Skywatchers

Newsletter of the China Lake Astronomical Society

APRIL 01, 2024 CLAS MEETING 7:30

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Monday, April 1, 2024 7:00 PM

April Meeting & Program

Refreshments: 7:00 PM

Announcements : 7:30

Program: 7:45

Photo by Ken Burrell

Program

Total Solar Eclipse Roundtable

Bring your eclipse equipment and knowledge to share with everyone. If you have something to present, bring that as well.

Location

Maturango Museum

Meetings 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).

All those attending will receive Solar Eclipse Shades

Two Great U.S. Eclipses in 7 years

Location	Partial Begins	Totality Begins	Maximum	Totality Ends	Partial Ends
Dallas, Texas	12:23 p.m. CDT	1:40 p.m. CDT	1:42 p.m. CDT	1:44 p.m. CDT	3:02 p.m. CDT
Idabel, Oklahoma	12:28 p.m. CDT	1:45 p.m. CDT	1:47 p.m. CDT	1:49 p.m. CDT	3:06 p.m. CDT
Little Rock, Arkansas	12:33 p.m. CDT	1:51 p.m. CDT	1:52 p.m. CDT	1:54 p.m. CDT	3:11 p.m. CDT
Poplar Bluff, Missouri	12:39 p.m. CDT	1:56 p.m. CDT	1:56 p.m. CDT	2:00 p.m. CDT	3:15 p.m. CDT
Paducah, Kentucky	12:42 p.m. CDT	2:00 p.m. CDT	2:01 p.m. CDT	2:02 p.m. CDT	3:18 p.m. CDT
Carbondale, Illinois	12:42 p.m. CDT	1:59 p.m. CDT	2:01 p.m. CDT	2:03 p.m. CDT	3:18 p.m. CDT
Evansville, Indiana	12:45 p.m. CDT	2:02 p.m. CDT	2:04 p.m. CDT	2:05 p.m. CDT	3:20 p.m. CDT
Cleveland, Ohio	1:59 p.m. EDT	3:13 p.m. EDT	3:15 p.m. EDT	3:17 p.m. EDT	4:29 p.m. EDT
Erie, Pennsylvania	2:02 p.m. EDT	3:16 p.m. EDT	3:18 p.m. EDT	3:20 p.m. EDT	4:30 p.m. EDT
Buffalo, New York	2:04 p.m. EDT	3:18 p.m. EDT	3:20 p.m. EDT	3:22 p.m. EDT	4:32 p.m. EDT
Burlington, Vermont	2:14 p.m. EDT	3:26 p.m. EDT	3:27 p.m. EDT	3:29 p.m. EDT	4:37 p.m. EDT
Lancaster, New Hampshire	2:16 p.m. EDT	3:27 p.m. EDT	3:29 p.m. EDT	3:30 p.m. EDT	4:38 p.m. EDT
Caribou, Maine	2:22 p.m. EDT	3:32 p.m. EDT	3:33 p.m. EDT	3:34 p.m. EDT	4:40 p.m. EDT

During the Eclipse you will be treated to see 5 planets during totality. Jupiter, Mercury, Venus, Mars & Saturn along with the Constellation Orion. In addition we may be blessed to see a Comet 12P/Pons-Brooks which should be visible with the naked eye during totality at Magnitude 5 located some 25 degrees towards Jupiter

1:42 CDT in Dallas Te

China Lake Astronomical Society

Membership or Renewal 2024

Name:_____

Address:_____

City, State, Zip:_____

Phone:_____Email:_____

Yearly Membership $ 25 (*due in January*) Family $ 40 Youth 18 & under $ 10.
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, Treasurer
China Lake Astronomical Society
P.O. Box 1783
Ridgecrest, CA 93556.

An NSF-funded solar-imaging instrument will fly on a high-altitude aircraft to explore infrared emission from the Sun's corona.

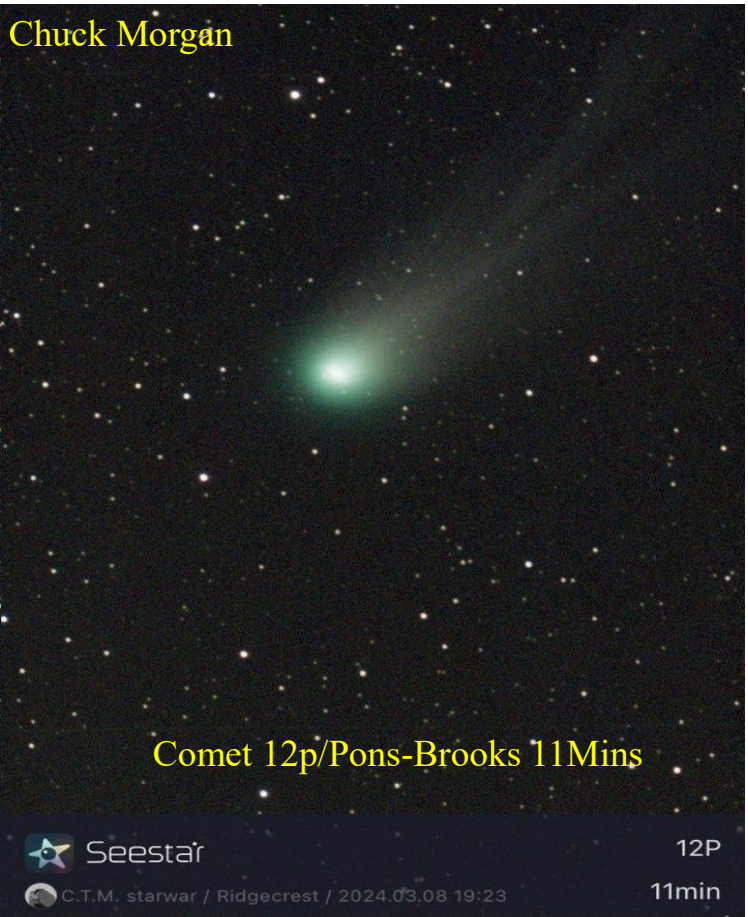
Samra is the principal investigator of the Airborne Coronal Emission Surveyor (ACES), a National Science Foundation-funded mission run by the Center for Astrophysics, Harvard & Smithsonian. The experiment will fly along the eclipse path, collecting infrared emission from the Sun's outer atmosphere, called the *corona*. With less than two weeks until the eclipse, Samra and her team are now busy testing the instrument and its upcoming flight path. On April 8th, they plan to take to the skies, measuring the temperature and density of the corona — and hoping to observe never-before-seen coronal emissions that reveal details of the corona's dynamic magnetic field. Although the Sun's corona burns extremely hot — more than 2 million degrees Fahrenheit — the brilliance of the Sun's visible surface obscures it. Only during a total solar eclipse, when the Moon blocks the Sun's surface, can scientists briefly study the corona's emissions and activity right down to the edge of the disk. Studying the corona helps scientists learn about *coronal mass ejections* (bursts of particles driven by the Sun's powerful magnetic field), which have the potential to create space weather near Earth.

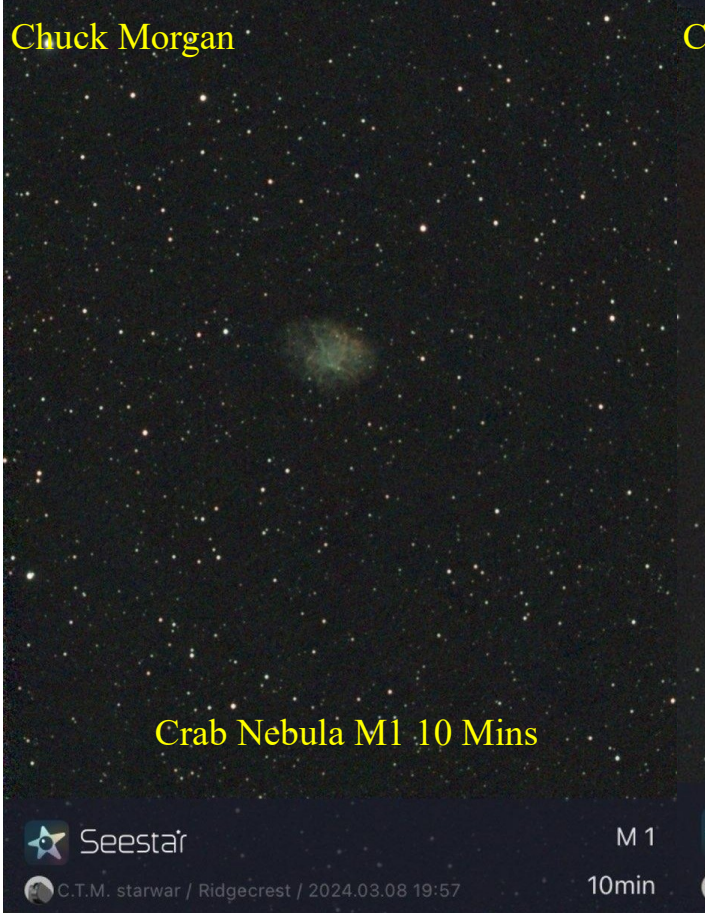
The Sun is currently near the maximum of its 11-year cycle of activity, so these energetic events are more common now. But while scientists have extensively studied such particle ejections at visible and ultraviolet wavelengths, their infrared emission has been underexplored. Enter ACES.ACES will observe the eclipse not from the ground but from the sky. Since Earth's atmosphere absorbs most of the infrared light that the Sun emits, ACES will fly above the densest part of the atmosphere, the *troposphere*, to achieve clear results. The instrument will be mounted on an airplane operated by the National Center for Atmospheric Research, which will fly at around 14 kilometers, or 46,000 feet — even higher than commercial aircraft.

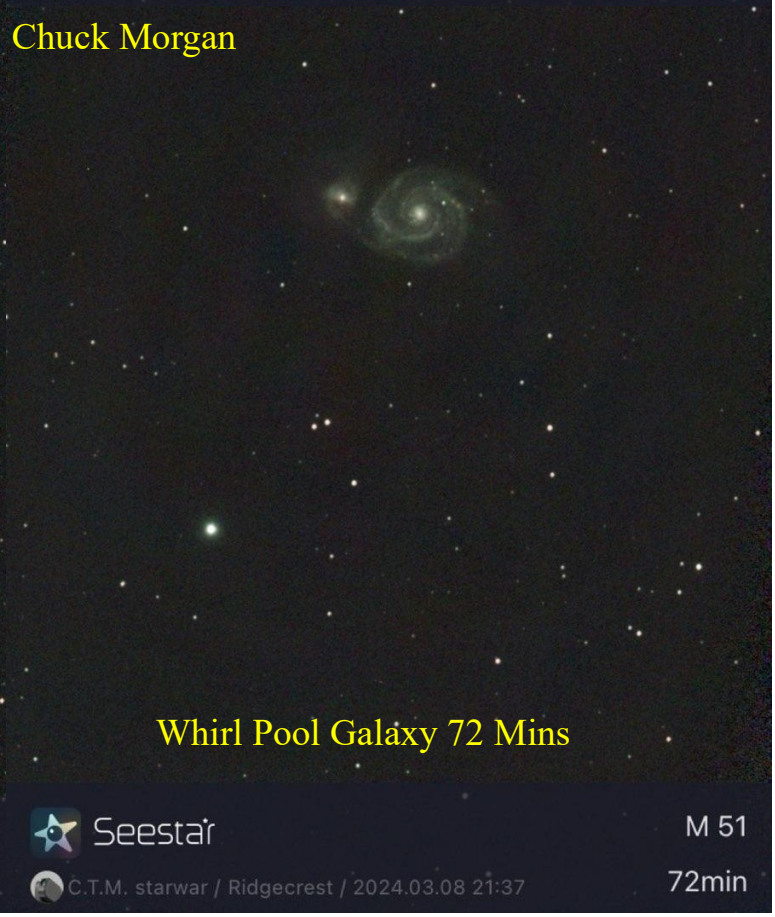
Flying through the shadow of the solar eclipse has a second key benefit: ACES can stay within the path of totality for longer. On the ground, the longest totality will be about four and a half minutes; in the air, traveling about 500 miles per hour, the instrument will be in darkness for around six minutes. Samra calls ACES' flight a "mission of opportunity." ACES isn't the only solar science mission capturing the eclipse off the ground. NASA's Parker Solar Probe and STEREO-A spacecraft as well as the ESA/NASA Solar Orbiter will all be monitoring the Sun and interplanetary space from the same side of the Sun as ACES. Yeimy Rivera, ACES project scientist, says the placement of the four instruments was "one of the best configurations that we could have possibly asked for." On eclipse day, ACES' sensitive spectrograph will capture infrared light from a thin sliver of the corona. The science team is looking for peaks in the resulting spectrum, which indicate particularly bright emission at certain wavelengths due to the presence of specific *ions*, or atoms with their electrons stripped away. Since the Sun's intense radiation is what strips those electrons, observing certain ions enables astrophysicists to work backward to determine the temperature and density of the corona itself. Observing rare ions in the corona will also help scientists decide if they should build dedicated instruments to study them and their role in the magnetic fields that twist through and guide the coronal flow. Similar to the way that we want to be able to predict the formation of hurricanes," Rivera says, "[we] want to do the same thing with coronal mass ejections." The space weather these ejections cause has the potential to affect not just our communication systems, but GPS navigation, power grids, and internet access. ACES is not the first instrument in this infrared science mission to fly during an eclipse. Its predecessor, AIR-Spec, flew over Kentucky in the 2017 eclipse and over the southern Pacific Ocean in the 2019 eclipse, recording emissions from iron and sulfur ions that had never been observed before. Since the 2019 eclipse, the team designed and built Airborne Stabilized Platform for InfraRed Experiments (ASPIRE), a system that stabilizes the telescope's camera and enables it to capture emission at wavelengths from 1 to 4 microns. However, due to time constraints, a modified camera flying on April 8th will only capture wavelengths from 1 to 4 microns. However, due to time constraints, a modified camera flying on April 8th will only capture wavelengths from 1 to 1.7 microns; the full-range detector will likely fly on the 2026 eclipse over Europe.

Aside from testing the instruments in time, the hardest part of the ACES mission is making sure the camera's small field of view is pointed at the desired location in the corona. The mission plans the alignment about a month in advance, but final adjustments are made in real time on the aircraft. "You're trying to catch this moving target in a moving airplane," explains Samra, who is in charge of pointing the instrument during the eclipse. "You have all of these moving parts that have to go right in order for you to do that." Despite the challenges, Samra and her team are excited for their third eclipse and the results it will reveal. "There's always a moment as the Sun begins to eclipse just partially, and you know totality is coming," Samra says. "And there's just this moment of excitement, and this thought of, 'How cool is my job?'"


Chuck Morgan
Thors Helmet 31 Mins
Seestar
SH 2- 298
C.T.M. starwar / Ridgecrest / 2024.03.05 20:51
31min


Chuck Morgan
Comet 12p/Pons-Brooks 11Mins
Seestar
12P
C.T.M. starwar / Ridgecrest / 2024.03.08 19:23
11min


Chuck Morgan
Crab Nebula M1 10 Mins
Seestar
M 1
C.T.M. starwar / Ridgecrest / 2024.03.08 19:57
10min


Chuck Morgan
Whirl Pool Galaxy 72 Mins
Seestar
M 51
C.T.M. starwar / Ridgecrest / 2024.03.08 21:37
72min

APRIL DAILY CELESTIAL CALENDAR

1	Mercury is Stationary, 3 P.M. PST
1	Last Quarter Moon occurs 8:15 P.M. PST
4	Asteroid Pallas is stationary 12:00 P.M. PST
4	The Moon passes 2 deg south of Mars, 9:00 P.M. PST
6	The Moon passes 1.2 deg south of Saturn 2:00 A.M. PST
7	New Moon passes 0.4 deg south of Neptune1:00 A.M. PST
7	The Moon passes 0.4 north of Venus, 10:00 A.M. PST
7	The Moon is at Perigee (222,979 miles from Earth), 10:51 A.M. PST
8	Asteroid Herculina is at opposition , 5:00 A.M. PST
8	New Moon occurs at , 11:21 A.M. PST (Solar Eclipse See pg 3 & 4)
10	The Moon passes 4 deg north of Jupiter at 2:00 P.M. PST
10	The Moon passes 4 deg north of Uranus at 5:00 P.M. PST
10	Mars passes 0.5 deg north of Saturn, 8:00 P.M. PST
11	Mercury is in inferior conjunction 4:00 P.M. PST
15	First quarter Moon occurs at 12:13 P.M. PST
18	Asteroid Juno is stationary at 8:00 A.M. PST
18	Mercury passes 2 deg north of Venus, 4:00 P.M. PST
19	The Moon is at apogee (252,043 miles from Earth), 7:00 P.M. PST
20	Jupiter passes 0.5 deg south of Uranus, 1:00 AM. PST
22	Lyrid meteor shower peaks
23	Full Moon occurs at 3:49 P.M. PST
24	Mercury is stationary, 1:00 A.M. PST
26	The Moon passes 0.3 deg north of Antares, 2:00 P.M. PST
27	Mars passes 0.04 deg south of Neptune, 9:00 P.M PST

2024/2025 New Moons

April 8, 2024
- May 7, 2024
- June 6, 2024
- July 5, 2024
- August 4, 2024
- September 2, 2024
- October 2, 2024
- 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 22, 2025
Sept 21, 2025
Oct 21, 2025
Nov 19, 2025
Dec 19, 2025

Red Rock Spring Star Parties

2024

- March 30th Saturday
- April 6th Saturday
- May 4th Saturday
- June 1st Saturday

Directions to Brown Road 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.

http://chinalakeastro.org/

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

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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.waa.av.org/

ASTRONOMY COLUMN

April EVENTS:

1. The next club meeting on April 1st in the Maturango Museum at 7:30 PM. The program this month will be an eclipse roundtable. Bring your questions and comment and join in.

Star parties:

April 5th: Brown road star party. 8 PM
April 6th Red Rock Canyon (The Eclipse might take away our volunteers)

April 8th: Eclipse viewing at the Maturango museum Check with the museum for details,

April CELESTIAL CALENDAR

1. Mercury moves from the evening sky to the morning sky but is too close to the sun to be easily seen this month.

2. Venus is also close to the sun but you might see it very low in the eastern morning sky the first few days of the month.

3. Mars and Venus remain close in the morning sky this month. They have a conjunction on the 10th. Look for them in the east before sunrise.

4. Jupiter moves ever closer to the sun in April but can be seen in the west after sunset. Jupiter also passes Uranus on the 29th.

5. The annual Lyrid meteor shower peaks on April 22nd but is strongly hampered by the full moon.

6. April 8th total eclipse of the sun across most of the US. 60% covered locally.

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