# Skywatchers

Newsletter of the China Lake Astronomical Society


INSIDE THIS ISSUE:

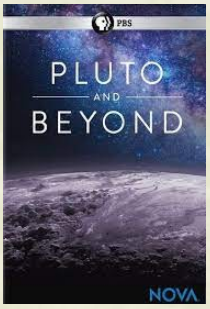


## Keith Weisz Presents

Keith Weisz will show a PBS Nova Video "Pluto and Beyond". It was first broadcast in Jan of 2019. One segment of the video shows exactly how they derived the orbit and the shape of486958 Arrokoth (Ultima Thule) using the same occultation techniques that Carol Evans and CLAS used.

*PBS narrative*

When the New Horizons spacecraft whizzed by Pluto in 2015, we Earthlings were dazzled by the breathtaking images it beamed home. They revealed a never-before-seen alien landscape - a world of mountains made of ice mixed with plains of frozen-solid methane and nitrogen. After more than two years of poring over the data, NASA has made remarkable new discoveries about everyone's favorite dwarf planet. But New Horizons didn't stop there. On New Year's Day 2019, the




probe attempts to fly by an object known now as Ultima Thule, believed to be a primordial building block of the solar system.

This will be the most distant flyby in NASA's history - 4 billion miles from Earth. If successful, it will shed light on one of the least understood regions of our solar system: the Kuiper Belt. NOVA will again be embedded with the New Horizons mission team to follow the action as they uncover in real time the secrets of what lies beyond Pluto.

## Upcoming Star Parties and Events

- Sat April 9 – Qtr Moon (Maturango)
- Fri April 29 – New Moon (Brown Road)
- Sat April 30 – New Moon (Red Rock Canyon)
- Sat May 7 – Qtr Moon (Maturango)
- Fri May 27 – New Moon (Brown Road)
- Sat May 28 – New Moon (Red Rock Canyon)
- •Sat Jun 4 – Qtr Moon (Maturango)

## HYBRID MEETING APR 4TH, 2022

Keith Weisz will present
Topic: Title: Pluto & Beyond
Time: April 04, 2022 07:30 PM Pacific Time (US and Canada)
Maturango Museum
and
Zoom Meeting
https://us02web.zoom.us/j/6727499334?pwd=VWhuVGZ3aFphL283THRKNUNoZ0RSZz09

Meeting ID: 672 749 9334
Passcode: 9V8FQM
One tap mobile
+14086380968,,6727499334#,,,,*562029# US (San Jose)
+16699006833,,6727499334#,,,,*562029# US (San Jose)

Dial by your location
+1 408 638 0968 US (San Jose)
+1 669 900 6833 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)
+1 646 876 9923 US (New York)
Meeting ID: 672 749 9334
Passcode: 562029

Find your local number: https://us02web.zoom.us/u/kzvHNprV6

## *China Lake Astronomical Society*

Membership or Renewal 2022

Name:_____

Address:_____

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Phone:_____Email:_____

Yearly Membership $ 25 (*due in January*) Checks or Money Orders accepted: # _____
Contact Roger Brower 760-446-0454 (email brower@iwvisp.com)

*Make Checks or Money Orders Payable to China Lake Astronomical Society.(CLAS)*

**Roger Brower**

# Sunspot outbursts likely to trigger more radio blackouts

The sun is waking up and we are experiencing the effects on Earth as disruptive radio blackouts and stunning aurora displays.

The "magnetically complex" sunspot called 2975 has spurted out about 20 solar flares over the past days including an X-class flare that blasted from the sun at 1:37 pm EDT (0537 GMT) on Wednesday (March 30). X-class flares are the most energetic type of solar flares that eject a large amount of charged particles into the surrounding space. These energized clouds travel very fast and can reach Earth within minutes.

Yesterday's flare was reported to have caused some disruptions to GPS signal and interference with high frequency radio transmissions, which are used by shortwave broadcasting stations, aviators and radio amateurs. "X-1.35 Flare! Region 2975 fires again with a possible Earth-directed #solarstorm too!" Tamitha Mulligan Skov, a space weather researcher at the Aerospace Corporation said on Twitter. (The 1.35 refers to the strength of the X-flare, indicating it was a relatively weak one.) "Expect waning #RadioBlackout & #GPS reception issues near dawn & dusk over next hour especially for USA, Canada, S.America, Hawaii, W. Africa & W.Europe." As sunspot 2975 continues its temper tantrums, further disruptions are possible in the coming days. For Thursday (March 31), the U.S. National Oceanic and Atmospheric Administration (NOAA) forecasts a 50% risk of minor to moderate radio blackouts. On Friday, April 1, the risk will go down to 35%. Both days have a 10% chance of a strong radio blackout, which could cause wide-spread disruption to high frequency radio communications on the sun-facing side of Earth, with a possible hour-long loss of signal.

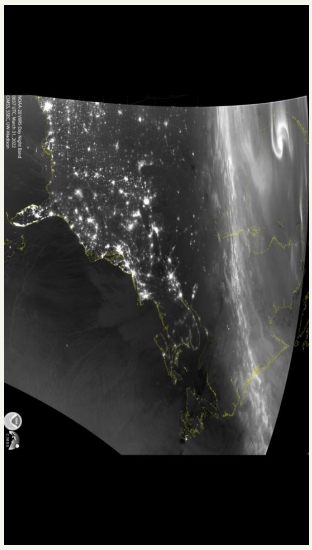
A strong radio blackout (R3 on NOAA's five-point scale) is a relatively common occurrence that can take place up to 2,500 times over the sun's 11-year cycle of ebbing and flowing activity, according to NOAA.

Although communications blackouts can be disruptive, the more sluggish outbursts called coronal mass ejections, or CMEs, that have accompanied some of the recent flares are raising the chances of catching breathtaking aurora displays for those living in the northern

## POSSIBLE AURORAS VISIBLE

parts of America and Europe, as well as New Zealand in the Southern Hemisphere.

CMEs are expulsions of magnetized plasma from the upper layers of the sun's atmosphere, the corona. When a CMEs hits Earth, it may temporarily disrupt the planet's protective magnetic field. When that happens, the plasma particles penetrate deep into Earth's atmosphere, where they trigger magnetic storms that produce colorful aurora displays. These auroras generally happen near the poles as the magnetic field is the weakest there, allowing the solar particles to sink deep into the atmosphere. The more poles the spectacle can be observed. powerful the geomagnetic storm, the farther away from the poles the spectacle can be observed. Two CMEs the sun blasted out on Monday (March 28) arrived yesterday night (March 30), delivering aurora viewing opportunities all over Canada, with reports also coming from North Dakota and even as far south as Colorado.



March 30, 2022

"1st test shot shows #aurora showing up on camera already before 10pm MST down to Paradox Valley Colorado currently!" Twitter user Derick Wilson tweeted on Wednesday night.

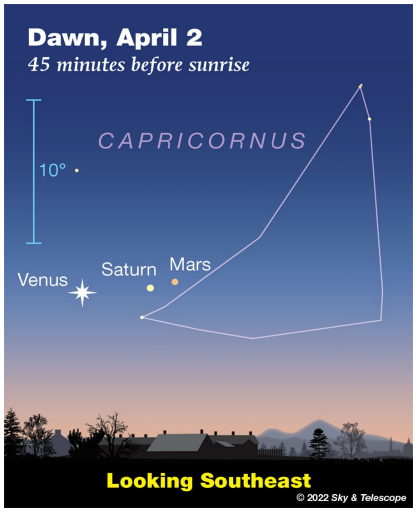
In the Southern Hemisphere, skywatchers from New Zealand and Tasmania also reported seeing the polar lights. "Aurora Australis over Butchers Dam on Sunday night #AlexandraNZ #NewZealand #CentralOtago," Andy Davey tweeted.

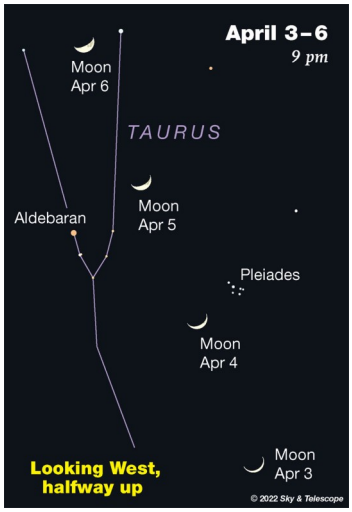
And there might be more to come. The geomagnetic situation around Earth is expected to become still more turbulent throughout Thursday and Friday, with a 30% possibility of a strong geomagnetic storm (G3 on a five-point scale) and even a 10% risk of a G4 storm, according to the U.K. national weather forecaster Met Office.Met Office personnel forecast "disturbed geomagnetic conditions" on Friday and that "unsettled" conditions may remain through Sunday (April 3).In addition to auroras, a G3 and G4 geomagnetic storm could cause minor problems to satellites in orbit and power networks on Earth.

The Wednesday X-flare also produced a CME, which is currently being analyzed "for any Earth-directed component," Met Office said in the statement. The agency also noted that further moderate-class flares are possible in the upcoming days.

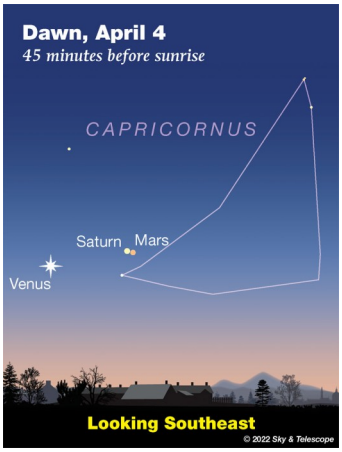
The sun's activity has only recently picked up after a prolonged minimum during which it sported virtually no sunspots. The star is still relatively sleepy, but its activity is expected to increase gradually as we head toward the next solar maximum, predicted to occur around 2025. Source: Sunspot outbursts likely to trigger more radio blackouts and auroras in coming days | Space

## Morning Viewing Early April 2nd

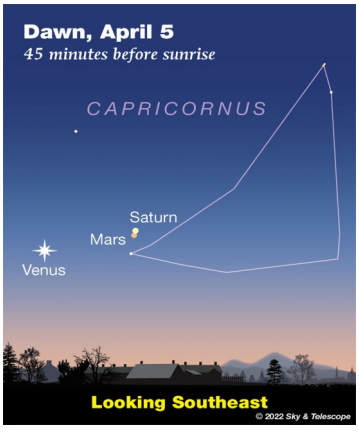


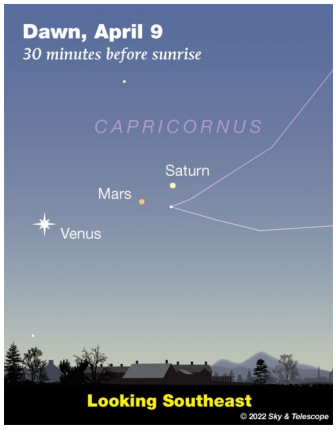




## Morning Viewing April 4th



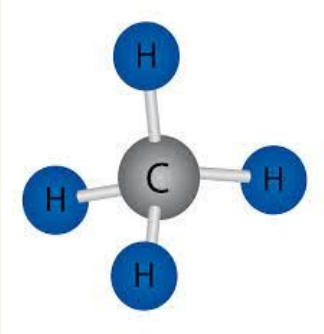

## Morning Viewing April 5-9



## Methane Could be the first Detectable Sign of Life Beyond Earth

If life is abundant in the universe, atmospheric methane may be the first sign of life beyond Earth detectable by astronomers. Although nonbiological processes can generate methane, a new study by scientists at UC Santa Cruz establishes a set of circumstances in which a persuasive case could be made for biological activity as the source of methane in a rocky planet's atmosphere. If life is abundant in the universe, atmospheric methane may be the first sign of life beyond Earth detectable by astronomers. Although nonbiological processes can generate methane, a new study by scientists at UC Santa Cruz establishes a set of circumstances in which a persuasive case could be made for biological activity as the source of methane in a rocky planet's atmosphere. Continued reading at Source: Methane could be the first detectable indication of life beyond Earth -- ScienceDaily

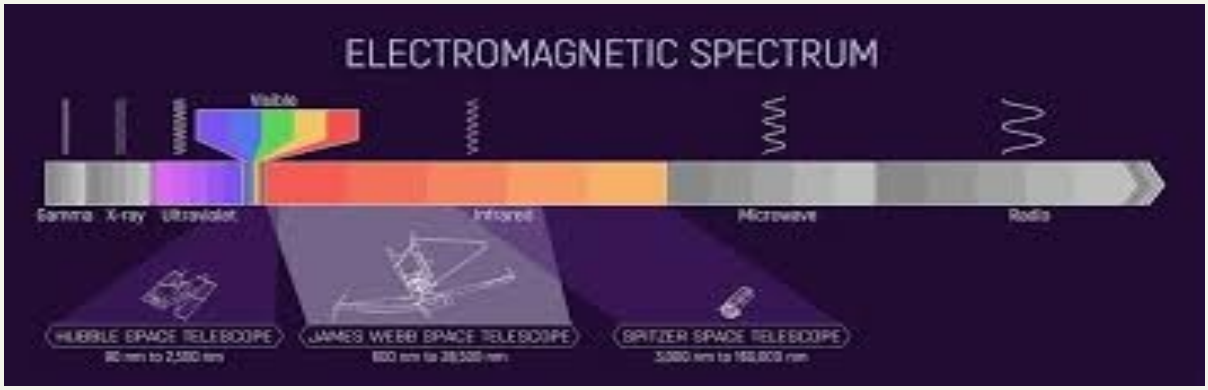



$CH_4$

The telescope 'time machine' will deliver 13.5 billion years of cosmic history.

## James Webb Space Telescope's infrared detectors

The newest deep space observatory, the James Webb Space Telescope, will give us a deeper view into the infrared universe than the iconic Hubble. A new video from the European Space Agency (ESA) showcases how Webb will open new vistas into astronomical objects across the universe, ranging from galaxies formed billions of years ago to clouds of gas and dust surrounding newborn stars.Infrared light is the heat-carrying part of the electromagnetic spectrum with longer wavelengths than visible light. The Hubble Space Telescope is optimized for visible light but can also detect some ultraviolet (shorter wavelengths than visible) and some infrared. Webb, however, was developed as an infrared specialist and can take on a much larger span of infrared wavelengths. That, for example, means seeing even deeper into the universe than Hubble does.




For continued reading Source: How the James Webb Space Telescope's infrared detectors will open new vistas in astronomy | Space

## Lunar Eclipse May 15-16

Don't miss the Lunar Eclipse on May 15-16. In Ridgecrest the Penumbral phase will start at 6:32 PM well before it rises in the east. At Moonrise it will be just 48 minutes before totality begins so it will be difficult to view until the moon rises higher. Totality starts at 8:29 PM and Maximum occurs at 9:11 PM. Total eclipse ends at 9:53 PM with the Penumbral phase ending at 11:50 PM. All in all a great opportunity for some great photography. Please send in your results for the June Newsletter & meeting. GFH

## Mercury has Geomagnetic Storms

An international team of scientists has proved that Mercury, our solar system's smallest planet, has geomagnetic storms similar to those on Earth. The research by scientists in the United States, Canada and China includes work by Hui Zhang, a space physics professor at the University of Alaska Fairbanks Geophysical Institute.

Their finding, a first, answers the question of whether other planets, including those outside our solar system, can have geomagnetic storms regardless of the size of their magnetosphere or whether they have an Earth-like ionosphere.

Source: https://www.sciencedaily.com/releases/2022/03/220311101604.htm

http://
chinalakeastro.org/

Star Party Reports

Had a star party Friday (March 25th)night. It was clouded over but I went anyway because after dark it sometimes clears up some. It did and 4 people showed up. All we were able to see though was Sirius, the Orion nebula, the Pleiades and a few other stars. Still I count it as a success. Roger

The Red Rock State Park Observing gathering for Saturday March 26th was cancelled because of strong winds & clouds. The next date is scheduled for April 30th. If you would like to bring a telescope and volunteer for the Red Rock State Park Star Parties please contact Lou Figueroa lou.figueroa@parks.ca.gov or 661-754-1055 for Volunteer forms and etc.

## A Note from your Editor

This newsletter is sent directly to 183 folks and available to many more that visit our website ChinaLakeAstro.org . There are so many interesting things that are of interest going on in the field and so many things "you may be doing" that we would love to hear about. Please consider writing an article and sending it my way so it can be added in. Photographs, field trips, book reviews, etc. Just about anything related to Astronomy, Space Science, or related fields. Use your imagination. Hope to hear from you soon. Remember this is your Newsletter.

Keep looking up.

## Club Information

Members receive discounted rates for Astronomy Magazine and /or Sky and Telescope Magazine.
The fee schedule is as follows: Verify current magazine prices with Roger!

Basic membership $25.00 per year.
Membership with Astronomy magazine is $59.00 per year.
Membership with Sky and Telescope magazine is $58.00 per year.
Membership with both S & T and Astronomy is $92.00 per year.

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Meetings of the China Lake Astronomical Society are held at the Maturango Museum at 7:30 p.m.