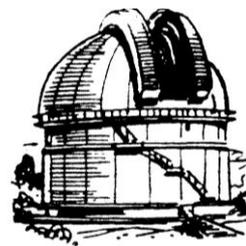


---

# Journal

of the



## Nottingham Astronomical Society

December 2014

---

### *Inside this issue*

- Sky Notes for December
- NAS e-Services
- Diary Dates
- The Great Andromeda Galaxy
- Society Information
- Membership application form

**Thursday, December 4<sup>th</sup>**

British Geological Survey

Nicker Hill, Keyworth

8 pm (doors open at 7.30pm)

Tonight we welcome

**Andrew Lound**

who will be delivering an illustrated lecture  
entitled

**“Into the Cosmic Ocean”  
*The Dream of Travel to the Stars***

### **RECENT NEWS STORIES ON THE WEB**

*Follow these links for interesting current news:*

A new method for estimating the distances of galaxies

<http://www.astronomy.com/news/2014/11/eye-of-sauron-provides-new-way-of-measuring-distances-to-galaxies>

Rosetta continues its full science phase

<http://www.sciencedaily.com/releases/2014/11/141119131812.htm>

Some galaxies appeared suddenly after the Big Bang

<http://www.astronomy.com/news/2014/11/subaru-telescope-detects-sudden-appearance-of-galaxies-in-the-early-universe>

Asteroid impacts make bizarre diamonds

<http://www.sciencedaily.com/releases/2014/11/141124125607.htm>

Chandra X-ray observatory studies supernova remnant MSH 11-62 in detail

<http://www.astronomy.com/news/2014/11/studying-the-complex-aftermath-of-a-supernova>

Discovery of an invisible shield 7,200 miles above Earth

<http://www.sciencedaily.com/releases/2014/11/141126133829.htm>

# Sky Notes

## December 2014

Compiled by Roy Gretton



*All times given below are in Universal Time (UT), effectively equal to GMT*

The **Winter Solstice**, when the Sun will be directly overhead at the Tropic of Capricorn, will occur on December 21<sup>st</sup> at 23:03hr. On that date the Sun will be less than 14 degrees above the southern horizon at midday at the latitude of Nottingham.

*(Our Winter Solstice is, of course, the Summer Solstice to dwellers in the southern hemisphere).*

### PHASES OF THE MOON

Full Moon	12:27 pm on December 6 <sup>th</sup>
Last Quarter	12:51 pm on the 14 <sup>th</sup>
New Moon	1:36 am on the 22 <sup>nd</sup>
First Quarter	6:32 pm on the 28 <sup>th</sup>

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

### THE PLANETS

**Mercury** begins the month as a morning object, unobservable as it moves toward superior conjunction on December 8<sup>th</sup>. Thereafter it emerges into the evening sky, but very unfavourably placed for observation from the U.K.

**Venus** is an evening object throughout December, but practically unobservable as it will be only a few degrees above the horizon at sunset.

**Mars** continues to move toward the Sun as this month progresses, and is effectively unobservable for UK observers.

**Jupiter**, close to the border between Cancer and Leo, is now the “stand-out” planet in our sky, and will remain so for several months until it is rivalled by Venus on spring evenings next year. Look toward the eastern horizon in the late evening to see Jupiter, bright and non-twinkling, climbing into view. By the end of December it will be rising at 8 pm, and shining at magnitude  $-2.4$ , and its angular diameter will exceed 43 arcseconds, making it an excellent subject for telescopic examination.

The constant movements of the four brightest satellites are fascinating to observe. Interesting phenomena include: **eclipses** (when a satellite disappears as it enters Jupiter’s shadow), **occultations** (when a satellite passes behind the body of the planet), **transits** (when a satellite passes in front of the planet) and **shadow transits** (when a satellite casts its shadow on to the visible surface of Jupiter). Of these, shadow transits are probably easiest to observe with a modest-sized telescope (say 100mm aperture or greater). Look for a dark spot crossing Jupiter’s disk. A list of shadow transits visible in the evenings this month is given below.

<b>December</b>	<b>Shadow transit of</b>
1 <sup>st</sup>	Europa begins at 22:57
3 <sup>rd</sup>	Io 20:55 to 23:11
4 <sup>th</sup>	Callisto begins at 21:20
10 <sup>th</sup>	Io begins at 22:48
19 <sup>th</sup>	Io ends at 21:26
26 <sup>th</sup>	Europa* 20:03 to 22:56
26 <sup>th</sup>	Io* 21:02 to 23:19

\*Note: Two shadows visible simultaneously  
*Data from the BAA Handbook*

**Saturn**, having passed through conjunction with the Sun on November 18<sup>th</sup>, emerges into the morning sky, but will still be too close to the Sun for effective observation this month.

**Uranus** is still readily visible in the evening sky through telescopes or binoculars. The planet is in the constellation of Pisces, shining at magnitude +5.9 and having an angular diameter of 3.6 arcseconds.

**Neptune** is an evening object in the constellation of Aquarius, and now becoming difficult to observe. Its magnitude is +7.9, and its diameter 2.3 arcseconds.

## **METEORS**

December once again brings the spectacular **Geminids** to our sky. These meteors are generally brighter and more prolific than the August Perseids, with over 100 meteors per hour visible under ideal conditions. This year maximum activity is expected to be at 7 am on December 14<sup>th</sup>, which means that the night of December 13<sup>th</sup>-14<sup>th</sup> is the one to mark in your diary. Conditions will be reasonably favourable, with the Last Quarter Moon not rising until midnight. But note that Geminid meteors begin to appear as early as December 8<sup>th</sup> and last until the 17<sup>th</sup>, so you may be lucky enough to see a specimen on any night during this period. Members with tripod-mounted cameras that allow for long exposures (say 10 seconds or more) may wish to have a go at capturing some of these events.

## **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](http://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 Journal e-mailing list**

To register for your monthly e-mailed copy of the NAS Journal, just e-mail [secretary@nottinghamastro.org.uk](mailto:secretary@nottinghamastro.org.uk)

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

# DIARY DATES 2014-2015

## Monthly Meetings of the Nottingham Astronomical Society

Our programme for this year is shown below. Check our website: [www.nottinghamastro.org.uk](http://www.nottinghamastro.org.uk) for the latest information about the Society's meetings and for further information about the talks and speakers.

Our meetings are held on the **FIRST THURSDAY** of the month, at the British Geological Survey, Keyworth, Notts, NG12 5GG

(except **August**, when we meet at our observatory site, between Cotgrave and Cropwell Bishop)

Doors open at 7:30pm for 8pm start.

<u>Date</u>	<u>Topic</u>	<u>Speaker</u>
2014 December 4 <sup>th</sup>	"Into the Cosmic Ocean" <i>The dream of travel to the stars</i>	Andrew Lound
2015 January 8 <sup>th</sup>	"It's Time for Astronomy!"	Dr Roy Gretton <i>NAS Vice President</i>
February 5 <sup>th</sup>	Open Evening Short talks by members, plus a telescope "surgery"	
March 5 <sup>th</sup>	"Curiosity and Co – The latest from Mars"	Dr John Bridges <i>University Of Leicester</i>
April 2 <sup>nd</sup>	"Images of the Universe"	Paul Money
May 7 <sup>th</sup>	"Proving Einstein Right"	Prof. Ian Morison, <i>University of Manchester</i>
June 4 <sup>th</sup>	"The Microwave Universe"	Dr Clive Dickinson <i>Jodrell Bank Centre for Astrophysics</i>
July 2 <sup>nd</sup>	"Rosetta - close ups of a comet"	<i>A scientist from the Open University</i>
August 6 <sup>th</sup>	Society BBQ at the observatory, plus solar, radio and night time observing	
September 3 <sup>rd</sup>	Open Evening	<i>Organised by John Hurst</i>
October 1 <sup>st</sup>	"How our Galaxy came to be"	Dr Chris Lintott, <i>University of Oxford, and BBC Sky at Night</i>
November 5 <sup>th</sup>	Annual General Meeting	
December 3 <sup>rd</sup>	"New Horizons : Pluto and the Kuiper Belt Objects"	Dr Chris Arridge, <i>University of Lancaster</i>

## M31, the Great Andromeda Galaxy

If you like to do your winter observing in the early evening rather than after midnight, early December is the ideal season for observing the Great Andromeda Galaxy. It will be due south at 8 pm as the month begins, and “almost overhead” (well, less than 12 degrees from the zenith when seen from Nottingham). So if you are observing with the naked eye or with binoculars, you might like to recline in a deck chair to avoid getting a stiff neck. The observing position with a Newtonian telescope is more comfortable, but as with any optical instrument aimed almost vertically, be aware that a layer of dew could form on your optics after a while. M31, at a distance of about 2.5 million light-years, is the most remote object visible to the naked eye. To see it clearly you need to shield your face from the glare of any artificial lights, allow several minutes for your eyes to dark-adapt, then use “averted vision” (look slightly to one side of the galaxy, so that the light falls on the most sensitive area of your retina). M31 should become visible as a small hazy patch of light. You may then pause to reflect on the fact that the photons arriving in your eye began their journey long before modern humans existed on Earth. The chart shows the position of M31, below the ‘W’ of Cassiopeia and to the upper left of the Square of Pegasus:



The Editor captured the following image of the central region of M31 on October 24<sup>th</sup>, using a Canon 450D camera at the prime focus of a 30-cm f/5.3 Newtonian reflector. The total exposure time was 23 minutes at ISO1600.



# Nottingham Astronomical Society

Affiliated to the **British Astronomical Association**  
Member of the **Federation of Astronomical Societies**  
Member of the **Society for Popular Astronomy**  
Supporters of the **Campaign for Dark Skies**  
**Registered Charity No: 1066645**

---

## **PRESIDENT:**

**Chris Jackson**

e-mail: [president@nottinghamastro.org](mailto:president@nottinghamastro.org)

## **VICE PRESIDENT:**

**Roy Gretton**

e-mail: [vicepresident@nottinghamastro.org](mailto:vicepresident@nottinghamastro.org)

## **SECRETARY:**

**Victoria Jolly**

e-mail: [secretary@nottinghamastro.org.uk](mailto:secretary@nottinghamastro.org.uk)

## **TREASURER:**

**David Anderson**

e-mail: [treasurer@nottinghamastro.org](mailto:treasurer@nottinghamastro.org)

## **JOURNAL EDITOR:**

**Roy Gretton**

e-mail: [journal@nottinghamastro.org](mailto:journal@nottinghamastro.org)

## **CURATOR OF INSTRUMENTS:**

**John Hurst**

e-mail: [curator@nottinghamastro.org.uk](mailto:curator@nottinghamastro.org.uk)

## **DIRECTOR OF OBSERVING:**

**Bob Richardson**

email: [observatory@nottinghamastro.org](mailto:observatory@nottinghamastro.org)

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

## **ORDINARY COMMITTEE MEMBERS:**

**Kevin Greally**

**Richard Myrie**

**Mike Ellis**

---

## **Meetings**

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

**The British Geological Survey  
Nicker Hill  
Keyworth  
Nottingham NG12 5GG**

Doors open 7.30pm

**Meetings start 8.00pm**

Meetings end 10.00pm

Meetings are open to the public, and visitors are always welcome to attend.

---

## **Annual subscriptions 2015**

Full	£30
Concessions	£15
Joint rate for partners living at the same address	£45

Subscriptions become due on 1<sup>st</sup> January. Half-price subscription is charged if joining after 1<sup>st</sup> July. 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](mailto: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.

---

## **The Nottingham Astronomical Society**

The Nottingham Astronomical Society, and/or the Editor accept no responsibility for any errors that may occur within this publication. Any views expressed in the **NAS Journal** are those of the individual authors and not necessarily endorsed by the Nottingham Astronomical Society, its Committee or Members.

# NOTTINGHAM ASTRONOMICAL SOCIETY



Founded in 1946 for all interested in astronomy  
Affiliated to the British Astronomical Association  
Member of the Federation of Astronomical Societies

Registered Charity No. 1066645  
Member of the Society for Popular Astronomy  
Supporter of the Campaign for Dark Skies

## Membership application and Gift Aid declaration

**Title:**

**Full name:**

**Full home address:**

**Postcode:**

**Telephone:**

**e-mail address:**

<b>Subscription rate:</b>	Full	£30.00	(year)	£15.00	(half year)
	Concession	£15.00		£7.50	
	Partnership	£45.00		£22.50	

Concession = under-18 / full-time student / unemployed and receiving benefits

Partnership = two members living together as a couple at the same address

I wish my subscriptions to be eligible for Gift Aid **Yes / No**

## Gift Aid declaration

**(HMRC reference XR32048)**

I want Nottingham Astronomical Society to treat all subscriptions and donations that I make from the date of this declaration as Gift Aid donations, until I notify you otherwise.

I pay an amount of UK Income Tax and/or Capital Gains Tax at least equal to the tax that Nottingham Astronomical Society reclaims on my donations in the appropriate tax year.

**Signature:**