-five members and one inquisitive cow. The only pity was the shortness of the evening due to daylight saving, with astronomical twilight delayed until about nine o'clock. Planetary observers who stayed all evening were treated to views of Mercury, Mars, Jupiter, Saturn, Uranus and Neptune. Only Venus did not make an appearance.

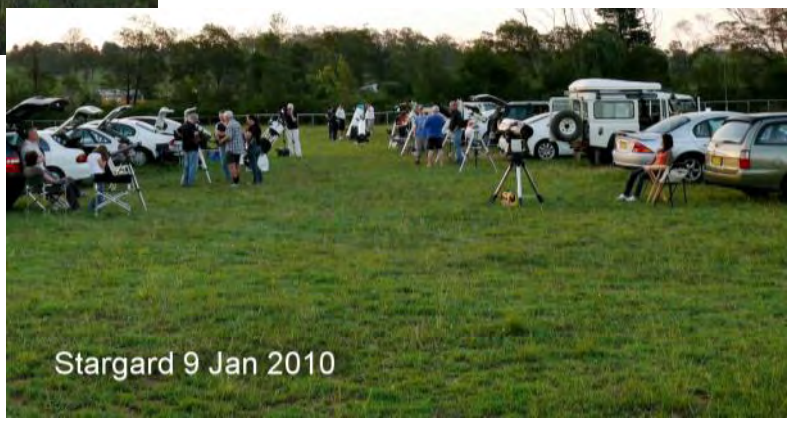
For 2010, both Mars and Saturn are now re-entering the evening sky. Saturn will be visible until September, whilst Mars will be gone a month later. Saturn's rings were edge on during 2009 but the ring plane angle is now widening and will reach ten degrees by the end of the year, making it a better target for astro-imagers. In the meantime, say goodbye to Jupiter, Uranus and Neptune for a few months.

2009 has gone and another decade is beginning. During the last ten years, we have found water on the Moon, roved around Mars, landed on Titan, sent probes to the Moon, Mercury, Saturn, comets and goodness knows where else. We have discovered hundreds of exo-planets and pinpointed the exact age of the Universe (13.73 billion years).

It has been an extraordinary decade. No longer is space exploration the sole domain of USA and Russia. Now we have China, Europe, Japan and India sending up their own space missions. The coming decade promises to be even more exciting!

Wishing all members a tremendous 2010.


Stargard December 2009


Stargard 9 Jan 2010

A Really Brief Note from the editor: Geoff Young

2010—my most sincere hopes for a good year with clear skies, especially at or near a new moon. I trust everyone had a relaxing and enjoyable time with family and friends over the Christmas / New Year break.

Thankyou to this month's contributors —because of you we have a nice little 10 page edition.

Our resident Ass-trologer has made a re-appearance. For those of you who are unaware, Heso Fulovit is actually two people—Heso and his brother Notso—Notso is responsible for this month's column and will accept all blame for anything that is predicted and does not happen, but will gratefully accept any winnings if he says it will happen and does.

OBSERVING JANUARY 2010

Sun, Moon and Planets Observing List, evening of 2010 Jan 16 at The Forest, Belanglo, NSW

Sunset 20:19, Twilight ends 21:55, Twilight begins 04:23, Sunrise 05:59, Moon rise 07:29, Moon set 20:48

Completely dark from 21:55 to 04:23. New Moon. All times local (GMT+11).

Listing All Classes visible above the perfect horizon and in twilight or moonlight after 21:17 and before 02:47.

Primary ID	Con	Mag	Rise	Transit	Set
Neptune	Cap	8	8:18	15:07	21:52
Jupiter	Aqr	-2.1	8:40	15:25	22:07
Uranus	Psc	5.9	10:35	16:54	23:09
Mars	Cnc	-1.1	21:22	2:30	7:37
Saturn	Vir	0.8	23:30	5:35	11:41

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	Equ	Equuleus	Tri	Triangulum
CMa	Canis Major	Oph	Ophiuchus	Eri	Eridanus	TrA	Triangulum Australe
CMi	Canis Minor	Ori	Orion	For	Fornax	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	Hy	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 2010 Jan 16 at The Forest, Belanglo, NSW

Sunset 20:19, Twilight ends 21:55, Twilight begins 04:23, Sunrise 05:59, Moon rise 07:29, Moon set 20:48

Completely dark from 21:55 to 04:23. New Moon. All times local (GMT+11).

Listing All Classes visible above the perfect horizon and in twilight or moonlight after 21:17 and before 02:47.

Cls	Primary ID	Alternate ID	Con	Mag	Size	Distance	Rise	Transit	Set
Glob	Pavo Globular	NGC 6752	Pav	5.3	29.0'	20000 ly	-	12:29	-
Glob	M 30	NGC 7099	Cap	6.9	12.0'	39000 ly	7:39	14:58	22:14
PNe	Helix	NGC 7293	Aqr	6.3	16.0'	530 ly	8:36	15:47	22:55
Gal	NGC 55	MCG -7-1-13	Scl	8.5	30.2'x 3.4'	4.9 Mly	9:02	17:32	1:59
Glob	47 Tucanae	NGC 104	Tuc	4	50.0'	20000 ly	-	17:41	-
Gal	M 110	NGC 205	And	8.9	17.8'x 9.8'	2.6 Mly	14:18	17:58	21:37
Gal	M 32	NGC 221	And	8.9	8.5'x 5.9'	2.6 Mly	14:15	18:00	21:44
Gal	Andromeda Galaxy	M 31	And	4.3	2.6°x 1.1°	2.6 Mly	14:18	18:00	21:42
Gal	Sculptor Galaxy	NGC 253	Scl	7.9	28.2'x 5.5'	13.0 Mly	10:38	18:05	1:28
Gal	Small Magellanic Cloud	NGC 292	Tuc	2.8	5.3°x 3.4°	200000 ly	-	18:10	-
Glob	NGC 288		Scl	8.1	13.0'	39000 ly	10:38	18:10	1:38
Glob	NGC 362		Tuc	6.8	14.0'	39000 ly	-	18:20	-
Gal	Pinwheel Galaxy	M 33	Tri	6.4	61.7'x 36.3'	2.9 Mly	14:19	18:51	23:23
PNe	Little Dumbbell	M 76	Per	10.1	2.7'	2400 ly	16:39	18:59	21:19
Open	NGC 752	Collinder 23	And	6.6	75.0'	1500 ly	15:14	19:15	23:16
Open	M 34	NGC 1039	Per	5.8	35.0'	1600 ly	16:25	19:59	23:33
Gal	M 77	NGC 1068	Cet	9.7	6.6'x 5.8'	70.0 Mly	13:53	19:59	2:06
Open	NGC 1245	Collinder 38	Per	7.7	40.0'	9100 ly	17:29	20:32	23:34
Open	NGC 1342	Collinder 40	Per	7.2	15.0'	2200 ly	16:46	20:48	0:51
Open	Pleiades	M 45	Tau	1.5	120.0'	490 ly	16:08	21:04	1:59
Open	NGC 1444	Collinder 43	Per	6.4	4.0'	3900 ly	19:00	21:06	23:13
Open	NGC 1528	Collinder 47	Per	6.4	16.0'	2500 ly	19:08	21:32	23:57
Open	Hyades	Collinder 50	Tau	0.8	5.5°	150 ly	16:22	21:43	3:05

OBSERVING JANUARY 2010

Best and Brightest 200 Observing List, evening of 2010 Jan 16 at The Forest, Belanglo, NSW
Sunset 20:19, Twilight ends 21:55, Twilight begins 04:23, Sunrise 05:59, Moon rise 07:29, Moon set 20:48
Completely dark from 21:55 to 04:23. New Moon. All times local (GMT+11).
Listing All Classes visible above the perfect horizon and in twilight or moonlight after 21:17 and before 02:47.

Cls	Primary ID	Alternate ID	Con	Mag	Size	Distance	Rise	Transit	Set
Open	NGC 1647	Collinder 54	Tau	6.2	40.0'	1800 ly	16:51	22:02	3:14
Open	NGC 1664	Collinder 56	Aur	7.2	9.0'	3900 ly	18:40	22:08	1:36
Open	NGC 1746	Collinder 57	Tau	6.1	42.0'	1400 ly	17:23	22:20	3:17
Glob	NGC 1851		Col	7.1	12.0'	55000 ly	13:59	22:30	7:02
Gal	Large Magellanic Cloud	ESO 56 115	Dor	0.8	10.8°x 9.2°	200000 ly	-	22:39	-
Open	M 38	NGC 1912	Aur	6.8	20.0'	3500 ly	18:35	22:45	2:55
Neb	Crab Nebula	M 1	Tau	8.4	8.0'		17:48	22:51	3:54
Neb	Great Orion Nebula	M 42	Ori	4	40.0'x 20.0'		16:30	22:52	5:13
Neb	M 43	NGC 1982	Ori	9	7.0'x 6.0'		16:31	22:52	5:13
Open	M 36	NGC 1960	Aur	6.5	10.0'	4300 ly	18:35	22:53	3:11
Neb	Tarantula Nebula	NGC 2070	Dor	8.3	5.0'		-	22:54	-
Neb	IC 434	LBN 954	Ori	11	50.0'x 8.0'		16:44	22:57	5:10
Neb	M 78	NGC 2068	Ori	8	8.0'		16:57	23:03	5:09
Open	M 37	NGC 2099	Aur	6.2	14.0'	4500 ly	18:44	23:09	3:33
Open	NGC 2129	Collinder 77	Gem	7	5.0'	4900 ly	18:19	23:17	4:16
Open	37 Cluster	NGC 2169	Ori	7	5.0'	3400 ly	17:57	23:25	4:52
Open	M 35	NGC 2168	Gem	5.6	25.0'	3000 ly	18:30	23:25	4:20
Open	NGC 2175	Collinder 84	Ori	6.8	22.0'	5300 ly	18:18	23:26	4:34
Neb	Rosette	NGC 2237	Mon	5.5	70.0'x 60.0'		17:56	23:48	5:41
Open	NGC 2264	Collinder 112	Mon	4.1	39.0'	2200 ly	18:18	23:57	5:36
Open	M 41	NGC 2287	CMa	5	39.0'	2300 ly	16:55	0:02	7:10
Open	NGC 2301	Collinder 119	Mon	6.3	14.0'	2800 ly	18:03	0:08	6:13
Open	M 50	NGC 2323	Mon	7.2	14.0'	3300 ly	17:49	0:19	6:48
Open	NGC 2353	Collinder 130	Mon	5.2	18.0'	3600 ly	17:55	0:31	7:06
Open	NGC 2355	Collinder 133	Gem	9.7	7.0'	7200 ly	19:05	0:33	6:01
Open	NGC 2360	Collinder 134	CMa	9.1	13.0'	6200 ly	17:43	0:34	7:25
PNe	Eskimo Nebula	NGC 2392	Gem	8.6	47"	3400 ly	19:39	0:45	5:52
Gal	NGC 2393	MCG 6-17-14	Gem	14.6	1.1'x 0.7'	220.0 Mly	20:28	0:46	5:05
Open	M 47	NGC 2422	Pup	4.3	25.0'	1600 ly	18:05	0:53	7:40
Open	NGC 2423	Collinder 153	Pup	7	12.0'	2500 ly	18:07	0:53	7:39
Open	NGC 2439	Collinder 158	Pup	7.1	9.0'	13000 ly	17:08	0:57	8:46
Open	M 46	NGC 2437	Pup	6.6	20.0'	4500 ly	18:09	0:58	7:46
PNe	NGC 2440	PN G234.8+02.4	Pup	11.5	54"	3700 ly	17:59	0:58	7:57
Open	M 93	NGC 2447	Pup	6.5	10.0'	3400 ly	17:42	1:00	8:19
Open	NGC 2451	Collinder 161	Pup	3.7	45.0'	720 ly	16:41	1:01	9:21
Open	NGC 2477	Collinder 165	Pup	5.7	15.0'	4000 ly	16:45	1:08	9:31
Open	NGC 2516	Collinder 172	Car	3.3	30.0'	1300 ly	-	1:14	-
Open	NGC 2506	Collinder 170	Mon	8.9	12.0'	11000 ly	18:39	1:16	7:52
Open	NGC 2547	Collinder 177	Vel	5	25.0'	1500 ly	15:36	1:26	11:16
Open	NGC 2546	Collinder 178	Pup	5.2	70.0'	3000 ly	17:10	1:28	9:46
Open	NGC 2571	Collinder 181	Pup	7.4	8.0'	4400 ly	17:54	1:35	9:15
Open	IC 2391	Collinder 191	Vel	2.6	60.0'	570 ly	14:56	1:56	13:00
Open	Beehive	M 44	Cnc	3.9	70.0'	610 ly	20:46	1:56	7:07
Open	IC 2395	Collinder 192	Vel	4.6	18.6'	2600 ly	16:21	1:58	11:35
Open	M 67	NGC 2682	Cnc	7.4	25.0'	3000 ly	20:34	2:07	7:41
Glob	NGC 2808		Car	6.2	14.0'	26000 ly	-	2:27	-
Open	IC 2488	OCL 789	Vel	7.4	18.0'	3700 ly	-	2:43	-
Open	NGC 3114	Collinder 215	Car	4.5	35.0'	3000 ly	-	3:18	-
PNe	Eight Burst	NGC 3132	Vel	8.2	1.4'	3600 ly	18:48	3:23	11:57
Glob	NGC 3201		Vel	6.9	20.0'	13000 ly	18:13	3:33	12:57
Open	NGC 3228	Collinder 218	Vel	6.4	5.0'	1800 ly	17:08	3:37	14:10
Gal	NGC 3227	Arp 94	Leo	11.5	4.1'x 2.1'		22:29	3:39	8:49
PNe	Ghost of Jupiter	NGC 3242	Hya	8.6	40"	2800 ly	20:40	3:40	10:41
Open	IC 2581	Collinder 222	Car	5.3	5.0'	8000 ly	-	3:43	-
Open	IC 2602	Collinder 229	Car	1.6	100.0'	520 ly	-	3:58	-
Open	NGC 3532	Collinder 238	Car	3.4	50.0'	1600 ly	-	4:21	-
Gal	M 65	NGC 3623	Leo	10.1	8.1'x 2.1'	41.0 Mly	23:04	4:34	10:04

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

Trevor's Trivia: Trevor Rhodes

Another great night had by those who attended **Wollondilly Anglican College**. Moving along the line, we had John Rombi, Anne Rhodes, myself, Jim Tuckwell, Debra Taylor and Graeme Bellamy. We set up in the bottom car park and waited for the sun to depart. The talk given by David Reneke was held in a small lecture theatre in a nearby building.

Although I was not able to attend the talk, I know it must have been good as the people who came from the talk to the telescopes were “Ooohing” and “Aaahing” before they even got near one. The students were a very well behaved group and are a credit to their parents and the school.

Discounting the moon which was not present, we showed them such things as Jupiter and it's moons, 47 Tucanae, M20 the Triffid Nebula, M22 a Globular Cluster and M27, the Dumbbell Nebula. The end of the night came with appreciation shown by all those present.

Night over? Not on your life. Anne and I were walking around the cars looking for anything that may have been inadvertently left lying around when I just had to open my mouth and say 'this would be just the time to get a flat'. Did I have a flat tyre? No. Did anyone else have a flat tyre? No. But I hadn't said 'flat tyre', just 'flat'. Our beloved Tea Lady, Debra Taylor had said goodnight, jumped into her car and attempted to start it.

Brrrrttttttttttt, ticka ticka ticka ticka ticka ticka ticka ticka ticka. Flat battery. John came to the rescue and hooked Debra's second battery up. The car started and we were all on the way home in no time. All John needs now is some shining armour.

Moving on south, we come to **The Forest**. The less seen, the less said. So I'll just say that we did see some things (in between the clouds) and they were very interesting.

Public Night 28th November at the UWS Domes.

What a cloudy day that was. I think everyone was less than impressed at the way the evening started out, but the skies did clear enough for us to make a successful night for the few people that did turn up.

It was probably our leanest night as far as the public goes as I counted somewhere between 20 to 30 people. The highlight of the night would have to be Sarkis turning up with his new telescope. Now, I heard he'd bought a nice shiny new 12", and he had. So what do we see when he pulls it out? A nice shiny new 16"!!! I can't wait till I get up one morning to see my 12" all grown up into a handsome new 16". The only trouble is I'd need a ladder and some roof racks to carry it on. I'm not that tall. The night went well though and ended as usual with all chairs out and good long chat. I go as much for the chat as the astronomy I think.

Our **Stargard** Night was a great success with 24 people on the field with16 scopes and a couple of cameras. I think I spent more time wandering around from scope to scope chatting than I did observing. Yes Geoff, I know, you can't shut me up. :)

INTERNATIONAL YEAR OF ASTRONOMY AT MAS: Roger Powell

The year just ended was a very hectic one for the Committee and a busy year for most members too. I didn't realise how much MAS had done during IYA2009 - until I was requested to compile a schedule of activities by the IYA2009 organisers.

So here, for the record, is the schedule, showing all events which MAS held or participated in during 2009 (on page 7).

Public nights and astronomy lectures at UWS held in collaboration with *University of Western Sydney.*

'100 Mile Dinner Under the Stars' was organised by The *Mamre Project.*

Many other organisations used IYA2009 to fill their coffers but to catch the spirit of IYA2009, *Macarthur Astronomical Society* did not charge to view through our telescopes at any event under our control, in order to attract as many as possible to each occasion. Exceptions were the joint UWS/MAS Fred Watson Lecture and the '100 mile Dinner Under The Stars'. MAS received no share of proceedings from either event, other than donations and merchandise sales at Fred's lecture..

Amazingly, only two of the listed viewing sessions were cancelled due to adverse weather conditions. However both were held in conjunction with an indoor lecture which did proceed.

INTERNATIONAL YEAR OF ASTRONOMY AT MAS: Roger Powell

DATE	EVENT	Est. No	COMMENTS
7th March	Public Observing Night at University of Western Sydney, Campbelltown.	200 free	UWS Rotary Observatory supplemented by telescopes of our members.
18th April	Campbelltown & Airds Historical Society – National Heritage Festival, Glenalvon House, Campbelltown.	90	'Our Place Under The Southern Cross' – A public lecture, delivered twice, on the history of astronomy by Robert Bee. Followed by MAS telescope daylight display and solar telescope viewing. Viewing free.
18th April	The Oaks Historical Society – National Heritage Festival, Heritage Centre, The Oaks.	80	'Our Place Under The Southern Cross' – A public lecture, delivered for the third time in 8 hours, on the history of astronomy by Robert Bee. Followed by nightsky viewing through member's telescopes. Viewing free.
23rd April	Australian Geographic Shop, Macarthur Square, Campbelltown.	40 free	'Astronomy for Beginners' – a public lecture to children by Robert Bee.
2nd May	Public Observing Night at University of Western Sydney, Campbelltown.	40 free	UWS Rotary Observatory supplemented by telescopes of our members.Cancelled due to weather but replaced by lecture by Dr Ragbir Bhathal.
30th May	Public Observing Night at University of Western Sydney, Campbelltown.	150 free	UWS Rotary Observatory supplemented by telescopes of our members.
13th June	Tudor House School, Moss Vale	50 free	'Astronomy for Beginners' – a lecture to students by Robert Bee. Followed by student telescope viewing which was cancelled by weather.
29th June	Cawdor Public School, Cawdor.	60 free	'Astronomy for Beginners' – a lecture to students by Robert Bee. Followed by nightsky viewing through member's telescopes.
4th July	Public Observing Night at University of Western Sydney, Campbelltown.	120 free	'Life in Space' Lecture by Dr Bhathal (UWS) followed by observing at UWS Rotary Observatory supplemented by telescopes of our members.
1st August	Public Observing Night at University of Western Sydney, Campbelltown.	10 free	UWS Rotary Observatory supplemented by telescopes of our members.
15th August	International House Students Observing Night	60 free	Night sky viewing for overseas university students at Belanglo Forest.
29th August	Public Observing Night at University of Western Sydney, Campbelltown.	100 free	UWS Rotary Observatory supplemented by telescopes of our members.
26th Sept.	"Why is Uranus Upside Down?'	100 $2.50	A public lecture by Professor Fred Watson (AAO) at University of Western Sydney, Campbelltown.
26th Sept.	Public Observing Night at University of Western Sydney, Campbelltown.	100 free	Lecture by Dr Bhathal (UWS) followed by observing at UWS Rotary Observatory supplemented by telescopes of our members.
16th Oct	'100 Mile Dinner Under the Stars' at Mamre Homestead, Blacktown.	100 free	Nightsky viewing for gathering of politicians and local councillors representing Sydney's West, North West and South-West regions.
24th Oct	Public Observing Night at University of Western Sydney, Campbelltown.	60 free	'The Life & Death of the Universe' Lecture by Dr Bhathal (UWS) followed by observing at UWS Rotary Observatory supplemented by telescopes of our members.
11th Nov	Wollondilly Anglican School, Tahmoor.	80 free	Lecture to students and parents followed by observing through members telescopes.
28th Nov.	Lecture and Public Observing Night at University of Western Sydney, Campbelltown.	30 free	Lecture by Dr. Bhathal (UWS) followed by observing at UWS Rotary Observatory supplemented by telescopes of our members.

The public reaction throughout the year was consistently of elation, astonishment and gratitude for the privilige of seeing the wonders of the night sky, very often for the first time in their lives. The Society only received one solitary complaint throughout the year.

Well done.

Character Analysis (or Assassination): Heso Fulovit

CAPRICORN - The Go-Getter (Dec 22 - Jan 19)

Optimistic and honest. Sweet personality. Very independent. Inventive and intelligent. Friendly and loyal. Can seem unemotional. Can be a bit rebellious. Very stubborn, but original and unique. Attractive on the inside and out. Eccentric personality. Nice all-round person

AQUARIUS - The Sweetheart (Jan 20 - Feb 18)

Generous, kind, and thoughtful. Very creative and imaginative. May become secretive and vague. Sensitive. Don't like details. Dreamy and unrealistic. Sympathetic and loving. Kind. Unselfish. Good kisser. Beautiful. Never backwards in coming forwards

PISCES - The Dreamer (Feb 19 - Mar 20)

Energetic. Adventurous and spontaneous. Confident and enthusiastic. Fun. Loves a challenge. EXTREMELY impatient. Sometimes selfish. Short fuse. (Easily angered.) Lively, passionate, and sharp wit. Outgoing. Lose interest quickly - easily bored... Egotistical. Courageous and assertive. Tends to be physical and athletic. Looks good in pink leotards.

ARIES - The Daredevil (Mar 21 - April 19)

Charming but aggressive. Can come off as boring, but they are not. Hard workers... Warm-hearted. Strong, has endurance. Solid beings that are stable and secure in their ways. Not looking for shortcuts. Take pride in their beauty. Patient and reliable. Make great friends and give good advice. Loving and kind. Loves hard - passionate. Express themselves emotionally... Prone to ferocious temper-tantrums. Determined. Indulge themselves often. Very generous when not miserly

TAURUS - The Enduring One (April 20 - May 20)

Smart and witty. Outgoing, very chatty. Lively, energetic. Adaptable but needs to express themselves. Argumentative and outspoken. Like change. Versatile. Busy, sometimes nervous and tense. Gossips. May seem superficial or inconsistent. Beautiful physically and mentally. Occasionally wears the same socks on both feet at the same time

GEMINI - The Chatterbox (May 21 - June 20)

Moody, emotional. May be shy. Very loving and caring. Pretty /handsome. Excellent partners for life. Protective. Inventive and imaginative. Cautious. Touchy-feely kind of person. Needs love from others. Easily hurt, but sympathetic. An all-round smoocher. Has an intense attraction to anyone in pink leotards. Especially disliked by Pisceans.

CANCER - The Protector (June 21 - July 22)

Very organised. Need order in their lives - like being in control. Like boundaries. Tend to take over everything. Bossy. Like to help Others. Social and outgoing. Extroverted. Generous, warm-hearted. Sensitive. Creative energy. Full of themselves. Loving. Doing the right thing is important. Attractive when not unattractive

LEO - The Boss (July 23 - Aug 22)

Dominant In relationships. Conservative. Always wants the last word. Argumentative. Worries. Very smart. Dislikes noise and chaos. Eager. Hardworking. Loyal. Beautiful. Easy to talk to. Hard to please. Harsh. Practical and very fussy. Often shy. Pessimistic. Has been known to stop talking occasionally.

VIRGO - The Perfectionist (Aug 23 - Sept 22)

Nice to everyone they meet. Can't make up their mind. Have own unique appeal. Creative, energetic, and very social. Hates to be alone. Peaceful, generous. Very loving and beautiful. Flirtatious. Give in too easily. Procrastinators. Very gullible when not being exceptionally incisive. Has a penchant for wearing tutus and hates Scorpios.

LIBRA - The Harmoniser (Sept 23 - Oct 22)

Very energetic. Intelligent. Can be jealous and/or possessive. Hardworking. Great kisser. Can become obsessive or secretive. Holds grudges. Attractive. Determined. Loves being in long relationships. Talkative. Romantic. Can be self-centred at times. Passionate and emotional. Can also be selfish and inattentive especially at meal times.

SCORPIO - The Intense One (Oct 23 - Nov 21)

Good-natured optimist. Doesn't want to grow up (Peter Pan Syndrome). Indulges self. Boastful. Likes luxuries and gambling. Social and outgoing. Doesn't like responsibilities. Often fantasizes. Impatient. Fun to be around. Having lots of friends. Flirtatious. Doesn't like rules. Sometimes hypocritical.. Dislikes being confined - tight spaces or even tight clothes. Doesn't like being doubted. Beautiful inside and out. Very attracted to tutus.

SAGITTARIUS - The Happy-Go-Lucky One (Nov 22 - Dec 21)

Patient and wise; practical and rigid. Ambitious. Tends to be good-looking. Humorous and funny. Can be a bit shy and reserved. Often pessimistic. Sagittarians tend to act before they think and can be unfriendly at times. Hold grudges. Like competition. Get what they want, often with complete disregard for others, whom they often forget exist.

OPHIUCHUS - The Forgotten One (Nov 15 – Nov 29)

For those of you born under this sign—sorry—I got this far and forgot about you and can't be bothered re - arranging all the others just to fit you in. Sort of exemplifies the garbage associated with this "art". As well, I couldn't think of any more meaningless platitudes.

Nuclear Fission v Nuclear Fusion: David M Jones

"Now I am become Death, the destroyer of worlds."
J. Robert Oppenheimer

Over the Christmas break I started to read a hefty, but very readable book entitled: '***The Making of the Atomic Bomb***'. As I waded through page after page relating to the development of the science and physics that would eventually bring about the birth of the nuclear age, I marvelled at how difficult it was - and no doubt, still is - for mankind to create that which occurs naturally in nature.

The logistics of bringing about an environment in which a nuclear chain-reaction can begin seemed hardly feasible. Many scientists considered the task might be physically impossible. The conditions required for a nuclear chain-reaction to occur must be akin to those that exist only in the stars.

My own curiosity eventually took me off on a tangent and I started to do a little research. Our earthly scientists sought how to split uranium atoms to bring about *nuclear fission*; I soon discovered this was not the process which occurs in the stars. On the contrary, stars, including our sun, create energy as a by-product of *nuclear fusion*! What was the difference I wondered?

A little more reading revealed that our atom bomb and its fission reaction is achieved through splitting uranium atoms by means of an implosion. That implosion results in a central core of fissionable material being placed under tremendous pressure – squeezing the metal core to less than half its previous volume. Under those conditions a fission chain-reaction is possible. This, I assumed, must at least compare briefly to natural conditions occurring under massive gravitational pressures.

Fusion

> *For fusion to work, extremely high energies are needed to fuse the nuclei together. This is needed to overcome the electrical repulsion (known as the coulomb barrier) between two positively charged nuclei, so that they get close enough to have the strong nuclear force bind the nuclei. This nuclear force has an effective range of around 10^{-15} meters, which is why fusion occurs most easily in stars, where a high density and temperature environment exists. The density and temperature are the primary factors in determining the probability of the nucleons fusing in the star... Most of the energy generated within the Sun is created from a sequence of reactions that "burns" hydrogen into helium, known as the proton-proton reaction.* (Team Thinkquest, 1998)

The article goes on to describe how, in our sun, the reaction occurs in the innermost region, where density is increased to one-hundred times the density of water on Earth. At this density, temperatures soar to approximately fifteen million K (15,000,000 degrees C). Hydrogen atoms are stripped of their electrons – creating plasma of free electrons and protons, the nuclei of the hydrogen. Under these conditions hydrogen is converted to helium. The resulting helium amalgam is smaller in mass than the original (hydrogen) free matter – the excess of this process being given off as heat and light. That description, I hasten to add, is a gross over-simplification on my part to meet the restrictions of this short article.

Fundamentals: the Sun as a Star

> *Our Sun is by far the largest object in our solar system, containing more than 99% of solar system's total mass. Observations of other stars indicate that the Sun is fairly "normal": it has a mass, luminosity and temperature that is somewhere in the middle-to-low end of the observed spectrum. It is also one of about 100 billion similar objects in the Milky Way. Its characteristics are hard to grasp by earthly values, with a mass of 2×10^{30} kg, an atmospheric temperature of 5500^{o} C and a luminosity of $4x10^{20}$ megawatts.*
>
> *The Sun is mainly composed of hydrogen and helium (~75% and ~25% by mass, respectively), with traces of heavier elements synthesised by past generations of stars in the solar neighbourhood. These heavier elements are the main constituents of the inner terrestrial planets in the solar system; the Jovian planets have compositions almost identical to the Sun itself.*
>
> *The proximity of the Sun to the Earth allows scientists to study phenomena in the solar atmosphere that are too small or too faint to be observed in even the next nearest star to our own.* (The Curious Team, 1997 - 2010)

Armed with the knowledge that fusion occurs naturally, and the process of fission was 'accidentally discovered' by radio-chemists Otto Hahn and Fritz Strassmann in 1938 – whilst in the course of unrelated experiments - I wondered where fission might occur spontaneously in nature.

> Unbelievably, it appears that 1.5 billion years ago - here on Earth - a natural nuclear fission

reaction took place. The site of this natural reaction was discovered 1972, in Oklo, Gabon, Africa. Scientists estimate the fission reaction continued on-and-off for hundreds of thousands of years! Whilst it was active, this natural process produced nuclear waste similar to the wastes produced by the man-made nuclear fission reactors of today.

Oklo Mine Site in Oklo, Gabon *Photo courtesy of Andreas Mittler*

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Article Submission

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

Monday 8th February 2010

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