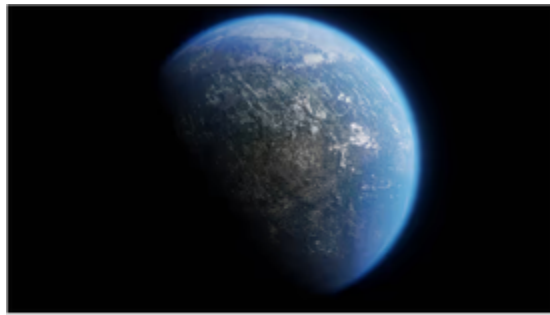


## SKYWATCHER NEWSLETTER

**A Step Closer to Solving the Fermi Paradox**

Finding evidence of complex life elsewhere in the Milky Way galaxy hinges on locating rocky planets with plate tectonics and a mixture of landmasses and oceans, new research suggests.

— Eos / May 24

<https://tinyurl.com/y5b27jkw>



## September's Night Sky Notes: Marvelous Moons

By: Kat Troche

September brings the gas giants Jupiter and Saturn back into view, along with their satellites. And while we organize celebrations to observe our own Moon this month, be sure to grab a telescope or binoculars to see other moons within our Solar System! We recommend observing these moons (and planets!) when they are at their highest in the night sky, to get the best possible unobstructed views.

### The More the Merrier

As of September 2024, the ringed planet Saturn has 146 identified moons in its orbit. These celestial bodies range in size; the smallest being a few hundred feet across, to Titan, the second largest moon in our solar system.

Even at nearly 900 million miles away, [Titan](#) can be easily spotted next to Saturn with a 4-inch telescope, under urban and suburban skies, due to its sheer size. With an atmosphere of mostly nitrogen with traces of hydrogen and methane, Titan was briefly explored in 2005 with the [Huygens probe](#) as part of the [Cassini-Huygens mission](#), providing more information about the surface of Titan. NASA's mission [Dragonfly](#) is set to explore the surface of Titan in the 2030s.

## LATEST NEWS

A very interesting article I've read recently is regarding planetary habitability. The opening paragraph states, "Don't you ever wonder where everybody is?" That question, famously posed in the mid-20th century by the physicist Enrico Fermi, spotlights the fact that precisely zero extraterrestrial civilizations have been found in the Milky Way, despite the fact that by some calculations, our galaxy ought to be teeming with communicative life.

We've only confirmed the existence of exoplanets since 1995. How long until we can confirm lifeforms beyond Earth? That would indeed be global news!

Until next month... SLK



The Saturnian system along with various moons around the planet Saturn: Iapetus, Titan, Enceladus, Rhea, Tethys, and Dione. Credit: Stellarium Web

Continued on page 4....

Saturn's moon [Enceladus](#) was also explored by the Cassini mission, revealing plumes of ice that erupt from below the surface, adding to the brilliance of Saturn's rings. Much like our own Moon, Enceladus remains tidally locked with Saturn, presenting the same side towards its host planet at all times.

### The Galilean Gang

The King of the Planets might not have the most moons, but four of Jupiter's 95 moons are definitely the easiest to see with a small pair of binoculars or a small telescope because they form a clear line. The Galilean Moons – Ganymede, Callisto, Io, and Europa – were first discovered in 1610 and they continue to amaze stargazers across the globe.

## LOCAL EVENTS

Sep 18 - CADAS - Gadgets and Gizmos Evening followed by Observing Session

Oct 1 - WAS Professor Martin Hendry – Einstein in the movies

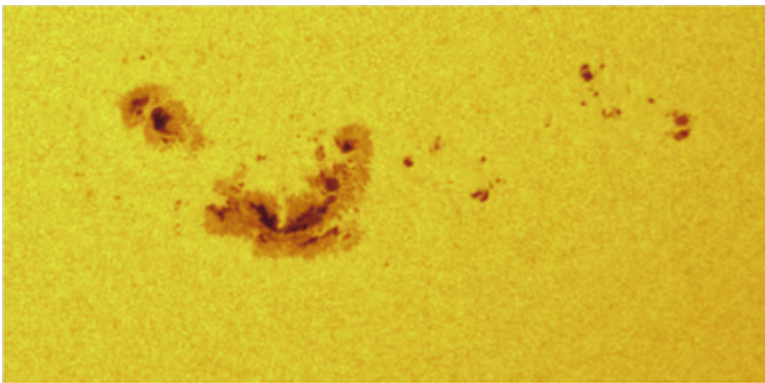
Oct 16 - CADAS - Adrian Denning Perfecting Portable

Nov 5 - WAS - John Martin MBE – Apollo Mission TBC

Nov 20 - CADAS - Brian Fraser Unmanned Lunar Landings

Dec 3 - WAS - Members Talks

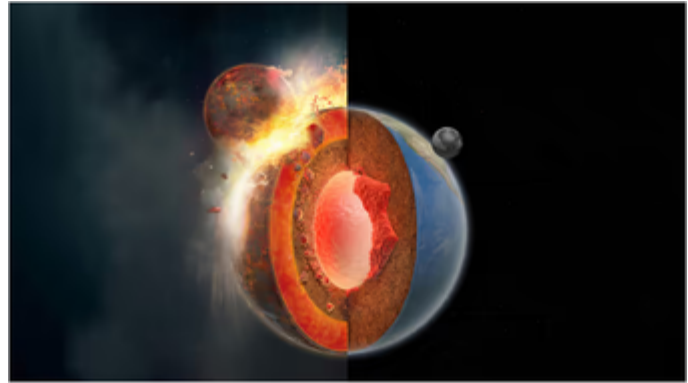
VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION



### Early riser! The Sun is already starting its next solar cycle

The first rumblings of the Sun's next 11-year solar cycle have been detected in sound waves inside our home star – even though it is only halfway through its current cycle...

<https://tinyurl.com/bdz7wkvj>



### Earth's Subduction May Have Been Triggered by the Same Event That Formed the Moon

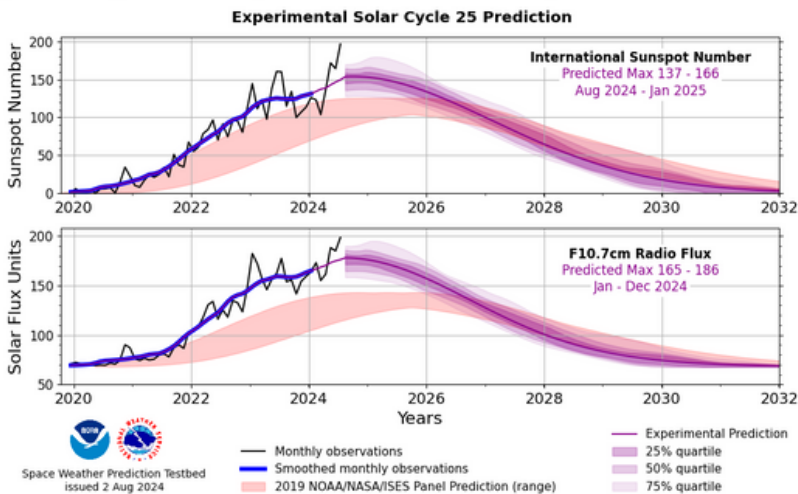
The giant impact that formed the Moon may also have led to extrastrong mantle plumes that enabled the first subduction event, kick-starting Earth's unique system of sliding plates.

— Eos / May 20

<https://tinyurl.com/k96afaay>

## Space Weather Prediction Testbed

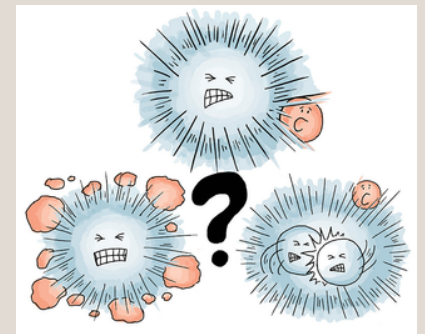
### Solar Cycle Progression Updated Prediction (Experimental)



An updated forecast for the amplitude and timing of Solar Cycle 25 is shown by the magenta line in Figure 1. This is obtained by applying a curve fit to the available observational data (black line) based on the same function that was used to produce the red line. In other words, the parameters in the panel prediction are adjusted to better match the observed sunspot number data. An average is then computed between the current fit and one made without the most recent nine months of data. This makes the prediction more robust to short-term trends. A new prediction is made in this way every month as new data become available.

The shaded regions show the uncertainty in the prediction, obtained by applying the same prediction method to previous cycles at the same stage in each cycle (measured in months since cycle beginning). In particular, the three shades show the first three quartiles of the deviations from previous predictions.

So, this should be interpreted as follows. There is roughly a 25% chance that the smoothed sunspot number will fall within the dark shaded region at a particular time in the future. Similarly, there is a 50% chance the smoothed sunspot number will fall in the medium-shaded region and a 75% chance it will fall in the lightest of the shaded regions.



### WAC Upcoming Events

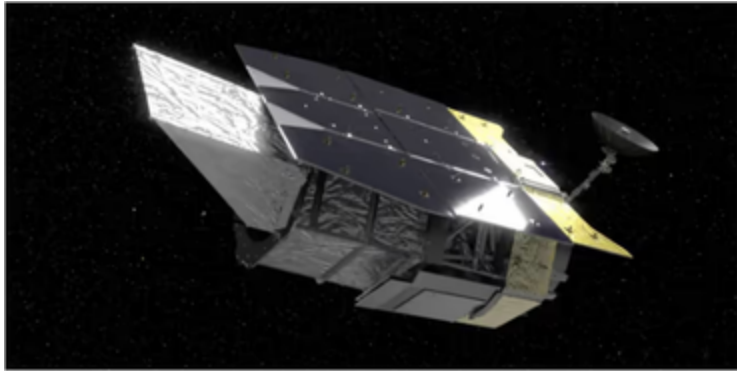
SEPT 13 - JAMES FRADGLEY: THE BORING BILLIONS (IN-PERSON AND ZOOM)

OCT 11 - CHRIS BOWDEN: BACK GARDEN ASTRONOMY AND BEYOND (IN-PERSON AND ZOOM)

NOV 8 - SHERI KARL: SOLAR ORBITING OBSERVATORY MISSIONS (ZOOM ONLY)

DEC 13 - LILLIAN HOBBS: MESSIER OBJECTS (IN-PERSON)

# WEYMOUTH ASTRONOMY

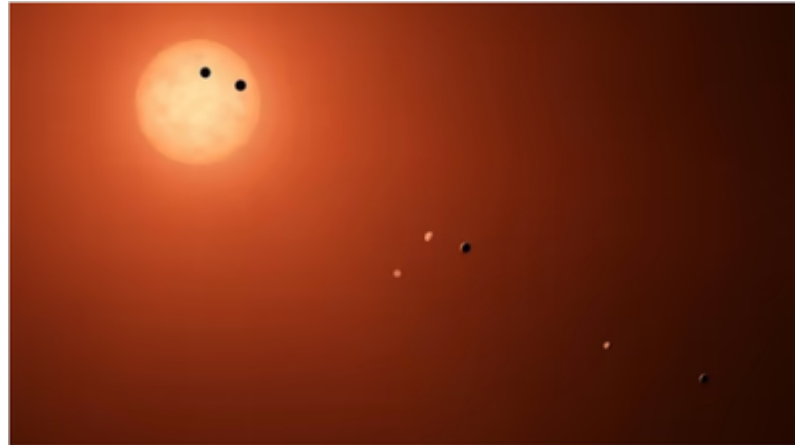


## A Trillion Rogue Planets and Not One Sun to Shine on Them

Inside the race to track down our galaxy's hidden, untethered worlds

IFFF Spectrum / Aug 14

<https://tinyurl.com/mr2bm862>



## Anemic Stars Don't Host Super-Earths

Planetary systems need the right stuff to make planets, and some stars just don't have it.

Eos / Aug 27

<https://tinyurl.com/3meydz7t>



<https://www.spaceweather.com>

## AURORAS SHOULD NOT BE ORANGE (BUT THEY ARE)

During this week's severe (G4-class) geomagnetic storm, Tony Bendele of Pennsylvania saw something rare and a little mysterious. "Orange auroras!" he says. "Yes, Orange. I had never seen this color in auroras before." He took this picture before sunrise on Aug. 12th:

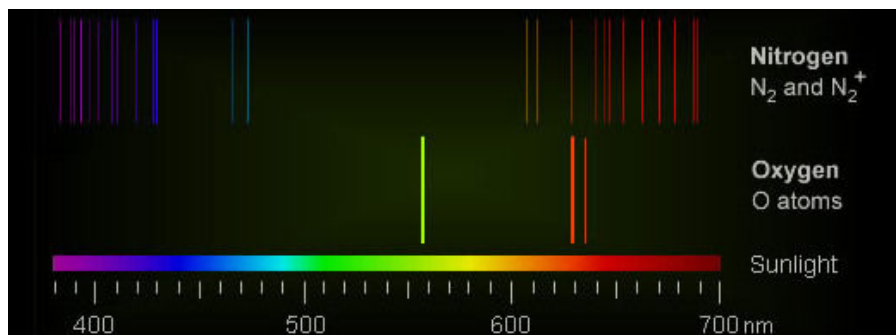
"At first, I thought something was wrong, so I checked this image numerous times. The color orange is really there," he says.

What's so mysterious about orange? Auroras get their colors from specific atoms and molecules in Earth's atmosphere. For instance, green is due to oxygen, while pink comes from nitrogen. The problem is, there's nothing in the air capable of making bright orange.

Theoretically, nitrogen and oxygen ( $N_2$ ,  $N_2^+$ , and  $O_2^+$ ) can produce emissions at orange wavelengths. However, these emissions are very weak compared to other competing colors produced by the same molecules. Auroras should not be orange.

Colors produced by atoms and molecules in Earth's atmosphere

The answer may be simple. During typical geomagnetic storms, red auroras and green auroras are well separated; red on top, green on the bottom. However, when geomagnetic storms become intense, as happened on Aug. 12th, red and green auroras can mix in a zone 150 km to 200 km high. The overlap naturally produces a yellow-orange glow—no mystery molecule required.



Colors produced by atoms and molecules in Earth's atmosphere

# WEYMOUTH ASTRONOMY

Continued from page 1:

- Ganymede: largest moon in our solar system, and larger than the planet Mercury, Ganymede has its own magnetic field and a possible saltwater ocean beneath the surface.
- Callisto: this heavily cratered moon is the third largest in our solar system. Although Callisto is the furthest away of the Galilean moons, it only takes 17 days to complete an orbit around Jupiter.
- Io: the closest moon and third largest in this system, Io is an extremely active world, due to the push and pull of Jupiter's gravity. The volcanic activity of this rocky world is so intense that it can be seen from some of the largest telescopes here on Earth.
- Europa: Jupiter's smallest moon also happens to be the strongest candidate for a liquid ocean beneath the surface. NASA's Europa Clipper is set to launch October 2024 and will determine if this moon has conditions suitable to support life. Want to learn more? Rewatch the July 2023 Night Sky Network webinar about Europa Clipper [here](#).

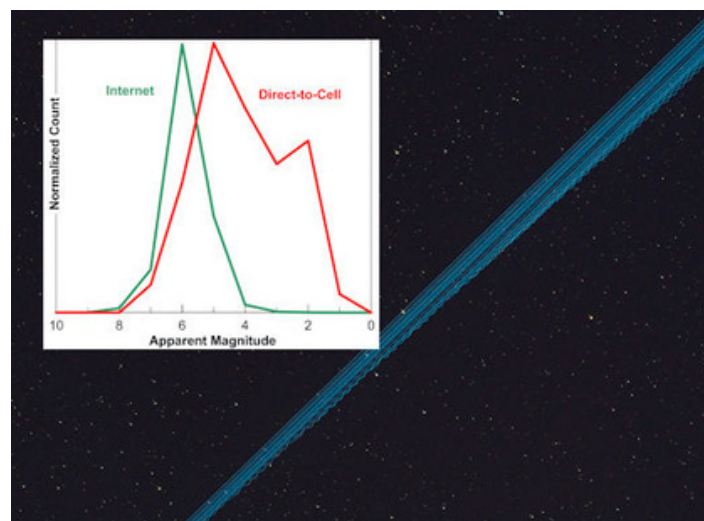


The Jovian system: Europa, Io, Ganymede, and Callisto. Credit: Stellarium Web

Be sure to celebrate [International Observe the Moon Night](#) here on Earth September 14, 2024, leading up to the super full moon on September 17th! You can learn more about supermoons in our mid-month article on the [Night Sky Network](#) page!



<https://www.spaceweather.com>



**STARLINK SATELLITES ARE TURNING BLUE:** When SpaceX first started launching Starlink satellites in 2019, astronomers saw red. Now they're seeing blue. "Recently, a number of people have reported sightings of blue satellites," says Croatian astronomer Marko Posavec. "On the night of Aug. 11th, while observing the Perseids, I captured an entire series of them."

"It was Starlink group G9-1, launched in June," says Posavec. "These are DTC (Direct to Cell) satellites. Apparently, the material they're using to try to reduce brightness also gives them a blue color, for which SpaceX says is 'not unexpected.' The color is visible to the naked eye."

DTC satellites are SpaceX's attempt to create "a cell tower in space." The first batch of six was launched in Jan. 2024, and now there are 129 DTCs in orbit. According to a recent study, on average they shine nearly five times brighter in the sky than earlier Starlinks. The extra brightness is a probable result of their larger antennas and lower altitudes.

This image combines brightness data from the IAU Centre for the Protection of Dark and Quiet Skies with a recent blue streak photo from amateur astronomer Mike Saemisch of New Harmony, Utah:

The inset plot shows DTC satellite magnitudes peaking at +5, which is barely visible to the unaided eye. However, the dispersion is large, and some are brighter than 1st magnitude stars.

Earlier this year, SpaceX requested an amendment to their license with the U.S. Federal Communications Commission allowing them to operate up to 7,500 DTCs orbiting at heights near 350 km. If that plan comes to fruition, there might soon be many more blue streaks in the night sky.

## WAC Members Corner



The WAC Social evening was held at a local Weymouth pub and we produced messages – Birthday or Christmas cards – using the coding on the parachute of the Perseverance Mars probe. This is explained in the YouTube video at <https://www.youtube.com/watch?v=W-xgAksRK2A>

Chairman John MacDonald produced templates, glue and crayons together with the instructions attached so that we each produced our own coded 'parachute' canopy. Family and friends will be receiving some puzzling greeting cards!

We welcomed Kate Earl, Chair of the Wessex Astronomical Society based at Wimborne.

It was a great evening! ~ G. Kirby



A spectacular Perseid imaged by Ennio on the morning of the 13 August from Black Down. Image taken with a Pentax Kx, 18mm lens at 30s exposure and ISO 1600. No processing of the image. Ennio says he took loads of frames but only caught one Perseid!

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 – September 2024

- 3 **New Moon** at 1:56 UT. Start of lunation 1258.
- 5 **Mercury at greatest elongation** west at 2h UT (18° from Sun, morning sky). Mag. -0.2.
- 5 **Moon near Venus** at 10h UT (25° from Sun, evening sky). Mag. -3.9. Occultation visible from Antarctica.
- 5 **Moon at apogee** (farthest from Earth) at 15h UT (distance 406,211km; angular size 29.4').
- 6 **Moon near Spica** at 18h UT (40° from Sun, evening sky). Occultation visible from Africa.
- 8 **Saturn at opposition** (opposite the Sun) at 4h UT. The planet is at its closest and brightest. Mag. 0.6.
- 8 **Mars 0.85° S of M35 star cluster** at 10h UT (74° from Sun, morning sky). Mag. 0.7.
- 10 **Moon near Antares** at 14h UT (evening sky). Occultation visible from western Australia.
- 11 **First Quarter Moon** at 6:06 UT.
- 17 **Moon near Saturn** at 11h UT (evening sky). Mag. 0.6. Occultation visible from western US, western Canada, NW Mexico, and NE Australia.
- 18 **Partial Eclipse of the Moon** from 2:13 to 3:16 UT, mid-eclipse at 2:44 UT. Visible from the Americas, Africa, and Europe.
- 18 **Full Moon** at 2:36 UT. Supermoon.
- 18 **Venus 2.4° NNE of Spica** at 10h UT (28° from Sun, evening sky). Mags. -3.9 and 1.0.
- 18 **Moon at perigee** (closest to Earth) at 13:34 UT (distance 357,286km; angular size 33.4'). Only 11 hours after Full Moon.
- 21 **Neptune at opposition** at 0h UT. Mag. 7.8.
- 22 **Moon near the Pleiades** at 12h UT (morning sky).
- 22 **September equinox** at 12:42 UT. The time when the Sun reaches the point along the ecliptic where it crosses into the southern celestial hemisphere marking the start of autumn in the Northern Hemisphere and spring in the Southern Hemisphere.
- 23 **Moon near Jupiter** at 23h UT (morning sky). Mag. -2.4.
- 24 **Last Quarter Moon** at 18:51 UT.
- 25 **Moon near Mars** at 14h UT (morning sky). Mag. 0.5.
- More sky events and links at <https://Skymaps.com/skycalendar/>  
All times in Universal Time (UT). (USA Eastern Summer Time = UT - 4.

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- *freely shared with sky watchers worldwide since January 2000* •

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