



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 32, No. 6 **Three-Time Winner of the Astronomical League's Mabel Sterns Award** ☀ 2006, 2009 & 2016 June 2024

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CCAS Member Astrophotography: Aurora Borealis



Photo taken by CCAS Member Bill Kellar on Saturday, 11 May 2024 at 4:42 a.m. EDT. See page 18 for imaging details.

Membership Renewals Due

06/2024	Crabb Curry Dautrich, Chris Dautrich, Cindy Dhargalkar Hanspal Harris Hebding Hodson Maynard Mazziotta & Calobrisi McCausland O'Neill Scott Thomas
07/2024	Hunsinger McGuigan Morgan Piehl
08/2024	Borowski Johnston & Stein Knabb Lurcott Manigly Schultz Tiedemann Trunk Zullitti

June 2024 Dates

- 6th** • New Moon 8:38 a.m. EDT.
- 8th** • Pollux is positioned above the Moon at nightfall with Castor to the right of Pollux..
- 13th** • Lunar X near crater Werner is visible to all North America observers, 8:00 p.m. EDT.
- 14th** • First Quarter Moon, 1:19 a.m. EDT .
- 15th** • Spica is positioned to the lower left of the Moon at nightfall.
- 19th** • Antares stands to the lower left of the Moon at nightfall.
- 21st** • Full Moon, Strawberry Moon, 9:08 p.m. EDT.
- 28th** • Last Quarter Moon 5:53 p.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 has several special "nights out" scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

- ☼ Friday, June 7, 2024 - CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session is from 7:00 p.m. to 9:00 p.m. EDT.
- ☼ Saturday, June 22, 2024 - CCAS Special Observing Session "FamilyFest" at the American Helicopter Museum, West Chester, PA. from 10 a.m. - 3 p.m. EDT.
- ☼ Friday, July 5, 2024 - CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session is from 7:00 p.m. to 9:00 p.m. EDT.
- ☼ Friday, July 12, 2024 - Friday, July 12, 2024 - CCAS Special Observing Session, Friday Night Lights, ChesLen Preserve, Coatesville, PA.
- ☼ Saturday, July 13, 2024 - West Goshen Park Star Party, West Chester, PA, 8:00 p.m. to 10:00 p.m. EDT.

For more information about future observing opportunities, contact our [Observing Chair](#), Michael Manigly.

Spring/Summer Society Events

June 2024

5th-9th • [York County Spring Star Party](#). Presented by Sky Shed Pod PA, York, PA.

7th • CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session is from 7:00 p.m. to 9:00 p.m. EDT.

20th • Solstice (northern summer/southern winter begins), 5 p.m. EDT. The North Pole of the earth will be tilted toward the Sun, which will have reached its northernmost position in the sky and will be directly over the Tropic of Cancer at 23.44° north latitude. This is the first day of summer (summer solstice) in the northern hemisphere and the first day of winter (winter solstice) in the southern hemisphere.

20th • Open call for articles and photographs for the July 2024 edition of [Observations](#).

22nd • CCAS Special Observing Session "FamilyFest" at the American Helicopter Museum, West Chester, PA. from 10 a.m. - 3 p.m. EDT.

26th • Deadline for newsletter submissions for the July 2024 edition of [Observations](#).

July 2024

3rd-6th • [Green Bank Star Quest XVII](#). National Radio Observatory, Green Bank, West Virginia.

5th • CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session is from 7:00 p.m. to 9:00 p.m. EDT.

12th • [Friday Night Lights Star Party](#), 7:00-10:00 p.m. EDT, ChesLen Preserve, Coatesville, PA. This is a fundraiser with music for the Natural Lands Trust. CCAS members who want to assist with the astronomy portion of this event must bring a telescope or mounted astronomical binoculars to qualify for free admission.

13th • [West Goshen Park Star Party](#), West Chester, PA, 8:00 p.m. to 10:00 p.m. EDT.

20th • Open call for articles and photographs for the August 2024 edition of [Observations](#).

26th • Deadline for newsletter submissions for the August 2024 edition of [Observations](#).

Monthly Meeting Minutes: May 14, 2024

by Bea Mazziotta, CCAS Secretary

- The May 2024 CCAS meeting was held in person at West Chester University, on YouTube and Zoom. This was the last club meeting before summer break. Meetings will resume in September. Dave Hockenberry, CCAS president welcomed members and guests.
- Bruce Ruggeri, program chair, announced the 2 recipients of this year's CCAS Scholarships. Each student received \$1500. The money remaining in the fund will go towards funding next year's awards.
- Don Knabb went over a list of upcoming star parties, observing events and camping events. Go to [CCAS.us](#) for more detailed information.
- Bruce Ruggeri introduced the evening's speaker, Dr. Erika Nesvold.
 - Dr. Nesvold has a PhD in physics and a background in computational astrophysics.
 - She has done research at NASA Goddard Space Flight Center, the Carnegie Institute for Science, NASA Ames, and SETI.
 - Currently she is an astrophysics engineer for the educational astrophysics' software Universe Sandbox.
 - Her presentation was titled Off-Earth Ethics: Learning from History to Build a Better Future in Space.
 - She addressed the question of how can we manage to avoid the mistakes we've made on earth should we someday live in space and on other planets.

September 2024 CCAS Meeting Agenda

by Bruce Ruggeri, CCAS Program Chair

Our next meeting will be held on September 10, 2024, in person at West Chester University's Merion Science Center, Room 113. The Science Center is located at 720 S. Church St., West Chester, PA. Member Speaker: John Conrad, NASA Solar System Ambassador and CCAS Member, "Spaceships for the 21st Century (aka SpaceX and the 7 Little Dwarfs)".

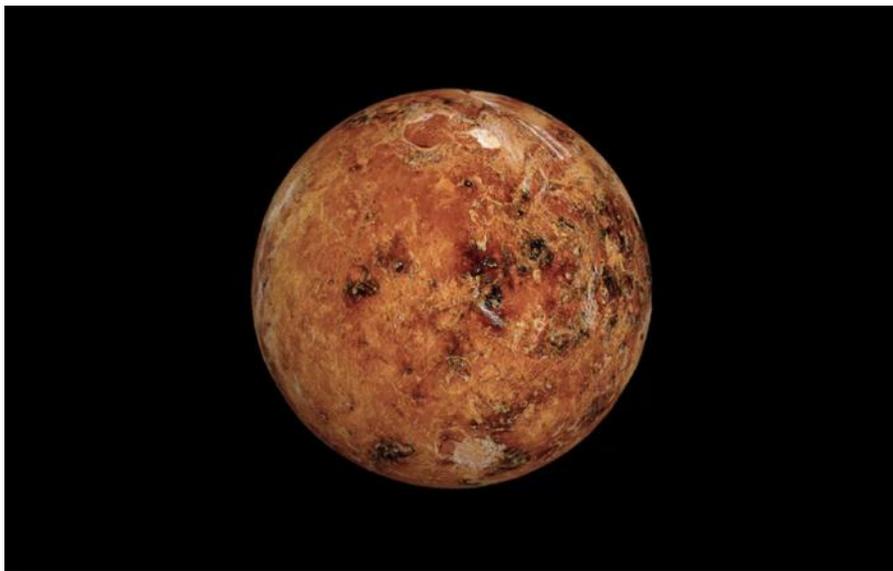
Please note that inclement weather or changes in speakers'

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 beyond our 2024-2025 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

Rivers of Lava on Venus Reveal a More Volcanically Active Planet

by Robin George Andrews, *New York Times*



The planet Venus, with its active volcanic region highlighted in red in the Sif Mons area.
Image Credit: IRSPS/Università d'Annunzio

Witnessing the blood-red fires of a volcanic eruption on Earth is memorable. But to see molten rock bleed out of a volcano on a different planet would be extraordinary. That is close to what scientists have spotted on Venus: two vast, sinuous lava flows oozing from two different corners of Earth's planetary neighbor.

"After you see something like this, the first reaction is 'wow,'" said [Davide Sulcanese](#), a doctoral student at the Università d'Annunzio in Pescara, Italy, and an author of a study reporting the discovery in the jour-

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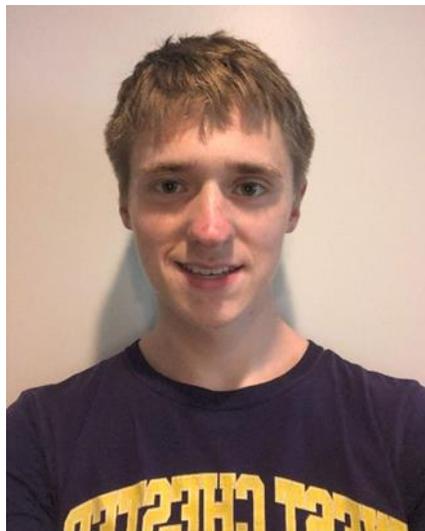
CCAS Student Scholarships Awarded for Academic Year 2024-2025

by Bruce Ruggeri, *CCAS Program Chair*

Greetings CCAS members! I am pleased to announce the two WCU student awardees of our CCAS Scholarships for the 2024-25 season: Max Hutchinson and Reagan Steiner.

As a reminder, these students were selected based upon their academic merits by an independent academic committee within the Department of Earth and Space Sciences at WCU. The committee reviewed applications from WCU students with an active interest and involvement in astronomy, planetary science, and space-related fields, as well as those who are interested in pursuing these fields as a future career.

The brief bio sketches of Max and Reagan are included in the following paragraphs. We extend our congratulations to Max and Reagan and wish them every success in their academic studies



Max Hutchinson
CCAS Scholarship Awardee 2024

and future careers!

Max Hutchinson is a physics major at WCU, having just completed his 4th full semester as of Summer 2024. Max has been interested in astronomy for most of his life and chose to major in physics because it can put him

on track to study astronomy (in graduate school) and do observational and/or theoretical work in the field. More specifically, Max's particular interests for future studies lie in planetary science, perhaps in studying exoplanets.

In Fall 2024, Max will be undertaking a research project with Dr. Gagne in the Earth and Space Sciences Department at WCU, and over this past semester (Spring 2024) he helped with some projects to support Dr. Gagne's research. Apart from astronomy, Max is interested in marine biology and many other sciences, as well as creative writing. In his free time, Max likes to write, watch movies and TV, read, and play video games.

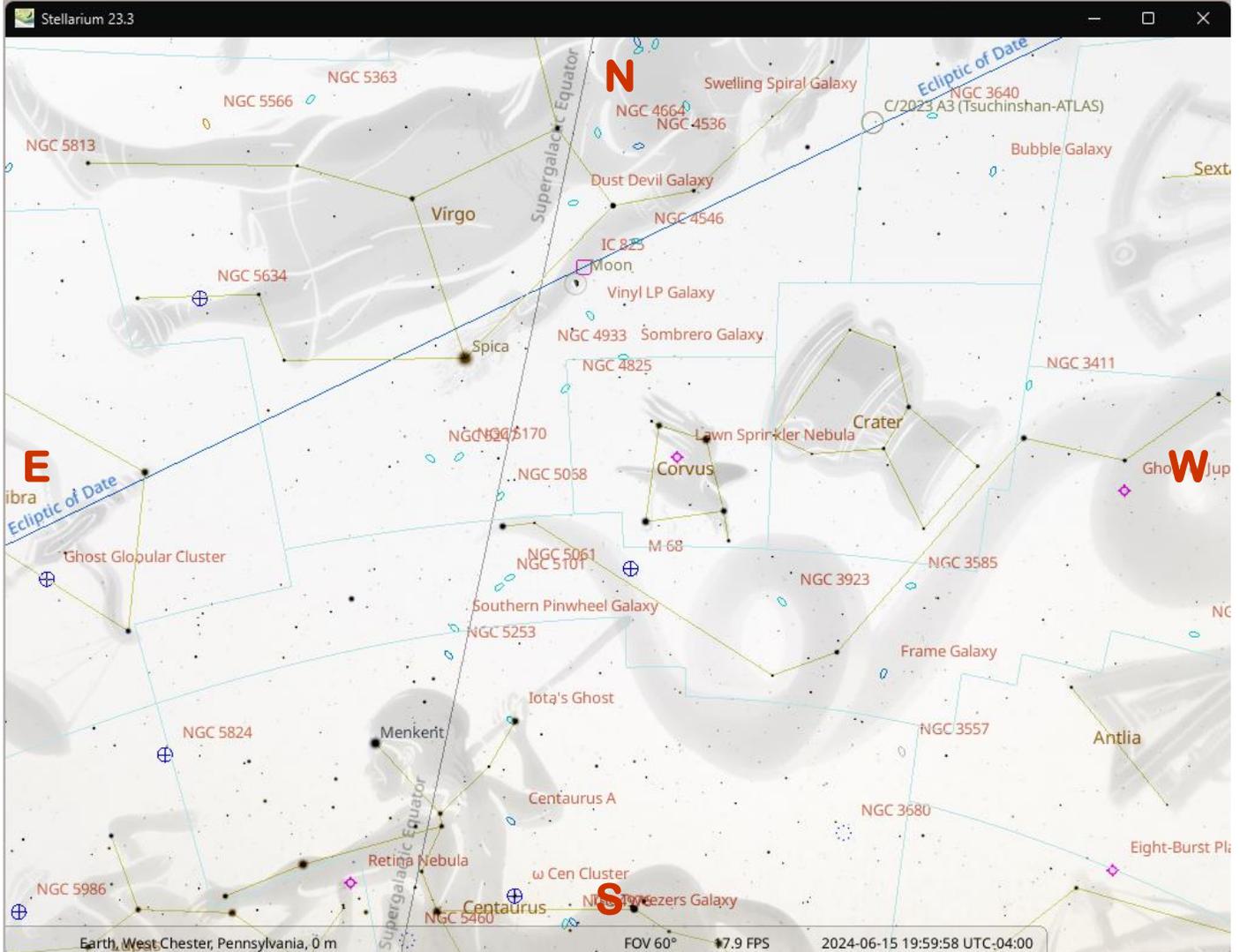
Reagan Steiner is a third-year student at WCU majoring in Special Education with a minor

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The Sky Over Chester County

June 15, 2024 at 8:00 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
06/01/2024	5:03 a.m. EDT	5:35 a.m. EDT	8:25 p.m. EDT	8:57 p.m. EDT	14h 49m 53s
06/15/2024	5:00 a.m. EDT	5:33 a.m. EDT	8:33 p.m. EDT	9:05 p.m. EDT	14h 59m 52s
06/30/2024	5:04 a.m. EDT	5:37 a.m. EDT	8:35 p.m. EDT	9:07 p.m. EDT	14h 57m 46s

Moon Phases					
			New Moon	06/06/2024	8:37 a.m. EDT
First Quarter	06/14/2024	1:18 a.m. EDT	Full Moon	06/21/2024	9:07 p.m. EDT
Last Quarter	06/28/2024	5:53 p.m. EDT			

June 2024 Observing Highlights

by Michael Manigly, CCAS Observing Chair

6	New Moon 8:38 a.m. EDT.
8	Pollux is positioned above the Moon at nightfall with Castor to the right of Pollux.
11	Regulus is situated quite close to the Moon at nightfall.
13	Lunar X near crater Werner is visible to all North America observers, 8:00 p.m. EDT.
14	First Quarter Moon 1:19 a.m. EDT and Lunar Straight Wall this evening.
15 & 16	Spica is positioned to the lower left of the Moon at nightfall on the 15th and to the right of the Moon the next night.
19	Antares stands to the lower left of the Moon at nightfall.
20	Summer Solstice starts in the Northern Hemisphere at 4:51 p.m. EDT. This day is the longest day of the year in our hemisphere.
21	Full Moon 9:08 p.m. EDT. This Moon is called the Trees Fully Leafed Moon. Alternative names for the June Full Moon include Flower Moon, Strawberry Moon, Rose Moon and Honey Moon.
23	The Moon occults Ceres at 11:20 p.m. EDT.
28	Last Quarter Moon 5:53 p.m. EDT. 42 Isis at opposition ($m=9.2$) and Neptune is located below the Moon around 1:00 a.m. EDT.

June observing highlights include the lineup of Jupiter, Mercury, Uranus, Mars, Neptune and Saturn during the predawn hours on the 1st.

The spring/early summer constellations of Boötes, Libra, Lupus and Ursa Minor are prominent with others viewable.

Multiple Messier deep sky objects may be available for observation as spring turns into summer.

Mercury: Increasingly difficult to find at morning twilight as June begins.

Venus: Not observable this month.

Mars: Best observed in the overnight or predawn hours.

Jupiter: Not visible in the evening sky but is now part of the predawn planet lineup.

Saturn: Rises before 2:00 a.m. EDT. It sits near the gibbous Moon on the 27th.

Uranus: Too close to the Sun to be observed.

Neptune: Rises around 12:30 a.m. EDT when it appears to sit to the southwest of the Moon.

Constellations: June constellations include Boötes, Libra, Lupus and Ursa Minor with Ursa Major always available. Each constellation provides excellent opportunities, under good dark sky conditions, to see multiple galaxies and deep sky objects (see below lists).

Messier/Deep Sky Objects viewable in June include:

Galaxies: M51a Whirlpool Galaxy and M64 Black Eye Galaxy;

Globular clusters: 13 Hercules Cluster and M5 Rose Cluster;

Open clusters: M6 Butterfly Cluster, M7 Ptolemy's Cluster and M11 Wild Duck Cluster;

Planetary nebulas: M57 Ring Nebula and M27 Dumbbell Nebula; and

Diffuse nebulas: M8 Lagoon Nebula and M16 Swan Nebula.

Meteor Showers: No major meteor showers are available for observation this month.

Comets: 13P/Olbers may be viewable low in the northwest sky during June.

Asteroids: No major asteroids visible in June.

Through the Eyepiece: The Coat Hanger Cluster, Cr 399

by Don Knabb, CCAS Treasurer & ALCOR

One of the most fun shapes in the sky to share with friends and family is the Coat Hanger Cluster, also known as Brocchi's Cluster or Collinder 399. This is a group of stars in the constellation Vulpecula that looks like a coat hanger, thus the name. You can find it rising in the east during June.

Pictures don't really provide the joy of discovery one feels when you find this group of stars, but below is one of the best photos I have seen of the Coat Hanger Cluster.

Brocchi's Cluster was first described by the Persian astronomer

Al Sufi in his *Book of Fixed Stars* in 964 and was independently rediscovered by Giovanni Hodierna in the seventeenth century. In the 1920s, D. F. Brocchi, an amateur astronomer and chart maker for the American Association of Variable Star Observers, created a map of this object for use in calibrating photometers.

The asterism is made up of ten stars ranging from fifth to seventh magnitude which form the conspicuous coat hanger, a straight line of six stars with a "hook" of four stars on the south side. An additional thirty or so fainter stars are sometimes con-

sidered to be associated as well.

I often see this cluster under a very dark sky as an unresolved patch of light, but this is not possible in Chester County skies. Unless you have a telescope with a wide field of view, binoculars are the best equipment to use to view this object.

CR 399 is found by slowly sweeping across the Milky Way along an imaginary line from the bright star Altair toward the even brighter star Vega. About one third of the way toward Vega, the Coat Hanger should be spotted easily against a darker region

(Continued on page 7)



Image credit: https://en.wikipedia.org/wiki/Brocchi%27s_Cluster#/media/File:Cr399.jpg, Petr Novák (<http://astrofotky.cz/~karneades>) - <http://www.astrofotky.cz/gallery.php?show=karneades/1383504467.jpg>, Creative Commons file - CC BY-SA 4.0

Eyepiece (Cont'd)



Sky map created with Stellarium planetarium software

(Continued from page 6)
of the Milky Way. Or you can scan upward from the tail of the arrow constellation, Sagitta, as seen in the screen print from Stellarium.

Several independent studies since 1998 have determined that this object is not a true cluster at

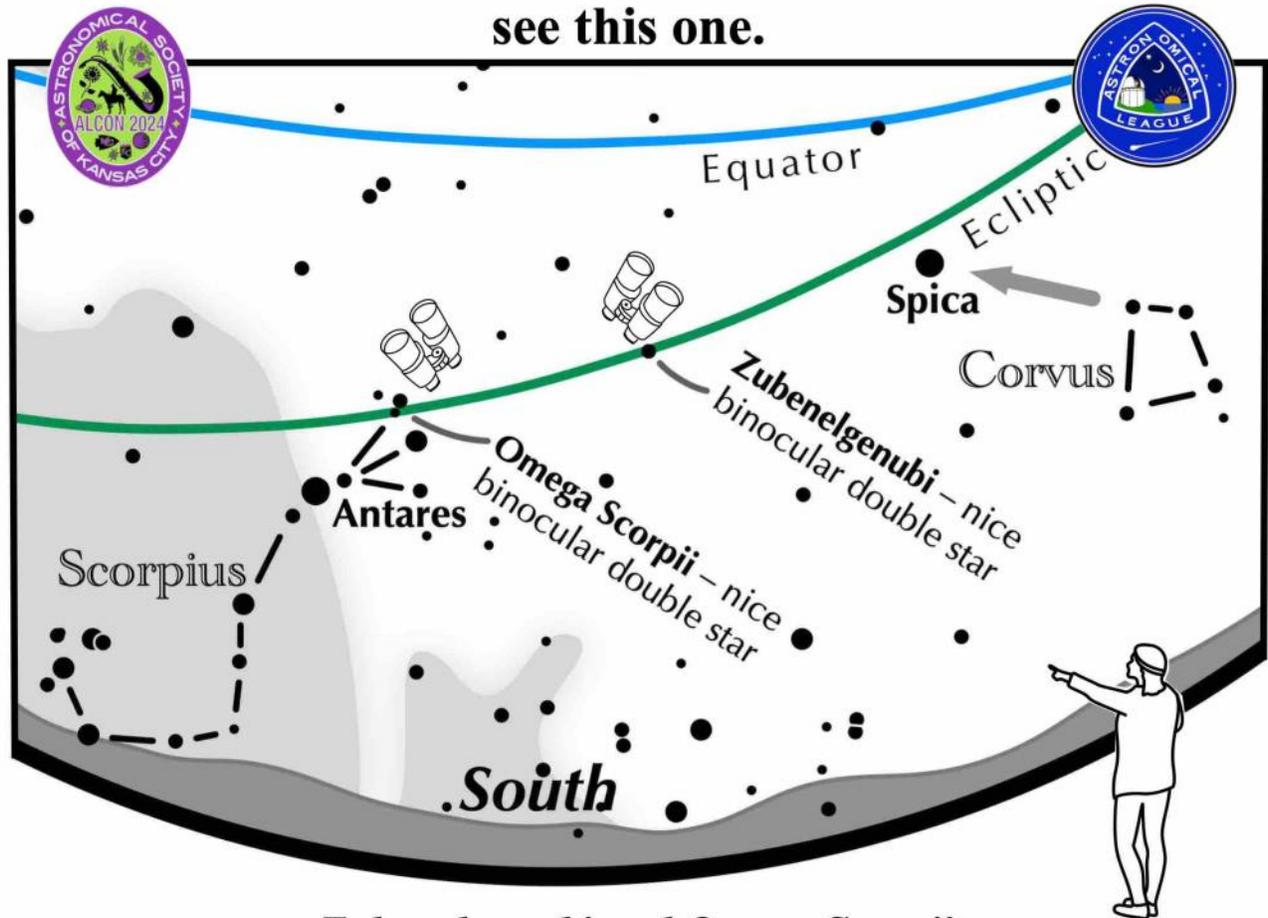
all, but rather just a chance alignment of stars. These recent studies have generally based their findings on improved measurements of parallax and proper motion provided by the Hipparcos satellite.

I have been able to successfully coach several inexperienced

observers to find the Coat Hanger Cluster with handheld binoculars. This is a great time of year to look for it with the Summer Triangle rising in the east. When seeing this object for the first time a “Wow!” is usually heard from the person at the binoculars. A more certain method to

(Continued on page 18)

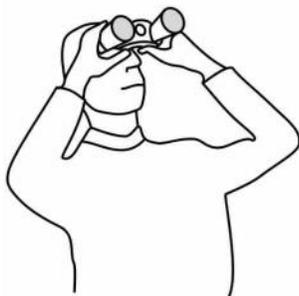
If you can see only one celestial event this June,
see this one.



***Zubenelgenubi and Omega Scorpii,
two easy binocular double stars.***

Throughout June ninety minutes after sunset, look low in the south for the bright stars Spica and Antares.

- Almost mid-way between them shines the moderately bright star Alpha Librae, also called Zubenelgenubi.
- Aim binoculars at it and two stars will be seen.
- To Antares' right are the three "claw" stars of Scorpius. Directly below the uppermost claw, Graffias – or Beta Scorpii – is Omega Scorpii.
- Binoculars will easily show two 4th magnitude stars, Omega 1 and 2, separated by nearly a full moon width. The two Omega's are a chance line of sight pair. They are not gravitationally bound to each other.



**Enhance the scene –
use binoculars!**

***The keen-eyed skywatcher will discern two stars when
gazing at both Zuben and Omega.***

Volcanoes (Cont'd)

(Continued from page 3)

nal [Nature Astronomy](#), published on Monday.

Earth and Venus were forged at the same time. Both are made of the same primeval matter, and both are the same age and size. So why is Earth a paradise overflowing with water and life, while Venus is a scorched hellscape with acidic skies?

Volcanic eruptions tinker with planetary atmospheres. One [theory](#) holds that, eons ago, several apocalyptic eruptions set off a runaway greenhouse effect on Venus, turning it from a temperate, waterlogged world into an arid desert of burned glass.

To better understand its volcanism, scientists hoped to catch a Venusian eruption in the act. But although the planet is known to be smothered in volcanoes, an opaque atmosphere has prevented anyone from seeing an eruption the way spacecraft have spotted them on [Io, the hyper-volcanic moon of Jupiter](#).

In the 1990s, NASA's spacecraft Magellan used cloud-penetrating radar to survey most of the planet. But back then, the relatively low-resolution images made spotting fresh molten rock a troublesome task.

By using modern software to peruse Magellan's data, scientists have now found two unambiguous lava flows: one tripping down the flank of Sif Mons, a broad shield volcano, and another winding its way across a western part of Niobe Planitia, a flat plain pockmarked with numerous volcanic mountains.

Many planetary scientists reckoned Venus was efferves-

cing with eruptions. "But it's one thing to strongly suspect it and quite another to know it," said [Paul Byrne](#), a planetary scientist at Washington University in St. Louis who was not part of the new study.

Venus [lacks the plate tectonics](#) of Earth. But its similarly rocky constitution and comparable size suggests that something must still be cooking inside the sun's second planet — and it should be volcanically active.

There is indirect supporting evidence: Volcanic gases linger in Venus's skies, and the way that [parts of the planet glow](#) suggests they were painted over by lava in the [recent geologic past](#).

Direct evidence of volcanic fury finally, and surprisingly, emerged in 2023, when researchers caught sight of a [volcanic vent doubling in size](#) and possibly filling with lava in old Magellan data. Other scientists still yearned for signs of an unequivocal lava flow, an almost literal smoking gun.

Mr. Sulcanese granted their wish. He found bright, riverlike patches on Sif Mons and Niobe Planitia in later Magellan survey images that weren't present in earlier data. After carefully ruling out other possibilities, including landslides, his team concluded that lava was the only reasonable explanation.

"Magellan is the gift that keeps on giving," said [Stephen Kane](#), a planetary astrophysicist at the University of California, Riverside, who was not involved with the new study.

Both lava flows are comparable in size to the output of the Kilauea volcano in Hawaii during its [three-month paroxysm](#) in 2018. And using these two eruptions, the study's authors estimate that there is considerably more eruptive activity than previously assumed — and that it's happening elsewhere on the planet in the present day.

"Venus is active," said [Giuseppe Mitri](#), an astronomer also at the Università d'Annunzio and an author of the study. More important, volcanically speaking, Venus "is Earth-like," said [Anna Gülcher](#), a planetary scientist at the California Institute of Technology who was not involved with the work.

The result also complicates the [tentative detection of phosphine](#) in Venus's atmosphere; phosphine is a substance that is usually associated on Earth with living things. But other explanations for its possible presence on Venus [couldn't be ruled out](#). Volcanic activity can also make phosphine, but rebuttals to that idea have suggested that Venus simply doesn't have sufficient volcanism to make it.

"Well, apparently there is," Dr. Kane said. The only way to find better answers — on phosphine, Venus's volcanic cadence, its cataclysmic transformation — is to revisit the planet. Fortunately, a fleet of new spacecraft is [set to do just that in the 2030s](#). While we wait, Magellan's memories will continue to offer unexpected gifts. "We can start to think of Venus as a living, breathing world," Dr. Byrne said.

[Editor's Note: Read [original article online](#) at [NYTimes.com](#)]

Night Sky Notes: Constant Companions—Circumpolar Constellations, Part III

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.

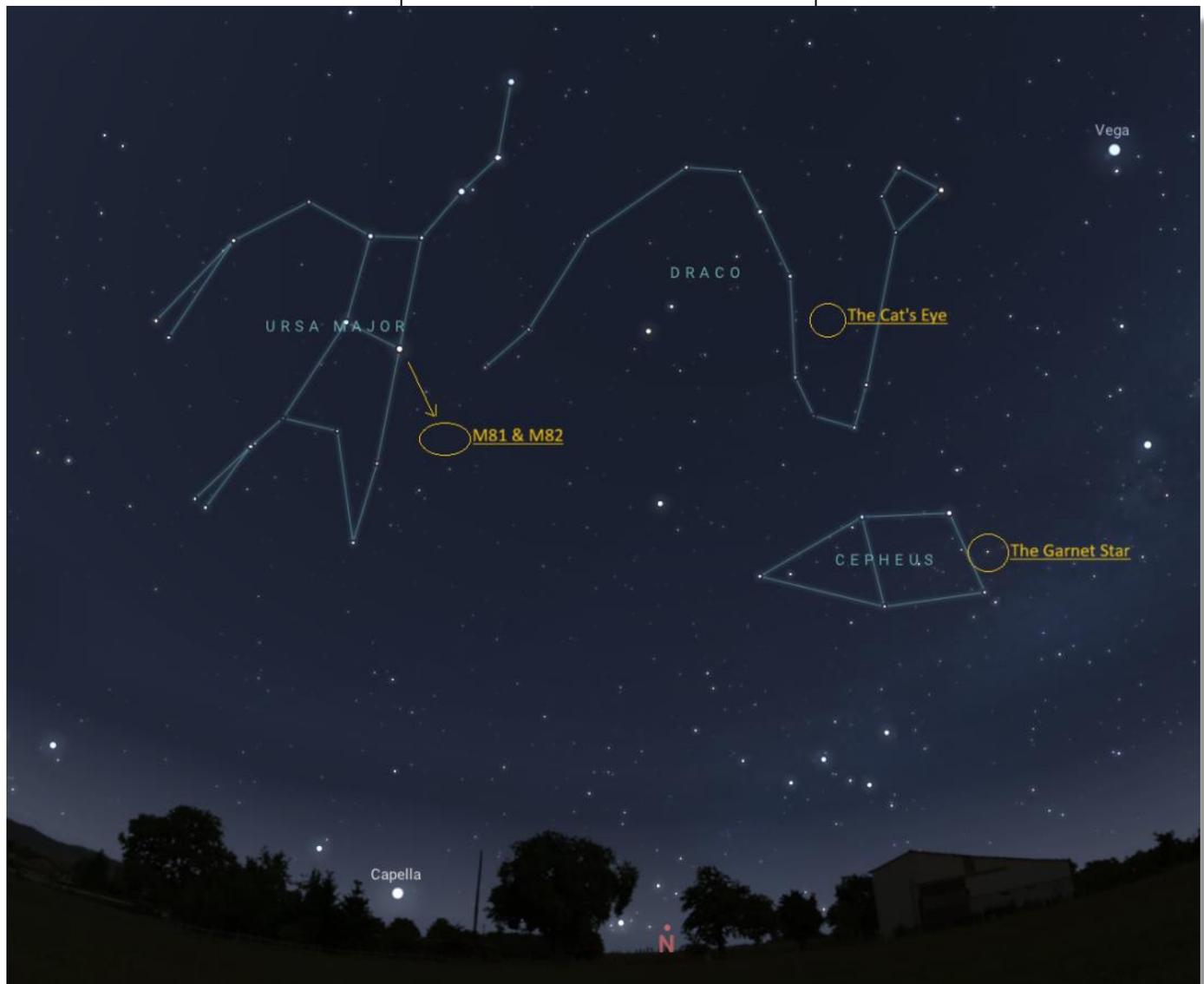
In our final installment of the stars around the North Star, we look ahead to the summer months, where depending on your latitude, the items in these circumpolar constellations are nice and high. Today, we'll discuss **Cepheus**, **Draco**, and **Ursa**



Major. These objects can all be spotted with a medium to large-sized telescope under dark skies.

- **Herschel's Garnet Star:** Mu Cephei is a deep-red hypergiant known as The Garnet Star, or Erakis. While the star is not part of the constellation pattern, it sits within the constellation boundary of Cepheus, and is more than

(Continued on page 11)



From left to right: Ursa Major, Draco, and Cepheus.
Image Credit: Stellarium Web.

Night Sky Notes (Cont'd)



This composite of data from NASA's Chandra X-ray Observatory and Hubble Space Telescope gives astronomers a new look for NGC 6543, better known as the Cat's Eye nebula. This planetary nebula represents a phase of stellar evolution that our sun may well experience several billion years from now. Credit: X-ray: NASA/CXC/SAO; Optical: NASA/STScI



The Cigar Galaxy. Credit: NASA, ESA, CXC, and JPL-Caltech

(Continued from page 10)

1,000 times the size of our Sun. Like its neighbor Delta Cephei, this star is variable, but is not a reliable Cepheid variable. Rather, its brightness can vary anywhere between 3.4 to 5.1 in visible magnitude, over the course of 2-12 years.

- **The Cat's Eye Nebula:** Labeled a planetary nebula, there are no planets to be found at the center of this object. Observations taken with NASA's Chandra X-ray Observatory and Hubble Space Telescopes give astronomers a better understanding of this complex, potential binary star, and how its core ejected enough mass to produce the rings of dust. When searching for this object, look towards the 'belly' of Draco with a medium-sized telescope.
- **Bode's Galaxy and the Cigar Galaxy:** Using the arrow on the star map, look diagonal from the star Dubhe in Ursa Major. There you will find Bode's Galaxy (Messier 81) and the Cigar Galaxy (Messier 82). Sometimes referred to as Bode's Nebula, these two galaxies can be spotted with a small to medium-sized telescope. Bode's Galaxy is a classic spiral shape, similar to our own Milky Way galaxy and our neighbor, Andromeda. The Cigar Galaxy, however, is known as a starburst galaxy

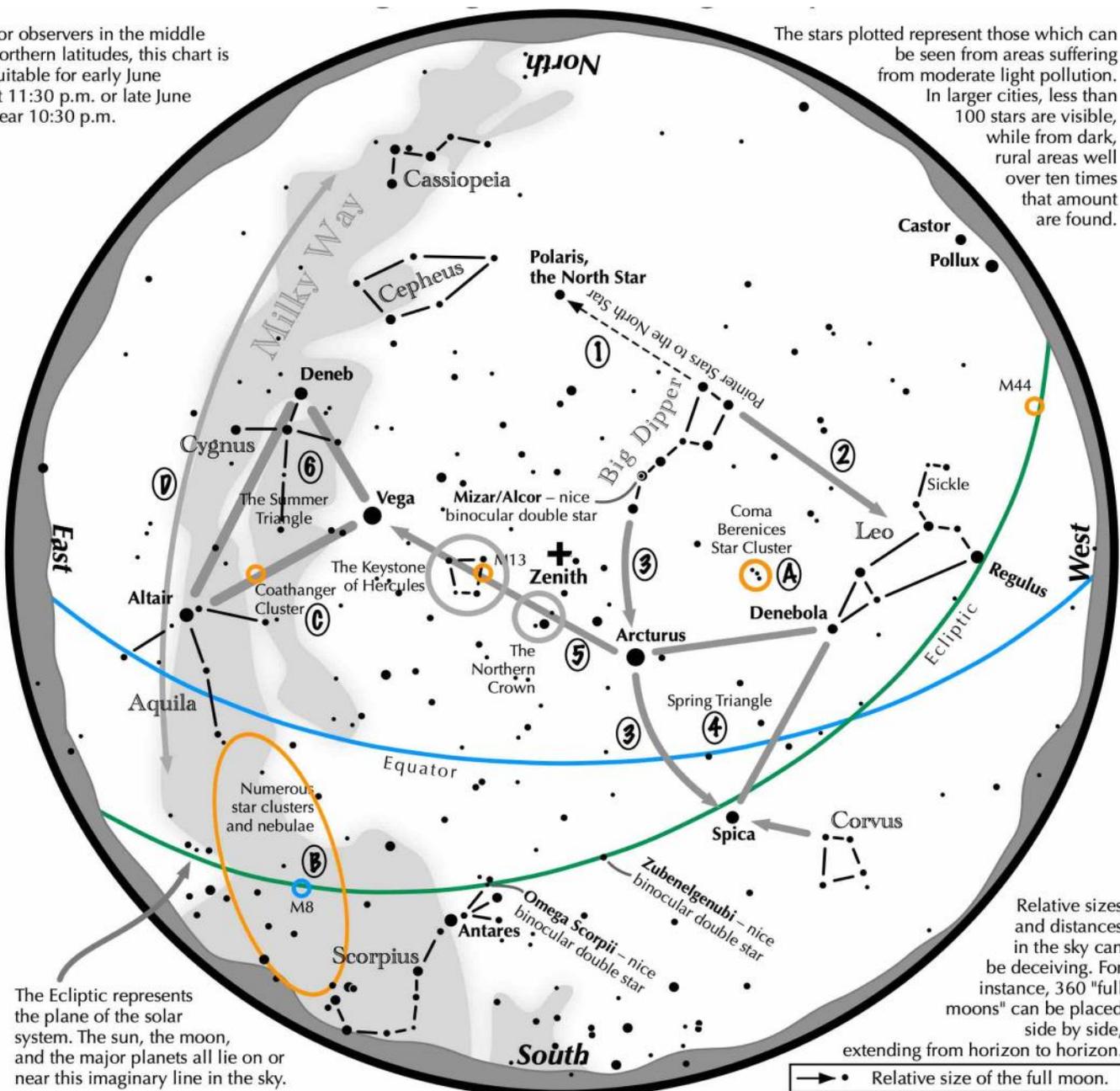
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Navigating the June 2024 Night Sky

by *Astronomical League*

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

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.



Night Sky Notes (Cont'd)

(Continued from page 11)

type, known to have a high star formation rate and incredible shapes. This image composite from 2006 combines the power of three great observatories: the Hubble Space Telescope imaged hydrogen in orange, and visible light in yellow green; Chandra X-Ray Observatory portrayed X-ray in blue; Spitzer Space Telescope captured infrared light in red.

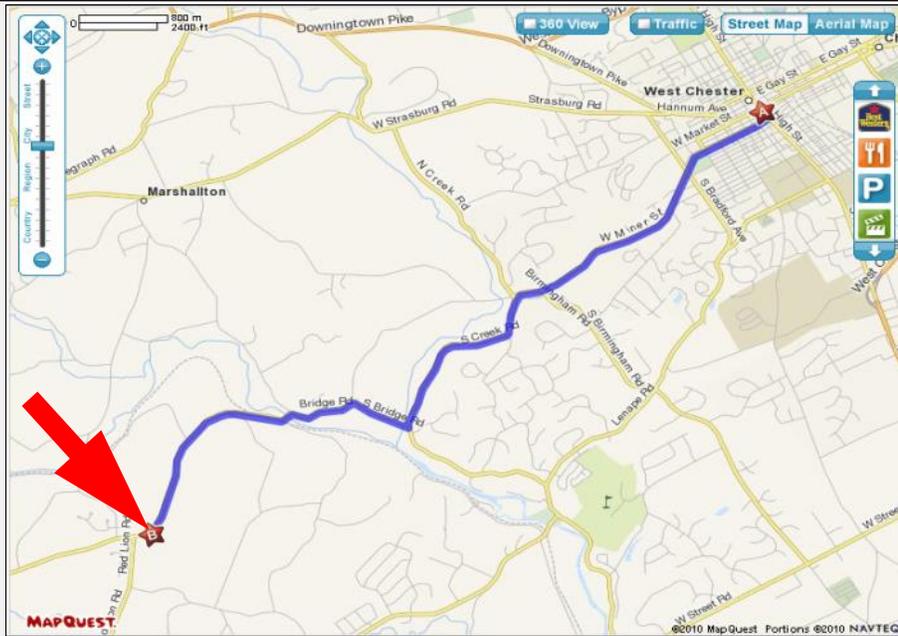
Up next, we celebrate the solstice with our upcoming mid-month article on the Night Sky Network page through NASA's website!

Classic La Para by Nicholas La Para



"YEP, THE SHROUD KEEPS DEW, STRAY LIGHT, AND GRANOLA"

CCAS Directions



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).

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.

Documentary Review: It's Quieter in the Twilight — Movies for the Rest of Us

by Bill Newcott, Courtesy of the Saturday Evening Post

It's Quieter in the Twilight, director Billy Miossi's affectionate chronicle of the Voyagers and their human caretakers, seeks out the staff of a dozen or so persons (down from thousands in the project's 1980s heyday) toiling away at a paneled office in an Altadena, California, strip mall. The year is 2019. Now pretty much an afterthought, the Voyager mission has long since been evicted from the plush Jet Propulsion Laboratory (JPL) in Pasadena, a few miles away, and ensconced in what looks like the domain of a down-on-his-luck chiropractor.

But, against all odds, the plucky Voyager crafts insist on creating new science. In the past decade, both of them have pushed beyond the outermost reaches of the sun's solar wind — defining for the first time just how big our solar envelope really is—and now are transmitting data from the immeasurable expanse of interstellar space.

Project scientist Edward Stone has been there from the beginning. In archival news footage, we see him as NASA's Voyager frontman, leading press conferences and triumphantly announcing new space exploration breakthroughs.

And here Stone is 50 years later — the only project scientist Voyager ever had — thumbing through the new data, discovering hidden scientific gems culled from signals beamed across the cosmos from a spacecraft operating on less power than it takes to light the bulb in your refrigerator. (Stone did finally retire in October of 2022.)



Documentary Poster

As remarkable as the continuing accomplishments of the Voyagers are, it is the human element that makes *It's Quieter in the Twilight* compelling. Suzanne Dodd worked as a low-level scientist during the Voyagers' early days, then moved on to other NASA projects. When, decades later, she was invited to become the program's final project manager, her response was: "Really? Voyager is still happening?"

The day-to-day work of the Voyager team is reminiscent of that old car mechanic just outside of town who still knows how to adjust a carburetor. As



Monday Morning Project Team Meeting

the probes' nuclear fuel steadily decays, the experts devise ingenious ways to make do, shutting down little-used onboard devices and shifting voltage back and forth between the few that are still running — pecking away on keyboards attached to computer monitors that resemble those of Commodore VIC-20s.

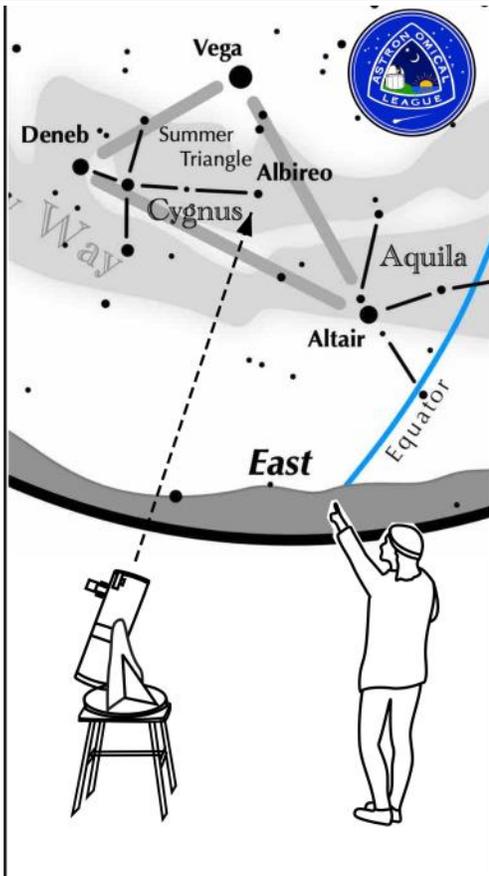
Faced with the news that the world's only antenna that can communicate with Voyager 2 is going to be shut down for a year, the team scrambles to create and upload a series of long-term programs that will keep the space probe operating throughout the period of radio silence. That's a tough enough assignment; compounding it is the reality that, even traveling at the speed of light, each simple computer command takes up to 20 hours to reach the spacecraft — and it will be another 20 hours before the scientists learn if the command actually worked.

Listening for those whispers from the cosmos are an appealingly nerdy team of space geeks, some of them having spent their entire careers nursing the spacecraft. Among the veterans is Mexico-born power subsystem manager Enrique Medina, who came to the U.S. on vacation in 1968 and decided to stay after he met the woman he'd marry. He started working as an engineer on the Voyager project in 1986.

Fernando Peralta recalls being overwhelmed by the sight of Neil Armstrong's first steps on the moon and deciding then and there to become part of the U.S. space program — this, despite

(Continued on page 17)

Other Suns: Beta Cygni (Albireo)
by *Astronomical League*



Other Suns: Beta Cygni (Albireo)

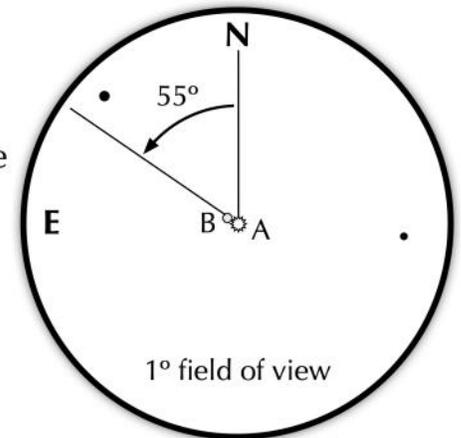
How to Beta Cygni on a June evening

Look in the east for the Milky Way and Cygnus. The Northern Cross shape of Cygnus lies in a horizontal position. The southernmost star of the Cross is Beta, also known as Albireo.

Beta Cygni

- A-B separation: 35 sec
- A magnitude: 3.4
- B magnitude: 4.7
- Position Angle: 55°
- A & B colors: orange, blue

Suggested magnification: >30x
Suggested aperture: >2 inches



Try 10x50 binoculars to separate Albireo.

Scholarships (Cont'd)

(Continued from page 3)
in Deaf Studies. During the school year, Reagan works at CCIU's Learning Center in Coatesville. Reagan has an avid and longtime interest in astronomy and enjoys learning as much as she can in this field.

As the Vice President for WCU's Astronomy Club, Reagan helps lead this student organization that welcomes all students regardless of major to learn more about astronomy and space-related topics and to connect students with shared interests in these fields.

Reagan is also the secretary of WCU's Banned Book Club, which challenges students to dis-



*Reagan Steiner
CCAS Scholarship Awardee 2024*

cuss the importance of combatting literary censorship in

schools and communities.

After college, Reagan aspires to become a Special Education teacher, as well as continue her education to hopefully work in educational policy and administration to help future students. Astronomy is—and always will be—an area of interest for Reagan, and she hopes to incorporate this interest into her education career goals.

Once again, many thanks to CCAS members for your support of this Scholarship Fund this year. We are already well positioned to support this Scholarship Fund next year thanks to your continued support and generosity.

JWST Finds the Most Distant Galaxy in the Universe Existing 300 Million Years After the Big Bang

by Jonathan Chadwick for MailOnline

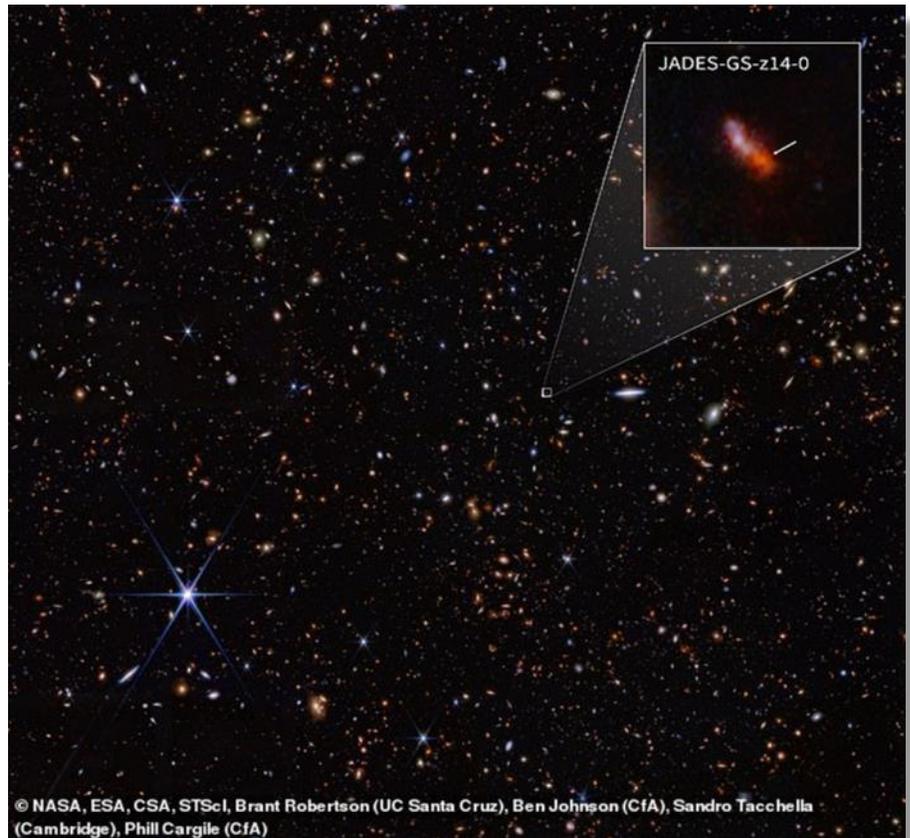
NASA's James Webb telescope has found the most distant galaxy in the universe – giving an astonishing glimpse into the distant cosmic past. Called JADES-GS-z14-0, the galaxy's light has taken around 13.5 billion years to reach us – so the light started its journey just 300 million years after the Big Bang.

The newly-found galaxy measures 1,600 light years across – meaning light takes 1,600 years to travel from one end of it to the other. Experts say JADES-GS-z14-0 is “remarkable for how big and bright it is”, with vast amounts of light being produced by its young stars.

The \$10 billion James Webb telescope – which can 'see back in time' – has also found the second-most-distant galaxy in the universe, called JADES-GS-z14-1.

Brant Robertson, astronomer at University of California, Santa Cruz and co-author of a new study, called the discovery “completely unanticipated.” He said, “It is likely to be seen as the most significant extragalactic discovery with the James Webb space telescope to date. This galaxy [JADES-GS-z14-0] is truly a gem, and it points at more hidden treasures in the early universe.”

James Webb telescope – which is in space orbiting our sun – is often described as being able to “see back in time”, and although it sounds fantastical, it really is true. Because the universe is so vast, light from one galaxy can take billions of years to reach another galaxy. When the light from a distant galaxy finally reaches us, the light reveals a



Using the NASA James Webb Space Telescope, scientists have found a record-breaking galaxy observed only 300 million years after the Big Bang

“snapshot” of the galaxy as it appeared as it started its journey billions of years ago.

“In this case, the light from JADES-GS-z14-0 – newly detected by the telescope – started its journey around 13.5 billion years ago,” said co-author Dr. Francesco D’Eugenio, astrophysicist at the University of Cambridge. At the time, the distance between JADES-GS-z14-0 and where our galaxy (the Milky Way) would eventually form was only 2 billion light years.

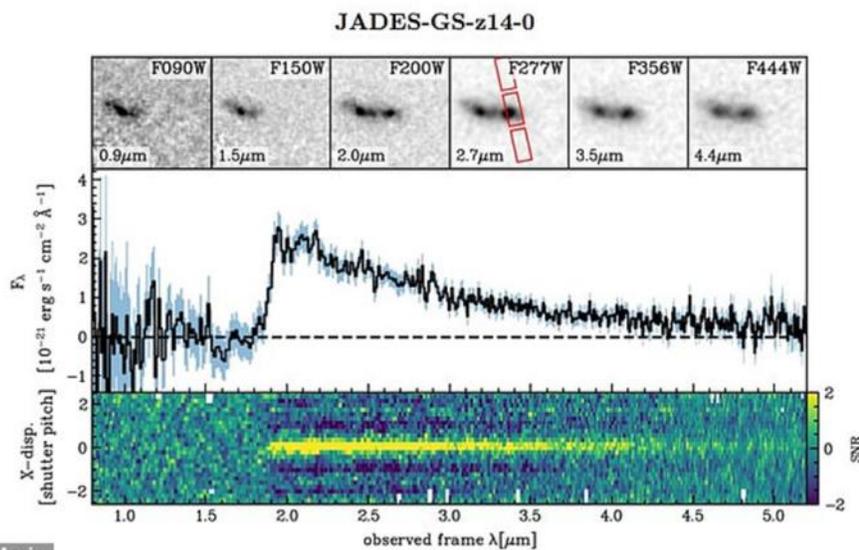
But because the universe has since greatly expanded, the distance between JADES-GS-z14-0 and the Milky Way is now more like 34 billion years. According to D’Eugenio, “If we were able to freeze time right now and put

a ruler between us and GS-z14-0, we would measure a distance of approximately 34 billion light years – that’s how much space has been added.”

Around 13.5 billion years ago, the universe was in its infancy, according to the expert. “Most of ordinary matter was in the form of cold gas,” D’Eugenio said. In some places, this gas was compressing and forming stars, i.e., the first galaxies, like JADES-GS-z14-0. Most of this gas was chemically very simple, being composed of only hydrogen and helium (and traces of lithium). These were the only three elements in the primordial universe, while every other element like carbon, oxygen, iron,

(Continued on page 17)

Most Distant Galaxy (Cont'd)



JADES-GS-z14-0, the galaxy's light has taken around 13.5 billion years to reach us \hat{c} so the light started its journey just 300 million years after the Big Bang (which was 13.8 billion years ago)

(Continued from page 16)

etc. was made in the core of stars and later disseminated inside and around galaxies by stars dying as supernovae.

By the time light from the most distant galaxies reaches Earth, it has been stretched by the expansion of the universe and shifted to the infrared region of the light spectrum, which Webb is equipped to detect with unprecedented clarity.

Many of the most luminous galaxies produce the bulk of their light via gas falling into a supermassive black hole. But the team says the large size of JADES-GS-z14-0 means that the light must be produced by young stars.

Astronomers first spotted JADES-GS-z14-0 in early 2023, but they needed further observations to be sure it really was a record-breaker rather than a “confounding oddball”. Meanwhile, the second-most-distant

galaxy in the universe (JADES-GS-z14-1, at 33.6 billion light years away) is smaller in size. “From its colors we can also say it's really a galaxy and not an accreting supermassive black hole,” Dr. D'Eugenio said.

The James Webb telescope has been described as a “time machine” that could help unravel the secrets of our universe. Since coming online in 2022, the Webb telescope has ushered in a new era of scientific breakthroughs, peering farther than ever before into the universe's distant reaches. It revealed its first set of images in July 2022, including a dying star cloaked by dust and a “cosmic dance” between a group of galaxies. Other astonishing images include the “Pillars of Creation”, Neptune's rings, a “cartwheel galaxy” and a stellar nursery known as the Tarantula Nebula.

[Editor's Note: Read the [original article online](#) at DailyMail.com]

Twilight (Cont'd)

(Continued from page 14)

the fact that he lived in Bogotá, Columbia. Moving to the U.S. with his young family, he found work in demolition while taking aerospace engineering courses at the University of Texas. A visit to JPL led, almost inexplicably, to a job offer: To join the team assigned to the then-decade-old Voyagers.

Sun King Matsumoto, born in South Korea, joined the team in 1985. At home, we find her in the kitchen with her grown son, proudly displaying a Lego Voyager he built as a child.

“When he calls, he asks me, ‘How is Voyager?’” she says. “Like he’s asking, ‘How is Grandma?’”

Like doctors tending to patients on life support, the Voyager team is slowly watching their patients’ vital organs fail. One morning, they know, they will come to work, transmit a digital “Good morning” across the Solar System — and get only silence in return.

As they sit before Miossi’s patient and compassionate camera, it is a prospect that moves more than one of them to tears.

“But we’ll be here,” project manager Dobbs tells the filmmaker. “Just as long as Voyager needs us.”

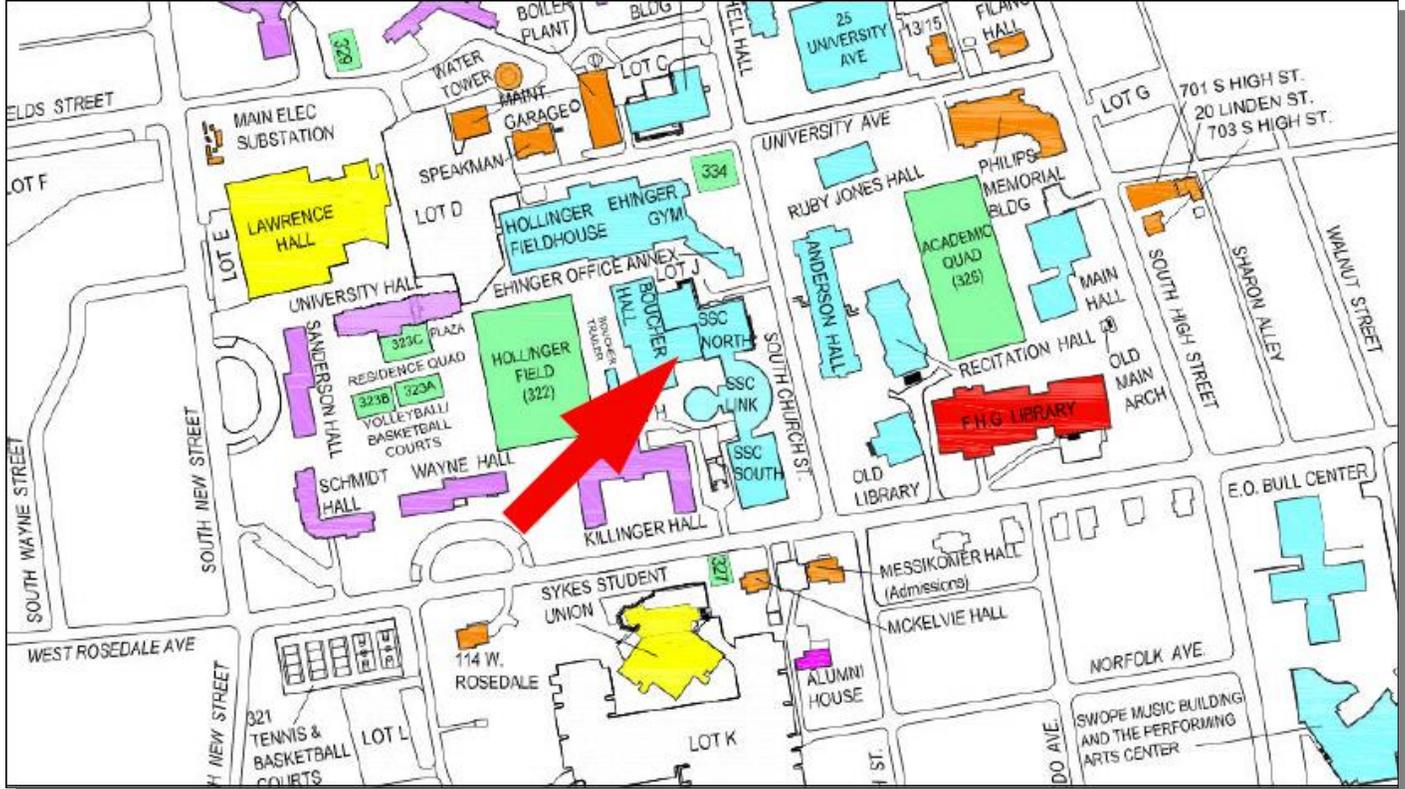
And until then, Medina adds solemnly, “You don’t want to let Voyager down.”

[Editor's Note: This is a rather bitter-sweet documentary [available online](#) on Amazon Prime. Read the [review online](#) at saturdayeveningpost.com]

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).



Eyepiece (Cont'd)

(Continued from page 7)

share this wonder of the sky is to mount your binoculars on a tripod for even children to see.

Information credits:

- Dickinson, Terence 2006. *Nightwatch: a practical guide to viewing the universe*. Buffalo, NY. Firefly Books
- http://en.wikipedia.org/wiki/Brocchi%27s_Cluster
- <http://www.seds.org/messier/xtra/ngc/brocchi.html>

CCAS Membership Information and Society Financials

Treasurer's Report by Don Knabb

May 2024 Financial Summary

Beginning Balance	\$1893
Deposits	\$205
Disbursements	-\$0
Ending Balance	\$2098

New Member Welcome!

Welcome to new CCAS member Ivne Haas from Malvern, PA.

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

Image on page 1 taken by CCAS Member Bill Kellar with an Apple iPhone 11Pro Max on 11 May 2024. Photographic details: Wide Camera - 26 mm f1.8 ISO3200, 1.1 second exposure.

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.

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 \$30.00 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](http://www.darksky.org). 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.



Skies Unlimited is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, Stellarvue, Takahashi, Vixen, Losmandy and more.

Skies Unlimited
Suburbia Shopping Center
52 Glocker Way
Pottstown, PA 19465

Phone: 610-327-3500 or 888-947-2673
 Fax: 610-327-3553
 Email: info@skiesunlimited.com

<http://www.skiesunlimited.net>



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.

CCAS Lending Library

Contact our Librarian, Barb Knabb, to make arrangements to borrow one of the books in the CCAS lending library. Copies of the catalog are available at CCAS meetings. Barb's phone number is 610-436-5702.

Contributing to *Observations*

Contributions of articles 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

Or mail the contribution, typed or handwritten, to:

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

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
610-558-4248

Vice President: Pete Kellerman
610-873-0162

ALCor & Treasurer: Don Knabb
610-436-5702

Observing: Michael Manigly
484-631-6197

Secretary: Beatrice Mazziotta
610-933-2128

Librarian: Barb Knabb
610-436-5702

Program: Bruce Ruggeri
610-256-4929

Education: Don Knabb
610-436-5702

Dennis O'Leary
610-701-8042

Webmaster & Newsletter: John Hepler
484-883-0533

Public Relations: Ann Miller
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 & Telescope Magazine

The club membership subscription cost for *Sky and Telescope* magazine has increased to **\$43.95**. This is still a good saving from the regular rate of **\$56.05**.

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.