# Observations

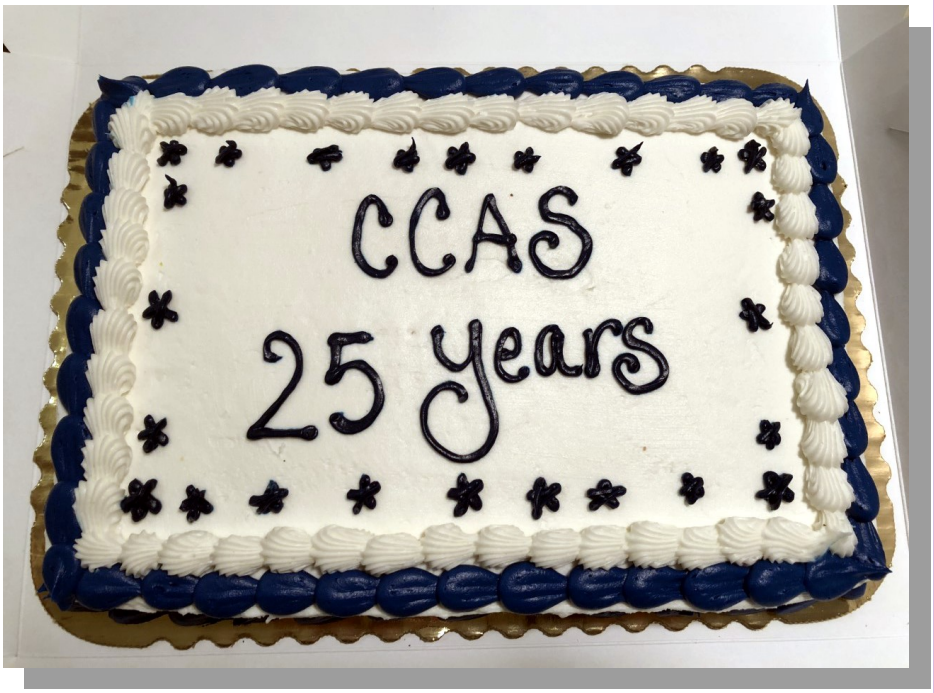
A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

*Vol. 26, No. 9* ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *September 2018*


## In This Issue



## Happy Anniversary to CCAS!




*CCAS members celebrated the 25th anniversary of the society's founding on September 1st.*

## Membership Renewals Due

| | |
|---|---|
| 09/2018 | Lurcott, E.<br>Squire Family<br>Stein Family |
| 10/2018 | Johanson<br>Kresch<br>Lane<br>Lester<br>Rosenblatt<br>Skelton |
| 11/2018 | Baker<br>Buczynski<br>Holenstein<br>Kerkel<br>Leiden<br>McNeal & Talunas |

## September 2018 Dates

**2nd** • Last Quarter Moon, 10:37 p.m. EDT

**9th** • New Moon, 2:17 p.m. EDT

**13th** • The Moon is near Jupiter

**16th** • First Quarter Moon, 7:14 p.m. EDT

**17th** • The Moon is near Saturn

**20th** • The Moon is near Mars

**22nd** • Fall equinox, 9:54 p.m. EDT

**24th** • Full Moon, the Harvest Moon or the Moose Calling Moon, 10:52 p.m. EDT

## 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, September 8, 2018** - CCAS Special Joint Observing Session with Atglen Library at Wolf's Hollow County Park, Atglen, PA.

☼ **Friday, September 14, 2018** - CCAS Special Observing Session at Starr Farm Park, Downingtown, PA. The observing session is scheduled from 7:30 pm to 9:00 pm.

☼ **Saturday, September 15, 2018** - CCAS Special Observing Session at Hoopes Park, West Chester, PA. For more information, contact our Observing Chair, Don Knabb.

☼ **Saturday, September 29, 2018** - CCAS Special Observing Session at Bucktoe Creek Preserve, Avondale, PA, from 7:00 pm to 9:00 pm. The event is open to be public but registration for non-CCAS members is required.

☼ **Saturday, October 13, 2018** - CCAS Special Observing Session at Anson Nixon Park, Kennett Square, PA. The session is scheduled from 6:00 to 9:00 p.m. EDT.

## Summer/Autumn 2018 Society Events

### September 2018

**1st** • CCAS Summer Picnic at Don & Barb Knabb's home in West Chester, PA.

**4th-7th** • Cherry Springs Park Camping & Observing Trip, Coudersport, PA.

**6th-7th** • The von Kármán Lecture Series: NASA@60: The Role of the Robots, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

**7th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

**8th** • CCAS Special Observing Session, Wolf's Hollow and Atglen Library joint event.

**11th** • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts immediately after at 7:30 p.m. Guest Speaker: Meteorologist Drew Anderson, "Space Weather."

**14th** • CCAS Special Observing Session, Starr Farm Park, Downingtown, PA.

**15th** • CCAS Special Observing Session at Hoopes Park, West Chester, PA.

**20th** • Open call for articles and photographs for the October 2018 edition of Observations.

**22nd** • Fall Equinox. 9:54 pm EDT. First day of autumn.

**26th** • Deadline for newsletter submissions for the October 2018 edition of Observations.

**29th** • CCAS Special Observing Session at Bucktoe Creek Preserve, Avondale, PA, from 7:00 pm to 9:00 pm. The event is open to be public but registration for non-CCAS members is required through The Land Conservancy for Southern Chester County website.

### October 2018

**4th-5th** • The von Kármán Lecture Series: Mapping Disasters from Space, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

**9th** • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts immediately after at 7:30 p.m. Presentation: "100 Years of the Telescope" narrated by Neil deGrasse Tyson.

**12th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

**13th** • CCAS Special Observing Session at Anson Nixon Park, Kennett Square, PA. The session is scheduled from 6:00 to 9:00 p.m. EDT.

**20th** • CCAS Special Observing Session, Willistown Conservation Trust Run-a-Muck. The observing session is scheduled from 6:30 pm to 8:00 pm. The event is open only to registered participants.

**20th** • Open call for articles and photographs for the November 2018 edition of Observations.

**26th** • Deadline for newsletter submissions for the November 2018 edition of Observations.

## 15 Years in Space for NASA's Spitzer Space Telescope

*courtesy Jet Propulsion Laboratory/California Institute of Technology*

*Illustration of Spitzer in the Beyond phase. Credit: NASA/JPL-Caltech*

Initially scheduled for a minimum 2.5-year primary mission, NASA's Spitzer Space Telescope has gone far beyond its expected lifetime — and is still going strong after 15 years.

Launched into a solar orbit on Aug. 25, 2003, Spitzer was the final of NASA's four Great Observatories to reach space. The space telescope has illuminated some of the oldest galaxies in the universe, revealed a new ring around Saturn, and peered through shrouds of dust to study newborn stars and black holes. Spitzer assisted in the discovery of planets beyond our solar system, including the detection of seven Earth-size planets orbiting the star TRAPPIST-1, among other accomplishments.

"In its 15 years of operations,

*(Continued on page 7)*

## September 2018 CCAS Meeting Agenda

*by Dave Hockenberry, CCAS Program Chair*

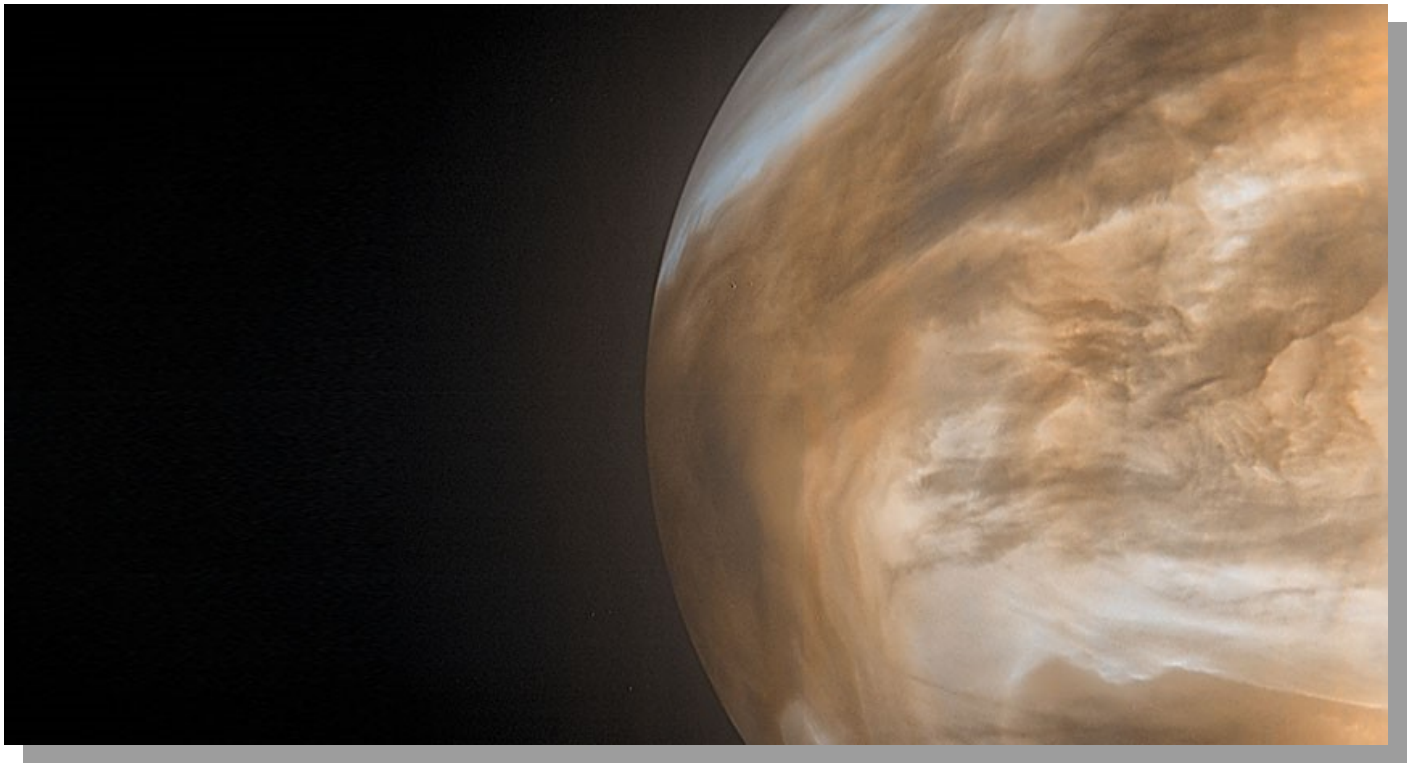
Our next meeting will be held on September 11, 2018, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker: Meteorologist Drew Anderson, "Space Weather."

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 2018-2019 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

## Venus' Thick Atmosphere Speeds Up the Planet's Spin

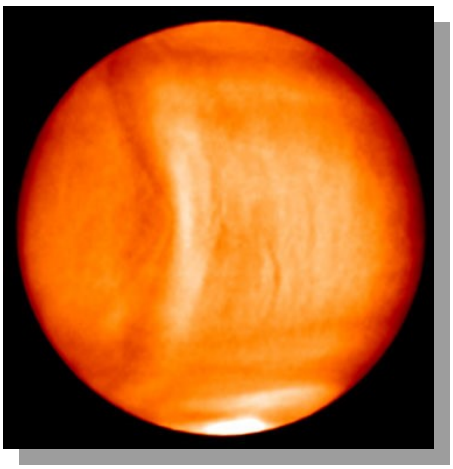
*by Lisa Grossman, ScienceNews*



*New research has shown that Venus' thick atmosphere, shown here in an image from the Japanese space agency's Akatsuki spacecraft, can speed up the planet's rotation. Damia Bouic, DARTS, ISAS, JAXA*

Time is out of joint on Venus. The planet's thick air, which spins much faster than the solid globe, may push against the flanks of mountains and change Venus' rotation rate.

Computer simulations show that the thick Venusian atmosphere, whipping around the planet at 100 meters per second, exerts enough push against a mountain on one side and suction on the other side to speed the planet's rotation rate by about two minutes each Venus day, according to a study in Nature Geoscience June 18.



*The motion of Venus' atmosphere over mountains on the planet's surface raises a bow-shaped wave that stretches from pole to pole in this image from Akatsuki. PLANET-C*

That's not much, considering that the planet rotates just once every 243 Earth days. By comparison, Venus' atmosphere rotates about once every four Earth days. Precise measurements of the planet's rotation rate have varied by about seven minutes, however. The push and pull of the air over the mountains could help explain the mismatch, with some other force—possibly the gravitational influence of the sun—slowing the planet's spin back down.

The simulations by UCLA planetary scientist Thomas Navarro and colleagues are the first to account for a 10,000-kilometer-long wave in Venus' cloud tops, spotted in 2015 by the Japanese space agency's Akatsuki spacecraft (SN: 2/18/17, p. 5). Similar waves are launched into the atmosphere on Earth when air flows over a mountain, but they normally dissipate quickly as opposing winds break them up. Venus' atmosphere rotates so much faster than the planet and in such a uniform direction that the waves could persist for a long time.

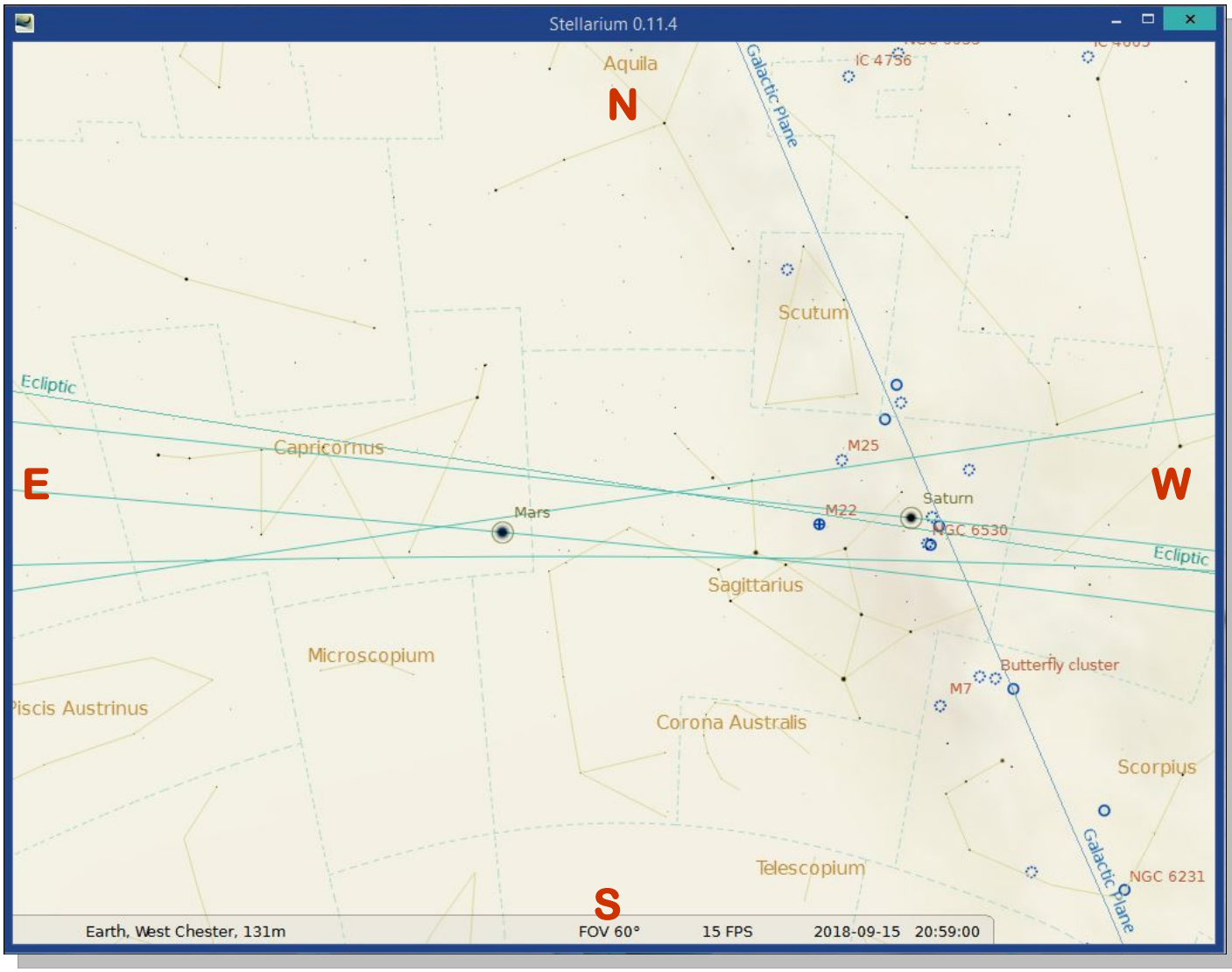
"This work is very interesting," says planetary scientist Tetsuya Fukuhara of Rikkyo University in Tokyo, one of the researchers who discovered the atmosphere wave. The work helps explain where the wave comes from and addresses how Venus' surface

*(Continued on page 9)*

# The Sky Over Chester County

September 15, 2018 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 |
|---|---|---|---|---|---|
| 09/01/2018 | 6:00 a.m. EDT | 6:28 a.m. EDT | 7:32 p.m. EDT | 7:59 p.m. EDT | 13h 03m 31s |
| 09/15/2018 | 6:14 a.m. EDT | 6:41 a.m. EDT | 7:09 p.m. EDT | 7:36 p.m. EDT | 12h 27m 39s |
| 09/30/2018 | 6:28 a.m. EDT | 6:55 a.m. EDT | 6:44 p.m. EDT | 7:11 p.m. EDT | 11h 48m 37s |

| Moon Phases | | | | | |
|---|---|---|---|---|---|
| Last Quarter | 09/02/2018 | 10:37 p.m. EDT | New Moon | 09/09/2018 | 2:17 p.m. EDT |
| First Quarter | 09/16/2018 | 7:14 p.m. EDT | Full Moon | 09/24/2018 | 10:52 p.m. EDT |

## September 2018 Observing Highlights

*by Don Knabb, CCAS Treasurer & Observing Chair*

| | |
|---|---|
| 2 | Last Quarter Moon, 10:37 p.m. EDT |
| 7 | Neptune is at opposition |
| 9 | New Moon, 2:17 p.m. EDT |
| 13 | The Moon is near Jupiter |
| 16 | First Quarter Moon, 7:14 p.m. EDT |
| 17 | The Moon is near Saturn |
| 17 | The Lunar Straight Wall is visible |
| 20 | The Moon is near Mars |
| 21 | Venus reaches maximum brightness |
| 22 | Fall equinox, 9:54 p.m. EDT |
| 24 | Full Moon, the Harvest Moon or the Moose Calling Moon, 10:52 p.m. EDT |

**The best sights this month:** Four bright planets continue their wonderful show that we have been enjoying this summer. Venus will shine at maximum brightness on the 21st, but it is dropping toward the horizon every day. Scanning east from Venus you will see Jupiter, Saturn and Mars. I continue to be amazed by the brightness of Mars shining in the southeastern sky.

**Mercury:** Mercury is visible in the pre-dawn sky early in the month.

**Venus:** As Venus nears passing us in our race around the Sun it drops lower into the fading glow of sunset every evening. On the 21st it reaches maximum brightness for this evening apparition at magnitude -4.8!

**Mars:** Mars is in the southeast after the light of the Sun leaves the sky. At magnitude -2.1 it is the 2nd brightest of the four planets in our evening sky. You won't be able to miss the bright red glow of the red planet. The best telescopic viewing during September is around 10:00 p.m. During August I was able to make out some faint surface features and a faint polar cap.

**Jupiter:** Jupiter continues to shine brightly in the southwest but drops lower toward the horizon as September progresses. For the best telescopic viewing aim your scope at Jupiter as soon as the sky is fully dark early in the month.

**Saturn:** Saturn is best about an hour after sunset during September. To add to the beauty of the planet itself, Saturn is passing through northern Sagittarius which is filled with deep sky wonders such as the Trifid Nebula and the Lagoon Nebula. The rings of Saturn are tilted at 27 degrees, the maximum for the year, making it easier to see the Cassini Division, the space between the main inner and outer rings.

**Uranus and Neptune:** Neptune reaches opposition on September 7th, so this is a great month to see this cold distant gas giant. Near midnight is the best time to seek out this blue jewel of the outer solar system. Uranus rises around 9:00 and is best viewed when it attains a reasonable height away from the thick atmosphere of the horizon, shortly after midnight.

**The Moon:** Full Moon is on September 24th. This full Moon is the Harvest Moon because it is the full Moon that occurs closest to the autumn equinox. In two years out of three, the Harvest Moon comes in September, but in some years it occurs in October. At the peak of harvest, farmers can work late into the night by the light of this Moon. It is also called the Barley Moon, because it is the time to harvest and thresh the ripened barley, so maybe we can call it the Beer Moon. Native Canadians called this the Moose Calling Moon.

**Constellations:** The September sky is dominated by the constellations of the Summer Triangle; Lyra, Cygnus and Aquila. But stay out a little later and the Great Square of Pegasus is rising and you can find our neighbor galaxy Andromeda with binoculars. Stay up a bit later yet and you will get a preview of the fall and winter constellations with the beautiful Pleiades leading the charge.

**Messier/deep sky:** September is your last chance of 2018 to catch the Messier objects in the southern constellations of Sagittarius and Scorpius. If you can find a clear view of the southern horizon you can find M4, M6, M7, M17, M8, M22 and more!

*(Continued on page 7)*

## Through The Eyepiece: NGC 6871, the Cygnus Star Chain

*by Don Knabb, CCAS Treasurer & Observing Chair*


*Image: NGC 6871, the Cygnus Star Chain . Image source: Stellarium.org*

The Cygnus Star Chain is a nice binocular object that is best viewed lying on your back on a sleeping bag or a lounge chair with your binoculars in your hands. That's because Cygnus is very high in the sky during September and if you try to see it holding your binoculars while you are standing up you'll only get a stiff neck, or worse you could end up falling over backwards. I speak from experience, since that nearly happened to me a few weeks ago when I observed the Cygnus Star Chain, NGC 6871, in preparation for writing this article.

Binoculars are the recommended method of seeing this interesting object. It is too wide spread to capture in anything but the widest field/lowest power telescopic view. The star chain is not terribly far from the famous Coat Hanger Cluster, which is also best viewed with binoculars, so you can see both these objects within a few minutes of gazing into the starry skies.

And starry skies you will see indeed! The Cygnus Star Chain is within the Cygnus Star Cloud, a wide band of stars that appears like a glowing oval between Albireo (the head of the Cygnus the Swan) and Sadr (the center star of Cygnus). If you have a clear night with no Moon to wash out the stars, your view will be filled with thousands of stars. It is good that you will be lying down; otherwise you might pass out from this amazing view.

While you are looking into this area of the sky, scan the area with your binoculars. The binocular view into this section of the Milky Way reveals a multitude of star groupings. Some of the star groupings are real clusters, not just chance alignments of distant stars. Such is the case with NGC 6871, which appears as a 1-degree long star chain, starting South of 27 Cygni, and running first North and then Northeast through 27 Cygni, ending just beyond 28 Cygni.

When I observed the Cygnus Star Chain I found it quickly in our Orion 10x50 binoculars. The chain-like appearance of the cluster was immediately apparent. It reminds me a little of Kemble's Cascade, which I wrote about in previous editions of Observations. There are images of NGC 6871 on the internet, but I did not include any because they really don't show this cluster as it appears to your

*(Continued on page 7)*

## Eyepiece (Cont'd)

(Continued from page 6)
eyes when using binoculars. The Cygnus Star Chain is something that should be experienced live.

NGC 6871 was discovered by Friedrich Georg Wilhelm von Struve (1793-1864) in 1825. Von Struve was a German-Russian astronomer who is best known for studying double stars. Open star clusters are widely distributed in our galaxy and represent a loose collection of stars which number from a few dozen to a few hundred stars and are weakly-held gravitationally. Perhaps the three most famous such open clusters are the Pleiades (M45) in Taurus, the Beehive (M44) in Cancer and the Double Cluster in Perseus. They are all characterized with a handful of hot and white prominent stars and nebular material surrounding these stars.

It is easy to find the Cygnus Star Chain. As you can see in the screen capture from Stellarium, NGC 6871 is just east of the center line of Cygnus the Swan, about one third of the way from Sadr to Albireo. You can also see the Cygnus Star Cloud in the Stellarium image, that glow of stars that fills the sky from Sadr to Albireo.

So grab your binoculars and a sleeping bag or a lounge chair and drink your fill of the Milky Way as you seek out the beautiful Cygnus Star Chain!

Information credits:

Dickinson, Terence 1996. *Summer Star Gazing*. Buffalo, NY. Firefly Books

Astronomy Sketch of the Day, http://www.asod.info/?p=1260

*Disrupting the Cygnus Star Cloud,* By Rony De Laet (NGC 6871)

*Sky Vistas: Astronomy for Binoculars and Richest-Field Telescopes,* By Craig Crossen, Gerald Rhemann

http://www.perseus.gr/Astro-DSO-NGC-6871.htm

http://cs.astronomy.com/asy/m/starclusters/450561.aspx

## Observing (Cont'd)

(Continued from page 5)
On the other side of the sky, if you stay out late, you can catch the open star clusters in Auriga: M36, M37 and M38.

Comets: Comet 21P/Giacobini-Zinner should peak at 6th or 7th magnitude during September. That sounds fairly bright for telescopic observing, but because the comet is fairly close to the Earth it will be a diffuse, dim fuzz ball. The comet will be in the constellation Auriga through

(Continued on page 10)

## Spitzer at 15 (Cont'd)

(Continued from page 2)
Spitzer has opened our eyes to new ways of viewing the universe," said Paul Hertz, director of the Astrophysics Division at NASA Headquarters in Washington. "Spitzer's discoveries extend from our own planetary backyard, to planets around other stars, to the far reaches of the universe. And by working in collaboration with NASA's other Great Observatories, Spitzer has helped scientists gain a more complete picture of many cosmic phenomena."

Spitzer detects infrared light — most often heat radiation emitted by warm objects. On Earth, infrared light is used in a variety of applications, including night-vision instruments. With its infrared vision and high sensitivity, Spitzer has contributed to the study of some of the most distant galaxies in the known universe. The light from some of those galaxies traveled for 13.4 billion years to reach Earth. As a result, scientists see these galaxies as they were less than 400 million years after the birth of the universe.

Among this population of ancient galaxies was a surprise for scientists: "big baby" galaxies that were much larger and more mature than scientists thought early-forming galaxies could be. Large, modern galaxies are thought to have formed through the gradual merger of smaller galaxies. But the "big baby" galaxies showed that massive collections of stars came together very early in the universe's history.

Studies of these very distant galaxies relied on data from both Spitzer and the Hubble Space Telescope, another one of NASA's Great Observatories. The four Great Observatories are Hubble Space Telescope (1990), Compton Gamma Ray Observatory (1991), Chandra X-ray Observatory (1999), and Spitzer Space Telescope (2003). Each collects light in a different wavelength range. By combining their observations of various objects and regions, scientists can gain a more complete picture of the universe.

## A Trip Through the Milky Way

*by Jane Houston Jones and Jessica Stoller-Conrad*

**This article is distributed by NASA Space Place.**

With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology.

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

Feeling like you missed out on planning a last vacation of summer? Don't worry—you can still take a late summertime road trip along the Milky Way!

The waning days of summer are upon us, and that means the Sun is setting earlier now. These earlier sunsets reveal a starry sky bisected by the Milky Way. Want to see this view of our home galaxy? Head out to your favorite dark sky getaway or to the darkest city park or urban open space you can find.

While you're out there waiting for a peek at the Milky Way, you'll also have a great view of the planets in our solar system. Keep an eye out right after sunset and you can catch a look at Venus. If you have binoculars or a telescope, you'll see Venus's phase change dramatically during September—from nearly half phase to a larger, thinner crescent.

Jupiter, Saturn and reddish Mars are next in the sky, as they continue their brilliant appearances this month. To see them, look southwest after sunset. If you're in a dark sky and you look above and below Saturn, you can't miss the summer Milky Way spanning the sky from southwest to northeast.

You can also use the summer constellations to help you trace a path across the Milky Way. For example, there's Sagittarius, where stars and some brighter clumps appear as steam from a teapot. Then there is Aquila, where the Eagle's bright Star

*(Continued on page 9)*


*Caption: This illustration shows how the summer constellations trace a path across the Milky Way. To get the best views, head out to the darkest sky you can find. Credit: NASA/JPL-Caltech*

## Space Place (Cont'd)

*(Continued from page 8)*

Altair combined with Cygnus's Deneb and Lyra's Vega mark what's called the "summer triangle." The familiar W-shaped constellation Cassiopeia completes the constellation trail through the summer Milky Way. Binoculars will reveal double stars, clusters and nebulae all along the Milky Way.

Between Sept. 12 and 20, watch the Moon pass from near Venus, above Jupiter, to the left of Saturn and finally above Mars!

This month, both Neptune and brighter Uranus can also be spotted with some help from a telescope. To see them, look in the southeastern sky at 1 a.m. or later. If you stay awake, you can also find Mercury just above Earth's eastern horizon shortly before sunrise. Use the Moon as a guide on Sept. 7 and 8.

Although there are no major meteor showers in September, cometary dust appears in another late summer sight, the morning zodiacal light. Zodiacal light looks like a cone of soft light in the night sky. It is produced when sunlight is scattered by dust in our solar system. Try looking for it in the east right before sunrise on the moonless mornings of Sept. 8 through Sept 23.

You can catch up on all of NASA's current—and future—missions at www.nasa.gov

## Venus (Cont'd)

*(Continued from page 3)*

features affect the atmosphere, "which is the most important issue in the Venus atmospheric science."

More detailed measurements of Venus' rotation, possibly taken with a future lander (SN: 3/3/18, p. 14), could eventually help reveal details of Venus' interior, such as the size of its core.

"Venus is the closest thing to Earth that we know of," Navarro says, and yet its hot, thick, toxic atmosphere makes it utterly alien. "We'd like to know what's inside."

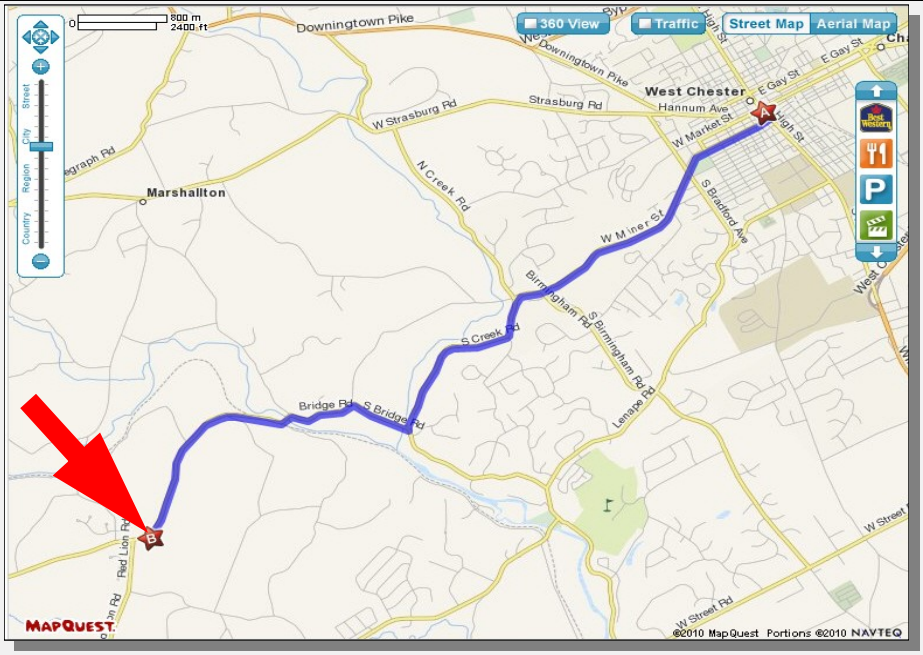
Sources:

T. Navarro, G. Schubert and S. Lebonnois. Atmospheric mountain wave generation on Venus and its influence on the solid planet's rotation rate. *Nature Geoscience.* Published online June 18, 2018. doi: 10.1038.s41561-018-0157-x.

L. Grossman. What will it take to go to Venus? *Science News.* Vol. 193, March 3, 2018, p. 14.

A. Yeager. Weird wave found in Venus' wind-whipped atmosphere. *Science News.* Vol. 191, February 18, 2017, p. 5.

## *CCAS Directions*




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

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

### Brandywine Red Clay Alliance

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

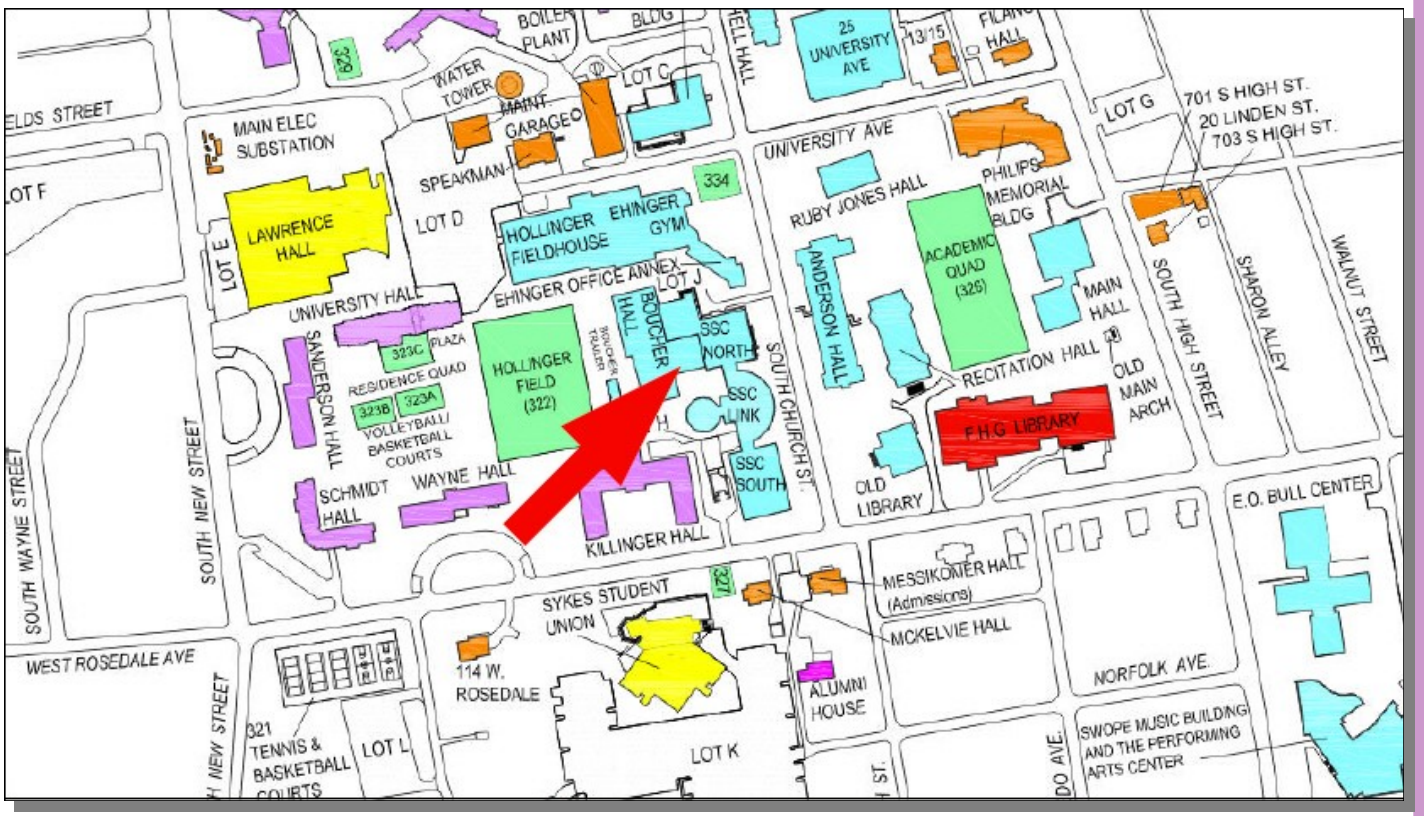
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BRC property, turn left off Route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

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

# CCAS Directions

## West Chester University Campus

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




## Observing (Cont'd)

*(Continued from page 7)*

the first half of September when it will pass close to the bright star Capella on September 2nd and 3rd, followed a few days later by a close pass to the open clusters M36, M37 and M38. A sky map for finding Comet 21P is in the September issue of Astronomy magazine.

**Meteor showers:** There are two minor meteor showers during September. First is the Aurigids, which peak in the early morning hours of September 1st. Then on the morning of September 9th the Epsilon Perseids peak. We can expect to see 5 or 6 "shooting stars" per hour from these meteor showers.

## *CCAS Membership Information and Society Financials*

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

**August 2018 Financial Summary**

| | |
|---|---|
| Beginning Balance | $746 |
| Deposits | $95 |
| Disbursements | -$0 |
| Ending Balance | $841 |

### New Member Welcome!

Welcome new CCAS members Bob Stein and Jeff Nye, both from Downingtown, 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**
**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**

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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:

**Dr. 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 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 (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<br>610-430-7768 |
| **Vice President:** | Liz Smith<br>610-842-1719 |
| **ALCor, Observing, and Treasurer:** | Don Knabb<br>610-436-5702 |
| **Secretary:** | Ann Miller<br>610-558-4248 |
| **Librarian:** | Barb Knabb<br>610-436-5702 |
| **Program:** | Dave Hockenberry<br>610-558-4248 |
| **Education:** | TBA |
| **Webmaster and Newsletter:** | John Hepler<br>410-639-4329 |
| **Public Relations:** | TBA |

## 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.**