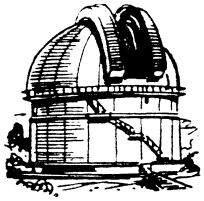
Journal

of the

Nottingham Astronomical Society

December 2018



In this issue

Thursday, December 6th

Gotham Memorial Hall
Gotham, NG11 0HE

8 pm (doors open at 7 pm)

Tonight we welcome

Prof Dame Jocelyn Bell Burnell

DBE, FRS, FRSE, FRAS

who will be speaking on

Transient Events in Astronomy

or

"Things that go bump in the night"

Winter Evenings return – but with them some old friends

Orion strides over the horizon, and the Bull rides high

Imaged by the Editor using a Canon 450D camera

Sky Notes
December 2018

Compiled by Roy Gretton

All times given below are in Universal Time (UT)

The **Winter Solstice** occurs at 10:23pm on December 21st, when the Sun will be 23.44 degrees south of the celestial equator. On that date the ***midday Sun will be less than 16 degrees*** above the southern horizon when viewed from the latitude of Nottingham, and the hours of darkness will be the greatest of the year.

PHASES OF THE MOON

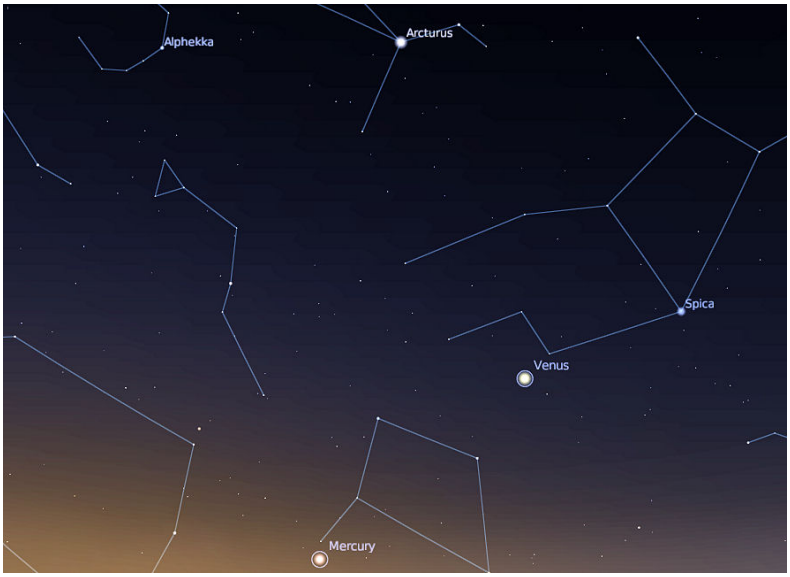
Phase	***Date***
New Moon	December 7th
First Quarter	December 15th
Full Moon	December 22nd
Last Quarter	December 29th

This month the Moon is closest to Earth on the 24th, and furthest on the 12th.

THE PLANETS

After passing through inferior conjunction late in November, **Mercury** spends the whole of this month as a morning object, reaching greatest western elongation (21 degrees) on December 15th. On this date it will be about 18 degrees south of the celestial equator, and therefore very difficult to observe from the latitude of the UK.

Venus is a brilliant object in the morning sky throughout December. It begins the month 10 degrees south of the celestial equator, shining at magnitude –4.6, and ends the month 15 degrees south and shining at magnitude –4.5. Through a telescope it will appear as a thickening crescent. Greatest western elongation will occur on January 6th.



Looking southeast at 7 am on December 14th

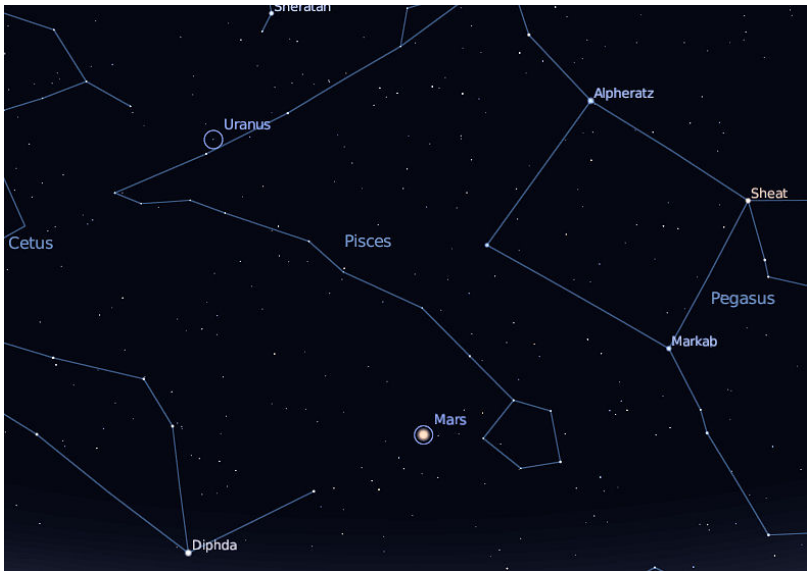
Venus shines brilliantly, heralding the dawn

Mars continues its long decline in brightness following the opposition of late July. Moving continually northward, it will be close to the celestial equator in the constellation of Pisces by the end of December, and very easy to spot, being the brightest "star" in that region of the sky.

Jupiter, close to the Sun in the morning sky, is virtually unobservable this month.

Saturn, too, is unobservable as it heads toward conjunction with the Sun in the New Year.

Uranus is very well placed for observation in the evenings this month (see star map below). Its magnitude is 5.7 and its angular diameter 3.7 arcseconds.



Looking southwest at 9pm on New Year's Eve

showing the positions of Uranus and Mars

Neptune, in the constellation of Aquarius, is an evening object, observable with a suitable telescope (magnitude 7.9).

METEORS

The **Geminids**, which reach their maximum activity on the night of **December 13th-14th**, are unrivalled as our most abundant meteor shower of the year, producing over 100 events per hour under ideal conditions. Furthermore, the radiant of the shower, close to the star Castor, is above the horizon for the whole night in December, so Geminids may be seen at any time after darkness falls (although the radiant doesn't reach its highest point until after 1 am, so a midnight vigil should yield greater rewards).
If you are able, do take advantage of the conditions this year, which will be much more favourable than those in 2019, when peak activity is expected on the night of the Full Moon! This year we shall have a 7-day-old Moon, which will have disappeared from the sky by midnight, leaving excellent conditions for meteor spotting. But you can also start looking for some Geminids as early as December 8th, when no Moon will be visible.
Of course there is the small matter of the weather! December nights can be ***cloudy*** (for which we have no remedy) and if clear may be ***cold*** (the remedy for which is to wear sufficient layers of warm clothes as you settle into your recliner and gaze skywards, or point your camera in a hopeful direction).

DIARY DATES 2018-2019

Monthly Meetings of the Nottingham Astronomical Society

1. Meetings at Gotham Memorial Hall

Nottingham Road, Gotham, NG11 0HE

Held on the **FIRST Thursday** of each month except **August**
Doors open at 7pm for 8pm start.

*These events are normally centred around a talk by a visiting speaker, except Open Evenings, when NAS members provide the activities. Normally we have a **Library** and a **Helpdesk** open at each meeting.*

Date	Topic	Speaker
December 6th	**Transient Events in Astronomy** **or** ***Things that go bump in the night***	**Prof Dame Jocelyn Bell Burnell** DBE, FRS, FRSE, FRAS
January 3rd	**Open Evening** ***with a New Year Quiz***	
February 7th	**Diamonds in the Sky** ***White Dwarfs in Modern Astrophysics***	**Prof Martin Barstow** University of Leicester
March 7th	**Beyond Pluto** ***New Horizons in the Kuiper Belt***	**Paul Money** FRAS, FBIS
April 4th	**Gaia's Galactic Survey**	**Dr Nicholas Walton** University of Cambridge
May 2nd	**It's About Time** ***Time's Arrow and Time Travel***	**Prof Ian Morison** University of Manchester
June 6th	**From Tycho to Newton** ***Foundations of modern astronomy***	**Dr Allan Chapman** FRAS
July 4th	**Metal Detecting** ***What are metals to astronomers?***	**Dr Julian Onions** University of Nottingham
August 3rd *(Saturday)*	**Annual Barbecue at the Observatory** *(Members and their guests only)*	
September 5th	**Where Are the Aliens?** ***Might we be alone?***	**Prof Brad Gibson** University of Hull
October 3rd	**The 200 at 70** ***The Hale Telescope***	**Dr Steve Barrett** University of Liverpool
November 7th	**Annual General Meeting** with a Wine and Cheese Social	
December 5th	**Voyages to the Sun** *Probing our nearest star*	**Prof Lucie Green** University College London

2. Social and Practical Astronomy Meetings at the Burnside Memorial Hall, Plumtree

Church Hill, Plumtree, Nottingham, NG12 5ND
Held on the **THIRD Thursday** of each month from **7:30pm**

These meetings are of a more informal nature, providing opportunity for members and guests to share their hobby over a cup of tea or coffee, as well as listening to a short talk.

The next meeting will be on December 20th (see further details below)

Check our website: www.nottinghamastro.org.uk
for the latest information about the Society's meetings
and for further information about the talks and speakers

Other astronomy-related events in the coming months open to everyone

(follow hyperlinks for more information and how to book)

8th December	BAA Christmas Lecture, London
26th January	SPA Meeting, London

NAS Library - Volunteer Wanted

Our successful library service has been running for several years at our Gotham and Plumtree meetings.
We are looking for a member to volunteer to assist with the running of the library at NAS meetings. The role involves liaising with our Librarian Lorraine, to ensure the books are brought to our society meetings. You must be able to arrive at the meetings by 7:30pm to put out the books. Any books returned or loaned need to be recorded on our simple paper records system. Other than that you just need a friendly smile!

Please help us to keep this service running at our meetings and volunteer to be help out with the library.

If you are interested speak to Richard or Lorraine at one of our meetings or please email us

NASlibrarian@hotmail.com
or
membership@nottinghamastro.org.uk

Social and Practical Astronomy, Plumtree

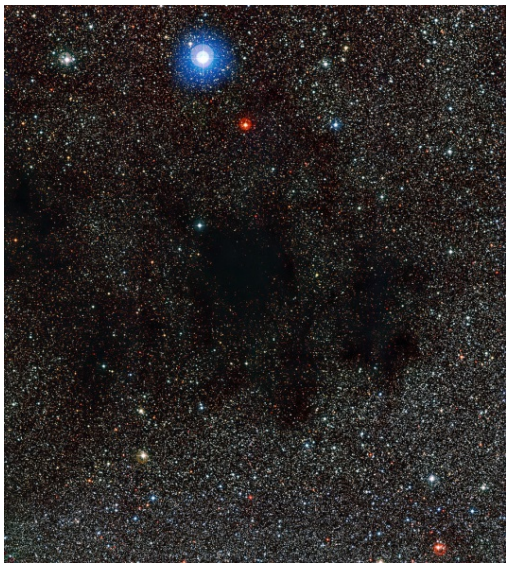
The **November** meeting at Plumtree saw our chairman, John Hurst, talk about the southern sky. John has travelled much nearer to the equator and well into the southern hemisphere on several occasions and talked about some of the wonders of the night sky.

John talked about the Caldwell Catalogue, which was devised by Patrick Moore in the mid 1990s. Unlike the list of Messier objects, which are all visible from the northern hemisphere, 34 objects in the Caldwell Catalogue are not visible from Paris where Charles Messier composed his list in the 1770s.

John picked a few of the southern constellations to talk about, as well as the astronomical entities within.

The Southern Cross (officially named Crux) is one of the most famous constellations in the south and contains two stunning objects listed in the Caldwell Catalogue.

The Coalsack Nebula (Caldwell 99, right) is a dark nebula and consists of gas and dust which blocks out the light of distant stars, and as such appears to represent a gap in the star field.



The Jewel Box (Caldwell 94, below) is an open star cluster also in Crux; named the Jewel Box by John Herschel, it is also one of the youngest open clusters known with an estimated age of just 15 million years.

John also talked about some of the double stars, globular clusters, and different types of bright nebula to be seen in the southern sky.

The appeal of being able to observe the night sky in a warm environment held appeal for all of the audience and I am sure John's talk will encourage some to consider a trip to the southern hemisphere to enjoy the night sky. Many thanks to John for his talk.

The **December** meeting at Plumtree will be a talk by Professor Mike Merrifield from the University of Nottingham about the Science of Christmas. We'll also have mulled wine and mince pies, so find someone to do the driving that night.

James Dawson
NAS Helpdesk
helpdesk@nottinghamastro.org.uk

Barnard's Star

A record of observations by Brian Griffin

Taken at first glance this red dwarf star (spectral class M4.0) would appear to be nothing special. Located in the constellation Ophiuchus (approx co-ordinates RA 17h 57m 49s, Dec +4deg 41min 36s) and shining at visual magnitude +9.5, at a distance of 6 light years it is the second nearest star after the alpha Centauri triple star system (of which proxima Centauri is the closest star to the Sun).

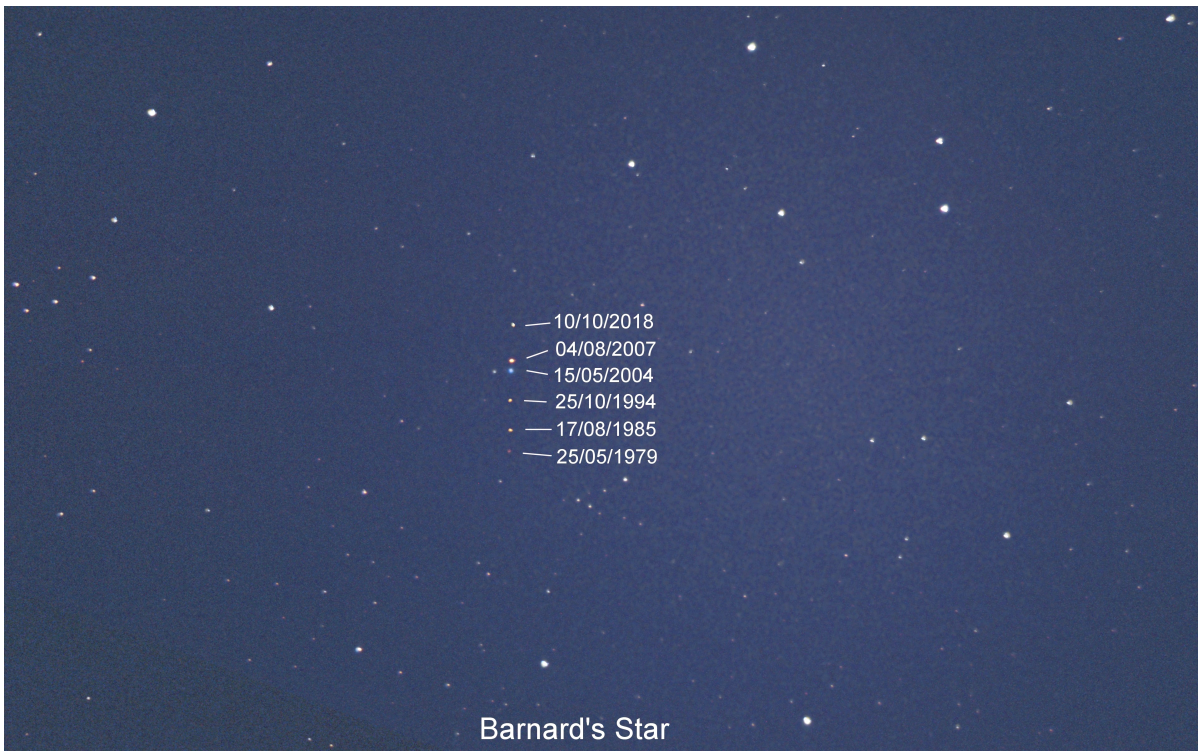
What makes Barnard's Star special is that it has the largest proper motion (10.3 arcseconds per year) of all the stars in the sky. Note that proper motion is the apparent motion of the star relative to the background stars rather than its physical velocity through space.

Although Barnard's Star was imaged in 1888 and 1890 it was not until 1916 that the eminent astronomer E E Barnard noted its large proper motion. The star was unofficially called Barnard's Star after 1916 in recognition of this fact. The IAU recently made the name official.

Depending on the various star catalogues in use, Barnard's Star would be identified under a different nomenclature (for instance, my old copy of Norton's Star Atlas has it listed as Munich 15040).

Over the years I have photographed Barnard's Star (at irregular intervals) at the prime focus of my 254mm f/5 reflector. Initially, a SLR film camera was used, whereas the last image was taken using a DSLR digital camera.
Note: all of my 35mm astronomical slides were digitally scanned to the same dpi setting.

Below is a composite image made by combining six separate images taken between 1979 and 2018.



My records show the following information:

1979 May 25	25sec exposure on Ektachrome 200 (ISO 200) taken at 23h 24m UT
1985 August 17	5min exposure on Ektachrome 200 (ISO 200) taken at 22h 03 m UT
1994 October 25	3min exposure on Ektachrome Elite (ISO 200) taken at 19h 07m UT
2004 May 15	5min exposure on Ektachrome II Elite (ISO 200) taken at 22h 35m UT
2007 August 4	4min exposure on Elite Chrome (ISO 200) taken at 22h 01m UT
2018 October 10	15sec exposure, Canon 450D, ISO 1600 taken at 20h 18m UT

Photoshop was used to present the image shown. The various images had to be rotated (in the case of the digital image scaled as well) to register the stars so as to form a composite image. Barnard's Star would reveal itself as the star that had moved by virtue of its proper motion. The final image was cropped slightly (north is at the top).
Over the nearly 40 years I have imaged Barnard's Star it has moved approximately 6.8 arcminutes through the sky.

Take a look at the Double Cluster!

The Perseus "Double Cluster" consists of two open star clusters that are actually close together in space (rather than simply lying along the same line of sight). They are listed as NGC 869 and NGC 884, and together constitute *Caldwell 14*. Their estimated distance from Earth is 7,500 light years, and their age is reckoned to be close to 13 million years (so quite young in astrophysical terms).
December evenings are a great time to observe the Double Cluster, high up in the south, and close to the plane of the Milky Way. They can be spotted with the naked eye, and are a stunning spectacle in binoculars or a small telescope.

Below is an image I captured on November 11th, using a Canon 450D at the prime focus of my 30-cm f/5.3 reflector. It is a single exposure of 30 seconds at ISO 800. The field of view is too small to include all the stars in the two clusters.

NGC 884 and **NGC 869**

Roy Gretton

The Nottingham Astronomical Society: E - SERVICES

Whether or not you are a NAS member, you can keep up to date with details of the Society's meetings and other events by visiting the NAS website: www.nottinghamastro.org.uk

NAS on Facebook
You are welcome to connect with other members and friends of the NAS on Facebook by going to: http://www.facebook.com/nas.org.uk

NAS on Twitter
The Society has a Twitter account at https://twitter.com/NottinghamAstro

NAS Journal e-mailing list
To register for your monthly e-mailed copy of the NAS Journal, just e-mail secretary@nottinghamastro.org.uk

You don't have to be a Society member to take advantage of this service.

If you happen to change your email address, please remember to inform the Society by emailing us at treasurer@nottinghamastro.org.uk

Nottingham Astronomical Society

Affiliated to the **B**ritish **A**stronomical **A**ssociation
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CHAIRMAN:
John Hurst
e-mail: president@nottinghamastro.org.uk

VICE CHAIRMAN:
Roy Gretton
e-mail: vicepresident@nottinghamastro.org.uk

SECRETARY:
(vacant post:)
e-mail: secretary@nottinghamastro.org.uk

TREASURER:
Mike Provost
e-mail: treasurer@nottinghamastro.org.uk

JOURNAL EDITOR:
Roy Gretton
e-mail: journal@nottinghamastro.org.uk

CURATOR OF INSTRUMENTS:
Leigh Blake
e-mail: curator@nottinghamastro.org.uk

DIRECTOR OF OBSERVING:
David Buxton
email: observatory@nottinghamastro.org.uk

Observatory line: **07726 940700 (line open during observing sessions)**

Meetings
Our formal meetings, often with an illustrated talk by a guest speaker, are held on the first Thursday of each month (except in August) at:

Gotham Memorial Hall
Gotham
Nottingham NG11 0HE

Doors open	7.00pm
Meetings start	**8.00pm**
Meetings end	10.00pm

These meetings are open to the public, and visitors are welcome to attend.

Annual subscriptions 2019

Full	£30
Joint rate for partners living at the same address	£45
Under-18s and full-time students	£5

Subscriptions become due on 1st January. Half-price subscription is charged if joining after 30th June (minimum subscription £5).

Please make cheques payable to:
Nottingham Astronomical Society.

If you would like more information about the **Nottingham Astronomical Society**, or would like to become a member, please contact the Secretary secretary@nottinghamastro.org.uk or speak to any NAS committee member at one of the regular monthly meetings. A membership application form is inside this issue of the Journal.