# Observations

A Monthly Publication Of The CHESTER COUNTY ASTRONOMICAL SOCIETY

*Vol. 33, No. 6* ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *June 2025*


## In This Issue



## Membership Renewals Due

| | |
|---|---|
| 06/2025 | Crabb |
| | Curry |
| | Dautrich, Chris |
| | Dautrich, Cindy |
| | Dhargalkar |
| | Hanspal |
| | Harris |
| | Hebding |
| | Lindtner |
| | Mazziotta & Calobrisi |
| | O'Neill |
| | Scott |
| | Thomas |
| 07/2025 | Beidler |
| | Hunsinger |
| | McGuigan |
| | Morgan |
| | Piehl |
| | Ramadoss |
| | Rauenzahn |
| 08/2025 | Borowski |
| | Johnston & Stein |
| | Kellar |
| | Knabb |
| | Lurcott, L. |
| | Manigly |
| | Schultz |
| | Tiedemann |
| | Trunk |
| | Zullitti |

## Deimos Before Sunrise


*Deimos captured before sunrise by Perseverance on March 1, the 1,433rd sol of the Mars rover's mission. Regulus and Algieba, bright stars in the constellation Leo, are also visible in the dark Martian predawn sky. Image Credit: NASA, JPL-Caltech*

## June 2025 Dates

**2nd** • First Quarter Moon, 11:40 p.m. EDT.

**11th** • Full Moon, the Strawberry Moon, 3:43 a.m. EDT.

**16th** • Mars passes 0.8° north of Regulus, midnight EDT.

**18th** • Last Quarter Moon, 3:19 p.m. EDT.

**18th** • The Moon passes 3° north of Saturn, midnight EDT.

**18th** • The Moon passes 2° north of Neptune, midnight EDT.

**22nd** • The Moon passes 7° north of Venus, 5 a.m. EDT.

**22nd** • The Moon passes 5° north of Uranus, midnight EDT.

**25th** • New Moon, 6:31 a.m. EDT.

## CCAS Upcoming Nights Out

In addition to our monthly observing sessions at the Myrick Conservancy Center, BRC (for directions, see pg. 13), CCAS schedules special "nights out" throughout the year. Members are encouraged to help out during these events any way they can. See below for more information.

☼ Friday, June 20, 2025 - CCAS special observing event: Star Party with Chester County Parks and Coatesville Library, 8:30 p.m. to 10:30 p.m. EDT, at Hibernia Park. (Rain date: June 21st same time.)

☼ Saturday, June 21, 2025 - CCAS Special Observing Session "FamilyFest" at the American Helicopter Museum, West Chester, PA. from 10 a.m. - 3 p.m. EDT.

☼ Friday, June 27, 2025 - CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

For more information about future observing opportunities, contact our Observing Chair, Don Miller.

## Spring/Summer Society Events

### June 2025

**19th-22nd** • Cherry Springs Star Party. Presented by the Astronomical Society of Harrisburg, Harrisburg, PA. Cherry Springs State Park, Coudersport, PA. For more information, contact our Observing Chair, For more information, contact our Observing Chair, Don Miller.

**20th** • Open call for articles and photographs for the July 2025 edition of Observations.

**20th** • CCAS special observing event: Star Party with Chester County Parks and Coatesville Library, 8:30 p.m. to 10:30 p.m. EDT, at Hibernia Park. (Rain date: June 21st same time.) or more information, contact our Observing Chair, For more information, contact our Observing Chair, Don Miller.

**20th** • Friday Night Lights Star Party, 7:00-10:00 p.m. EDT, ChesLen Preserve, Coatesville, PA. This is a fundraiser for the Natural Lands Trust where music is provided. Several local astronomy clubs set up telescopes for the concert goers to view the night sky during the event. For more information, contact our Observing Chair, Don Miller.

**20th** • Solstice (northern summer/southern winter begins), 11 p.m. EDT.

**21st** • CCAS Special Observing Session "FamilyFest" at the American Helicopter Museum, West Chester, PA. from 10 a.m. - 3 p.m. EDT. For more information, contact our Observing Chair, Don Miller.

**25th-28th** • Green Bank Star Quest XX. National Radio Observatory, Green Bank, West Virginia.

**25th-29th** • York County Spring Star Party. Susquehannock State Park, 1880 Park Dr, Drumore, PA 17518. For more information, contact our Observing Chair, Don Miller.

**26th** • Deadline for newsletter submissions for the July 2025 edition of Observations.

**27th** - CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset. See pg. 17 for map and directions.

### July 2025

**18th** • CCAS Special Observing Session, Battle of the Clouds, 8:30 p.m. to 10:30 p.m. EDT. Cohosted by the Chester County Library System. (Rain date: July 19th.) For more information, contact our Observing Chair, Don Miller.

**20th** • Open call for articles and photographs for the August 2025 edition of Observations.

**22nd-25th** • CCAS Special Camping Trip & Observing Session at Cherry Springs State Park, Coudersport, PA. For more information, contact our Observing Chair, Don Miller.

**24th-27th** • Stellafane Convention. The 88th Convention of Amateur Telescope Makers on Breezy Hill in Springfield, Vermont. Sponsored by the Springfield Telescope Makers, Inc.

**25th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset. See pg. 17 for map and directions.

**26th** • Deadline for newsletter submissions for the August 2025 edition of Observations.

## May 2025 Meeting Minutes

*by Bea Mazziotta, CCAS Secretary*

- The May 2025 meeting was held on May 13, 2025, at West Chester University and online via Zoom and YouTube.
- Club President Dave Hockenberry welcomed members and guests
- Observing Chair Don Miller reviewed the upcoming events and observing calendar. The calendar with details is available at ccas.us. He reviewed some of the highlights of the May night sky, noting two Globular Clusters which are in constellations that are relatively close to home - M4 in Scorpius and M5 in Serpens. Don also briefly spoke about recent funding cuts that will affect scientific research in general and space exploration in particular. He noted that the Nancy Grace Roman Telescope may not launch due to these cuts. That would be a huge loss. You can make your support for science known by telling your representatives that funding scientific research is important and benefits everyone.
- Don Knabb noted that a CCAS member was awarded a third place Horkheimer journalism award. Look for details in the newsletter. Don presented Kathy Buczynski with her Nightsky Network pin for community outreach. He also reminded members about a lending telescope that is available and informed them that two smaller telescopes may be available for purchase. Please contact Don for further details.
- Bruce Ruggeri, Program Chair, announced that CCAS was able to raise enough money to award 3 scholarships to WCU science students. Recipients' names along with some biographical information will be published in the newsletter.
- Bruce went on to introduce the evening's speaker, Dr. Julien deWit. Dr. deWit holds a PhD in Planetary Science from MIT where he is also on the faculty of the Earth, Atmospheric and Planetary Sciences dept. He initiated the atmospheric exploration of the TRAPPIST-1 exoplanetary system and continues to spearhead the implementation and study of atmospheric surveys and new analytical techniques to enhance our planetary defense capabilities. His presentation was titled 'Searching for Extra-Solar Life while Defending Earth-based Life'.

## September 2025 CCAS Meeting Agenda

*by Bruce Ruggeri, CCAS Program Chair*

Our next meeting will be held on September 9, 2025, in person at West Chester University's Merion Science Center, Room 112. The Science Center is located at 720 S. Church St., West Chester, PA. Our guest speaker is Dr. Bhuvnesh Jain from the University of Pennsylvania, Dept of Astronomy and Physics. His presentation is titled "The Nature of Dark Matter and Dark Energy and their Roles in Galaxy Formation."

Please note that inclement weather or changes in speakers' schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

As for future meetings, we are looking for presenters for the coming 2025-2026 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

## Third Annual CCAS Scholarship Awards

*by Bruce Ruggeri, CCAS Program Chair*

I am pleased to announce the three West Chester University student winners of our 3rd annual CCAS Scholarship Awards for the 2025-26 academic year and present their bio sketches and photos to our CCAS members.

All three recipients were selected based upon their academic merits, their involvement in astronomy-related co-curricular and extra-curricular activities, and their future career goals and aspirations.

Our deepest thanks to Dr. Marc Gagne, Professor in the Department of Earth and Space Sciences, and colleagues for leading the academic committee which reviews and selects our CCAS Scholarship recipients each year.

All of the students expressed their deepest gratitude and appreciation to the CCAS for these awards that not only help in their ongoing undergraduate studies but have provided them with additional impetus to pursue graduate studies and careers in astronomy and planetary science-related careers.

We wish these students every success in their academic studies at West Chester and in pursuing their future studies and careers - you will shape and guide the future of astronomy, space and planetary sciences!

Many thanks to all of our CCAS members for their support of this Scholarship Fund – your generosity and continued support for this core "pillar" of our Society are greatly appreciated.

**Bio sketches and photos of the CCAS Scholarship Recipients for 2025-26:**

**Cecelia Bates** has just completed her freshman year at West Chester University as a physics major with a minor in astronomy. Her experiences

*(Continued on page 8)*

## CCAS Member Sadhvi Krishna Prasad Wins Astronomical League Award

*By Don Knabb, CCAS Treasurer & ALCOR*

*CCAS Member Sadhvi Krishna Prasad*

CCAS member Sadhvi Krishna Prasad won third place in the 2025 annual AL Horkheimer/ O'Meara Youth Journalism competition from the Astronomical Society.

Sadhvi, a self-described "a space enthusiast", lives with her family in Downingtown and is in 6th grade at the Marsh Creek Sixth Grade Center in Downingtown.

The Al Horkheimer/O'Meara Journalism Award is open to Astronomical League members between 8 and 14 years of age who are engaged in science-related writing. The winner receives a plaque and a $1,000 cash prize. Second and third place finishers receive $500. and $250. cash prizes respectively.

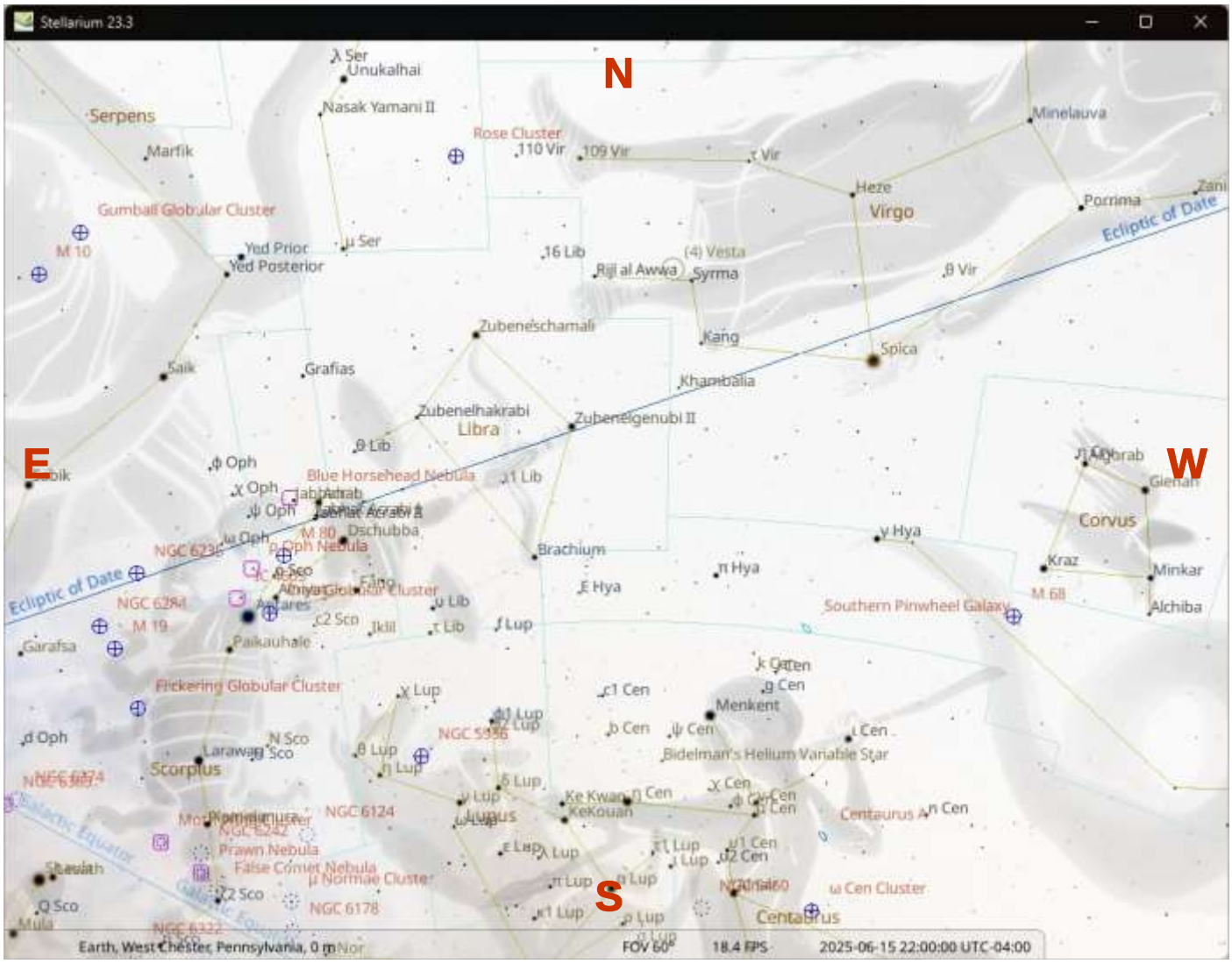
Members can be nominated by anyone, including family members. However, the must be sponsored by an Astronomical League regional officer or by an Astronomical League club officer. Only one nominee per sponsor is permitted.

Enjoy Sadhvi's essay and photos of her receiving her award from CCAS President Dave Hockenberry on pg. 9.

# The Sky Over Chester County

June 15, 2025 at 10:00 p.m. ET

Note: This screen capture is taken from Stellarium, the free planetarium software available for download at www.stellarium.org.

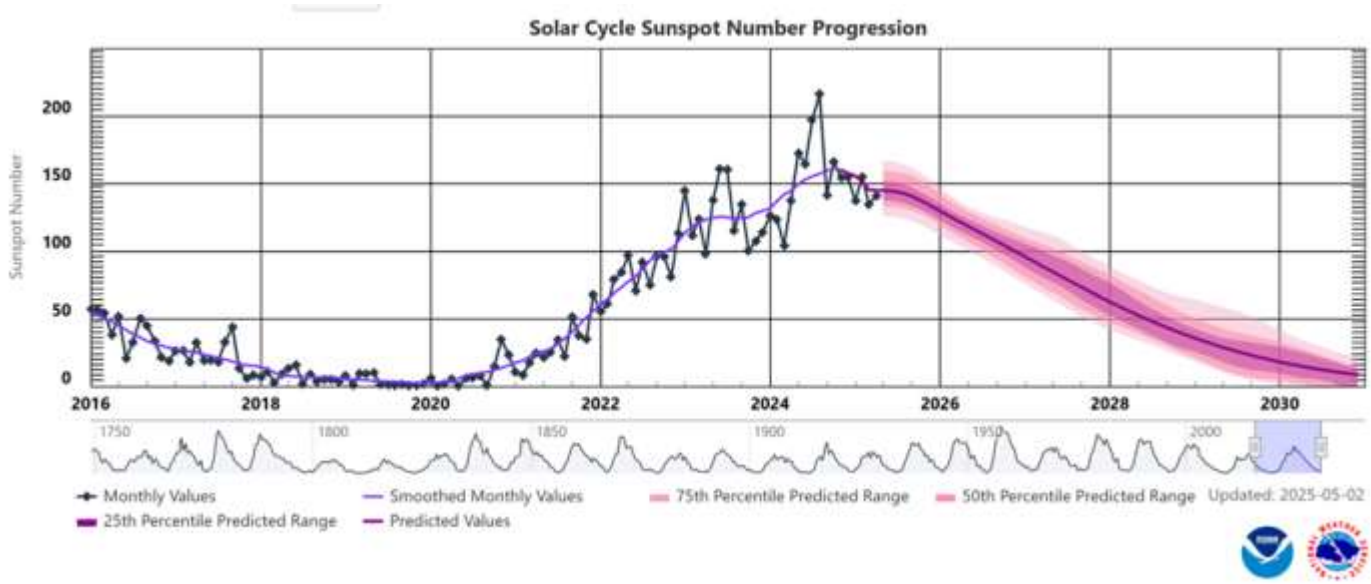



| Date | Civil Twilight Begins | Sunrise | Sunset | Civil Twilight Ends | Length of Day |
|---|---|---|---|---|---|
| 06/01/2025 | 5:03 a.m. EDT | 5:35 a.m. EDT | 8:27 p.m. EDT | 9:00 p.m. EDT | 14h 51m 55s |
| 06/15/2025 | 5:16 a.m. EDT | 5:33 a.m. EDT | 8:35 p.m. EDT | 8:41 p.m. EDT | 15h 02m 15s |
| 06/30/2025 | 5:00 a.m. EDT | 5:36 a.m. EDT | 8:24 p.m. EDT | 9:08 p.m. EDT | 14h 48m 29s |

| Moon Phases | | | | | |
|---|---|---|---|---|---|
| First Quarter | 06/02/2025 | 11:40 p.m. EDT | Full Moon | 06/11/2025 | 3:43 a.m. EDT |
| Last Quarter | 06/18/2025 | 3:19 p.m. EDT | New Moon | 06/25/2025 | 6:31 a.m. EDT |

## June 2025 Observing Highlights

*by Don Miller, CCAS Observing Chair*




*Solar Cycle Sunspot Number Progression tracking from the Space Weather Prediction Center National Oceanic and Atmospheric Administration website*

**Key Events This Month**:

The summer solstice occurs on June 20th at 10:41 p.m. EDT. Our area will have approximately 15 hours 4 minutes of daylight on that day. The sun will begin its southward journey after this date as the duration of daylight diminishes. The solstice is not the hottest day of the year given the thermal lag of the Earth, which takes another month or two to reach the highest temperatures.

June 30th is Asteroid Day in remembrance of the Tunguska event in 1908 and also to raise public awareness of the need for planetary defense from asteroids.

**Discussion**:

Now that we have some warm weather, get out those dew zappers…

**Sun:**

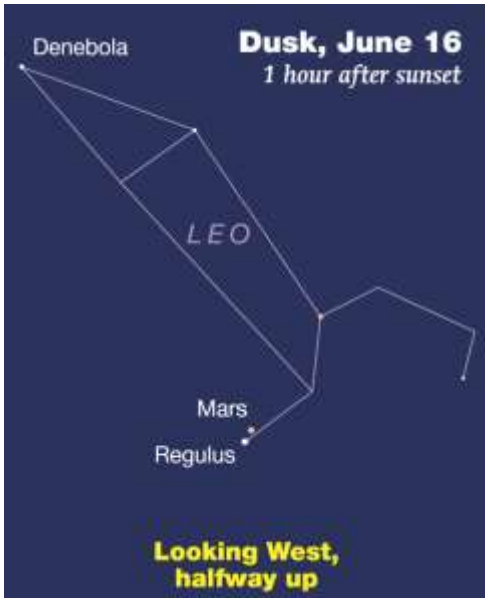
The sun is continuing its streak of zero spotless days with 67 spot number as of this writing (21 May). We have passed the peak of sunspot numbers for this solar cycle, per NOAA. (See chart above.)

**Moon**:

First quarter on the 3rd; full on the 11th; last quarter on the 18th and new on the 25th. The Native American Tribes called this month's full moon the "Strawberry Moon" given that wild strawberries ripen this month.

**Planets**:

We are entering a time of year where we will have only a few planets visible in our evening sky. In fact, this month we will only have Mars to enjoy in Leo. This planet will be very close to a first magnitude star, Regulus. The pair will make a nice color contrast given Mar's orangish red versus Regulus' blue-white (use binoculars to better see the colors, activate those cones). June 17th should be their closest approach to one another.




*Mars in Leo in June 2025*

The early morning sky will have several planets in view: Venus rises 2.5 hours before sunrise, Saturn rises around 2 a.m. EDT. Jupiter will be in conjunction with the Sun on June 24th and will not be visible.

**Select Night Sky Objects and Events**:

Two of my favorite globular clusters will be on display this month. Both appear in Hercules.

*(Continued on page 8)*

## Through the Eyepiece: Scorpius, the Big Bug of the Southern Sky

*by Don Knabb, CCAS Treasurer & ALCOR*

With summer's arrival, I always look to the south to enjoy the southern constellations during their brief visit to our Chester County skies. One needs an observing location with a low southern horizon to have a good view of these stunning constellations.

Scorpius the Scorpion is one of my favorite constellations. Isn't it nice when a constellation looks similar what it is named after?

When you see the entire constellation it's easy to see the scorpion shape. The Chinese called this grouping of stars a dragon, while the native cultures of the South Pacific saw a fishhook (it is easy to see why). The myths surrounding Scorpius explain why Scorpius rises in the east as Orion sets in the west. The Scorpion is the slayer of Orion, so they were put on opposite sides of the sky to prevent any further fighting.

It's impossible to miss the wonderful star Antares, the heart of the Scorpion. This red star is the fifteenth-brightest star in the sky. It is a supergiant star that has a diameter 700 times that of our Sun. If our Sun was replaced by Antares, we'd be really complaining about the summer heat since we'd be in the interior of the star. The star's surface would extend all the way to the orbit of Jupiter.

*(Continued on page 7)*


*Image Credit: sky map produced using Stellarium, the free planetarium software*

## Through the Eyepiece (Cont'd)

*M4. Image credit: ESO Imaging Survey - https://www.eso.org/public/usa/images/eso1235a/, CC BY 4.0, https://commons.wikimedia.org/w/index.php?curid=94663247*

*M6. Image credit: Giuseppe Donatiello from Oria (Brindisi), Italy - Messier 6 - The Butterfly Cluster, CC0, https://commons.wikimedia.org/w/index.php?curid=98058374*

*(Continued from page 6)*

There are several excellent deep sky objects in Scorpius. As you can see on the star chart, just to the right of Antares is M4. This is one of the largest and closest globular clusters in our sky and it is easy to find in any pair of binoculars. M4 is a swarm of several hundred thousand stars and is "only" 7,200 light-years away, which puts it far behind most of the stars you see around it.

Perhaps my favorite object in Scorpius is the open cluster Messier 6. M6 is called The Butterfly Cluster. In binoculars, Messier 6 stars will all appear to be around the same brightness and the 'butterfly' asterism will be unmistakable. In a telescope, many more stars will be revealed – making the namesake a bit harder to recognize, but more interesting because more stars are seen, and color is perceived. However, watch this cluster on nights when there is a little fine cloud in the sky or moonlight. You'll see the shape in a telescope quite clearly then! Be sure to use a minimum magnification when using a telescope, because this is a large open star cluster.

Robert Burnham, Jr. comments "The present author regards this as one of the most attractive clusters in the heavens for small instruments, a completely charming group whose arrangement suggests the outline of a butterfly with open wings."

Another of my favorite objects is another open cluster, Messier 7 or M7, also designated NGC 6475 and sometimes known as

*(Continued on page 15)*

## Observing (Cont'd)

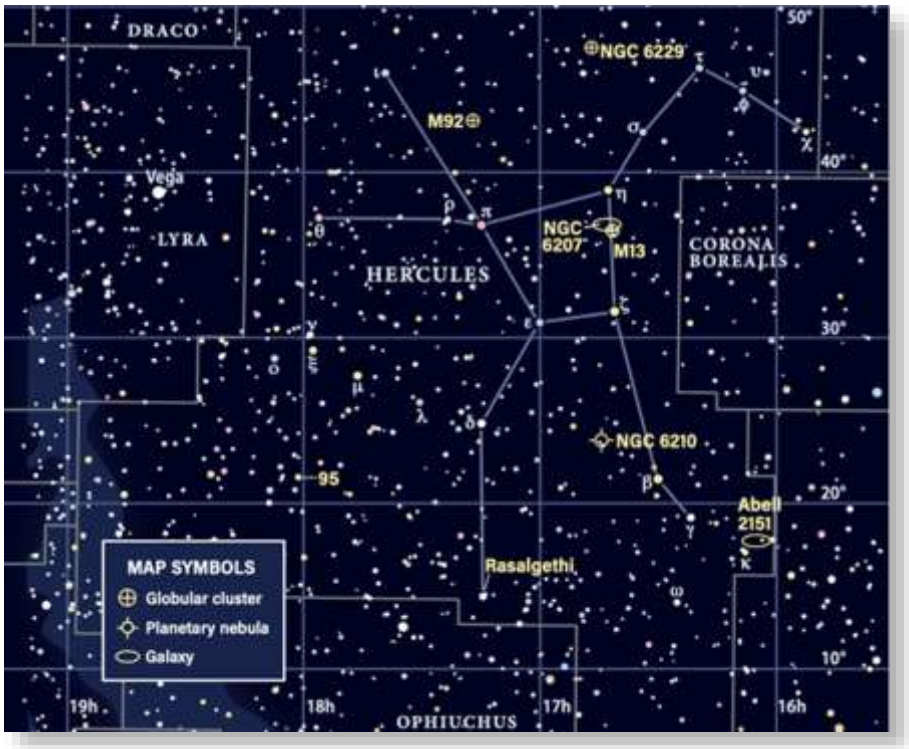
*(Continued from page 5)*

M13 and M92. The smaller, dimmer one (mag 6.5), is a bit harder to find without a go-to scope but worth it. Rather than zooming in on M13 (mag 5.8) when you're visiting this constellation, take some time to appreciate M92's beauty.

M13 is one of the sky's true jewels. You can lose yourself staring into its seemingly 3D depths. Don't rush looking at this one, take at least a few minutes to appreciate what it has to offer.

Another nearby globular cluster in this constellation is NGC 6229.

*(Continued on page 14)*




*Look for M13 and M92 in the Hercules constellation this month.*

## CCAS Scholarships (Cont'd)

*Cecelia Bates*

*Isabella Ashman*

*Kate Frederick*

*(Continued from page 3)*

have been great so far- participating in the Astronomy Club, Society of Physics Students, and Underrepresented Genders in Physics. From these clubs, the favorite events that Cecelia attended were the talks given through the CCAS and our star parties and observing events.

*(Continued on page 11)*

**Stardust Trinkets**
*by CCAS Member Sadhvi Krishna Prasad*

"In the vast expanse of the cosmos, the dreams of humanity are no longer confined to the realms of imagination. My name is Doctor Emily Thorpe, and I am at the helm of a groundbreaking initiative—Stardust Trinkets (ST). Our mission is to revolutionize space mining by providing affordable, professional mining services that prioritize the preservation of celestial bodies."

Stardust Trinkets is a space mining company that does space mining to civilians low of cost, Fastly delivered, and the rock will be handled professionally. Major advantages are not disturbing the celestial bodies from being harmed when mined, and the rock will never be harmed or lost because the robot will stop at the Space Station of Exo Genesis to make sure everything is in order. My result of the mission is a happy customer, unharmed celestial body and a reusable robot. You can pick what planet you want the rock from, and you can pick how big of a rock you want it to be.

Sit tight and listen carefully as I take you on one of my missions to get a small rock for a necklace from the planet of WASP-12b. It was August 12, 2050, and I got a call from a customer named Ms. Tweedle ordering a rock from WASP-12b for her necklace. I immediately got to work; I woke up my reusable Space mining robot, NovaRover. I programmed it at an accurate angle to go to WASP-12b, I gave it orders to pick up a little more than a rock because WASP-12b was an uncharted planet and I would like to learn more about it. After a couple hours of programming, NovaRover was on its eighty-third mission to do the fascinating subject of space mining. I monitored it on my computer as it landed. NovaRover mined a chunk equivalent to the size and weight of a peanut. NovaRover was on his way to Exo Genesis Space Station where my good friend Marty was to make sure everything is in place. As NovaRover docked and charged, Marty was checking the basics and he was stunned, mesmerized how beautiful space can be.

Once NovaRover was fully charged, it undocked and started its way to the planet we call home. As soon as NovaRover reached ST, it started to unravel. I was blown away as I saw the rock, it was a beautiful milky blue color with a hint of white mixed around. I carefully measured the rock, designed the necklace, and put it into a tiny red box to give to my customer. This mission took only twelve hours and WASP-12b wasn't harmed at all. As I gave Ms. Tweedle the rock, her eyes were filled with joy, gratitude and love. As I saw her, I decided to give another piece of rock to her for free as the only money I need is the joy in people's eyes.

As this story comes to an end, I'm sure that Stardust Trinkets and space mining will shine brightly.

*CCAS President Dave Hockenberry congratulates Sadhvi Krishna Prasad and presents her with a CCAS shirt at the May 2025 monthly meeting.*

## June's Night Sky Notes: Seasons of the Solar System

*by Kat Troche*

*This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach.*

*Visit nightsky.jpl.NASA.gov to find local clubs, events, stargazing info and more.*

Here on Earth, we undergo a changing of seasons every three months. But what about the rest of the Solar System? What does a sunny day on Mars look like? How long would a winter on Neptune be? Let's take a tour of some other planets and ask ourselves what seasons might look like there.

### Martian Autumn

Although Mars and Earth have nearly identical axial tilts, a year on Mars lasts 687 Earth days (nearly 2 Earth years) due to its average distance of 142 million miles from the Sun, making it late autumn on the red planet. This distance and a thin atmosphere make it less than perfect sweater weather. A recent weather report from Gale Crater boasted a high of -18 degrees Fahrenheit for the week of May 20, 2025.

### Seven Years of Summer

Saturn has a 27-degree tilt, very similar to the 25-degree tilt of Mars and the 23-degree tilt of Earth. But that is where the similarities end. With a 29-year orbit, a single season on the ringed planet lasts seven years. While we can't experience a Saturnian season, we can observe a ring plane crossing here on Earth instead. The most recent plane crossing took place in March 2025, allowing us to see Saturn's rings 'disappear' from view.

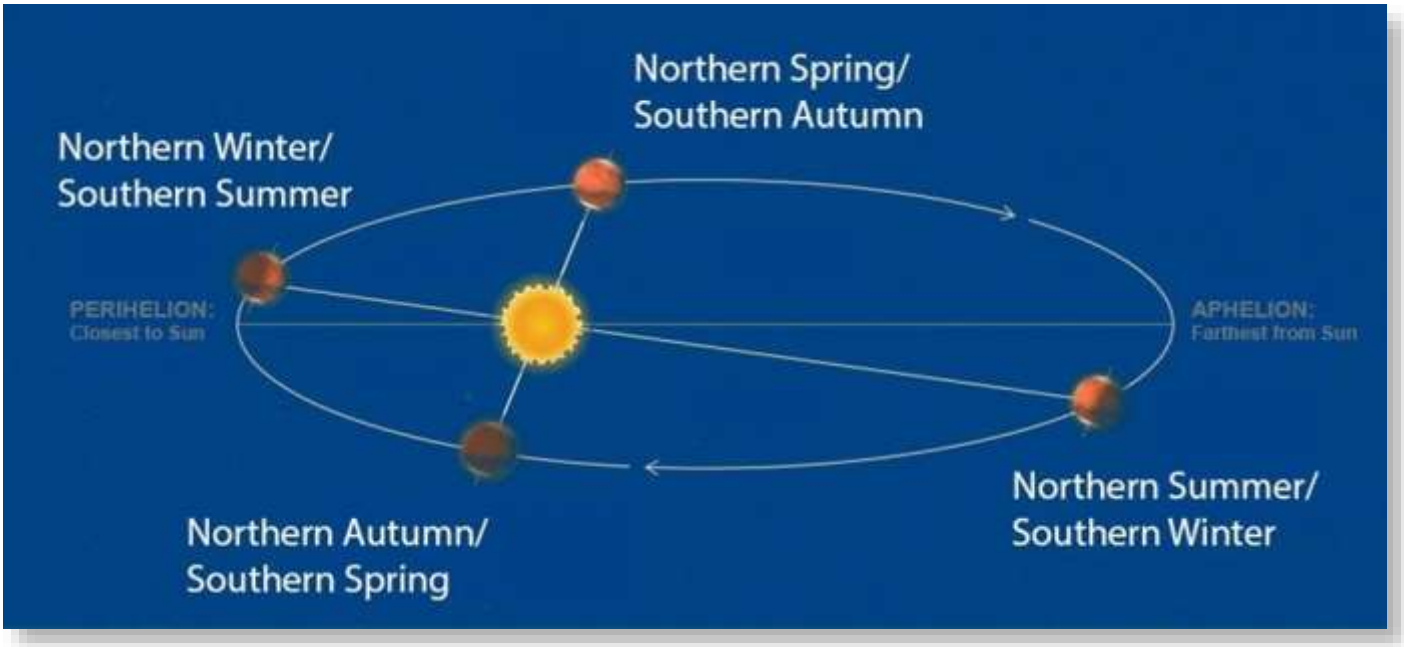
### A Lifetime of Spring

Even further away from the Sun, each season on Neptune lasts over 40 years. Although changes are slower and less dramatic than on Earth, scientists have observed seasonal activity in Neptune's atmosphere. The images on the following page were taken between 1996 and 2002 with the Hubble Space Telescope, with brightness in the

*(Continued on page 11)*


*Uranus rolls on its side with an 84-year orbit and a tilt just 8° off its orbital plane. Its odd tilt may be from a lost moon or giant impacts. Each pole gets 42 years of sunlight or darkness. Voyager 2 saw the south pole lit; now Hubble sees the north pole facing the Sun. Credit: NASA, ESA, STScI, Amy Simon (NASA-GSFC), Michael Wong (UC Berkeley); Image Processing: Joseph DePasquale (STScI)*

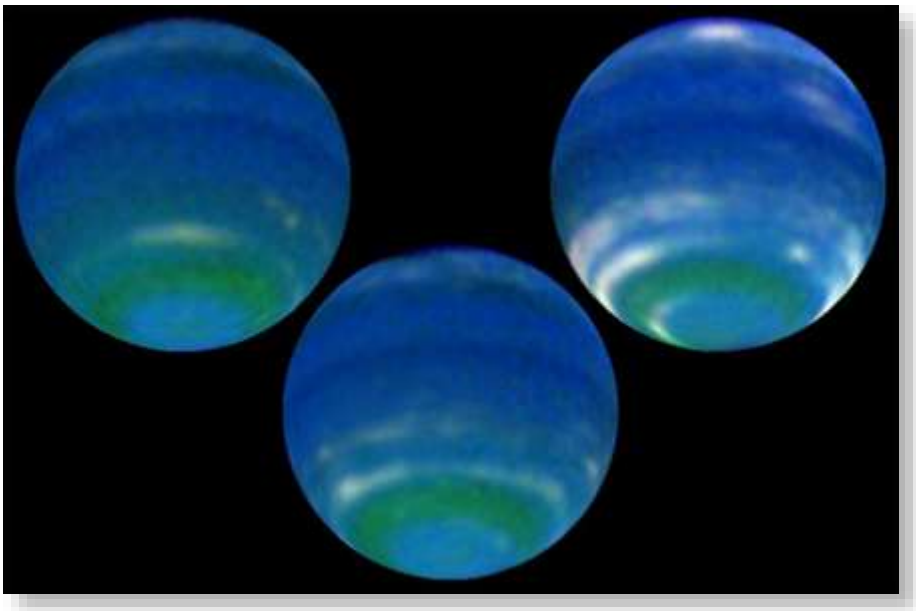
## Night Sky Notes (Cont'd)




*An artist's rendition of Mars' orbit around the Sun, and its seasons. Credit: NASA/JPL-Caltech*

*(Continued from page 10)*
southern hemisphere indicating seasonal change.

As we welcome summer here on Earth, you can build a Sun-track model that helps demonstrate the path the Sun takes through the sky during the seasons. You can find even more fun activities and resources like this model on NASA's Wavelength and Energy activity.



*NASA Hubble Space Telescope observations in August 2002 show that Neptune's brightness has increased significantly since 1996. The rise is due to an increase in the amount of clouds observed in the planet's southern hemisphere. Credit: NASA, L. Sromovsky, and P. Fry (University of Wisconsin-Madison)*

## CCAS Scholarships (Cont'd)

*(Continued from page 8)*

Despite having held an interest in astronomy for years, this year was the first time that Cecelia ever owned a telescope and setting it up to view the full moon was one of the highlights of her semester.

After completing her bachelor's degree, Cecelia aspires to continue her education and pursue a master's and doctorate in astrophysics, eventually doing her own research in astronomy; she just is not certain what subfield of astronomy that may be. Time will tell!

**Isabella Ashman** just completed her junior year at West Chester University, majoring in Geoscience. Her academic interests include planetary geoscience and geochemistry. Outside of class, Isabella spends a con-

*(Continued on page 15)*

## The New, Farthest Galaxy Has Been Found by JWST, Only 280 Million Years After the Big Bang

*by Evan Gough, courtesy of Phys.org*

The JWST has done it again. The powerful space telescope has already revealed the presence of bright galaxies only several hundred million years after the Big Bang. Now, it's sensed light from a galaxy only 280 million years after the Big Bang, the most distant galaxy ever detected.

Prior to the JWST, we had no infrared telescopes with large enough mirrors to detect light from the early galaxies. The Hubble can see near-infrared light, but only has a 2.4-meter mirror. It found only one galaxy from the universe's 500 million years. The Spitzer Space Telescope was a dedicated infrared telescope, but it only had an 85 cm mirror. Not only does the JWST have a much larger mirror, but detector technology has advanced so much that the veil obscuring the early universe is being lifted one ancient galaxy at a time.

One of the JWST's primary science themes is the Assembly of Galaxies. We need to see the universe's earliest galaxies to understand how they form and evolve. Within weeks of beginning observations, the telescope found an abundance of bright galaxies at redshifts greater than z=10. "This unexpected population has electrified the community and raised fundamental questions about galaxy formation in the first ≈ 500 Myrs," write the authors of a new paper.

The JWST has consistently pushed back our observation horizon, and this newest detection shows it may not have reached its limit yet.


*Since its science observations began in July, 2022, the JWST has discovered a series of increasingly distant, ancient galaxies. JADES-GS-z14-0 was the record holder at a redshift of 14.32. But now it's found another ancient, bright galaxy at redshift z=14.44. Credit: NASA, ESA, CSA, STScI, B. Robertson (UC Santa Cruz), B. Johnson (CfA), S. Tacchella (Cambridge), P. Cargile (CfA)*

The newly discovered galaxy is named MoM-z14, and it comes from the Mirage or Miracle survey. This spectroscopic survey is designed to confirm high-redshift candidate galaxies, and z14 refers to the galaxy's redshift. This finding is surprising because astronomers expected to find very few galaxies at such a high redshift.

The discovery is presented in a new paper titled "A Cosmic Miracle: A Remarkably Luminous Galaxy at zspec = 14.44 Confirmed with JWST." The lead author is Rohan Naidu from the MIT Kavli Institute for Astrophysics and Space Research. The paper's been submitted to the *Open Journal of Astrophysics* and is available on the arXiv preprint server.

"JWST has revealed a stunning population of bright galaxies at surprisingly early epochs, z > 10, where few such sources were expected," the authors write. At a redshift of z = 14.4, this galaxy "expands the observational frontier to a mere 280 million years after the Big Bang." They point out that the JWST has found far more bright galaxies between z = 14 and 15 than the consensus showed before its launch.

This study isn't just another cu-

*(Continued on page 13)*

## Farthest Galaxy (Cont'd)

*(Continued from page 12)*

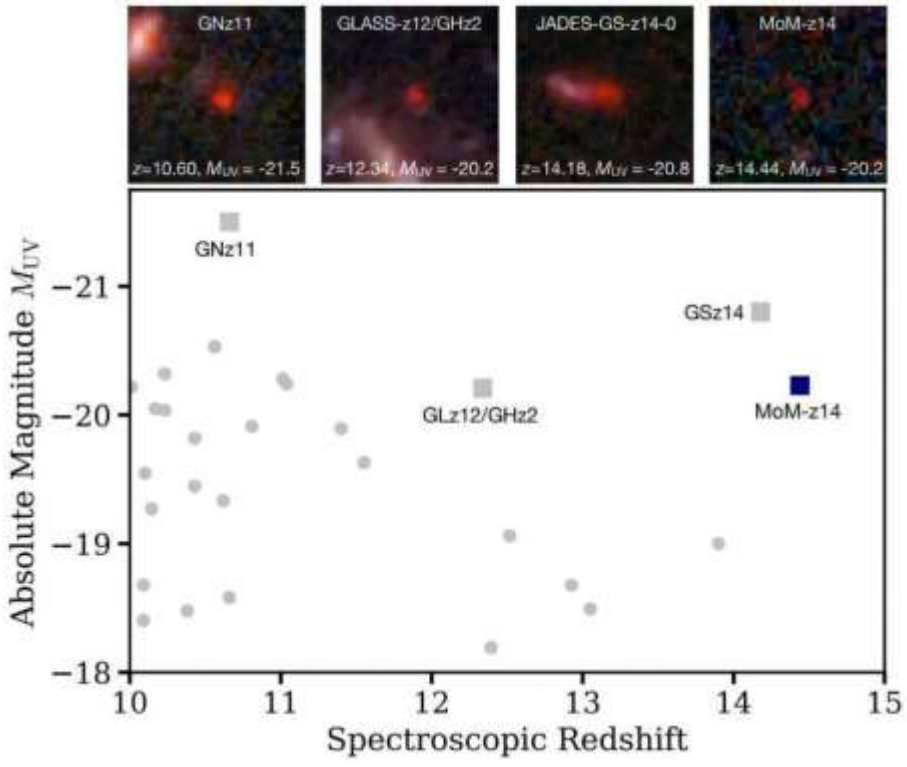
riosity. The spectroscopic examination revealed interesting results related to the JWST's Assembly of Galaxies theme.

Observations show that most of the galaxy's light comes from stars, not an active galactic nucleus (AGN). AGN are the bright cores of galaxies powered by supermassive black holes accreting matter. So MoM-z14 likely hosts some luminous supermassive stars, something that theory predicted about the early universe.

The galaxy's nitrogen-to-carbon ratio is higher than that observed in the sun. Its chemical composition resembles ancient globular clusters attached to the Milky Way. This means that the stars in the galaxy and those in globular clusters formed in similar environments with similar nucleosynthesis and metallicity pollution from previous stars.

"Since this abundance pattern is also common among the most ancient stars born in the Milky Way, we may be directly witnessing the formation of such stars in dense clusters, connecting galaxy evolution across the entire sweep of cosmic time," the authors write.

There seem to be two morphologies for these ancient bright galaxies: point source and extended. The relation between their morphologies and their chemistry is another potential link in galaxy evolution. "Furthermore, as noticed by Harikane et al (2024b), these morphological differences are reflected in chemical abundance patterns, signaling a deeper connection between morphology and evolutionary pathways," the authors write.




*This figure shows high-redshift galaxies on the cosmic frontier by redshift and magnitude.*

As the JWST has found more ancient bright galaxies, a class of objects that are strong nitrogen emitters has become apparent, including luminous Little Red Dots. MoM-z14 could be among the most nitrogen-enhanced objects the JWST has ever found. "It adds further evidence for a size-chemistry bimodality at z > 10, wherein extended sources tend to be nitrogen weak while compact sources are strong N emitters," the authors explain.

The space science community waited a long time for the JWST and its ability to observe the early universe. While some of its findings have been surprising, this study shows how astronomers are finding connections between the surprises revealed in the early universe and the modern universe.

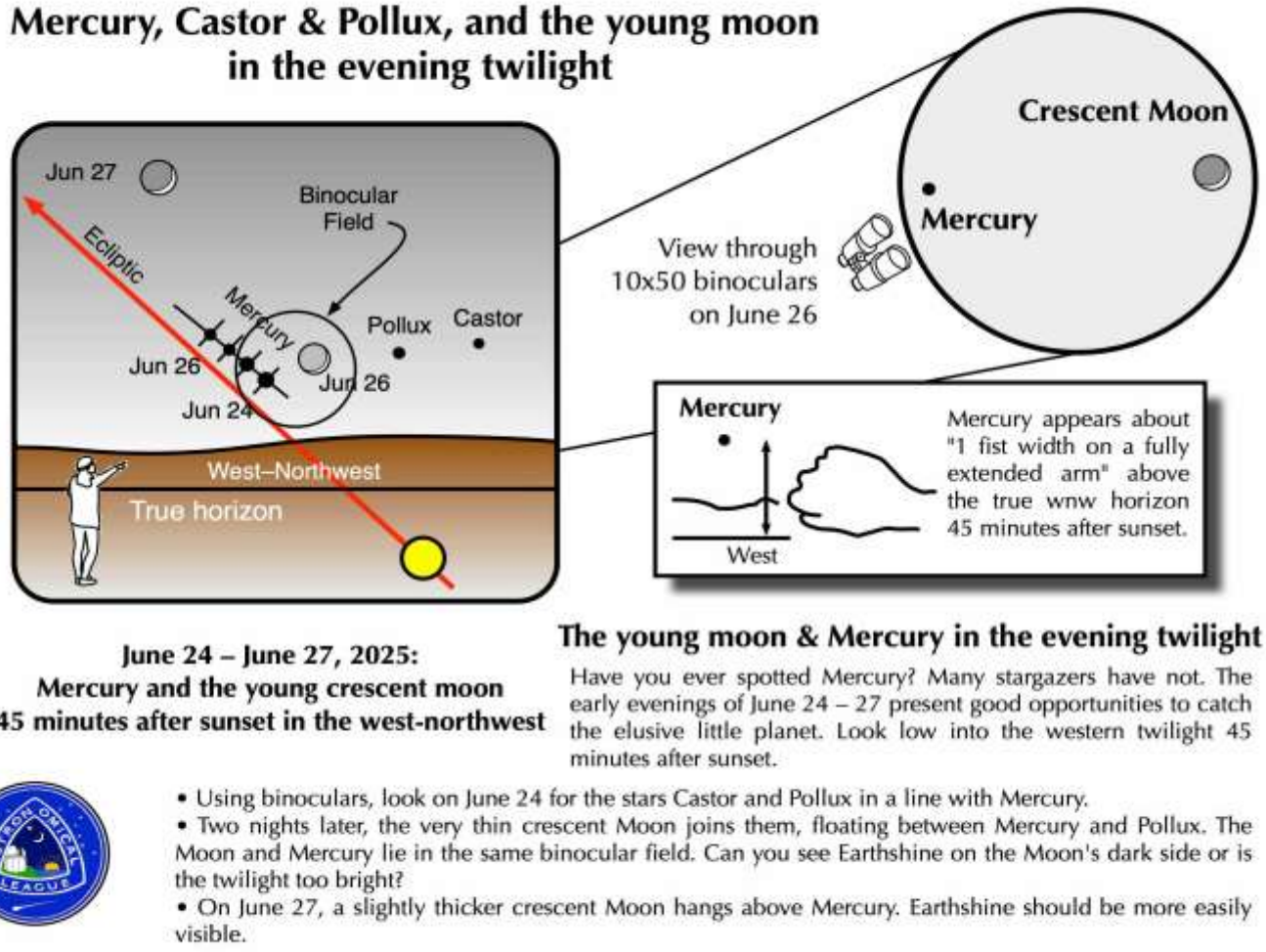
"We interpret MoM-z14 and N -emitters through Galactic archaeology, connecting their abundance patterns to the most ancient stars born in the Milky Way at z □ 4 as well as to globular clusters," the authors write in their conclusion. "The N-enhancement, brightness, hard ionizing spectra, stellar density, morphology, redshift dependence, and black hole fraction of these sources may be linked to globular cluster-like environments wherein runaway collisions may produce extraordinary objects such as supermassive stars."

If it survives repeated cancel-

*(Continued on page 17)*

## Binocular Challenge for June 2025

*courtesy of Astronomical League*




**June 24 – June 27, 2025:**
**Mercury and the young crescent moon 45 minutes after sunset in the west-northwest**

### The young moon & Mercury in the evening twilight

Have you ever spotted Mercury? Many stargazers have not. The early evenings of June 24 – 27 present good opportunities to catch the elusive little planet. Look low into the western twilight 45 minutes after sunset.

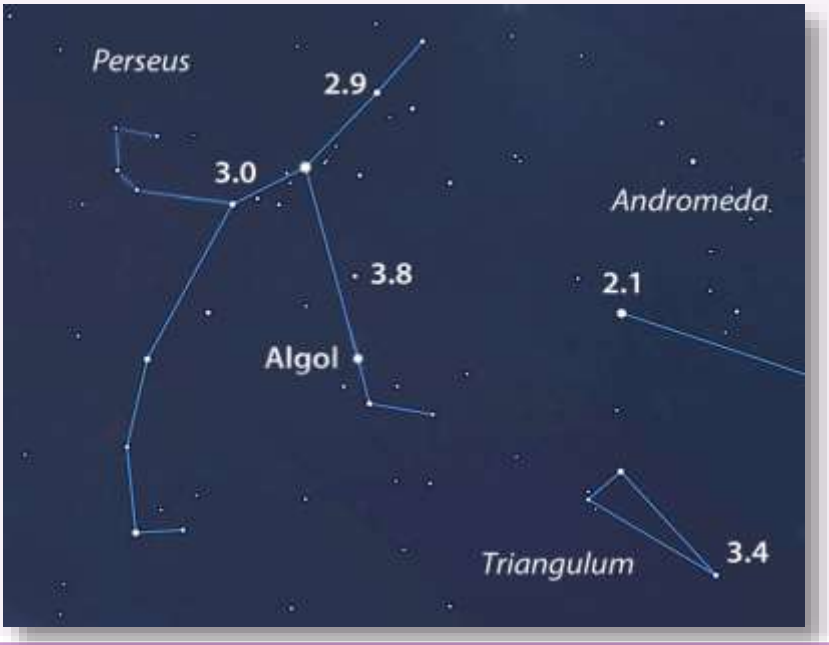
- Using binoculars, look on June 24 for the stars Castor and Pollux in a line with Mercury.
- Two nights later, the very thin crescent Moon joins them, floating between Mercury and Pollux. The Moon and Mercury lie in the same binocular field. Can you see Earthshine on the Moon's dark side or is the twilight too bright?
- On June 27, a slightly thicker crescent Moon hangs above Mercury. Earthshine should be more easily visible.

## Observing (Cont'd)

*(Continued from page 8)*

While you are in Hercules, be sure to check out NGC 6210, a planetary nebula. It is 14" in size and with a high surface brightness you can really go to high magnifications, seeing conditions permitting.

Algol: at minimum on the 3rd, 6th, 8th, 23rd for non-daytime occurrences this month. Use the chart to the right to assess this star's brightness (the numbers next to the stars are for reference brightness, they reflect each star's magnitude).



## Eyepiece Cont'd)

*M7. Image Credit: ESO - http://www.eso.org/public/images/eso1406a/ http://www.eso.org/public/archives/images/large/eso1406a.jpg, CC BY 3.0, https://commons.wikimedia.org/w/index.php?curid=31346316*

*(Continued from page 7)*

Ptolemy's Cluster. From a dark sky site, the cluster is easily detectable with binoculars, close to the "stinger" of Scorpius. Both M6 and M7 were easily seen with the naked eye at Cherry Springs State Park.

M7 has been known since antiquity. This great open star cluster is most often credited to Ptolemy, who listed it in his 'Almagest' as Object Number 567 in 130 AD. From his notes he describes it as "A nebulous cluster following the sting of Scorpius." Italian astronomer Giovanni Batista Hodierna observed it before 1654 and counted 30 stars in it. In 1764, French astronomer Charles Messier catalogued the cluster as the seventh member in his list of comet -like objects. English astronomer John Herschel described it as "coarsely scattered clusters of stars".

So, enjoy the warm summer night sky and gaze low into the southern horizon to experience the sights of Scorpius the Scorpion!

Information credits:


- Dickinson, Terence 2006. *Nightwatch: a practical guide to viewing the universe.* Buffalo, NY. Firefly Books
- http://www.universetoday.com/31228/messier-7/
- http://en.wikipedia.org/wiki/Butterfly_Cluster
- http://www.theskyscrapers.org/messier-6-and-messier-7
- http://www.universetoday.com/31219/messier-6/


## CCAS Scholarships (Cont'd)

siderable amount of time working at the Mather Planetarium, where she creates and presents public shows on various astronomy topics.

Isabella is also involved in geochemistry research within the Geoscience Department and serves as president of the university's chapter of the National Society of Leadership and Success.

In her free time, Isabella enjoys rock climbing and oil painting. She hopes to pursue graduate studies and is grateful for this CCAS scholarship to support her on that path.

**Kate Frederick** has just completed her sophomore year at West Chester University majoring in Geoscience with minors in Astronomy and Science Education. Since the winter of her freshman year, Kate has been involved in research on stellar evolution, light pollution, and geoscience pedagogy.

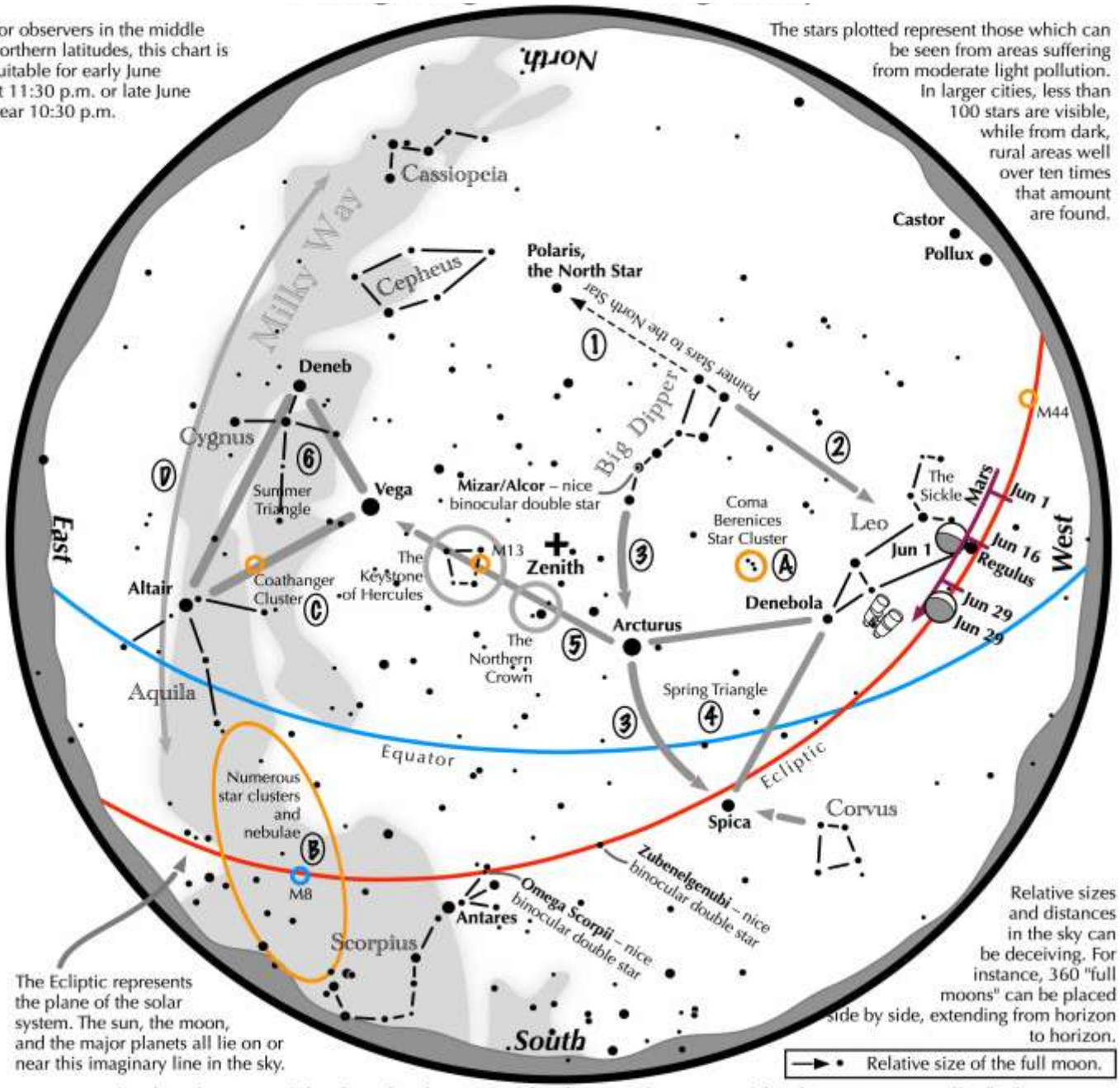
Presently, Kate is working at NJ IT over the summer researching "ionospheric activities during solar eclipses using radio observations" with the goal to limit distortions and improve accuracy in radio astronomy.

Kate is an active member of the Astronomy Club and the Earth and Space Science Club. She has participated in several local outreach events, including volunteering annually at the Chester County History Center's "Discovery in the Dark" event, creating activities for local Boy Scouts troops to earn their astronomy merit badges, volun-

*(Continued on page 18)*

## Navigating the Mid-June 2025 Night Sky

*courtesy of the Astronomical League*




**Navigating the June night sky: Simply start with what you know or with what you can easily find.**

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
3. Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
4. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
5. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
6. High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

**Binocular Highlights**

**A:** Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
**B:** Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
**C:** 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
**D.** Sweep along the Milky Way for an astounding number of faint glows and dark bays.

**Astronomical League** *www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.*

## Farthest Galaxy (Cont'd)

*(Continued from page 13)*

lation threats, the Roman Space Telescope should reveal hundreds more of these types of galaxies. A larger dataset is always desirable and would help solidify some of these findings, or maybe introduce new mysteries. Either way, it'll be progress. But for now, the James Webb Space Telescope deserves the spotlight for this discovery.

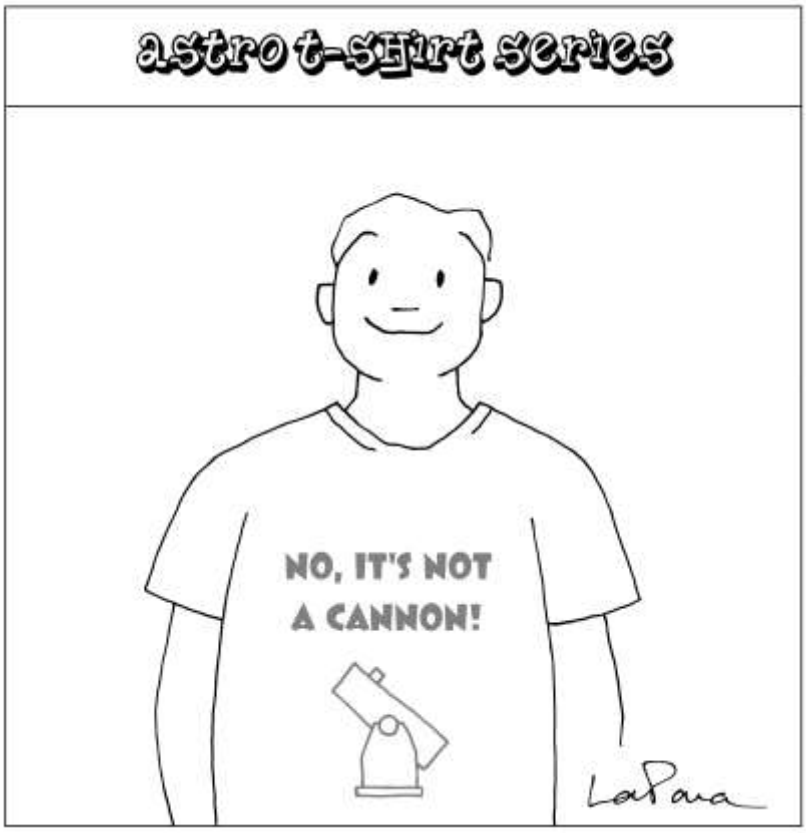
"JWST itself appears poised to drive a series of great expansions of the cosmic frontier, previously unimaginable redshifts, approaching the era of the very first stars, no longer seem far away," the researchers conclude.

More information: Rohan P. Naidu et al, A Cosmic Miracle: A Remarkably Luminous Galaxy at zspec=14.44 Confirmed with JWST, *arXiv* (2025). DOI: 10.48550/arxiv.2505.11263

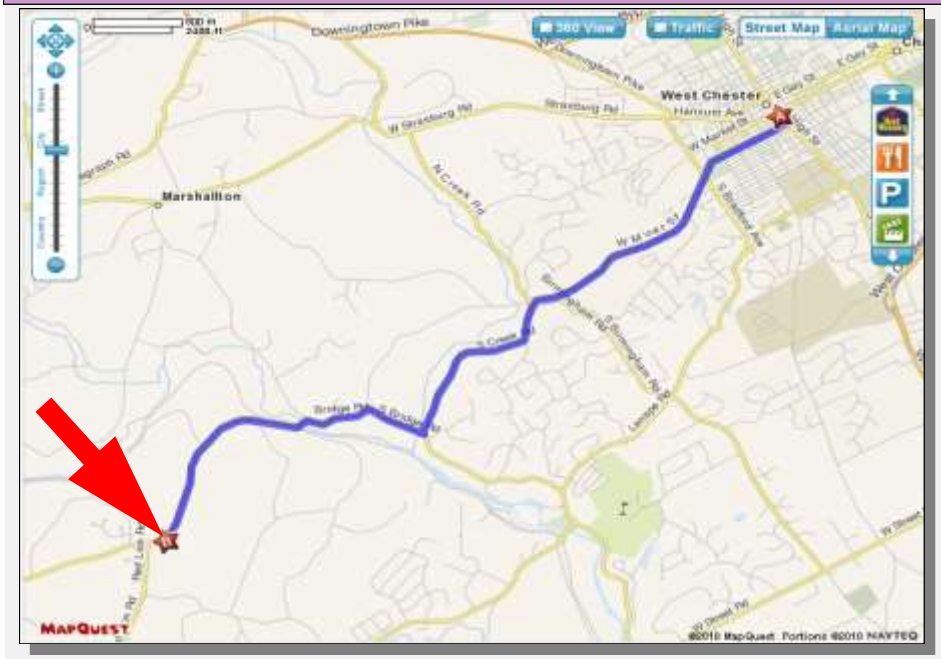
Provided by Universe Today. This story was originally published on Phys.org.

## Classic La Para

*by Nicholas La Para*




## *CCAS Directions*




**Brandywine Red Clay Alliance**
1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090
http://brandywinewatershed.org/

BRC was founded in 1945 and is committed to promoting and protecting the natural resources of the Brandywine Valley through educational programs and demonstrations for all ages.

### Brandywine Red Clay Alliance

The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Red Clay Alliance.

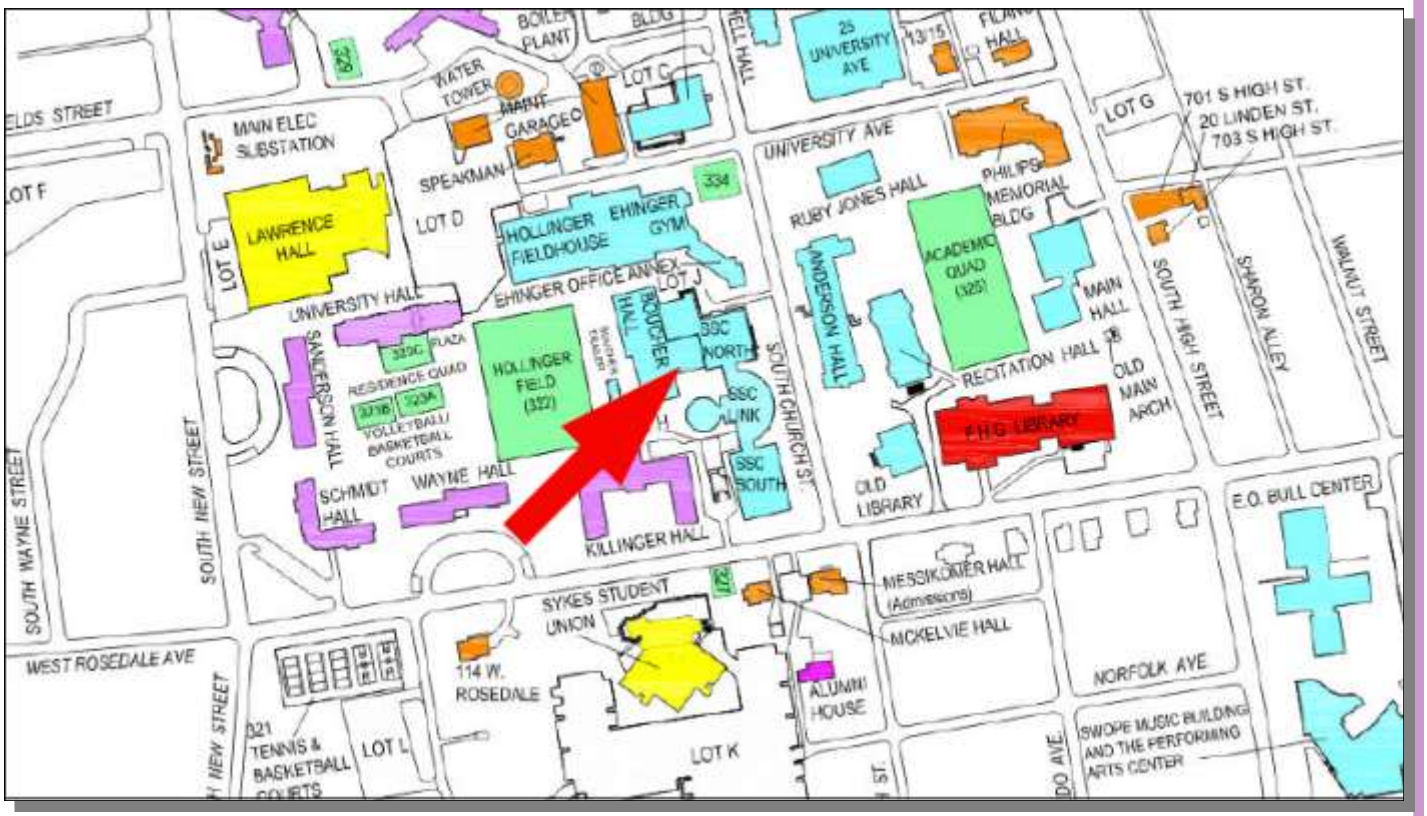
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BRC property, turn left off Route 842 into the parking lot by the office: look for the signs to the office along Route 842. From that parking lot, go left through the gate and drive up the farm lane about 800 feet to the top of the hill. The observing area is on the right.

If you arrive after dark, *please turn off your headlights and just use parking lights* as you come up the hill (so you don't ruin other observers' night vision).

# CCAS Directions

## West Chester University Campus

The monthly meetings (September through May) are held in Room 112 in Merion Science Center (formerly the Boucher Building), attached to the Schmucker Science Center. The Schmucker Science Center is located at the corner of S. Church St & W. Rosedale Ave. Parking is generally available across Rosedale in the Sykes Student Union parking lot (Lot K).




## CCAS Scholarship (Cont'd)

*(Continued from page 15)*

teering for Eclipse Day, and volunteering for West Chester University's Dark Sky Branch. These outreach experiences have deepened Kate's commitment to making astronomy accessible, sustainable, and exciting for people regardless of background.

Kate intends to pursue graduate studies in planetary geology and a career in planetary science, with a focus on public engagement and science communication.

Congratulations again to our three deserving WCU students!

## *CCAS Membership Information and Society Financials*

### Treasurer's Report
*by Don Knabb*

**April 2025 Financial Summary**

| | |
|---|---|
| Beginning Balance | $1850 |
| Deposits | $50 |
| Disbursements | -$0 |
| Ending Balance | $1900 |

### New Member Welcome!

Welcome to new CCAS member Robert Scottoline, a WCU student from Havertown, PA.

We're glad you decided to join us under the stars! Clear skies to you!

### Membership Renewals

You can renew your CCAS membership by writing a check payable to "Chester County Astronomical Society" and sending it to our Treasurer:

**Don Knabb**
**988 Meadowview Lane**
**West Chester PA 19382**

The current dues amounts are listed in the *CCAS Information Directory*. Consult the table of contents for the directory's page number in this month's edition of the newsletter.

# *CCAS Information Directory*

## Join the Fight for Dark Skies!

You can help fight light pollution, conserve energy, and save the night sky for everyone to use and enjoy. Join the nonprofit International Dark-Sky Association (IDA) today. Individual memberships start at $35.00 for one year. Send to:

**International Dark-Sky Association**
**5049 E Broadway Blvd, #105**
**Tucson, AZ 85711**

Phone: **520-293-3198**
Fax: **520-293-3192**
E-mail: **ida@darksky.org**

For more information, including links to helpful information sheets, visit the IDA web site at:

**http://www.darksky.org**

## Dark-Sky Website for PA

The Pennsylvania Outdoor Lighting Council has lots of good information on safe, efficient outdoor security lights at their web site:

**http://www.POLCouncil.org**

## Find out about Lyme Disease!

Anyone who spends much time outdoors, whether you're stargazing, or gardening, or whatever, needs to know about Lyme Disease and how to prevent it. You can learn about it at:

**http://www.lymebasics.org**

Take the time to learn about this health threat and how to protect yourself and your family. It is truly "time well spent"!

## Good Outdoor Lighting Websites

One of the biggest problems we face in trying to reduce light pollution from poorly designed light fixtures is easy access to good ones. When you convince someone, a neighbor or even yourself, to replace bad fixtures, where do you go for good lighting fixtures? Check out these sites and pass this information on to others. Help reclaim the stars! And save energy at the same time!

Light pollution from poor quality outdoor lighting wastes billions of dollars and vast quantities of valuable natural resources annually. It also robs us of our heritage of star-filled skies. Starry Night Lights is committed to fighting light pollution. The company offers the widest selection of ordinance compliant, night sky friendly and neighbor friendly outdoor lighting for your home or business. Starry Night Lights is located in Phoenix, Arizona.

Phone: **520-280-3846**

**http://www.starrynightlights.com**

★ ★ ★ ★ ★

LIGHTHOUSE
OUTDOOR LIGHTING

Lighthouse Outdoor Lighting is a dedicated lifetime corporate member of the International Dark-Sky Association. Lighthouse's products are designed to reduce or eliminate the negative effects outdoor lighting can have while still providing the light you need at night.

**211 North Walnut St.**
**1st Floor**
**West Chester, PA 19380**

Phone: **484-291-1084** or **800-737-4068**

**https://www.lighthouse-lights.com/landscape-lighting-design/pa-west-chester/**

## Local Astronomy-Related Stores

Listing retail sites in this newsletter does not imply endorsement of any kind by our organization. This information is provided only as a service to our members and the general public.

HIGH POINT SCIENTIFIC

High Point Scientific is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, StellarMate, Takahashi, and many more. They also have an extensive blog of advice and education for amateur astronomers.

**High Point Scientific**
**442 Route 206**
**Montague NJ, 07827**

Phone: **800-266-9590**

**https://www.highpointscientific.com/**

★ ★ ★ ★ ★

Spectrum Scientifics
Quality Science Products for All Ages

Located in Manayunk, Spectrum Scientifics educates and entertains customers with an array of telescopes, microscopes, binoculars, science toys, magnets, labware, scales, science instruments, chemistry sets, and much more.

**4403 Main Street**
**Philadelphia, PA 19127**

Phone: **267-297-0423**
Fax: **215-965-1524**

**Hours:**
Monday thru Friday: 9AM to 5PM

**http://www.spectrum-scientifics.com**

# *CCAS Information Directory*

## CCAS Lending Telescopes

Contact Don Knabb to make arrangements to borrow one of the Society's lending telescopes. CCAS members can borrow a lending telescope for a month at a time; longer if no one else wants to borrow it after you. Don's phone number is 610-436-5702.

## Contributing to *Observations*

Contributions of articles and images relating to astronomy and space exploration are always welcome. If you have a computer, and an Internet connection, you can attach the file to an e-mail message and send it to: **newsletter@ccas.us** to:

**Dr. John C. Hepler**
**21 Medinah Drive**
**Reading, PA 19607**

The deadline for submissions to the monthly newsletter is the 26th of each month. Articles and images should be original or the author/artist must be given credit. Articles should be in MS Word format with 12 point Times New Roman Font with single row spacing and one-inch margins on all four sides. Images should be in JPG or PNG file format. The submission window opens on the 20th of each month.

## CCAS Newsletters via E-mail

You can receive the monthly newsletter (in full color!) via e-mail. All you need is a PC or Mac with an Internet e-mail connection. To get more information about how this works, send an e-mail request to Dr. John Hepler, the newsletter editor, at: **newsletter@ccas.us**.

## CCAS Website

Dr. John Hepler is the Society's Webmaster. You can check out our Website at:

**http://www.ccas.us**

Dr. Hepler welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work—no copyrighted material! Give your contributions to Dr. Hepler at (484) 883-5033 or e-mail to webmaster@ccas.us

## CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "nights out" for school, scout, and other civic groups.

## CCAS Executive Committee

For further information on membership or society activities you may call:

| | |
|---|---|
| **President**: | Dave Hockenberry<br>610-558-4248 |
| **Vice President:** | Pete Kellerman<br>610-873-0162 |
| **ALCor & Treasurer:** | Don Knabb<br>610-436-5702 |
| **Observing:** | Don Miller<br>610-247-8712 |
| **Secretary:** | Beatrice Mazziotta<br>610-933-2128 |
| **Program:** | Bruce Ruggeri<br>610-256-4929 |
| **Education:** | Don Knabb<br>610-436-5702 |
| | Dennis O'Leary<br>610-701-8042 |
| **Webmaster & Newsletter:** | John Hepler<br>484-883-0533 |
| **Public Relations:** | Ann Miller<br>610-558-4248 |

## CCAS Membership Information

The 2023 membership rates are as follows:

**REGULAR MEMBER**……$30/year
**SENIOR MEMBER**…….$15/year
**STUDENT MEMBER**……..$ 5/year
**JUNIOR MEMBER**……..$ 5/year
**FAMILY MEMBER**…….$40/year

## Membership Renewals

Check the Membership Renewals on the front of each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

**Don Knabb**
**988 Meadowview Lane**
**West Chester PA 19382-2178**

Phone: **610-436-5702**
e-mail: **treasurer@ccas.us**

## *Sky & Tel*escope Magazine

The club membership subscription cost for *Sky and Telescope* magazine has increased to **$45.75**. This is still a good saving from the regular rate of **$57.75**.

There is no need to go through the CCAS treasurer for subscriptions or renewals. Just go to the Sky and Telescope website and select "Magazine", then under the FAQs you can subscribe at the club rate.

https://skyandtelescope.org/subscribe/

If you have **any** questions call Don Knabb at 610-436-5702.

## *Astronomy* Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$34.00** which is much less than the individual subscription price of **$42.95** (or $60.00 for two years).

There is no need to go through the CCAS treasurer for subscriptions or renewals. Just call customer service at 877-246-4835 and request the club rate for your new subscription or renewal.