

SKYWATCHER NEWSLETTER



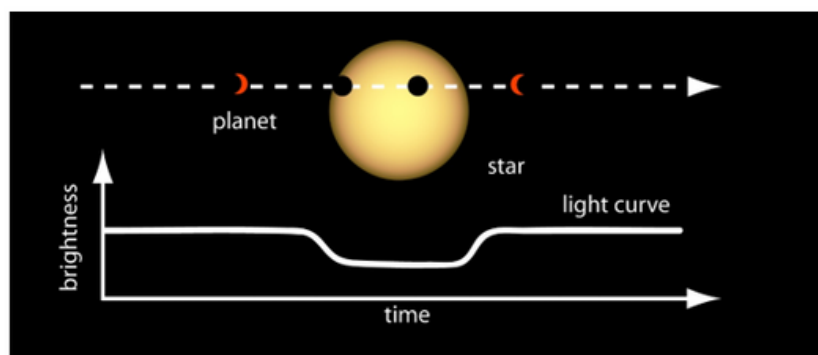
LATEST NEWS

The WAC members were able to capture some nice images of atmospheric and astronomical features this past month. These have kindly been shared on the active WhatsApp group. There have also been some good discussion and reminders of upcoming events to watch for such as TV/radio programmes which are science related as well as meteor showers and good binocular or naked eye events. If you haven't joined the group yet, this is an interesting group aimed at all experience levels in the Club.

A milestone which just snuck up on me is that the WAC is entering its 20th year! Page 3 features a flash in the past to Issue 1 of the SkyWatcher before it was named even! If you have any memories of the WAC over the years to share, please send them to me for inclusion!

Until next month and hopefully 20 years more of the WAC... SLK

The Transit Method



A planet passing in front of its parent star creates a drop in the star's apparent brightness, called a transit. Exoplanet Watch participants can look for transits in data from ground-based telescopes, helping scientists refine measurements of the length of a planet's orbit around its star. Credit: NASA's Ames Research Center



May's Night Sky Notes: How Do We Find Exoplanets?

By: Dave Prosper

Updated by: Kat Troche

Astronomers have been trying to discover evidence that worlds exist around stars other than our Sun since the 19th century. By the mid-1990s, technology finally caught up with the desire for discovery and led to the first discovery of a planet orbiting another sun-like star, Pegasi 51b. Why did it take so long to discover these distant worlds, and what techniques do astronomers use to find them?

The Transit Method

A planet passing in front of its parent star creates a drop in the star's apparent brightness, called a transit. Exoplanet Watch participants can look for transits in data from ground-based telescopes, helping scientists refine measurements of the length of a planet's orbit around its star. Credit: NASA's Ames Research Center

- One of the most famous exoplanet detection methods is the transit method, used by Kepler and other observatories. When a planet crosses in front of its host star, the light from the star dips slightly in brightness. Scientists can confirm a planet orbits its host star by repeatedly detecting these incredibly tiny dips in brightness using sensitive instruments.

If you can imagine trying to detect the dip in light from a massive searchlight when an ant crosses in front of it, at a distance of tens of miles away, you can begin to see how difficult it can be to spot a planet from light-years away! Another drawback to the transit method is that the distant solar system must be at a favorable angle to our point of view here on Earth – if the distant system's angle is just slightly askew, there will be no transits. Even in our solar system, a transit is very rare. For example, there were two transits of Venus visible across our Sun from Earth in this century. But the next time Venus transits the Sun as seen from Earth will be in the year 2117 – more than a century from now, even though Venus will have completed nearly 150 orbits around the Sun by then!

The Wobble Method

- As a planet orbits a star, the star wobbles. This causes a change in the appearance of the star's spectrum called Doppler shift. Because the change in wavelength is directly related to relative speed, astronomers can use Doppler shift to calculate exactly how fast an object is moving toward or away from us.

LOCAL EVENTS

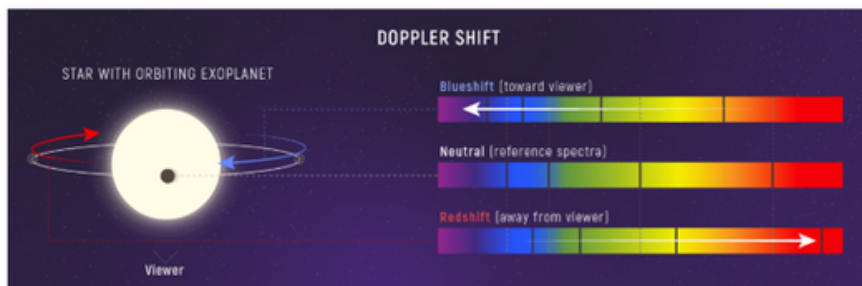
- 21 May - FA - The James Webb Telescope at Work - John Thatcher
- 3 June - WAS - Paul Fellows – Quark stars (In Person)
- 18 June - FA - Astro Processing. Curves, Levels and Layers - Ken Pitts
- CADAS - The third Wednesday of the month from January 2025 to December 2025
- 1 July - WAS - Robert Harvey – Stumbling around in the dark – a 2 hour astrophoto session (In Person)
- 16 July - FA - Equipment Clinic. Come along and see what other people are using. Display your own kit, or bring along anything you need some help with.
- 5 Aug - WAS - Social and Equipment Night with Quiz
- 20 Aug - FA - Tutorial Clinic

MORE TO COME IN 2025!

VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION

Continued from page 1:

The Wobble Method



As a planet orbits a star, the star wobbles. This causes a change in the appearance of the star's spectrum called Doppler shift. Because the change in wavelength is directly related to relative speed, astronomers can use Doppler shift to calculate exactly how fast an object is moving toward or away from us. Astronomers can also track the Doppler shift of a star over time to estimate the mass of the planet orbiting it. Credit: NASA, ESA, CSA, Leah Hustak (STScI)

Spotting the Doppler shift of a star's spectra was used to find Pegasi 51b, the first planet detected around a Sun-like star. This technique is called the radial velocity or "wobble" method. Astronomers split up the visible light emitted by a star into a rainbow. These spectra, and gaps between the normally smooth bands of light, help determine the elements that make up the star. However, if there is a planet orbiting the star, it causes the star to wobble ever so slightly back and forth. This will, in turn, cause the lines within the spectra to shift ever so slightly towards the blue and red ends of the spectrum as the star wobbles slightly away and towards us. This is caused by the blue and red shifts of the planet's light. By carefully measuring the amount of shift in the star's spectra, astronomers can determine the size of the object pulling on the host star and if the companion is indeed a planet. By tracking the variation in this periodic shift of the spectra, they can also determine the time it takes the planet to orbit its parent star.

Direct Imaging

Finally, exoplanets can be revealed by directly imaging them, such as this image of four planets found orbiting the star HR 8799! Space telescopes use instruments called coronagraphs to block the bright light from the host star and capture the dim light from planets. The Hubble Space Telescope has captured images of giant planets orbiting a few nearby systems, and the James Webb Space Telescope has only improved on these observations by uncovering more details, such as the colors and spectra of exoplanet atmospheres, temperatures, detecting potential exomoons, and even scanning atmospheres for potential biosignatures!

You can find more information and activities on [NASA's Exoplanets](#) page, such as the [Eyes on Exoplanets](#) browser-based program, [The Exoplaneteers](#), and some of the [latest exoplanet news](#). Lastly, you can find more resources in our [News & Resources section](#), including a [clever demo](#) on how astronomers use the wobble method to detect planets!

The future of exoplanet discovery is only just beginning, promising rich rewards in humanity's understanding of our place in the Universe, where we are from, and if there is life elsewhere in our cosmos.

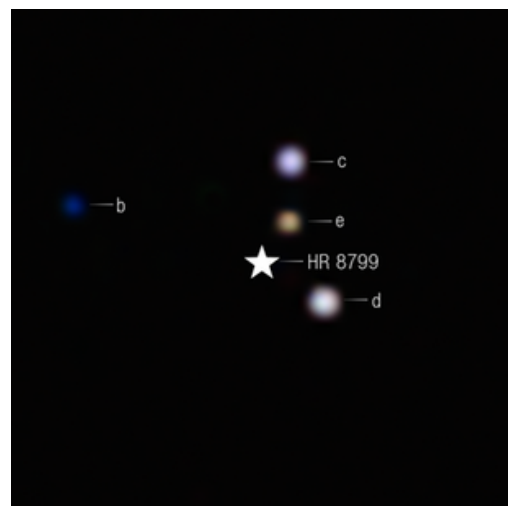
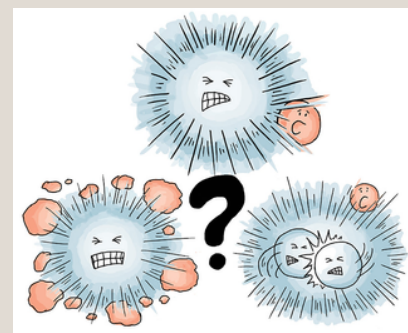


Image taken by the James Webb Space Telescope of four exoplanets orbiting HR 8799. Credit: NASA, ESA, CSA, STScI, Laurent Pueyo (STScI), William Balmer (JHU), Marshall Perrin (STScI)



WAC Upcoming Events

JUNE 13 - MARY MCINTYRE - WOMEN IN ASTRONOMY (IN-PERSON AND ZOOM)

JULY 11 - EQUIPMENT EVENING, SOLARGRAPHS AND MEAL/SOCIAL (IN-PERSON ONLY)

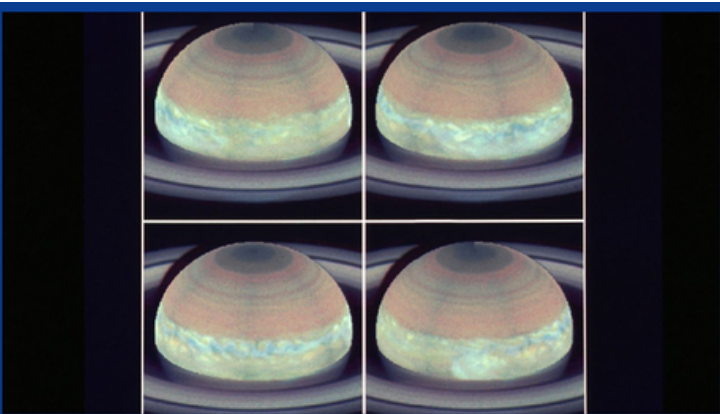
AUG - NO MEETING THIS MONTH

SEPT 12 - DAVID WHITEHOUSE - SEARCHING FOR LIFE (IN-PERSON AND ZOOM)

WEYMOUTH ASTRONOMY

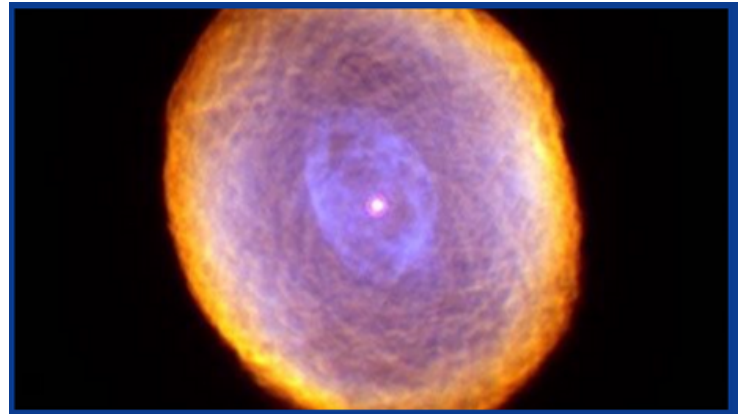


<https://science.nasa.gov/mission/hubble/hubble-news/hubble-social-media/35-years-of-hubble-images/>



Year 1 - Major Storm on Saturn

These Hubble images show Saturn's white spot, a great storm in the planet's equatorial region, discovered by amateur astronomers in September, 1990. Such storms are rare: the last one previous to this storm in the equatorial region occurred in 1933. The storm extends completely around the planet, in some places appearing as great masses of clouds and in others as well organized turbulence. Knowing that this storm is probably a once in a lifetime event, scientists and engineers of a special White Spot Observing Team, the Wide Field/Planetary Camera Team, the Space Telescope Science Institute, and the Goddard Space Flight center reprogrammed Hubble's observing schedule and were able to get several days of Saturn observations in mid-November 1990, shortly before Saturn moved too near in the sky to the Sun for safe observations by Hubble.



Year 11 - Spirograph Nebula

Glowing like a multi-faceted jewel, the planetary nebula IC 418 lies about 2,000 light-years from Earth in the direction of the constellation Lepus. A planetary nebula represents the final stage in the evolution of a star similar to our Sun. The star at the center of IC 418 was a red giant a few thousand years ago, but then ejected its outer layers into space to form the nebula, which has now expanded to a diameter of about 0.1 light-year. The stellar remnant at the center is the hot core of the red giant, from which ultraviolet radiation floods out into the surrounding gas, causing it to fluoresce. Over the next several thousand years, the nebula will gradually disperse into space, and then the star will cool and fade away for billions of years as a white dwarf. Our own Sun is expected to undergo a similar fate, but fortunately this will not occur until some 5 billion years from now.



Year 32 - CW Leonis

This Hubble image captures the red giant star CW Leonis. The orange-red "cobwebs" are dusty clouds of sooty carbon engulfing the dying star. They were created when CW Leonis threw out its outer layers into the inky black void. The carbon, cooked up through nuclear fusion in the star's interior, gives it a carbon-rich atmosphere. Blasting the carbon back into space provides raw material for the formation of future stars and planets. All known life on Earth is built around the carbon atom. Complex biological molecules consist of carbon atoms bonded with other common elements in the universe. At a distance of 400 light-years from Earth, CW Leonis is the closest carbon star. This gives astronomers the chance to understand the interplay between the star and its surrounding, turbulent envelope. The complex inner structure of shells and arcs may be shaped by the star's magnetic field. Detailed Hubble observations of CW Leonis taken over the last two decades also show the expansion of threads of ejected material around the star.



Year 35 - NGC 5335

NASA's Hubble Space Telescope captured in exquisite detail a face-on view of a remarkable-looking galaxy. NGC 5335 is categorized as a flocculent spiral galaxy with patchy streamers of star formation across its disk. There is a striking lack of well-defined spiral arms that are commonly found among galaxies, including our Milky Way. A notable bar structure slices across the center of the galaxy. The bar channels gas inwards toward the galactic center, fueling star formation. Such bars are dynamic in galaxies and may come and go over two-billion-year intervals. They appear in about 30 percent of observed galaxies, including our Milky Way.

WEYMOUTH ASTRONOMY

WAC Members Corner

WEYMOUTH ASTRONOMY

Inaugural Newsletter

Volume 1, Issue 1
12 May 2006



Name the Newsletter Competition

We are looking for help in naming our Weymouth Astronomy newsletter. Some ideas include:

Weymouth Watcher
Star Gazette
Constellation
Celestial Sights
The Pulsar

Send your submissions to:
Weymouth Astronomy
70 Brackendown Avenue
Weymouth DT3 6HX
07970 644637
astro@digital-reality.co.uk
Or let Sheri know!

Upcoming Events:

- **Regular Meetings:** Please refer to the website for information. Meetings will be planned monthly on or about the 2nd Friday of the month.
- **Open viewing night** (if weather permits): **Perseid Meteor Shower 11-12 Aug.** Details to be announced at an upcoming meeting and on the website.

First Event—11 February 2006
'Weymouth Astronomy' was born. Many enthusiasts met up at Chickerell Army Camp. Unfortunately the stars were masked by a layer cloud thus making observing impossible.

Despite the poor observing conditions over 20 keen amateur astronomers turned up (some even with telescopes!!).

Weymouth Astronomy is keen to attract enthusiasts regardless of ability, the only prerequisite required is an interest in the night sky.

The launch of the club website—
www.weymouthastronomy.co.uk

For all the latest club news, meeting minutes and event schedules, monthly notable celestial sights to see, members own image gallery and a Beginner's Guide to Astronomy as well as useful links and recommendations.

If there is anything you would like to be included on the site or would like to submit articles and/or photos, please email:

webmaster@weymouthastronomy.co.uk

Celestial Sights



12 May—Full Moon

13 May—Comet 73P closest approach

27 May—New-est Moon

30 May—Mars in line with Castor and Pollux in Gemini

13 June—Saturn & Mars aside the Beehive M44

Who Wants to be a Daredevil?

By Patrick L. Barry and Dr. Tony Phillips

When exploring space, NASA naturally wants to use all the newest and coolest technologies—artificial intelligence, solar sails, onboard supercomputers, exotic materials.

But "new" also means unproven and risky, and that could be a problem.

Testing advanced technologies in space is the mission of the New Millennium Program (NMP), created by NASA's Science Mission Directorate in 1995 and run by JPL. Like the daredevil test pilots of the 1950s who would fly the latest jet technology, NMP flies new technologies in space to see if they're ready for prime time with much less risk.

Example: In 1999, the program's Deep Space 1 probe tested a system called "AutoNav," short for *Autonomous Navigation*. AutoNav used artificial intelligence to steer the spacecraft without human intervention. It worked

so well that elements of AutoNav were installed on a real mission, Deep Impact, which famously blasted a crater in Comet Tempel 1 on July 4, 2005. Without AutoNav, the projectile would have completely missed the comet.

Some NMP technologies "allow us to do things that we literally could not do before," says Jack Stocky, Chief Technologist for NMP. Dozens of innovative technologies tested by NMP will lead to satellites and space probes that are smaller, lighter, more capable and even cheaper than those of today.

Another example: An NMP test mission called Space Technology 9, which is still in the planning phase, may test fly a solar sail. Solar sails use the slight pressure of sunlight itself, instead of heavy fuels, to propel a spacecraft. Two proposed NASA missions would be possible

only with dependable solar sails—L1 Diamond and Solar Polar Imager—both of which would use solar sails to fly spacecraft that would study the Sun.

According to Stocky, "The technologies that we validate have future missions that need them. We try to target [missions] that are about 15 to 20 years out."

A menagerie of other cool NMP technologies include ion thrusters, hyperspectral imagers, and miniaturized electronics for spacecraft navigation and control. NMP focuses on technologies that have been proven in the laboratory but must be tested in the extreme cold, vacuum, and high radiation environment of space, which can't be fully recreated in the lab.

New NMP missions fly every year and one-half to two years.



This month marks the start of the 20th year of the modern incarnation of the WAC!

Digging through the archives, we've located the very first edition of the newsletter that was yet to be named!

Perhaps it still looks familiar to long standing members...

Throughout 2025, we'll revisit a few favourite front pages to remember back to the first year.

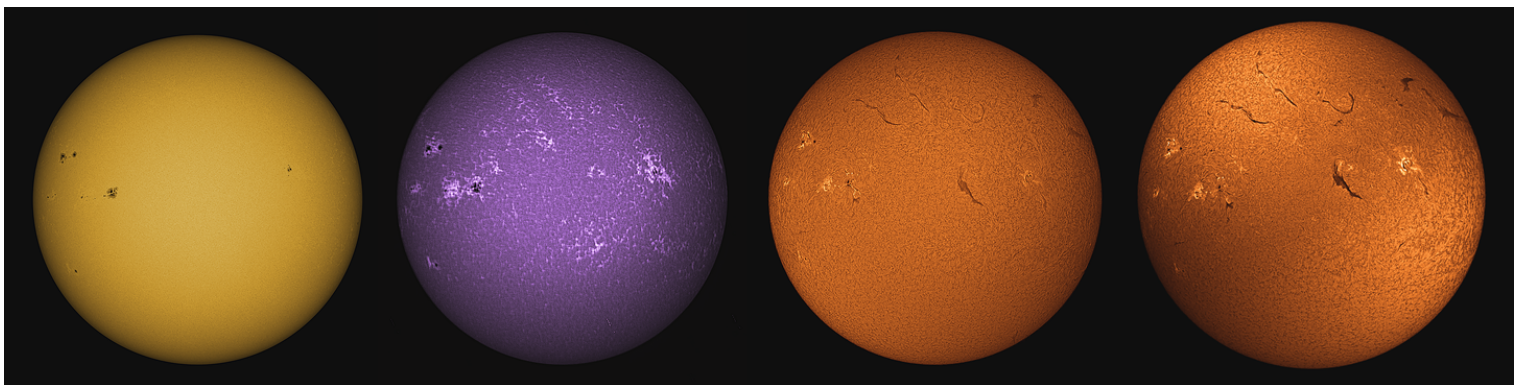
Great to have such a friendly and thriving local astronomy club after all these years.

Please feel free to send any memories that you may have for the club over the past 20 yrs.

Looking forward to the next 20 yrs!

Until next month ~ Sheri

<http://www.weymouthastronomy.co.uk>



18 April 2025 - The Sun remains active in Solar Cycle 25. The above images span white light, Calcium-K, and Hydrogen Alpha using both a single stacked and double stacked etalon. No significant prominences on this date but a growing sunspot AR4062 which resembled a solar butterfly to me! Hopefully more activity to come as the days are growing longer... All images taken from Aberdeen by S Karl

WEYMOUTH ASTRONOMY



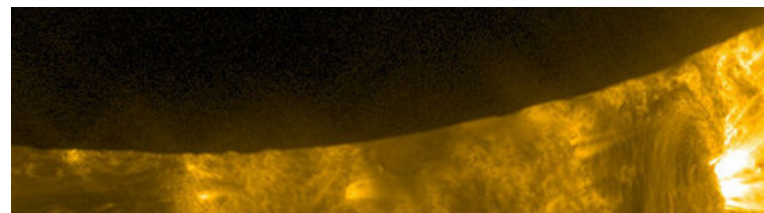
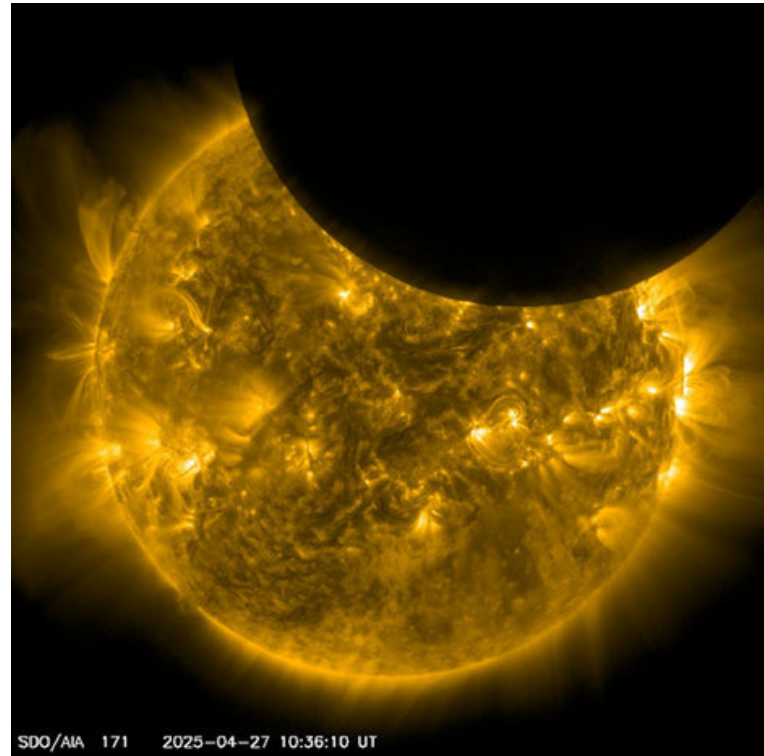
<https://www.spaceweather.com>

A SOLAR ECLIPSE IN SPACE: Yesterday, the Moon eclipsed the sun. No one on Earth saw it. The "lunar transit" was only visible from space. NASA's Solar Dynamics Observatory recorded the whole thing from geosynchronous orbit.

At maximum, 23% of the sun was covered. That makes it a partial eclipse. Every year, SDO observes multiple lunar transits. An eclipse on July 25th will be much deeper: 62%. SDO is solar powered, but it won't "brown out" in May because mission controllers will give the spacecraft's batteries an extra charge before the eclipse.

Bonus: You can see lunar mountains in these images. Zoom in to the edge of the Moon (Lower right).

This has practical value to the SDO science team. Undulations in the sharp edge of the Moon help researchers measure how light diffracts around the telescope's optics and filter support grids. Once these are calibrated, it is possible to correct SDO data for instrumental effects and sharpen the images even more than before.



A Geologic Map of the Asteroid Belt

Scientists leveraged a global camera network and doorbell cameras to track dozens of meteorites to their asteroid families.

Eos / Apr 30

<https://eos.org/articles/a-geologic-map-of-the-asteroid-belt>



A Two-Step Approach to Training Earth Scientists in AI

Researchers learned machine learning methods during a boot camp, then applied their new knowledge to real-world research problems during a hackathon.

Eos / Apr 29

<https://eos.org/science-updates/a-two-step-approach-to-training-earth-scientists-in-ai>

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 – May 2025

Follow us on Bluesky
skymaps.com/blsky/

- 1 **Asteroid 4 Vesta** at opposition at 12h UT. Mag. 5.7.
- 1 **Moon near M35 Cluster** at 12h UT (51° from Sun, evening sky).
- 4 **Moon, Mars and Beehive Cluster (M44)** within circle 2.6° diameter at 1h UT (evening sky). Mag. 1.0.
- 4 **First Quarter Moon** at 13:52 UT.
- 5 **Mars 0.6° NNE of Beehive Cluster (M44)** at 14h UT (evening sky). Mag. 1.0.
- 5 **Moon near Regulus** at 21h UT (evening sky).
- 5 **Eta Aquarid meteor shower peaks**. Most active for 7 days around this date. Associated with Comet Halley. Very fast, bright meteors, up to 50 per hour. Best seen from the tropics and southern hemisphere a few hours before dawn. Viewing conditions are ideal in 2025 for this major meteor shower.
- 10 **Moon near Spica** at 6h UT (evening sky). Occultation visible from southern Pacific Ocean.
- 11 **Moon at apogee** (farthest from Earth) at 1h UT (distance 406,244km; angular size 29.4°).
- 12 **Full Moon** at 16:57 UT.
- 14 **Moon near Antares** at 2h UT (morning sky). Occultation visible from Argentina, Chile, Uruguay and the Falkland Islands.
- 14 **Asteroid 3 Juno** at opposition at 6h UT. Mag. 10.1.
- 20 **Last Quarter Moon** at 11:59 UT.
- 22 **Moon near Saturn** at 16h UT (morning sky). Mag. 1.1.
- 23 **Moon near Venus** at 19h UT (morning sky). Mag. -4.4.
- 26 **Moon at perigee** (closest to Earth) at 1:32 UT (distance 359,022km; angular size 33.3°).
- 27 **New Moon** at 3:03 UT. Start of lunation 1267.
- 28 **Moon near Jupiter** at 14h UT (20° from Sun, evening sky). Mag. -1.9.
- 28 **Moon near M35 Cluster** at 22h UT (25° from Sun, evening sky).
- 30 **Mercury at superior conjunction** with the Sun at 4h UT (not visible). The innermost planet passes into the evening sky.
- 31 **Moon near Beehive Cluster (M44)** at 11h UT (evening sky).

More sky events and links at <http://Skymaps.com/skycalendar/>

All times in Universal Time (UT). (USA Eastern Daylight Time – UT – 4 hours.)

Help Support The Evening Sky Map

Freely shared with sky watchers worldwide since January 2000

Shop: skymaps.com/amazon/ • Donate: skymaps.com/donate/
Recommended Telescopes & Products at: skymaps.com/astro/

