Observations

A Monthly Publication Of The CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 32, No. 11 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *November 2024*

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Northern Lights in Chester County

Original astrophotography by Don Knabb, CCAS Treasurer & ALCOR

November 2024 Dates

1st • New Moon, 8:47 a.m. EDT

4th • Venus is near the Moon

9th • First Quarter Moon, 12:55 a.m. EST, and Lunar Straight Wall this evening.

10th • Saturn is very close to the Moon at 9 p.m. EST

15th • Full Beaver Moon, the Rivers Freezing Moon, 4:28 p.m. EST

16th • Mercury is at its greatest evening elongation (23°) and Uranus is at opposition

17th • The Leonid meteors peak in the predawn hours

22nd • Last Quarter Moon, 8:27 p.m. EST

CCAS Upcoming Nights Out

In addition to our monthly observing sessions at the Myrick Conservancy Center, BRC (for directions, see pg. 11), 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, November 1, 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, November 2, 2024 - CCAS Special Observing Session, Astronomy STEM Workshop at the American Helicopter Museum, West Chester, PA. The observing session is scheduled from 6:00 p.m. to 9:00 p.m. EDT.

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

Autumn/Winter Society Events

November 2024

1st • 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.

2nd • CCAS Special Observing Session, Astronomy STEM Workshop at the American Helicopter Museum, West Chester, PA. The observing session is scheduled from 6:00 p.m. to 9:00 p.m. EDT.

3rd • Daylight Saving Time ends, 2:00 a.m. ET.

12th • CCAS Monthly Meeting, in person (as well as via Zoom) at West Chester University's Merion Science Center, Room 112. Guest Speaker: Dr. Ravi Sheth, Dept of Astronomy and Astrophysics, University of Pennsylvania, "Making Black Holes out of…..Light? – New Perspectives."

20th • Open call for articles and photographs for the December 2024 edition of Observations.

26th • Deadline for newsletter submissions for the December 2024 edition of Observations.

December 2024

4th • 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.

10th • CCAS Annual Holiday Party, Iron Hill Brewery & Restaurant, West Chester, PA. The gathering starts at 7:00 p.m. EST.

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

22nd • December Solstice, 4:20 am EST. First day of winter in northern hemisphere.

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

CCAS Holiday Party

CCAS will host its annual holiday party for members and their families on Tuesday, December 10, 2024, at Iron Hill Brewery in West Chester. The restaurant is located at 3 West Gay St. and its phone number is 610-738-9600. The party will be from 7:00 to 10:00 p.m. EST. There are two parking garages about one block away. More details will appear in the December 2024 edition of *Observations*.

October 2024 Meeting Minutes

by Bea Mazziotta, CCAS Secretary

- The October 2024 CCAS meeting was held in person on October 8, 2024 at West Chester University, on YouTube, and on Zoom.
- Dave Hockenberry, CCAS president, welcomed members and guests and announced upcoming fall viewing and outreach events.
    - They include the final BRCA viewing evening on 11/1 and an outreach event at the Helicopter Museum on 11/2. Look for details on ccas.us.
- Don Knabb shared photos he took at the recent York County Star Party including M33, the Crescent Nebula and parts of the Cygnus Loop, a supernova remnant.
- The evening's program, "Living with a Red Dwarf Program: How do M Dwarf Stars Evolve and Can They Host Habitable Planets?" was presented by Dr. Scott Engle, a professor of Astrophysics and Planetary Sciences at Villanova University.
    - Red Dwarfs are the most plentiful stars in our cosmic neighborhood and, astronomers suspect, throughout the observable universe.
    - Dr. Engle's interest lies in defining the characteristics of these smaller, cooler stars. They have proven themselves to be difficult subjects but data has been emerging slowly over the course of the 20-year study.
    - While these stars can host smaller earth type planets, their potential habitability is still very much in question.

November 2024 CCAS Meeting Agenda

by Bruce Ruggeri, CCAS Program Chair

Our next meeting will be held on November 12, 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. Our guest speaker is Dr. Ravi Sheth, of the Dept. of Astronomy and Astrophysics at the University of Pennsylvania. His presentation is entitled, "Making Black Holes out of…..Light? – New Perspectives."

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.

November 2024 Meeting Details & Speaker Profile

by Bruce Ruggeri, CCAS Program Chair

I am pleased to announce the in person and Zoom monthly CCAS meeting for Tuesday, November 12 beginning informally at 7:00pm, with the meeting program commencing at 7:30pm. Our speaker is astrophysicist, Dr. Ravi Sheth, Professor and Graduate Chairperson, from the Dept of Astronomy and Astrophysics, University of Pennsylvania.

The CCAS meeting presentation will commence at approximately 7:50 PM ET. Our meetings are held at West Chester University's (WCU) Merion Science Center, Room 112. The Science Center is located at 720 S. Church St. in West Chester. The presentation is entitled **Making black holes out of ... light?** .

Dr. Ravi Sheth, University of Pennsylvania

Synopsis: Galileo showed how things fall, and Newton explained why. In Newton's theory of gravity, sufficiently concentrated matter will create a 'black hole' - an object from which light cannot escape. More than two hundred years later, Einstein showed that matter was just a concentrated form of energy, and that sufficiently concentrated energy will create a black hole. Since light is a form of energy, Hawking and others argued that it should be possible to make a black hole from light - a sort of natural oxymoron. Dr. Sheth will discuss why such light black holes might actually be quite heavy, and might make up most of the matter in our universe. Finally, Dr. Sheth will discuss how we might detect these black holes even though they don't shine.

About the speaker: Ravi Sheth is a world-renowned astrophysicist and cosmologist whose major research efforts are focused on stochastic processes and developing physical models and statistical methods which allow the data from large scale galaxy and cluster surveys to constrain models of galaxy formation and cosmology. Recently, in addition to thinking about what black holes made from light would look like, Ravi has been working on Optimal Transport methods for making more reliable estimates of the cosmological distance scale and hence constraining the expansion history of the universe. Sadly, Ravi claims none of these efforts have helped improve his squash game!

Ravi received his BS in Physics at Haverford College (PA) and was a Marshall Scholar at Cambridge University (UK) where he got his PhD in Astrophysics in 1994. He has conduct-

(Continued on page 7)

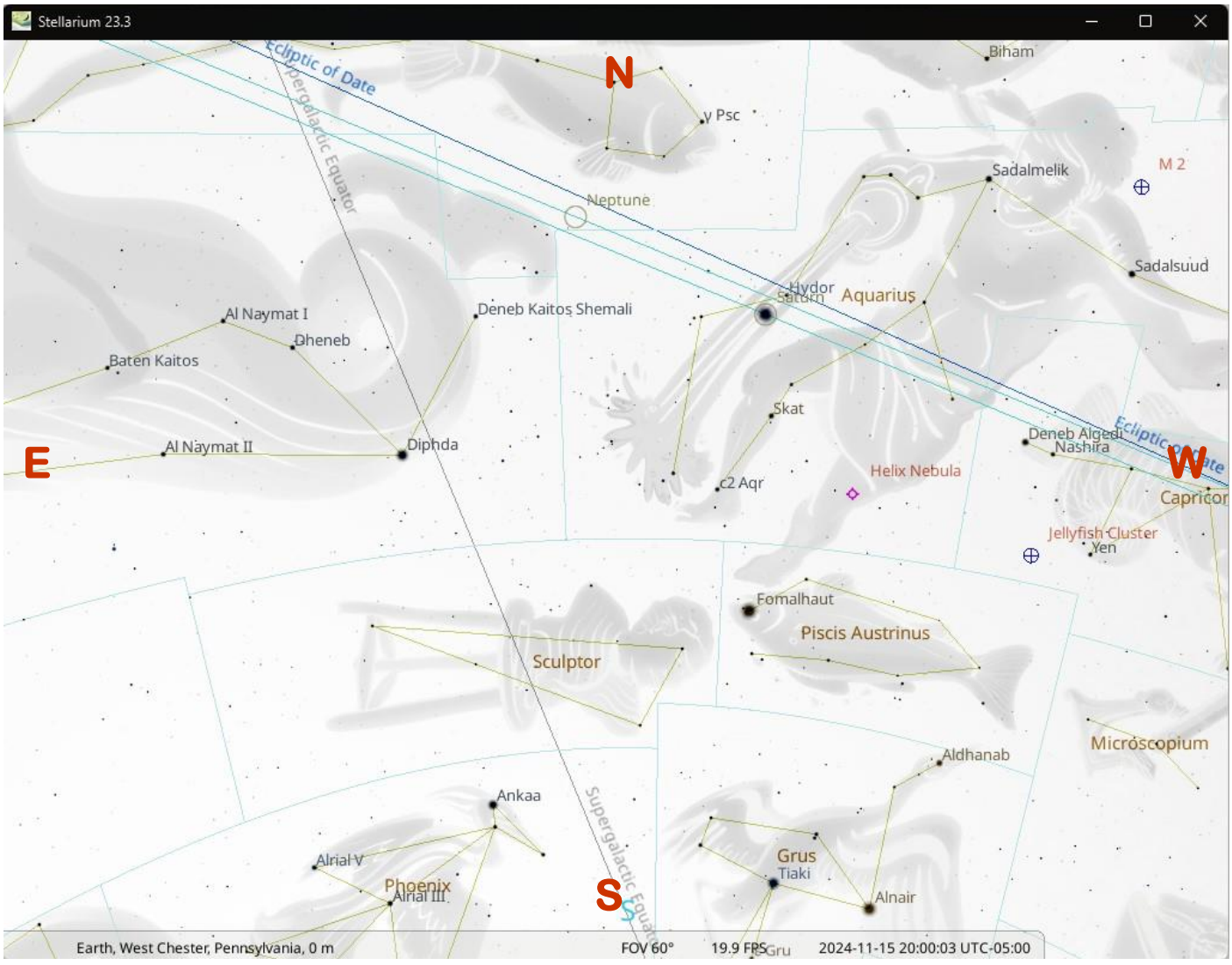
Northern Lights in Berks County, Pennsylvania

by Andrea Swift, Ed.D., Accessibilities Services Director, Alvernia University

The Sky Over Chester County

November 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
11/01/2024	7:03 a.m. EDT	7:32 a.m. EDT	5:59 p.m. EDT	6:27 p.m. EDT	10h 27m 19s
11/15/2024	6:19 a.m. EST	6:48 a.m. EST	4:45 p.m. EST	5:14 p.m. EST	09h 57m 36s
11/30/2024	6:34 a.m. EST	7:04 a.m. EST	4:37 p.m. EST	5:07 p.m. EST	09h 33m 27s

Moon Phases					
			New Moon	11/01/2024	8:47 a.m. EDT
First Quarter	11/09/2024	12:55 a.m. EST	Full Moon	11/15/2024	4:28 p.m. EST
Last Quarter	11/22/2024	8:27 p.m. EST			

November 2024 Observing Highlights

by Don Knabb, CCAS Interim Observing Chair

1	**New Moon, 8:47 a.m. EDT**
4	**Venus is near the Moon**
5	**The Southern Taurid Meteors peak in the predawn hours**
9	**First Quarter Moon, 12:55 a.m. EST, and the Lunar Straight Wall is visible**
10	**Saturn is very close to the Moon at 9 p.m. EST**
11	**The Moon occults Neptune around 9 p.m. EST**
12	**The Northern Taurid Meteors peak in the predawn hours**
15	**Full Moon, the Full Beaver Moon, the Rivers Freezing Moon, 4:28 p.m. EST**
16	**Mercury is at its greatest evening elongation (23º) and Uranus is at opposition**
17	**The Leonid meteors peak in the predawn hours**
22	**Last Quarter Moon, 8:27 p.m. EST**

The best sights this month: November is a good month to see all the planets! Mercury is best viewed in the middle of the month, Venus and Saturn are visible in the early evening and later Jupiter shines brightly in the east. Pull out your telescope to track down Uranus and Neptune during prime evening viewing time. Then the last to walk onto the stage is Mars.

Mercury: November is an excellent month to add Mercury to your observing list. On the 16th Mercury is at its greatest elongation from the Sun and sets a full hour after sunset.

Venus: The "evening star" is becoming more prominent in the western sky not long after sunset. On the 4th Venus is close to the Moon.

Mars: Wait until Thanksgiving to look for Mars, which rises at 8:30 p.m. at month's end and will be high in the sky by 11 p.m.

Jupiter: The king of the planets rises around 8:30 p.m. at the start of the month but by month's end it will be rising in evening twilight and will be in fine viewing position during the evening hours.

Saturn: The most beautiful planet is ideally located for evening observing. Set up a telescope and share the view with your family, friends, and neighbors!

Uranus and Neptune: Uranus reaches opposition on the 16th so it is visible all night. And using the Pleiades as a guide will allow you to easily find Uranus with binoculars or a telescope. Neptune is 14º northeast of Saturn near the Circlet asterism of the constellation Pisces. It will take careful star hopping to find Neptune, but this is a good opportunity to add the furthest planet from the Sun to your list of observed planets.

The Moon: Full moon occurs on November 15th. This full Moon is the Full Beaver Moon. For Native Americans, the time of this full moon was the time to set beaver traps before the swamps froze, to ensure a supply of warm winter furs. It is sometimes also referred to as the Frosty Moon, but I don't think they were referring to the snowman, even though the Moon kind of looks like the head of a snowman. Native Canadian tribes called this the Rivers Freezing Moon.

Constellations: During November the Great Square of Pegasus is at "center stage". To the left of the Great Square, sweeping up to the left is the constellation Andromeda. Use your binoculars to find our neighbor galaxy, which is also named Andromeda. It is a large fuzzy spot located between the constellation Andromeda and Cassiopeia. And by 9 p.m. the beautiful Pleiades, that really little dipper, is rising in the east ahead of Taurus the Bull. Capella in Auriga is a bright point of light upper left of Taurus. As it gets a bit later our old friend Orion returns from his summer vacation.

Messier/deep sky: I always look forward to autumn for viewing the Double Cluster between Cassiopeia and Perseus. This is a nice binocular object. Rising behind Perseus is the constellation Auriga and its three open star clusters M36, M37 and M38. If you stay up late you can get an early view of M42, the Great Orion Nebula.

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Through the Eyepiece: Herschel's Garnet Star in Cepheus, Mu Cephei

by Don Knabb, CCAS Treasurer & ALCOR

Galaxies, nebula and clusters are the most observed objects in the night sky. But sometimes it is nice to look for other objects and sometimes individual stars are more than worthy of our attention. One such star can be found high in the northern sky in November. There you will find a bright red star that is referred to as Herschel's Garnet Star, which is the star Mu Cephei. I observed the Garnet Star during the recent York County Star Party, and it is a joy to behold.

Mu Cephei is a red supergiant star. It appears garnet red and is located at the edge of the IC 1396 nebula. Mu Cephei is one of the most luminous red supergiants in the Milky Way. It is also one of the largest stars so far discovered. Mu Cephei is one of the largest and brightest stars visible not only to the naked eye but in the entire Milky Way Galaxy. Mu Cephei is so large that its actual apparent disk is readily discernable with professional telescopes!

Were Herschel's Garnet Star placed in the Sun's position it would reach between the orbit of Jupiter and Saturn. Mu Cephei could fit around 2 billion Suns into its volume. Only five known stars are believed to be larger than it. The luminosity of Mu Cephei is estimated at approximately 400,000 times that of our Sun.

The deep red color of Mu Cephei was noted by William Herschel, who described it as "a very fine deep garnet colour, such as the periodical star o Ceti". Though sometimes known as "Erakis," it is more familiarly referred to as "Herschel's Garnet Star," the name honoring both the star's deep color and Sir William Herschel, who in 1781 discovered the planet Uranus and who also founded modern observational astronomy with vast numbers of other discoveries that included infrared radiation.

Note to science fiction fans – when I first learned the formal name of this star as Erakis I immediately thought of the planet in Frank Herbert's *Dune* novel. However, the planet in *Dune* is named Arrakis.

Strongly colored stars have always fascinated astronomers. The long history of red-star observations begins in the early 19th century, with famous observers such as Angelo Secchi and Thomas Espin. And those who think that stars are not highly colored need only look at Mu Cephei.

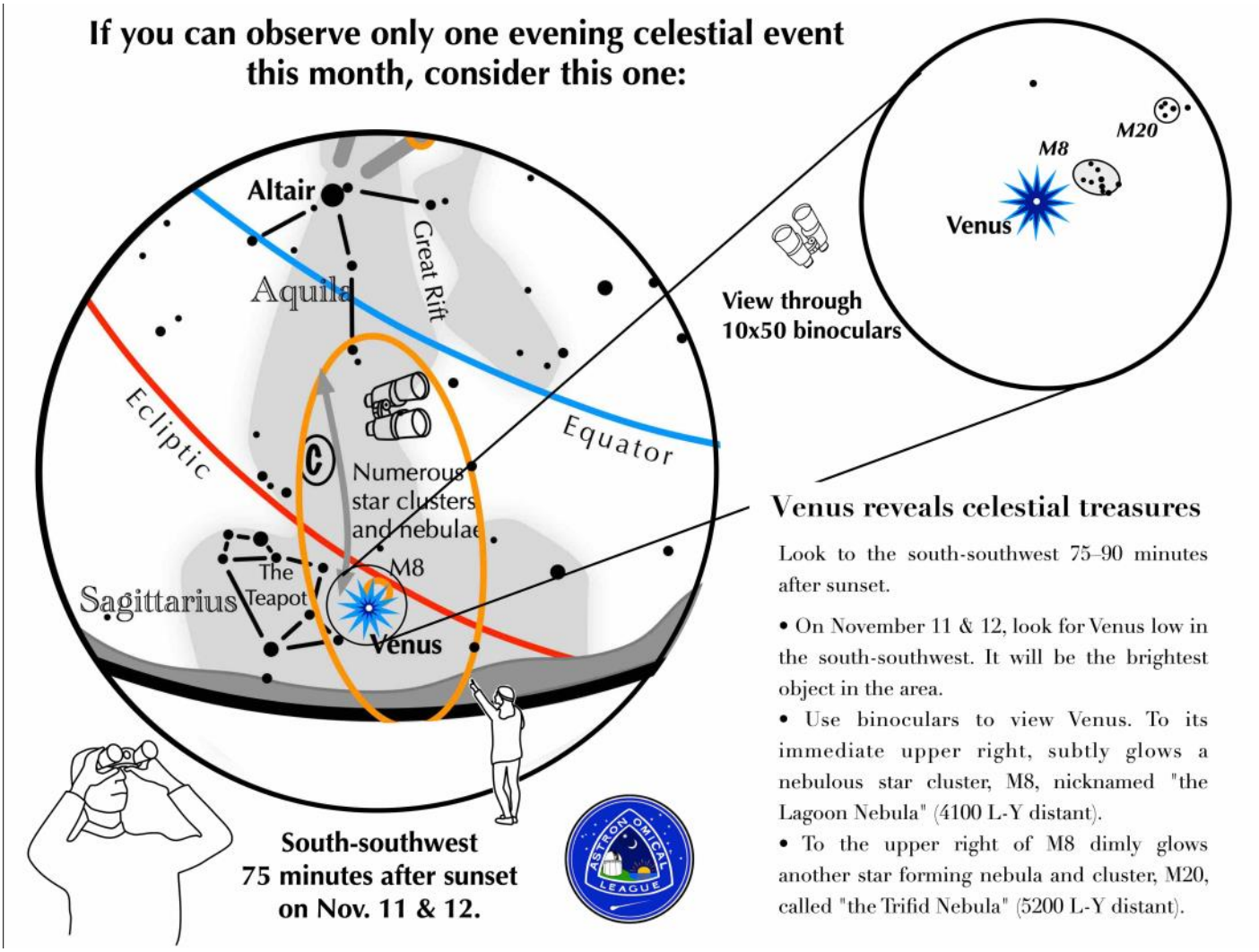
Mu Cephei is nearing death. It has begun to fuse helium into carbon, whereas a main sequence star fuses hydrogen into helium. When a supergiant star has converted elements in its core to iron, the core collapses to produce a supernova and the star is destroyed, leaving behind a

(Continued on page 12)

Public domain image by NiKo, The Garnet Star; captured 2023 in Krefeld, Germany with a Skywatcher 150/750; ZWO ASI 2600MC Pro Color and an Optolong L-Extreme filter; total exposure time of 4h; https://en.wikipedia.org/wiki/Mu_Cephei

Binocular Challenge for November 2024

courtesy of the Astronomical League



Speaker (Cont'd)

(Continued from page 3)

ed research at UC Berkeley (1994-1996), the Max-Planck Institut fur Astrophysik in Garching, Germany (1996-1999), and Fermilab (1999-2001) before becoming an Assistant Professor at the University of Pittsburgh (2002-2004). Ravi relocated to the University of Pennsylvania in 2005, where he is a full Professor (since 2009) and Graduate Chairman in the Dept of Physics and Astronomy.

He spends his summers at the International Centre for Theoretical Physics in Trieste (Italy) and serves as a member of the Science Advisory Board of the Kaufman Foundation, the Scientific Council of the East Africa Institute for Fundamental Research (Kigali, Rwanda), and the Scientific Council of the Inter-University Centre for Astronomy and Astrophysics (Pune, India).

Ravi previously spoke to the CCAS in February of 2020 where he delivered an amazing presentation entitled, *"Gravity Waves: The Discovery that Shook the Earth."*

We look forward to seeing members and friends on November 12 or joining our CCAS meeting virtually through Zoom or YouTube.

Please spread the word about CCAS to your family, friends and fellow students who wish to learn more about astronomy and space and planetary science and welcome them to our Zoom or in-person meetings. Many thanks in advance to everyone for your attendance and participation!

Night Sky Notes: Snowballs from Space

by Dave Prosper; updated 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.

If you spotted comet C/2023 A3 (Tsuchinshan-ATLAS) in person, or seen photos online this October, you might have been inspired to learn more about these visitors from the outer Solar System. Get ready for the next comet and find out how comets are connected to some of our favorite annual astronomy events.

A comet is defined as an icy body that is small in size and can develop a 'tail' of gas as it approaches the Sun from the outer

Solar System. The key traits of a comet are its **nucleus**, **coma**, and **tail**.

The **nucleus** of the comet is comprised of ice, gas, dust, and rock. This central structure can be up to 80 miles wide in some instances, as recorded by the Hubble Space Telescope in 2022 – large for a comet but too small to see with a telescope. As the comet reaches the inner Solar System, the ice from the nucleus starts to vaporize, converting into gas. The gas cloud that forms around the comet as it approaches the Sun is called the **coma**. This helps give the comet its glow. But beware: much like Icarus, sometimes these bodies don't survive their journey around the Sun and can fall apart the closer it gets.

The most prominent feature is the **tail** of the comet. Under moderately dark skies, the

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Comet McNaught over the Pacific Ocean. Image taken from Paranal Observatory in January 2007. Credits: ESO/Sebastian Deiries

A view of the 2023 Perseid meteor shower from the southernmost part of Sequoia National Forest, near Piute Peak. Debris from comet Swift-Tuttle creates the Perseids. Credit: NASA/Preston Dyches

(Continued from page 8)

brightest comets show a dust tail, pointed away from the Sun. When photographing comets, you can sometimes resolve the *second* tail, made of ionized gases that have been electronically charged by solar radiation. These ion tails can appear bluish, in comparison to the white color of the dust tail. The ion tail is also always pointed away from the Sun. In 2007, NASA's STEREO mission captured images of C/2006 P1 McNaught and its dust tail, stretching over 100 million miles. Studies of those images revealed that solar wind influenced both the ion and dust tail, creating striations – bands – giving both tails a feather appearance in the night sky.

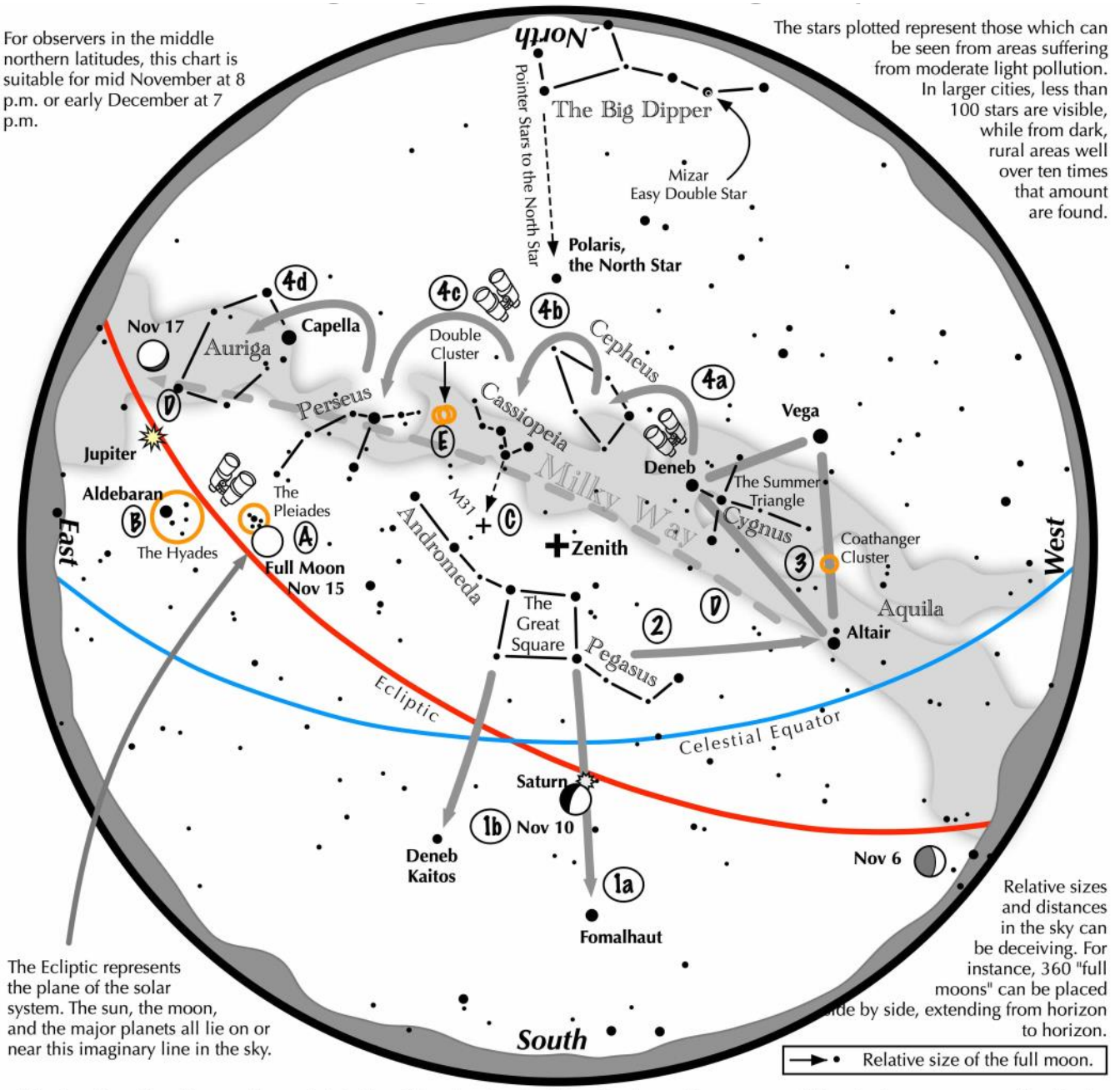
Comets appear from beyond Uranus, in the Kuiper Belt, and may even come from as far as the Oort Cloud. These visitors can be **short-period** comets like Halley's Comet, returning every 76 years. This may seem long to us, but **long-period** comets like Comet Hale-Bopp, observed from 1996-1997 won't return to the inner Solar System until the year 4385. Other types include **non-periodic** comets like NEOWISE, which only pass through our Solar System once.

But our experiences of these comets are not limited to the occasional fluffy snowball. As comets orbit the Sun, they can leave a trail of rocky debris in its orbital path. When Earth finds itself passing through one of these debris fields, we experience meteor showers! The most well-known of these is the Perseid meteor shower, caused by Comet 109P/Swift-Tuttle. While this meteor shower happens every August in the northern hemisphere, we won't see Comet Swift-Tuttle again until the year 2126.

See how many comets (and asteroids!) have been discovered on NASA's Comets page, learn how you can cook up a comet, and check out our mid-month article where we'll provide tips on how to take astrophotos with your smartphone!

Navigating the Mid-November 2024 Night Sky

courtesy of the Astronomical League



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

1. Face south. Almost overhead lies the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend a line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the south. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second brighest star in the south.
2. Draw a line westward following the southern edge of the Square until it strikes Altair, part of the "Summer Triangle."
3. Locate Vega and Deneb, the other two stars of the Summer Triangle. Vega is its brightest member, while Deneb sits in the middle of the Milky Way.
4. Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, then to Perseus, and finally to Auriga with its bright star Capella.

Binocular Highlights

A and B: Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **D:** Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas. **E.** The Double Cluster.

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

Observing (Cont'd)

(Continued from page 5)

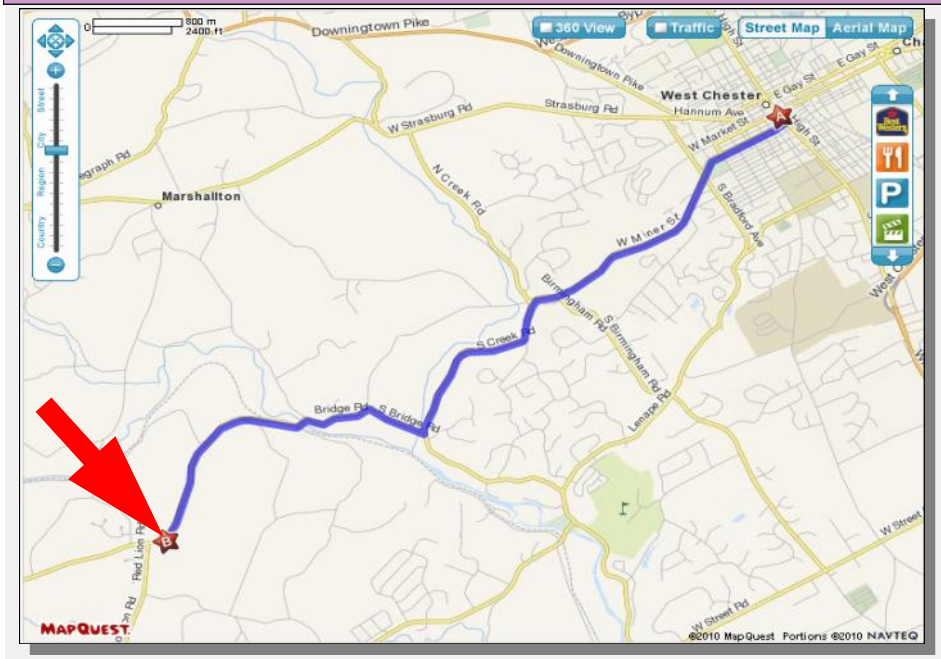
Comets: Sadly, Comet C/2023 A3 (Tsuchinshan-ATLAS) has faded from our skies, but you can still find it with binoculars or a telescope using the sky map in the November issue of Astronomy magazine or your favorite astronomy app on your mobile device.

Meteor showers: The Leonid meteor shower is active between the 6th and the 30th with the peak predicted on the 17th. Unfortunately, the nearly full Moon will wash out all but the brightest meteors on that night. The best viewing will be during the evenings before the Full Moon.

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).

Eyepiece (Cont'd)

A star map I created using Stellarium, the free planetarium software

(Continued from page 6)

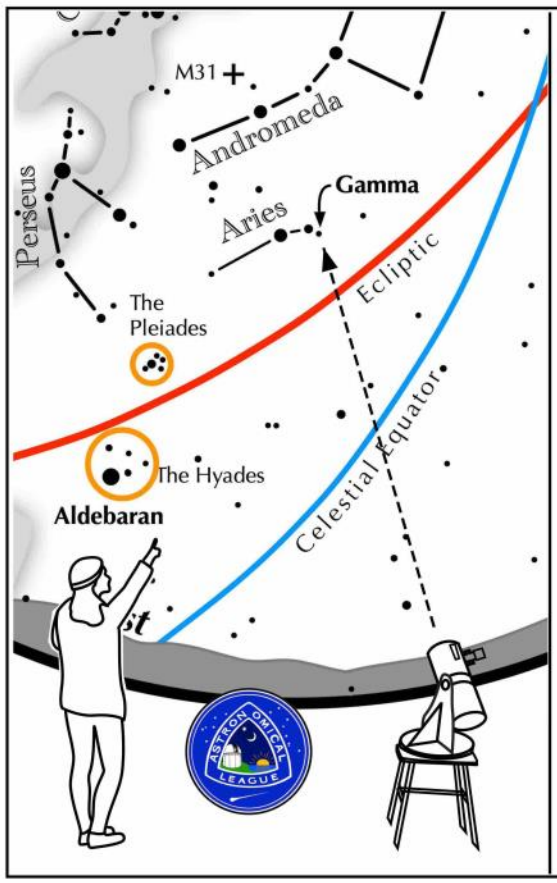
vast gaseous cloud and a small, dense remnant. For a star as massive as Mu Cephei the remnant is likely to be a black hole.

Finding Herschel's Garnet Star is not difficult, but since it shines at 4th magnitude it is not very bright in our light polluted Chester County skies. Binoculars are a great help, as is a telescope. Cepheus is between Ursa Minor and Cassiopeia and is a somewhat dim constellation in the shape of a house. The Garnet Star is in the basement of this house, nearly equidistant from the two "foundation" stars.

When you find it, you will

(Continued on page 14)

Double Star Challenge for November 2024
courtesy of the Astronomical League



Other Suns: Gamma Arietis

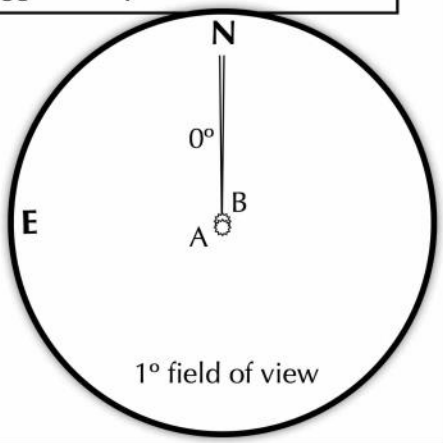
How to find Gamma Arietis on a November evening

Face east. Locate the Pleiades. Aries lies to its upper right about the same distance that it is from the Hyades. Gamma is a dim star at the end of the string of stars that form Aries.

Suggested magnification: >50x
Suggested aperture: >2 inches

Gamma Arietis
A-B separation: 7.5 sec
A magnitude: 4.5
B magnitude: 4.6
Position Angle: 0º
A & B colors:
white, white

Also known as the "Ram's Eyes."



CCAS Original Astrophotography
by CCAS member Rick Maynard

I've submitted an image of Comet C/2023 A3 Tsuchinshan ATLAS that I took on October 16, 2024, at 8:30 pm at the Sandy Hollow Park on Birmingham road.

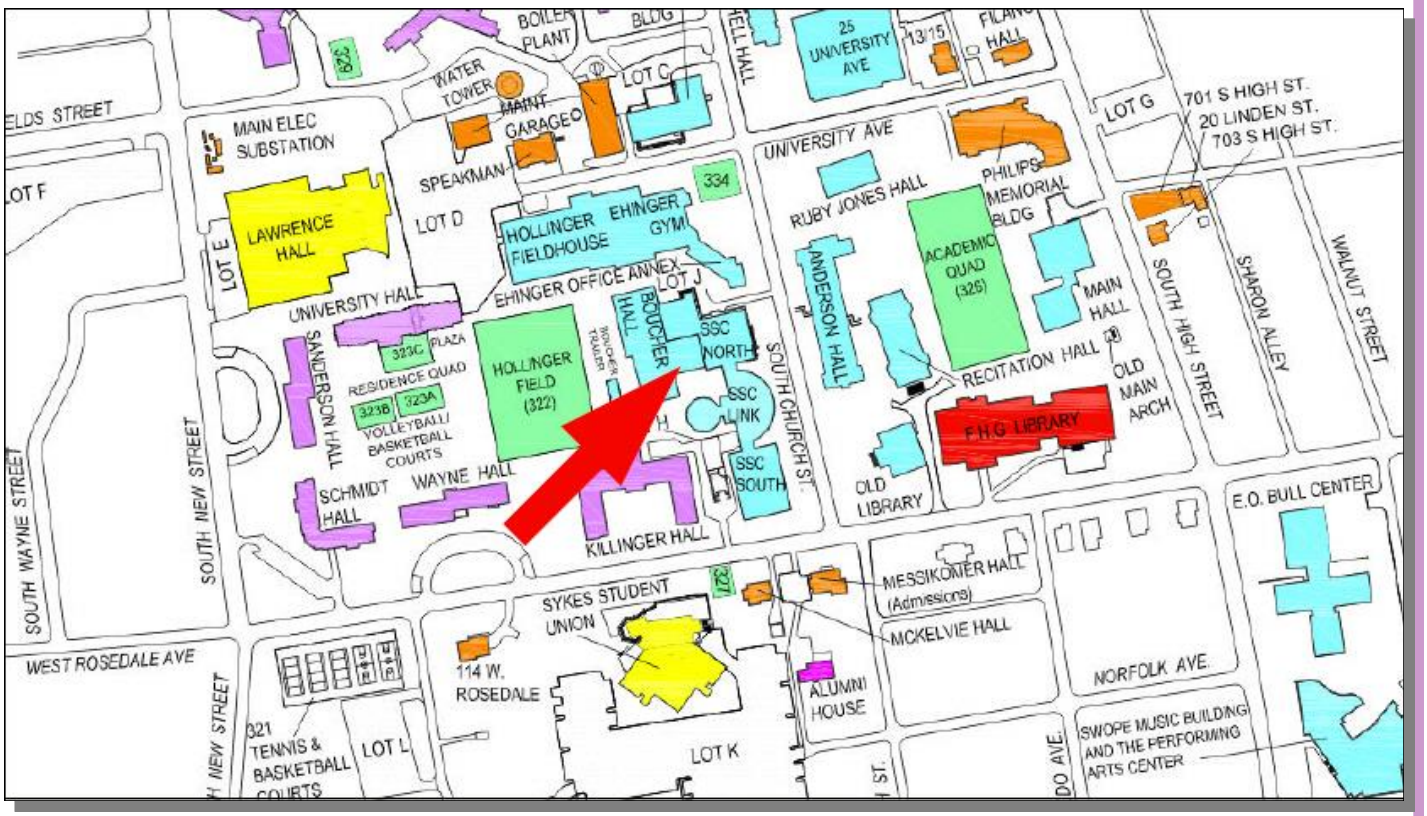
I shot the image with a Canon 5D Mk 4 and Canon EF f4 500mm lens in raw format. Camera settings were ISO 2500, f8.0 and 5 second exposure. Image was post processed in Adobe Lightroom and Topaz Photo AI.

On that night you could make out the comet with the naked eye once you got adjusted to the night sky.

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 12)

know it because of the distinct red color.

Information sources:

- Sky Safari app, adapted from STARS by Jim Kaler, Professor Emeritus of Astronomy, University of Illinois
- http://stars.astro.illinois.edu/sow/garnet.html
- http://www.nightskyinfo.com/archive/mu_cephei/
- https://en.wikipedia.org/wiki/Mu_Cephei

CCAS Membership Information and Society Financials

Treasurer's Report

by Don Knabb

Oct. 2024 Financial Summary

Beginning Balance	$1723
Deposits	$525
Disbursements	-$514
Ending Balance	$1734

New Member Welcome!

Welcome to new CCAS members Michael Stefanowicz and Laura Cochrane WCU, West Chester, PA; Tobias Kurz, Coatesville, PA; Phyllis Skupien, Downingtown, PA; and Mihir Pilgaonkar, Wyomissing, 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 $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

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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 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/

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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 610-558-4248
Vice President:	Pete Kellerman 610-873-0162
ALCor & Treasurer:	Don Knabb 610-436-5702
Interim Observing:	Don Knabb 610-436-5702
Secretary:	Beatrice Mazziotta 610-933-2128
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 & 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.