Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 27, No. 7 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *July 2019*

In This Issue

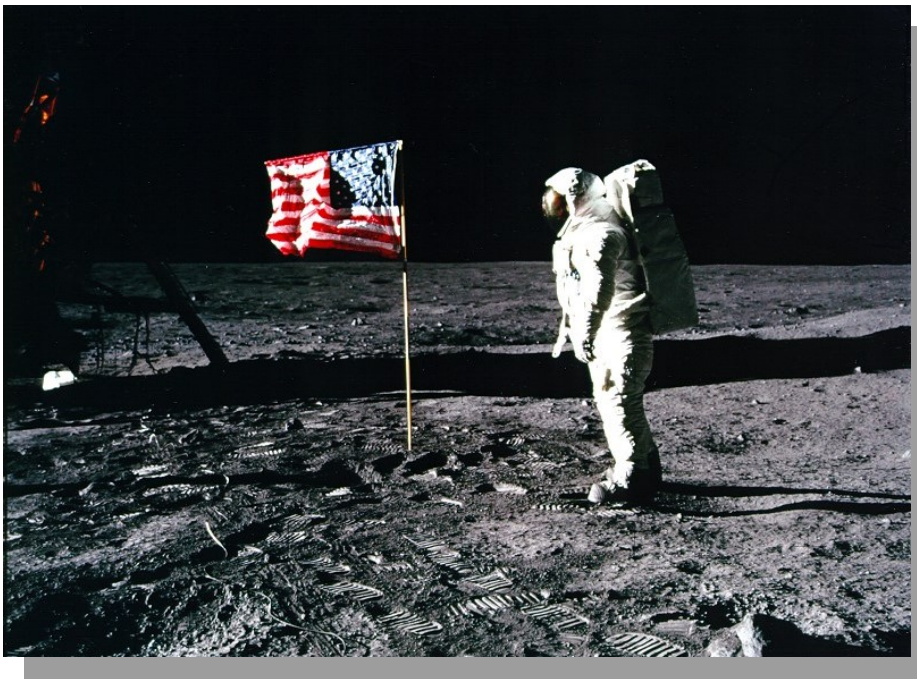
Membership Renewals Due

07/2019 Hockenberry & Miller
Hunsinger
Johnston

08/2019 Buki
Krus
Lurcott, L.
Stein
Tiedemann
Zullitti

09/2019 Lurcott, E.
Nye
Squire

Apollo 11 Fiftieth Anniversary!



Buzz Aldrin Salutes the U.S. Flag.
Image credit: NASA History Office and the NASA JSC Media Services Center

July 2019 Dates

2nd • New Moon, 3:16 p.m. EDT

9th • First Quarter Moon, 6:54 a.m. EDT, and Saturn is at opposition

13th • The Moon is near Jupiter

16th • Full Moon, the Full Buck Moon or the Birds Shed Feathers Moon, 5:38 p.m. EDT

16th • The Moon is near Saturn

24th • Last Quarter Moon, 9:18 p.m. EDT

31st • Black Moon (2nd New Moon in a month), 11:11 p.m. EDT

CCAS Upcoming Nights Out

In addition to our monthly observing sessions at the Myrick Conservancy Center, BRC (see pg. 2), CCAS has several special "nights out" scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

☼ **Friday, July 12, 2019** - Friday Night Lights at ChesLen Preserve, Coatesville, PA. CCAS members who want to assist with the astronomy portion of this event must bring a telescope or mounted astronomical binoculars to qualify for free admission. Members must contact Don Knabb by June 9th.

☼ **Saturday, August 3, 2019** - CCAS Special Observing Session at Hickory Run State Park, White Haven, PA. The observing session is from 8:00 p.m. to 10:00 p.m.

☼ **Thursday, August 22, 2019** - CCAS Special Observing Session at Starr Farm Park in Downingtown, PA. The session is scheduled from 8:00 PM to 9:30 PM.

Summer Society Events

July 2019

11th-12th • The von Kármán Lecture Series: Apollo 50th Anniversary, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

12h • 9th Annual Friday Night Lights at ChesLen Preserve, Coatesville, PA, this is a fundraiser for the Natural Lands Trust where music is provided. Several local astronomy clubs are setting up telescopes for the concert goers to view the night sky during the event. If you are not a member of CCAS you must purchase tickets from the Natural Lands Trust. CCAS members who want to assist with the astronomy portion of this event must bring a telescope or mounted astronomical binoculars to qualify for free admission.

13th • WCU Department of Earth & Space Sciences Event: Apollo 50 Year Celebration in the WCU Quad.

20th • Open call for articles and photographs for the August 2019 edition of Observations.

26th • CCAS monthly observing session at Myrick Conservancy Center, BRC. The observation session starts at dusk.

26th • Deadline for newsletter submissions for the August 2019 edition of Observations.

August 2019

2nd • CCAS Special Observing Session at Hickory Run State Park, White Haven, PA.

8th-9th • The von Kármán Lecture Series: Small Worlds, Big Science, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the September 2019 edition of Observations.

22nd • CCAS Special Observing Session at Starr Farm Park, Downingtown, PA. The session is scheduled from 8:00 PM to 9:30 PM. For more information, contact our Observing Chair, Don Knabb.

23rd • CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session starts at sunset.

26th • Deadline for newsletter submissions for the September 2019 edition of Observations.

27th-30th • Cherry Springs Camping Trip, Coudersport, PA.

New BBC Podcast Series on NASA's Apollo Program

by Don Knabb, CCAS Treasurer & Observing Chair

Image credits: BBC World Service

If you are interested to hear more about the Apollo 11 mission, I recommend you listen to a new podcast from BBC World Service called *13 Minutes to the Moon*. The podcast episodes I have heard thus far present aspects of the mission to the Moon that I was previously not aware of. It is well organized and well presented.

Ten episodes will be available eventually. I have listened to the first five. The episodes so far are:

- "*We choose to go.*" With no idea how to get there, the race to the moon begins – "We intend to win."
- *Kids in control.* Unsung heroes who saved the day. The "26-year-old kid who could stop the lunar mission."
- *Long Island Eagle*. Ugly, angry, with four legs and wrapped in gold: a spacecraft like nothing on Earth.
- *Fire to the Phoenix.* "You heard 'fire', then you heard a scream." The Apollo 1 tragedy and what happened next.
- *The Fourth Astronaut.* The computer that got us to the moon. There had never been anything like it.
- *Saving 1968*. War, riots, assassinations: "the year that shattered America." But it ended with Apollo 8.
- *Michael Collins: Third man*. Without the astronaut who didn't step on the moon, Apollo 11 wouldn't have succeeded.
- "We're Go for Powered Descent." The 13 minutes begin. Eagle is going too fast. There are communications problems.

You can listen to the podcast series on line at https://www.bbc.co.uk/programmes/w13xttx2 or through your favorite podcast app.

NASA to Open IIS for Commercial Business — Including Tourism

by Kenneth Chang, the New York Times

Spend the night in the IIS — Only $35,000 a Night! Image Credit: Roscosmos, via NASA

NASA announced on Friday, June 27, 2019, that for the first time it is allowing private citizens to fly, if not to the moon, at least to the International Space Station, the only place where people currently live off the planet.

NASA is not transforming into a space travel agency. Private companies will have to pay it about $35,000 a night per passenger to sleep in the station's beds and use its amenities, including air, water, the internet and the toilet. (The companies would charge much more to cover rocket flights to and from space, and to make a profit.)

Friday's announcement was one of several new policies designed to allow companies to take advantage of the space station as a place for business, something that NASA has often frowned on in the past.

The announcement could also help resolve questions about the space station's future. The Trump administration last year created tumult when it proposed ending federal financing of the International Space Station by the end of 2024 and move to commercial alternatives that are far from being built.

NASA officials said the goal was an eventual transition to orbital outposts fully operated by private companies, but there was no set date.

"We're hoping new capabilities will develop that can one day take over for the space station," said Robyn Gatens, the deputy space station director for NASA. "We won't transition off station until we have something else to go to so we don't have a date certain."

Among the agency's other announcements on Friday: It will allow some ventures that are purely for profit, without requiring some educational or research component. That could include flying trinkets to space and then selling them on Earth. Later this month, NASA will seek proposals for adding a module to the space station that is owned and operated by a private company, and it will select a plan by the end of the year.

What is not up for sale, at least in Friday's announcements, are corporate sponsorships for parts of the station. NASA astronauts still would not be allowed to endorse products, but might perform off-camera production on commercials from orbit for paying customers.

While pricey, the revenues generated by space tourism for NASA would not come close to covering the costs of operating the space station, which are one of the agency's greatest expenses. It currently spends $3 billion to $4 billion a year, or more than $8 million a day.

Bigelow Space Operations of North Las Vegas, Nev., has already reserved four launches. The company will use SpaceX, the rocket company run by Elon Musk, to take private astronauts. Each flight would have at least four seats.

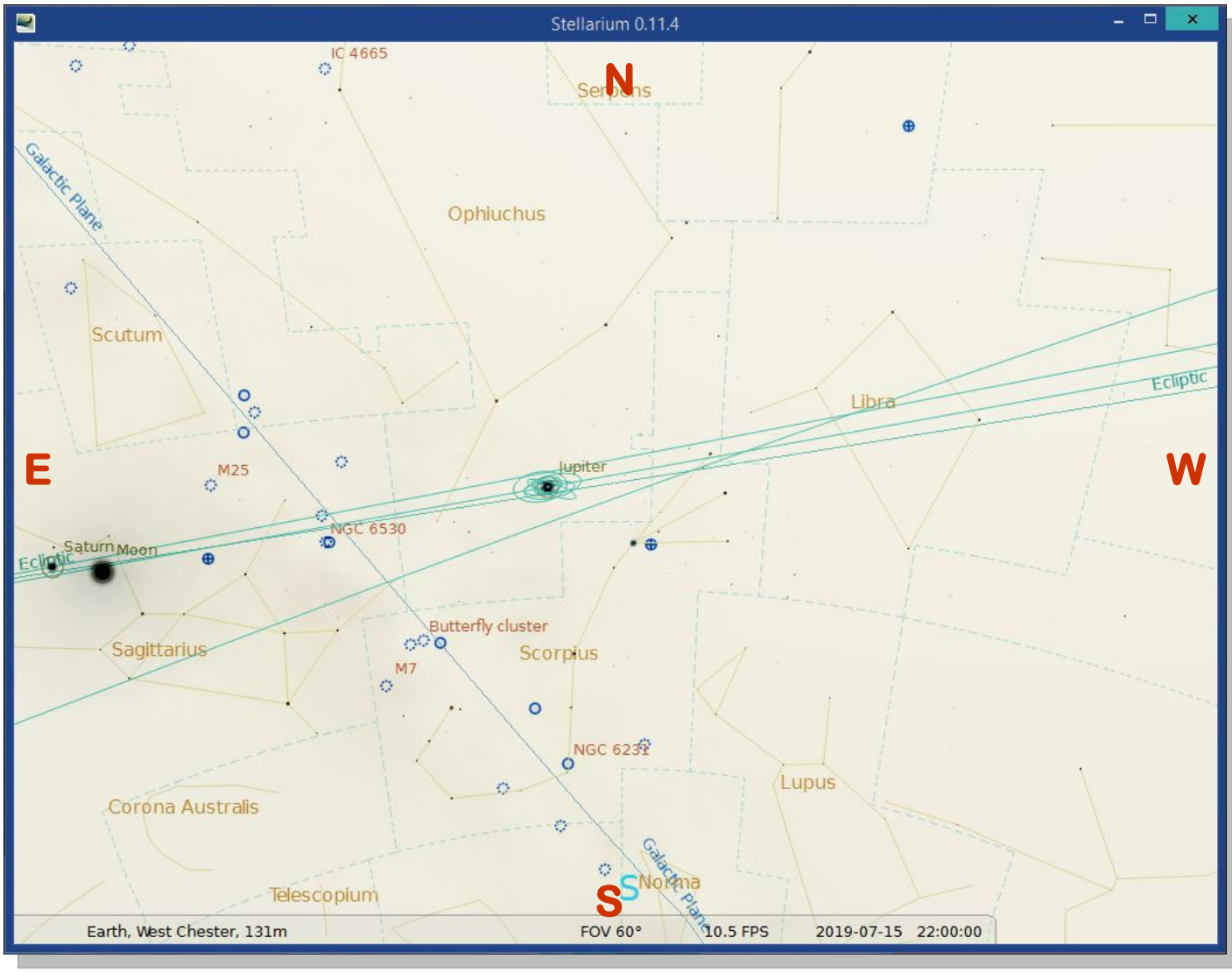
Axiom Space of Houston, run by Michael Suffredini, a former NASA space station manager, is also arranging flights and hopes to fly tourists next year. Both Bigelow and Axiom aim to use the International Space Station as the starting point for setting up their own space stations in orbit. Mr. Bigelow said flying tourists to the International Space Station would give his company experience at handling the complex logistics of arranging spaceflights.

Read the full article online at https://www.nytimes.com/2019/06/07/science/space-station-nasa.html

The Sky Over Chester County

July 15, 2019 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
07/01/2019	5:02 a.m. EDT	5:35 a.m. EDT	8:33 p.m. EDT	9:05 p.m. EDT	14h 57m 34s
07/15/2019	5:12 a.m. EDT	5:44 a.m. EDT	8:28 p.m. EDT	9:00 p.m. EDT	14h 43m 56s
07/31/2019	5:27 a.m. EDT	5:58 a.m. EDT	8:15 p.m. EDT	8:45 p.m. EDT	14h 17m 24s

Moon Phases					
			New Moon	07/02/2019	3:16 p.m. EDT
First Quarter	07/09/2019	6:54 a.m. EDT	Full Moon	07/16/2019	5:38 p.m. EDT
Last Quarter	07/24/2019	9:18 p.m. EDT	New Moon	07/31/2019	11:11 p.m. EDT

July 2019 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

2	New Moon, 3:16 p.m. EDT
2	Total solar eclipse (not visible in the U.S.)
3	Observing challenge: find the Moon, Mercury and Mars low in the west
9	First Quarter Moon, 6:54 a.m. EDT, and Saturn is at opposition
10	The Lunar Straight Wall is visible
13	The Moon is near Jupiter
16	Full Moon, the Full Buck Moon or the Birds Shed Feathers Moon, 5:38 p.m. EDT
16	Total lunar eclipse (not visible in the U.S.)
16	The Moon is near Saturn
20	50-year anniversary of first man on the Moon
24	Last Quarter Moon, 9:18 p.m. EDT
29/30	The Delta Aquariid meteor shower peaks
31	Black Moon (2nd New Moon in a month), 11:11 p.m. EDT

The best sights this month: There is nothing really special about the appearance of the Moon when it rises just before midnight on July 20th, but take a look and ponder that 50 years ago Neil Armstrong stepped down from the ladder of the lunar lander and took "…one small step for a man, one giant leap for mankind". Then look to the upper right of the Moon to see beautiful Saturn and bright Jupiter ruling the summer sky.

Mercury: Mercury will disappear from view in early July, but on July 3rd look for a day-old crescent Moon, Mercury and Mars low in the west after sunset as the glow of the Sun fades.

Venus: Venus shines brightly, low in the glow of the rising Sun, and disappears from view late in the month and reappears as the "evening star" in a few months.

Mars: The red planet is now quite dim and sinks lower into the glow of the setting Sun each day, disappearing from view late in July. Mars will reappear in a few months in the pre-dawn sky.

Jupiter: The king of the planets rules the evening sky, appearing highest in the sky during prime viewing time. Watch the dance of the four Galilean moons as they change position by the hour and try to see the Great Red Spot as it slides across the face of this distant gas giant.

Saturn: Saturn reaches opposition on July 9th so it will be visible all night and is easy to find just to the left of the lid of the "teapot" of Sagittarius. For the best view of the ringed planet look around midnight when Saturn will be highest in the sky.

Uranus and Neptune: Neither gas giant is in good viewing position during July.

The Moon: The Moon is full on July 16th. Native Americans called this the Full Buck Moon because July is normally the month when the new antlers of buck deer push out of their foreheads with coatings of velvety fur. It was also often called the Full Thunder Moon, since thunderstorms are most frequent during this time of year. This Full Moon has also been called the Full Hay Moon. Native Canadians called this the Birds Shed Feathers Moon.

Constellations: I love the warm July nights! Settle back in a lounge chair on a clear July night and enjoy the wonderful stars of summer! In the west is bright Arcturus in Boötes with the beautiful Corona Borealis, the Northern Crown, just to its east. Then we pass through Hercules to the Summer Triangle with the Milky Way filling the spaces within the triangle. Lean back with a pair of binoculars and gaze into the triangle and you will see thousands of stars!

Messier/deep sky: While the southern constellations of summer, Sagittarius and Scorpius, are visible don't miss the chance to gaze into the heart of the Milky Way. M4, a globular cluster near red Antares in Scorpius is a nice sight in binoculars or a telescope. Two of my favorite open clusters are low in the south: M6 and M7. These are easy to find if you use the tail of Scorpius as a guide. Then head north to find M22, a nice globular cluster, and continue north to find the Swan Nebula, M17. Open clusters, a globular cluster and a nebula all in one area of the sky, and that is just scratching the surface of the southern summer sky!

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Through The Eyepiece: Scorpius, The Big Bug in the Southern Sky

by Don Knabb, CCAS Treasurer & Observing Chair

With summer's arrival, I always look to the south to enjoy the southern constellations during their brief visit to our Chester County skies. One needs an observing location with a low southern horizon to have a good view of these stunning constellations. If you can join us at our star party at Nottingham County Park in the fall you will have an excellent view of Scorpius and will see all the objects mentioned below.

Scorpius the Scorpion is one of my favorite constellations. Isn't it nice when a constellation actually looks similar what it is named after?

When you see the entire constellation it's easy to see the scorpion shape. The Chinese called this grouping of stars a dragon, while the native cultures of the South Pacific saw a fishhook (it is easy to see why). The myths surrounding Scorpius explain why Scorpius rises in the east as Orion sets in the west. The Scorpion is the slayer of Orion, so they were put on opposite sides of the sky to prevent any further fighting.

It's impossible to miss the wonderful star Antares, the heart of the Scorpion. This red star is the fifteenth-brightest star in the sky. It is a supergiant star that has a diameter 700 times that of our Sun. If our Sun was replaced by Antares, we'd be really complaining about the summer heat since we'd be in the interior of the star. Its' surface would extend all the way to the orbit of Jupiter.

There are several excellent deep sky objects in Scorpius. As you can see on the star chart, just to the right of Antares is M4. This is one of the largest and closest globular clusters in our sky and it is easy to find in any pair of binoculars. M4 is a swarm of several hundred thousand stars and is "only" 7,200 light-years away, which puts it far behind most of the stars you see around it.

Sky map created using Stellarium planetarium software

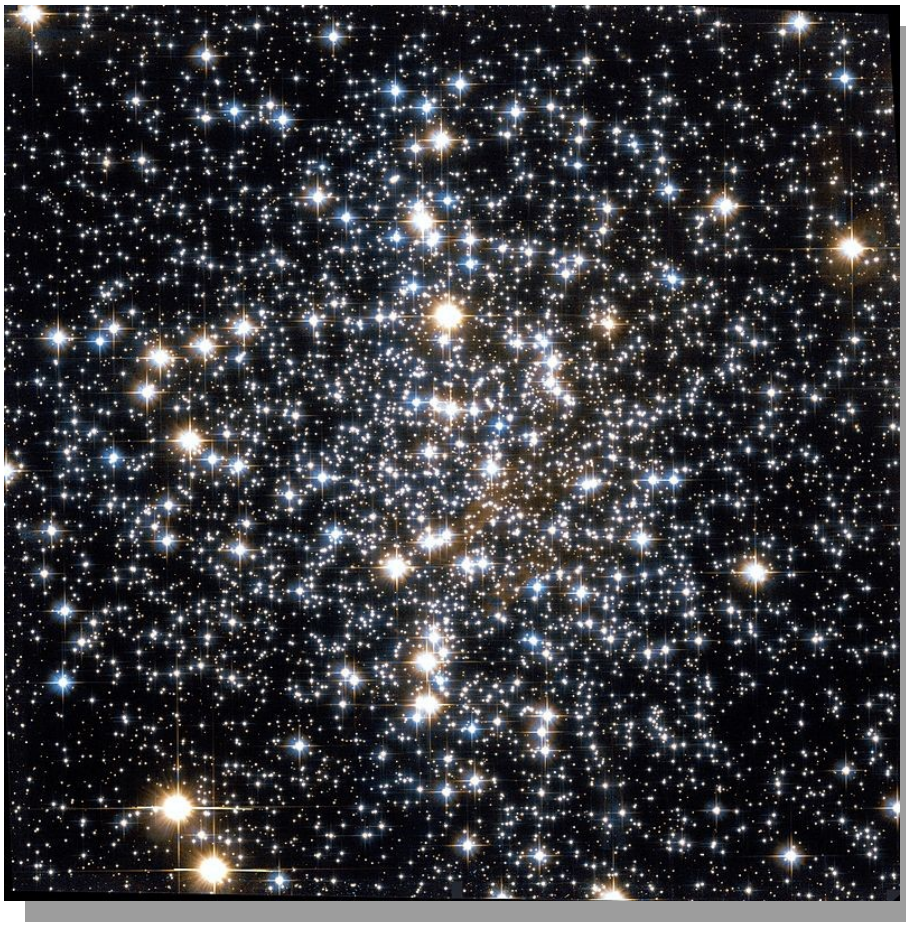
One of the more challenging objects to find is called the Northern Jewel Box, NGC 6231 or Caldwell 76. This open cluster is just above where the tail of the scorpion takes a sharp turn to the east (left). You really need to time it right and have a good view of the southern horizon to see this beautiful cluster.

Perhaps my favorite object in Scorpius is the open cluster Messier 6. M6 is called The Butterfly Cluster. In binoculars, Messier 6 stars will all appear to be around the same brightness and the 'butterfly' asterism will be unmistakable. In a telescope, many more stars will be revealed – making the namesake a bit harder to recognize, but more interesting because more stars are seen, and color is distinguished. However, watch this cluster on nights when there is a little fine cloud in the sky or moonlight. You'll see the shape in a telescope quite clearly then! Be sure to use a minimum magnification when using a telescope, because this is a large open star cluster

Robert Burnham, Jr. comments "The present author regards this as one of the most attractive clusters in the heavens

(Continued on page 7)

Eyepiece (Cont'd)



M4. Image credit: Hubble Space Telescope NASA/STScI/WikiSky

M6. Image credit: Ole Nielsen, CC BY-SA 2.5,

(Continued from page 6)

for small instruments, a completely charming group whose arrangement suggests the outline of a butterfly with open wings."

Another of my favorite objects is another open cluster, Messier 7 or M7, also designated NGC 6475 and sometimes known as Ptolemy's Cluster. From a dark sky site, the cluster is easily detectable with binoculars, close to the "stinger" of Scorpius. Both M6 and M7 were easily seen with the naked eye at Cherry Springs State Park last summer.

M7 has been known since antiquity. This great open star cluster is most often credited to Ptolemy, who listed it in his 'Almagest' as Object Number 567 in 130 AD. From his notes he describes it as "A nebulous cluster following the sting of Scorpius." Italian astronomer Giovanni Batista Hodierna observed it before 1654 and counted 30 stars in it. In 1764, French astronomer Charles Messier catalogued the cluster as the seventh member in his list of comet-like objects. English astronomer John Herschel described it as "coarsely scattered clusters of stars".

An open cluster is a group of up to a few thousand stars that were formed from the same giant molecular cloud and have roughly the same age. More than 1,100 open clusters have been discovered within the Milky Way galaxy, and many more are thought to exist. They are loosely bound to each other by mutual gravitational attraction and become dis-

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NASA Night Sky Notes: Observe the Moon & Beyond — Apollo 11 at 50

by David Prosper

This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, stargazing info and more.

Saturn is at opposition this month, beckoning to future explorers with its beautiful rings and varied, mysterious moons. The **Moon** prominently passes Saturn mid-month, just in time for the 50th anniversary of **Apollo 11**!

Saturn is in opposition on July 9, rising in the east as the Sun sets in the west. It is visible all night, hovering right above the teapot of Sagittarius. Saturn is not nearly as bright as Jupiter, nearby and close to Scorpius, but both giant planets are easily the brightest objects in their constellations, making them easy to identify. A full **Moon** scrapes by the ringed planet late in the evening of the 15th through the early morning of the 16th. Some observers in South America will even see the Moon occult, or pass in front of, Saturn. Observe how fast the Moon moves in relation to Saturn throughout the night by recording their positions every half hour or so via sketches or photos.

While observing the Saturn-Moon celestial dance the early morning of the 16th, you can also contemplate the 50th anniversary of the launch of the **Apollo 11** mission! On June 16, 1969, Apollo 11 blasted off from Cape Canaveral in Florida on a journey of almost a quarter million miles to our nearest celestial neighbor, a mission made possible by the tremendous power of the Saturn V rocket – still the most powerful rocket ever launched. Just a few days later, on July 20, 1969 at 10:56 pm EDT, Neil Armstrong and Buzz Aldrin set foot on the lunar surface and became the first people in history to walk on another world. The astronauts set up equipment including a solar wind sampler, laser ranging retroreflector, and seismometer, and gathered up almost 22 kilograms (48 pounds) of precious lunar rocks and soil samples. After spending less than a day on the Moon's surface, the duo blasted off and returned to the orbiting Columbia Command Module, piloted by Michael Collins. Just a few days later, on

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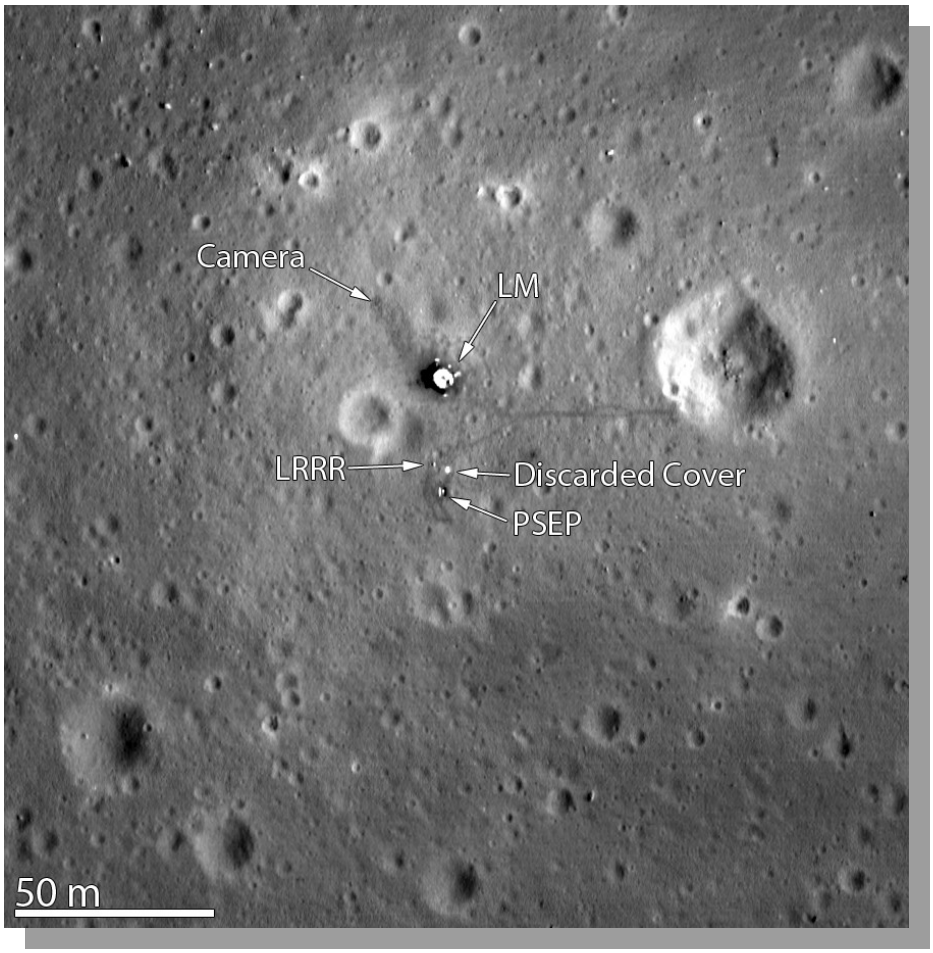
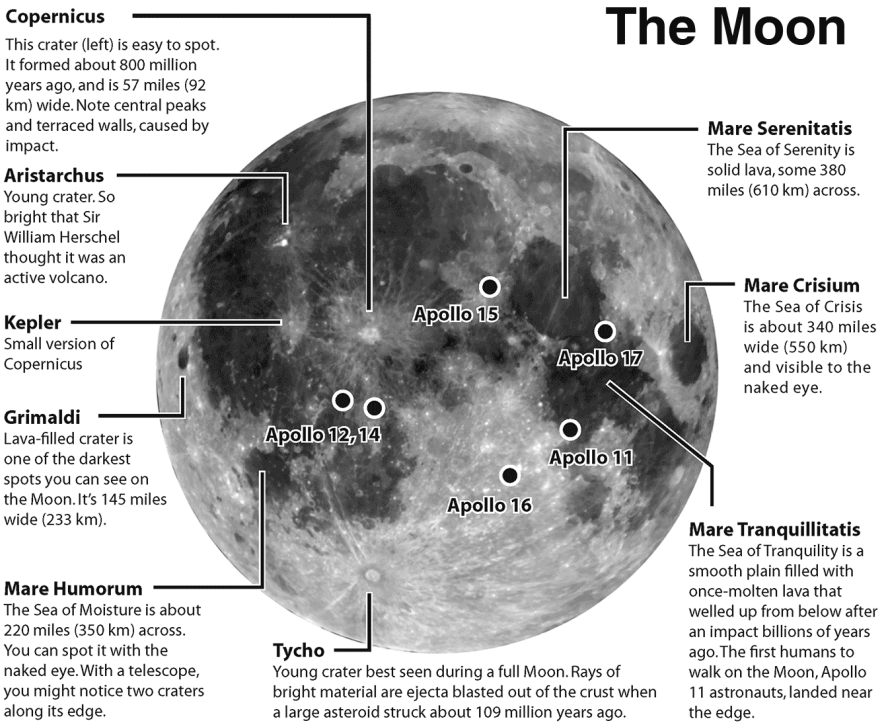


***Caption**: Earth-based telescopes can't see any equipment left behind at the Apollo 11 landing site, but the cameras onboard NASA's Lunar Reconnaissance Orbiter (LRO) can. This is Tranquility Base as seen from the LRO, just 24 kilometers (15 miles) above the Moon's surface, with helpful labels added by the imaging team. Image Credit: NASA Goddard/Arizona State University. See more landing sites at: bit.ly/ApolloLRO*

Night Sky Notes (Cont'd)



SOURCES: NASA; ADVANCED SKYWATCHING; CAMBRIDGE ATLAS OF ASTRONOMY; DK VISUAL ENCYCLOPEDIA

Photos: James Scala. Layout and text for Moon map used with permission: Robert Roy Britt/SPACE.com.

Caption: Observe the larger details on the Moon with help from this map, which also pinpoints the Apollo landing site. Full handout available at bit.ly/MoonHandout

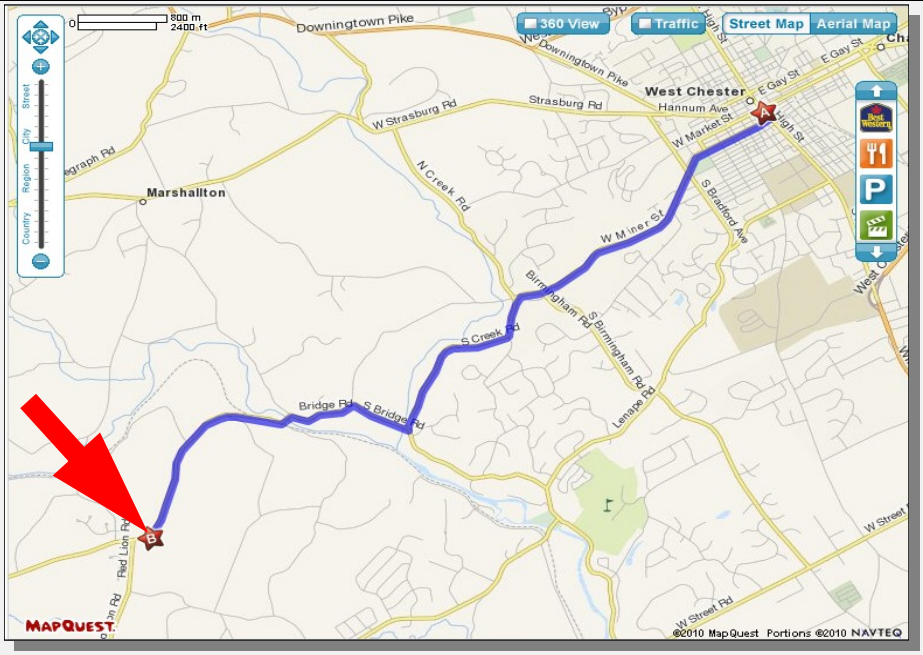
(Continued from page 8)

July 24, all three astronauts splashed down safely in the Pacific Ocean. You can follow the timeline of the Apollo 11 mission in greater detail at bit.ly/TimelineApollo11 and dig deep into mission history and science on **NASA's Apollo History Site**: bit.ly/ApolloNASA.

Have you ever wanted to see the flag on the Moon left behind by the Apollo astronauts? While no telescope on Earth is powerful enough to see any items left behind the landing sites, you can discover how much you **can** observe with **the Flag on the Moon** handout: bit.ly/MoonFlag

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

CCAS Directions



Brandywine Red Clay Alliance

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

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

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

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

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

CCAS Member John Conrad Featured Speaker at WCU Event

On July 19, 1969, Apollo 11 made history when the first men walked on the Moon. The Mather Planetarium will be hosting a special event to celebrate the 50th anniversary of these extraordinary NASA Apollo missions on July 13, 2019. We invite everyone to join us for an evening of activities including a keynote presentation, planetarium shows, telescope viewing, and hands-on activities. See the table below for details.

This special event is FREE and open to the general public. Visitors may park in any WCU commuter parking lot free of charge. Parking meters must be paid. A map of the campus, with the locations of the various activities, is available at https://www.wcupa.edu/sciences-mathematics/earthSpaceSciences/planetarium/images/appolloMap.jpg Questions should be directed to Dr. Karen Schwarz.

WCU Apollo 11 Celebration Schedule of Events

Activity	Location
5-6 PM **Keynote Speaker John Conrad, NASA Solar System Ambassador** **"Lunar Reflections: Before, During, and After Apollo 11"** After billions of years with only one satellite (our Moon), we Earthlings entered the Space Age only 62 years ago with the launch of our first manmade satellites. And then – within only about a decade – America's Apollo astronauts were standing on the Moon. Here's the story of those amazing early decades of spaceflight – the 50's and 60's – and how and why the world made such rapid progress. From his perspective as an active space program participant, our speaker will bring you the highlights of Apollo 11, as well as personal insights and stories from those years, ending with a brief look ahead to what's next. **Our Speaker**: John Conrad followed his childhood interest in space and spaceflight – just before the dawn of the Space Age – earning his Astronautical Engineering degrees from the US Air Force Academy and Purdue University and going straight into leadership of space programs for the Air Force, NASA, and the aerospace industry. Upon retirement, he was selected by NASA/JPL as a NASA Solar System Ambassador. In this role, he reaches a broad range of audiences with the latest and greatest in NASA's programs and achievements. His active participation in the space launch programs of the 60's have given him first-hand experiences, insights, and stories which he'll share in his talk.	**Main Hall 168**
6-10 PM **Planetarium Show** **Fulldome Movie "Apollo 11: Man's First Steps onto the Moon"** Free timed-tickets will be given out at the door starting at 6PM; first come, first served. Showings will run every half hour starting at 6PM.	**Mather Planetarium Schmucker Science Center Link 158**

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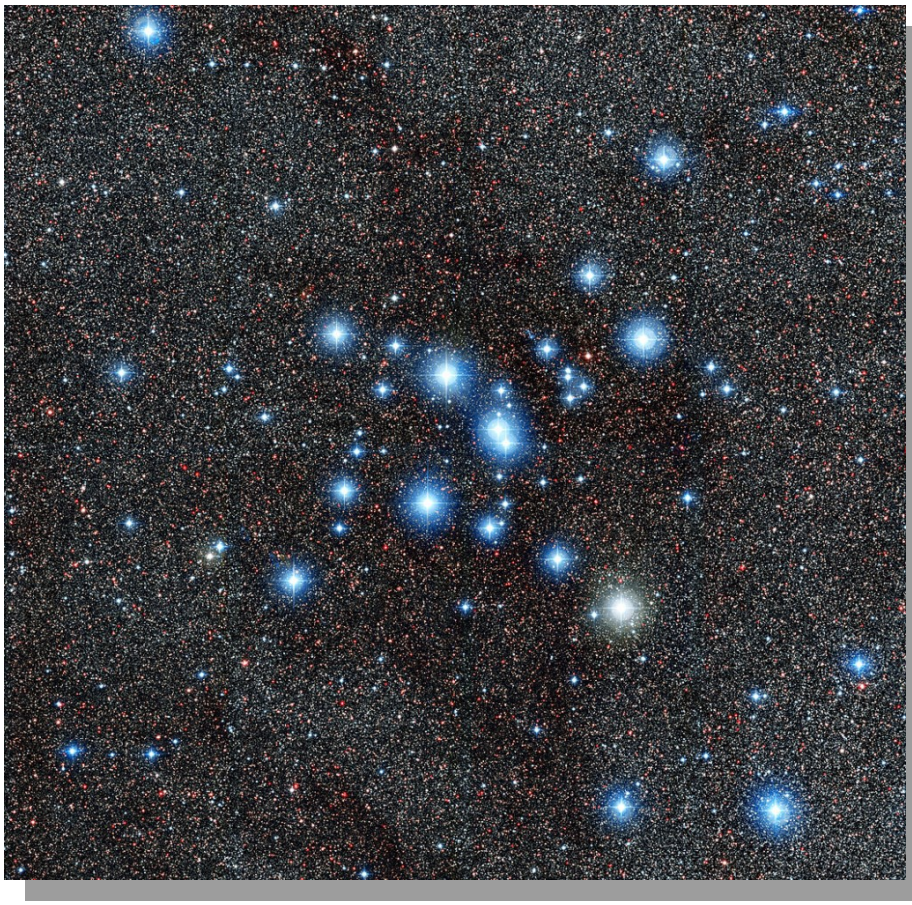
Eyepiece (Cont'd)



M7. Image credit: ESO (European Southern Observatory) licensed under a Creative Commons Attribution 4.0 International License

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rupted by close encounters with other clusters and clouds of gas as they orbit the galactic center. Open clusters generally survive for a few hundred million years. In contrast, the more massive globular clusters of stars exert a stronger gravitational attraction on their members and can survive for many billions of years.

So enjoy the warm summer night sky and gaze low into the southern horizon to experience the sights of Scorpius the Scorpion!

Information credits:

- Dickinson, Terence 2006. Nightwatch: a practical guide to viewing the universe. Buffalo, NY. Firefly Books
- http://www.universetoday.com/31228/messier-7/
- http://en.wikipedia.org/wiki/Butterfly_Cluster
- http://www.theskyscrapers.org/messier-6-and-messier-7
- http://www.universetoday.com/31219/messier-6/

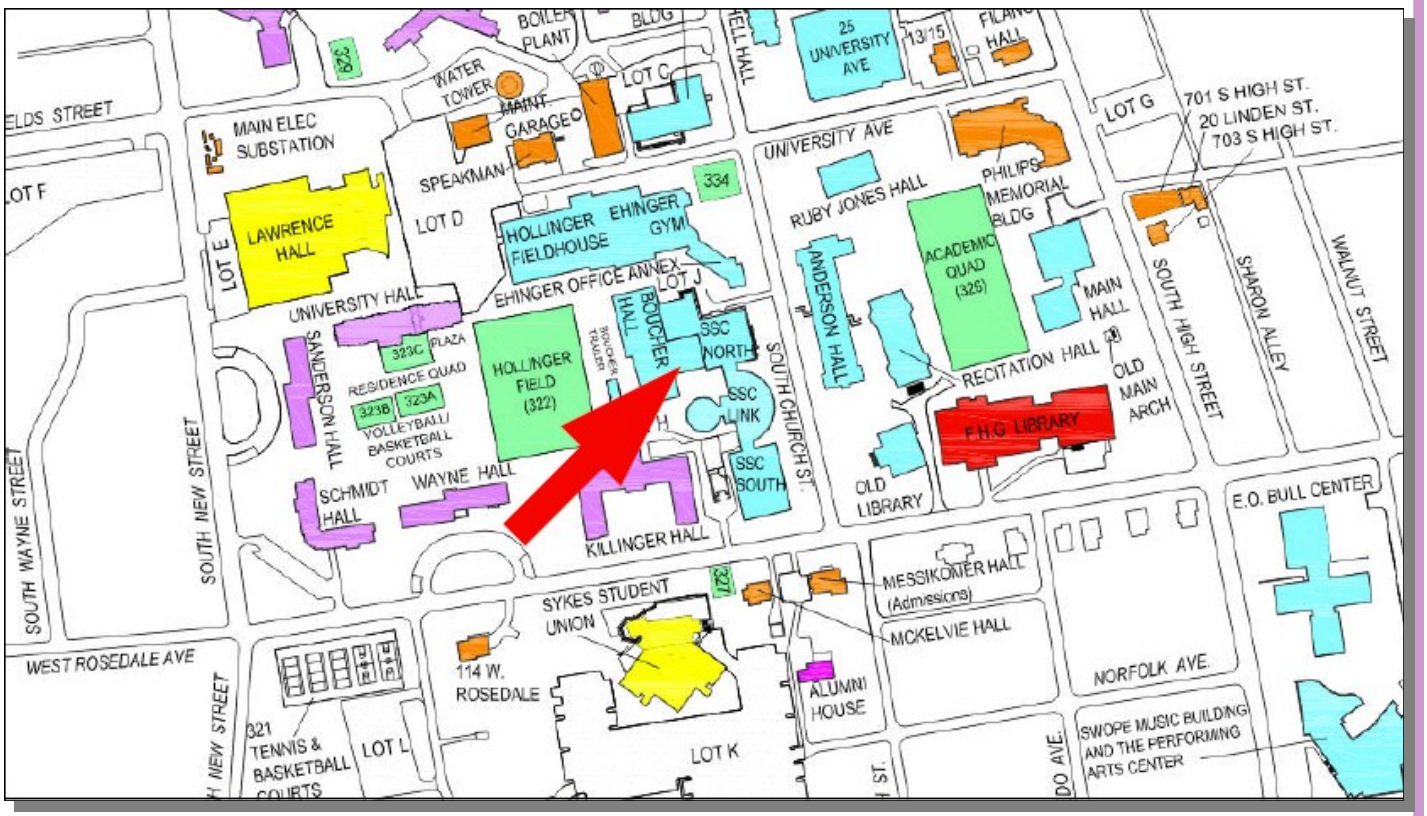
WCU Celebration (Cont'd)

Activity	Location
6-10 PM **Telescope Viewing** Members of the Chester County Astronomical Society will have their telescopes out for viewing the Moon, Jupiter, Saturn, and other astronomical objects. Telescope viewing is weather dependent.	**Academic Quad**
6-10 PM **Hands-on Activities** Activities for all ages will be going on all evening in the Schmucker Science Center and on the Academic Quad. Come and make a solar system that will fit in your pocket, learn why the Moon has phases, create your own space helmet, and much, much more!	**Schmucker Science Center Link & Academic Quad**

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).



Black Hole Image (Cont'd)

(Continued from page 5)

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

Meteor showers: The Delta Aquariid meteor shower peaks the night of July 29/30. We won't have an impressive shower, but one might see 25 fast meteors per hour from a dark site. This meteor shower has a broad peak, so you can look a day or two before or after the peak and still see meteors. And with no Moon to light up the sky this is a great opportunity to see some "shooting stars".

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

June 2019 Financial Summary

Beginning Balance	$1,393
Deposits	$160
Disbursements	-$540
Ending Balance	$1,013

New Member Welcome!

Welcome new CCAS members Todd Morgan from Downingtown, Jeff Barasatian from West Chester, Angela Bissinger from Glenmoore, and James McGuigan from Coatesville. 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

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

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Lighthouse Outdoor Lighting is a dedicated lifetime corporate member of the International Dark-Sky Association. Lighthouse's products are designed to reduce or eliminate the negative effects outdoor lighting can have while still providing the light you need at night.

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

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Located in Manayunk, Spectrum Scientifics educates and entertains customers with an array of telescopes, microscopes, binoculars, science toys, magnets, labware, scales, science instruments, chemistry sets, and much more.

4403 Main Street
Philadelphia, PA 19127

Phone: **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 C. 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:	Dave Hockenberry 610-558-4248
Vice President:	Pete Kellerman 610-873-0162
ALCor, Observing, & Treasurer:	Don Knabb 610-436-5702
Secretary:	Beatrice Mazziotta 610-933-2128
Librarian:	Barb Knabb 610-436-5702
Program:	Bruce Ruggeri 484-883-5092
Education:	Don Knabb 610-436-5702 Dennis O'Leary 610-701-8042
Webmaster & Newsletter:	John Hepler 410-639-4329
Public Relations:	Ann Miller 610-558-4248

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.**