

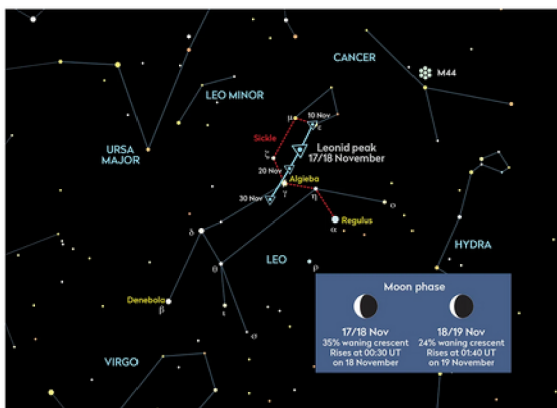
## SKYWATCHER NEWSLETTER

### LATEST NEWS

This month features the Leonid Meteor Shower which is expected to peak the evening of the 17/18 Nov. The Moon will be positioned near the radiant which may work out well for observers as meteors are best seen away from the radiant!

Hope you have clear skies!

Until next month... SLK



Look to the Sickle asterism in Leo for the radiant of the Leonids. Credit: Pete Lawrence



The stars of Cepheus are visible all year round for many in the Northern Hemisphere, but fall months offer some of the best views of this circumpolar constellation to warmly-dressed observers. Just look northwards! Image created with assistance from Stellarium: stellarium.org

### Cepheus: A House Fit for a King

by David Prosper



Sometimes constellations look like their namesake, and sometimes these starry patterns look like something else entirely. That's the case for many stargazers upon identifying the constellation of Cepheus for the first time. These stars represent Cepheus, the King of Ethiopia, sitting on his throne. However, many present-day observers see the outline of a simple house, complete with peaked roof, instead – quite a difference! Astronomers have another association with this northern constellation; inside its borders lies the namesake of one of the most important types of stars in modern astronomy: Delta Cephei, the original Cepheid Variable.

Cepheus is a circumpolar constellation for most observers located in mid-northern latitudes and above, meaning it does not set, or dip below the horizon. This means Cepheus is visible all night long and can be observed to swing around the northern celestial pole, anchored by Polaris, the current North Star. Other circumpolar constellations include Cassiopeia, Ursa Major, Ursa Minor, Draco, and Camelopardalis. Its all-night position for many stargazers brings with it some interesting objects to observe.

Among them: the “Garnet Star” Mu Cephei, a supergiant star with an especially deep red hue; several binary stars; several nebulae, including the notable reflection nebula NGC 7023; and the “Fireworks Galaxy” NGC 6946, known for a surprising amount of supernovae.

Perhaps the most famous, and certainly the most notable object in Cepheus, is the star Delta Cephei. Its variable nature was first discovered by John Goodricke, whose observations of the star began in October 1784. Slightly more than a century later, Henrietta Leavitt studied the variable stars found in the Magellanic Clouds in 1908 and discovered that the type of variable stars represented by Delta Cephei possessed very consistent relationships between their luminosity (total amount of light emitted), and their pulsation period (generally, the length of time in which the star goes through a cycle of where it dims and then brightens). Once the period for a Cepheid Variable (or Cepheid) is known, its luminosity can be calculated by using the scale originally developed by Henrietta Leavitt, now called “Leavitt’s Law.” So, if a star is found to be a Cepheid, its actual brightness can be calculated versus its observed brightness. From that difference, the Cepheid’s distance can then be estimated with a great deal of precision. This revolutionary discovery unlocked a key to measuring vast distances across the cosmos, and in 1924 observations of Cepheids by Edwin Hubble in what was then called the Andromeda Nebula proved that this “nebula” was actually another galaxy outside of our own Milky Way!

You may now know this object as the “Andromeda Galaxy” or M31. Further observations of Cepheids in other galaxies gave rise to another astounding discovery: that our universe is not static, but expanding!

Because of their importance as a “standard candle” in measuring cosmic distances, astronomers continue to study the nature of Cepheids. Their studies revealed that there are two distinct types of Cepheids: Classical and Type II. Delta Cephei is the second closest Cepheid to Earth after Polaris, and was even studied in detail by Edwin Hubble’s namesake telescope, NASA’s Hubble Space Telescope, in 2008. These studies, along with others performed by the ESA’s Hipparcos mission and other observatories, help to further refine the accuracy of distance measurements derived from observations of Cepheids. What will further observations of Delta Cephei and other Cepheids reveal about our universe?

### LOCAL EVENTS

Nov 16 - CADAS - Steve Tonkin  
Ten Ways the Universe Tries to Kill You

Next Durlston Event – Friday Nov 18th from 7.00pm until 9.00. Talk at 7.30. Leonid meteors, Mars, Jupiter, Saturn, Orion Nebula and Autumn constellations. £3 entry, no need to book

Nov 22 - BNSS - James Fradgley  
Birth of the Solar System

Dec 6 - WAS - Christmas Social and Members 10 Minute Talks

Dec 21 - CADAS - Christmas Social and members' short talks

VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION

## SKYWATCHER NEWSLETTER



NEW PODCAST EPISODE

### Taking Flight on Another World Mars Helicopter/Ingenuity

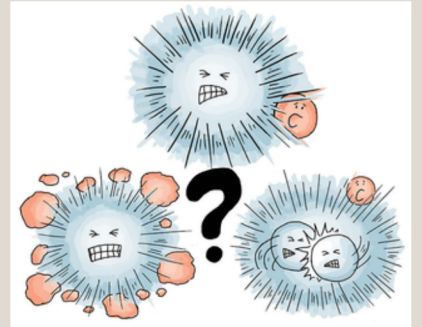


The Mars Helicopter, Ingenuity, is a technology demonstration to test powered, controlled flight on another world for the first time. It hitched a ride to Mars on the Perseverance rover. Once the rover reached a suitable "airfield" location, it released Ingenuity to the surface so it could perform a series of test flights over a 30-Martian-day experimental window.

The helicopter completed its technology demonstration after three successful flights. For the first flight on April 19, 2021, Ingenuity took off, climbed to about 10 feet (3 meters) above the ground, hovered in the air briefly, completed a turn, and then landed. It was a major milestone: the very first powered, controlled flight in the extremely thin atmosphere of Mars, and, in fact, the first such flight in any world beyond Earth. After that, the helicopter successfully performed additional experimental flights of incrementally farther distance and greater altitude.

With its tech demo complete, Ingenuity transitions to a new operations demonstration phase to explore how future rovers and aerial explorers can work together.

[mars.nasa.gov/technology/helicopter/](https://mars.nasa.gov/technology/helicopter/)  
[https://mars.nasa.gov/files/mars2020/MarsHelicopterIngenuity\\_FactSheet.pdf](https://mars.nasa.gov/files/mars2020/MarsHelicopterIngenuity_FactSheet.pdf)



### WAC Upcoming Events

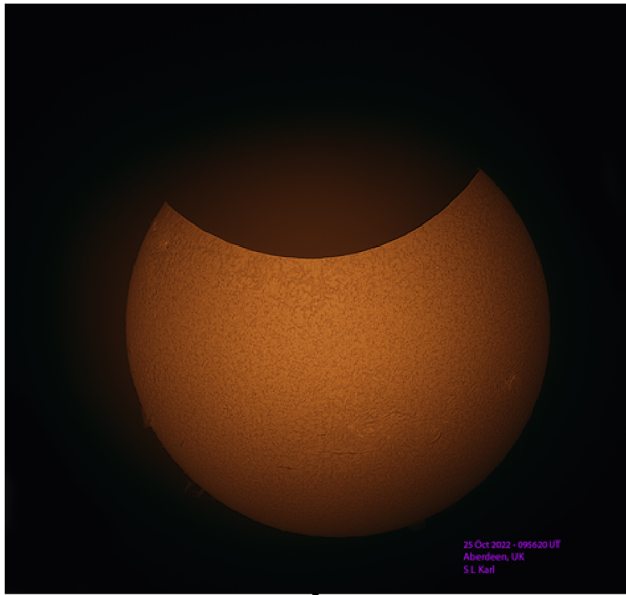
Dec 9 - John Macdonald - The Astronomical Unit (Face to face and Zoom)

MORE TO COME IN 2023!

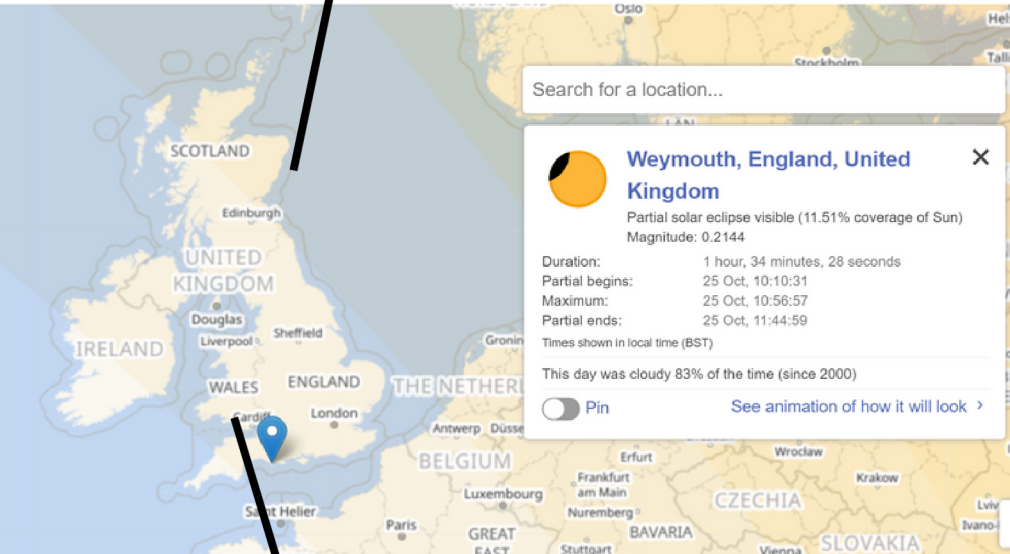
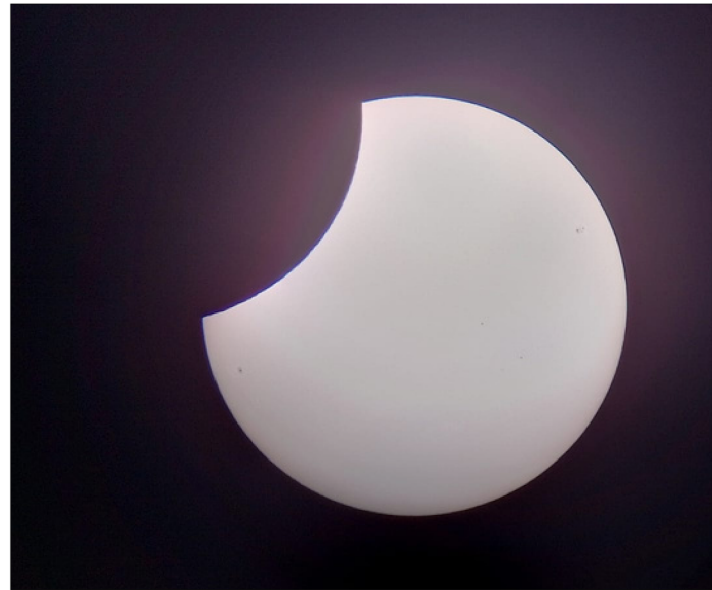




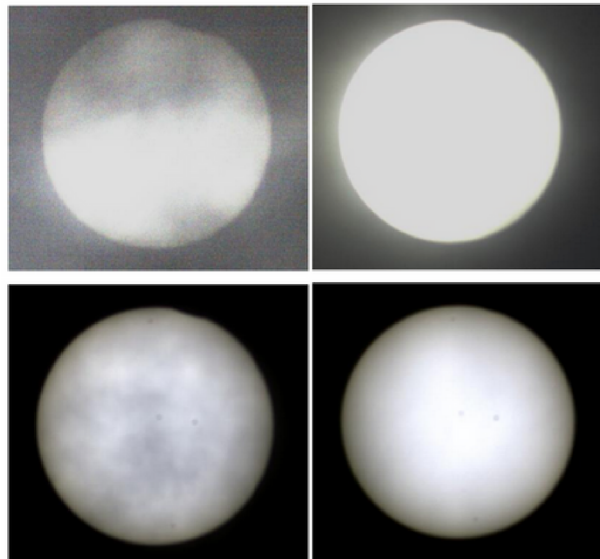
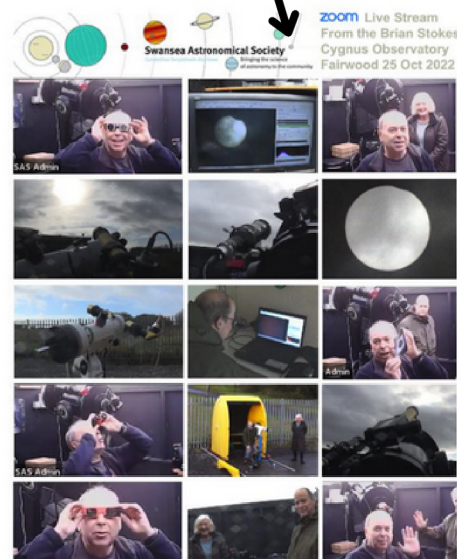
25 Oct 2022 brought a partial solar eclipse to the UK shores. Here are a few images captured from around the country by members and members remote.



Right: Ennio Tabone - 900 mm lens with a 3x teleconverter. A careful look reveals a rough lunar surface.



Above: Ray Capp - Eclipse at maximum from Weymouth taken through using a 100mm refractor and android phone held to the eyepiece!! There's a couple of sunspots thrown in for good measure at NE & SW.



Left: Swansea Astronomical Society viewing event submitted by Chris Bowden

We enjoyed the glimpses we managed to get during unfavourable cloud cover but managed just 4 SER captures.



Skymaps.com—Feel free to download the full article directly each month.

## The Evening Sky Map

FREE! EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

### Sky Calendar – November 2022

Get Sky Calendar on Twitter  
<http://twitter.com/skymaps>

**NORTHERN HEMISPHERE**  
**NOVEMBER 2022**

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS  
 EARLY NOV 8 PM  
 LATE NOV 7 PM

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

Use the Big Dipper (or Plough) to find Polaris, the North Star. The constellation Ursa Major (the Big Dipper) is circled in red. The constellation Cygnus, the Swan, is circled in blue. The constellation Hercules, the eagle that carried the bundles of the Greek god Zeus, is circled in green. The constellation Aquila, the eagle that carried the bundles of the Greek god Zeus, is circled in yellow.

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**SOUTH**

INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH) AND THE OUTER CIRCLES THE CONSTELLATION CYGNUS, THE SWAN, IS CIRCLED IN BLUE. THE CONSTELLATION HERCULES, THE EAGLE THAT CARRIED THE BUNDLES OF THE GREEK GOD ZEUS, IS CIRCLED IN GREEN. THE CONSTELLATION AQUILA, THE EAGLE THAT CARRIED THE BUNDLES OF THE GREEK GOD ZEUS, IS CIRCLED IN YELLOW.

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**Symbols**

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular Star Cluster

**Star Magnitudes**

- 1
- 2
- 3
- 4

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- 1 First Quarter Moon at 6:38 UT.
  - 2 Moon near Saturn at 0h UT (evening sky). Mag. 0.7.
  - 4 Moon near Jupiter at 23h UT (evening sky). Mag. -2.8.
  - 8 Total Lunar Eclipse begins at 10:17 UT and ends at 11:41 UT. Greatest eclipse at 10:59 UT. Partial phases begin at 9:09 UT and end at 12:49 UT. During totality the Moon will appear red-orange in color once it passes into the Earth's shadow; the color of all the sunsets and sunrises in Earth's atmosphere. The total lunar eclipse will be visible from Asia, Australia, the Pacific and the Americas.
  - 8 Full Moon at 11:02 UT.
  - 8 Moon near Uranus at 13h UT (midnight sky). Mag. 5.6. Occultation visible from east Asia, Japan & Alaska.
  - 8 Mercury at superior conjunction with the Sun at 16h UT. The inner planet passes into the evening sky.
  - 9 Uranus at opposition at 8h UT. Mag. 5.6.
  - 9 Moon near the Pleiades at 15h UT (morning sky).
  - 10 Moon near Aldebaran at 9h UT (morning sky).
  - 11 Moon near Mars at 14h UT (morning sky). Mag. -1.5.
  - 12 Moon at northernmost declination (27.5°) at 14h UT.
  - 14 Moon at apogee (farthest from Earth) at 7h UT (distance 404,921km; angular size 29.5').
  - 15 Moon near Beehive cluster M44 at 5h UT (morning sky).
  - 16 Last Quarter Moon at 13:28 UT.
  - 17 Moon near Regulus at 2h UT (morning sky).
  - 19 Leonid meteor shower peaks at 6h UT. Arises from debris ejected by comet 55P/Tempel-Tuttle. Produces very fast meteors (70 km/sec). Expect 10–15 meteors per hour under dark skies. Moonlight will interfere with observations.
  - 21 Moon near Spica at 8h UT (morning sky).
  - 23 New Moon at 22:56 UT. Start of lunation 1236.
  - 26 Moon at perigee (closest to Earth) at 1:37 UT (distance 362,826km; angular size 32.9').
  - 29 Moon near Saturn at 8h UT (evening sky). Mag. 0.8.
  - 30 First Quarter Moon at 14:37 UT.
- More sky events and links at <http://skymaps.com/skycalendar/>
- All times in Universal Time (UT). (USA Eastern Standard Time = UT - 5 hours.)

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 .com

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