

SKYWATCHER NEWSLETTER

LATEST NEWS

This month the Sun is truly showing its increased activity. The latest news on [Spaceweather.com](https://www.spaceweather.com) states that there has been a SOLAR FLARE AND RADIO BLACKOUT: Two days ago, sunspot AR3213 didn't even exist. Now it stretches almost 100,000 km across the surface of the sun with at least two dark cores larger than Earth. The fast-growing spot is crackling with solar flares. The strongest so far, an M6-class flare on Feb 7th (2307 UTC), caused a shortwave radio blackout over the Pacific Ocean.

Mariners and ham radio operators around the Pacific may have noticed unusual propagation effects at frequencies below 30 MHz for at least an hour after the flare. As always, keep your eye on the sky and if you are interested in radio astronomy, activity is on the rise there too!

Until next month... SLK

Spot the King of Planets:

Observe Jupiter

by David Prosper



Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its awesome size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together they would still only be half as massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud tops with such violence that the fireballs and dark impact spots were not only seen



This stunning image of Jupiter's cloud tops was taken by NASA's Juno mission and processed by Kevin M. Gill. You too can create amazing images like this, all with publicly available data from Juno.

Full Image Credit: NASA/JPL-Caltech/SwRI/MSSS; Processing: Kevin M. Gill, license: CC BY 2.0)

by NASA's orbiting Galileo probe, but also observers back on Earth!

Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million km)! While the King of Planets has a coterie of around 75 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Callisto – can be easily observed by Earth-based observers with very modest equipment. These are called, appropriately enough, the Galilean moons. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but sometimes they can pass behind or in front of Jupiter, or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening - and night to night – can be a rewarding project! You can download an activity guide from

the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

NASA's Juno mission currently orbits Jupiter, one of just nine spacecraft to have visited this awesome world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. In 2024 NASA will launch the Europa Clipper mission to study this world and its potential to host life inside its deep subsurface oceans in much more detail. Find the latest discoveries from Juno and NASA's missions at nasa.gov.

LOCAL EVENTS

Feb 15 - CADAS - Steve Tonkin
Ten Ways the Universe Tries to Kill You

Mar 7 - WAS - Sandra Brantingham – The Aurora and STEVE

Mar 15 - CADAS - Hugh Allen
Spectroscopy : Cracking starlight's hidden code

Apr 4 - WAS - Mary Macintyre – Reflection, Refraction & Excitation: The Hunt for Atmospheric Optics

Apr 19 - CADAS - TBA

VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION

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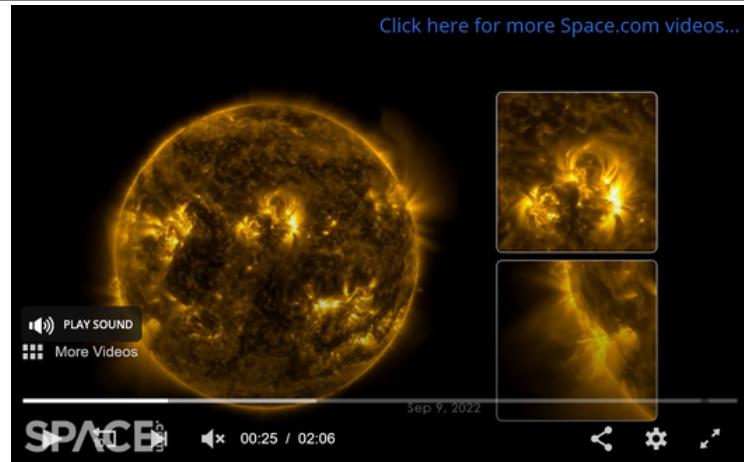
SEE 133 DAYS ON THE SUN IN JUST 2 MINUTES IN THIS MESMERIZING NASA VIDEO BY TARIQ MALIK

YOU CAN ZEN OUT TO A FULL HOUR OF THE 133-DAY SUN WEATHER TIME-LAPSE VIDEO FROM NASA'S SOLAR DYNAMICS ORBITER, TOO. THE SUN IS A CONSTANT PRESENCE FOR ALL LIFE ON EARTH, BRINGING LIGHT, WARMTH AND SPLITTING OUR DAYS AND NIGHTS. BUT THE SUN IS MORE THAN JUST A BRIGHT LIGHT IN THE SKY AND A NEW NASA VIDEO REVEALS ITS EVER-CHANGING SURFACE IN A STUNNING TIME-LAPSE THAT SPANS 133 DAYS.

THE NEW SUN VIDEO, WHICH NASA RELEASED ON YOUTUBE JAN. 5, SHOWS THE SUN AS IT APPEARED OVER FOUR MONTHS FROM AUG. 12 TO DEC. 22 IN 2022. NASA'S SOLAR DYNAMICS OBSERVATORY (SDO) CAPTURED THE VIDEO AS PART OF ITS CONSTANT WATCH FOR SOLAR FLARES AND OTHER SPACE WEATHER.

SCIENTISTS THEN COMPRESSED THE VIDEO SO THAT ALL 133 DAYS OF IT TAKE UP JUST 1 HOUR OF YOUR TIME. THE VIDEO ABOVE, CREATED BY OUR SPACE.COM TEAM, COMPRESSED THE SDO TIME-LAPSE EVEN FURTHER, SQUEEZING ALL 133 DAYS OF SUN VIDEOS INTO JUST 2 MINUTES.

READ MORE AT THE LINK BELOW THE SCREENSHOT:



[HTTPS://WWW.SPACE.COM/SEE-133-DAYS-OF-THE-SUN-IN-MINUTES-NASA-VIDEO](https://www.space.com/see-133-days-of-the-sun-in-minutes-nasa-video)

POLAR STRATOSPHERIC CLOUDS OVER SCOTLAND

January 30th 2023



Polar Stratospheric Clouds (PSCs) are supposed to stay inside the Arctic Circle. Last night they broke out and made a rare appearance over Scotland.

"Thanks to a heads-up from SpaceWeather.com and Jonathan Shanklin (Emeritus Fellow of the British Antarctic Survey) I've been keeping an eye open for these clouds," says Tough. "This beauty between between rain showers on the evening of Jan 29th. Note Venus to the lower right of the cloud."

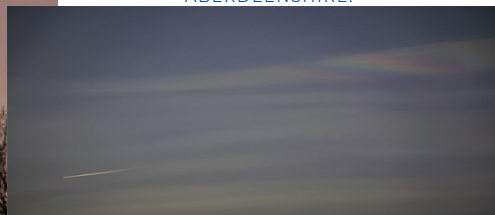
Polar stratospheric clouds are rare. Earth's stratosphere is very dry and normally it has no clouds at all. PSCs form when the temperature in the stratosphere drops to a staggeringly-low -85 C. Then, and only then, can widely-spaced water molecules begin to coalesce into tiny ice crystals. High-altitude sunlight shining through the crystals creates intense iridescent colors visible in twilight or even dark-night sky.

Usually such low stratospheric temperatures happen only inside the Arctic Circle, but this week extreme cold is drifting over the UK as well. Sky watchers in the area are encouraged to submit pictures here.

ALAN C. TOUGH PHOTOGRAPHED THE PSC DISPLAY FROM ELGIN, MORAY:



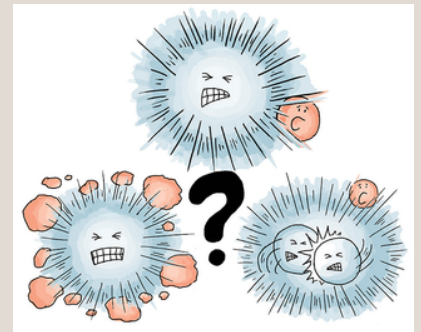
TORCUILL TORRANCE PHOTOGRAPHED THE PSC DISPLAY FROM STONEHAVEN, ABERDEENSHIRE:



BEN SUTHERLAND PHOTOGRAPHED THE PSC DISPLAY FROM HATTENBURN, ABERDEENSHIRE:



SHERI KARL PHOTOGRAPHED AN IRIDESCENT DISPLAY THE DAY BEFORE THE PSC DISPLAYS FROM STONEHAVEN, ABERDEENSHIRE:



WAC Upcoming Events

MARCH 10 - MARY MCINTYRE - SHADOWS IN SPACE AND THE STORIES THEY TELL

APRIL 14 - ASK THE PANEL (FACE TO FACE AND ZOOM)

MAY 12 - AGM FOLLOWED BY JAMES FRADGLEY: THE ANGULAR MOMENTUM PROBLEM (FACE TO FACE AND ZOOM)

JUNE 9 - BOB MIZON: ASTERISMS: JEWELS OF THE NIGHT SKY (FACE TO FACE AND ZOOM)

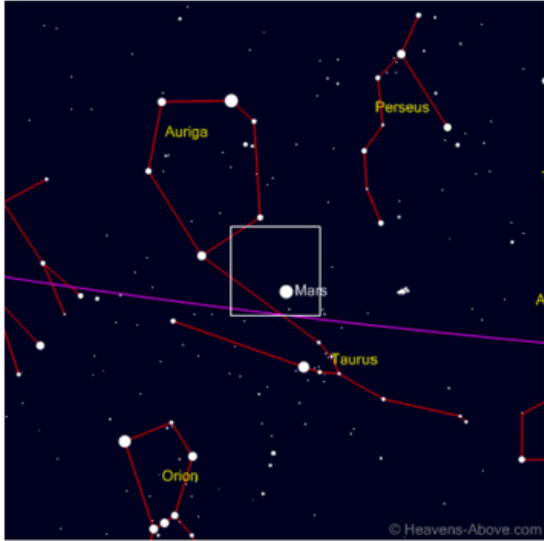
JULY 14 - JULIAN ONIONS: COLD DARK MATTER - IS IT COLD, IS IT DARK AND IS IT MATTER? (FACE TO FACE AND ZOOM)

MORE TO COME!!

PRACTICAL OBSERVING

*RIGHT: COMET C/2022 E3 ZTF
TAKEN WITH A 300 MM LENS WITH A 1 MINUTE
EXPOSURE AT 1600 ISO
ENNIO TABONE*

Year Month Day Time



Coarse finder chart
(Field of view: 60°, Max. star mag.: 5)

[HTTPS://WWW.HEAVENS-ABOVE.COM/](https://www.heavens-above.com/)



RIGHT: FEBRUARY IS A GREAT TIME FOR THE BRIGHT WINTER CONSTELLATIONS EARLIER IN THE EVENING. LOOKING TO THE SOUTHEAST AFTER SUNSET GIVES GREAT VIEWS OF VENUS, JUPITER AND MARS AS WELL AS ORION AND GEMINI RISING. THESE VIEWS ARE GREAT FOR WIDEFIELD IMAGING WITH LESS THAN 10 SECOND EXPOSURES SO NO TRACKING REQUIRED,

IMAGE CREATED WITH ASSISTANCE FROM STELLARIUM.



LEFT: LOOK FOR JUPITER AS IT FORMS ONE OF THE POINTS OF A CELESTIAL TRIANGLE, ALONG WITH VENUS AND A VERY THIN CRESCENT MOON, THE EVENING OF FEBRUARY 22, 2023. THIS TRIO CONSISTS OF THE BRIGHTEST OBJECTS IN THE SKY - UNTIL THE SUN RISES! BINOCULARS MAY HELP YOU SPOT JUPITER'S MOONS AS SMALL BRIGHT STAR-LIKE OBJECTS ON EITHER SIDE OF THE PLANET. A SMALL TELESCOPE WILL SHOW THEM EASILY, ALONG WITH JUPITER'S FAMED CLOUD BANDS. HOW MANY CAN YOU COUNT? KEEP WATCHING JUPITER AND VENUS AS THE TWO PLANETS WILL CONTINUE TO GET CLOSER TOGETHER EACH NIGHT UNTIL THEY FORM A CLOSE CONJUNCTION THE NIGHT OF MARCH 1. IMAGE CREATED WITH ASSISTANCE FROM STELLARIUM.

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

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

Sky Calendar – February 2023

- 1 Comet C/2022 E3 (ZTF) is closest to Earth (42 million km) and at its brightest. Use binoculars or a telescope to see the comet which is best placed for northern hemisphere observers on this date. The sky map shows the comet's position at 0h UT on other dates.
- 2 Moon near M35 star cluster at 1h UT (evening sky).
- 4 Moon at apogee (farthest from Earth) at 9h UT (distance 406,476km; angular size 29.4').
- 5 Moon near Beehive cluster M44 at 1h UT (midnight sky).
- 5 Full Moon at 18:30 UT.
- 6 Moon near Regulus at 23h UT (morning sky).
- 11 Comet C/2022 E3 (ZTF) near Mars (see sky map). Requires binoculars or a telescope.
- 11 Moon near Spica at 9h UT (morning sky).
- 13 Last Quarter Moon at 16:02 UT.
- 14 Moon near Antares at 20h UT (morning sky).
- 15 Venus 0.03° E of Neptune at 13h UT (28° from Sun, evening sky). Mags. -4.0 and 8.0.
- 16 Saturn at conjunction with the Sun at 17h UT. The ringed planet (not visible) passes into the morning sky.
- 18 Moon near Mercury at 23h UT (19° from Sun, morning sky). Mag. -0.2.
- 19 Moon at perigee (closest to Earth) at 8:57 UT (distance 358,267km; angular size 33.4').
- 20 New Moon at 7:08 UT. Start of lunation 1239.
- 22 Moon near Venus at 10h UT (29° from Sun, evening sky). Mag. -4.0. Look out for this spectacular sight!
- 23 Moon near Jupiter at 0h UT (evening sky). Mag. -2.1. Occultation visible from Argentina, Antarctica, Chile and Falkland Islands.
- 26 Moon near the Pleiades at 17h UT (evening sky).
- 27 First Quarter Moon at 8:05 UT.
- 28 Moon near Mars at 5h UT (evening sky). Mag. 0.4. Occultation visible from eastern Greenland, Svalbard, western Russia and Jan Mayen.

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

All times in Universal Time (UT). (USA Eastern Standard Time = UT - 5 hours.)

In ancient times, the twins of Greek mythology, Castor & Pollux, were considered patron saints of sailors. Magnificent Orion dominates the southern sky. The constellation represents a hunter with his two dogs, the Big Dipper (or Plough) located in the north-eastern sky to find Polaris, the North star. Use the Big Dipper (or Plough) to find Polaris. The only star in the Northern Hemisphere (other than the Sun) that is brighter than the North Star. The ecliptic is the path that the Sun, Moon and planets follow in the sky. The ecliptic is the path that the Sun, Moon and planets follow in the sky. The ecliptic is the path that the Sun, Moon and planets follow in the sky.

NORTHERN HEMISPHERE
FEBRUARY 2023

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

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

SOUTH

THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY. INSTRUCTIONS: THE SKY MAP SHOWS THE SKY 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 CIRCLE IS THE HORIZON. COMPASS DIRECTIONS ARE INDICATED ALONG THE HORIZON CIRCLE (FOR EXAMPLE, EAST IS AT THE BOTTOM OF THE MAP). THE SKY MAP IS THE SAME AS THE DIRECTION THAT YOU FACE. BEGIN BY USING THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY.

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WWW.WEYMOUTHASTRONOMY.CO.UK