
Journal

of the

Nottingham Astronomical Society

October 2022



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Thursday, October 6th

**Nottingham Emmanuel School
Gresham Park Road,
West Bridgford,
Nottingham, NG2 7YF**

7:45pm (doors open at 7:15pm)

This evening we welcome

**Prof Alfonso Aragon-Salamanca
of the University of Nottingham**

who will be speaking on

The Cosmic Web

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 link to the NAS Journal, and a copy of our SkyNotes, 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

Chairman's Message, October 2022

Dear all,

Autumn seems to have descended with a vengeance. I've even started looking at the heating system at home to see if it should be switched on! This does mean the nights are drawing in, which means we should be able to do more observing. At the same time the weather gets colder and worse, but we're ever hopeful. Meanwhile there has been a lot of work done at the observatory. We have attached some new solar panels which will give us 4 times the solar power, although as the days get shorter not the best time to try it out. The dome rotation motor is working very well, but it does still need a few tweaks. The dome has also been painted inside and out, and looks a whole lot better as a result. A little more tidying up and it will be ready for action again.



Before

After

Our next meeting we have Professor Alfonso Aragon-Salamanca from Nottingham University to come to talk to us about the cosmic web, and hopefully some breaking news on a telescope he is involved with.

We're now looking at having a regular meeting in December, and an AGM/Party/Quiz at the December Plumtree meeting which I hope you can all come to and make merry just before Christmas.

Best wishes to all, and hope to see you at the October meetings.

Julian,
NAS chair

Sky Notes

October 2022

Compiled by Roy Gretton



All times given below are in British Summer Time unless otherwise stated

British Summer Time ends on October 30th. Clocks should be put back one hour at 2 am on that date.

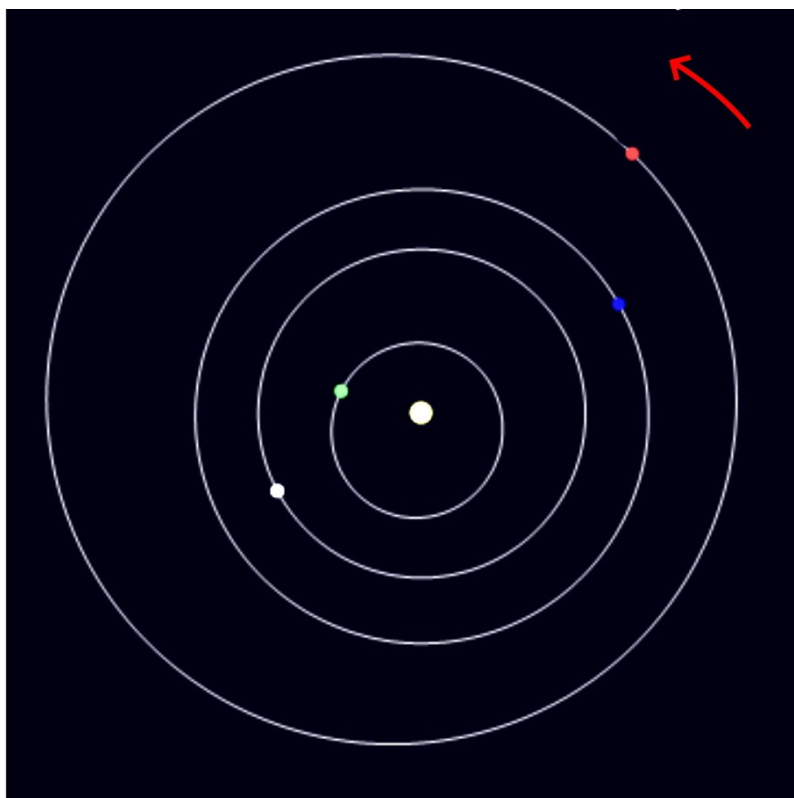
PHASES OF THE MOON

<i>Phase</i>	<i>Date</i>
First Quarter	October 3 rd
Full Moon	October 9 th
Last Quarter	October 17 th
New Moon	October 25 th

This month the Moon is closest to Earth on the 29th, and furthest on the 17th.

The Inner Solar System on 22nd October

viewed from above the north pole. The red arrow shows the direction of rotation



Venus (white dot), at superior conjunction is 180 degrees from **Earth** (blue dot), which is chasing **Mars** (red dot) which it will overtake in December. **Mercury** (green dot) is 10 degrees to the west of the Sun and therefore a morning object

PARTIAL ECLIPSE OF THE SUN, October 25th

The first half of the eclipse will be visible from the UK, beginning soon after 10 am. Maximum eclipse will occur shortly before 11 am. Greatest eclipse will occur over Russia, where 86 percent of the Sun will be obscured.

THE PLANETS

Mercury puts in an appearance in the morning sky this month. Greatest western elongation occurs on October 8th, when the planet will be 18 degrees from the Sun. (Back in August this was 27 degrees in the evening sky – to the delight of observers in the southern hemisphere). After this, Mercury moves toward superior conjunction, which will occur early in November.

Venus is unobservable this month, as it will be at superior conjunction on October 22nd.

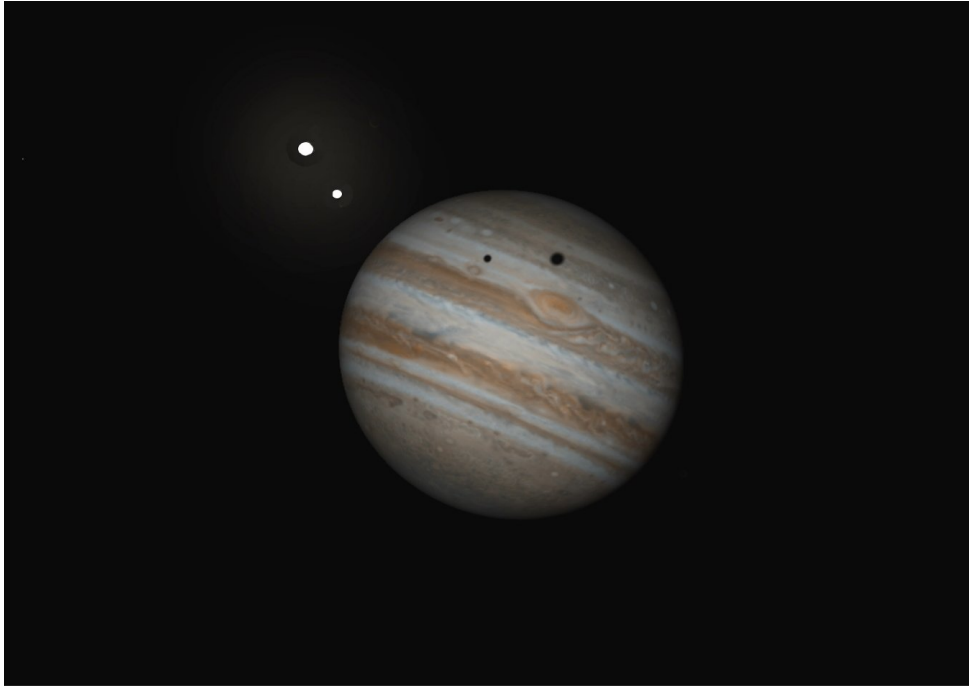
Mars will be rising at about 9:30pm as October begins, and before 7 pm by the close of the month, when it will be shining brightly at magnitude -1.2. By then its angular diameter will exceed 15 arcseconds, and its declination will be approaching +24 degrees – so the planet will be a splendid target for telescopic observation.

Jupiter is a brilliant object in the evening sky, and throughout the night, not setting until about an hour before sunrise. It is about one degree south of the celestial equator in the constellation of Pisces.

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.

October	Shadow transit of
1 st	Europa begins 11:50pm
2 nd	Io begins 11:18pm
11 th	Io ends 9:57pm
18 th	Io 9:38pm to 11:52pm
25 th	Io begins 11:34pm
26 th	Ganymede begins 9:20pm
26 th	Europa 8:55pm to 11:25pm
27 th	Io ends 8:16pm

On the evening of October 26th it will be possible to see two satellites throwing their shadows on to the cloud-tops of Jupiter at the same time. The image shows the view at 10:30pm that night:



The left-hand satellite is Ganymede, casting the right-hand shadow, and the right-hand satellite is Europa, casting the left-hand shadow (*south at the top*)

Saturn is an evening object in the constellation of Capricornus, setting at 2 am as October begins, and at 11pm at the end of the month. Magnitude 0.5 fading to 0.6, width of ring system 40 arcseconds.

Uranus, in the constellation of Aries, will be visible for most of the night this month, shining at magnitude 5.6.

Neptune is an evening object close to the border between Aquarius and Pisces, shining at magnitude 7.8.

METEORS

The main meteor shower in October is the **Orionids**, which put in a very favourable appearance this year, peaking on the 22nd, three days before New Moon. Twenty events per hour may be visible under ideal conditions.

DIARY DATES 2022-23

Monthly Meetings of the Nottingham Astronomical Society

1. Meetings at
Nottingham Emmanuel School
Gresham Park Road,
West Bridgford,
Nottingham, NG2 7YF

Held on the **FIRST Thursday** of each month **(unless otherwise stated)**
except **August**

Doors open at 7:15pm for 7:45pm start.

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

Date	Topic	Speaker
October 6 th	The Cosmic Web	Prof Alfonso Aragon-Salamanca
November 3 rd	Galaxies to Atoms	Dr Susan Cartwright Sheffield University
December 4 th	Planetary Formation	Rebecca Nealon
* January 12 th	(To be confirmed)	
February 2 nd	New Science from the JWST	Dr Henrik Melin Leicester University (STFC James Webb Fellow)

***Note unusual date**

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 or discussion

The next meeting will be on October 20th

Also, by way of advance notice, on **December 15th**
we shall be holding our **Annual General Meeting**
at Plumtree, to be followed by cheese, wine and cake

Social and Practical Astronomy, Plumtree, September 2022

At the **September** Plumtree James and Julian talked about some of the numerous astronomical catalogues in existence.

Wikipedia lists over 800 astronomical catalogues, but I suspect this isn't the definitive list.
https://en.wikipedia.org/wiki/List_of_astronomical_catalogues

After thinking about why astronomers construct catalogues, James talked about the very earliest astronomical catalogues, the first of which was probably by Hipparchos of Nikaia (190-126 BCE). Before the widespread use of the telescope, astronomical catalogues were of stars. The first catalogue of deep sky objects was probably constructed by Giovanni Batista Hodierna (1597-1660) in 1654. The history of early discovery of deep sky objects is covered well on this webpage: <https://www.messier.seds.org/xtra/history/deepskyd.html>

In the Victorian era there was vast interest in double stars, and seeing whose telescope had the best optics and could split the very closest double stars (<https://adsabs.harvard.edu/full/1993QJRAS..34..423W>) and also the colour of stars was an interest for many.

Julian spoke about the Messier Catalogue, and the history and origins of the New General Catalogue (NGC) which is a fascinating story and covered by this webpage; <https://astronomy.com/magazine/2018/08/an-ngc-primer>

[image below of Julian talking, courtesy of Richard Severn]



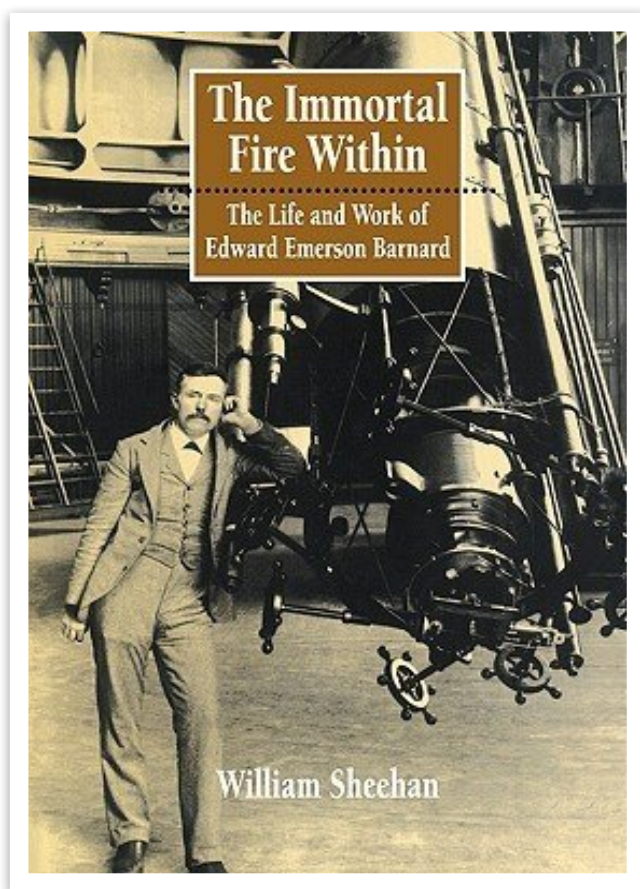
Julian also described the GAIA Catalogs and the data releases from GAIA and reminded us about the GAIA mission and goals. All of the previously released data from GAIA can be downloaded from the GAIA website: <https://www.gaia.ac.uk/>

James described how the development of photography took off in the mid 1800s and was soon employed to study and record the sky, and how photographic sky surveys began to detect fainter objects in the night sky, all of which needed classifying and cataloguing.

George O Abell undertook a PhD at the University of California using the data and photographic plates of the Palomar Sky Survey undertaken in the 1940s and 1950s. Abell's PhD was on the distribution of rich clusters of galaxies. Abell's catalogue of galaxy clusters consists of 2712 clusters, many of which are within the reach of amateur astronomer Abell also is credited with a catalogue of planetary nebulae.

James also talked about three other catalogues. Edward Emerson Barnard's Catalogue of Dark Nebula; Patrick Moore's Caldwell Catalogue, and the Collinder Catalogue which was constructed by a the Swedish astronomer, Per Collinder. A fascinating and in dept biography of Edward Emerson Barnard called *The Immortal Fire Within* by Bill Sheehan is available to purchase online for under £25. It is a substantial book and highly recommended for anyone with an interest in the history of astronomy.

James and Julian only had time to scratch the surface of this topic, and I suspect we'll talk about other astronomical catalogues in the future at Plumtree.



In addition to the talk, Richard brought along a many of the telescopes, mounts and accessories that belonged to Bryan Lilley, a long-standing member of the Society who passed away last year. Bryan's family asked Richard to sell on his astronomy equipment so others could make use of it. Bryan's astronomy equipment attracted a lot of attention which was great to see, and I'm pleased much of it was purchased. The money raised will be given back to Bryan's family. The family were also keen that a few items were passed on to the Society, and more about this will be described in a subsequent issue of the Journal.

The topic of the **October** Plumtree meeting is yet to be finalised, and if there are subjects or ideas you have for Plumtree, please do get in touch.

James Dawson

Observatory Director

helpdesk@nottinghamastro.org.uk

THE COCOON NEBULA

On 27th August, I imaged the Cocoon Nebula, also known as C14 or NGC 5146.

4000 light years distant, the nebula is both a reflection and emission nebula. Blue areas are reflected starlight and the red is ionised hydrogen alpha emission, energised by the massive young stars in this stellar nursery. Faintly visible trailing from the centre to the lower right is the dark nebula Barnard 168. I stacked 4 hours worth of data to produce the image below, using an ED80 and a ZWO ASI533MC.



Leigh Blake

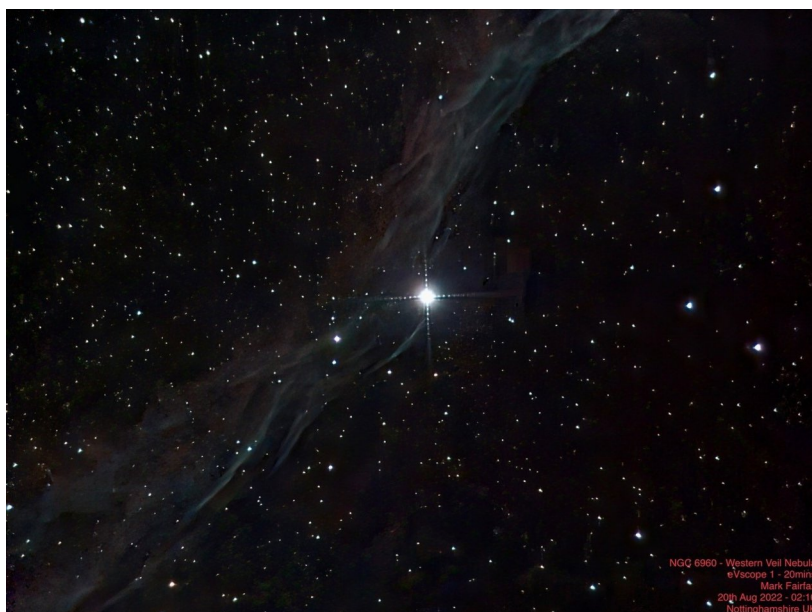
My eVscope with a new filter by Mark Fairfax

My first results with a new filter, Optolong L-eNhance narrowband, on my Unistellar eVscope 1, and I'm very pleased with them. This Optolong deep sky imaging filter effectively isolates the H-Alpha, H-Beta and Oxygen III nebula emission lines and achieves a maximum transmission of up to 90%.

1) Messier 27 the Apple Core Nebula, also known as the Dumbbell Nebula & NGC 6853, is a planetary nebula (nebulousity surrounding a white dwarf) in the constellation Vulpecula. Distance of about 1,360 light-years and visual magnitude of 7.5. Pleasing first attempt with my new Optolong L-eNhance filter which revealed a lot more nebulousity.



2) Western Veil Nebula NGC 6960, also known as Caldwell 34 & the Witch's Broom Nebula, at magnitude 7 in the constellation Cygnus with a recent determination of 2,400 light-years distant. The Veil Nebula is a cloud of heated and ionised gas and dust - the analysis of the emissions from the nebula indicates the presence of oxygen, sulphur & hydrogen.



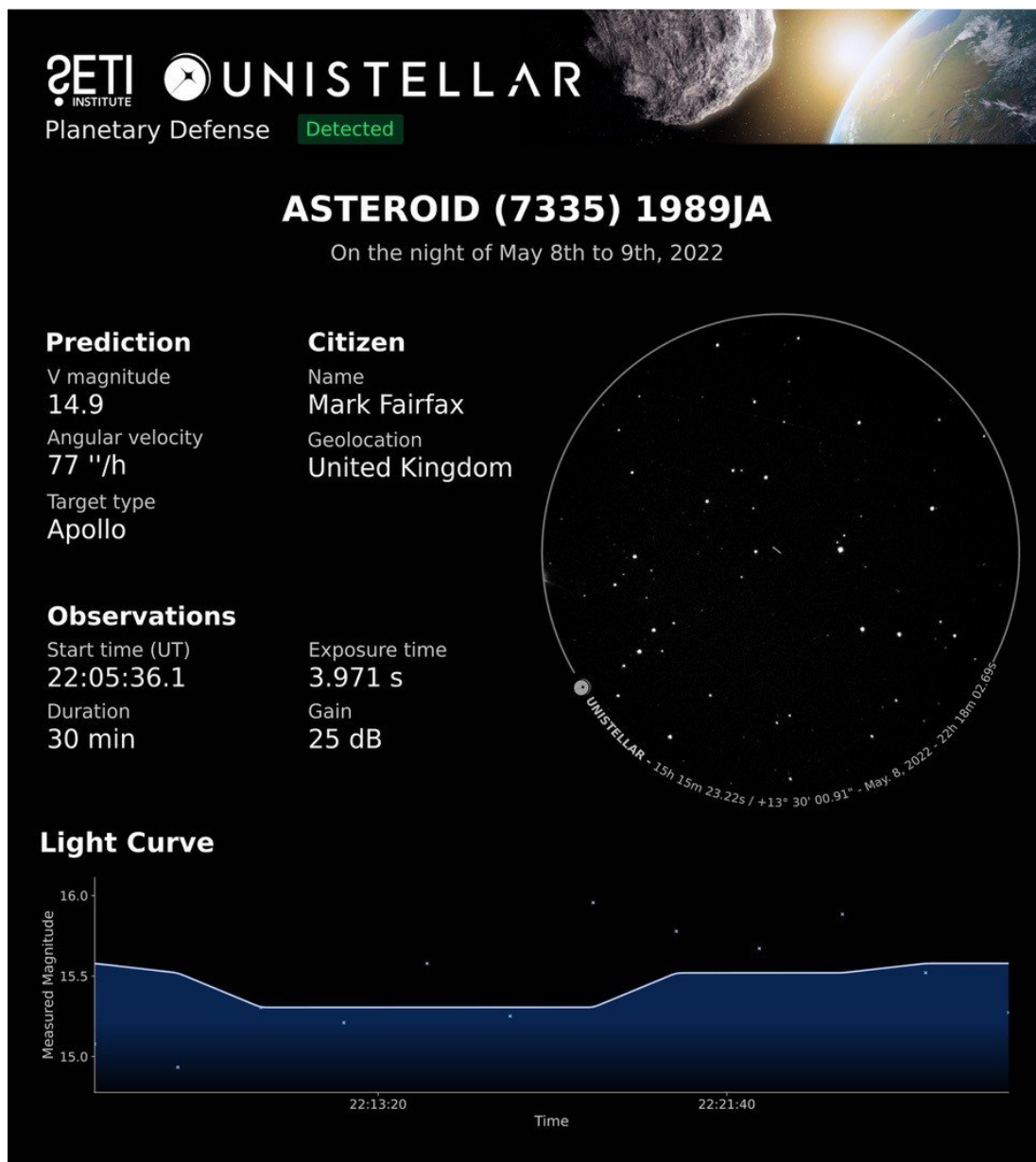
3) Eastern Veil Nebula NGC 6992, also known as Caldwell 33, at magnitude 7 in the constellation Cygnus.



Citizen Science 1989JA near-Earth asteroid with my eVscope by Mark Fairfax

Unistellar Citizen Science - Planetary Defence (in collaboration with the SETI Institute)

I'm named as a contributor/co-author in another Unistellar analysis paper "Rotation period determination for (7335) 1989JA" - this one to be published in the Minor Planet Bulletin. The results of an observational study of the near-Earth asteroid (7335) 1989JA during its recent close approach. Using data collected from participating Unistellar network of citizen astronomers.



Number	Name	20yy mm/dd	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E.	Amp	A.E.	Exp	Grp
7335	1989JA	22 05/24-05/25	30.7, 35.5	-1	226	2.592	0.006	0.09	0.01	4200	PHA

Table I. Observing circumstances and results. The phase angle is given for the first and last date. L_{PAB} and B_{PAB} are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris et al., 1984). Exp is the exposure (sec) or average if a range of exposures was used. Grp is the asteroid family/group (Warner et al., 2009).

ROTATION PERIOD DETERMINATION FOR (7335) 1989JA

Ryan Lambert¹, Franck Marchis¹, Josef Hanuš², John Archer³, Mario Billiani³, John K. Bradley³, Phil Breeze-Lamb³, Michael Camilleri³, Martin Davy³, John Deitz³, Stephen Donnelly³, Mark Fairfax³, Keiichi Fukui³, Ryan Gamurot³, Tateki Goto³, Bruno Guillet³, Scott Kardel³, Rachel Knight³, William Hedegaard Langvad³, Margaret A. Loose³, Nicola Meneghelli³, Mike Mitchell³, Pavel Nikiforov³, Bruce Parker³, John W. Pickering³, Michael Primm³, Justus Randolph³, Felipe Braga Ribas³, Fabien Richardot³, Darren A. Rivett³, Masao Shimizu³, Georges Simard³, Martin Smullen³, Ethan Teng³, Marcos A. van Dam³, Aad Verveen³, Joe Widi³

¹SETI Institute, Carl Sagan Center, 189 Bernardo Avenue, Suite 200, Mountain View CA, 94043, USA

²Charles University, Faculty of Mathematics and Physics, Institute of Astronomy, V Holešovičkách 2, 18000 Prague 8, Czech Republic

³Unistellar Citizen Astronomer

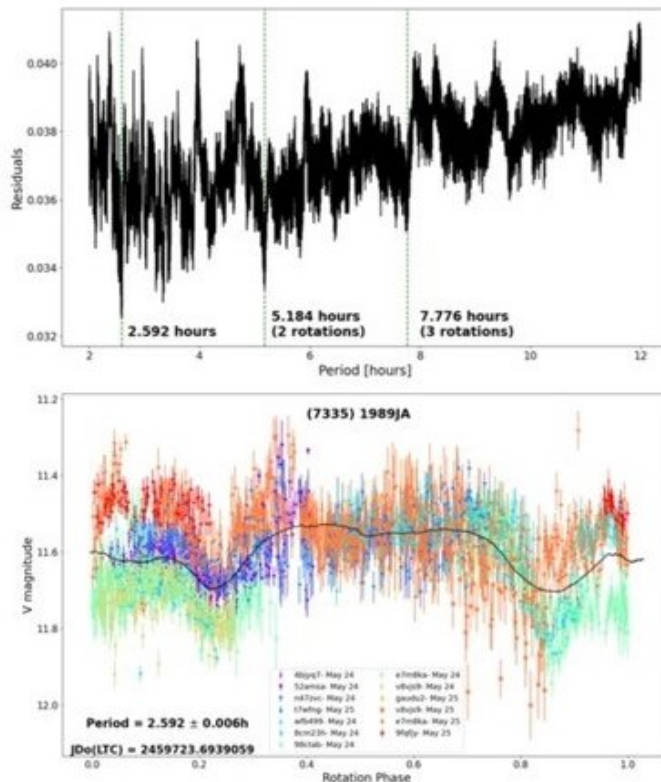
We present the results of an observational study of the near-Earth asteroid (7335) 1989JA conducted during its recent close approach. Using data collected from participating Unistellar network citizen astronomers, we report a best-fitting synodic rotation period of 2.592 ± 0.006 hours with a corresponding amplitude of 0.09 ± 0.01 magnitudes for (7335) 1989JA.

Beginning on 2022 May 5, the Unistellar citizen science network (Marchis et al., 2020) began a campaign to observe the near-Earth asteroid, (7335) 1989JA during its close approach on 2022 May 27. The campaign ran from 2022 May 5 to 2022 Jun 2 and resulted in 75 observations from 35 different citizen astronomers. Observations were taken using Unistellar digital telescopes, named eVscope, eQuinox, eVscope 2. These telescopes are 114mm f/4 reflectors and use a Sony Exmor IMX224 (eVscope, eQuinox) and Sony Exmor IMX347 CMOS (eVscope 2) detector. Before 2022 May 22, observations were performed as a series of consecutive, unfiltered 4 second exposures with a gain of 25dB. Exposures were taken for 40 minutes before the eVscope was realigned onto the target. On 2022 May 22, the radial velocity of 1989JA was great enough that the observation procedures were updated to realign every 20 minutes to avoid the asteroid leaving the field of view. Observations were then uploaded to the Unistellar server where the images were dark subtracted, plate-solved, and stacked according to the radial velocity of 7335 (1989JA) at the time of observation.

(7335) 1989JA was discovered in May, 1989 by Eleanor Helin at the Palomar observatory. It is a potentially hazardous near-Earth asteroid with a semi-major axis of 1.772 AU, eccentricity of 0.485,

inclination of 15.17° , and orbital period of 2.36 years. The diameter has been estimated to be 0.932 ± 0.153 km from the NEOWISE survey (Mainzer et al., 2019) using an absolute magnitude $H=17$. Radar observations taken by Mahapatra et al. (2002) constrained the synodic rotation period to <12 hours but no further attempts to constrain the rotation period appear on the asteroid lightcurve database (LCDB; Warner et al., 2009).

To determine the synodic rotation period a subsample of 13 observations that occurred between 2022 May 24 and May 25 were selected. As (7335) 1989JA was in the midst of a close approach this two day window was chosen to minimize the change in magnitude that would occur across observations due to the changing distance and phase angle. Analysis of the periodogram created from the lightcurves of these 13 observations reveals a best fitting synodic rotation period of 2.592 hours with other high-probability signals occurring at the integer aliases of this rotation period. We assumed an uncertainty corresponding to a 10% rotation phase offset, resulting in a synodic rotation period of 2.592 ± 0.006 hours. In the second figure, we present a rotation phase plot of our 13 observation subsample. Each observation has been labeled by the 6 character serial number of the eVscope that took the observation along with the date the observation was taken. To more easily identify features in the lightcurve a black line has been added to the plot that is the rolling weighted average magnitude of 200 subsequent magnitude measurements. We estimate the amplitude as half of the difference between the highest and lowest magnitude across the weighted rolling average. Using this method we find an amplitude of $A=0.09 \pm 0.01$ mag.



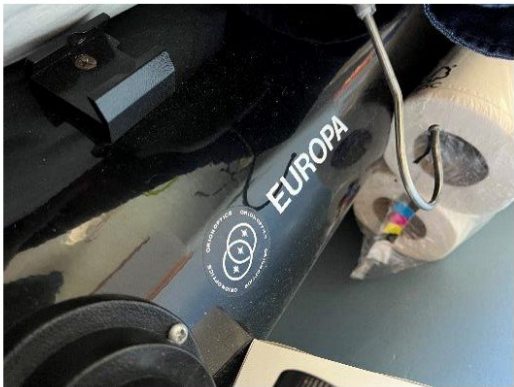
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Advertisements

ASTRONOMICAL EQUIPMENT SALE

Last November you may recall we lost a long time member Bryan Lilley. His family have asked if we would try and sell some of his many telescopes. Attached is a guide detailing the individual items for sale. Included is the retail price and a second hand price. If you are interested in buying any of the items please email membership@nottinghamastro.org.uk Any items unsold will be on sale at the October Plumtree meeting. Items are sold on a first come first served basis, items are sold as seen. NAS is not responsible for the quality of the items. We can only accept cash or cheques payable to Mrs Averil Lilley. The remaining items for sale are



What it is	Cost new	Second hand price
OrionOptics Europa reflecting telescope, 8", f/6	£300	£50



What it is	Cost new	Second hand price
Astele 150 LOMO Maksutov-Cassegrain f/14.4, D150mm, FL2134mm On fork mount	£1000	Make an offer

FOR SALE

Atik 460EX Monochrome Cooled CCD, with original box and cables - £700

SkyWatcher ED80 DS-Pro with Moonlite focuser,
SkyWatcher 0.85 Reducer/Flattener and original case. £650



More details and pictures available on request.

Contact leigh@xanthic.co.uk

FOR SALE

Set of four coloured 1.25-inch filters £25

Please contact Sam Boote
sam@boote.myzen.co.uk or at Society meetings

FOR SALE

Skywatcher Skymax 127 SynScan GoTo Maksutov-Cassegrain computerised telescope

Basically brand new and unused but opened. Complete with original box and all packaging, all accessories, tripod, mount, instructions, etc. and is in perfect condition. A Lynx Astro heated dew shield also included (but this doesn't have a controller unit with it).

This package would cost well over £500 new but I'm happy to offer it to NAS members for **£300** (or near offer). The OTA is highly regarded and is an excellent planetary telescope. There is plenty of information available online if more details are required.

Please email brian@greenfieldworld.co.uk

Brian Greenfield

FOR SALE

Contact Mark Fairfax at fairf77@icloud.com

Celestron telescope accessories

Celestron deluxe tele-extender (#93643) £50

For eyepiece projection photography with your 5 to 14-inch Celestron SCT to take magnified images of the Solar System.

Celestron Neximage 10 Solar System Colour Imager (#93708) £220

Easy to use color camera, provides live video for quick focusing

Celestron 18774-CGL PowerTank 7, 12V -7Ah, Black £75

Mobile power station with spotlight

Nottingham Astronomical Society

Affiliated to the **British Astronomical Association**
Member of the **Federation of Astronomical Societies**
Supporters of the **Commission for Dark Skies**

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Meetings

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

Nottingham Emmanuel School
Gresham Park Road,
West Bridgford,
Nottingham, NG2 7YF

Doors open 7:15pm

Meetings start 7:45pm

Meetings end 9:15 pm

These meetings are open to the public, and visitors are welcome to attend, subject to a charge of £3 per meeting for adults.

Annual subscriptions 2022

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.

The Nottingham Astronomical Society

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