Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 25, No. 8 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *August 2017*

In This Issue

CCAS Summer/Fall Events..... 2
CCAS Original Astrophotography 2
September Meeting Agenda 2
Preparing for the August 2017 Total Solar Eclipse 3
The Sky Over Chester County: August 2017 4
August 2017 Observing Highlights 5
NASA Space Place..... 6
CCAS Directions: Brandywine Red Clay Alliance 7
Through the Eyepiece: M27, the Dumbbell Nebula 8
CCAS Annual Summer Party..... 9
Membership Renewals 10
New Member Welcome 10
CCAS Directions: WCU Map 10
Treasurer's Report..... 10
CCAS Information Directory..... 11-12

Are You Ready for August 21st?

Annular eclipse 20 May 2012. Image credit: G.R.R. at Flickr.com

Membership Renewals Due

08/2017	Buki
	Knabb & Family
	Lurcott, L.
	Tiedemann
09/2017	Armored
	Lurcott, E.
	Proko
10/2017	Conrad
	Johanson
	Lane
	Lester
	Rosenblatt
	Skelton
	Zandler

August 2017 Dates

2nd • The Moon is near Saturn

7th • Full Moon, the Full Sturgeon Moon or the Ripening Moon, 2:10 p.m. EDT

12th • The Perseid meteor shower peaks in the early morning hours

14th • Last Quarter Moon, 9:14 p.m. EDT

21st • New Moon and total solar eclipse!

29th • First Quarter Moon, 4:12 a.m. EDT

30th • The Lunar Straight Wall (Rupes Recta) is visible

CCAS Upcoming Nights Out

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.

☼ **Saturday, August 12, 2017** - Hickory Run State Park and Perseid meteor shower.

☼ **Friday, August 25, 2017** - Star Farm Park Star Party.

☼ **Saturday, September 9, 2017** - Anson Nixon Park Star Party.

☼ **Saturday, September 23, 2017** - Nottingham Park Star Party

☼ **Saturday, October 21, 2017** - Willistown Run-a-Muck.

Summer/Autumn 2017 Society Events

August 2017

2nd • 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.

12th • CCAS Special Observing Session at Hickory Run State Park and Perseid meteor shower.

18th • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

20th • Open call for articles and photographs for the September 2017 edition of Observations.

21st • CCAS Special Observing Session Star Farm Park star party. The session is scheduled from 8:00 p.m. to 10:00 p.m.

24th-25th • The von Kármán Lecture Series: 40 Years in Space: Voyager's Remarkable Journey Continues, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

26th • CCAS Annual Summer Party. See pg. 7 for details.

26th • Deadline for newsletter submissions for the September 2017 edition of Observations.

September 2017

6th • 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.

9th • CCAS Special Observing Session at Anson Nixon Park, Kennett Square, PA. This event is scheduled from 7:30 p.m. to 9:00 p.m.

12th • CCAS Monthly Meeting starting at 7:30 p.m. in Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker: Gordon Richards, Ph.D., from Drexel University, will present "The LSST and Upcoming Discoveries."

15th-17th • CCAS Camping Trip to BMVO.

21st-22nd • The von Kármán Lecture Series: A Volcanologist's Paradise, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the October 2017 edition of Observations.

22nd • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

23rd • CCAS Special Observing Session, at Nottingham County Park, Nottingham, PA. The observing session is schedule from 7:30 PM to 9:30 PM.

26th • Deadline for newsletter submissions for the October 2017 edition of Observations.

CCAS Original Astrophotography

by CCAS Member Steve Leiden

M27 is a magnitude 7.5 planetary nebula in the constellation Vulpecula, about 1,360 light-years away from Earth. The Dumbbell Nebula is the first planetary nebula to be discovered by Charles Messier in 1764. The likely age is 9800 years based on the expansion rate.
This picture is the first foray into going deep for this amateur astronomer. It's the result of thirteen 120 second guided subframes for a total of 26 minutes of data integration. The subframes were taken with a Canon 70D DSLR through a Celestron Ultima C11 with the Celestron .63 reducer/corrector on a

(Continued on page 7)

September 2017 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on September 12, 2017, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Our guest speaker is Gordon Richards, Ph.D., from Drexel University, who will present "The LSST and Upcoming Discoveries."

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 our Fall 2017 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

Preparing for the August 2017 Total Solar Eclipse

Courtesy of NASA/Goddard Space Flight Center

The path of the Moon's umbral shadow across land begins in Oregon and ends in South Carolina. Numerous large cities lie within easy reach of the center line. The longest duration of totality — 2 minutes and 41.6 seconds — occurs in and around Giant City State Park, in Illinois. Astronomy: Roen Kelly

On Monday, Aug. 21, 2017, a total eclipse will cross the entire country, coast-to-coast, for the first time since 1918. Weather permitting, the entire continent will have the opportunity to view an eclipse as the moon passes in front of the sun, casting a shadow on Earth's surface. The total solar eclipse begins near Lincoln City, Oregon, at 10:15 a.m. PDT (1:15 p.m. EDT). Totality ends at 2:48 p.m. EDT near Charleston, South Carolina. The partial eclipse will start earlier and end later, but the total eclipse itself will take about one hour and 40 minutes to cross the country.

During a total eclipse, we have the rare opportunity to look directly at the sun's vast, striking outer atmosphere, the corona. The corona appears as pearly white rays and streamers, radiating around the lunar disk. The August 2017 eclipse will present this exciting opportunity to millions across the entire country.

Even during an eclipse, it is not safe to look directly at the sun – except for the brief phase of totality, when the moon fully obscures the sun. The only safe way to look directly at the partially eclipsed sun is through a specialized filter. Eclipse glasses are equipped with the proper filters to minimize ultraviolet, visible and infrared light.

It's crucial to know when to take off and replace your glasses to avoid permanently damaging your eyes. Alex Young, a solar scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, described the different phases of a total eclipse, in which the sun provides important visual clues for when totality is about to start and end.

"If you're wearing your eclipse glasses and it becomes so dark you can't see anything, you know it's safe and it's time to take them off," Young said.

When viewing a partial eclipse, observers must use eye protection at all times. Partial eclipses can be observed indirectly by projection, in which viewers watch the eclipse on a screen. These can be easily constructed at home with few, simple materials – such as a piece of paper and cardboard box.

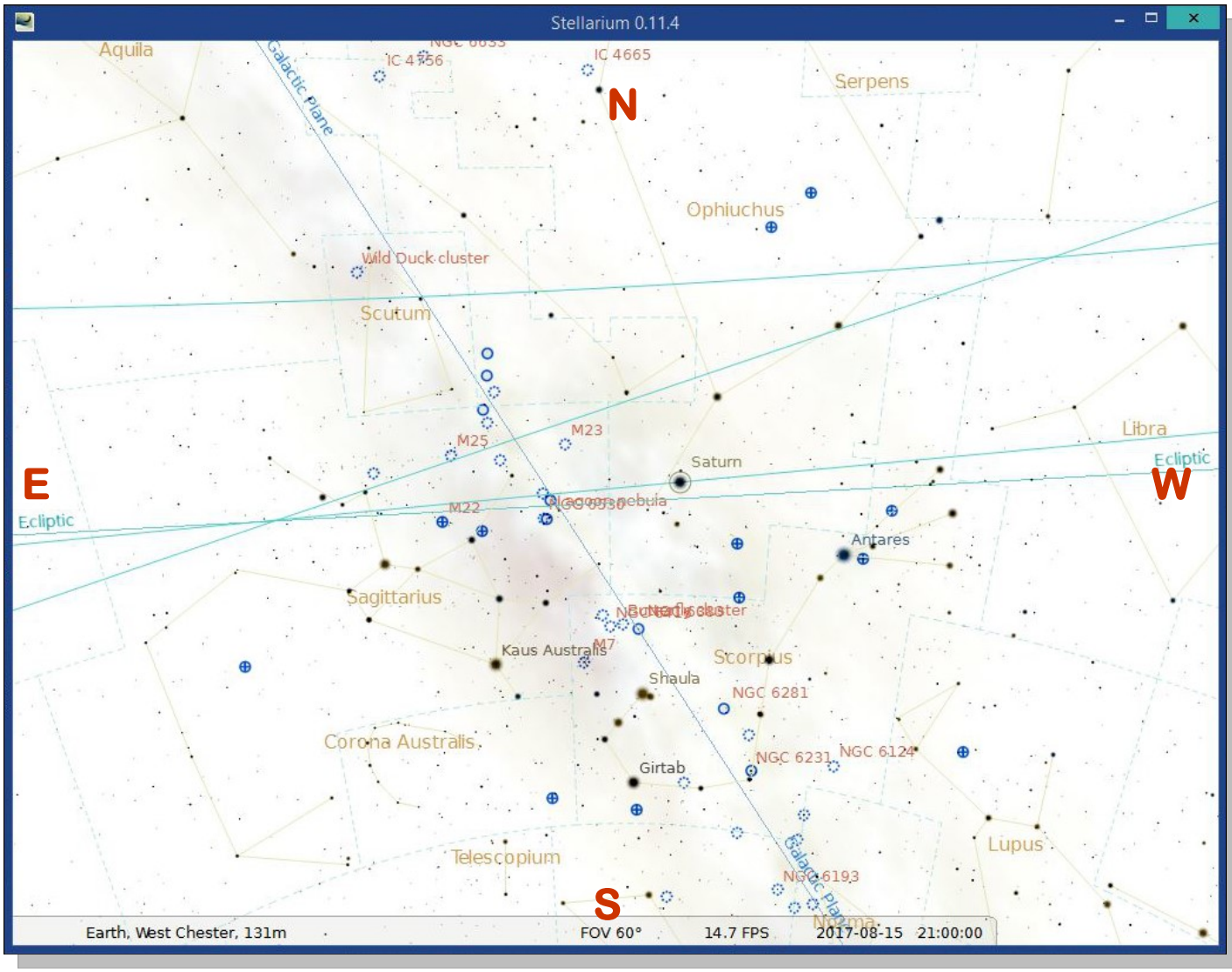
Visit the NASA eclipse site for more advice on viewing the eclipse safely.

Watch the animation at https://www.timeanddate.com/eclipse/in/usa/philadelphia

The Sky Over Chester County

August 15, 2017 at 10:00 p.m. ET

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



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
8/01/2017	5:29 a.m. EDT	5:59 a.m. EDT	8:13 p.m. EDT	8:44 p.m. EDT	14h 14m 29s
8/15/2017	5:43 a.m. EDT	6:12 a.m. EDT	7:56 p.m. EDT	8:25 p.m. EDT	13h 44m 12s
8/31/2017	5:59 a.m. EDT	6:27 a.m. EDT	7:33 p.m. EDT	8:00 p.m. EDT	13h 05m 24s

Moon Phases					
			Full Moon	8/07/2017	2:10 p.m. EDT
Last Quarter	8/14/2017	9:14 p.m. EDT	New Moon	8/21/2017	2:30 p.m. EDT
First Quarter	8/29/2017	4:12 a.m. EDT			

August 2017 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

2	**The Moon is near Saturn**
7	**Full Moon, the Full Sturgeon Moon or the Ripening Moon, 2:10 p.m. EDT**
12	**The Perseid meteor shower peaks in the early morning hours**
14	**Last Quarter Moon, 9:14 p.m. EDT**
21	**New Moon and total solar eclipse!**
25	**The Moon is near Jupiter and along with Spica they form a triangle in the south-west**
29	**First Quarter Moon, 4:12 a.m. EDT**
30	**The Lunar Straight Wall (Rupes Recta) is visible**

The best sights this month: The highlight of the year occurs on August 21st when a total eclipse of the Sun occurs. Totality can be seen in a narrow band across the United States and as a partial eclipse in Chester County. We are also treated to the Perseid meteor shower on August 12th.

Mercury: The best time to see the planet closest to the Sun is during the first few days of the month when it is low in the western sky just as the sky darkens after sunset.

Venus: The "morning star" continues to shine brightly at magnitude -4.0, rising about 2 ½ hours before the Sun.

Mars: Mars is too close to the Sun to be seen during August. It will appear in the dawn sky during September.

Jupiter: Enjoy telescopic views of Jupiter during August because as fall approaches the king of the planet drops toward the western horizon and we will be looking through more atmosphere, which will decrease the sharpness of the image in your eyepiece. So enjoy this beautiful planet while we can, watching the dance of the four Galilean moons and the passing of moon shadows and the Great Red Spot on the planetary surface.

Saturn: Look at Saturn just after the sky becomes fully dark for the best view of this incredible planet. The rings are tilted at 27 degrees which gives us a nice view of the Cassini Division, the dark gap between the inner and outer rings.

Uranus and Neptune: Uranus is best viewed an hour or two before sunrise, but Neptune is higher in the sky and is in good position in the hour or two after midnight. Later this fall these gas giants will be in better position for viewing without impacting our sleep.

The Moon: The Moon is full on August 7th. Native Americans called this the Full Sturgeon Moon. The fishing tribes are given credit for the naming of this Moon, since sturgeon, a large fish of the Great Lakes, were most readily caught during this month. A few tribes knew it as the Full Red Moon because as the Moon rises it appears reddish through the sultry haze of summer. Native Canadians called this the Full Ripening Moon.

Constellations: The warm nights and bright stars of August make for some great observing opportunities. The Summer Triangle and all its treasures are shining overhead and if we get a good clear night the Milky Way arches overhead like the backbone of the sky. The Dipper is holding water and Cassiopeia is climbing up the other side of the sky. As the night gets late the Great Square of Pegasus is easily visible so grab your binoculars and look for our neighbor galaxy Andromeda.

Messier/deep sky: Aim your binoculars or telescope straight up during August and you will cut through most of the haze that often fills the sky at this time of year. That part of the sky has some beautiful deep sky objects such as M13 and M92, the two bright globular clusters in Hercules. Not far away is M57, the Ring Nebula in Lyra. This is a fairly faint object that is best viewed with averted vision in binoculars or a small telescope. Or, set your hardware aside, lay down a blanket and lie on your back and just enjoy the incredible glow of the Milky Way!

Comets: There are no bright comets visible during August.

(Continued on page 10)

Twenty Years Ago on Mars…

by Linda Hermans-Killiam

On July 4, 1997, NASA's Mars Pathfinder landed on the surface of Mars. It landed in an ancient flood plain that is now dry and covered with rocks. Pathfinder's mission was to study the Martian climate, atmosphere and geology. At the same time, the mission was also testing lots of new technologies.

For example, the Pathfinder mission tried a brand-new way of landing on Mars. After speeding into the Martian atmosphere, Pathfinder used a parachute to slow down and drift toward the surface of the Red Planet. Before landing, Pathfinder inflated huge airbags around itself. The spacecraft released its parachute and dropped to the ground, bouncing on its airbags about 15 times. After Pathfinder came to a stop, the airbags deflated.

Before Pathfinder, spacecraft had to use lots of fuel to slow down for a safe landing on another planet. Pathfinder's airbags allowed engineers to use and store less fuel for the landing. This made the mission less expensive. After seeing the successful Pathfinder landing, future missions used this airbag technique, too!

Pathfinder had two parts: a lander that stayed in one place, and a wheeled rover that could move around. The Pathfinder lander had special instruments to study Martian weather. These instruments measured air temperature, pressure and winds. The measurements helped us better understand the climate of Mars.

The lander also had a camera for taking images of the Martian landscape. The lander sent back more than 16,000 pictures of Mars. Its last signal was sent to Earth on Sept. 27, 1997. The Pathfinder lander was renamed the Carl Sagan Memorial Station. Carl Sagan was a well-known astronomer and science educator.

Pathfinder also carried the very first rover to Mars. This remote-

(Continued on page 7)

Caption: The Mars Pathfinder lander took this photo of its small rover, called Sojourner. Here, Sojourner is investigating a rock on Mars. Image credit: NASA/JPL-Caltech

Space Place (Cont'd)

(Continued from page 6)

ly-controlled rover was about the size of a microwave oven and was called Sojourner. It was named to honor Sojourner Truth, who fought for African-American and women's rights. Two days after Pathfinder landed, Sojourner rolled onto the surface of Mars. Sojourner gathered data on Martian rocks and soil. The rover also carried cameras. In the three months that Sojourner operated on Mars, the rover took more than 550 photos!

Pathfinder helped us learn how to better design missions to Mars. It gave us valuable new information on the Martian climate and surface. Together, these things helped lay the groundwork for future missions to Mars.

Learn more about the Sojourner rover at the NASA Space Place: https://spaceplace.nasa.gov/mars-sojourner

This article is provided by **NASA Space Place**. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

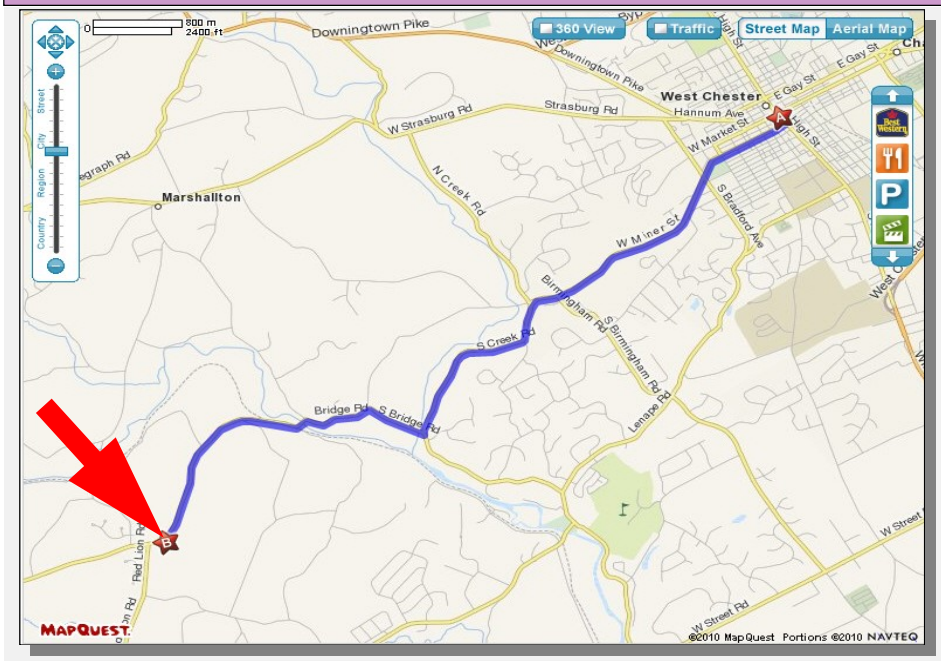
Visit spaceplace.nasa.gov to explore space and Earth science!

Astrophotography (Cont'd)

(Continued from page 2)

CGEM-DX mount. Guiding was accomplished via PHD2 connected to an Orion Starshoot Autoguider using an Orion short tube 80 guide-scope. Capture was accomplished using BYEOS, processed through Nebulosity 4.1 and post processed with GIMP 2.9.5 (GNU Image Manipulation Program CCE - Freeware) to improve color and contrast. An objective for this cut was to keep the foreground stars from being overwhelmed by the nebulosity. Note the beginning of the encroachment of the red border. The project will be continued the next opportunity with some clear skies.

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

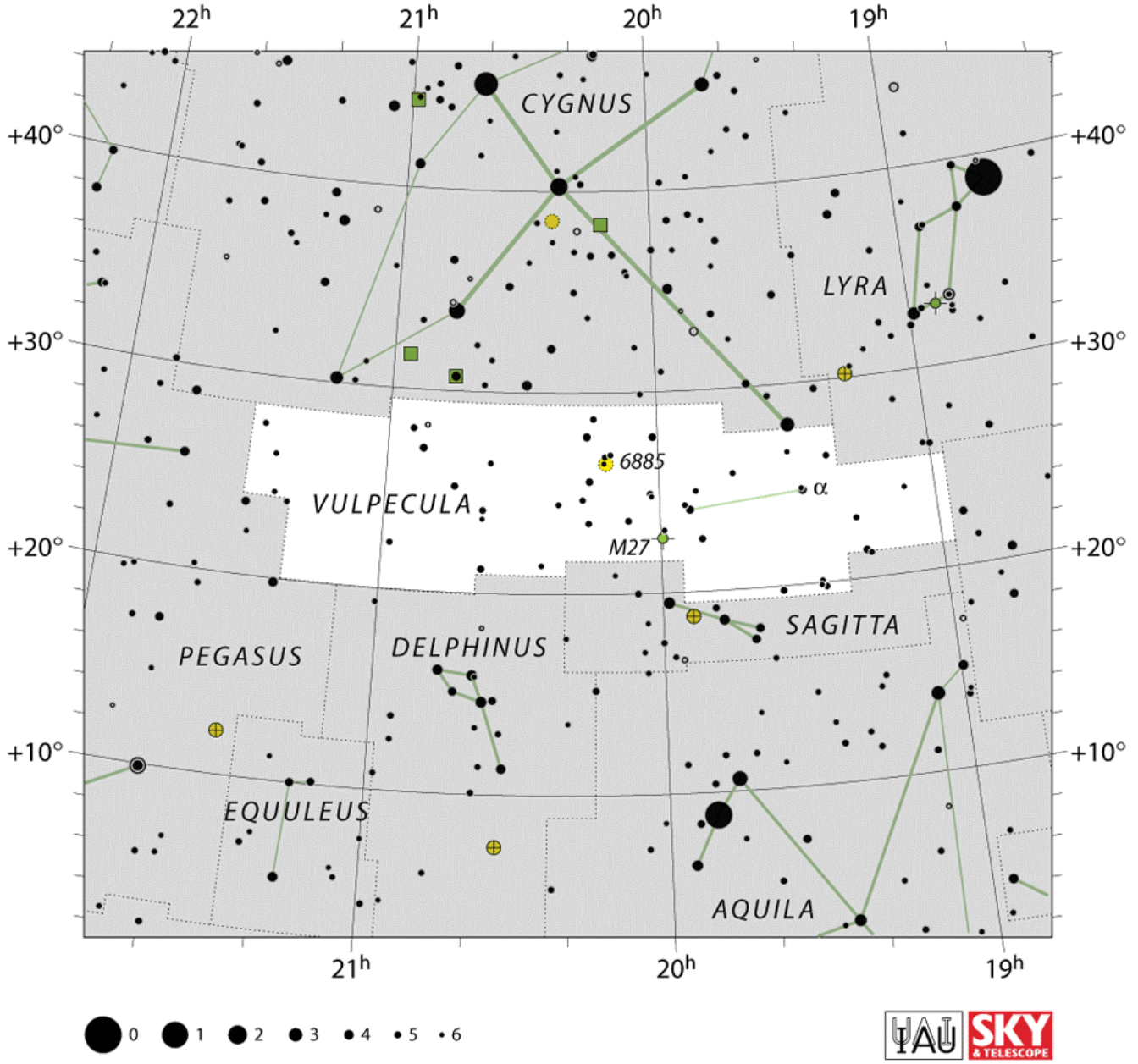
The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Red Clay Alliance.

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).

Through The Eyepiece: M27, the Dumbbell Nebula

by Don Knabb, CCAS Treasurer & Observing Chair



Sky map credit: From Wikimedia Commons, the free media repository, IAU and Sky & Telescope magazine (Roger Sinnott & Rick Fienberg)

Messier 27, the Dumbbell Nebula, is a planetary nebula in the constellation Vulpecula. It is well placed for viewing during August, being nearly overhead during prime viewing time. It is just barely within the Summer Triangle, located near the tip of the constellation Sagitta, the Arrow.

The first hint of what will become of our Sun was discovered inadvertently in 1764. At that time, Charles Messier was compiling a list of diffuse objects not to be confused with comets. The 27th object on Messier's list, now known as M27 or the Dumbbell Nebula, is a planetary nebula, the type of nebula our Sun will produce when nuclear fusion stops in its core. M27 is one of the brightest planetary nebulae in the sky, and can be seen with binoculars.

Despite their name, planetary nebulae have nothing to do with planets. They were given this name because their discoverers observed them visually

(Continued on page 9)

Eyepiece (Cont'd)

M27 The Dumbell

Photo credit: Brent Crabb, astrophotographer, Fountain Valley, CA, used with permission.

(Continued from page 8)

and they did not appear as stellar point sources, but rather as small diffuse objects that resembled the outer planets in our solar system such as Uranus and Neptune when seen in a telescope

Planetary nebula are shells of gas shed by stars late in their life cycles after using up all of their nuclear fuel. The star then ejects a significant portion of its mass in a gaseous shell, which is illuminated by its extremely hot central star, which is just the core left from the original star. The Sun is expected to undergo the same process in a couple of billion years. Planetary nebulae do not last long in cosmic terms, the shell of gas expands and diffuses becoming invisible and the star turns into a white dwarf.

Information credits

Dickinson, Terence 2006. Nightwatch: a practical guide to viewing the universe. Buffalo, NY. Firefly Books
http://en.wikipedia.org/wiki/Messier_27
http://www.astropix.com/HTML/E_SUM_N/M27.HTM
http://antwrp.gsfc.nasa.gov/apod/ap050603.html

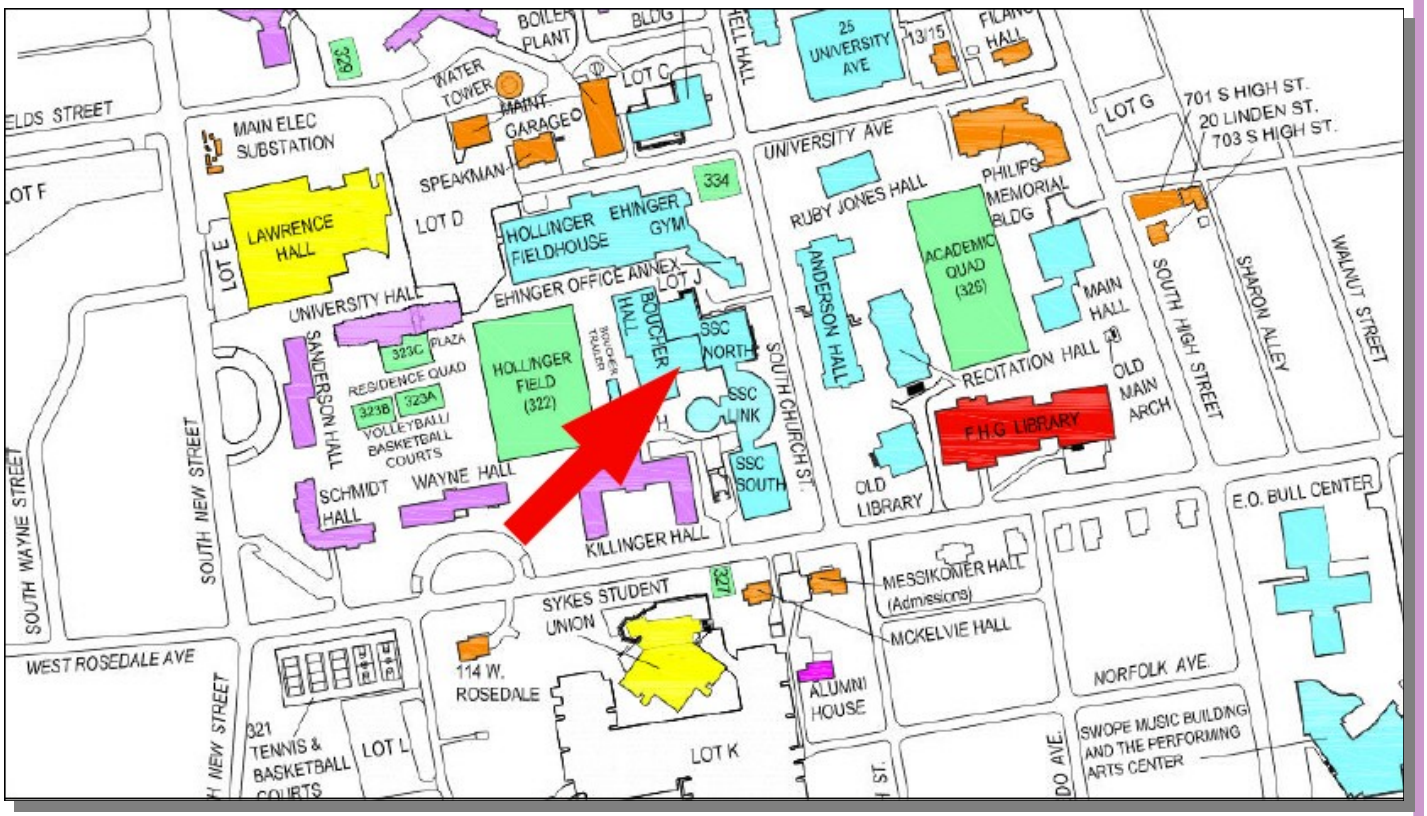
CCAS Annual Summer Party

Barb and Don Knabb have graciously offered to host the annual CCAS summer party at their home on Saturday, August 26th, at 6:00 p.m. Their address is 988 Meadowview Lane and their phone number is 610-436-5702. A Google Maps search will provide good directions to their house. Their home is at the end of a cul-de-sac and 988 is on the mailbox. They have a long driveway and the house has a garage facing the street. Please RSVP to dknabb00@comcast.net if you plan to attend.

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).



Observing (Cont'd)

(Continued from page 5)

Meteor showers: It is again time for the most popular meteor shower of the year, the Perseid meteor shower! This year is a not optimum for viewing due to a bright waning gibbous Moon rising around 11:00 p.m. My favorite part of this shower is earlier in the evening when you will see fewer shooting stars but you have a good chance of seeing an "Earth grazer" that travels nearly all the way across the sky. Don't miss this shower! When you see a fireball fly cross the sky you will never forget it.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

July 2017 Financial Summary

Beginning Balance	$1,338
Deposits	$85
Disbursements	$340
Ending Balance	$1,083

New Member Welcome!

Welcome new CCAS members Tina Dwyer from West Chester, PA. We're glad you decided to rejoin 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

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!

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 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 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

★ ★ ★ ★ ★

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.

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