No. 559 Registered Charity 271313 November 2019

# OASI News

The newsletter of the Orwell Astronomical Society

**Sun-gazing at Bawdsey Radar museum on Sunday 27 October. Yes, sunshine!**

**Paul Whiting, Andy Gibbs, Bill Barton, Martin RH (behind camera). Mike O'Mahoney arrived later**

***Photo by Martin RH***

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# Society Notices

## Society Contact details

| | |
|---|---|
| Observatory (meeting nights only) | 07960 083714 |
| Email queries: | info@oasi.org.uk |
| Facebook: | Orwell Astronomical |
| Twitter: | @OASIpswich |
| OASI groups.io | Members-only message board replacing the Yahoo group |

**Please send material for the OASI web site and newsletter e.g. observations, notices of events, general interest articles, to**

**news@oasi.org.uk**

**Other contact details will be issued to members on a separate printed list.**

## Access into the School Grounds and Observatory Tower

Please use the third gate into the school grounds by the gym.

## Areas out of Bounds

Access to the Observatory is **only via the black door** at the foot of the Observatory tower, which leads to the staircase and thence to the spiral staircase up to the Observatory. If the black door is locked, please phone the observatory mobile, **07960 083714** during meeting hours.

**Please do NOT explore other routes. When in doubt, ask or call the Observatory mobile.**

Remember this is a school and straying into the main part of the school where the pupils reside would cause the society big problems and could see us losing the use of the observatory. Any member found to be anywhere other than the approved access route or the observatory area will face serious sanctions up to and including expulsion from OASI.

**Please note that access time for all observatory member nights is after 20:15**

## Articles for OASI News

News, pictures and articles for this newsletter are always welcome. Please send them to

**news@oasi.org.uk**

### The CLOSING date is the 15th day of the month

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtfd, doc, docx, odt, Pages, pdf
Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers
Images: tiff, png, jpg
Please send tables as separate files in one of the above formats.

If you don't feel up to writing a major article, perhaps you might write a short note for OASI News along the lines of *"This month I have mostly been observing/constructing/mending/reading/etc."*?

Newsletter archive www.oasi.org.uk/NL/NL_form.shtml

**Authors, please note that your articles will now be publicly available worldwide!**

### Reproducing articles from OASI News

If you plan to reproduce an article exactly as per OASI News then please contact the Editor – otherwise, as a matter of courtesy, please seek permission from and credit the original source/ author. You may not reproduce articles for profit or other commercial purpose.

## Committee 2019

| | | |
|---|---|---|
| Chairman | Andy Gibbs | Set overall agenda for OASI,<br>Chair committee meetings,<br>Press and publicity, |
| Secretary | Roy Gooding | Outreach meetings (jointly with Chairman), observatory decoration. |
| Treasurer | Paul Whiting FRAS | Finance, Supervision of applications for grants. |
| | | Visits by outside groups, Observatory tours, Public appreciation of astronomy, Outreach activities. |
| Committee | James Appleton | Committee meeting minutes, Web site |
| | Martin Cook | Membership, Tomline refractor maintenance & user testing |
| | Matt Leeks | Safety & security |
| | Peter Richards | Lecture meetings, Email distribution lists |
| | Martin Richmond-Hardy | Newsletter, OASI @ Newbourne |
| | John Wainwright | Equipment curator |
| | Mike Whybray | Astronomy Workshops, Child protection officer,<br>Orwell Park School Astronomy Club. |
| | Andy Wilshere | Librarian |

### Signing in and out

Please ensure you sign in and out when visiting the Observatory and/or Newbourne.
This is for fire safety precautions and also provides an historic record.

## Message board https://groups.io/g/OASI replaces Yahoo group

Lots of features of Yahoo groups will cease on the 21st October 2019 amongst other things all attachments will be deleted and message digests will cease.

> *Yahoo has made the decision to no longer allow users to upload content to the Yahoo Groups site. Beginning October 21st you won't be able to upload any more content to the site, and as of December 14th all previously posted content on the site will be permanently removed. You'll have until that date to save anything you've uploaded.*

The OASI members-only group hosted by Yahoo is therefore being transferred to groups.io.

Members may already have received an invitation to join the group from Membership Secretary, Martin Cook.

If you don't wish to join then just discard the email. Once you accept, you can set preferences, such as how often to receive emails etc.

So far the new platform seems better than Yahoo Groups, For starters, attachments actually work!

## Next Committee Meeting

Friday 22 November 2019, 8pm at Horley Spiritualist Church, 345 London Rd, Ipswich IP2 0BG

# OASI and BAA Events

**For the latest event details, please see www.oasi.org.uk/Events/Events.php**

There's a Google Calendar on the OASI web site with the latest dates (and corrections!). If you want to easily add OASI Events to your own computer/ phone/tablet calendar application click this button on the website Events page (bottom right of the calendar) or use this address to access this calendar from other calendar applications.

https://calendar.google.com/calendar/ical/1jhs9db71ncki4sojo7092vfvc%40group.calendar.google.com/public/basic.ics

**For other astronomy news and astro pictures try our**

Twitter feed https://twitter.com/OASIpswich

Facebook page https://www.facebook.com/pages/Orwell-Astronomical/158256464287623

Subscribe to the OASI Yahoo group by emailing oasi-subscribe@yahoogroups.com

Key:

**OASI public events** *BAA events* *Other events*

| Date, Time & Location | Contact | Event |
|---|---|---|
| Weekly, every Wednesday, 20:15–22:00<br>Orwell Park Observatory | Martin Cook,<br>Roy Gooding | General observation (weather permitting) using a variety of telescopes.<br>Entry via the third gate left. NOT the main gate |
| 28 Oct–4 Nov | | *Haw Wood Autumn Star Party* |
| Wed 30 Oct | | *BAA AGM* |
| Mon 11 Nov | | Transit of Mercury. First contact 12:35 UTC |
| Monday 11 Nov from 19:00<br>Newbourne Village Hall | Martin Richmond-Hardy<br>newbourne@oasi.org.uk | OASI @ Newbourne. |
| Fri/Sat 15/16 Nov. Stoneleigh Park, Coventry CV8 2LH | https://www.ukastroshow.com | *International Astronomy Show* |
| Fri 15 Nov 20:00<br>St Augustine's Church Hall | Peter Richards<br>lectures@oasi.org.uk | Lecture. "Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association. |
| Sun 17 Nov, 05:30 | James Appleton<br>info@oasi.org.uk | Field trip to observe graze of ZC1128. More info. |
| Monday 25 Nov from 19:00<br>Newbourne VH | Martin Richmond-Hardy<br>newbourne@oasi.org.uk | OASI @ Newbourne.<br>19:30 Sky notes<br>19:45 Talk: The Christmas star. Paul Whiting<br>Bookswap |

| Date, Time & Location | Contact | Event |
|---|---|---|
| Monday 9 Dec from 19:00<br>Newbourne VH | Martin Richmond-Hardy<br>newbourne@oasi.org.uk | OASI @ Newbourne. |
| Wed 11 Dec 20:00<br>Coach and Horses, Melton | r.gooding908@btinternet.com | Christmas Party 2019 |
| Fri 20 Dec 2019, 04:30 | James Appleton<br>info@oasi.org.uk | Field trip to observe graze of ZC1840. More info. |
| Monday 23 Dec from 19:00<br>Newbourne VH | Martin Richmond-Hardy<br>newbourne@oasi.org.uk | OASI @ Newbourne.<br>19:30 Sky notes<br>Bookswap |

# OASI @ Newbourne

**Martin Richmond-Hardy newbourne@oasi.org.uk**

We normally meet at Newbourne Village Hall, Mill Lane, IP12 4NP on the 2nd and 4th Mondays (with a few exceptions).

**OASI @ Newbourne** is a good place to start for beginners. If you are thinking of buying a scope or binoculars, come and try before you buy and talk to owners about the strengths and weaknesses of particular models. If you've already splashed the cash, bring your new scope along to use or for advice on setting-up and adjustment. All welcome, with or without telescopes. We would like visitors to join OASI to enjoy the full benefits of membership.

There are also **Stargazers' Guide (Sky Notes), Astronomy Workshops and the Book Swap.**

**OASI@Newbourne Meetings**

| | | | |
|---|---|---|---|
| 11 Nov | 25 Nov (S+W+B) | 9 Dec | 23 Dec (S+B) |
| 13 Jan | 27 Jan (S+B) | 10 Feb | 24 Feb (S+B) |
| 9 March | 23 March (S+B) | 13 April | 27 April (S+B) |
| 4 May[*] | 25 May (B/H) (S+B) | 8 Jun | 22 Jun (S+B) |

We open up for all meetings at 7pm. Star Guide (S) at 7:30pm and Workshops (W) at 7:45pm. B = Book Swap night (see below).

* 1st Monday due to Parish Council meeting on 2nd Monday

## Stargazer's Guide

On the last meeting each month Bill Barton FRAS will give a short presentation of what can be viewed in the following 4 weeks plus a reminder of OASI events.

## Astronomy Workshops/Informal talks

**Contact Mike Whybray** **Location: Newbourne Village Hall IP12 4NP**

**Doors open at 7:00pm.** **Workshops start at 7:45pm**

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, interactive workshops, films, etc., suitable for all. They are also a chance to chat with other members over a cup of tea and a biscuit, in a venue rather warmer than the observatory dome on a winter's night!

Given a clear night, we can make use of the field for a workshop or continue afterwards with some observing.

***25 November  Paul Whiting FRAS, The Christmas Star, 2019***

Paul Whiting, Bill Barton, James Appleton and Andy Gibbs offered to lead workshops as follows:

- Paul: *3000 Years of Eclipses Visible from Orwell Park Observatory*, date TBA.
- Paul: *Wartime Astronomy*, date TBA.
- Paul: *Galaxy Collisions*, date TBA.
- Bill: *Celestial Coordinates*, date TBA. New members at Newbourne have requested this workshop; Bill is willing to lead it but will defer if anyone else would rather do so.
- James: *Update on OASI All-Sky Meteor Cameras*, date TBA.
- Andy: *Frances "Poppy" Northcutt (former NASA flight controller)*, date TBA.

Do you have a subject you could workshop? You could do a short one, or share the effort with a partner. Drop Mike Whybray a line! workshops@oasi.org.uk

# Lecture Meetings

**Contact: Peter Richards lectures@oasi.org.uk**

We have an exciting and interesting set of lectures by guest speakers for the Autumn.

There is a new venue for lectures this year which is:

St Augustine's Church Hall
Bucklesham Road
Ipswich IP3 8TH.

The start time for all talks will be 8pm and, as usual, the talks will be held on Friday evenings.


## OASI Guest Speaker Lectures

15th November  "Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association.

# Other local astronomy society meetings

## Athaneum Astro Society

**www.3a.org.uk/index.htm**

We meet fortnightly on Thursdays, from 7.30pm, at our dark-sky site in the Walled Garden at Nowton Park, just outside Bury St Edmunds. If you're planning on joining us for the first time, please contact us in advance, just to make sure the meeting is going ahead. We recommend that you wear warm clothing (even summer nights can be chilly, especially when the skies are clear!) and bring a flask, or insulated mug, for a warm drink. We have tea and coffee-making facilities on-site. Events are listed here http://www.3a.org.uk/events.htm

## LYRA Lowestoft & Yarmouth Regional Astronomers

**www.lyra-astro.co.uk**

LYRA Programme and Local Events 2019 – All talks (unless other wise stated) will commence at 7.30pm in the Coach House Room at Parkhill Hotel, just outside Oulton Village on the B1375 (Oulton Broad to Gt. Yarmouth Road) NR32 5DQ

All Talks £2.50 For Non Members

Nov 12  TBA
Nov 26  LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm

## DASH Astro

**Darsham And Surrounding Hamlets http://dash-astro.co.uk**

Meetings are hels at New Darsham Village Hall and all DASH Astro observing sessions will take place at WESTLETON COMMON. ASOG observing sessions and locations may be arranged at the time of observation.

Unless stated all group meetings will take place from 7:30 pm.

**Note these meetings are now on Sundays.**

Nov 10 Meeting – Steve Hubbard, Ian Lomas & David Gwynn, plus “Q & A Panel” Title TBC
Nov 11 DASH Observing. “Transit of Mercury” start 12:35 ends 16:06 (sunset )
Nov 24 Dash Observing Session (Sunset 15:49, Moonset 15.10, 6.7% Moon )
Dec 07(Saturday) DASH Christmas Social – confirmed. (Members and Guests only )

# BAA news

## BAA meetings in November & December

7th December BAA Christmas Meeting - INSTITUTE OF PHYSICS, 37 Caledonian Road, London, N1 9BU. Booking will be open soon, and fill up quickly. Speakers are Prof Mark Kidger and Prof Emma Bruce with Nick James presenting the sky notes. We hope to again live stream this meeting after last year's success making it available to members unable to travel.

For full details of all meetings please go to https://britastro.org/meetings

# Christmas Trees @ Nacton

OASI has been invited to exhibit a Christmas Tree in the village church on 30th November and 1st December. The event will raise money for 2 local charities.

Nicky and I are going to help out and other OASI members have indicated they might help out. We now need any members interested in helping to let us know. We also need someone to lend a Christmas Tree. Do you have one to lend? It will be returned after 1st December.

Contact: Pete Richards.

# The move from Yahoo to Groups.io

**Martin Richmond-Hardy**

In mid October Yahoo group owners received the following message:

> Dear Group Moderators and Members,
>
> We are notifying you about upcoming changes to Yahoo Groups, which affect how content is shared and group membership is managed. We know that our users are deeply passionate about connecting around shared interests, and we want to continue offering the best experience possible.
>
> We extensively researched the Yahoo Groups usage and user experience. In doing so, we determined that the majority of our members use the Yahoo Groups email functionality to share content, rather than posting directly to website message boards.
>
> To align our features with user preferences, effective October 28, the following changes will be made to Yahoo Groups:
>
> Uploading of new content will be disabled on the Yahoo Groups website. All users can continue to communicate and share content via email using any email client.
>
> All users will only be able to join Groups either through an invite from the Group Moderator or by submitting a request to join a Group, which requires approval by the Group Moderator.
>
> Starting December 14, all previously uploaded content stored on the website will be removed and all existing public Groups will be made private. If you would like to keep any of the content you've posted or stored within your Yahoo Group, you have until December 14 to download it by accessing this link. More information about the upcoming changes can be found here.
>
> Since most content sharing among Yahoo Group members now occurs over email, we believe it is the right time to make this change. Please be assured that while posted content will be removed, Yahoo Groups is not going away, and new Groups can still be formed, allowing users to join and connect with their communities and passions.
>
> Yahoo Groups is an online extension of your real-life group of friends, interests, and communities, so we hope this change will streamline and improve your experience.

Following this announcement many yahoo groups migrated to groups.io.

Our OASI yahoo group has been used as a repository for all sorts of files and in view of the above I have set up a group OASI.groups.io to replace the OASI yahoo group.

You should by now have received an invitation to join the new group.

The group is private, open only to members of OASI

At the time of writing, over 50 members have already joined the group.

# Members in the news

## Bill Barton FRAS


Yesterday at the AGM of Society for the History of Astronomy (SHA) Bill was awarded the Roger Jones Award. This award is for contributions to the SHA county survey.

Also...

On 1 January Bill will become the Deputy Director of the BAA Historical Section.

Congratulations, Bill!

# The Night Sky in November

**Martin RH**

All event times (**UTC**) are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E

## Moon

Source: http://heavens-above.com/moon.aspx

| New Moon | 1st Quarter | Full Moon | Last Quarter |
|---|---|---|---|
| 28 Oct 03:39 | 04 Nov10:23 | 12 Nov 13:34 | 19 Nov 21:11 |
| 26 Nov 15:06 | | | |

## Sun, Moon and planets

Source: http://heavens-above.com/PlanetSummary.aspx **Times for 31 Oct are GMT (UTC)**.

| Object | Date | Rise | Set | Mag. | Notes |
|---|---|---|---|---|---|
| **Sun** | 1 | 06:49 | 16:27 | | |
| | 30 | 07:39 | 15:48 | | |
| **Moon** | 1 | 11:47 | 19:39 | | Apogee 405.058 km 07 Nov 08:37<br>Perigee 366,716 km 23 Nov 07:41 |
| | 30 | 11:18 | 19:20 | | |
| **Mercury** | 1 | 08:57 | 16:45 | 0.7 | Inferior conjunction Nov-11 |
| | 30 | 05:43 | 15:03 | -0.5 | |
| **Venus** | 1 | 08:54 | 17:08 | -3.8 | Aphelion Nov-28 |
| | 30 | 10:07 | 17:18 | -3.8 | |
| **Mars** | 1 | 04:54 | 15:48 | 1.8 | |
| | 30 | 04:49 | 14:28 | 1.7 | |
| **Jupiter** | 1 | 10:56 | 18:30 | -1.8 | |
| | 30 | 09:30 | 17:01 | -1.7 | |
| **Saturn** | 1 | 12:27 | 20:10 | 0.6 | |
| | 30 | 10:41 | 18:29 | 0.6 | |
| **Uranus** | 1 | 16:15 | 06:28 | 5.7 | |
| | 30 | 14:19 | 04:28 | 5.7 | |
| **Neptune** | 1 | 14:56 | 01:50 | 7.8 | |
| | 30 | 13:02 | 23:51 | 7.9 | |

## Paul's Astronomy Podcast for November

**Paul Whiting FRAS Podcast, November 2019 www.oasi.org.uk/2019_11_pod.mp3**

## Occultations during November 2019

**James Appleton**

The table lists occultations during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

The events should be readily visible in small telescopes or binoculars. The first two columns list the date and time (UT) of the occultation. Column three gives the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of disappearances and reappearances as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase ('+' for waxing and '-' for waning). Columns five and six give the altitude of the Sun and the star, both in degrees. (A negative solar altitude means that the Sun is below the horizon.) Columns seven and eight provide the star's magnitude and catalogue number.

The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Please note that **times are shown in UTC**.

| Date | Time (UT) | D/R | Lunar Phase | Sun Alt(°) | Star Alt(°) | Mag | Star |
|---|---|---|---|---|---|---|---|
| 01 Nov | 17:33:36 | D | 0.24+ | -11 | 10 | 5.5 | 24 Sgr |
| 07 Nov | 17:41:07 | D | 0.79+ | -13 | 20 | 7.2 | ZC3480 |
| 07 Nov | 19:16:46 | D | 0.80+ | -28 | 28 | 6.9 | ZC3484 |
| 07 Nov | 21:42:18 | D | 0.80+ | -48 | 28 | 7.2 | ZC3490 |
| 08 Nov | 20:50:54 | D | 0.87+ | -42 | 34 | 7.3 | H1900 |
| 09 Nov | 00:39:02 | D | 0.88+ | -53 | 20 | 6.9 | ZC60 |
| 15 Nov | 21:53:06 | D | 0.88- | -51 | 30 | 3.3 | 7 Gem, η Gem |
| | 22:15:10 | R | | -53 | 33 | | |
| 16 Nov | 01:33:33 | D | 0.87- | -50 | 58 | 2.9 | 13 Gem, μ Gem |
| | 02:50:56 | R | | -40 | 60 | | |

On 17 November at 05:29 UT there is a southern limit graze of the magnitude 6.8 star ZC1128. Details are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2019.php. An observing trip will be organised if weather conditions are favourable; contact Alan Smith or James Appleton if your are interested in participating.

## Meteor showers

**Source: BAA Handbook 2019 p100-101**

| Shower | Maximum | Normal limits | ZHR at Max | Notes |
|---|---|---|---|---|
| Orionids | Oct 22–23 | Oct 2 – Nov 7 | 20 | Fast meteors, many with persistent trains. Flat maximum, with several sub-peaks. Good in 2007. Quite favourable. |
| Northern Taurids | Nov 12 | Oct 20 – Dec 10 | 5 | Northern branch of the Taurid complex. Slow meteors. Unfavourable. |
| Leonids | Nov 18d 23h | Nov 6–30 | 15 | Very fast meteors, many with persistent trains. Enhanced activity unlikely until the late 2020s. Unfavourable. |
| Monoceritids | Nov 21 | Nov 15–25 | ? | Occasional very short-lived outbursts inactivity, most recently in 1995 and possibly 2016. Favourable. |

For radio observation, use reflections from Graves radar on 143.050MHz or the Brams transmitter in Belgium on 49.97MHz,

## Visible ISS passes ≥15º max altitude

**Martin RH**

Source: http://heavens-above.com/PassSummary.aspx?satid=25544

**Times are UTC.** Predictions are approximate (24 Oct) due to craft adjustments. Check the day before.

| Date | Brightness (mag) | Start | | | Highest point | | | End | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Time | Alt. | Az. | Time | Alt. | Az. | Time | Alt. | Az. |
| 01 Nov | -3.7 | 04:47 | 58° | SSW | 04:48 | 65° | SSE | 04:51 | 10° | E |
| 02 Nov | -1.6 | 04:01 | 26° | E | 04:01 | 26° | E | 04:02 | 10° | E |
| 02 Nov | -3.8 | 05:34 | 21° | W | 05:36 | 87° | S | 05:39 | 10° | E |
| 03 Nov | -3.9 | 04:47 | 80° | SW | 04:47 | 84° | S | 04:50 | 10° | E |
| 04 Nov | -1.4 | 04:00 | 24° | E | 04:00 | 24° | E | 04:02 | 10° | E |
| 04 Nov | -3.8 | 05:33 | 23° | W | 05:35 | 78° | S | 05:38 | 10° | ESE |
| 05 Nov | -3.9 | 04:46 | 84° | SSE | 04:46 | 84° | SSE | 04:50 | 10° | E |
| 05 Nov | -3 | 06:20 | 10° | W | 06:23 | 42° | SSW | 06:26 | 10° | SE |
| 06 Nov | -1.2 | 04:00 | 22° | E | 04:00 | 22° | E | 04:01 | 10° | E |
| 06 Nov | -3.4 | 05:33 | 25° | W | 05:34 | 55° | SSW | 05:38 | 10° | ESE |
| 07 Nov | -3.6 | 04:46 | 64° | SSE | 04:46 | 64° | SSE | 04:49 | 10° | ESE |
| 07 Nov | -2.2 | 06:19 | 10° | W | 06:22 | 24° | SSW | 06:25 | 10° | SSE |
| 08 Nov | -1 | 03:59 | 19° | ESE | 03:59 | 19° | ESE | 04:00 | 10° | ESE |
| 08 Nov | -2.7 | 05:32 | 24° | WSW | 05:33 | 33° | SSW | 05:37 | 10° | SE |
| 09 Nov | -2.7 | 04:46 | 37° | SSE | 04:46 | 37° | SSE | 04:48 | 10° | SE |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Nov | -2 | 05:32 | 17° | SW | 05:32 | 18° | SW | 05:35 | 10° | S |
| 11 Nov | -1.6 | 04:45 | 18° | S | 04:45 | 18° | S | 04:47 | 10° | SSE |
| | | | | | | | | | | |
| 23 Nov | -1.7 | 18:07 | 10° | SSW | 18:09 | 18° | S | 18:09 | 18° | S |
| 24 Nov | -1.6 | 17:19 | 10° | S | 17:21 | 14° | SE | 17:22 | 13° | ESE |
| 24 Nov | -1 | 18:54 | 10° | SW | 18:55 | 17° | SW | 18:55 | 17° | SW |
| 25 Nov | -2.7 | 18:05 | 10° | SW | 18:08 | 35° | S | 18:08 | 35° | S |
| 26 Nov | -2.4 | 17:17 | 10° | SSW | 17:20 | 27° | SSE | 17:21 | 19° | ESE |
| 26 Nov | -1.2 | 18:53 | 10° | WSW | 18:54 | 21° | WSW | 18:54 | 21° | WSW |
| 27 Nov | -1.8 | 16:28 | 10° | SSW | 16:31 | 19° | SE | 16:33 | 10° | E |
| 27 Nov | -3.5 | 18:04 | 10° | WSW | 18:07 | 60° | S | 18:07 | 60° | S |
| 28 Nov | -3.2 | 17:15 | 10° | SW | 17:18 | 47° | SSE | 17:20 | 23° | E |
| 28 Nov | -1.3 | 18:51 | 10° | W | 18:53 | 23° | W | 18:53 | 23° | W |
| 29 Nov | -2.6 | 16:26 | 10° | SW | 16:29 | 35° | SSE | 16:32 | 10° | E |
| 29 Nov | -3.8 | 18:02 | 10° | W | 18:06 | 80° | SSW | 18:06 | 80° | SSW |
| 30 Nov | -3.7 | 17:14 | 10° | WSW | 17:17 | 71° | SSE | 17:19 | 24° | E |
| 30 Nov | -1.3 | 18:50 | 10° | W | 18:52 | 23° | W | 18:52 | 23° | W |

## Astronomy on the radio

### Bill Barton's Radio Broadcast

ICRFM (Ipswich Community Radio) 105.7 MHz at about 08:25 in the morning of the first Wednesday of each month. I aim to cover what there is to see in the sky and then a little bit on something topical. ICRFM is also available to listen to over the Internet and there is a listen again option on their website. http://www.icrfm.com

### David Murton's Radio Broadcast

On 1st Tuesday of the month, 1.40pm on the Lesley Dolphin show on BBC Radio Suffolk – now digital (channel 10c) and FM 103.9 (Ipswich), 104.6 (west Suffolk), 95.5 (Lowestoft), 95.9 (Aldeburgh) and the internet. https://www.bbc.co.uk/radiosuffolk

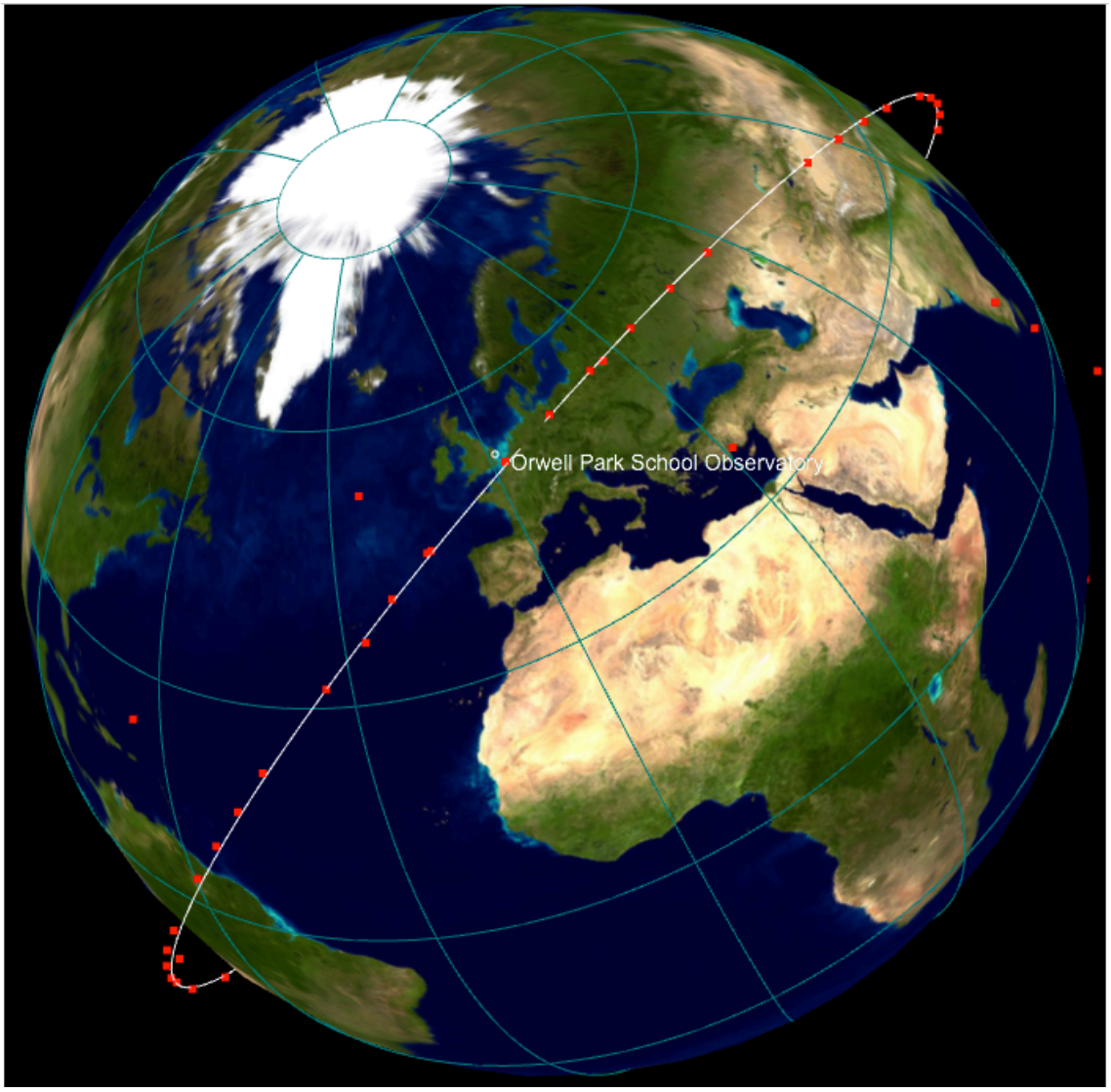
# Starlink

**Starlink** is a satellite constellation being constructed by American company SpaceX, to provide satellite Internet access.[3][4] The constellation will consist of thousands of mass-produced small satellites, working in combination with ground transceivers. SpaceX also plans to sell some of the satellites for military,[5] scientific or exploratory purposes.[6]

As of May 2019, SpaceX has deployed 62 satellites. They plan to deploy 60 more per launch, at a rate of one launch every two weeks beginning in November 2019. In total, nearly 12,000 satellites will be deployed by the mid-2020s, with a possible later extension to 42,000.[7] The initial 12,000 satellites are planned to orbit in three orbital shells: first placing approximately 1,600 in a 550-kilometer (340 mi)-altitude shell, then approximately 2,800 $K_u$- and $K_a$-band spectrum satellites at 1,150 km (710 mi) and approximately 7,500 V-band satellites at 340 km (210 mi).[8] Commercial operation could begin in 2020.[9]

Concerns have been raised about the long term danger of space junk resulting from placing thousands of satellites in orbits above 1000 km[10] and a possible impact on astronomy.[11]

**Reference:** https://en.wikipedia.org/wiki/Starlink_(satellite_constellation)




**Display of all objects from the recent Starlink launch**
Source: https://heavens-above.com/StarLink.aspx

# Transit of Mercury, 11 November 2019

**James Appleton**

A transit of Mercury occurs on 11 November 2019. From the UK, the initial stages of the event will be visible (weather permitting!) but the Sun will set before the egress stages. Event times are as follows (computed using the NASA JPL ephemeris DE-430) for the location of Orwell Park:

| Explanation | Time (UT) |
|---|---|
| First contact: initial apparent geometric contact between the disks of Mercury and the Sun. | 12:35:35 |
| Second contact: first instant at which the disk of Mercury appears fully within the solar disk. | 12:37:16 |
| Greatest transit: Mercury passes closest to the centre of the Sun. | 15:19:44 |
| Sunset | 16:10 |

Martin Cook and James Appleton are coordinating arrangements to observe the event from Orwell Park. Access arrangements are still to be confirmed with the School, but it is likely that observers will need to gather at the School front door at 10.00am and sign in before making their way to the Observatory. Observers will need to arrive promptly; the School will not welcome the disruption caused by late arrivals.

The event is open to all members of OASI. If you aim to attend, you must pre-book by notifying Martin and/or James by email (contact details below). Further details of access arrangements will be provided once they are agreed with the School.

If the weather is hopeless, observing will be cancelled. There will be a go/no-go decision at 9.00am on 11 November, and prospective observers will be advised of the outcome by email.

Please note that the Tomline Refractor will be out of operation from 30 October – 10 November to allow the Dome to be prepared for the event.

If you have any queries, and to register your interest in observing from Orwell Park, please contact us as below.

**James Appleton, info@oasi.org.uk**

**Martin Cook, membership@oasi.org.uk**

# The Crowd and the Cosmos


The world of science has been transformed. Where once astronomers sat at the controls of giant telescopes in remote locations, praying for clear skies, now they have no need to budge from their desks as data arrives in their inbox. And what they receive is overwhelming. Projects are now able to provide more data in a few nights than in the whole of humanity's history of observing the Universe. But more data means more scientists needed to analyse it. Many more. And so, across a variety of scientific fields, it's time for us all to pitch in and we'd love your members to get involved…

**How?** By joining Zooniverse, the world's largest and most popular citizen science project, co-founded by *BBC Sky at Night* presenter and Professor of astrophysics at Oxford, Chris Lintott.

In his semi-autobiographical new book, *The Crowd and the Cosmos*, published in October, Chris tells his own story and how and why Zooniverse came about, how and why it works, and some of the really amazing discoveries members of the public have made.

## Review

**Martin Richmond-Hardy**

Last month I received a copy of Chris Lintott's new book (published by Oxford University Press, ISBN 978-0-19-884222-4).

The book became available in the UK in October. Normally retailing at £20, it will be on offer to order online for £14 from http://www.oup.com with promotion code ASPROMPS.

So, how was it for me?

It's very readable, entertaining and informative. Starting with an overview of how science is done and how he got into science, the book covers the advent of 'big data' and the need for powerful data processing. For example, the Large Synoptic Survey Telescope (LSST) produces some 30TB of data every night; this needs some filtering if it is to be manageable. The Large Hadron Collider, used to detect the Higgs boson, produces about 300GB of data every second. Enter Galaxy Zoo – announced by BBC News following a headline about garlic and cow flatulence. Galaxy Zoo invites people to act as image processors to help with classification of galaxy images. This relies on the brain's ability to recognise patterns even too difficult (at present) for computers; indeed, experts in the particular field being studied can be less successful than the uninitiated whose observations are not coloured by previous experience.

The book covers a number of research projects and problems still to be solved, including studying penguins, supernovae – at the time of writing, more than 70 projects.

Well worth a read. My review copy will go into the OASI library.

# Bolometers and SCUBA.

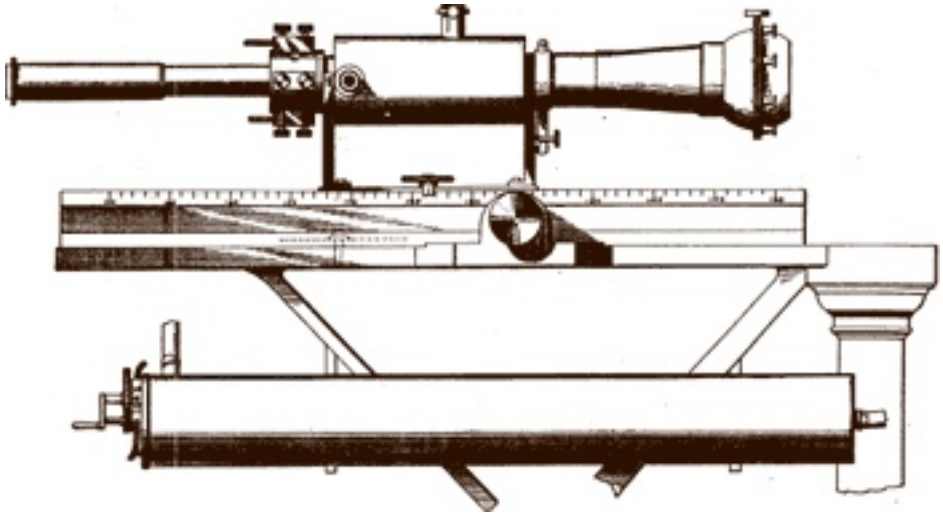
## A few thoughts from the library

**Andy Willshere**

Recently a very informative talk was given by Dr Mathew Bothwell (outreach facilitator at the Institute of Astronomy, University of Cambridge) titled "Monsters in the Dark". The talk contained information as to why the largest galaxies in the universe are so hard to find and that perhaps the solution to the formation of the cosmos could be held within them. I thought that I would attempt to provide for those members who couldn't make the talk a little of the flavour of the evening and a few extra tidbits.

The start of the talk covered galaxies in general and the question of why they existed at all was postulated to the audience. An inclusion was made of the first description of our galaxy in 1750 by the astronomer Thomas Wright.(22September 1711- 25 February 1786), who was a mathematician, instrument maker, architect and garden designer. This gentleman became the first to give details of the configuration of the Milky Way and speculate about distant galaxies. We then travelled away from this area to look at our 'Local Group' of galaxies, with its assortment of types. However even with this miscellany, Dr Bothwell considered that one type of galaxy was absent. This was the humongous elliptic galactic variation, which in fact is absent within our 'Local Group'. The problem with these giant elliptical galaxies is that they don't manufacture new stars, and just exist in a dormant state, but if seen can provide a vast quantity of information.

How do we go about gathering this information? One way is to change how we view the cosmos by moving from optical light to another type found in the spectrum, i.e. from radio waves to X-rays. Enter the Bolometer. This was a device built in 1880 by the American astronomer Samuel Langley, (22 Aug.1834 - 27 Feb. 1906). Measuring far infra-red radiation was the first use of this instrument and Langley published a paper in 1881 on the amount of solar energy on the Earth, entitled ' The Bolometer and Radiant Energy'. Interestingly enough, in 1886 the results he obtained by measuring the interference of infrared radiation by carbon dioxide were used by Svante Arrhenuis, a Swedish scientist, to evaluate how much climate change there would be if carbon dioxide levels in the future doubled.



**A diagram of Langley's Bolometer.**

***Picture credit: https://earthobservatory.nasa.gov/features/Langley/langley_2.php***

The talk continued to tie in how the Bolometer has been used to look for these ultra massive galaxies hidden in plain sight. The basic answer is to use infrared wavelengths which are capable of travelling through dust and smoke and can therefore find objects that are not normally elicited using conventional instruments. However the instruments used initially were quite archaic in design, and throughout the 20th century bolometers were constrained as a single-pixel

apparatus. Towards the end of that century, it became technically possible to couple these devices together and form a more sophisticated camera.

The talk then continued to discuss Sub-millimetre galaxies, which can only be seen in the sub-millimetre limits of the e.m.f spectrum, and has an ≈ wavelength of between 1mm and 100μm, existing between the far infrared and microwave wavebands. It is also known as terahertz radiation. Nearly all of the energy discharged by galaxies in this zone is due to thermal emission from dust grains. We've only had the capability to observe in the sub-millimetre range for a couple decades.

This now brings us to the Sub millimetre Common User Bolometer Array, more commonly known as SCUBA. Having replaced in the early 1990's the older single pixel mechanism, today's SCUBA-2 camera has over 10,000 pixels and is more sophisticated than its predecessor. Interstellar dust produces thermal emission to which SCUBA was reactive. It is composed of sizeable arrays of superconducting transition edge sensors (TES ( a cryogenic particle detector)) whose mapping speed was greatly enhanced when compared to SCUBA/1. It comprised 5120 array elements with the dual wavelengths producing 10,240 pixels. This means that there is an immense escalation in the pixel count, allowing the SCUBA/2 apparatus to chart the sky at an impressive 100-150 times faster. In order to achieve this execution, the detectors are run at ≈ 120mK. This camera can be found at the James Clerk Maxwell telescope situated on Mauna Kea in Hawaii, which has a diameter of 15" and was designed especially to function at sub millimetre wavelengths.

What is this new type of galaxy capable of? SMGs are immense entities situated many billions of light years away. They are also known as very efficient star manufacturing plants generating thousands of new stars on a yearly basis. Could they have left the Universe with dead red giants floating about? Could this be the "monster" from Dr Bothwell's lecture title?

So, why have they remained hidden for so long. The talk considers that because optical wavelengths were being used, cosmic dust precluded their observation, especially as silicates and oxides are included within the dusty fog.

There are still sizeable gaps in our knowledge of these galaxies, mainly due to their distances away from the Earth, especially in how the star manufacturing plants function. We also don't know what happens when they die? Perhaps it is the interactions between their medial supermassive black hole and the rest of the broader galaxy?

The talk ended with consideration of the future and several new observational techniques designed to enhance our knowledge of these amazing galaxies.

The floor was then opened for questions.

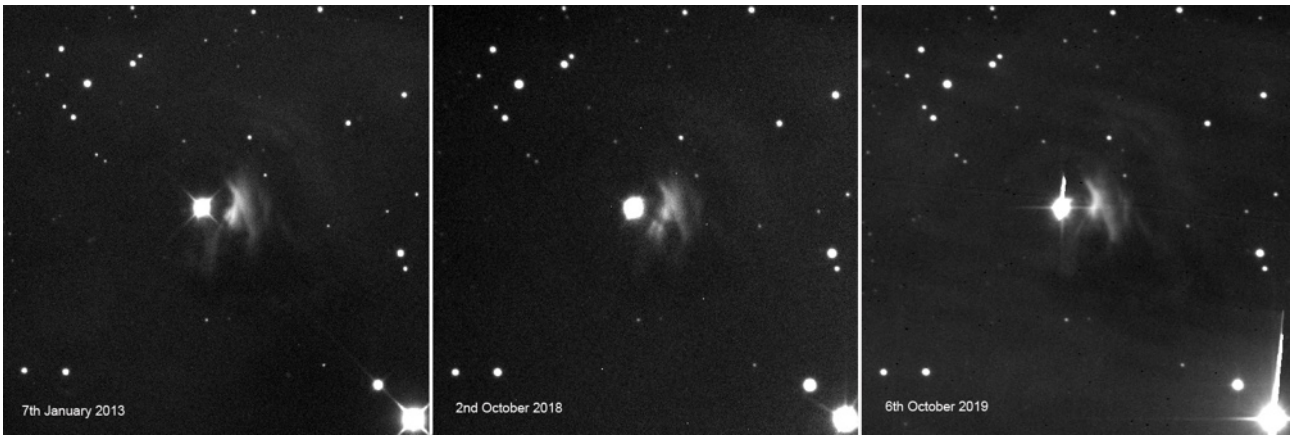
### References:


1. https://arxiv.org/abs/1301.3650
2. https://academic.oup.com/mnras/article/430/4/2513/1090786/
3. https://aeon.co/essays/on-the-hunt-for-the-universes-biggest-galaxies-far-far-away
4. https://ned.ipac.caltech.edu/level5/Sept04/Blain/frames.html


## Gyulbudaghian's nebula

A very long session on Gyulbudaghian's nebula but no sign of the "bubble" seen on the previous image. Maybe a transient effect or maybe just an artefact??? And the latest remote image of Hind's nebula compared to previous remote observations, details at: https://www.britastro.org/node/19589 . Very small changes but shows it's worth monitoring...

A summary of recent variable nebula and variable star observations follows.


**Hind's nebula compared to previous remote observations,**

# Variable Stars & Nebulae

**Mike Harlow**

## 1 Variable Star Watch

Several variable stars have been observed over the last month with cataclysmic variables, CVs and eclipsing binaries being the main targets. Imaging and spectroscopy from home, combined with online magnitude data from the AAVSO [1], can be used to build an understanding of these fascinating objects.

### Z Camelopardalis (RA 08h 25m 13s Dec +73d 06m 43s (J2000))

The cataclysmic variable Z Cam is imaged at every opportunity to catch the onset of outburst activity. It is currently in a 'standstill' phase where it stays at almost constant brightness for long periods. This latest standstill has lasted for over a year now, as of 14th October, so the tell-tale dip in magnitude signalling the start of outburst activity could occur at any time. The longest standstill this century was for 485 days starting on 14th September 2003 [2] - so there may still be a bit of a wait!

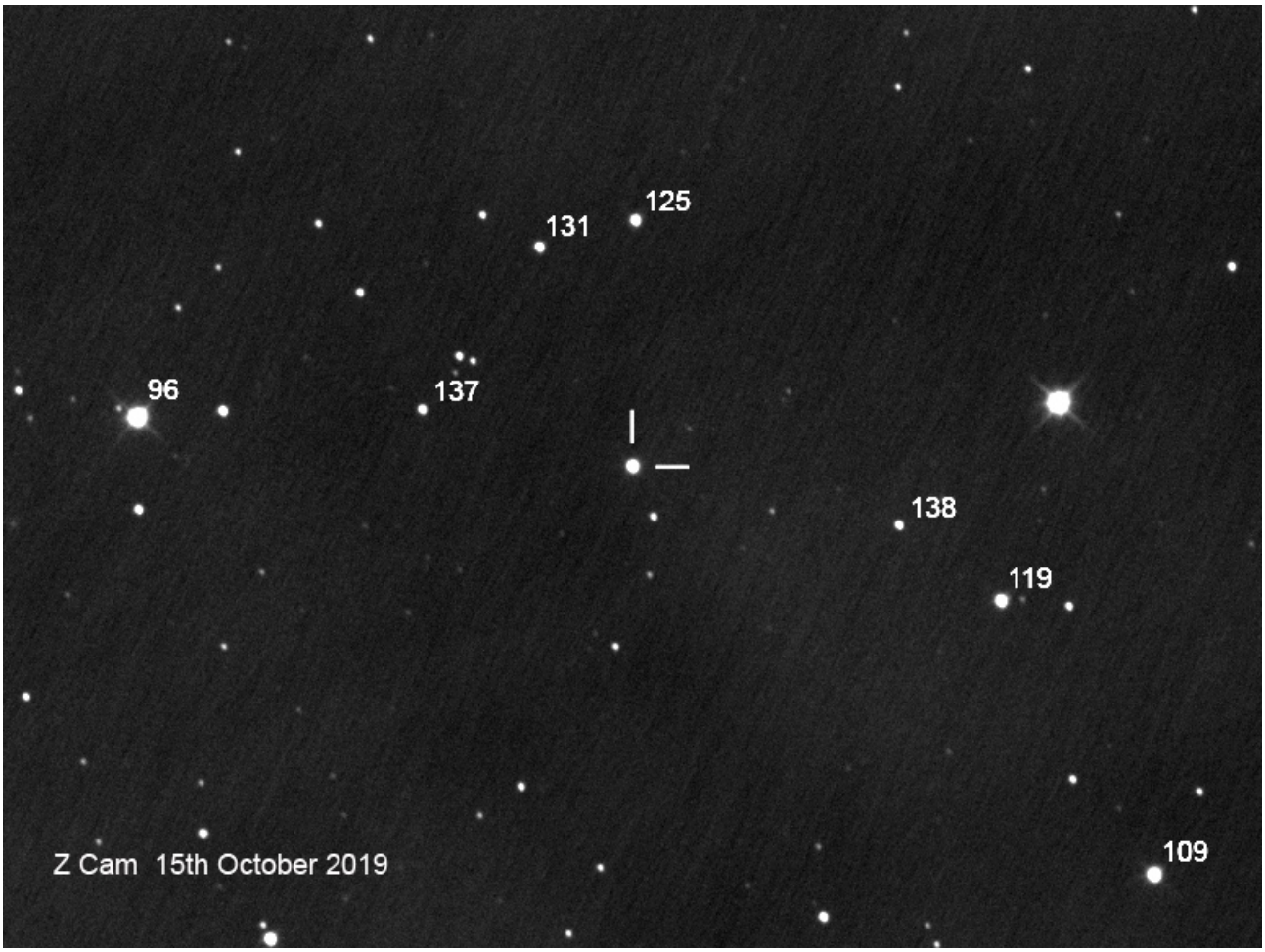



**Figure 1.1. Z Cam imaged on 15th October 2019. One year at standstill and counting! FOV 19 x 14 arc minutes, North to left. Numbers are reference star magnitudes with the decimal point omitted.**

### U Geminorum (RA 07h 55m 06s Dec. +22d 00m 09s (J2000) )

The last observed outburst of the cataclysmic variable U Gem was in March-April 2019 **[3]**. The expected outburst in the summer was lost in the glare of the Sun and the next outburst is expected anytime from now on. Gemini is a morning object so it requires an early start to observe it. The first image of this season was taken on 10th October and shows U Gem at minimum near magnitude 14. During outburst it can reach near mag 9, an increase of 100 in brightness.

***Update:*** *While I was writing this article U Gem went in to outburst on 22nd October. Figure 1.2 shows the before and after photos!*

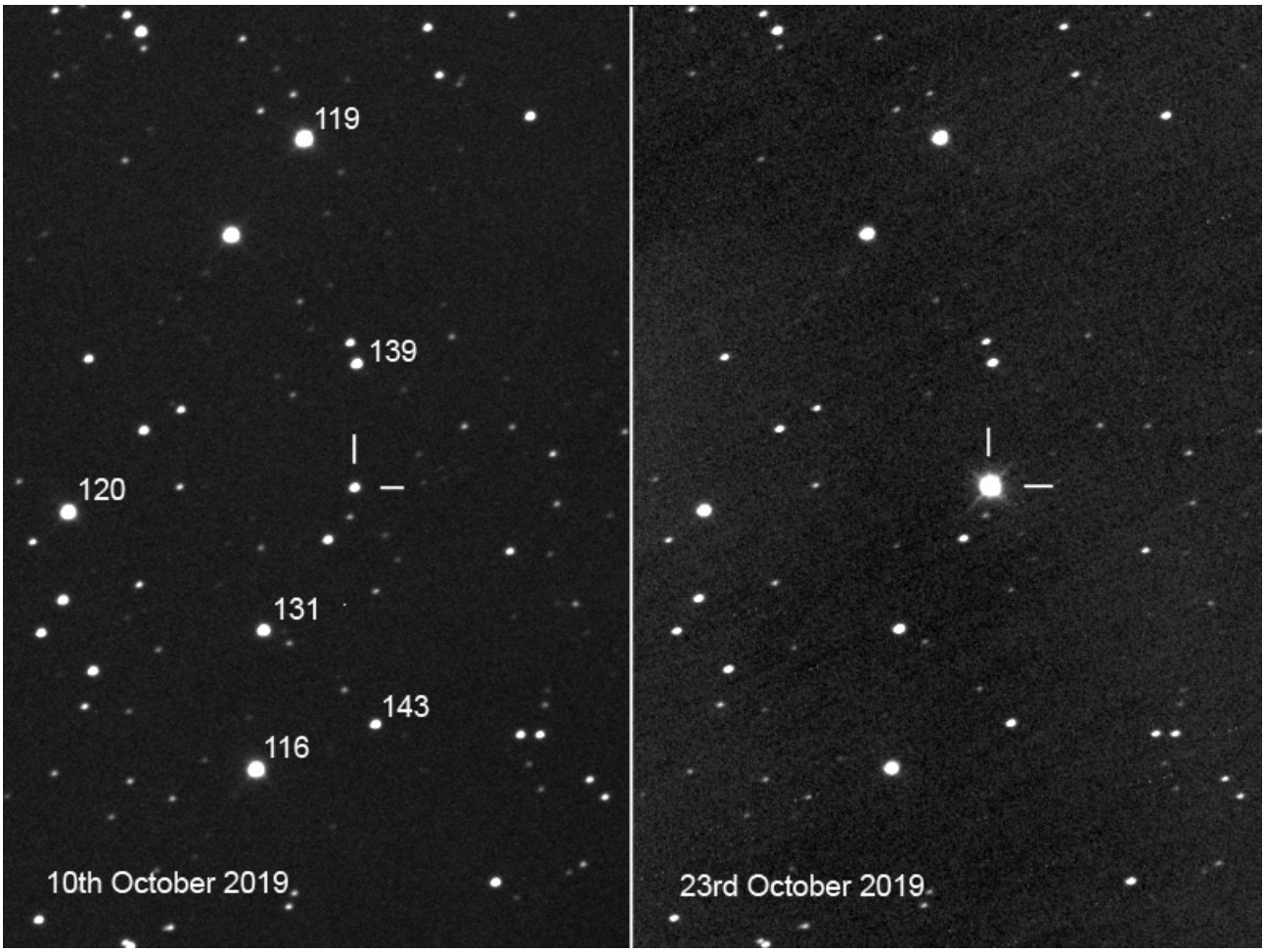



**Figure 1.2. U Gem on 10th October 2019 at magnitude 14 and in outburst on 23rd October at mag 9.5. Each field is 9 x 14 arc mins with north up.**

Other CVs have been observed recently, including RX And and SS Aur, but these will be discussed in future updates.

### RW Tauri (RA 04h 03m 54s Dec. +28d 07m 34s (J2000) )

Just five degrees north-east of the Pleiades, this is an eclipsing binary star with a very large magnitude range of 7.6 to 12.0. It is reported to have a disc of gas around the secondary star showing emission lines during eclipses **[4]** making it an interesting target for spectroscopy. The star was first observed on 8th October when at maximum and the total eclipse was observed on the morning of 10th October. Images taken at maximum and as the eclipse progressed are shown in figure 1.3.

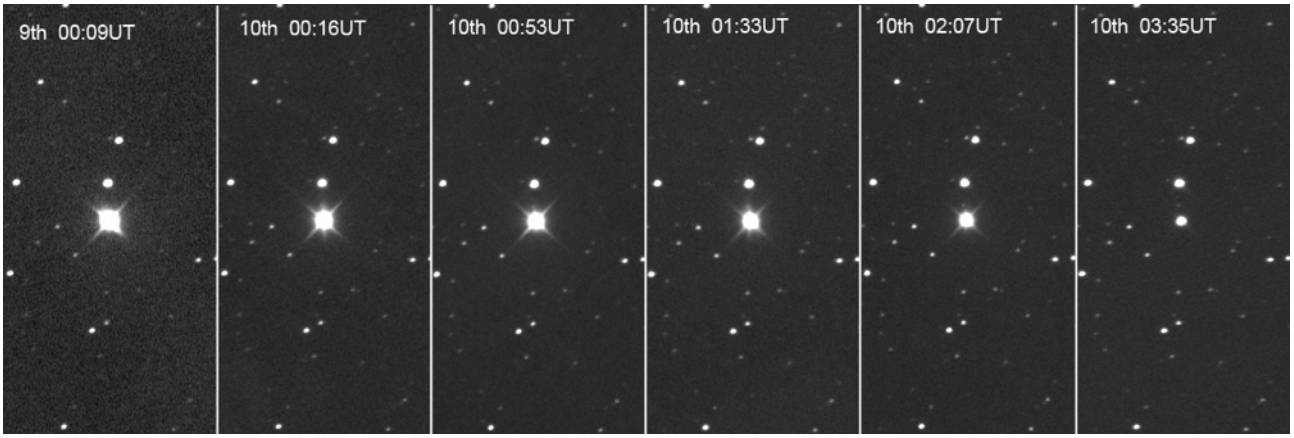



**Figure 1.3. Sequence of images of RW Tau showing the large magnitude range of its eclipse. Each panel is 4.5 x 9 arc mins with north up.**

Spectroscopy was attempted to show the emission features reported in the literature but none were seen. Only the hydrogen Balmer series spectrum of the B-type star was recorded well outside of eclipse. During totality, a featureless spectrum was recorded with no sign of any emission lines. Note the blue end of the spectrum (right) has faded as the hot, blue star is eclipsed. Maybe my system isn't sensitive enough to detect the emission lines or possibly they vary in intensity over time and were just too faint for detection at this eclipse. The observation will be repeated to see if there are changes over time.

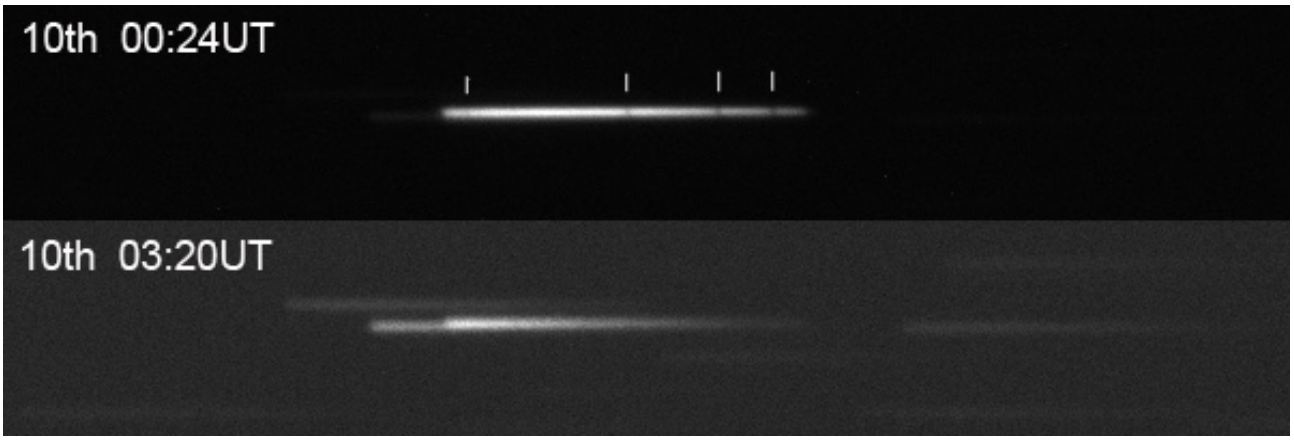



**Figure 1.4. Spectra of RW Tau at maximum (top) and during eclipse. Hydrogen Balmer lines are visible in the un-eclipsed spectrum but the spectrum during eclipse is featureless.**

Future eclipses of RW Tau can be found in ref. **[5]**.

### U Cephei (RA 01h 02m 19s Dec. +81d 52m 34s (J2000))

As reported in the September Newsletter (pages 18 to 20), this eclipsing binary showed some interesting features in spectra taken during the eclipse on 25th February 2019. Hydrogen emission lines were seen in the spectrum during the total phase and the hydrogen alpha absorption line was weak early in the partial phase. These observations were reported on my BAA web page **[6]** and fellow BAA member, Hugh Allen **[7]**, responded that he had also taken spectra of U Cep back in 2016 but had not seen any emission lines. He repeated his observation in September 2019 but again didn't record any emission. We are currently coordinating observations of U Cep to investigate these conflicting results.

***Update:*** *An objective prism spectrum recorded during the eclipse on 23rd October again showed hydrogen emission lines. More details in a future article.*

The timings of U Cep eclipses can be found in ref. **[8]**.

### Zeta Aurigae (RA 05h 02m 29s Dec. +41d 04m 32s (J2000))

One of the 'kids' below Capella, zeta Aur is a long period eclipsing binary. The total eclipse was due to start on 25th October so should be underway when this newsletter is published. Total eclipses occur every 972 days and last for 38 days so the end of this total should be on 3rd December.

Zeta is just 48 arc minutes away from eta Aur which is a hot blue star and shows a nice colour contrast in the DSLR image in figure 1.5. The colour of zeta should become slightly redder during the eclipse as its blue binary companion is hidden during totality.


**Figure 1.5 Colour contrast of eta and zeta Aurigae, 10th October 2019.**
**4 inch F/5 Newtonian with Canon 550 DSLR.**

## 2 Variable Nebula update

Three variable nebulae have been observed over the last two months from home and using remote telescopes.

### Gyulbudaghian's variable nebula

Observed from home over three consecutive nights from 19th to 21st September. Images from all three nights were combined into a single image.

The nebula was also imaged using the University of Iowa Gemini telescope in Arizona (part of SSON **[9]**) but with rather disappointing results. A much better image was then acquired using the 12 inch at home on the night of 2nd/3rd October over a period of 4 hours. In fact, the imaging run was so long that poor polar alignment of the mount became apparent and the images had to be de-rotated before final staking to avoid trailing! Both images are shown in figure 2.1.

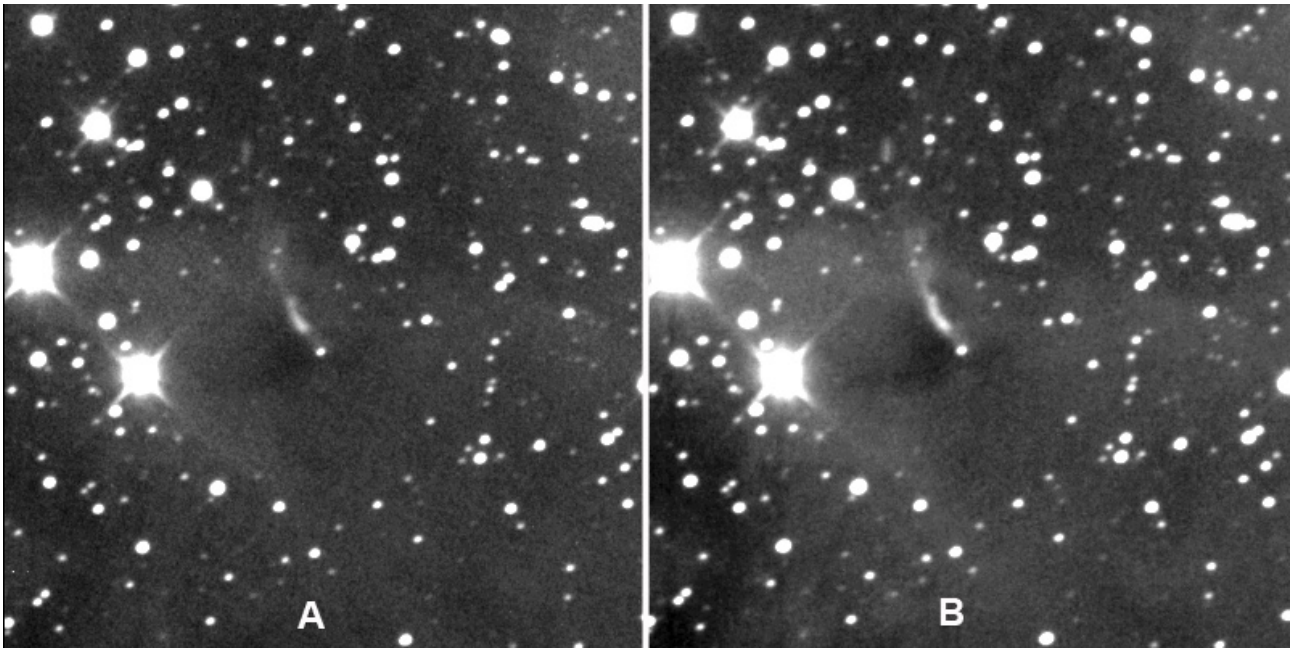



**Figure 2.1 Recent images of Gyulbudaghian's nebula. 12 inch F/3.6 astrograph with starlight Xpress H16 CCD and astrodon luminance filter. A) 19th, 20th and 21st September, B) 2nd - 3rd October. 9 x 9 arc min fields of view with north up.**

### Hind's variable nebula, NGC1555.

Just above the Hyades, my first image from home was on 3rd October. I also imaged it using a remote telescope on 6th October to get a bigger image scale for this relatively small object. That remote telescope image is compared to earlier images in figure 2.2 to show the very subtle changes visible in this object.

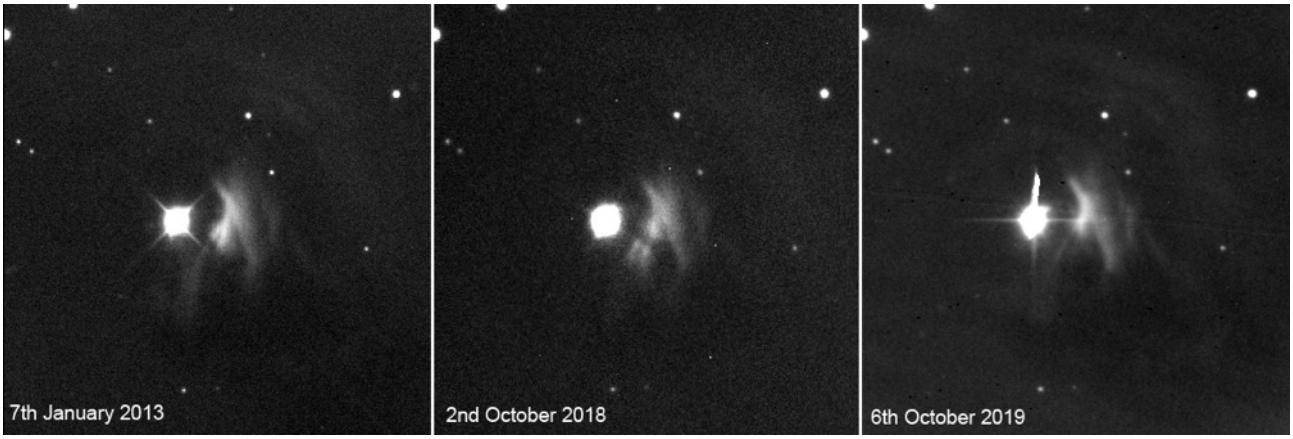



**Figure 2.2 Hind's variable nebula over 6 years. 2013: Mt Lemmon 0.8M telescope. 2018: Las Cumbres observatory 2.0M telescope. 2019: 0.5M Gemini telescope in Arizona. Each panel 6 x 6 arc mins with north up.**

### McNeil's variable nebula

Part of the nebulosity associated with M78 in Orion, this too is currently best observed in the early morning. A rather poor image from SSON (again!) on 30th September was followed by a much better image from home on 3rd October.

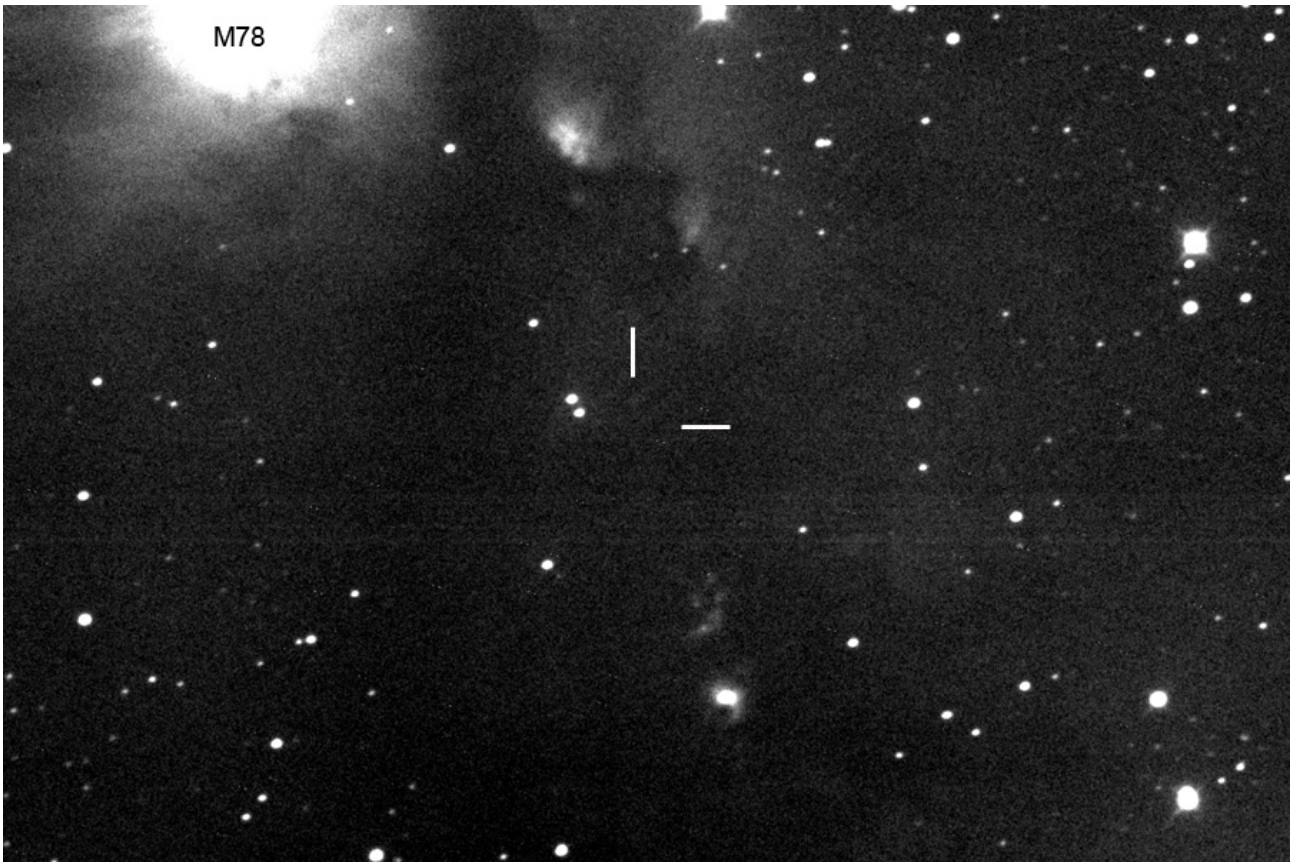



**Figure 2.3 The position of McNeil's nebula near M78.**
**Image on 3rd October 2019 with 12 inch F3.6 astrograph. Field of view 28 x 19 arc mins with north up.**

The nebula remains invisible after it faded from view last year **[10]** but the region will be monitored at regular intervals to check for its return. Watch this space...literally!

## References


1. American Association of Variable Star Observers (AAVSO) light curve generator: https://www.aavso.org/lcg
2. BAA variable star section newsletter no. 181, September 2019: http://www.britastro.org/vss/VSSC181.pdf
3. OASI October Newsletter pages 35-36
4. Burnham's celestial handbook, Volume 3, page 1841 (Dover publishing,1978)
5. RW Tau eclipse timings at: http://www.as.up.krakow.pl/minicalc/TAURW.HTM
6. Observation of U Cep spectrum 25th February 2019: https://www.britastro.org/node/19199
7. Hugh Allen wrote a nice article on amateur spectroscopy in *Astronomy Now* magazine, October 2019, pages 78-82.
8. U Cep eclipse timings at: http://www.as.up.krakow.pl/minicalc/CEPU.HTM
9. Sierra Stars Observatory Network: http://sierrastars.com/
10. OASI Newsletter December 2018.

# A Visit to the Sydney Observatory

**Neil Short**

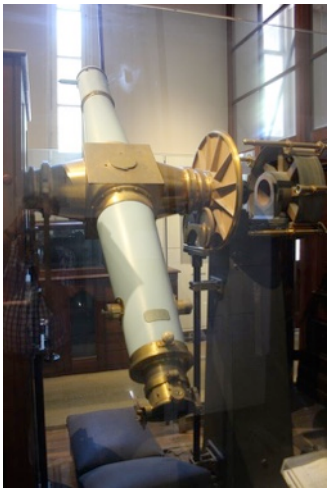
Following my 2018 journey to New Zealand, part two (of two) of my retirement holiday was a further visit to Australasia, this time for a 30+day trip to Australia. As usual, landscape and wildlife interests (and iconic sights of the country) were to the fore so no significant astrophotography opportunities were expected on the trip. As before, my photographic travelling companion was my Canon 100D camera fitted with a Tamron 18-200mm lens.

In early September, following a 21-hour flight (broken only by a 3-hour stop-over in Singapore) my wife, Katherine, and I landed in Sydney and travelled to our hotel in the central harbour district. To aid our recovery from jetlag, a walk around the central district was in order. I had, pre-travel, confirmed the existence of an Observatory and, with an element of good fortune it was only some 15 minute walk away; hence, a good initial target for our stay was in place.

The weather was beautiful, some 25 degrees with a perfect bright blue sky. I, however, was not overly excited by the potential for any astronomical viewing on this visit to Sydney. In line with a number of visits to historic old Observatory sights in cities around the world, the early perfect build location on a hill above the harbour is now lost amongst a forest of tall skyscrapers.

The Observatory was built in 1857-9 next to the site of an earlier Signal Station built in 1825 (cottage at left built in 1848). Until the 1920s the flagpole remained the primary means of informing signal stations and the port authorities of ship arrivals.

The Observatory building combined the needs of both observing and accommodation for the Astronomer. In the early days, the primary purpose for the station was that of timekeeping, that is the accurate determination of time through movement of the stars. As with Greenwich a time ball is on top of the observatory (yellow in this case as against the red of Greenwich) which, at 1300 every day was raised and dropped to confirm the time to vessels in the harbour. Inside was a museum offering information about the Observatory, its function over time and the local area. The transit telescope (source of the above star movement information) was still in place.

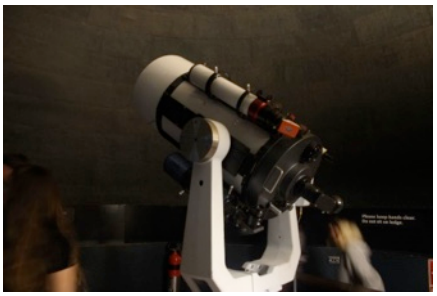


Notwithstanding my limited expectation of night viewing from the observatory, I did book onto an evening at the Observatory for the following night, if only to see the telescopes within.

The views from the Observatory to the south are indeed impressive with the iconic harbour bridge to the fore. However, the evening observing visit was to confirm just how little can now be seen astronomically from the Observatory.

The tour was run with the support of students from a local University and our Guide was extremely enthusiastic. Our tour of the museum gave more information about the telescopes. The primary (and oldest) telescope in the main (south) dome is an equatorial 29cm (11.4 inch) refractor, made by Hugo Schroeder in Germany and installed to observe the transit of Venus in 1874. It remains the oldest functioning telescope in Australia.

Perhaps an early indication of likely observed targets for the evening was the Guide's statement that her favourite object was the Moon. Sure enough, an early view of the half-moon through the telescope would certainly have removed any dark adaption we may have had! Further bright targets of Jupiter and Saturn followed before a move to the other telescope at the site, a modern 16-inch Celestron SCT where one particular observed target (the cluster 47 Tucanae) at least had the interest of being unobservable in the northern hemisphere. This, at Mag 4.1 was still just visible as a smudge (a web-picture below), suggesting a probable limiting Mag for the Observatory. The tour finished with a quick trip into a small Planetarium within the Museum where we were shown a review of what could be seen in a darker sky.



Overall, a lovely site to visit if you are ever in the area and the evening tour is indeed worthwhile but clearly don't build up too much excitement as to the viewing of the southern sky from this specific location.

*Neil J Short*

16th Oct 2019

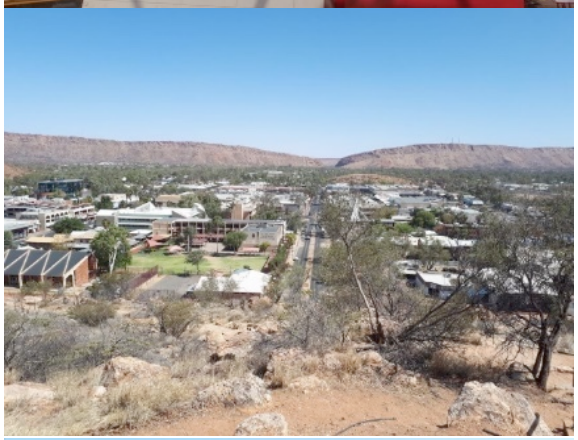
# An Alice Springs Experience

**Neil Short**

It's September 2019 and my pension pot has delivered once again. This time a visit to Australia, ticking off one of my final "big ticket" destinations. Visits to Sydney, the Barrier Reef and Darwin, for my favourite stopover in Kakadu National Park had come and gone. I had enjoyed iconic sights and great wildlife and landscapes on one of my great holidays.

Unfortunately, if astronomy sightings were an aim (not a true priority for the visit) then the nature of the trip created some difficulties. Firstly, each evening was spent in a built-up area with the light pollution that brings. In most cases, the opportunity to travel into a dark area was limited (no car) but where the opportunity did arise a different problem appeared - wildlife. In addition, whilst happy to roam within the UK, the known ability of a wide variety of Australian wildlife to ruin your day (or night) made me cautious to say the least. For sites near water, large yellow signs remind you of the constant crocodile presence, advising you to stay at least 10m from the water. Apparently, this should be enough to outrun one as they quickly give up the chase. In bush areas, risks are due to a wide range of snakes, insects and even kangaroos. All in all, any astro-photographic activity would have to take its chance near to habitation.

From Darwin, our journey took us to the Ghan Railway and a four-day journey across the centre of Australia to Adelaide. The first night's stop at Katherine offered no night viewing opportunity. However, our second night's stop at Alice Springs had potential. Following a day touring the "sights" of Alice Springs, a town of some 30,000 souls, we were treated to "An Outback Pioneer Dinner" held at the historic Telegraph Station (1872) on the outskirts of the town.

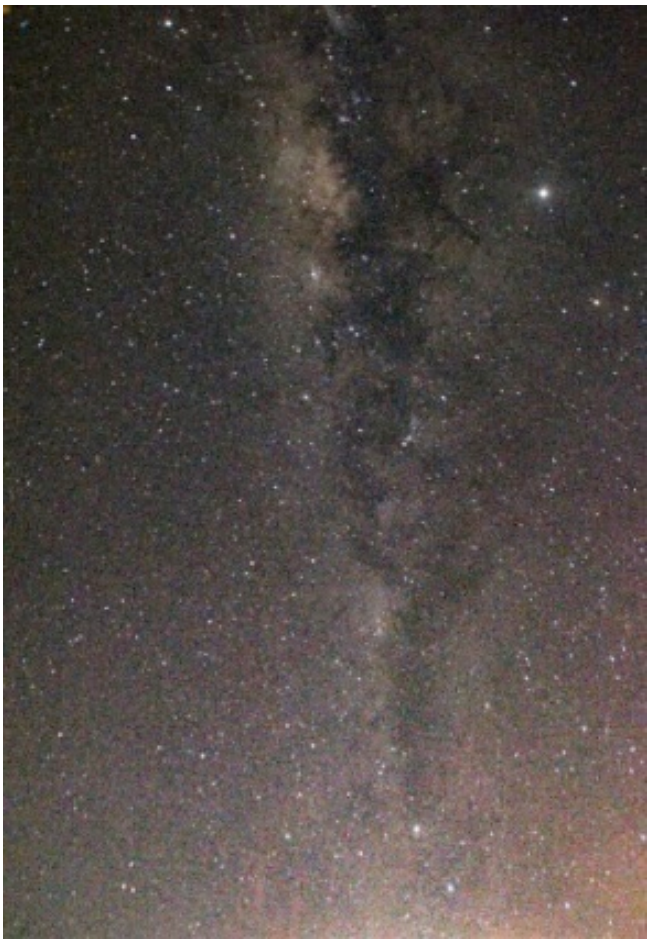
Quite what Outback Pioneers would have thought of our 4-course BBQ-based dinner is open to question, but my hope was that the evening would bring the opportunity for a view of the southern sky. As it happened, the photographic opportunities of the evening were mixed. The dinner was excellent, but the night sky view somewhat diminished by arc-lights prettily illuminating the surrounding gum trees – yes, trees were also an issue. Undeterred I disappeared between courses behind buildings in the hunt for a little shadow.

Fortunately, and key to my photographic technique, there were a number of fence posts on which to balance the camera for the requisite time. My view from the shadows was indeed splendid, even with the light leakage into the lower sky. The centre of the Milky Way was almost at zenith; the first time in my life that I had seen this region of the home galaxy and did, most certainly, satisfy my astronomy viewing needs for the trip.

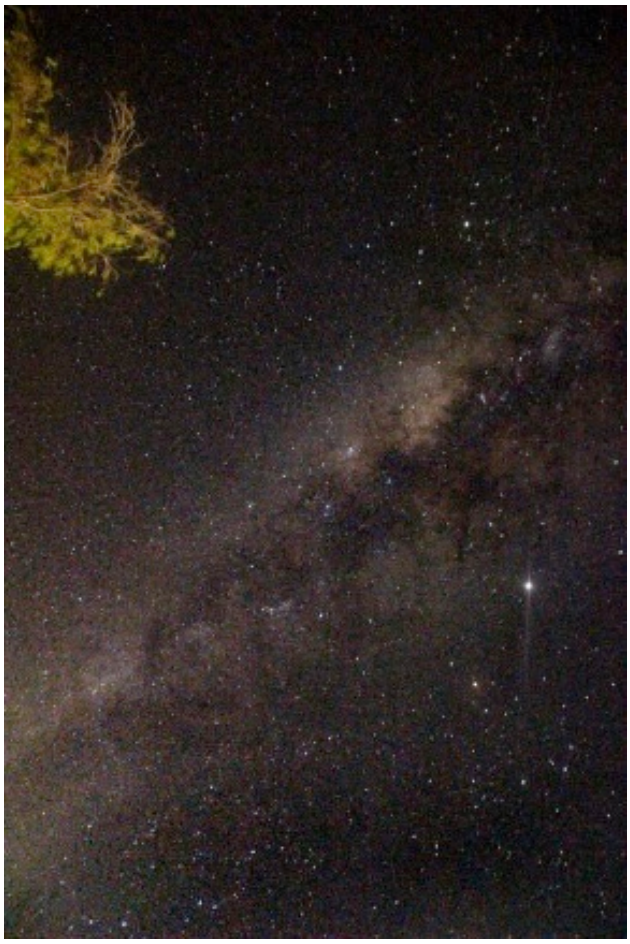
My Canon 100D with attached Tamron 18-200mm lens was set to an ISO of 6400. I guessed infinity focus, propped up the camera at the right angle (largely pointing "straight up") then opened the shutter for around 20-30secs. As the evening progressed and I found darker places to try, I obtained some quite pleasing "dark-sky" shots.

Despite my limited memory of the central Milky Way, I could clearly identify the galaxy centre and the constellation of Sagittarius with the “Teapot” asterism. Further bright patches suggested the location of the Lagoon nebula and others. As an added bonus, I was fortunate to add the planet Jupiter to my photographs, beautifully framed below galaxy centre.

All in all, I was impressed with the resultant photographs; after all, my primary aim was merely to obtain a memory jog. On returning home, a little “teasing” through simple edit adjustments of light, colour and clarity functions produced the remaining photos within the Newsletter. Finally, on further analysis, I identified a small overlap of my March 2018 NZ Milky Way images and aligned below by the bright stars of Hadar and Rigel Kentaurus in the constellation Centaurus.



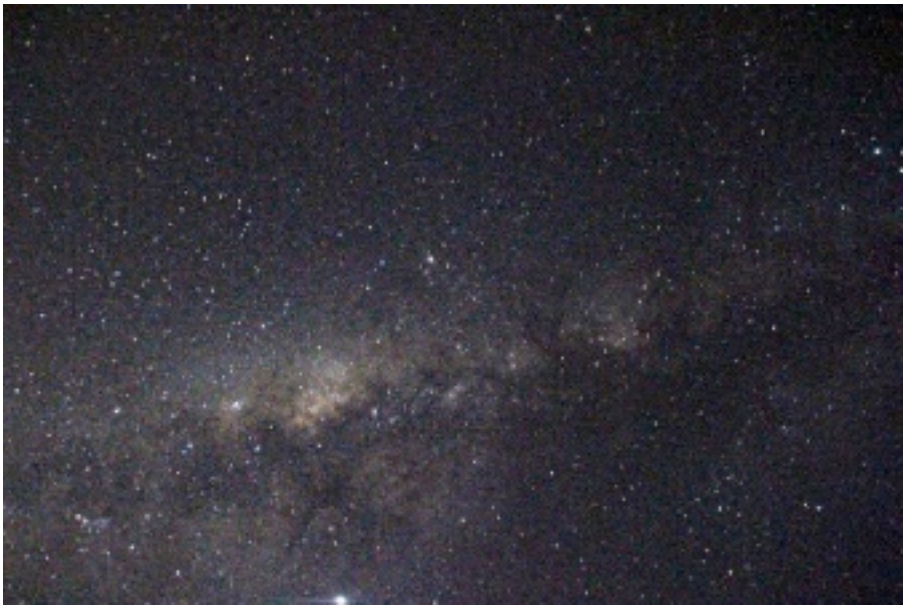
**Australia – September 2019**

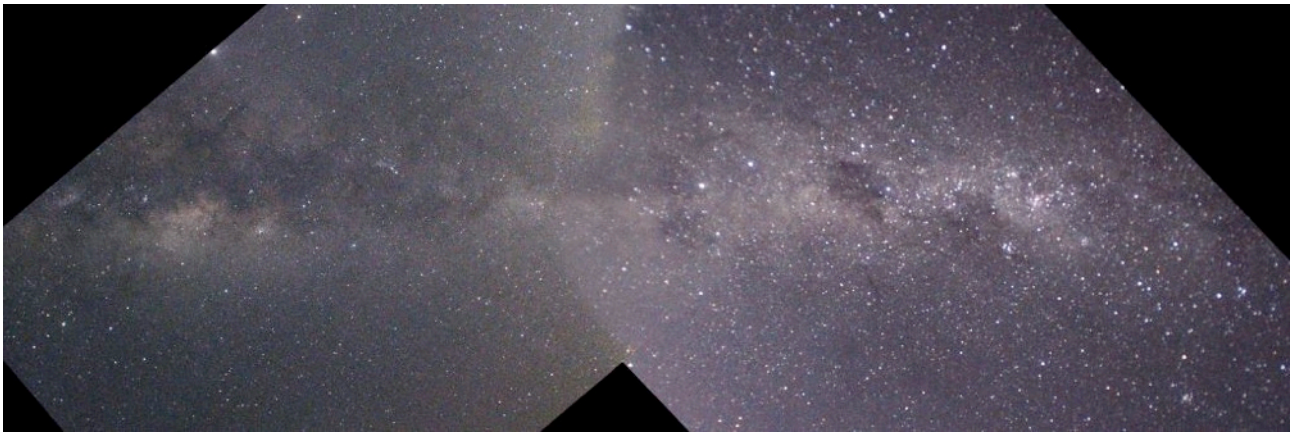


**New Zealand – March 2018**

I therefore have a good portion of the southern skies Milky Way. All in all, not bad pictures and lots of happy memories.

*Camera settings for the above photos: ISO 6400, Exposure time of 25-30sec & F/3.5 at 18mm.





*Neil J Short*
25th Oct 2019

## Observatory Shed

**Ian Hastie**

Due my physical condition I decided that I needed a permanent telescope set-up if I was to enjoy the hobby into the future but due to the age old problem i.e. lack of money and, after a great deal of research, I felt it was best to have a roll-away shed. I decided against the shed where the top half alone rolled back due to possible blockage to the west when open so decided to roll the whole shed away on 2 substantial tracks. The plastic shed I purchased was a Keter Manor out door plastic shed. The cheapest one I found was from Amazon costing £329 but may be cheaper elsewhere. It is well designed and fits together well and has a very good and clear assembly manual even for old people like me. I wanted to retain the SkyWatcher EQ5 go-to tripod and realised that I would have to remove 50% of the floor to achieve this and decided to fit. 3/4 inch exterior ply wood underneath the plastic floor to replace the Lost strength and also I could fit the wheels to it. I purchased the plywood from Collier and Catchpole as it was a good deal cheaper then elsewhere. The rails I made from 2 inch alloy angle from Sackers scrapyard at Ipswich docks. It was very strong and I used substantial pop rivets to hold together two sections to form a U Channel section wide enough not to jam the wheels. I was hoping to use 3" x 32 mm wide wheels. I used eight sections of angle to make two 16ft long rails facing east to west for best

observing in my back garden. Two wheels were fixed and two had swivels but due to jamming I welded in the straight ahead position. One problem I had was the 3 inch wheels jammed due to the axle bolts catching in the channel sides so I fitted sections of 50 mm Stud inside the rails to lift up the wheels clear of the rail sides, which for now works very well – isn't forward planning a wonderful thing – 4 3/4in diameter wheels would have worked perfectly but new ones are about £45 for four.

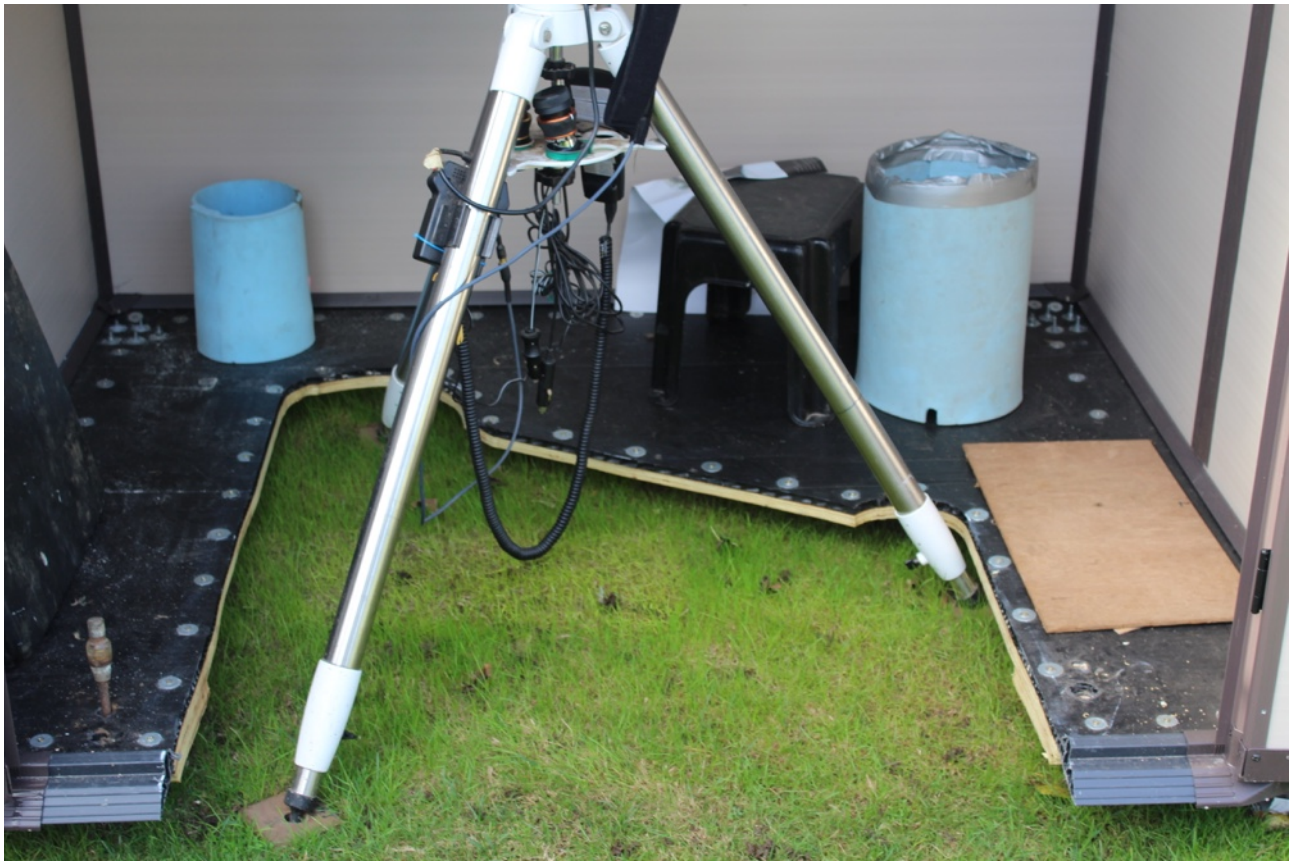
The result is a shed, sorry, Observatory, that holds my EQ5 go-to tripod with a 200p scope easily and, after lifting 2 Anchor spikes in the ground, allows the shed to roll away with one hand and back just as easily.

The prices I paid are as follows

| | |
|---|---|
| Shed | £329 |
| Wheels approx. | £45 new |
| Alloy rails | £40 |
| Tw 8' x 4' 3/4" exterior plywood | £48.54 |
| Total cost | £447.54 |

If anyone would like to visit to check out the shed, sorry, Observatory they would be most welcome.

**Rail**



**Scope *in situ***

**The finished ~~Shed~~ Observatory**

# Christmas Party 2019

## Coach and Horses in Melton

Date:Wednesday 11th December

Time: 20:00

Deposit: £5

2 course £19.00

3 Course £23.00

If you would like to attend please contact me (Roy Gooding) with your menu choice and deposit. **Booking closes Tuesday 5th November.**

Email: r.gooding908@btinternet.com

### Starters

**Leek & Roasted Potato Soup**
**G/F, D/F**

Served with fresh bread

**Smoked Fish Platter**
**G/F, D/F**

Pinney's of Orford mackerel & oak roasted salmon with lemon mayonnaise & baby leaf

**Slow Roasted Sticky Pork Belly**
**G/F, D/F**

Crunchy Asian slaw salad

**3-Cheese Baked Portobello Mushroom**
**G/F**

Herb crumb & baby leaf

**Filo Wrapped Tiger Prawns**

Tiger prawns wrapped in filo pastry with a sweet chilli dip

### Main Course

**Traditional Roast Suffolk Turkey**
**G/F, D/F**

Roasted Suffolk turkey breast served with rich sage & onion stuffing, Procter's Cumberland chipolata wrapped in smoked bacon, golden roasted potatoes, fresh vegetables & rich gravy

**Leek & Winter Vegetable Wellington**
**D/F**

Served with white wine chive cream sauce & vegetable medley

**Slow Roasted Shoulder of Lamb**
**G/F, D/F**

Served with fondant potatoes, minted redcurrant gravy & vegetable medley

**Smoked Haddock & Prawn Gratin**

cooked in herb cream sauce with herb & mozzarella crumb & served with a vegetable medley

**Roasted Sirloin Steak**
**(£5 supplement) G/F, D/F**

Served with garlic buttered mushrooms, coleslaw, onion rings & chips

### Desserts

**Traditional Christmas pudding**

Served with brandy sauce

**Chocolate Truffle Tart G/F**

Served with salted caramel ice cream

**Selection of Fine Cheese & Biscuits**
**G/F**

with a selection of crackers & apple

**Mulled Berry Trifle**

Chocolate shavings

### Mince Pies to Finish G/F

**G/F Gluten-free**

**D/F Dairy-free**