Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 23, No. 10 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009* *October 2015*

In This Issue

CCAS Autumn 2015 Events 2
September 2015 Meeting Minutes 2
October 2015 Meeting 2
Dusty Mystery Around AU Microscopii 3
The Sky Over Chester County: October 2015 4
October 2015 Observing Highlights 5
Through the Eyepiece: The Spiral Cluster – Messier 34 6
NASA Space Place 8
Eclipse at Star Farm Park..... 9
CCAS Directions: Brandywine Valley Association..... 9
Membership Renewals..... 10
New Member Welcome 10
CCAS Directions: WCU Map 10
Treasurer's Report 10
CCAS Information Directory..... 11-12

Super Moon Lunar Eclipse!

Photo by CCAS Member and Secretary Ann Miller. Taken with an iPad through a TeleVue telescope.

Membership Renewals Due

10/2015	Baran
	Conrad
	Rosenblatt, Harriet
	Rosenblatt, Herb
11/2015	Buczynski
	Cavanaugh
	Giles
	Grinberg
	Holenstein
	Luttrell-Pollard
	Smith
	Taylor
12/2015	Bogard
	Bogusch
	O'Leary

Important October 2015 Dates

4th • Last Quarter Moon, 5:06 p.m.

12th • New Moon, 8:05 p.m.

20th• First Quarter Moon, 4:31 p.m.

21st • Orionid Meteor Shower Peaks.

27th • Full Moon, 8:05 a.m.

CCAS Upcoming Nights Out

CCAS has several "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.

☼ **Saturday, October 10, 2015.** CCAS Special Observing Session, Anson Nixon Park, Kennett Square, PA. For more information, contact our Observing Chair, Don Knabb.

☼ **Friday, October 16, 2015.** CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

Autumn 2015 Society Events

October 2015

7th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

8th-9th • The von Kármán Lecture Series: Unveiling an Alien World: Dawn at Ceres at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

10th • CCAS Special Observing Session, Anson Nixon Park, Kennett Square, PA.

13th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. CCAS Speaker: John Conrad, NASA Ambassador.

16th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

20th • Open call for articles and photographs for the November 2015 edition of Observations.

21st-22nd • Orionids Meteor Shower Peaks.

26th • Deadline for newsletter submissions for the November 2015 edition of Observations.

November 2015

1st • Daylight Saving Time ends, 2:00 A.M. EST. Turn clocks back one hour.

4th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

5th-6th • The von Kármán Lecture Series: The Juno Mission to Jupiter, at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

10h • CCAS Monthly Meeting, Merion Science Center, Rm 112, West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: TBA.

13th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

13th • West Chester University Planetarium Show: " Andromeda: Our Galaxy Neighbor." The show starts at 7 p.m. For more information and reservations, visit the WCU Public Planetarium Shows webpage.

17th-18th • Leonid Meteor Shower Peaks.

20th • Open call for articles and photographs for the December 2015 edition of Observations.

26th • Deadline for newsletter submissions for the December 2015 edition of Observations.

Minutes from the September 8, 2015, Society Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor welcomed 19 member and guests to the September 8, 2015 meeting of CCAS.
- Don Knabb, our observing chair, shared highlights of the night sky for the next month with Stellarium. He reminded us that a total lunar eclipse will occur on Sunday, September 27, 2015.
- Don also reminded club members of the upcoming star parties. Nottingham Park Star Party is on Friday, September 11, 2015 at 7:30pm. Hoopes Park Star Party is on Saturday, September19, 2015.
- David Hockenberry, program chair, welcomed our speaker Dr. Scott Engel from Villanova University.
- Dr. Engel invited our club to attend the lunar eclipse observing session at Villanova University Observatory on September 27, 2015. He also informed us that the Astrophilly.org website is reactivated. The website lists events for local astronomy clubs and universities on this site. Astrophilly also has a yearly meeting. Dr. Engel then gave a talk on "What Do You Mean When You Ask If a Planet is Habitable?"

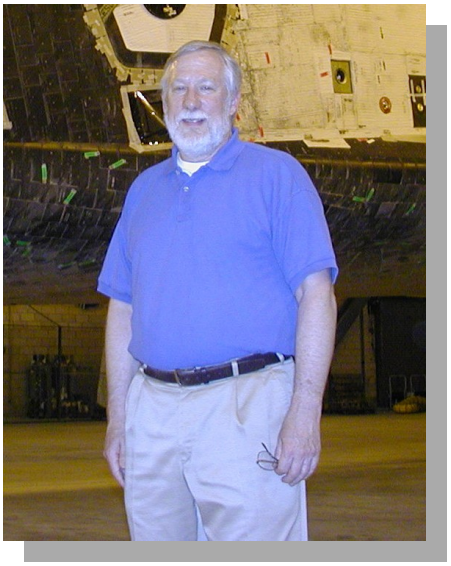
October 2015 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on October 13, 2015, starting at 7:30 p.m. The meeting will be held in Room 112, Merion Science Center (former Boucher Building), West Chester University. CCAS President Roger Taylor will welcome members and the general public to the first meeting in our 2015-2016 season. Our speaker is John Conrad, NASA Ambassador. His presentation is entitled, "Climate Change: The View (and the latest news) from Space."

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.

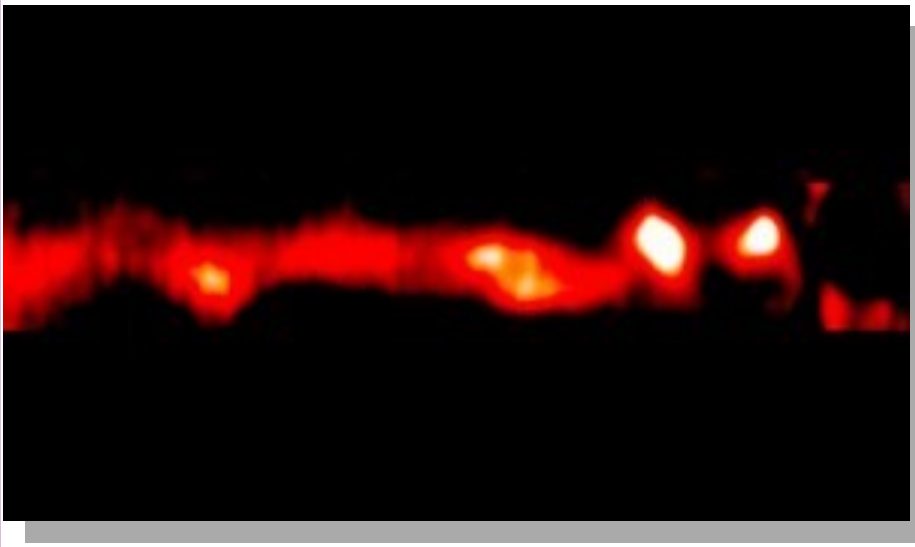
We are looking for presenters for future meetings in our 2015-2016 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.



John Conrad, NASA Ambassador

A Dusty Mystery Around AU Microscopii

submitted by Shannon Hall, Sky & Telescope Magazine



The Ripples Seen by SHERE in 2014. VLT / SPHERE / IRDIS

Nearby debris disks — the dusty, sometimes rocky planes circling young stars — have only recently become the hunting grounds of astronomers, who search for the telltale signs of forming planets: gaps, clumps or warped features in these disks. But thus far, very few disks have revealed planets hidden inside. The majority remain a mystery waiting to be unfolded.

SPHERE, an instrument mounted on the Very Large Telescope in Chile, is designed to directly image debris disks and reveal their secrets. Its coronagraph blocks the light of the host star, while the instrument's adaptive optics reveals details around the star to a resolution of 0.5 arcseconds, rivaling the Hubble Space Telescope's imaging prowess.

In 2014, Anthony Boccaletti (Paris Observatory) and his colleagues pointed SPHERE at a test target known as AU Microscopii, a young star 32 light-years away in the southern constellation Microscopium. But what they found was something utterly unexpected: wave-like arches on one side of the disk. Were they real? The team turned to data gathered by the Hubble Space Telescope in 2010 and 2011, and sure enough, the features were there too.

What's more, the arching waves had moved at a breakneck pace through the disk, moving away from the central star at 4 to 10 kilometers per second (between 9,000 and 22,000 mph).

"This is a fascinating result," says Richard Nelson (Queen Mary University of London), who was not involved in the study. "But interpreting the observations is a real puzzle." Not only have astronomers never seen anything like it, they really can't find a viable explanation.
The five bright smears in AU Mic's disk lie within 10 and 60 times the Earth-Sun distance of the star, and are probably clumps or clouds of dust shining in near-infrared light. The Hubble photos allowed the team to track the ripples over a 4-year baseline, revealing their immense speed. The outer waves moved much faster than the inner ones, and at least three of the features are moving so fast that they could easily slip beyond the star's gravitational pull.

Such high speeds rule out any classic scenarios caused by orbiting planets. A warp carved in the disk by a nearby planet, for example, would move at speeds too lethargic compared to the observed ripples. Boccaletti and his colleagues searched high and low for a planet with no luck. "If there was a planet in there and it was larger than 6 Jupiter masses, we'd be able to find it," says co-author Dean Hines (Space Telescope Science Institute). "If there's something in there stirring up the pot, which there almost certainly is, it's going to be smaller than that."

So maybe, the authors propose, two smaller as-yet unseen planets collided within the disk. After all, most astronomers expect that all forming planetary systems are extremely violent. Our solar system, for example, is still scarred by the collisions of its youth, which should have been readily visible to an extra-terrestrial observer.

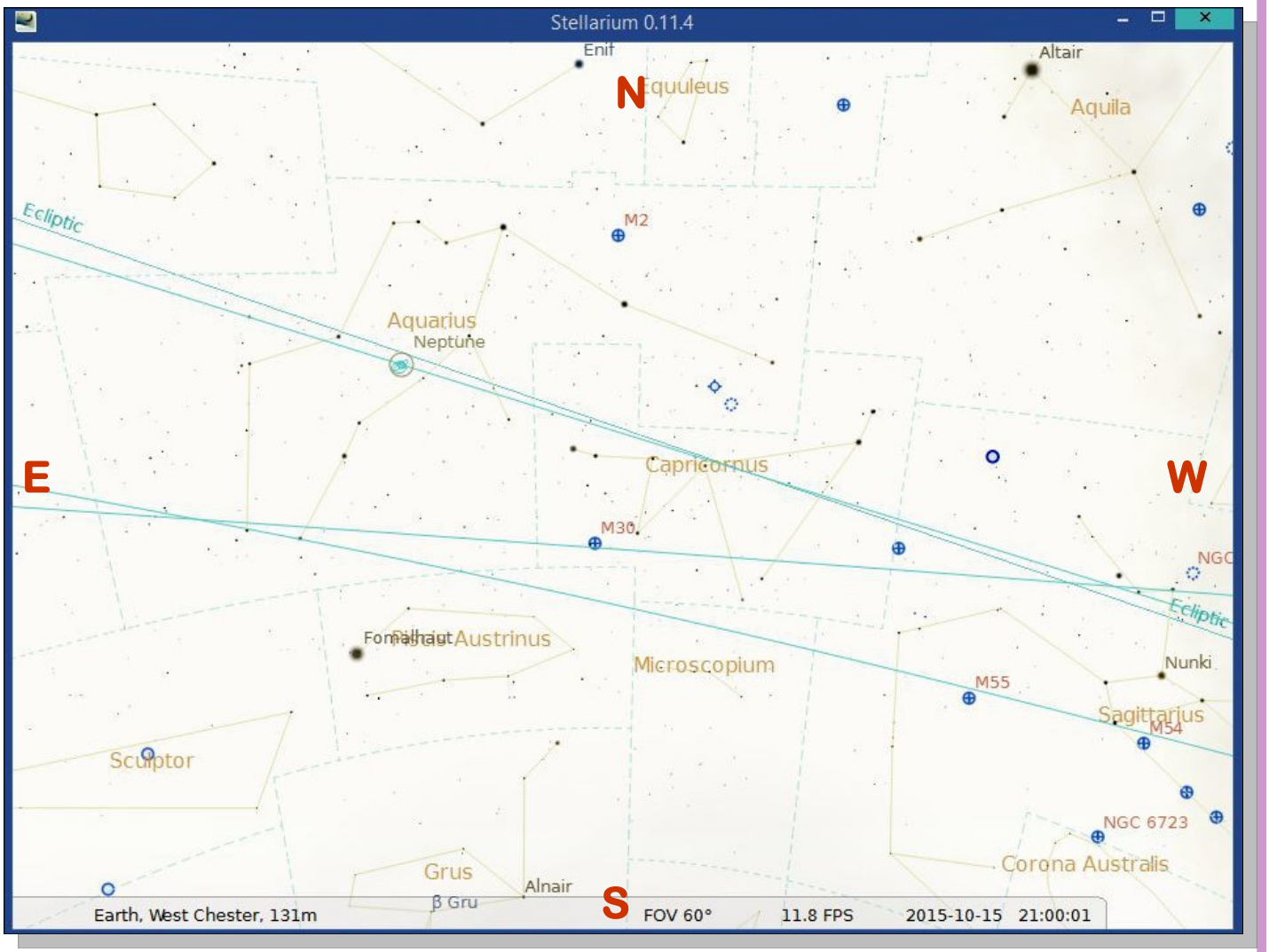
"If you grind up chalk, put it in a bag and pop it, the chalk dust goes everywhere," Hines says. "It's really hard if you're in the back of the room to see that piece of chalk, but once you explode it, it has a huge surface area and it's easy to see." Although a collision might explain

(Continued on page 9)

The Sky Over Chester County

October 15, 2015 at 9:00 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
10/01/2015	6:30 a.m. EDT	6:57 a.m. EDT	6:43 p.m. EDT	7:10 p.m. EDT	11h 46m 43s
10/15/2015	6:44 a.m. EDT	7:11 a.m. EDT	6:22 p.m. EDT	6:49 p.m. EDT	11h 10m 41s
10/31/2015	7:00 a.m. EDT	7:28 a.m. EDT	6:00 p.m. EDT	6:28 p.m. EDT	10h 31m 33s

Moon Phases					
Last Quarter	10/04/2015	5:06 p.m. EDT	New Moon	10/12/2015	8:05 p.m. EDT
First Quarter	10/20/2015	4:31 p.m. EDT	Full Moon	10/27/2015	8:05 a.m. EDT

October 2015 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

4	Last Quarter Moon
11-17	Venus, Mars, Jupiter and Mercury are visible in the pre-dawn sky
12	Uranus is at opposition
12	New Moon
16	The Moon is near Saturn
19	The Lunar X is visible around 10 p.m.
20	First Quarter Moon
20	The Lunar Straight Wall is visible
21	The Orionid meteors peak tonight
26	Venus is at greatest western (morning) elongation
27	Full Moon, the Hunter's Moon

The best sights this month: The planetary highlight of October occurs in the pre-dawn sky during mid-month when Mercury, Venus, Mars and Jupiter appear together. If I were to pick one day to rise early it would be October 11th when the 4 planets will also be joined by a thin crescent Moon. The evening highlight will be on October 19th when the elusive Lunar X can be seen.

Mercury: Mercury can be seen in the pre-dawn sky from mid-month through the 3rd week of October.

Venus: Venus reaches greatest elongation from the Sun on October 26th and is near Mars and Jupiter all month in the hours before dawn.

Mars: Throughout October Mars and his pals Venus and Jupiter fly through the sky together before the glow of the Sun fills the sky.

Jupiter: Jupiter snuggles up next to Mars – less than ½ degree separation – on the morning of October 17th. Jupiter is of course much brighter than dim Mars, but even Jupiter seems dim compared to brilliant Venus.

Saturn: Take a last look at Saturn as soon as the sky darkens. It will not be many weeks before we lose Saturn to the glow of the setting sun and say goodbye until the ringed planet comes into the dawn sky later this year.

Uranus and Neptune: Uranus reaches opposition on October 12th so it will be high in the sky at midnight. Neptune is also in good viewing position at that time. Finder charts for both gas giants are at available skypub.com/urnep, provided by Sky and Telescope magazine.

The Moon: Full moon occurs on October 27th. The October full Moon is the first full Moon after the Harvest Moon and it is called the Hunter's Moon. The Hunter's Moon is so named because plenty of moonlight is ideal for hunters shooting migrating birds in Northern Europe, and the name is also said to have been used by Native Americans as they tracked and killed their prey by autumn moonlight, stockpiling food for the winter ahead.

Constellations: During October, we begin to lose the summer triangle and all the delights it holds, but here come the fall and winter treasures! The dim but huge Great Square of Pegasus dominates the southern sky and by 9:00 we can find the jewels of the night: the Pleiades, rising in the east. Stay up late and Taurus the Bull leads Orion the Hunter up from the eastern horizon.

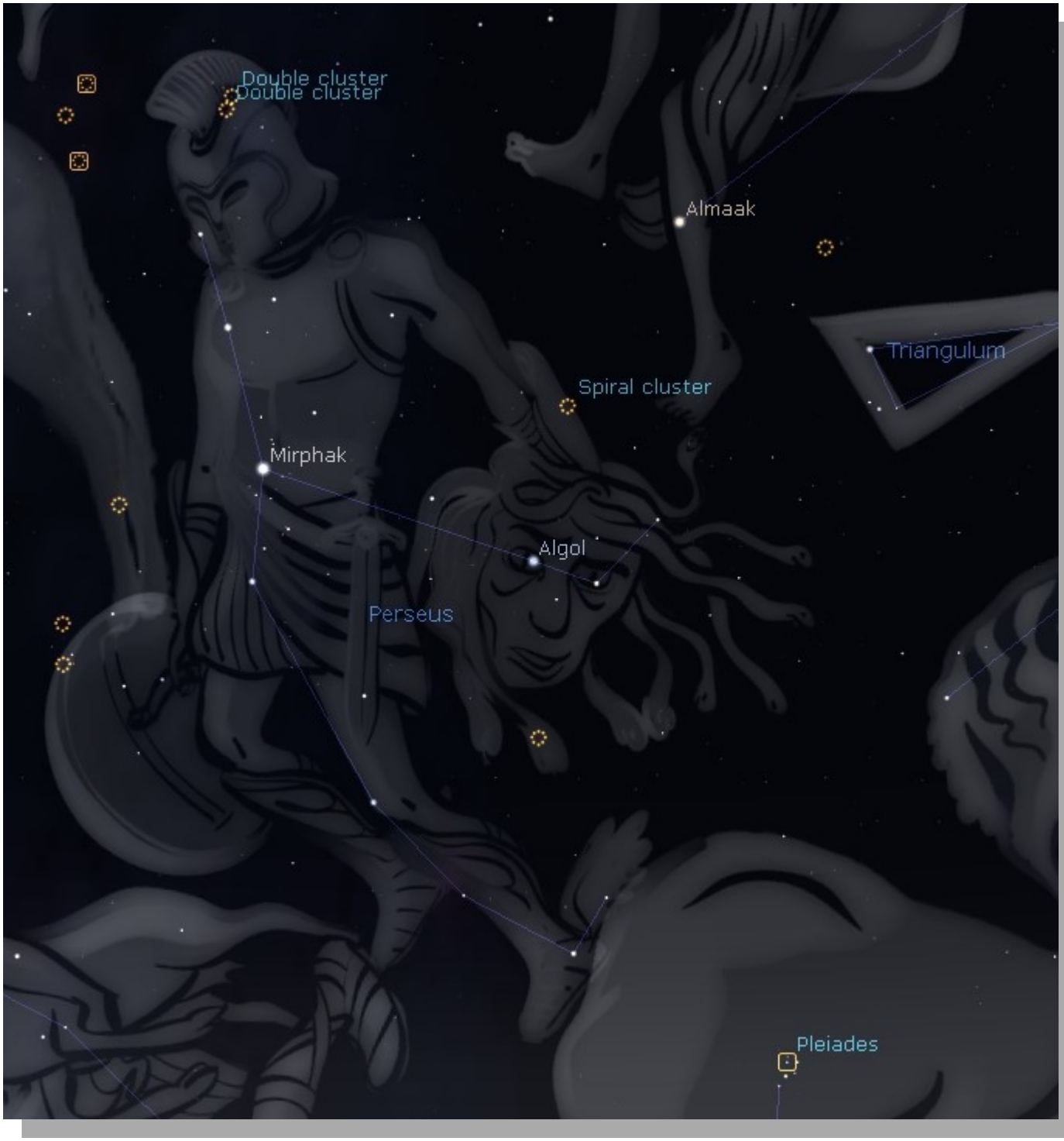
Messier/deep sky: The deep sky highlight of this time of year for me is the Andromeda Galaxy, M31. You don't need to be up late to catch the wonderful Double Cluster in Perseus and the compact star cluster M34 is just a bit to the south, also in Perseus. Stay up until 10:00 and you can see the star clusters in Auriga rising: M36, M37 and M38.

Comets: There are no bright comets in the sky during October.

Meteor showers: The Orionid meteor shower peaks in the early morning hours of October 21st. You could see up to 15 "shooting stars" per hour. This is a good opportunity to see meteors since the Moon will be setting by the time the shower gets into full swing.

Through the Eyepiece: The Spiral Cluster – Messier 34

by Don Knabb, CCAS Treasurer & Observing Chair



Star map generated with Stellarium

While you are cruising around the area of the sky that includes the Andromeda Galaxy, the Double Cluster in Perseus and the Pleiades in Taurus, look for M 34, often referred to as The Spiral Cluster, an open cluster just to the northwest of the famous variable star Algol in Perseus. There are two stellar arcs visually apparent under low power that gave rise to the name "Spiral Cluster."

(Continued on page 7)

Eyepiece (Cont'd)

Photo credit: CCAS Member Pete La France

(Continued from page 6)

An open cluster is a group of up to a few thousand stars that were formed from the same giant molecular cloud and are still loosely gravitationally bound to each other in contrast to globular clusters which are very tightly bound by gravity.

Messier 34 (also known as M 34 or NGC 1039) is in the constellation Perseus. It was probably discovered by Giovanni Batista Hodierna before 1654 and was included by Charles Messier in his catalog of comet-like objects in 1764. Messier described it as, "A cluster of small stars a little below the parallel of γ (Andromendae). In an ordinary telescope of 3 feet one can distinguish the stars."

Open clusters are very important objects in the study of stellar evolution. Because the stars are all of very similar age and chemical composition, the effects of other more subtle variables on the properties of stars are much more easily studied than they are for isolated stars. A number of open clusters, such as the Pleiades, Hyades or the Alpha Persei Cluster are readily visible with the naked eye. Some others, such as the Double Cluster, are barely perceptible without instruments, while many more can be seen in binoculars or telescopes.

M34 can be found with the naked eye under very good conditions as a faint nebulous patch. It is probably beyond perception in Chester County skies without binoculars. But it is resolved into stars even in 10x50 binoculars and is best at low magnifications in telescopes. About 20 brighter stars, filling a 10' area, are surrounded by a larger number of fainter outlying members. Larger amateur instruments show a total of about 80 stars. Many stars are arranged in pairs.

I have included a picture of M 34 taken by CCAS member Pete LaFrance.

(Continued on page 10)

Measure the Moon's Size and Distance During the Next Lunar Eclipse

by Dr. Ethan Siegel

The moon represents perhaps the first great paradox of the night sky in all of human history. While its angular size is easy to measure with the unaided eye from any location on Earth, ranging from 29.38 arc-minutes (0.4897°) to 33.53 arc-minutes (0.5588°) as it orbits our world in an ellipse, that doesn't tell us its physical size. From its angular size alone, the moon could just as easily be close and small as it could be distant and enormous.

But we know a few other things, even relying only on naked-eye observations. We know its phases are caused by its geometric configuration with the sun and Earth. We know that the sun must be farther away (and hence, larger) than the moon from the phenomenon of solar eclipses, where the moon passes in front of the sun, blocking its disk as seen from Earth. And we know it undergoes lunar eclipses, where the sun's light is blocked from the moon by Earth.

Lunar eclipses provided the first evidence that Earth was round; the shape of the portion of the shadow that falls on the moon during its partial phase is an arc of a circle. In fact, once we measured the radius of Earth (first accomplished in the 3rd century B.C.E.), now known to be 6,371 km, all it takes is one assumption—that the physical size of Earth's shadow as it falls on the moon is approximately the physical size of Earth—and we can use lunar eclipses to measure both the size of and the distance to the moon!

Simply by knowing Earth's physical size and measuring the ratios of the angular size of its shadow and the angular size of the moon, we can determine the moon's physical size relative to Earth. During a lunar eclipse, Earth's shadow is about 3.5 times larger than the moon, with some slight variations dependent on the moon's point in its orbit. Simply divide Earth's radius by your measurement to figure out the moon's radius!

Even with this primitive method, it's straightforward to get a measurement for the moon's radius that's accurate to within 15% of the actual value: 1,738 km. Now that you've determined its physical size and its angular size, geometry alone enables you to determine how far away it is from Earth. A lunar eclipse is coming up on September 28th, and this super moon eclipse will last for hours. Use the partial phases to measure the size of and distance to the moon, and see how close you can get!

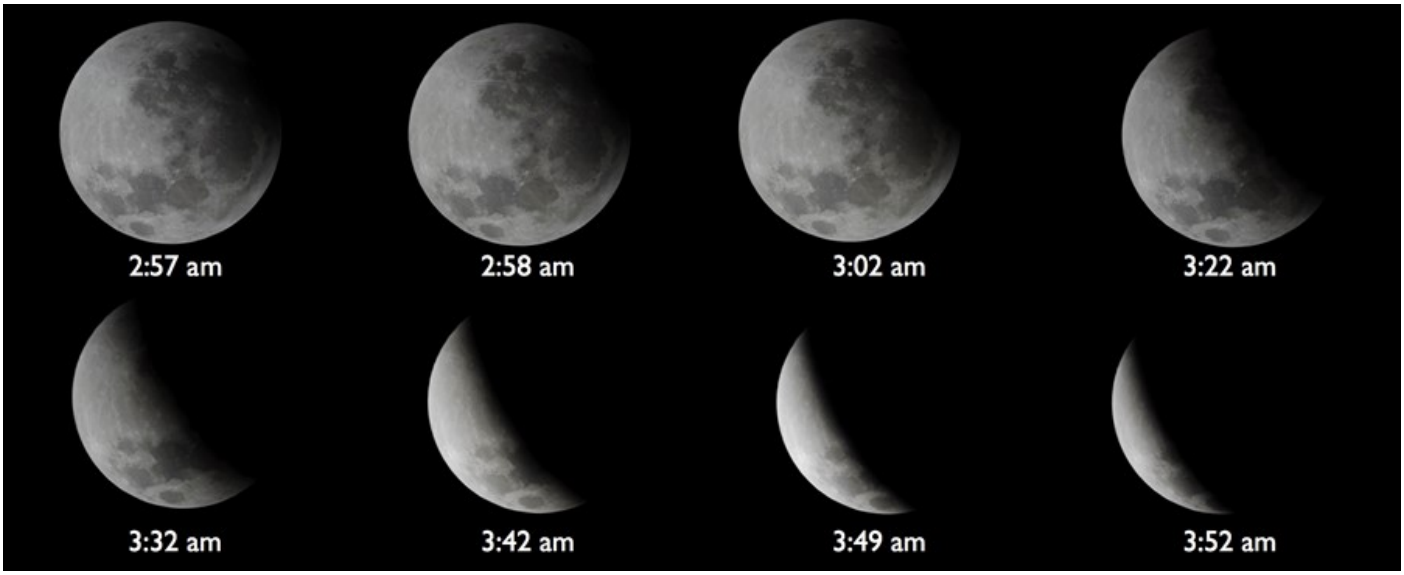


Image credit: Daniel Munizaga (NOAO South/CTIO EPO), using the Cerro Tololo Inter-American Observatory, of an eight-image sequence of the partial phase of a total lunar eclipse.

Ripples (Cont'd)

(Continued from page 3)

the asymmetries in brightness from one side of the disk to the other, it couldn't cause material to move so fast.

The most promising scenario requires an even more violent interaction. Young stars, while promising abodes for life, are wildly active. They emit giant flares — huge eruptions of charged particles — that can wreak havoc on a circling planetary disk. If a flare hits a forming planet, it could easily strip material away from the planet and propagate it outward at rapid speeds. Nelson, however, doubts whether even these speeds would be fast enough to match those found within AU Microscopii's disk.

The team plans to continue to observe the system with SPHERE and other facilities. "It's not often that you see something changing on human timescales," says Hines, who is excited to see further changes that will allow them to narrow down the range of possibilities.

"We wish we knew what it was," says co-author John Debes (Space Telescope Science Institute). "But sometimes you just have to throw up you hands and say 'We don't know what it is yet and we'll keep looking and keep thinking to try to come up with the answer.'"

Reference:

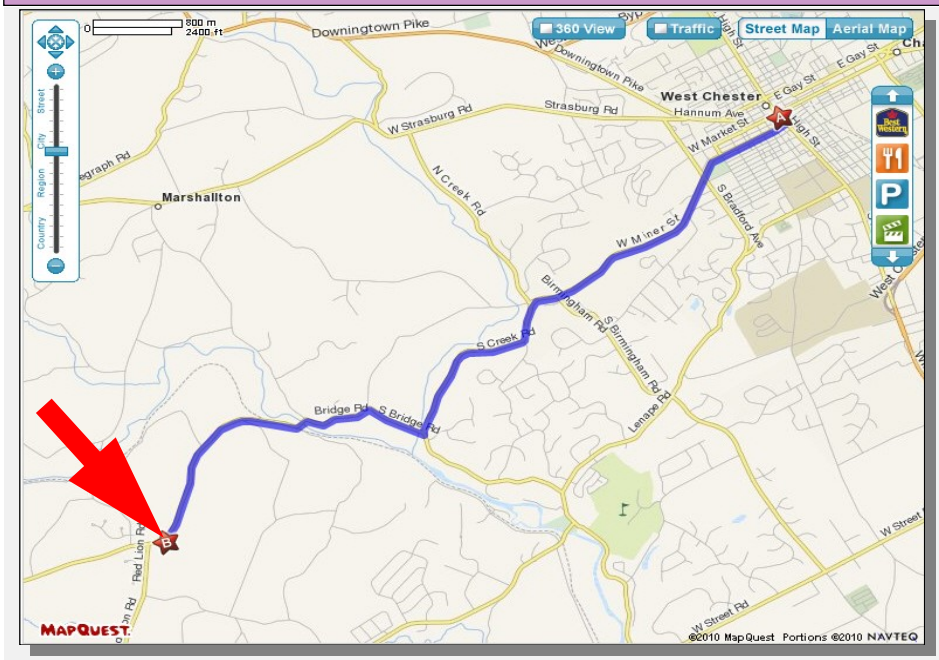
Anthony Boccaletti et al. "Fast-Moving Structures in the Debris Disk Around AU Microscopii." *Nature*. October 8, 2015.

Lunar Eclipse at Star Farm Park

by Don Knabb

For a long time we thought we would see nothing except the glow of the Moon behind the clouds, but lo and behold, the skies parted for at least a while and we had a great view from the beginning of the eclipse to totality, then the clouds moved in again.

CCAS Directions



Brandywine Valley Association
1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090
http://brandywinewatershed.org/

BVA 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 Valley Association

The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Valley Association.

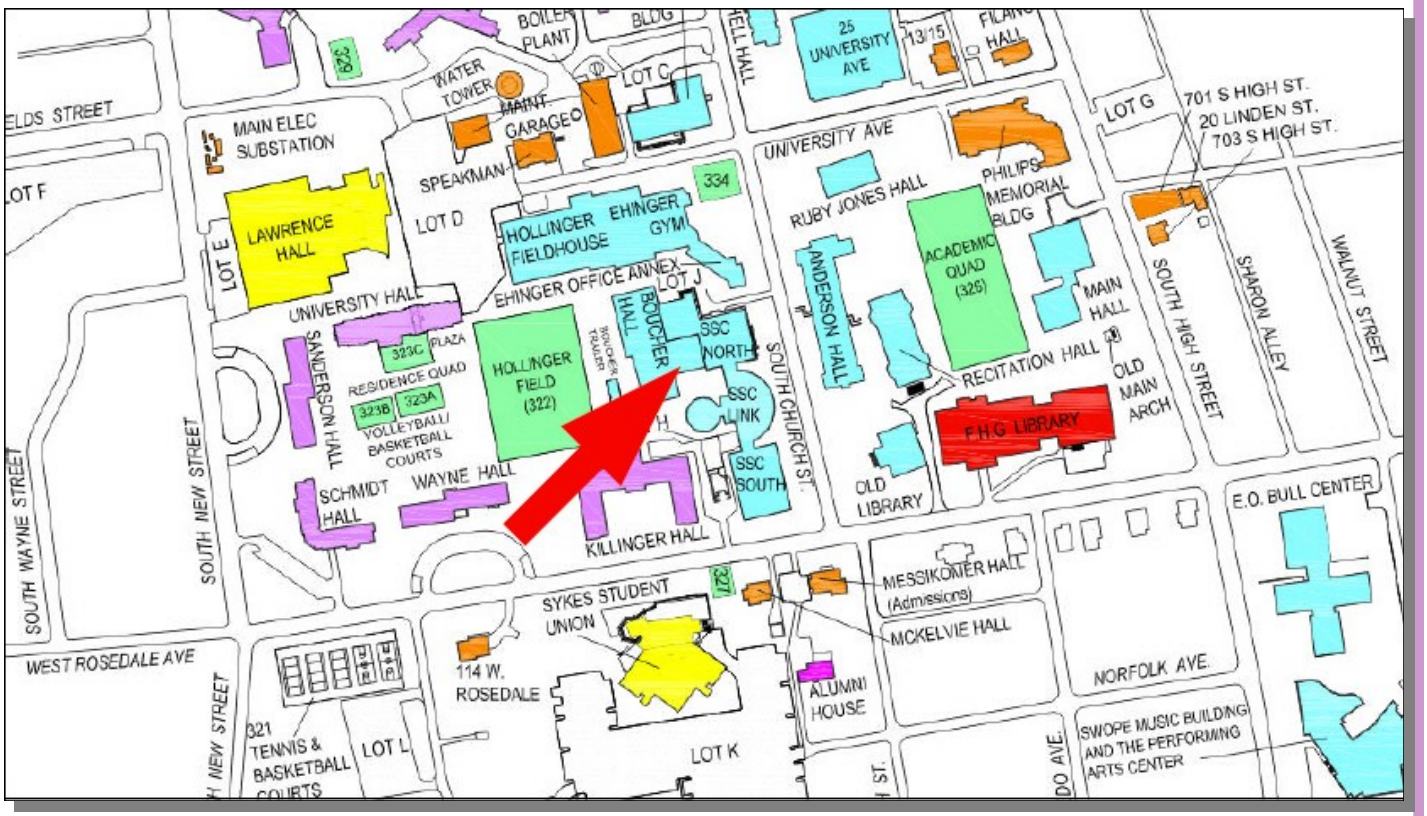
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route 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).



Eyepiece (Cont'd)

(Continued from page 7)

You can view more of Pete's astrophotography at http://www.plafrance.org/.

So add M 34 to your observing list for October. It is not one of the more famous star clusters but it is a beautiful cluster worthy of your attention.

Information credits:

http://www.seds.org/messier/m/m034.html
http://en.wikipedia.org/wiki/Messier_34
http://en.wikipedia.org/wiki/Open_clusters
http://darkhorseobservatory.org/product.php?ProductID=126

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

Sept. 2015 Financial Summary

Beginning Balance	$2,075
Deposits	$148
Disbursements	$94
Ending Balance	$2,129

New Member Welcome!

Welcome new CCAS members Marietta Neary from Unionville and Nova Kazmi from West Chester. 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
3225 North First Avenue
Tucson, AZ 85719

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

PENNSYLVANIA OUTDOOR LIGHTING COUNCIL

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.LymePA.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!

Starry Night Lights

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 Park City, Utah.

Phone: **877-604-7377**
Fax: **877-313-2889**

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.

Phone: **484-291-1084**

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

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**

http://www.skiesunlimited.net

★ ★ ★ ★ ★

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: **215-667-8309**
Fax: **215-965-1524**

Hours:
Tuesday thru Saturday: 10AM to 6PM
Sunday and Monday: 11AM 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, and on the CCAS website. 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:

John Hepler
21103 Striper Run
Rock Hall, MD 21661

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 John Hepler, the newsletter editor, at: **newsletter@ccas.us**.

CCAS Website

John Hepler is the Society's Webmaster. You can check out our Website at:
http://www.ccas.us

John 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 John Hepler at (410) 639-4329 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:	Roger Taylor 610-430-7768
Vice President:	Liz Smith 610-842-1719
ALCor, Observing, and Treasurer:	Don Knabb 610-436-5702
Secretary:	Ann Miller 610-558-4248
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 410-639-4329
Public Relations:	Deb Goldader 610-304-5303

CCAS Membership Information

The present membership rates are as follows:

REGULAR MEMBER……$25/year
SENIOR MEMBER…….$10/year
STUDENT MEMBER……..$ 5/year
JUNIOR MEMBER……..$ 5/year
FAMILY MEMBER…….$35/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 & Tele*scope Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95,** much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Buying a subscription this way also gets you a 10% discount on other Sky Publishing merchandise.

To **start** a **new** subscription, make **sure** you make out the check to the **Chester County Astronomical Society**, note that it's for *Sky & Telescope*, and mail it to Don Knabb.

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders. If you have **any** questions call Don first 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). If you want to participate in this special Society discount offer, **contact our Treasurer Don Knabb.**