

PrimeFocus

July 2024



WHEN:

July 19, 2024
Doors open at 7:00pm
Meeting at 7:30pm
Lecture at 8:00pm

WHERE:

Unitarian Church
1893 North Vasco Rd.
Livermore, CA 94551
and via Zoom

TVS QR CODE

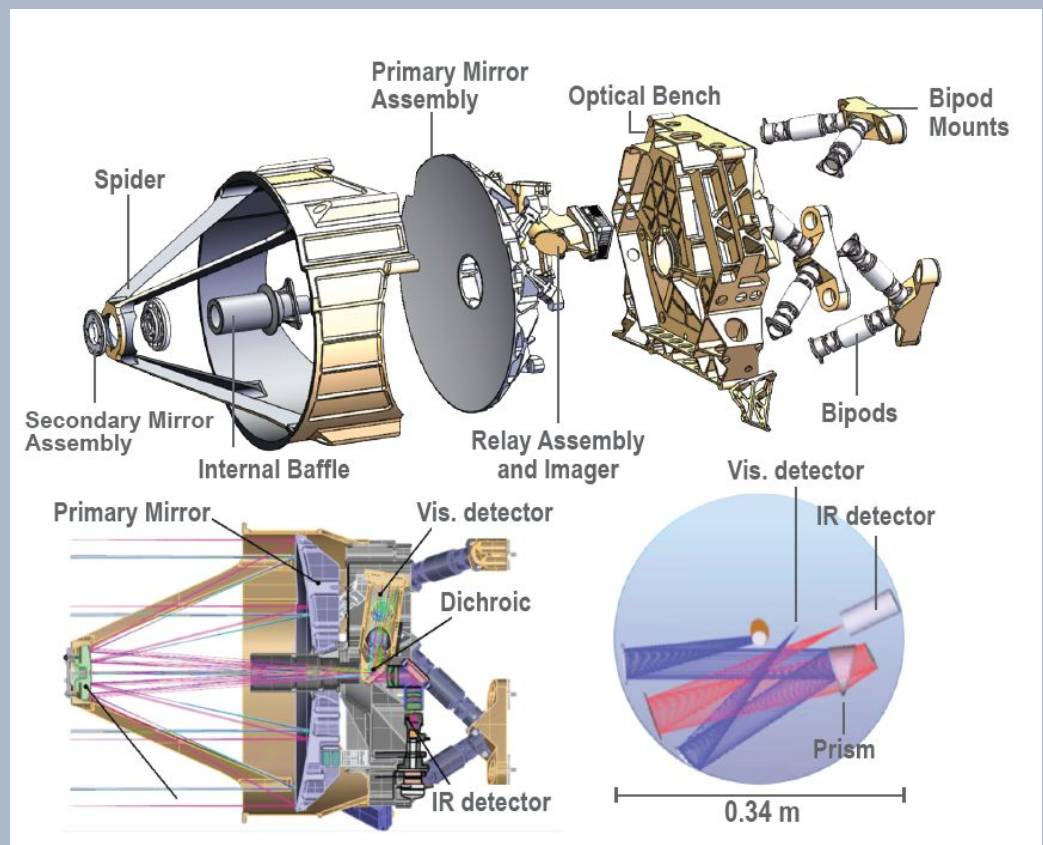


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THE PANDORA SMALLSAT: CHARACTERIZING EXOPLANETS FROM A LOW-COST SPACE TELESCOPE DR THOMAS BARCLAY

The Pandora SmallSat is a NASA flight project designed to study the atmospheres of exoplanets. Transmission spectroscopy of transiting exoplanets provides our best opportunity to identify the makeup of planetary atmospheres in the coming decade. Stellar brightness variations due to star spots, however, have been shown to contaminate the observed spectra in these high-precision measurements. Pandora will collect long-duration photometric observations to constrain star spot covering fractions of exoplanet host stars, enabling star and planet signals to be disentangled in transmission spectra to reliably determine exoplanet atmosphere compositions. Pandora will observe exoplanets with sizes ranging from Earth-size to Jupiter-size and host stars spanning mid-K to late-M spectral types. Pandora was selected in early 2021 as part of NASA's Astrophysics Pioneers Program and is intended to be ready for launch in 2025.



Pandora CODA Telescope Concept. Credit: NASA Goddard.

Dr. Thomas Barclay is an Astrophysicist at NASA Goddard Space Flight Center where he is the Operations Project Scientist for the Nancy Grace Roman Space

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Pandora SmallSat Continued

Telescope, and Deputy Project Scientist for the Pandora SmallSat. He was previously at NASA Ames Research Center where his work with the astronomical community led to thousands of astrophysical and planetary science discoveries including new planets, galaxies and supernovae using the Kepler Spacecraft. Dr. Barclay uses data from both ground and space-based telescopes to study exoplanets and their host stars. Dr. Barclay received his Ph.D. from the University College London in 2011. He has participated in the discovery of over 800 exoplanets and is known for his discovery of Kepler-37b, a planet about the size of the Moon that is the smallest planet known outside of our Solar System.

NEWS AND NOTES

2024 Meeting Dates

Club Meeting	Board Meeting	PrimeFocus Deadline
Jul. 19	Jul. 22	Jul. 4
Aug. 16	Aug. 19	Aug. 3
Sept. 20	Sept. 23	Sept. 3

Money Matters

As of the last Treasurer's Report on 6/24/24, our club's account balance is \$54,768.73, this includes \$26,147.47 in the H2O Rebuild fund.

TVS Welcomes New Members

TVS welcomes new members Riley Mullinix, Julio Laguardia, Ravi Papolu, Alex Dannenbaum, Amanda Pepper, Vamsi Punyamurtula, Hongbo Feng, Jaegon Lee, Mitchell Koerner, & Ahmad Abuisneineh. Please say hello and chat with him during our meetings.

2024 TVS Club Star Party Schedule

Save the dates for the 2024 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.

August 10: Club/public star party at Del Valle Arroyo Road Staging Area. Set-up at 7:30pm, Observing 7:30 until 10:00pm.

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.

August 31: Tesla Vintner's Star Party, 5143 Tesla Rd., Livermore. Set-up at 7:30pm, Observing 8:15-Midnight.

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.

Sept 28: H2O Open House, at 5pm the caravan to H2O PROMPTLY leaves the corner of Mines and Tesla Rds., Livermore. Observing until 11:30pm.

July 12-13: Public stargazing at Glacier Point in Yosemite National Park; 5:00-11:00pm; We are happy to announce the return of the outreach star party at Glacier Point in Yosemite National Park after a several year hiatus due to COVID and road construction. In return for setting up our telescopes and binoculars at Glacier Point for the public to look through, we get free admission to the park, and free camping (typically at the nearby Bridal Veil Creek campground). The moon will be near first quarter, so it will set about midnight Friday night, and about 12:30 am Saturday night / Sunday morning. We will have our usual Saturday evening pot luck, and TVS will provide hamburgers, hot dogs and veggie burgers. Due to limited park staffing, the park has scheduled about half of the usual number of public astronomy events this summer. Therefore, we are sharing the camp site with the East Bay Astronomical Society (EAS). We are limited to 15 people total, depending on how many come from EAS, so you must sign up ahead of time by sending an email to outreach@trivalleystargazers.org. Also, let me know how many people in your group, how many telescopes, how many nights, and what you want for dinner Saturday. Due to the limited space available at the campground, we may need to limit the number of TVS attendees. Priority will be given to those who can commit to participating both nights, who have a minimum number of non-astronomer guests, and who sign up early. We may need to share tents and/or carpool.

CALENDAR OF EVENTS

July 19, 20, 26, 27, August 2, 3, 9, 10, 7:30-10:30 PM

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://chabot.space.org/events/events-listing/>

August 19, 7:30 PM

What Mapping our Galactic Backyard
Who California Academy of Sciences
Where Morrison Planetarium; 55 Music Concourse Drive, San Francisco, CA 94118
Cost Public: \$15; Members and seniors: \$12

Join us on a journey through the Sun's galactic backyard as we explore our corner of our home galaxy, the Milky Way. Using the latest 3D models enabled by the Gaia space astrometry mission, we will map the nearest 10,000 light years around our solar system, revealing nebulous clouds of interstellar gas, giant cavities carved out by powerful supernova explosions, and a colossal wave-like structure along the closest spiral arm to Earth. We will discuss how these gaseous structures are shaping and being shaped by the youngest generation of stars, and how us Earthlings are

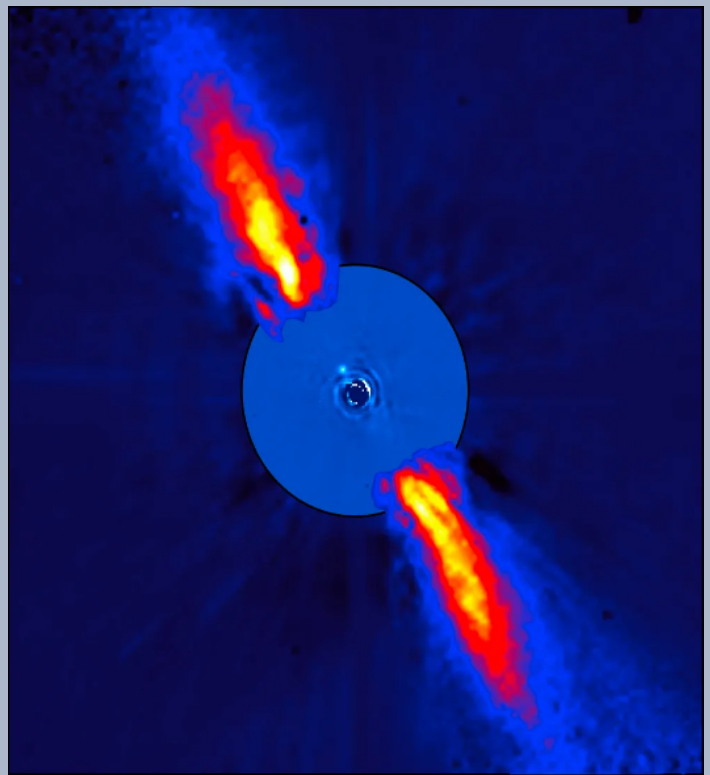
JWST WITNESSES BIRTH PANGS OF PLANETARY SYSTEMS SAANIKA KULKARNI

The James Webb Space Telescope (JWST), astronomy's newest marvel, is proving its scientific capability. In a recent observation, JWST trained its powerful infrared eye on Beta Pictoris, a young star just 63 light-years away. What it captured wasn't a pristine image

getting a front-row seat to all the action as we voyage through the Milky Way

Catherine Zucker is an astrophysicist at the Center for Astrophysics | Harvard & Smithsonian. She received her B.A. in astrophysics from the University of Virginia and M.A. and Ph.D. in Astronomy from Harvard University. Before joining the Center for Astrophysics in 2023, she spent two years as a Hubble Fellow at the Space Telescope Science Institute. She leverages large surveys of the sky in combination with new data science and data visualization techniques to produce new models of our Milky Way galaxy, with the goal of better understanding how stars like the Sun are born.

For more information, see:
<https://www.calacademy.org/events/benjamin-dean-astronomy-lectures/mapping-our-galactic-backyard>



Beta Pictoris as seen in infrared. Credit: NASA Science

of a distant sun, but the aftermath of a celestial brawl – a colossal collision of asteroids within the last two decades. This discovery offers a unique window into the violent processes that sculpt planetary systems during their infancy.

A Dusty Aftermath

Beta Pictoris is no stranger to astronomers. It's

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JWST Witnesses Birth Pangs Continued

surrounded by a vast disk of dust and gas (called infrared excess), a telltale sign of ongoing planet formation. However, this dusty shroud also makes it difficult for traditional telescopes to see what's happening within the system. This is where JWST shines. Its infrared capabilities allow it to pierce through the dust and reveal the hidden secrets of Beta Pictoris.

The data revealed a significant increase in dust emission around the star. This newfound dust is likely debris from a massive asteroid collision, with the impact estimated to have released 200 times the amount of dust produced by the asteroid belt in our own solar system each year. This colossal event offers a glimpse into the chaotic period of planetary system formation, where violent collisions and interactions between celestial bodies are commonplace.

Clues to Planetary Formation

The JWST observation provides valuable insights into two key aspects of planet formation: (1) Building Blocks: Asteroids and dust are the raw materials from which planets are born. Their collision and subsequent shattering create smaller particles that eventually coalesce into planets and moons. By studying the aftermath of such collisions, astronomers can gain a better understanding of the composition and distribution of these building blocks in young planetary systems, and

(2) A Dynamic Process: Planetary formation isn't a serene ballet. It's a tumultuous period marked by frequent collisions and gravitational interactions. Witnessing a recent collision around Beta Pictoris allows astronomers to directly observe this dynamism and refine their models of how planetary systems take shape.

Beyond Beta Pictoris

The JWST observation of Beta Pictoris is just the beginning. The telescope's ability to peer through dust clouds in infrared light makes it ideally suited to study young stellar systems where planet formation is still ongoing. Astronomers plan to use JWST to observe other dusty environments around young stars, potentially uncovering additional evidence of collisions and gaining a more comprehensive picture of the messy, yet fascinating, process of planetary birth.

A New Era of Discovery

The JWST's success highlights a new era in astronomy. Its advanced technology allows us to peer deeper into the universe and observe celestial phenomena that were previously hidden from view. This groundbreaking discovery demonstrates the power of JWST to revolutionize our understanding of planetary systems, from their infancy to their mature stages. As JWST continues its mission, we can expect even more exciting discoveries that will reshape our knowledge of the universe and our place within it.

OFFICERS AND VOLUNTEER POSITIONS

Officers	Club Star Party Coordinator	Night Sky Network Rep.	Refreshment Coordinator
President Ron Kane president@trivalleystargazers.org	Eric Dueltgen coordinator@trivalleystargazers.org	Ross Gaunt nnsn@trivalleystargazers.org	OPEN
Vice-President Eric Dueltgen vice_president@trivalleystargazers.org	Del Valle Coordinator David Wright delvalle@trivalleystargazers.org	H2O Observatory Director / Rebuild Chairman Chuck Grant H2O@trivalleystargazers.org	Web and Email www.trivalleystargazers.org info@trivalleystargazers.org
Treasurer John Forrest treasurer@trivalleystargazers.org	Historian OPEN historian@trivalleystargazers.org	Observing Program Coordinator Ron Kane awards@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.
Secretary David Lackey secretary@trivalleystargazers.org	Librarian Ron Kane librarian@trivalleystargazers.org	Outreach Coordinator Eric Dueltgen outreach@trivalleystargazers.org	
Past President Roland Albers past_president@trivalleystargazers.org	Loaner Scope Manager Ron Kane telescopes@trivalleystargazers.org	Potluck Coordinator OPEN potluck@trivalleystargazers.org	
Volunteer Positions	Newsletter Scott Schneider (Editor) Saanika Kulkarni (Contributing Editor) newsletter@trivalleystargazers.org	Program Coordinator Dan Helmer programs@trivalleystargazers.org	
Astronomical League Rep. Don Dossa alrep@trivalleystargazers.org	Webmaster Swaroop Shere webmaster@trivalleystargazers.org	Publicity and Fundraising OPEN publicity@trivalleystargazers.org	



M51, The Whirlpool Galaxy, by Ashish Joshi

LRGBHa, 6hr 47min total integration, taken with Sharpstar SCA260 and ASI2600mm Pro Camera

For a full resolution image see <https://www.astrobin.com/z2msvd/>



IC434, The Horsehead And Flame Nebula, by Ashish Joshi

HaSII, 5hr integration, taken with Askar FRA500 and ASI2600mm Pro Camera

See the full resolution image: <https://www.astrobin.com/9klck2/>

WHATS UP

Adapted from Sky & Telescope

All times are Pacific Standard Time

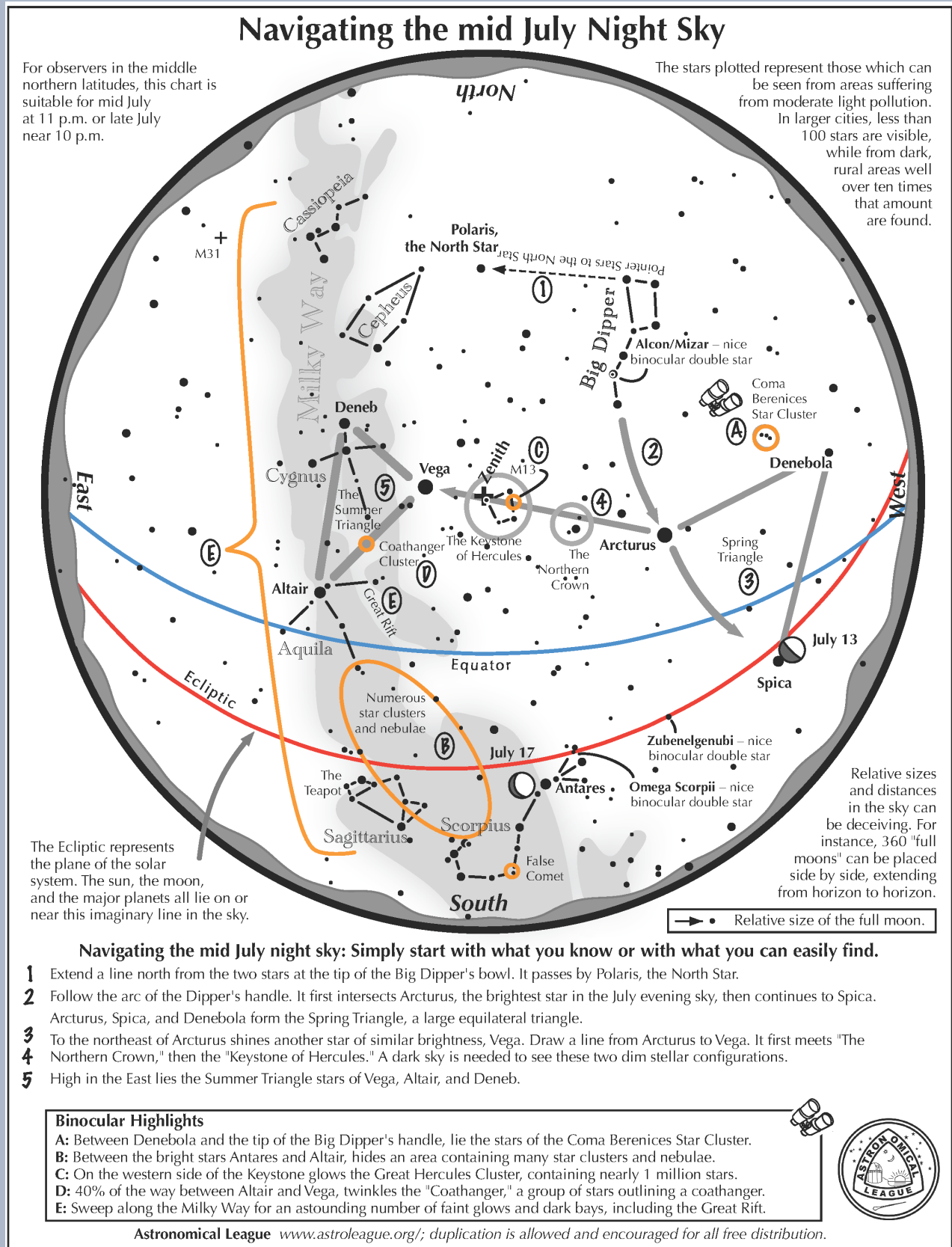
July 2024

- 17 Wed In the evening, Moon is 3.5° left of the heart of Scorpius, Antares
- 20 Sat Look for comet 13P/Olbers low in the northwest just after sunset on its closest approach to Earth
- 21 Sun Full Moon**
- 24 Wed Look toward the east-southeast to see Saturn with the waning gibbous Moon following in the evening.
- 28 Sun Moon at last quarter
- 29-31 Mon - In the morning see the waning crescent Moon, Jupiter, Mars, Aldebaran, and the Pleiades gather in
Wed above the Eastern horizon

August 2024

- 2 Fri At dawn facing east-northeast, see the Moon about 6° right of Castor and Pollux
- 4 Sun New Moon**
- 5 Mon Moon is $\frac{1}{2}^\circ$ above Venus low near the west-northwest horizon at dusk
- 9 Tue Moon leads Spica by about $4\frac{1}{2}^\circ$ at dusk as they sink together toward the west-southwest
- 11-12 Sun - All night long the Perseid Meteor Shower is expected to peak
Mon
- 12 Mon Moon at first quarter
- 14 Wed Mars and Jupiter will be $\frac{1}{2}^\circ$ apart in the early morning greeting those who are earlier risers

NAVIGATING THE NIGHT SKY FOR JULY



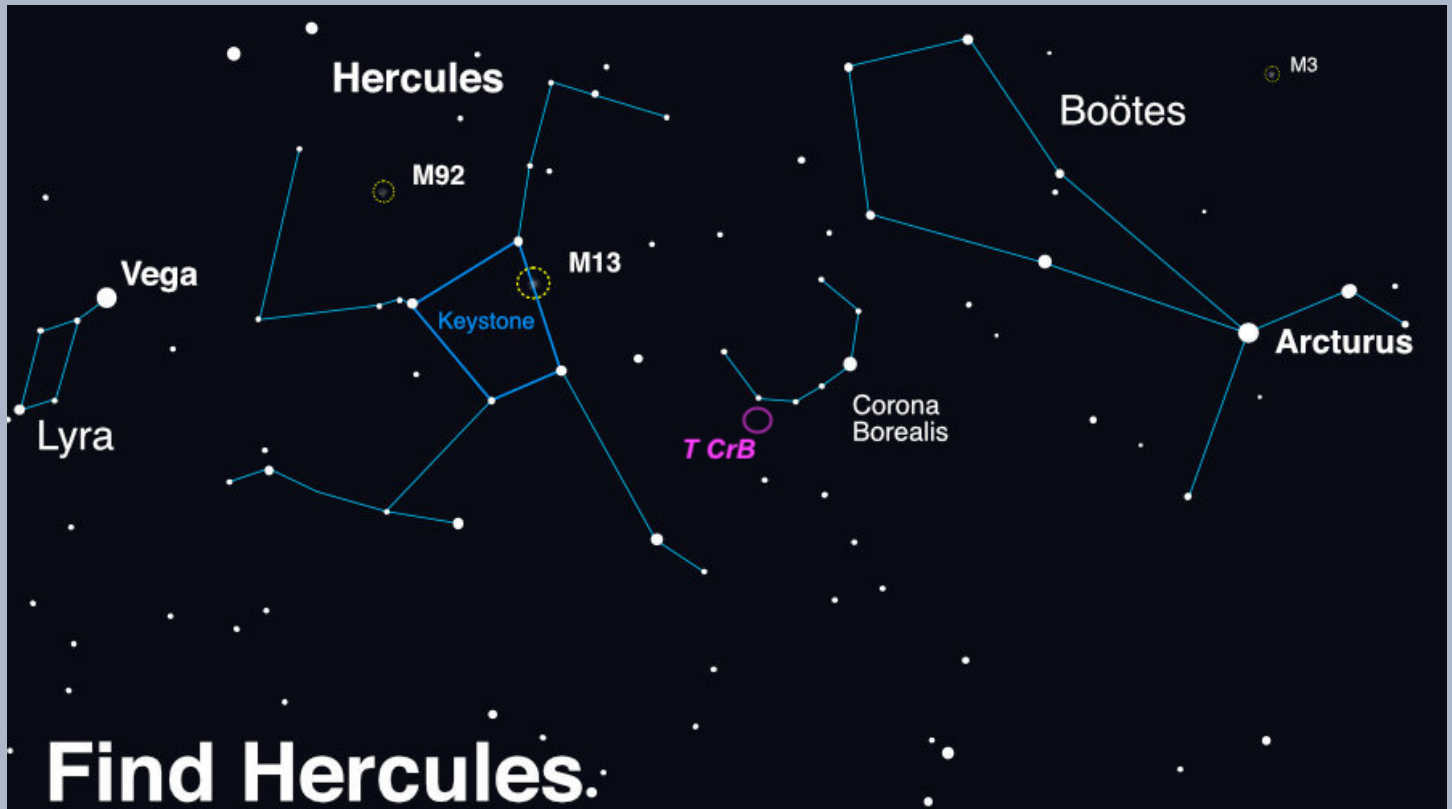
Download pdf here: <https://www.astroleague.org/wp-content/uploads/2024/06/2024-July.pdf>

NASA NIGHT SKY NOTES

A Hero, A Crown, and Possibly a Nova

By Vivian White

High in the summer sky, the constellation Hercules acts as a centerpiece for late-night stargazers. At the center of Hercules is the “Keystone,” a near-perfect square shape between the bright stars Vega and Arcturus that is easy to recognize and can serve as a guidepost for some amazing sights. While not the brightest stars, the shape of the hero's torso, like a smaller Orion, is nearly directly overhead after sunset. Along the edge of this square, you can find a most magnificent jewel - the Great Globular Cluster of Hercules, also known as Messier 13.



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 (and a smaller globular cluster M92). If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org

Globular clusters are a tight ball of very old stars, closer together than stars near us. These clusters orbit the center of our Milky Way like tight swarms of bees. One of the most famous short stories, Nightfall by Isaac Asimov, imagines a civilization living on a planet within one of these star clusters. They are surrounded by so many stars so near that it is always daytime except for once every millennium, when a special alignment (including a solar eclipse) occurs, plunging their planet into darkness momentarily. The sudden night reveals so many stars that it drives the inhabitants mad.

Back here on our home planet Earth, we are lucky enough to experience skies full of stars, a beautiful Moon, and regular eclipses. On a clear night this summer, take time to look up into the Keystone of Hercules and follow this sky chart to the Great Globular Cluster of Hercules. A pair of binoculars will show a faint, fuzzy patch, while a small telescope will resolve some of the stars in this globular cluster.



A red giant star and white dwarf orbit each other in this animation of a nova similar to T Coronae Borealis. The red giant is a large sphere in shades of red, orange, and white, with the side facing the white dwarf the lightest shades. The white dwarf is hidden in a bright glow of white and yellows, which represent an accretion disk around the star. A stream of material, shown as a diffuse cloud of red, flows from the red giant to the white dwarf. When the red giant moves behind the white dwarf, a nova explosion on the white dwarf ignites, creating a ball of ejected nova material shown in pale orange. After the fog of material clears, a small white spot remains, indicating that the white dwarf has survived the explosion. NASA/Goddard Space Flight Center

Bonus! Between Hercules and the ice-cream-cone-shaped Boötes constellation, you'll find the small constellation Corona Borealis, shaped like the letter "C." Astronomers around the world are watching T Coronae Borealis, also known as the "Blaze Star" in this constellation closely because it is predicted to go nova sometime this summer. There are only 5 known nova stars in the whole galaxy. It is a rare observable event and you can take part in the fun! The Astronomical League has issued a Special Observing Challenge that anyone can participate in. Just make a sketch of the constellation now (you won't be able to see the nova) and then make another sketch once it goes nova.

Tune into our mid-month article on the Night Sky Network page, as we prepare for the Perseids! Keep looking up!



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.