PrimeFocus

July 2025

WHEN

July 18, 2025
Doors open at 7:00pm
Meeting starts at 7:30pm
Lecture starts at 8:00pm

WHERE

Unitarian Church
1893 North Vasco Road
Livermore, CA 945571
and via Zoom

TVS QR CODE

INSIDE THIS ISSUE

M51 by Swaroop Shere

THIS MONTH'S SPEAKER

Astronomy and the Billionaire Space Race
Samantha Lawler

In February 2024, hundreds of pounds of potentially lethal debris from a SpaceX Crew Dragon trunk from a private astronaut mission fell on farmland near Regina, Saskatchewan. Dr. Samantha Lawler of the University of Regina has been studying the degradation of the night sky due to thousands of new commercial satellites over the past six years and was stunned to learn that space debris fell so close to her home. This talk begins with the story of SpaceX employees driving a rented U-Haul truck to an isolated grain farm to be greeted by an astronomer and a dozen of Saskatchewan's finest local journalists. By the end of the talk, we'll cover international space law, atmospheric pollution due to launches and reentries, and how thousands of new commercial satellites are already changing casual stargazing, astrophotography, and astronomy research alike. About the Speaker: Dr. Samantha Lawler is an Associate Professor of Astronomy at Campion College and the Department of Physics at the University of Regina in Saskatchewan, Canada. She received her B.S. in Astrophysics from the California Institute of Technology, an M.A. in Astronomy from Wesleyan University, and a Ph.D. from the University of British Columbia. Her research includes studying how the Kuiper Belt formed and how its orbits have changed over time, the stability of exoplanet orbits and how they interact with planetesimal disks, how to make artificial satellites less visible and less harmful, and whether planets can support life. Her discoveries in the Kuiper Belt and predictions for satellite pollution have been featured by CBC, CNN, NPR, Scientific American, The New York Times, The Los Angeles Times, Wired Magazine, Nature, and many other international news outlets. She lives on a farm outside Regina and deeply appreciates the beautiful prairie skies. Recorded: February 7, 2025

A SpaceX Falcon 9 rocket carrying the company's Dragon spacecraft is launched on NASA's SpaceX Crew-5 mission to the International Space Station with NASA astronauts Nicole Mann and Josh Cassada, Japan Aerospace Exploration Agency (JAXA) astronaut Koichi Wakata, and Roscosmos cosmonaut Anna Kikina onboard, Wednesday, Oct. 5, 2022, at NASA's Kennedy Space Center in Florida. NASA's SpaceX Crew-5 mission is the fifth crew rotation mission of the SpaceX Dragon spacecraft and Falcon 9 rocket to the International Space Station as part of the agency's Commercial Crew Program. Mann, Cassada, Wakata, and Kikini launched at 12:00 p.m. EDT from Launch Complex 39A at the Kennedy Space Center to begin a six-month mission onboard the orbital outpost.
Credits: NASA/Joel Kowskyu003c/strongu003e

NEWS AND NOTES

Meeting Dates

Club Meeting	Board Meeting	PrimeFocus Deadline
July 18	July 21	July 6
August 15	August 18	August 5
September 19	September 22	September 6

Money Matters

As of the last Treasurer's Report on 6/23/25, our club's account balance is $47,871.00, this includes $11,170.77 in the H2O Rebuild fund.

TVS Welcomes New Members

TVS welcomes new members Robert Fellows, Jennifer Ortiz, Sherif Tawdros, Daniel Vancura, Emma Litzer, Cameron Lewis, Martin Martino, Melissa Bettencourt, Michael Underwood, Bernice Mills, Aveesh Agrawal, Kylara Martin, and Sagar Khanna. Please say hello and chat with them during our meetings.

2025 TVS Club Star Party Schedule

Save the dates for the 2025 Club Star Parties.
Del Valle star parties are also public outreach events. They are jointly hosted with the EBRPD and held at the Arroyo Staging Area (Coords: 37.6196638, -121.7528899). The public is invited for the first 1.5-2 hours, while club members can stay the remainder of the night.

No events currently scheduled for Del Valle.

Tesla Vintners star parties are open to only club members and their guests. These star parties end at midnight, but participants can leave earlier, should they wish.

July 19: Tesla Vintner's Star Party, 5143 Tesla Rd., Livermore. Set-up at 7:30pm, Observing 8:00-Midnight.

September 13: Tesla Vintner's Star Party, 5143 Tesla Rd., Livermore. Set-up at 6:30pm, Observing 7:00pm-11-30pm.

H2O Open House star parties are open to only club members and their guests. The open house ends at midnight, and all participants are encouraged to stay the duration. The drive to H2O takes about 1 hour, and the caravan leaves promptly from the corner of Mines and Tesla Rds. No gas stations are available on the route, so be prepared. Admission is $3/car-bring exact change. H2O is a primitive site with two porta-potties. Bring water, food, and warm clothing, as needed. Red flashlights are to be used so observers can preserve their night vision.

August 16: H20 Open House, 5:00pm caravan to H2O PROMPTLY leaves the corner of Mines and Tesla Rds., Livermore. Observing until 11:30pm. Meeting times are tentative.

Sunol Star Party. Credit: Johnathan Bailey

Sunol Star Party. Credit: Johnathan Bailey

CALENDAR OF EVENTS

July 23, 24, 30,31, August 6, 7, 13,14, 20, 21, 7:30-10:30pm

What	Free Telescope Viewing
Who	Chabot Staff
Where	Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost	Free

Join Chabot astronomers on the Observatory Deck for a free telescope viewing! Weather permitting, this is a chance to explore stars, planets and more through Chabot's historic telescopes. Chabot's three large historic telescopes offer a unique way to experience the awe and wonder of the Universe. Three observatory domes house the Center's 8-inch (Leah, 1883) and 20-inch (Rachel, 1916) refracting telescopes, along with a 36-inch reflecting telescope (Nellie, 2003).

Are the skies clear for viewing tonight? Viewing can be impacted by rain, clouds, humidity and other weather conditions. Conditions can be unique to Chabot because of its unique location in Joaquin Miller Park. Before your visit, check out the Weather Station to see the current conditions at Chabot.

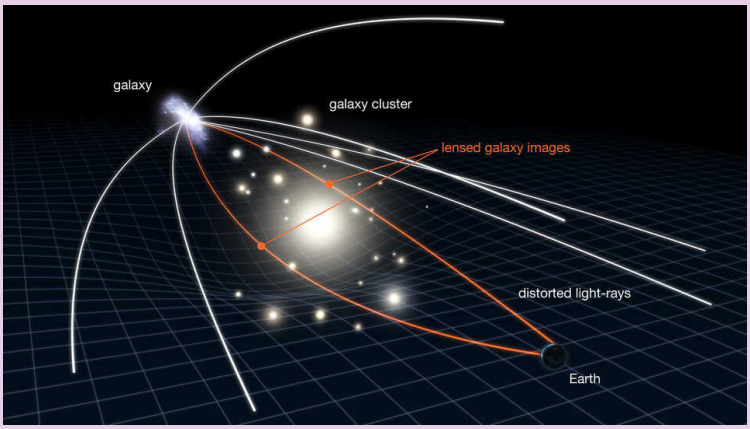
For more information, see
https://chabotspace.org/events/events-listing/
https://eastbayastro.org/chabot-telescope-status/

August 11, 7:30 PM

What	The Most Powerful Zoom Lenses in the Universe
Who	California Academy of Sciences
Where	Morrison Planetarium; 55 Music Concourse Drive, San Francisco, CA 94118
Cost	Public: $15; Members and seniors: $12

Featuring Dr. David Pooley, Trinity University

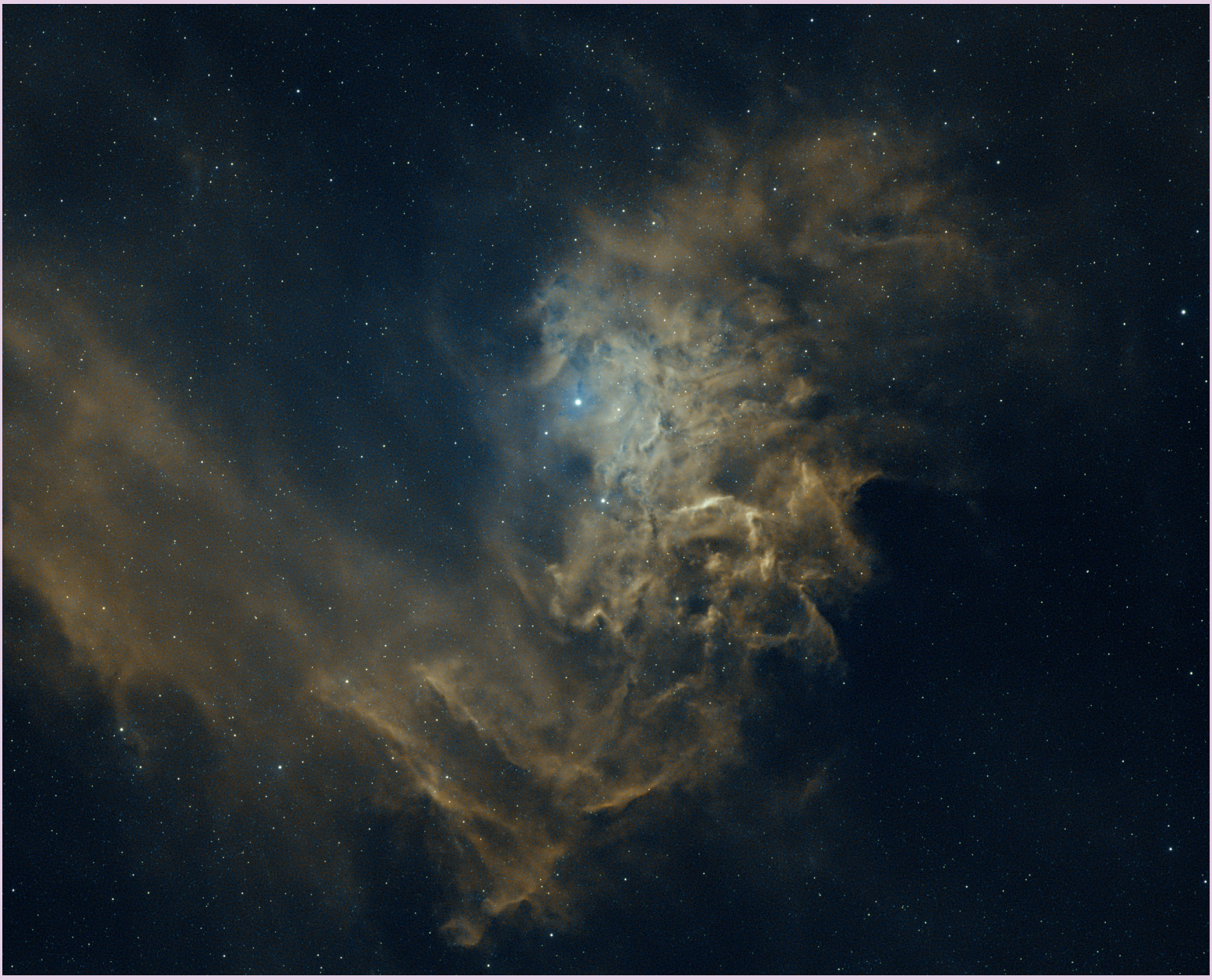
Delve into the profound and captivating realm of gravitational lensing, a cosmic spectacle predicted by Albert Einstein's revolutionary theory of General Relativity. This isn't merely a scientific curiosity; it's an unparalleled astronomical instrument, surpassing the capabilities of any telescope we could realistically construct in the foreseeable future. We will embark on a journey to comprehend how immensely massive objects, such as galaxies, exert a powerful gravitational effect that warps the fabric of spacetime itself. As light travels through this distorted spacetime, it doesn't travel in a straight line but follows the curved path dictated by gravity. This bending of light is called gravitational lensing, where light from distant sources, such as luminous quasars situated at the farthest reaches of the observable universe, is deflected and magnified as it passes by intervening massive objects. Explore how this cosmic phenomenon enables astronomers to achieve unprecedented levels of resolution and magnification, unveiling quasars' intricate and minute structures with remarkable clarity, akin to using a powerful magnifying glass. Moreover, discover how gravitational lensing is an invaluable tool for mapping the elusive dark matter. Unravel the secrets hidden within the distorted light of distant quasars and unlock insights into the nature of dark matter, pushing the boundaries of our understanding of the universe beyond what was previously thought possible.



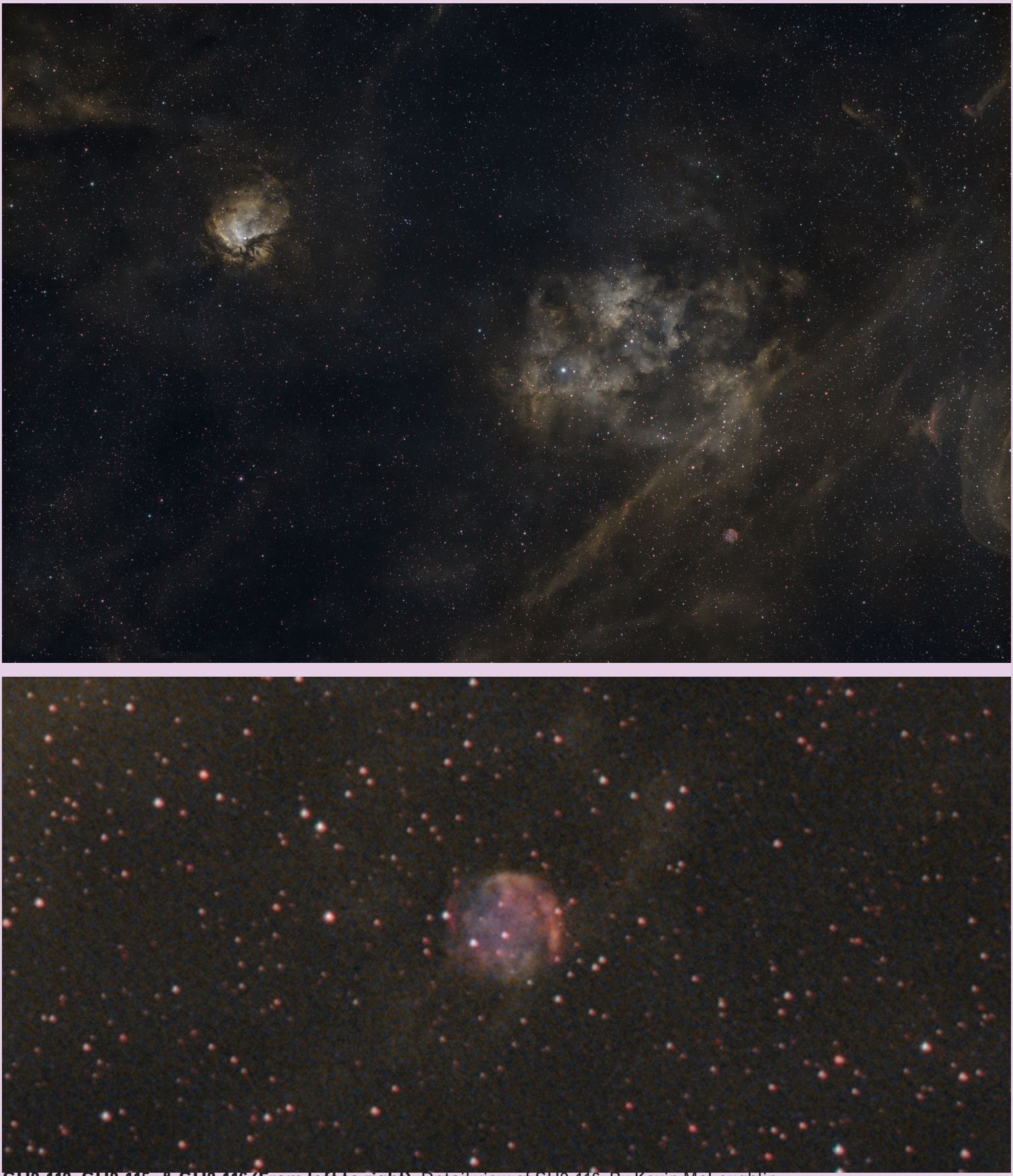
This illustration shows a phenomenon known as gravitational lensing, which astronomers use to study very distant and very faint galaxies. Lensing clusters are clusters of elliptical galaxies whose gravity is so strong that they bend the light from the galaxies behind them. This produces distorted, and often multiple, images of the background galaxy. But despite this distortion, gravitational lenses allow for greatly improved observations as the gravity bends the light's path towards Hubble, amplifying the light and making otherwise invisible objects observable. Credit: NASA, ESA & L. Calçada

David Pooley is a Professor in the Department of Physics & Astronomy at Trinity University in San Antonio, Texas, and recently won the 2024-2025 Distinguished Scholarship, Research, or Creative Work or Activity Award. He has a broad range of interests in high energy astrophysics including supermassive black holes, supernova explosions, and close binary systems in dense stellar clusters. He received his PhD from MIT in 2003 and was subsequently a Chandra Fellow at UC Berkeley. He is dedicated to mentoring undergraduate research, having supervised over 40 undergraduates to date in obtaining, reducing, and analyzing data from Chandra, XMM-Newton, Swift, Fermi, Hubble, Spitzer, GALEX, and ground-based observatories. He is currently chair of NASA's Physics of the Cosmos Program Executive Committee and chair of the Chandra Users' Committee.

TVS ASTROPHOTOGRAPHY



IC 405, By Kevin McLoughlin.



SH2-112, SH2-115, & SH2-116 (From left to right), Detail view of SH2-116, By Kevin McLoughlin.
For a full resolution image see https://app.astrobin.com/i/ldke93

Lassen Milky Way, By Tushar Shanker.

M8, By Prashant Vaidyapn.

M81 & M82, By Prashant Vaidyapn.

WHATS UP

Adapted from Sky and Telescope

All times are Pacific Standard Time

July 2025		
20	Sun	In the morning facing East Northeast, see the moon about 1½° from the Pleiades just about the horizon
23	Wed	At dawn the Moon is a thin crescent just 5° left of Jupiter
24	**Thu**	**New Moon**
26	Sat	At dusk, crescent moon is less than 2° from Regulus.
28	Mon	After sunset, Moon is just 4° lower left of Mars
August 2025		
1	**Fri**	**Moon at first quarter**
3	Sun	Facing south at dusk look for the moon hang about 1° below Antares
9	**Sat**	**Full Moon**
11	Mon	Looking east as the moon rises, Saturn trails the moon by about 5°
12-13	Tue-Wed	Peak of the Perseid meteor shower all night but moon will be bright
16	**Sat**	**Moon at last quarter**

OFFICERS AND VOLUNTEER POSITIONS

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Vice-President
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Refreshment Coordinator
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Web and Email
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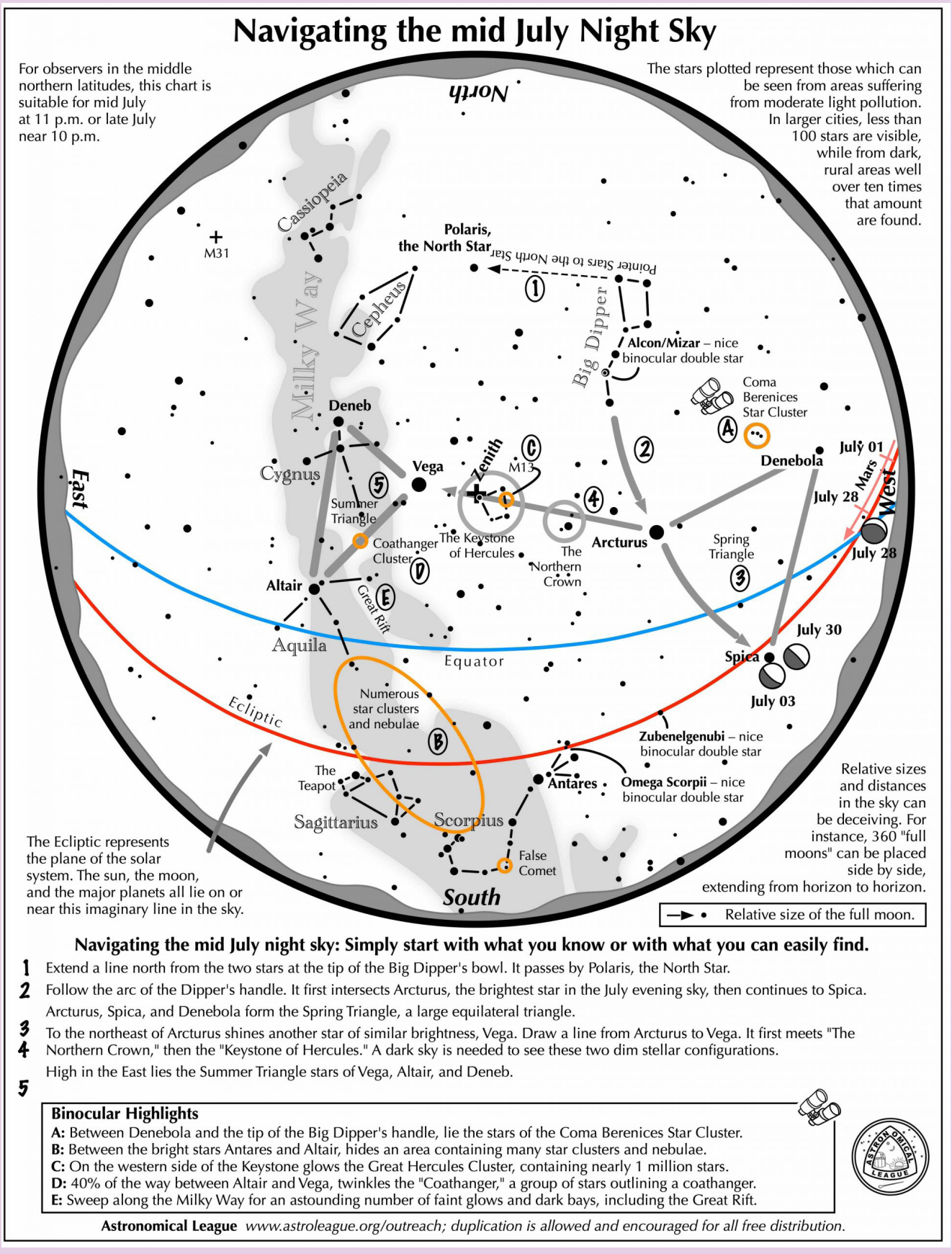
info@trivalleystargazers.org

TVS E-Group
To Join the TVS E-Group just send an email to TVS at info@trivalleystargazers.org asking to join the group. Make sure you specify the email address you want to use to read and post to the group.

NAVIGATING THE NIGHT SKY FOR JULY



Download pdf here: https://www.astroleague.org/wp-content/uploads/2025/06/2025-July.pdf

NASA NIGHT SKY NOTES

Spy the Scorpion

By Kat Troche

As summer deepens in the Northern Hemisphere, a familiar constellation rises with the galactic core of the Milky Way each evening: Scorpius the Scorpion. One of the twelve zodiacal constellations, Scorpius contains many notable objects, making it an observer's delight during the warmer months. Here are some items to spy in July:

The star map of the Scorpius constellation highlights the star Antares and several notable deep-sky objects like the Rho Ophiuchi Complex, Messier 4, the Cat's Paw Nebula, and Caldwell 76, the Baby Scorpion Cluster. Credit: Stellarium Web

- Antares: referred to as "the heart of the scorpion," this supergiant has a distinct reddish hue and is visible to the naked eye. If you have good skies, try to split this binary star with a medium-sized telescope. Antares is a double star with a white main-sequence companion that comes in at a 5.4 magnitude.
- Messier 4: one of the easiest globular clusters to find, M4 is the closest of these star clusters to Earth at 5,500 light years. With a magnitude of about 5.6, you can spot this with a small or medium-sized telescope in average skies. Darker

skies will reveal the bright core. Use Antares as a guide star for this short trip across the sky.

- Caldwell 76: If you prefer open star clusters, locate C76, also known as the Baby Scorpion Cluster, right where the 'stinger' of Scorpius starts to curve. At a magnitude of 2.6, it is slightly brighter than M4, albeit smaller, and can be spotted with binoculars and the naked eye under good sky conditions.

A digital map of the Rho Ophiuchi Complex. Credit: Stellarium Web

Lastly, if you have an astrophotography set up, capture the Cat's Paw Nebula near the stinger of Scorpius. You can also capture the Rho Ophiuchi cloud complex in the nearby constellation Ophiuchus. Brilliant Antares can be found at the center of this wondrous structure.

Manaiakalani

While many cultures tell tales of a 'scorpion' in the sky, several Polynesian cultures see the same stars as the demigod Māui's fishhook, Manaiakalani. It is said that Māui didn't just use his hook for giant fish in the sea, but to pull new islands from the bottom of the ocean. There are many references to the Milky Way representing a fish. As Manaiakalani rises from the southeast, it appears to pull the great celestial fish across a glittering sea of stars.

Measure Your Darkness

While you can use smartphone apps or dedicated devices like a Sky Quality Meter, Scorpius is a great constellation to measure your sky darkness with! On a clear night, can you trail the curve of the tail? Can you see the scorpion's heart? Use our free printable Dark Sky Wheel, featuring the stars of Scorpius on one side and Orion on the other for measurements during cooler months. You can find this resource and more in the Big Astronomy Toolkit.

JWST Rho Ophiuchi: https://webbtelescope.org/contents/media/images/2023/128/01H449193V5Q4Q6GFBKXAZ3S03

ADDITIONAL LINKS:

Messier 4: https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubble-messier-catalog/messier-4/
Caldwell 76: https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubble-caldwell-catalog/caldwell-76/
Cat's Paw Nebula: https://www.nasa.gov/image-article/newborn-stars-blow-bubbles-cats-paw-nebula/
Rho Ophiuchi: https://apod.nasa.gov/apod/ap190513.html
Manaiakalani: https://archive.hokulea.com/ike/hookele/hawaiian_star_lines.html#manaiakalani
Dark Sky Wheel: https://nightsky.jpl.nasa.gov/news/337/
Big Astronomy Toolkit: https://nightsky.jpl.nasa.gov/news/341/

This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Tri-Valley Stargazers
P.O. Box 2476
Livermore, CA 94551
www.trivalleystargazers.org

Tri-Valley Stargazers Membership Application

Contact information:

Name: _____ Phone: _____

Street Address: _____

City, State, Zip: _____

Email Address: _____

Status (select one): _____ New member _____ Renewing or returning member

Membership category (select one): Membership term is for one calendar year, January through December.

_____ Student member ($10). Must be a full-time high-school or college student.

_____ Regular member ($30).

Hidden Hill Observatory Access (optional): Must be 18 or older.

_____ One-time key deposit ($20). This is a refundable deposit for a key to H2O. New key holders must first hear an orientation lecture and sign a usage agreement form before using the observing site.

_____ Annual access fee ($10). You must also be a key holder to access the site.

Donation (optional):

_____ Tax-deductible contribution to Tri-Valley Stargazers

Total enclosed: $ _____

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function. TVS will not share information with anyone except as detailed in our Privacy Policy (http://www.trivalleystargazers.org/privacy.shtml).

Mail this completed form along with a check to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551.