13 OCTOBER 2023 WEYMOUTH ASTRONOMY VOLUME 18 #5

SKYWATCHER NEWSLETTER

Johannes de Sacrobosco's 13th century text De Sphaera Mundi depicts an eclipse. Credit: New York Public Library, Public Domain

LATEST NEWS

In a recent EOS article it reports that Eclipse Records Pin Dates of 12th and 13th Century Eruptions Ancient accounts of dark and blood-red moons help scientists peek at past eruptions and their effect on global climate.

The beauty of eclipses is that we know exactly when they occurred. And crucially, the color of the Moon during totality turns out to be a good proxy for whether there's been a massive volcanic eruption lately.

Read the full article at:
https://eos.org/articles/astronomers-may-have-spotted-the-birth-of-a-planet

Until next month... SLK

From Galileo to Clipper, Exploring Jupiter's Moons

By: Vivian White

As autumn begins, if you're up late, you may notice a bright point of light rising in the east. Look a bit closer, with a pair of binoculars, and you'll notice it's not a star at all. While stars look pointlike no matter how big your backyard telescope, this light appears as a circle under closer examination. Even more curious, you will likely see a line of smaller dots on one or both sides. Congratulations! You've rediscovered the king of the planets - majestic Jupiter - and its four largest moons.

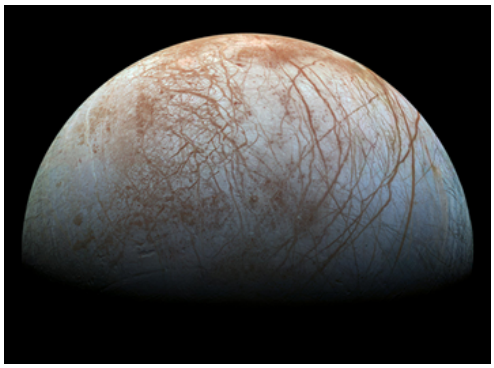
Galileo famously chronicled the four moving dots near Jupiter and surmised that they were orbiting the distant world. While Jupiter has well over 80 discovered moons as of September 2023, these brightest four are called the "Galilean Moons" - Io, Europa, Ganymede, and Callisto. (Great mnemonics exist to remember these in order of distance from Jupiter, such as "I Eat Green Caterpillars") You can follow these like Galileo did, using stargazing apps or the handy image below. A favorite beginning observing challenge is to track the movement of the Galilean Moons over the course of many nights. Even within a few hours, you will notice them moving in relation to Jupiter, just as Galileo did.
Fast forward 414 years, and NASA will be sending a robotic mission to investigate the surface of one of these distant worlds. The Europa Clipper Mission is launching to the cold, icy moon in 2024, to begin orbiting in 2030.

With its salty oceans covered by ice, Europa was chosen as an excellent location to continue the search for life outside of Earth. Clipper will be the largest spacecraft ever sent to another planet, designed to withstand Jupiter's punishing radiation. Once it arrives at Jupiter in 2030, NASA plans to do about 50 flybys of Europa, mapping almost the entire surface of this watery world.

What was once only dreamed of in the small telescope of Galileo, or in great works of fiction, NASA is turning our wildest imagination into reality. One of the celebrated quotes from the classic 2010: Odyssey Two warns, "All these worlds are yours, except Europa. Attempt no landing there." Science fiction fans can feel relieved knowing that writer Arthur C. Clarke gave his blessing for the Europa Clipper mission.

Join the Europa Message in a Bottle Campaign to send your name with the spacecraft, hear the rest of the poem by the US Poet Laureate, and learn more about the wonders of space travel with the Clipper Mission: https://europa.nasa.gov/participate

Watch a wonderful Clipper webinar with Dr. Cynthia Phillips, planetary geologist with the mission:
https://www.youtube.com/live/RnnLJBLRBCA?feature=shared&t=269



LOCAL EVENTS

Oct 18 - CADAS - Kate Earl Prehistoric Astronomy

Nov 7 - WAS - Robert Massey – (RAS) Satellite Constellation update

Dec 5 - WAS - Christmas Social and members' 10-min talks

Dec 20 - CADAS - Christmas Social and members' short talks

More to come in 2024!

VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION

WEYMOUTH ASTRONOMY

SKYWATCHER NEWSLETTER

THE SUN'S MAGNETIC POLES ARE DISAPPEARING: The sun is about to lose something important: Its magnetic poles. spaceweather.com

Recent measurements by NASA's Solar Dynamic Observatory reveal a rapid weakening of magnetic fields in the polar regions of the sun. North and south magnetic poles are on the verge of disappearing. This will lead to a complete reversal of the sun's global magnetic field perhaps before the end of the year.

If this were happening on Earth, there were be widespread alarm. Past reversals of our planet's magnetic field have been linked to calamities ranging from sudden climate change to the extinction of Neanderthals. On the sun, it's not so bad. "In fact, it's routine," says Todd Hoeksema, a solar physicist at Stanford University. "This happens every 11 years (more or less) when we're on the verge of Solar Maximum."

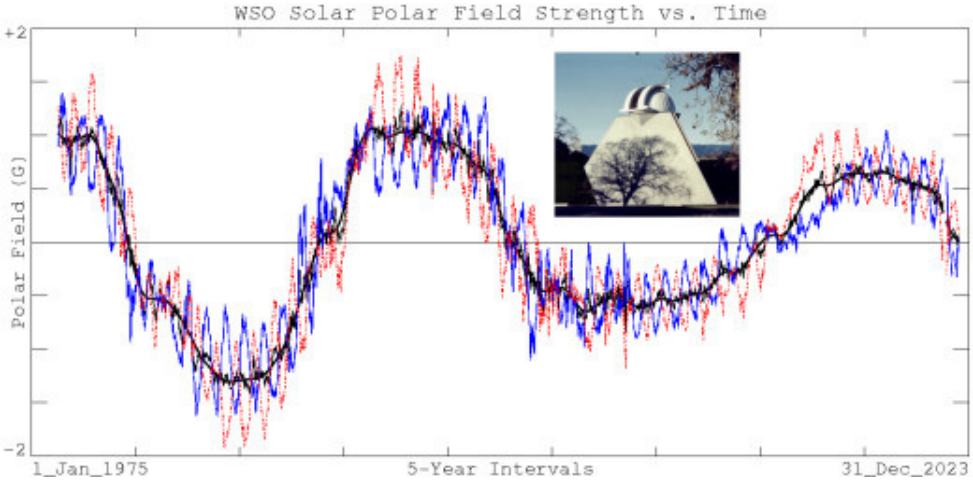
Vanishing poles and magnetic reversals have been observed around the peak of every single solar cycle since astronomers learned to measure magnetic fields on the sun. Hoeksema is the director of Stanford's Wilcox Solar Observatory (WSO), that is observing its fifth reversal since 1980. The last five polar field reversals observed at the Wilcox Solar Observatory (inset below). "One thing we have learned from these decades of data is that no two polar field reversals are alike," he says.

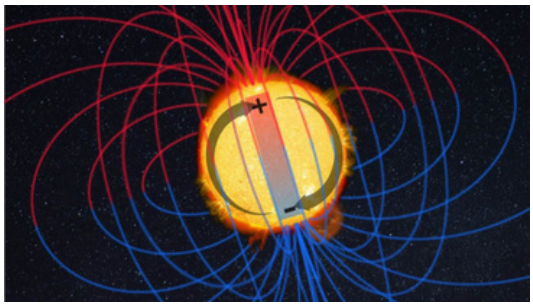
Sometimes the transition is swift, taking only a few months for the poles to vanish and reappear on opposite ends of the sun. Sometimes it takes years, leaving the sun without magnetic poles for an extended period of time.

"Even more strange," says Hoeksema, "sometimes one pole switches before the other, leaving both poles with the same polarity for a while." Indeed, such a scenario could be playing out now. The sun's south magnetic pole has almost completely vanished, but the north magnetic pole is still hanging on, albeit barely.

How does all this effect us on Earth? One way we feel solar field reversals is via the heliospheric current sheet. The sun is surrounded by a wavy ring of electricity that the solar wind pulls and stretches all the way out to the edge of the Solar System. This structure is a part of the sun's magnetosphere. During field reversals, the current sheet becomes extra wavy and highly tilted. As the sun spins, we dip in and out of the steepening undulations. Passages from one side to another can cause geomagnetic storms and auroras.

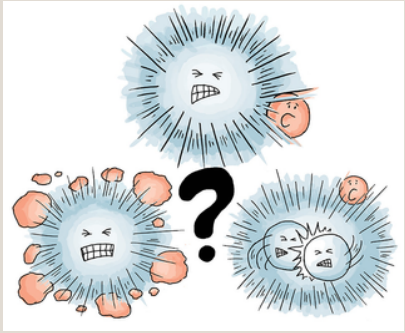
Most of all, the vanishing of the poles means we're on the verge of Solar Maximum. Solar Cycle 25 is shaping up to be stronger than forecasters expected, and its peak could be relatively intense. Stay tuned for updates!





An artist's concept of the sun's dipolar magnetic field. Credit: NSF/AURA/NSO.

An artist's concept of the heliospheric current sheet.



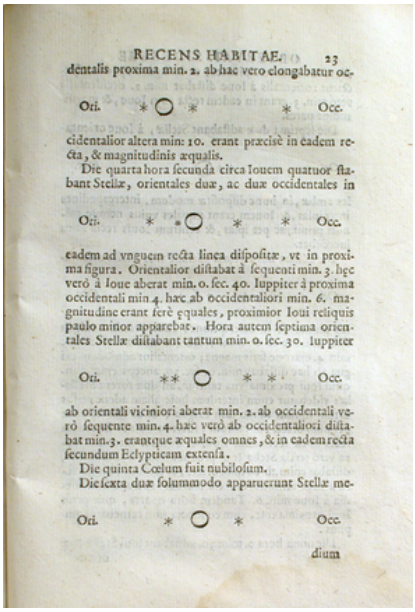
WAC Upcoming Events

10TH NOVEMBER
SHERI KARL - GETTING STARTED IN SOLAR OBSERVING (FACE TO FACE AND ZOOM)

8TH DECEMBER
BARRY FITZGERALD (FACE TO FACE AND ZOOM)

MORE TO COME IN 2024!!

WEYMOUTH ASTRONOMY



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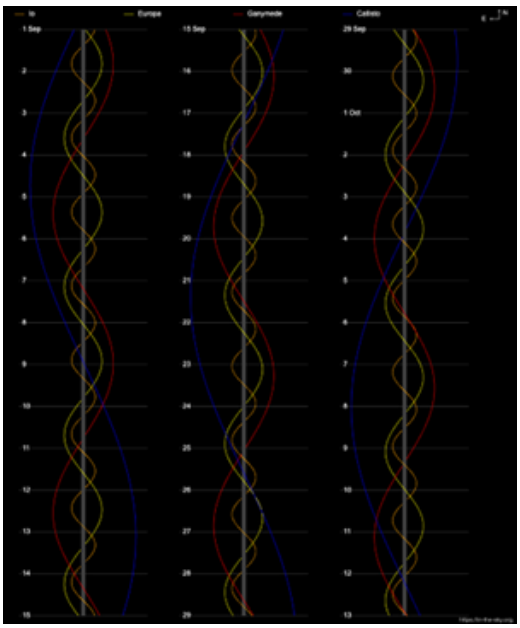
Galileo's drawings of Jupiter and its Medicean Stars from Sidereus Nuncius. Image courtesy of the History of Science Collections, University of Oklahoma Libraries.



The position of the Galilean Moons of Jupiter in October 2023: https://in-the-sky.org/jupiter.php

PRACTICAL OBSERVING

Partial Lunar Eclipse: Saturday, 28 Oct 2023

Global Event:	Partial Lunar Eclipse
Local Type:	Partial Lunar Eclipse in Weymouth, England
Begins:	Sat, 28 Oct 2023, 19:01
Maximum:	Sat, 28 Oct 2023, 21:14 0.122 Magnitude
Ends:	Sat, 28 Oct 2023, 23:26
Duration:	4 hours, 25 minutes

All times shown on this page are local time.

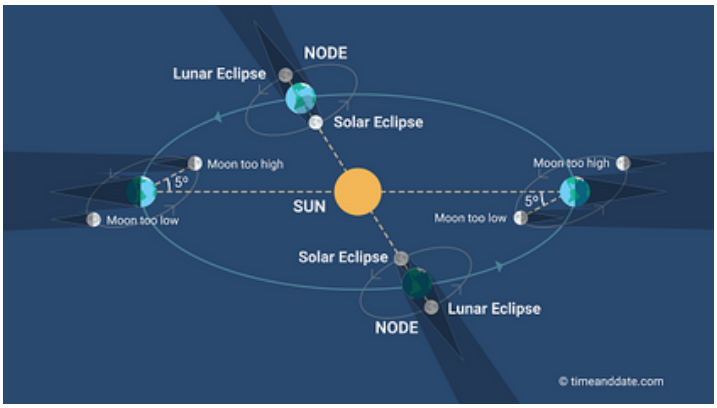
Conditions for a Partial Lunar Eclipse

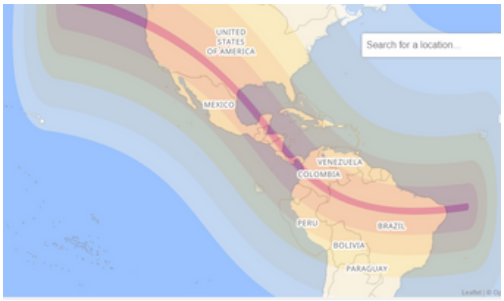
For a partial lunar eclipse to occur, two celestial events must happen at the same time:

A Full Moon.
The Sun, Earth, and Moon must be aligned in almost a straight line.

What Is a Partial Lunar Eclipse?

A partial lunar eclipse happens when the Earth moves between the Sun and the Moon, but they are not aligned in a straight line. Only part of the Moon's...





Saturday, Oct. 14, 2023, annular solar eclipse will cross North, Central, and South America. It will be visible in parts of the United States, Mexico, and many countries in South and Central America.

Observe the event remotely!
Ring of Fire Annular Eclipse - Slooh Event Starts the morning of October 14 at 11 AM EDT (15:00UTC)
LIVE RING OF FIRE ANNULAR ECLIPSE Slooh will be broadcasting a live Star Party on Saturday, October 14 at 11 AM EDT (15:00UTC) with commentary and live telescope views of the Ring of Fire annular eclipse. Everyone can watch on Slooh's social channels, and members can interact with Slooh's experts and capture images from the live telescope feeds.

https://www.slooh.com/families

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