Skywatchers

Newsletter of the China Lake Astronomical Society

JUNE 06, 2022 CLAS MEETING 7:30 PM

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This months Meeting will start at the Maturango Museum where we will conduct a short business meeting and then transfer to the Observatory at Cerro Coso College. Before Covid-19 each year the College would have a fundraising barbeque at the site for public viewing. During those events members of CLAS were active in assisting . It is not certain if there will be a fundraiser this year but we will spend some time for observing in the southeast dome which house a LX– 200 Meade 14” GoTo telescope.

UPCOMING STAR PARTIES AND EVENTS

- •Sat Jun 4 – Qtr Moon (Maturango)
- Fri June 24th Brown Road
- Fri July 22nd Brown Road
- Fri Aug 26th Brown Road
- Fri Sept 23rd Brown Road
- Fri Oct 21st Brown Road
- Fri Nov 25th Brown Road

<u>Red Rock August Perseid Meteor Shower Observing Conditions .</u>

<u>Not Good! -Aug 11—Full Moon</u>

Red Rock Fall Schedule

- *Sept 24th Saturday*
- *October 22 Saturday*
- *November 26 Saturday*

Hybrid Meeting June 06th, 2022

Topic: Title: Cerro Coso College Observatory
Time: June 6th, 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)
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+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:____

City, State, Zip:____

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

Scientists have grown plants in Lunar Soil

For the first time in history, researchers have used a small sample of lunar regolith to sprout seeds. The results can tell us much about feeding humanity throughout the solar system

The Moon would be a harsh place to call home. It has no weather and no liquid water. And with no atmosphere to hold conditions steady, lunar temperatures can oscillate from 224 degrees Fahrenheit (107 degrees Celsius) in the daytime to –228 degrees Fahrenheit (–144 C) at night. What's more, the surface isn't exactly ripe for agriculture. Buzz Aldrin once described lunar regolith, akin to soil, as "talcum powder-like dust." And researchers who've studied lunar soil samples have described it as glassy, metallic, and loaded with minerals that have forms not commonly found on Earth. That's why it is so impressive that, for the first time, scientists have successfully grown plants using lunar soil gathered from previous missions to the Moon. A study recently published in the journal *Communications Biology* documents the feat. According to study author Rob Ferl, a professor of horticultural sciences at the University of Florida, the experiment has been in the works for over a decade but researchers only carried it out last year. "Something like this takes tons of planning," he says, because Moon soil is a finite resource and once you run out, it's hard to come by. The team had only the equivalent of a few teaspoons to work with in a pot about the size of a thimble.

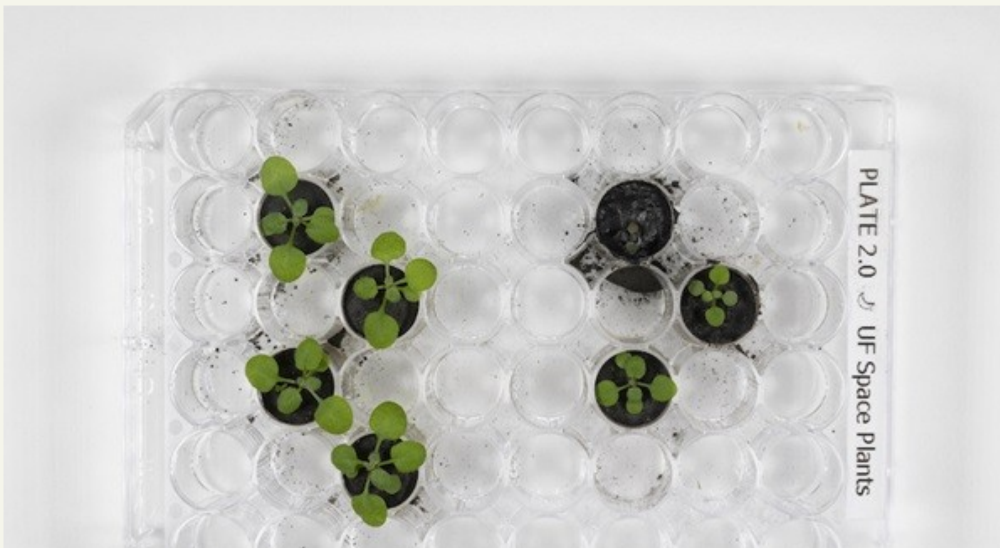
Lunar vs. Terrestrial Soil

In the years leading up to the experiment, researchers gathered soils from Earth that were as similar as possible to the makeup of lunar soil, says Ferl. In particular, they used soil sourced from around terrestrial craters, as well as a "lunar simulate soil" called JSC1A, an industrial mixture of chemicals meant to mimic the Moon's soil conditions. He says getting things just right beforehand was imperative to optimizing growing conditions when the time came to plant in the real lunar soil.

The lack of a lunar atmosphere makes outdoor agriculture impossible, so researchers simulated a laboratory environment on the Moon instead. "Given conditions on the Moon, you can't just throw seeds out on the surface and ask them to grow," says Ferl. He says lunar soil is different from what you might find on Earth because of the harsh solar wind and cosmic rays. Researchers found that the soil's jagged edges and metallic minerals created suboptimal conditions for growing the *Arabidopsis* plant, a small flowering weed native to Europe and Asia. They chose this variety because unlike most other plants, its genes have already been mapped, making it easier to study the species' gene expression as part of the experiment. So, how did the plants fare? The team could tell both physically and biologically that the plants grown in the lunar soil struggled compared to control plants grown in terrestrial soil. "Plants grown in lunar soil tended to be smaller and they contained purplish pigments that were indications of stress. They also expressed genes typical of plants grown in marginal conditions like salty soils and soils with high metal content," Ferl says. But still, says Ferl, the plants grew — and that's a big deal. Clive Neal, a researcher at Notre Dame who focuses on lunar exploration, agrees. He says that this was an excellent first experiment testing the "validity of using lunar regolith" to grow this novel set of Moon plants. "The really intriguing thing is the results suggest mature regolith inhibits plant growth," says Neal.
The maturity of lunar soil is based on its exposure to solar winds and other inhospitable aspects the lunar surface. Researchers can pinpoint the soil's maturity based on the size of granules as well as gases implanted in soil particles. But Neal says that there's still a lot we don't know. "We need more regolith returned from the Moon of varying degrees of maturity [to further study it]," he says.

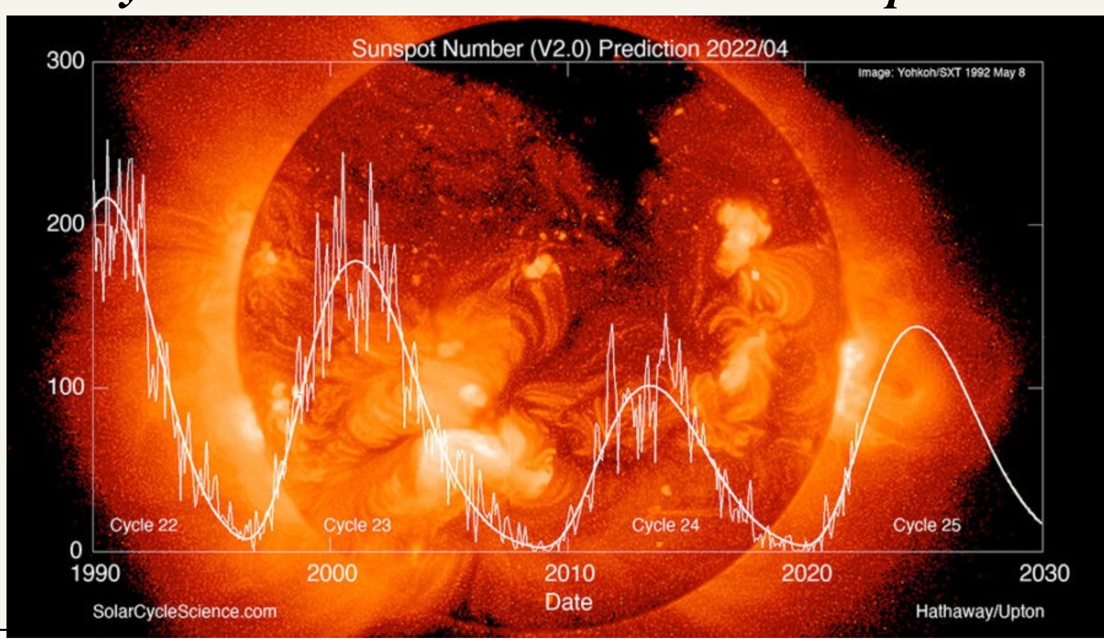
Although this research is still in its infancy, Ferl is excited about where it might take researchers next. He says that this is about so much more than lunar soil. It's about figuring out how plants can be a support system on other planets, just as they are on Earth. "What are the limits of our collective biology's ability to live somewhere else in the solar system?" he asks. And there's also a more practical perspective: Ferl and his team want to figure out how to produce enough food so that humans can stay on the Moon and Mars for longer periods of time. And if plants could be a support system somewhere else in the solar system, then humans could provide their own food, rather than surviving on only what they're able to bring along.

Source:[Scientists have grown plants in genuine lunar soil for the first time | Astronomy.com]



UF researchers pitted lunar soil simulant against the real deal, with marked differences. Plants grown in simulated soil (left) displayed different characteristics than those grown in actual material returned from the Moon (right).

The Sun is ramping up activity, but contrary to some reports, this solar cycle is still consistent with scientists' predictions.



In recent weeks, NASA has announced X-class solar flares, observers have seen large sunspot groups with the unaided eye, and online services have issued multiple aurora alerts even for mid-latitudes. After years of quiescence — the Sun was more often spotless than not in 2018, 2019, and 2020 — the change of pace is exciting solar observers. The Sun goes through 11-year cycles of magnetically instigated activity, which include sunspots, flares, and massive eruptions. While such activity last peaked around 2012 through 2014, that maximum was meager at best. In fact, it marked one of the quietest cycles in 100 years. Now, the uptick in activity seems to mark a change in the Sun's behavior. Lisa Upton (Space Systems Research Corporation), co-chair of the Solar Cycle 25 Prediction Panel, says that for the first time in 50 years, this solar cycle seems to be stronger than the one before it. She and colleague David Hathaway are predicting that this cycle will be up to 30% more active.

"This may mean that we have reached the inflection point in the current Gleissberg cycle and might start to see bigger cycles," Upton speculates. "It's a bit too early to say for sure, though."

However, she emphasizes that we shouldn't expect *too* much from the Sun's current activity. "The cycle is following very nicely along the strongest/earliest of [the panel's] predictions and is certainly on track to be another weak cycle," she adds.

"We still consider this cycle to be below average," confirms panel co-chair Doug Biesecker (National Oceanic and Atmospheric Administration). "Even with the recent activity, the sunspot number is still within the error bars of the solar cycle prediction from the panel."

Prediction vs. Reality

In 2019, that panel of experts reviewed the available models and predictions for the next solar cycle. In doing so, they recognized that physics-based scenarios were more successful than other prediction methods, such as those based on empirical data of the Sun's behavior. In particular, the most successful models incorporated the behavior of the Sun's magnetic fields, especially those at the poles, as well as an understanding energy flow within the turbulent solar interior. As a result of these investigations , the panel came to a consensus:

That the new solar cycle had started sometime between July 2019 and July 2020, and that activity would peak in 2025 with a maximum sunspot number between 105 and 125. The wiggle room in the prediction reflects that even the physics-based models are not in 100% agreement with one another. Now, with two years of the cycle under our collective belt, the predictions are holding up well, albeit with numbers veering toward the earlier and higher end of the forecast. Understanding this slight shift will likely take a year or two more data, but Upton and Hathaway have a report coming out soon with preliminary findings (though you can read a summary of their findings here). "I would say that the panel's forecast for solar cycle 25 is holding up very well," Upton adds. "I believe this will likely be the best forecast to come out of one of the NOAA/NASA Cycle prediction panels." While scientists have a growing confidence in their ability to predict what the Sun will do next, that doesn't mean there isn't room for disagreement. Scott McIntosh (National Center for Atmospheric Research), for one, has gone against the consensus in predicting that this cycle will be one of the strongest on record.

The cycle's earlier and more active start has some practical consequences. While the original prediction was that the cycle would peak in July 2025, if it started six months early then a six months' earlier maximum is likely, too. And that would put the maximum closer to the total solar eclipse set to sweep over Central and North America on April 8, 2024. As the Moon blocks the Sun's light, it will reveal the corona, the wispy, white solar atmosphere that streams into space — and the corona takes on drastically different shapes depending on solar activity. “We should have a very interesting Sun to see during the 2024 Great American Eclipse,” Upton says, “certainly *very* different from the 2017 Great American Eclipse.” Source: The Sun Is Waking Up — Right On Schedule - Sky & Telescope - Sky & Telescope (skyandtelescope.org)

Something to Think About—Observing at Mount Wilson

Popular Public Ticket Nights allow individuals, rather than groups, to experience the thrill of viewing celestial objects through our large, historic telescopes — the two largest in the world dedicated to public viewing.

Join a small group of individuals to observe the Universe through a night on the 100-inch, a night on the 60-inch, or our Hyper Night, where attendees will use both telescopes, switching midway through the session.

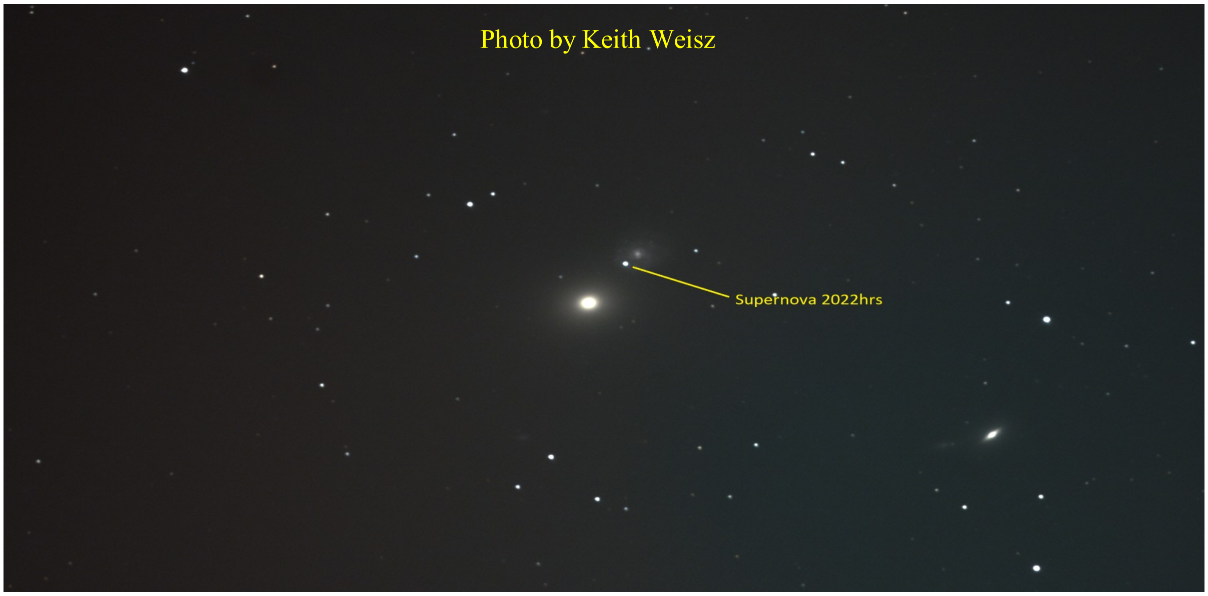
As the number of people is limited, you should have the opportunity to see many objects through these amazing instruments.

Ticket Prices = $ 225 100” Telescope
“ = $ 100 Hyper Night
“ = $ 95 60” Telescope
(Please contact for up-dated prices)

When purchasing, please review our Terms & Conditions.
Any questions can be directed to our Public Ticket Night Coordinator at: pubtix@mtwilson.org.

CLAS Observing at Mt Wilson Saturday September 24, 2005

Supernova May 03, 2022



ASTRONOMY COLUMN
JUNE EVENTS:

The next club meeting will be on June 6th. We will be having our meeting in the Maturango Museum. The time will be 7:30 PM. Current Covid requirements will be enforced. You can also join us on zoom.

Join Zoom Meeting:
https://us02web.zoom.us/j/6727499334?pwd=VWhuVGZ3aFphL283THRKNUNoZ0RSZz09

Star parties

Directions: Brown road star parties are held in the desert. Take south China lake Boulevard to 395. Cross 395 and go 2.3 miles on Brown road until you come to signs in cones pointing to the left. Take this dirt road .5 miles to the star party site.

June CELESTIAL CALENDAR

ASTRONOMY COLUMN
JUNE EVENTS:

1. The next club meeting will be on June 6th in the Maturango Museum at 7:30 PM. You can also join us on zoom.

https://us02web.zoom.us/j/6727499334?pwd=VWhuVGZ3aFphL283THRKNUNoZ0RSZz09

Star parties:

June 4 Qtr moon at Maturango museum 8:30 PM.
June 24th Brown road signs out 8:30 PM viewing 9 PM.

Directions: Brown road star parties are held in the desert. Take south China lake Boulevard to 395. Cross 395 and go 2.3 miles on Brown road until you come to signs in cones pointing to the left. Take this dirt road .5 miles to the star party site.

JUNE CELESTIAL CALENDAR

1. Saturn, Mars, Jupiter and Venus are all in the morning sky all month. They are joined by Mercury by midmonth. Look for them all in the east, southeast and south.
*2, There is a chance of a new meteor show showing up on the night of May 30/31. It would be called Tau Herculids. Its from a new comet breakup and could be spectacular or just a total dud.

INFORMATION:

Please visit us at our website ChinaLakeAstro.org.

For more information, contact the China Lake Astronomical Society at 760-446-0454 or 760-384-8666.

Roger Brower

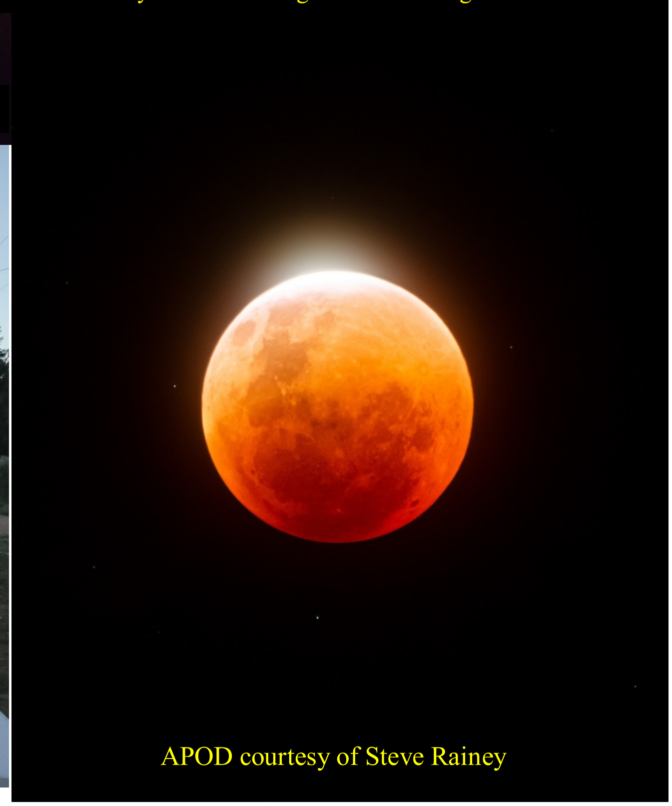
The Planets in June

David Gregg

Climbers on El Capitan at left, Half Dome background center and Bridal Veil Falls.

Taken at Cerro Coso College with a Smart Phone. 5 sec with binoculars. Candy Cane-Ted Hodgkinson-Joe Hodgkinson

David Gregg Observatory located at Lockwood Valley



APOD courtesy of Steve Rainey

Star Party Reports

The Brown Road Star on May 27th was cancelled do to high winds and clouds.

We lost a number of events in May due to poor observing conditions both at Brown Road and Red Rock. Hopefully June will be better

The Red Rock State Park Observing gathering for Saturday May 28th was cancelled because of strong winds & clouds.. 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…..G.F.H

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.