Skywatchers
Newsletter of the China Lake Astronomical Society

NOVEMBER 4TH, 2024 CLAS MEETING 7:30

INSIDE THIS ISSUE:

Monday, November 04, 2024 7:00 PM

November 04th Meeting & Program

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November 04th Meeting & Program

Refreshments: 7:00 PM Announcements : 7:30 Program: 7:45

Prof. Scott Cameron (CCCC)

Government UFO/UAP Research Since 1947

Professor Scott Cameron will tell us about research by the US government since 1947 that seeks to explain UAP or Unidentified Aerial Phenomena. While UFOs have featured prominently in popular culture and SciFi, there have been various observations into unexplained sightings over the years.

Little Green Men? Foreign governments? Close encounters? "The truth is out there." Come hear what serious studies show. Location: Maturango MuseumMeetings and programs are open to the public, and are held at Maturango Museum on the first Monday of every month (or the following Monday for holidays).

China Lake Astronomical Society

Membership or Renewal 2024

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Yearly Membership $ 25 (*due in January*) Family $ 40 Youth 18 & under $ 10.
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P.O. Box 1783
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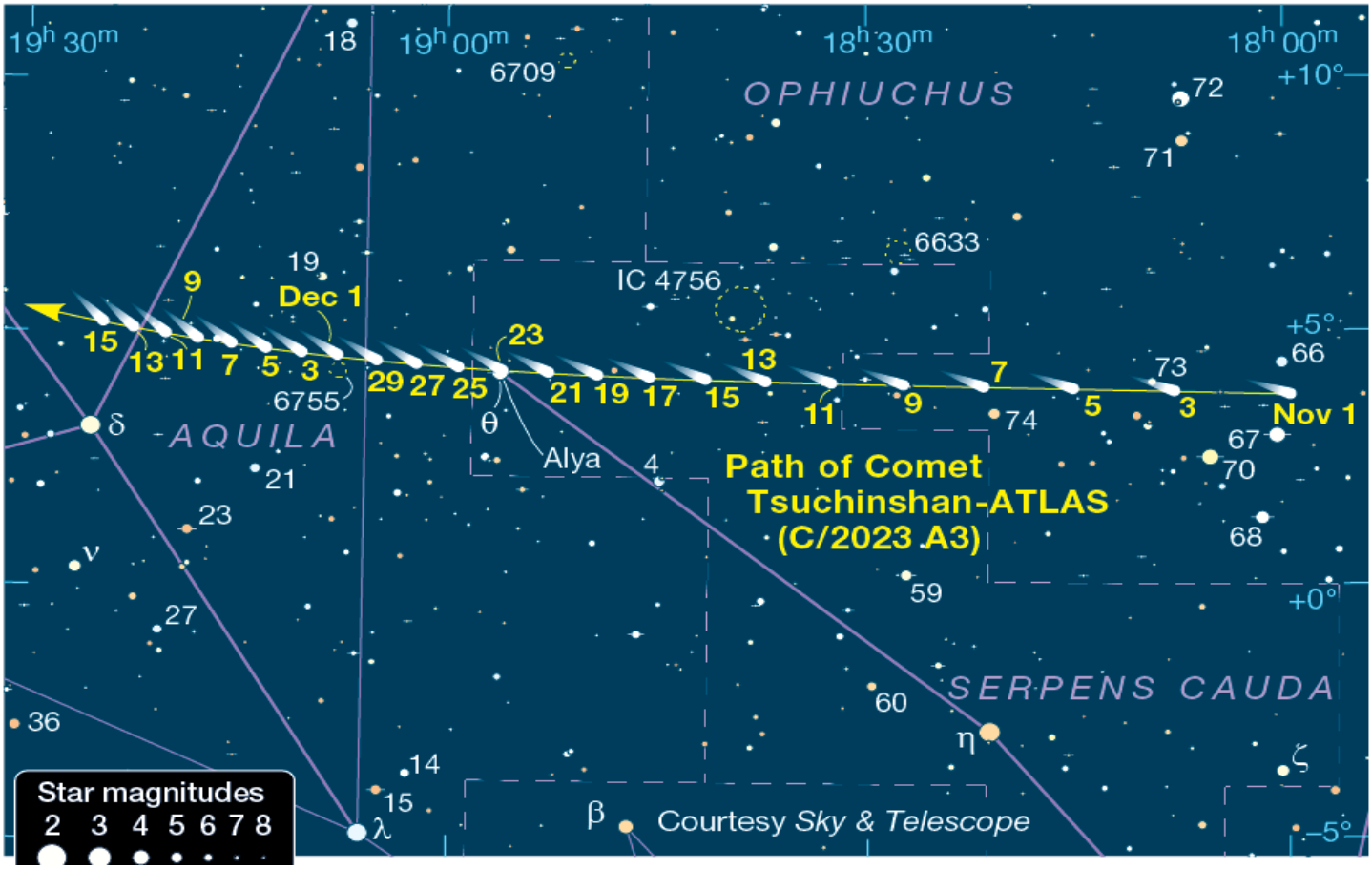


Starlink satellites' leaky radio waves obscure the cosmos

Their unintentional emissions are about 10 million times brighter than natural sources

While SpaceX's Starlink satellites are enabling internet access and cell phone communications around the globe, they're also posing a threat to radio astronomy, a new study suggests.

In some wavelength bands, unintended leakage of electromagnetic radiation from the latest generation of the satellites is more than 30 times brighter than emissions from previous versions, Cees Bassa, a radio astronomer at the Netherlands Institute for Radio Astronomy in Dwingeloo and his colleagues report September 18

In some wavelength bands, unintended leakage of electromagnetic radiation from the latest generation of the satellites is more than 30 times brighter than emissions from previous versions, Cees Bassa, a radio astronomer at the Netherlands Institute for Radio Astronomy in Dwingeloo and his colleagues report September 18 in *Astronomy & Astrophysics* .

Because the latest generation of Starlink satellites will orbit as many as 100 kilometers lower than earlier satellites, they'll seem even brighter to ground-based telescopes. Overall, their brightness could easily mask observations of dimmer objects like distant galaxies or stars.

Radio telescopes, rather than gathering visible light, collect lower-energy waves from sources that emit radiation at longer wavelengths. Bassa and his team used six radio telescopes at an observatory near Exloo, Netherlands, to characterize the emissions from Starlink satellites during two hourlong sessions in July. Although the satellites passed through the telescopes' field of view for between only 12 and 40 seconds, they were very bright: Compared with the faintest astronomical sources that can be observed by those telescopes, Starlink satellites are about 10 million times brighter, Bassa and his team noted.

And the problem will likely get worse: SpaceX is launching about 40 second-generation Starlink satellites each week, the researchers note, with more than 6,000 already out there (*SN: 3/3/23).* Bassa and his colleagues have found that other companies' satellites are detectable by radio telescopes too, and they're working to measure those emissions as well.

Bassa and his colleagues hope that their continuing observations will spur the developers of such satellites to redesign their equipment where possible to reduce unintended radio emissions.

Note from the Editor:

All please remember this is the Clubs newsletter and if anyone has any idea or articles of interest please send them to me at ghodkinson@sbcglobal.net for posting.

In addition Comet Tsuchinshan-Atlas (C/2023 A 23) is still a great object to view and photograph. For those who have photographed the comet please consider sending your results so I can include them in the next newsletter. Thanks ***gfh***

GOES-19 satellite shares first imagery from solar-monitoring telescope

The Solar Ultraviolet Imager, or SUVI, onboard NOAA's GOES-19 satellite, which launched on June 25, 2024, began observing the sun on Sept. 24, 2024. SUVI monitors the sun in the extreme ultraviolet portion of the electromagnetic spectrum to watch for hazardous space weather that could affect Earth.

The sun's upper atmosphere, or solar corona, consists of extremely hot plasma, which is ionized gas. This plasma interacts with the sun's powerful magnetic field, generating bright loops of material that can be heated to millions of degrees.

Outside hot coronal loops, there are cooler regions called filaments which can erupt and become a key source of space weather when the sun is active. Filaments and active regions sometimes produce coronal mass ejections (CMEs), hurtling huge tangled clouds of plasma and magnetic field out into the solar system. The sun's 11-year activity cycle has entered the solar maximum period, meaning phenomena such as CMEs and solar flares are occurring more frequently than during other parts of the solar cycle. GOES-19's SUVI captured an X9 flare on Oct. 3, 2024, which can be seen in the lower half of the sun in the 131 Å channel animation above.

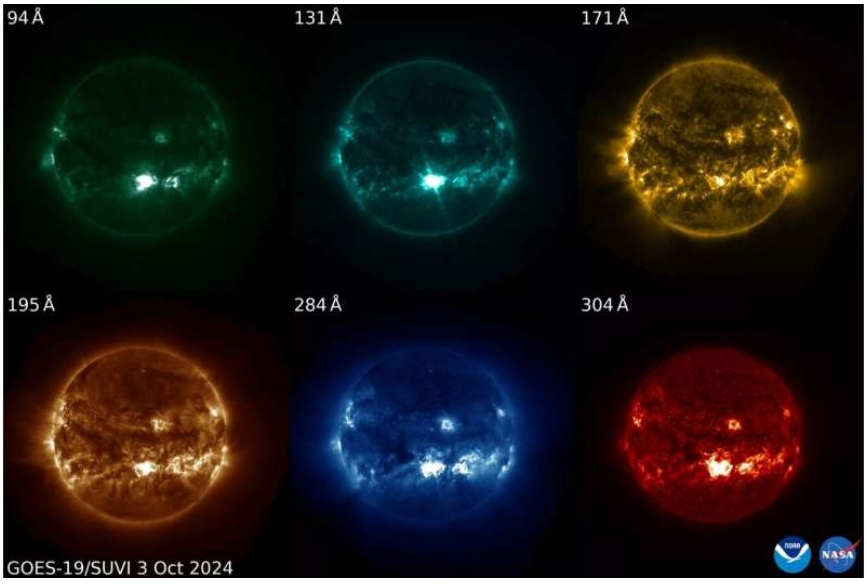
This was the most powerful flare so far in the current solar cycle. X-class flares are the strongest category of flares, and the number gives more information about a flare's strength. Learn more about NOAA space weather scales from the Space Weather Prediction Center (SWPC).

The solar corona is so hot that it is best observed with X-ray and extreme-ultraviolet (EUV) cameras. Various elements emit light at specific EUV and X-ray wavelengths depending on their temperature, so by observing in several different wavelengths, a picture of the complete temperature structure of the corona can be made.

The GOES-19 SUVI observes the sun in six EUV channels, as seen in the top image. The clearest depiction of the solar flare captured on Oct. 3, 2024, is in the 131 Å channel (top center). SUVI also has a large field of view, which allows scientists to observe distinctive features of the corona.

Depending on the size and the trajectory of solar eruptions, the possible effects to near-Earth space and Earth's magnetosphere can cause geomagnetic storms, which can disrupt power utilities and communication and navigation systems. These storms may also cause radiation damage to orbiting satellites and the International Space Station. The Oct. 3 X9 flare led SWPC to issue an alert to the public about potential disruptions to radio communications.

GOES-19 is currently undergoing post-launch testing and checkout of its instruments and systems. After GOES-19 is assigned the operational role as NOAA's GOES East satellite in April 2025, SUVI observations will help SWPC provide early warning to electric power companies, telecommunication providers, and satellite operators.

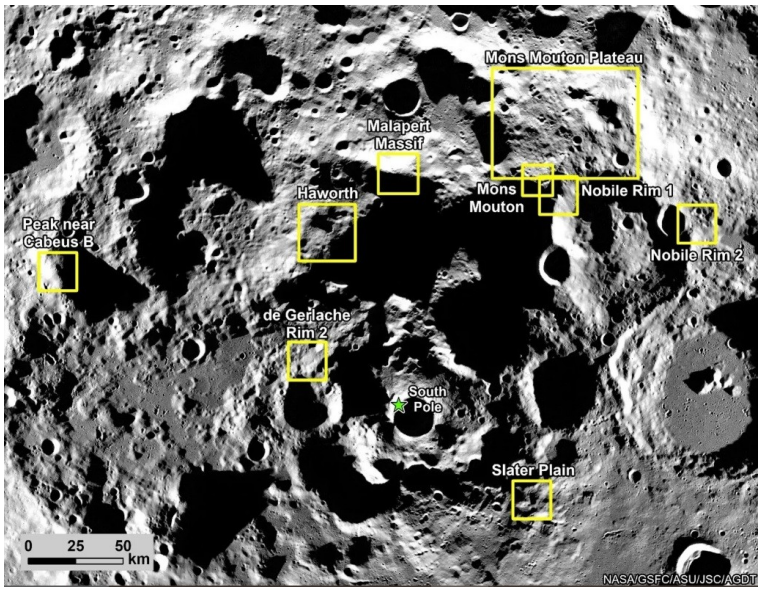


Provided by NOAA Headquarters
October 30th, 2024

GOES-19 satellite shares first imagery from solar-monitoring telescope

Note: Article taken from Physic.org

NASA Announces 2 potential sites for Artemis *III to the Moon*



NASA has chosen nine potential landing sites near the Moon's south pole for Artemis III's crewed lunar landing.

After more than half a century, NASA is planning to return to the Moon with Artemis III. This first crewed landing of the Artemis program will see astronauts exploring the lunar south pole region. As a prelude, this week NASA announced the selection of nine potential candidate landing sites for this mission.Those sites will be further evaluated for multiple considerations: "Each of the regions contains sites that will be narrowed down based on the combination of illumination, terrain, science and mission availability,"

says Artemis Surface Planning Lead Tamra George (NASA). While NASA wants the most scientific value out of this landing, to be assessed by the Artemis III geology team, the site will also need line-of-sight communication with Earth and the correct shadow angle and lighting conditions during approach.

Apollo missions took these aspects into consideration as well, landing near local lunar sunrise when potentially dangerous pits and boulders stood out in sharp contrast. But the science goals of the Apollo and Artemis missions differ.

"The Moon's south pole is a completely different environment than where we landed during Apollo missions," says Sarah Noble (NASA). "It offers access to some of the Moon's oldest terrain, as well as cold, shadowed regions that may contain water and other compounds. Any of these landing regions will enable us to do amazing science and make new discoveries."

The nine sites surrounding the lunar South Pole region are:

- A peak near Cabeus B crater
- Haworth crater
- Malapert Massif
- Mons Mouton Plateau
- Mons Mouton
- Nobile Rims 1 and 2
- de Gerlache Rim 2
  Slater Plain

Some of these sites may sound familiar. In 2009 NASA's Lunar Crater Observation and Sensing Satellite (LCROSS) impacted the Moon near Cabeus Crater. Intuitive Machines' Odysseus lander came to rest on its side at Malapert A crater, not far from Malapert Massif. Finally, NASA's now-canceled VIPER rover was to land near Mons Mouton.

The new sites were narrowed down from 13 candidate landing sites announced in 2022. They are all at the south lunar pole, where permanently shadowed regions could harbor water ice, potentially supporting long-term stays on the Moon.

Check out the YouTube Video

Artemis III Landing Region Candidates - YouTube

To land near the south pole, Artemis III will first need to achieve a *near-rectilinear halo orbit* around the Moon. All six Apollo missions landed at lower latitudes on the nearside of the Moon, so approaching the south pole is new territory, both literally and figuratively. The CAPSTONE mission, launched in 2022, served a proof of concept for achieving this trajectory.Artemis III follows on the first two missions of the initiative: Artemis I, which launched in November 2022, acted as the first launch of NASA's massive Space Launch System (SLS) rocket, carrying the Orion capsule. That mission deployed 10 smallsats as well. Artemis II, currently set for September 2026 (but see below), will carry crew, announced in 2023, around the Moon. It represents the first crewed mission for SLS and of the Artemis project.Stated milestones for Artemis III are to land the first woman, first person of color, and the first partner nation (non-U.S.) person on the Moon. The mission is expected to last 30 days.Stated milestones for Artemis III are to land the first woman, first person of color, and the first partner nation (non-U.S.) person on the Moon. The mission is expected to last 30 days.

Right now, the timeline shows the landing of Artemis III as set for September 2026, but that's probably overly optimistic. First, Artemis II needs to lift off, and while current plans call for launch in September 2025, issues with the Orion command module's heat shield could cause delays.

The crew for Artemis II: Jeremy Hansen, Victor Glover, Reid Wiseman, and Christina Koch
NASA

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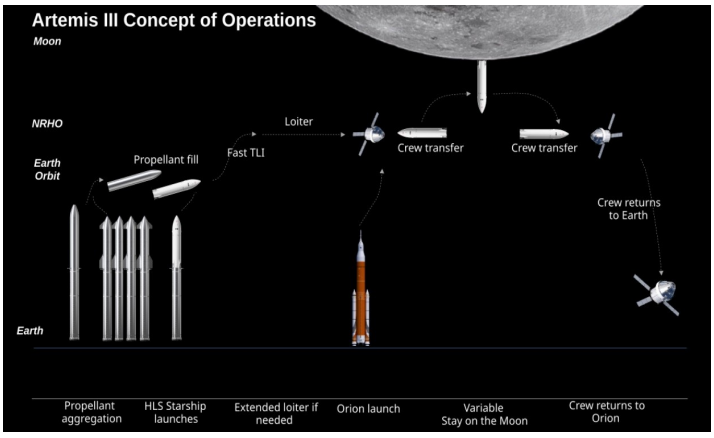
Even if Artemis II goes off without a hitch, Artemis III adds a new component: Even though the crew will launch on the SLS and in the Orion capsule, it's SpaceX's Starship Human Landing System (launched separately on a Starship rocket) that will carry the crew of the third Artemis mission to the lunar surface. Plans call for the HLS to rendezvous with Orion in lunar orbit. The landing system will be capable of carrying 100 tons, far more than the Apollo lunar module's maximum of five tons.

But the Starship HLS still needs to achieve the rating necessary to carry crew. SpaceX completed the first successful test of the Starship rocket from their Boca Chica launch facility in Texas back in March. (Two previous test flights were unable to achieve orbit.) The HLS has yet to be tested; that could happen in 2025.Certainly, there remain many milestones to be achieved. Not to mention, Artemis will have to navigate another upcoming change of presidential administrations in 2025. Still, the goals are now in sight as humans prepare to return to the Moon.



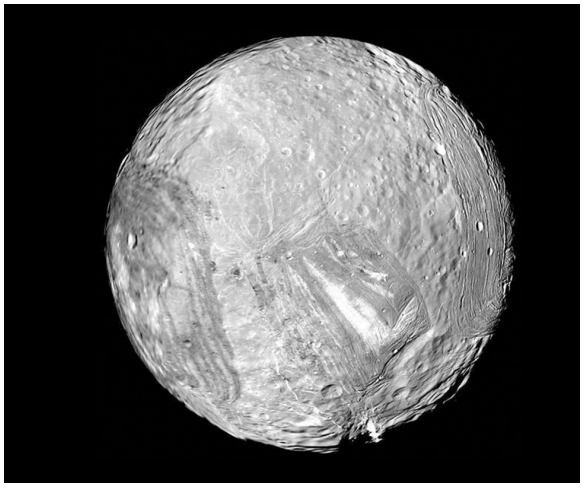
A new study suggests Uranus' moon ***Miranda*** may harbor a water ocean beneath its surface, a finding that would challenge many assumptions about the moon's history and composition and could put it in the company of the few select worlds in our solar system with potentially life-sustaining environments.

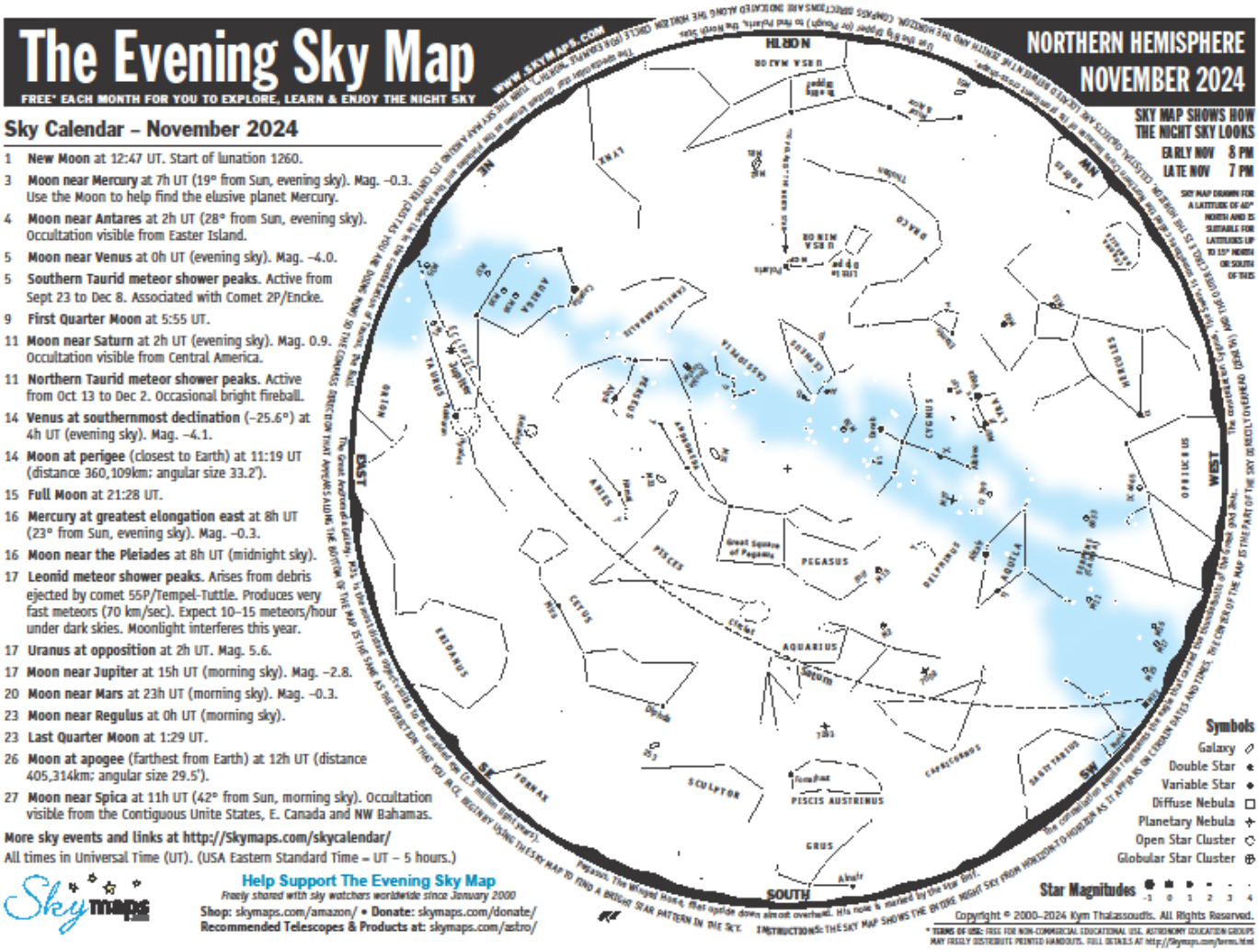
"To find evidence of an ocean inside a small object like Miranda is incredibly surprising," said Tom Nordheim, a planetary scientist at the Johns Hopkins Applied Physics Laboratory (APL) in Laurel, Maryland, a study co-author, and the principal investigator on the project that funded the study. "It helps build on the story that some of these moons at Uranus may be really interesting — that there may be several ocean worlds around one of the most distant planets in our solar system, which is both exciting and bizarre."Among the moons in the solar system, Miranda stands out. The few images Voyager 2 captured in 1986 show Miranda's southern hemisphere (the only part we've seen) is a Frankenstein-like hodgepodge of grooved terrain quartered off by rough scarps and cratered areas, like squares on a quilt. Most researchers suspect these bizarre structures are the result of tidal forces and heating within the moon. Caleb Strom, a graduate student at the University of North Dakota who worked with Nordheim and Alex Patthoff of the Planetary Science Institute in Arizona, revisited the Voyager 2 images. The team set out to explain Miranda's enigmatic geology by reverse engineering the surface features, working backward to uncover what the moon's interior structure must have been to shape the moon's geology in response to tidal forcing. After first mapping the various surface features like cracks, ridges and Miranda's unique trapezoidal coronae, the team developed a computer model to test several possible structures of the moon's interior, matching the predicted stress patterns to the actual surface geology. The setup that produced the best match between predicted stress patterns and observed surface features required the existence of vast ocean beneath Miranda's icy surface some 100-500 million years ago. This subsurface ocean was at least 62 miles (100 kilometers) deep, according to the study published Oct. 16 in the Planetary Science Journal, and hidden beneath an icy crust no more than 19 miles (30 kilometers) thick. Given Miranda has a radius of just 146 miles (235 kilometers), the ocean would have filled almost half of the moon's body. "That result was a big surprise to the team," Strom said.

Key to creating that ocean, the researchers believe, were tidal forces between Miranda and nearby moons. These regular gravitational tugs can be amplified by orbital resonances — a configuration where each moon's period around a planet is an exact integer of the others' periods. Jupiter's moons Io and Europa, for example, have a 2:1 resonance: For every two orbits Io makes around Jupiter, Europa makes exactly one, leading to tidal forces that are known to sustain an ocean beneath Europa's surface.

These orbital configurations and the resulting tidal forces deform the moons like rubber balls, leading to friction and heat that keeps interiors warm. This also creates stresses that crack the surface, creating a rich tapestry of geologic features. Numerical simulations have suggested that Miranda and its neighboring moons likely had such a resonance in the past, offering a potential mechanism that could have warmed Miranda's interior to produce and maintain a subsurface ocean.

At some point, the moons' orbital ballet desynchronized, slowing the heating process so that the moon's insides started to cool and solidify. But the team doesn't think Miranda's interior has fully frozen yet. If the ocean had completely frozen, Nordheim explained, it would have expanded and caused certain telltale cracks on the surface, which aren't there. This suggests that Miranda is still cooling — and may have an ocean beneath its surface even now. Miranda's modern-day ocean is probably relatively thin, Strom noted. "But the suggestion of an ocean inside one of the most distant moons in the solar system is remarkable," he said. *Article continued on the bottom of page 8.*





Miranda wasn't predicted to have an ocean. With its small size and old age, scientists thought it would likely be a frozen ball of ice. Any leftover heat from its formation was assumed to have dissipated long ago. But as Patthoff pointed out, predictions about ice moons can be wrong, as evidenced by Saturn's moon Enceladus. Before the Cassini spacecraft arrived in 2004, many scientists thought Enceladus was a frozen ball of ice and rock. But it was actually harboring a global ocean and active geological processes. "Few scientists expected Enceladus to be geologically active," Patthoff said. "However, it's shooting water vapor and ice out of its southern hemisphere as we speak." Enceladus is now a prime target in the search for life beyond Earth. Miranda might be a similar case. It's comparable in size and composition to Enceladus, and according to a 2023 study led by APL's Ian Cohen, it may be actively releasing material into space. If it has (or even had) an ocean, it could be a future target for studying habitability and life. However, Nordheim cautions that there's still too much we don't know about Miranda and the Uranian moons to speculate about the existence of life.

"We won't know for sure that it even has an ocean until we go back and collect more data," he said. "We're squeezing the last bit of science we can from Voyager 2's images. For now, we're excited by the possibilities and eager to return to study Uranus and its potential ocean moons in depth."

Source: Uranus' Moon Miranda May Have an Ocean Beneath Its Surface, New Study Finds | Johns Hopkins University Applied Physics Laboratory

About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. **Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars.** They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

NORTHERN HEMISPHERE CELESTIAL OBJECTS NOVEMBER 2024

Sky maps

Easily Seen with the Naked Eye

Altair	Aql	✦	Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
Capella	Aur	✦	The 6th brightest star. Appears yellowish in color. Spectroscopic binary. Dist=42 ly.
δ Cephei	Cep	✦	Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Deneb	Cyg	✦	Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
α Herculis	Her	✦	Semi-regular variable. Magnitude varies between 3.1 & 3.9 over 90 days. Mag 5.4 companion.
Vega	Lyr	✦	The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Algol	Per	✦	Famous eclipsing binary star. Magnitude varies between 2.1 & 3.4 over 2.867 days.
Fomalhaut	PsA	✦	Brightest star in Piscis Austrinus. In Arabic the "fish's mouth". Dist=25 ly.
Pleiades	Tau	✧	The Seven Sisters. Spectacular cluster. Many more stars visible in binoculars. Dist=399 ly.
Hyades	Tau	✧	Large V-shaped star cluster. Binoculars reveal many more stars. Dist=152 ly.
Aldebaran	Tau	✦	Brightest star in Taurus. It is not associated with the Hyades star cluster. Dist=66.7 ly.
Polaris	UMi	✦	The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.

Easily Seen with Binoculars

M31	And	⌀	The Andromeda Galaxy. Most distant object visible to naked eye. Dist=2.5 million ly.
M2	Aqr	✧	Resembles a fuzzy star in binoculars.
η Aquilae	Aql	✦	Bright Cepheid variable. Mag varies between 3.6 & 4.5 over 7.166 days. Dist=1,200 ly.
M38	Aur	✧	Stars appear arranged in "pi" or cross shape. Dist=4,300 ly.
M36	Aur	✧	About half size of M38. Located in rich Milky Way star field. Dist=4,100 ly.
M37	Aur	✧	Very fine star cluster. Discovered by Messier in 1764. Dist=4,400 ly.
μ Cephei	Cep	✦	Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
Mira	Cet	✦	Famous long period variable star. Mag varies between 3.0 & 10.1 over 332 days.
χ Cygni	Cyg	✦	Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	✧	May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	✦	Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M13	Her	✧	Best globular in northern skies. Discovered by Halley in 1714. Dist=23,000 ly.
M92	Her	✧	Fainter and smaller than M13. Use a telescope to resolve its stars.
ε Lyrae	Lyr	✦	Famous Double Double. Binoculars show a double star. High power reveals each a double.
R Lyrae	Lyr	✦	Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
IC 4665	Oph	✧	Large, scattered open cluster. Visible with binoculars.
6633	Oph	✧	Scattered open cluster. Visible with binoculars.
M15	Peg	✧	Only globular known to contain a planetary nebula (Mag 14, d=1"). Dist=30,000 ly.
Double Cluster	Per	✧	Double Cluster in Perseus. NGC 869 & 884. Excellent in binoculars. Dist=7,300 ly.
M25	Sgr	✧	Bright cluster located about 6 deg N of "teapot's" lid. Dist=1,900 ly.
253	Scl	⌀	Fine, large, cigar-shaped galaxy. Requires dark sky. Member of Sculptor Group.
Mizar & Alcor	UMa	✦	Good eyesight or binoculars reveals 2 stars. Not a binary. Mizar has a mag 4 companion.
Cr 399	Vul	✧	Coathanger asterism or "Brocchi's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

γ Andromedae	And	✦	Attractive double star. Bright orange star with mag 5 blue companion. Sep=9.8".
7009	Aqr	+	Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages.
7293	Aqr	+	Helix Nebula. Spans nearly 1/4 deg. Requires dark sky. Dist=300 ly.
γ Arietis	Ari	✦	Impressive looking double blue-white star. Visible in a small telescope. Sep=7.8".
η Cassiopeiae	Cas	✦	Yellow star mag 3.4 & orange star mag 7.5. Dist=19 ly. Orbit=480 years. Sep=12".
Albireo	Cyg	✦	Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	✦	Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
γ Delphini	Del	✦	Appear yellow & white. Mags 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
β Lyrae	Lyr	✦	Eclipsing binary. Mag varies between 3.3 & 4.3 over 12.940 days. Fainter mag 7.2 blue star.
M57	Lyr	+	Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
M17	Sgr	□	Omega Nebula. Contains the star cluster NGC 6618. Dist=4,900 ly.
M11	Sct	✧	Wild Duck Cluster. Resembles a globular through binoculars. V-shaped. Dist=5,600 ly.
M16	Ser	□	Eagle Nebula. Requires a telescope of large aperture. Dist=8,150 ly.
M1	Tau	□	Crab Nebula. Remnant from supernova which was visible in 1054. Dist=6,500 ly.
M33	Tri	⌀	Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million ly.
M81	UMa	⌀	Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	⌀	Close to M81 but much fainter and smaller.
M27	Vul	+	Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.

November DAILY CELESTIAL CALENDAR

1 New Moon occurs at 5:47 A.M. PST

3 The Moon passes 2 deg south of Mercury, 12:P.M. PST

3 The Moon passes 0.08 deg south of Antares 5:00 P.M. PST

4 The moon passes 3 deg south of Venus, 4 P.M. PST

9 First Quarter Moon occurs at 9:55 A.M. PST.

9 Mercury passes 2 deg north of Antares, 8 P.M. PST

10 The Moon passes 0.09 deg north of Saturn, 6 P.M. PST

11 The Moon passes 0.6 deg north of Neptune 6 P.M. PST

14 The Moon is at perigee (223,762 miles from Earth), 3:16 A.M. PST

15 Full Moon occurs at 1:29 P.M. PST

15 The Moon passes 4 deg north of Uranus, 5 P.M. PST

16 Mercury is at greatest eastern elongation (23 deg), 12:00 P.M. PST

17 Leonid meteor shower peaks.

17 The Moon passes 6 deg north of Jupiter, 7 A.M. PST

20 The Moon passes 2 deg north of Mars, 1 P.M. PST

22 Last Quarter Moon occurs at 5:28 P.M. PST

25 Mercury is stationary, 8 P.M. PST

26 The Moon is at apogee (251,850 miles from Earth), 3:56 A.M. PST

27 The Moon passes 0.4 deg north of Spica, 4 A.M. PST

2024 & 2025 New Moons

- November 1, 2024
- Dec 01, 2024
- Dec 30, 2024
- Jan 29, 2025
- Feb 27, 2025
- March 29, 2025
- April 27, 2025
- May 26, 2025
- June 25, 2025
- July 24, 2025
- August 22nd 2025
- September 21st 2025
- Oct 21st, 2025
- November 19th, 2025
- December 19th, 2025

Star Parties for Red Rock Ricardo Station

Saturday Nov 2nd Sunset

Saturday Nov 30th Sunset

Brown Road Star Parties

Friday Nov 1st 6:30 P.M.

Friday Nov 29th

Maturango Museum

Quarter Moon Star Party

October 12th 7:30 P.M.

CLUB INFORMATION

Monthly Skywatchers Newsletter.

Our newsletter is sent by email once a month to those who have subscribed. You do not have to be a member. Subscribe at a meeting or online at ChinaLakeAstro.org/subscribe

Annual Membership Dues

- Individual $25.00 per year.
- Family $ 40
- Youth 18 & under $10

Officers

PRESIDENT – Ralph Paonessa

VICE-PRESIDENT – Keith Weisz

SECRETARY – Vacant

TREASURER – Roger Brower

NEWSLETTER EDITOR – Ted Hodgkinson ghodkinson@sbcglobal.net

Club Information

Meetings of the China Lake Astronomical Society are held at the Maturango Museum 7:00 P.M. on the first Monday evening of each month, except when the first Monday is a holiday.

WESTERN AMATEUR ASTRONOMERS WEB SITE http://www.waastro.org/