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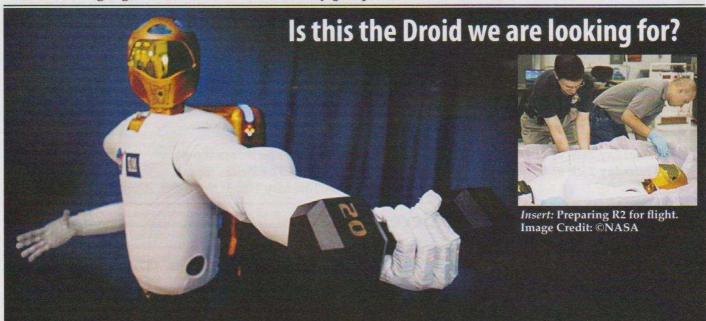
SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

Volume XIX, No. 5 (October/November/December 2010)

The Mornington Peninsula Astronomical Society (formerly the Astronomical Society of Frankston) was founded in 1969 with the aim of fostering the study and understanding of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general community at all levels.

The Society holds a focused general meeting each month for the exchange of ideas and information. Regular public and private observing nights are arranged to observe currently available celestial objects and phenomena. In addition, the society encourages the services of its members for educational presentations and observing nights for schools and community groups.



Almost 200 people from 15 countries have visited the International Space Station, but the orbiting complex has so far only ever had human crew members – until now.

Robonaut 2, the latest generation of the Robonaut astronaut helpers, is set to launch to the space station aboard space shuttle Discovery on the STS-133 mission, in November. It will be the first humanoid robot in space, and although its primary job for now is teaching engineers how dexterous robots behave in space, the hope is that through upgrades and advancements, it could one day venture outside the station to help spacewalkers make repairs or additions to the station or perform scientific work.

R2, as the robot is called, will launch inside the Leonardo Permanent Multipurpose Module, which will be packed with supplies and equipment for the station and then installed permanently on the Unity node. Once R2 is unpacked – likely several months after it arrives – it will initially be operated inside the Destiny laboratory for operational testing, but over time both its territory and its applications could expand. There are no plans to return R2 to Earth.

http://www.nasa.gov/mission_pages/station/main/robonaut.html Article Extract and Image Credit: ©NASA

Society Calendar

Upcoming Events in October

Friday 1st of Oct.: Public Viewing Night at The Briars (8pm).

October's regular Public Viewing Nights at The Briars, starting at 8pm, and held regardless of the weather. As usual, a large turnout is expected so we will need at least

6 scopes.

Wednesday 20th of Oct.: October's General Meeting at the Peninsula School (8pm).

Session 1 - Speaker Andrew Rennie on 'Saturns Rings and Moons'

Session 2 - Open Forum and 'Sky for the Month'

Saturday 23rd of Oct.: President's Birthday & Members Viewing Night at The Briars.

This month's members viewing night and this year's President's Birthday has been organised for the 23rd of October. Intensity of incident light from our Lunar neighbour is quite high with a Full Moon. So while not a great night's viewing (weather permitting of course), some of the regulars are still there to visit again. As with all member viewing

nights, there will be a free BBQ Sausage-Sizzle prior to viewing.

Wednesday 27th of Oct.: October's Committee Meeting at The Briars (8pm).

Upcoming Events in November

Friday 5th of Nov.: Public Viewing Night at The Briars (8pm).

November's regular Public Viewing Nights at The Briars, starting at 8pm, and held regardless of the weather. As usual, a large turnout is expected so we will need at least

6 scopes.

Saturday 13th of Nov.: Members Viewing Night at The Briars.

This month's members viewing night has been organised for the 13th of November. Intensity of incident light from our Lunar neighbour is slight with a First Quarter Moon. So why not bring your scopes along for a great night's viewing (weather permitting of course). As with all member viewing nights, there will be a free BBQ Sausage-Sizzle

prior to viewing.

Wednesday 17th of Nov.: Annual General Meeting at the Peninsula School (8pm).

Session 1 - Tabling of the Annual General Meeting. Session 2 - Speaker & Topic: To be Confirmed. Session 3 - Open Forum and 'Sky for the Month'

Wednesday 24th of Nov.: November Committee Meeting at The Briars (8pm). Thursday 25th of Nov.: St. Augustine's Primary School at The Briars (8pm).

(Approx. 45 Year 3/4 pupils) on Thursday 25th of November. About 3 scopes required

Upcoming Events in December

Friday 3rd of Dec.: Public Viewing Night at The Briars (8pm).

December's regular Public Viewing Nights at The Briars, starting at 8pm, and held regardless of the weather. As usual, a large turnout is expected so we will need at least

6 scopes.

Saturday 11th of Nov.: MPAS Christmas Party & Members Viewing Night at The Briars.

This month's members viewing night is also this year's MPAS Christmas Party. Organised for the 11th of December. Intensity of incident light from our Lunar neighbour is slight with a First Quarter Moon. So why not bring your scopes along for a great night's viewing (weather permitting of course) and join in the Christmas cheer. As with all member viewing nights, there will be a free BBQ Sausage-Sizzle prior to viewing.

Note: there is no General Meeting in December

ADVANCE NOTICE - January's Public Viewing Nights at The Briars

With the Summer holiday makers about in January, the society will once again be holding Public Viewing Nights at The Briars on every Friday in this month. Any assistance that could be offered over this period would be greatly appreciated.

While all care is taken to ensure the above dates are correct, these can change at late notice. To be up-to-date on the latest society happenings, check either E-Scorpius, the MPAS website: www.mpas.asn.au, or the latest "What's On" for up-to-date information.



Society News



The Committee and Society welcome the following new members.

Wishing you clear skies.

Tracey Neave John & Sunahwa O'Mahony Denis O'Loughlin Jenny Thompson Peter Honey

Kolawole Family -Michael, Helen, Reni, Seyi

George Family -

Regina, Murray, Chelton, Jarrod, April, Charlotte, Maeve

Hanna Family -Robert, Michael, Morgan, Jody, Joseph, Ronar

President's Report 2010_

h what a year! Astronomy in 2009 was busy, and breaking a few bones in the process. 2010 has continued at the same pace. I think I'll go down in history as the Although the weather this year has only astronomy society president to not been helpful for viewing, we be "attacked" by a meteorite. have maintained all our normal latitude!!

half of the month, which is out of Betelgeuse. sync with our General Meetings on the third Wednesday of the month. Apart from better facilities inside Thus we have been holding our the main building we have extended normal members viewing night the concrete observing platforms close to the New Moon plus the to provide additional space and special events closer to the Full power. The main building has been Moon. Happily the New Moon goes enclosed and we plan to incorporate back to the latter half of the month the library into this new section. in 2011 where it belongs.

and fortunately wasn't hurt. I did The International Year of my foot at another viewing night

Ian Sullivan has maintained a public and members viewing nights. high standard of guest speakers for One of the new concrete slabs in 2010 Dare I say, the lack of sunspots has our general meetings. Bob Heale has brought wetter weather to our maintained his high standard Sky for the Month presentations and We have held a record number this year introduced a new section of BBQ/Viewing nights this year showing the Sky for the Month because the Moon's phase. New from other parts of the Galaxy. Moon has been occurring in the first Handy if you need a star chart from

The Briars continues to develop.

The lower building is being School viewing nights have also extended to increase the storage continues at a high rate with ten space for scopes. We plan to have this school events held this year. School work completed for the VASTROC events have become decidedly next year at the end of April. This dangerous this year. At one event will be out third VASTROC and it Fiona stepped off a cliff in the dark will be held at our Briars facilities



together with the Briars Camp.

There has been a technological arms race at the Briars site with various iPods, iPad, iPhones, new automated telescopes and astrophotographic rivalry. I'm not sure if Alex's new 22" Dobsonian has been dubbed the "Rain Make" or "Leaning Tower of Piza" but it's a beautiful instrument.

As always none of this is possible without the work and commitment from the committee and volunteers who provide enormous support to keep the activities successful and fun. 2011 is shaping up to be another exciting year and all we need is a naked eye comet or supernova for VASTROC.

Clear skies and Happy viewing

Peter Lowe

President



Society News

2011 VASTROC - Call for Presentations

7ASTROC 2011 aims to bring together amateur astronomers from Victoria and beyond and provide opportunities for these astronomers to present and share their work and interests. We plan to have various streams of presentations covering a great width of astronomical work including observing, instrumentation, education, research, history and local activities.

Presentations may be made on any topic pertaining to Astronomy, preferably on work done by Vastroo the presenter in observing, instrument making, software development or education. The types of presentations that we are hoping to present are:

Oral Addresses

Call them papers or lectures, if you prefer. These will occur on the Saturday and Sunday. Length is usually in 30 minutes time slots, but allow up to a third of the time for discussion. We request you to provide a computer-based visual accompaniment to your address, e.g. using PowerPoint™ or Keynote™, which will be included in the conference CD.

Posters

Posters can take many forms, limited only by your artistic imagination. And a poster doesn't need to be all on one big sheet. Try to make them as visual as possible, and arresting from a distance. Consider tear-offs of useful Web addresses or other information. The idea is to communicate, and that need not be one-way. There will be a time-slot in the Oral Addresses programme for all poster presenters to give a 5-minute talk on their poster: what it's about, what it concludes, why it matters, will you join my project.

These will be aimed specifically at training, skill improvement, etc. and should be as interactive as possible. Workshops are to be delivered within a time frame of 60 minutes, including the completion of all practical requirements.

If you are considering making a presentation, but are not sure of what's expected, how to prepare, whether the topic is suitable, or any other issue, please contact the M.P.A.S. VASTROC Committee with your concerns. A member of the VASTROC Committee will get back to you to assist.

We look forward to your contribution for the VASTROC in 2011.

Regards Peter Skilton Convenor, VASTROC 2011.

A Big Till (OD for a big August_

Amonth for the society with Week. multiple public viewing nights,

ugust was indeed a very busy another successful National Science on a job very well done.

this challenge again and produce out over this period, congratulations to discuss any help you can give.

Remember, if you can spare The time and enthusiasm these the time just every once in a while, putting extra pressure on our small volunteers bring earned positive we could always use an extra set of band of volunteers. So it is with reviews from the public who hands. If interested, just catch up relief that we have been able to meet attended. So for those that helped with one of the committee members

Missing September.

meant it was a difficult month to format will be quite limited. put Scorpius together.

edition of Scorpius covers October, an online PDF format, to keep the will be sought. November, and December. Hence society newsletter regular and the reason why some pages are informative for members footed with Sept./Oct. and others with Oct./Nov./Dec.

unfortunately the afore mentioned that most members will be able to School.

A pologies to members looking work commitments means my embrace the format change over. Afor their September issue ability to produce the society of Scorpius. Work commitments newsletter in usual paper mailout please forward an email to Scorpius

Because of the above, this be having to transfer Scorpius to concerns and an alternative arrange

We inconvenience some

If you have concerns about this, (scorpius@mpas.asn.au), or discuss Because of this, in 2011 I will with a committee member your

The limited paper versions of Scorpius (as mentioned earlier) understand this will will only be available at The Briars society Astronomical Facility, and at the discussing Scorpius, members, however we also hope General Meetings at the Peninsula



Society News

Ongoing Briars Site Works

of months would have noticed the when driving or walking around Display Home. works going on around the Briars the site. Observing site.

Anyone who has been to the assured, the site can be used for preferably use the upper public Briars over these past couple observing but please be careful carpark, in front of the Sustainability

Unfortunately with these works, that are not setting up equipment during these works, and hope to some disruptions to the normal on the observing field, please refrain have the observing area back to viewing practices may occur. Rest from driving through the site, and normal quite soon.

Once again this edition we thank We especially ask that members members for their understanding

Society

One Neptunian Year - Beginning with a great discovery in 1846

Rod Brown of ASV gave a talk at our last General Meeting in August . and mentioned a forthcoming historic event - the completion of one sidereal period of Neptune since its discovery.

In 1845 Urbain Le Verrier of the Paris Observatory, prompted by the errant behaviour of Uranus, calculated and published a paper on the position of another possible planet, causing what we now call a perturbation. A copy was sent to the British Astronomer Royal, George Airy claiming it then had a heliocentric longitude of of 325°.

Airy did nothing until the following year, when he heard from John Adams, a Cambridge mathematician who, independently, 'purely empirical Bode's Law' of Paris Observatory. Both placed the fame. planet at about 30 Astronomical Units from the Sun.



made a very similar estimate. French cartoon shows Adams viewing Le Verriers work rather than the sky; and shows that these Both calculations were based on scientific events were then better publicised, than today. Newtonian mechanics and the From Hoskin's 'Cambridge History of Astronomy', two copies of which are in the MPAS Library of Astronomy', two copies of which are in the MPAS Library

Verrier nor Adams were observers, a controversy ensued, some credit buffs will calculate again, to make Airy gave the Adams estimate was eventually shared, but Airy, by allowance for the many gravitational to Challis at the Cambridge initially ignoring Adams, was never effects that will cause change. We Observatory and Le Verrier alerted allowed to forget his lost claim to amateurs all know at least about

Soon, As both Observatories were called Neptune and its period weather in July, it may be an event, slow to act, an impatient Le Verrier of revolution was estimated to if only as there will not be much passed the information on to the be (Earth time) 164 years, 287.9 movement for several nights. Berlin Observatory to look at days. Next year, 2011, marks one around 5° from the star Gamma revolution since this discovery, and Capricorni. On 23 Sep 1846, Galle at around July 12 is the time. Then, Berlin found a non stellar body near many amateurs will attempt to view the position given, and claimed and make comparison of its position

planetary distances. As neither Le the glory of actual discovery. After in the star field. No doubt maths precession and the elliptical, by international not circular, orbits of all planets. agreement, the new planet was Nevertheless, allowing for usual

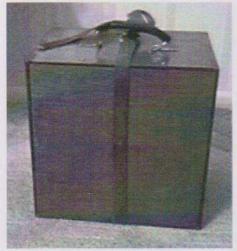
> Ian Sullivan August '10



Society Projects

Rod's Travel Telescope

This year was our chance to travel the Northern Territory. After working in the same job for ten years, I had earned long service leave. And we decided to hire a campervan for the 6 week family holiday. Before leaving I decided it would be great to take a telescope with me. I looked at several Travelscope designs on the internet and ultimately decided to build one around US amateur Greg Babcock's design located at: http://www.synrgistic.com/astro/ telescopes/traveler.htm



The telescope when packed up for transport.

Greg's, I used a 10 inch F6 mirror I way. They were very clear. had made myself. I drew plans with This made assembly much simpler. objects.

The plan was to carry the optical

was a real treat. I don't think I have parks. One older gentleman and his ever seen such dark skies. Scorpio wife thought it was amazing and looked fantastic and the milky way asked how they could get their own seemed to almost extend from one instrument. They had not looked horizon to the other. I had been through a large telescope before.



Rod's assembled 10 inch travel telescope, ready for the night sky.

concerned about dew but needn't have worried.

at King's Canyon. I set up at the so faint fuzzies were washed out. camping site and another camper Nevertheless, they were amazed by was excited to join me. It turned it the moon Saturn, the jewel box etc. he was a Queensland amateur and was regretting not being able to disappointment was that the seeing bring an instrument of his own. We in the Northern part of the Territory, spent two night looking at the night past Katherine was not that good sky there. I spent most of my time while we were there. There was a looking at messier objects around lot of smoke from the burning off Instead of a 12 inch mirror, like scorpio and browsing the milky this time of year and we got much

a free CAD package and announced from Standly Chasm. We camped a shorter scope - F5. This would be my intention on iceinspace. Another there for the night and I used some a little lighter and enable a shorter iceinspace member offered to cut setting circles I made for the first mirror box that should meet the the parts for me with a CNC router. time. This helped me locate fainter airline carry on requirements.

The scope performed very parts as hand luggage and the rest well. It was a fiddle to set up the would go in my suitcase. Well it first time but once I did it once it didn't quite go that way. The airline was fine and I found I could leave said the corners of the mirror box it partially assembled in the van. I were dangerous, so it had to travel got a lot of strange looks as I set up. as oversize luggage. Fortunately, the Most people had no idea what I was mirror box and optical components doing. But I would offer the chance arrived safely at both destinations. to look to any passers by. I used Observing in Central Australia the scope in a couple of caravan

Some German tourists joined me at Edith Falls, just north of Katherine My first chance to observe was gorge. The moon was at first quarter

It was great fun. My only more cloud than in the centre. If I My best night was observing were to do this again, I would build

Rod Brackenridge

August '10





Journal of the Mornington Peninsula Astronomical Society Volume XIX, No. 5 (September/October 2010)

Skywatcher: October's Rise & Shine Times

These times can be used throughout the Mornington Peninsula and surrounding areas to within +/-1 minute. The Briars Observing Facility: Latitude 38° 16' South, Longitude 145° 02' East. The following times are calculated for the Local Time at

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---- Daylight Savings Begins. At 2am, Sunday 3rd of October, clocks go forward 1 hour to 3am.

Full - Full Moon 1.Q. - Last Quarter Moon New - New Moon F.Q. - First Quarter Moon D.N.R. - Moon Does Not Rise D.N.S. - Moon Does Not Set

Civil Twilight is calculated when the Sun is 6° below the horizon, and is practically marked as the begining or end of the day's useable light. The first of the evening stars are visible at this time.

Skywatcher: November's Rise & Shine Times

The following times are calculated for the Local Time at The Briars Observing Facility: Latitude 38° 16′ South, Longitude 145° 02′ East.

These times can be used throughout the Mornington Peninsula and surrounding areas to within +/-1 minute.

	Ü	0	Sun	Çivil	9	(Moon		₩ We	Mercury	Q Venus	sous	Q Mars	ars	2 Jupiter	piter	h Saturn	aturn	O Uranus	anns	₩ Neptune	ptune
Date	Twilight	Sunrise	Sunset	Twilight Ends	Phase	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets
Nov 1 (Mon)	05:45	06:13	19:55	20:23		02:50	14:14	06:37	20:43	05:37	19:37	07:27	21:56	16:04	04:36	05:15	17:35	16:20	04:40	13:46	03:20
Nov 2 (Tue)	05:43	06:12	19:56	20:24	0	03:22	15:25	06:38	20:48	05:32	19:29	07:25	21:55	16:00	04:32	05:11	17:31	16:16	04:36	13:42	03:16
Nov 3 (Wed)	05:42	06:10	19:57	20:25		03:53	16:37	06:38	20:52	05:28	19:22	07:24	21:55	15:56	04:27	05:08	17:28	16:12	04:32	13:38	03:12
Nov 4 (Thu)	05:41	60:90	19:58	20:27		04:24	17:50	06:38	20:56	05:23	19:15	07:22	21:55	15:51	04:23	05:04	17:25	16:08	04:28	13:34	03:08
Nov 5 (Fri)	05:40	80:90	19:59	20:28		04:58	19:03	06:39	21:00	05:19	19:08	07:21	21:54	15:47	04:19	02:00	17:21	16:04	04:24	13:30	03:04
Nov 6 (Sat)	05:39	06:07	20:00	20:29	New	05:36	20:16	06:39	21:04	05:15	19:01	07:19	21:54	15:43	04:15	04:57	17:18	16:00	04:20	13:26	03:00
Nov 7 (Sun)	05:38	90:90	20:01	20:30	6	06:20	21:25	06:40	21:08	05:11	18:54	07:18	21:54	15:39	04:11	04:53	17:14	15:56	04:16	13:22	02:56
Nov 8 (Mon)	05:36	06:05	20:03	20:31		07:10	22:28	06:40	21:12	05:07	18:48	07:17	21:53	15:35	04:07	04:46	17:11	15:52	04:12	13:18	02:52
Nov 9 (Tue)	05:35	06:04	20:04	20:33		90:80	23:23	06:41	21:16	05:03	18:41	07:15	21:53	15:31	04:03	04:46	17:08	15:48	04:08	13:14	02:48
Nov 10 (Wed)	05:34	06:03	20:05	20:34		90:60	D.N.S.	06:42	21:19	02:00	18:35	07:14	21:53	15:27	03:59	04:42	17:04	15:44	04:04	13:11	02:45
Nov 11 (Thu)	05:33	06:02	20:06	20:35		10:07	00:10	06:42	21:23	04:56	18:29	07:13	21:52	15:23	03:55	04:38	17:01	15:40	04:00	13:07	02:41
Nov 12 (Fri)	05:32	06:02	20:07	20:36		11:08	00:49	06:43	21:27	04:52	18:23	07:11	21:52	15:19	03:51	04:35	16:57	15:36	03:56	13:03	02:37
Nov 13 (Sat)	05:31	10:90	20:08	20:37		12:08	01:22	06:44	21:31	04:49	18:18	07:10	21:52	15:14	03:47	04:31	16:54	15:32	03:52	12:59	02:33
Nov 14 (Sun)	05:31	00:90	20:09	20:39	F.Q.	13:06	01:51	06:45	21:34	04:46	18:12	60:20	21:51	15:10	03:43	04:27	16:51	15:28	03:48	12:55	02:29
Nov 15 (Mon)	05:30	05:59	20:10	20:40		14:03	02:17	06:46	21:38	04:42	18:07	80:20	21:51	15:06	03:39	04:24	16:47	15:24	03:44	12:51	02:25
Nov 16 (Tue)	05:29	05:58	20:11	20:41		15:00	02:41	06:47	21:41	04:39	18:02	70:70	21:50	15:02	03:35	04:20	16:44	15:20	03:40	12:47	02:21
Nov 17 (Wed)	05:28	05:58	20:12	20:42		15:57	90:80	06:48	21:45	04:36	17:57	07:05	21:50	14:59	03:31	04:16	16:40	15:16	03:36	12:43	02:17
Nov 18 (Thu)	05:27	05:57	20:14	20:43		16:56	03:31	06:50	21:48	04:33	17:53	07:04	21:50	14:55	03:27	04:13	16:37	15:12	03:32	12:39	02:13
Nov 19 (Fri)	05:26	05:56	20:15	20:45		17:56	03:58	06:51	21:51	04:30	17:48	07:03	21:49	14:51	03:23	04:09	16:33	15:08	03:28	12:35	02:00
Nov 20 (Sat)	05:26	05:55	20:16	20:46		18:58	04:29	06:52	21:54	04:27	17:44	07:02	21:49	14:47	03:19	04:05	16:30	15:04	03:24	12:31	02:05
Nov 21 (Sun)	05:25	05:55	20:17	20:47		20:00	05:05	06:54	21:57	04:24	17:40	07:01	21:48	14:43	03:15	04:02	16:27	15:00	03:20	12:28	02:01
Nov 22 (Mon)	05:24	05:54	20:18	20:48	Full	21:02	05:47	06:55	21:59	04:22	17:37	00:20	21:48	14:39	03:11	03:58	16:23	14:56	03:16	12:24	01:57
Nov 23 (Tue)	05:24	05:54	20:19	20:49		22:00	06:37	06:57	22:02	04:19	17:33	06:59	21:48	14:35	03:07	03:54	16:20	14:52	03:12	12:20	01:54
Nov 24 (Wed)	05:23	05:53	20:20	20:50		22:52	07:35	06:58	22:04	04:16	17:30	06:58	21:47	14:31	03:03	03:51	16:16	14:48	03:08	12:16	01:50
Nov 25 (Thu)	05:22	05:53	20:21	20:52	•	23:37	08:39	00:20	22:06	04:14	17:27	06:57	21:47	14:27	03:00	03:47	16:13	14:44	03:04	12:12	01:46
Nov 26 (Fri)	05:22	05:52	20:22	20:53	•	D.N.R.	09:47	07:01	22:08	04:11	17:24	99:90	21:46	14:24	02:56	03:43	16:09	14:40	03:00	12:08	01:42
Nov 27 (Sat)	05:21	05:52	20:23	20:54	•	00:17	10:56	07:02	22:10	04:09	17:21	06:55	21:46	14:20	02:52	03:40	16:06	14:36	02:56	12:04	01:38
Nov 28 (Sun)	05:21	05:51	20:24	20:55		00:52	12:06	07:04	22:12	04:07	17:18	06:54	21:45	14:16	02:48	03:36	16:02	14:32	02:52	12:00	01:34
Nov 29 (Mon)	05:20	05:51	20:25	20:56	L.Q.	01:24	13:15	07:05	22:13	04:04	17:16	06:53	21:45	14:12	02:44	03:32	15:59	14:28	02:48	11:56	01:30
Nov 30 (Tue)	05:20	05:51	20:26	20:57		01:54	14:24	07:07	22:14	04:02	17:14	06:53	21:44	14:09	02:40	03:29	15:55	14:24	02:44	11:53	01:26

Civil Twilight is calculated when the Sun is 6° below the horizon, and is practically marked as the begining or end of the day's useable light. The first of the evening stars are visible at this time. Full - Full Moon L.Q. - Last Quarter Moon New - New Moon F.Q. - First Quarter Moon D.N.R. - Moon Does Not Rise D.N.S. - Moon Does Not Set

Skywatcher: December's Rise & Shine Times

The following times are calculated for the Local Time at The Briars Observing Facility: Latitude 38° 16′ South, Longitude 145° 02′ East.

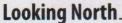
These times can be used throughout the Mornington Peninsula and surrounding areas to within +/-1 minute.

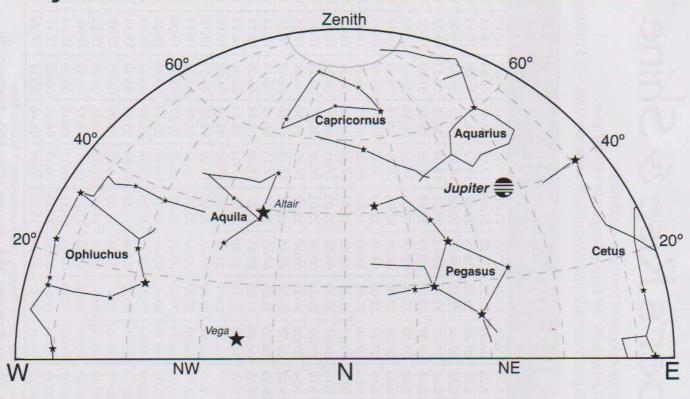
Page		Ë	•	Sun	Ü	9	(Moon		₩ †Q	ercury	Q Venus	snus	Q' Mars	ars	され	Jupiter	b Saturn	ıturn	O Uranus	anns	Ž	₩ Neptune
1, 05.20 05.51 20.22 20.58 0.224 15.34 0.708 22.14 0.409 17.12 0.65.2 21.44 4.05 0.236 0.325 0.321 15.48 0.559 0.255 0	Date	Twilight	Sunrise	Sunset	I willight Ends	Phase	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets	Rise	Sets
05:19 05:50 00:28 00:59 00:26 10:46 07:09 02:14 03:56 17:10 06:51 14:01 10:00 02:20 03:17 15:48 05:19 05:50 02:02 02:02 02:00 03:10 17:54 07:00 02:10 03:00 17:00 06:49 02:142 13:45 02:25 03:14 15:41 15:41 05:19 05:50 05:02 02:02 02:01 03:10 03:10 07:10 02:10 03:00 17:00 06:49 02:142 13:55 02:25 03:14 15:41 15:41 05:19 05:50 05:02 02:02 02:02 03:10 03:10 07:10 02:10 03:00 17:00 06:49 02:142 13:45 02:10 03:10 15:34 05:19 05:50 05:02 02:03 1:04 06:45 02:10 07:10 07:10 02:10 03:00 17:00 06:49 02:14 13:46 02:13 03:00 15:34 05:18 05:50 02:03 03:04 07:05 02:40 07:05 02:40 07:05 02:40 17:00 06:47 02:40 13:45 02:10 07:05 02:40 07:40 13:45 02:40 13:45 02:40 15:20 02:40 07:40 07:40 02:40 07:40 02:40 07:40 02:40 07:40 02:40 07:40 02:40 07:40 02:40 02:40 02:40 02:40 07:40 02:40 02:40 02:40 02:40 02:40 02:40 02:40 07:40 02:4	Sec 1 (Wed)	05:20	05:51	20:27	20:58	•	02:24	15:34	80:20	22:14	04:00	17:12	06:52	21:44	14:05	02:36	03:25	15:52	14:20	02:41	11:49	01:22
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Civil Twilight is calculated when the Sun is 6° below the horizon, and is practically marked as the begining or end of the day's useable light. The first of the evening stars are visible at this time. Full Moon L.Q. - Last Quarter Moon New - New Moon F.Q. - First Quarter Moon D.N.R. - Moon Does Not Rise D.N.S. - Moon Does Not Set

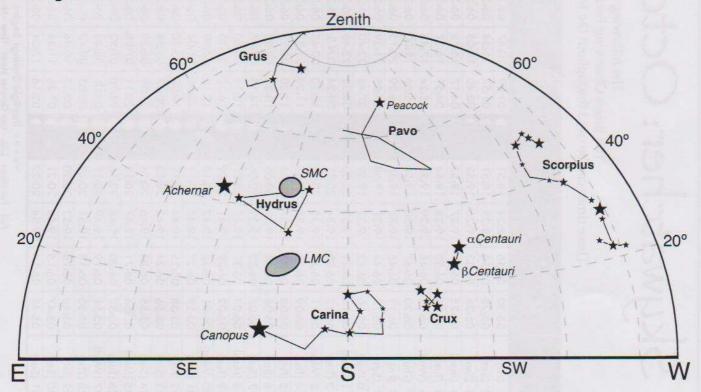
Skywatcher: In the October Sky

The following hemispherical positionals for October is calculated for The Briars Observing Facility, at approximately 10:00pm Eastern Daylight Savings Time. This can be used throughout October along the Mornington Peninsula and surrounding areas.





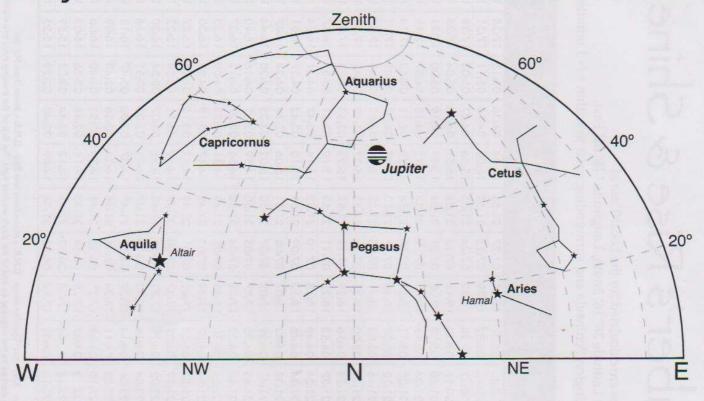
Looking South



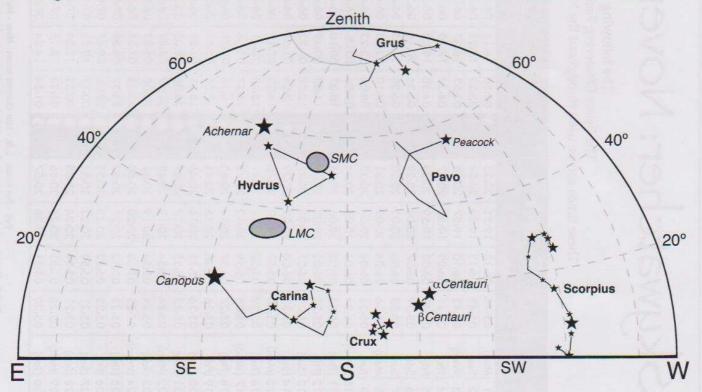
Skywatcher: In the November Sky

The following hemispherical positionals for November is calculated for The Briars Observing Facility, at approximately 10:00pm Eastern Daylight Savings Time. This can be used throughout October along the Mornington Peninsula and surrounding areas.

Looking North



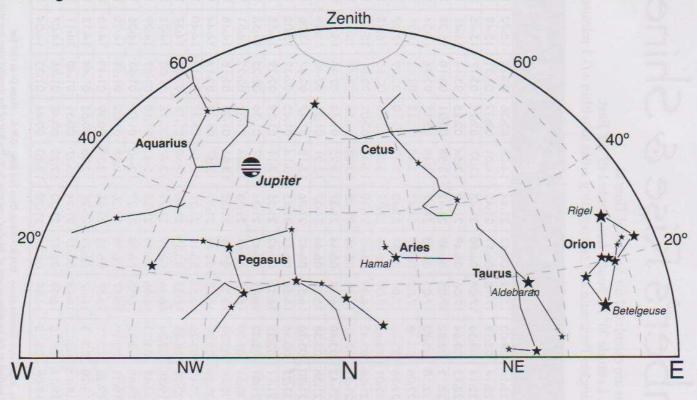
Looking South



Skywatcher: In the December Sky

The following hemispherical positionals for December is calculated for The Briars Observing Facility, at approximately 10:00pm Eastern Daylight Savings Time. This can be used throughout October along the Mornington Peninsula and surrounding areas.

Looking North



Looking South

