Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 25, No. 6 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *June 2017*

In This Issue

Beneath Jupiter

Image Credit: NASA, Juno, SwRI, MSSS, Gerald Eichstädt & Seán Doran. Explanation: Jupiter is stranger than we knew. NASA's Juno spacecraft has now completed its sixth swoop past Jupiter as it moves around its highly elliptical orbit. Pictured, Jupiter is seen from below where, surprisingly, the horizontal bands that cover most of the planet disappear into swirls and complex patterns. A line of white oval clouds is visible nearer to the equator. Recent results from Juno show that Jupiter's weather phenomena can extend deep below its cloud tops, and that Jupiter's magnetic field varies greatly with location. Juno is scheduled to orbit Jupiter 37 times with each orbit taking about six weeks.

Membership Renewals Due

06/2017	Hanspal Hebding Mazziotta/Calobrisi McCausland
07/2017	Hockenberry/Miller Hunsinger Johnston
08/2017	Buki Knabb & Family Lurcott, L. Tiedemann

June 2017 Dates

1st • First quarter Moon, 8:42 a.m. EDT

3rd • Two moon shadows are visible on Jupiter at 10:22 p.m. EDT

9th • Full Moon, the Full Strawberry Moon, 9:09 a.m. EDT

17th • Last Quarter Moon, 7:32 a.m. EDT

21st • Summer solstice at 12:24 a.m. EDT

23rd • New Moon, 10:30 p.m. EDT

30th • First Quarter Moon, 8:51 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.

☼ **Friday, June 9, 2017** - The Green Valleys Watershed Association is holding a Strawberry Moon picnic from 6:00 to 9:00. They have asked if a few of us can be there to talk about the Strawberry Moon and set up scopes to view the night sky.

☼ **Friday, July 14, 2017** - Friday Night Lights with the Natural Lands Trust - this is a fund raiser for the Natural Lands Trust where music is provided. Last year 600 people attended and it will be bigger this year! Several local astronomy clubs set up telescopes during the event. If you want to help with this event let me know so I can tell the organizers. You must bring a telescope or mounted astronomical binoculars to this event if you want to attend.

Spring/Summer 2017 Society Events

June 2017

1st-2nd • The von Kármán Lecture Series: The Golden Age of Exploration, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

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

9th • The Green Valleys Watershed Association is holding a Strawberry Moon picnic from 6:00 to 9:00. They have asked if a few of us can be there to talk about the Strawberry Moon and set up scopes to view the night sky.

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

21st • Summer Solstice, 12:24 am EDT. First day of summer.

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

30th • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

July 2017

5th • 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.

13th-14th • The von Kármán Lecture Series: Five Years of Exploring Gale Crater with the Curiosity Mars Rover, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

14th • Friday Night Lights with the Natural Lands Trust - this is a fund raiser 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 at https://natlands.org/event/fridaynightlights2017/. 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.

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

21st • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

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

Minutes from the May 9, 2017, CCAS Meeting

by Ann Miller, CCAS Secretary

- On May 9, 2017, Roger Taylor welcomed 34 guests and members to the last meeting of the 2016-2017 schedule of CCAS.
- Roger thanked all who participated in the "Astronomy Day Miracle" at Nottingham Park Star Party.
- Our upcoming events are:
  - Anson Nixon Park Star Party in Kennett Square, PA on May 13
  - A rescheduled star party at Bucktoe Preserve on May 20
  - Friday Night Lights Star Party at ChesLen Preserve on July 14
- Don Knabb introduced our first guest of the evening, Science Fiction author, Jack McDevitt.
  - Jack has authored 22 novels and counting including the Priscilla Hutchins series.
  - Jack shared that he first became interested in Science Fiction when his father took him to Flash Gordon and Buck Rodgers movies at the Bell Theater in South Philly in the 1940's.
  - He published his first story in Twilight Zone Magazine in 1981.
  - Jack answered our questions about writing science fiction stories.
  - Jack shared copies of his novel "Starhawk" with our club and was gracious enough to sign them for us.
  - He left us with these concluding remarks that "most of us underestimate what we are capable of doing."
  - We also would like to thank Jack's son, Chris, for accompanying him to Pennsylvania from Georgia.
- David Hockenberry introduced our second speaker of the evening, Dr. Edward Guinan, Professor of Astronomy and Astrophysics at Villanova University.
  - Dr. Guinan presented "Proxima b: The Alien Next Door-Is Anyone Home?"
  - For further information on exoplanet census, go to http://phl.upr.edu/projects/habitable-exoplanets-catalog and Kepler.nasa.gov.
  - The website for Living with a Red Dwarf is www.astronomy.villanova.edu/lward.
- Pete Kellerman announced that he will be attending the Cherry Springs Star Party on June 22-25, 2017. Please contact him if anyone else from our club is attending.
- Planetary Society handouts and eclipse glasses were available again for our members.

September 2017 CCAS Meeting Agenda

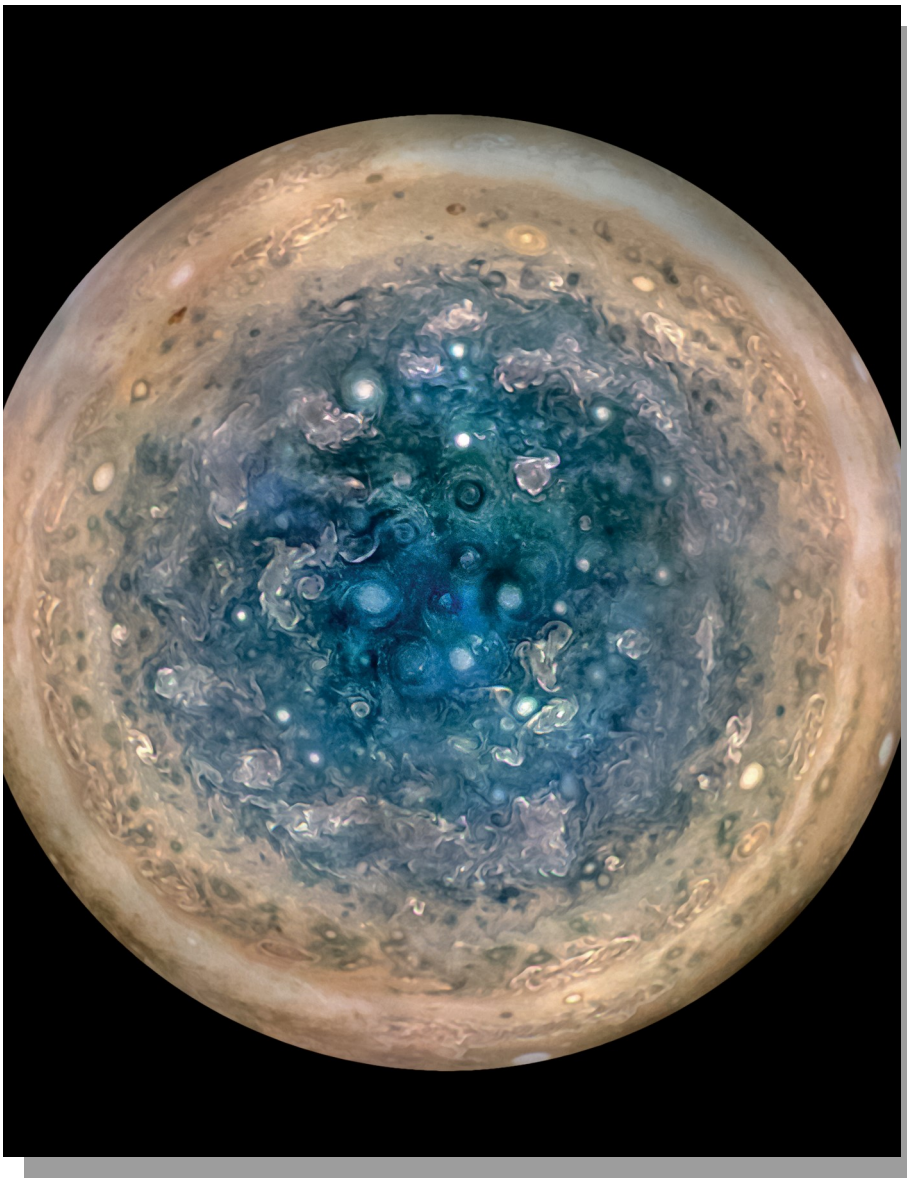
by Dave Hockenberry, CCAS Program Chair

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.

A Whole New Jupiter: First Science Results from NASA's Juno Mission
Courtesy of NASA



This image shows Jupiter's south pole, as seen by NASA's Juno spacecraft from an altitude of 32,000 miles (52,000 kilometers). The oval features are cyclones, up to 600 miles (1,000 kilometers) in diameter. Multiple images taken with the JunoCam instrument on three separate orbits were combined to show all areas in daylight, enhanced color, and stereographic projection. Credits: NASA/JPL-Caltech/SwRI/MSSS/ Betsy Asher Hall/Gervasio Robles

Early science results from NASA's Juno mission to Jupiter portray the largest planet in our solar system as a complex, gigantic, turbulent world, with Earth-sized polar cyclones, plunging storm systems that travel deep into the heart of the gas giant, and a mammoth, lumpy magnetic field that may indicate it was generated closer to the planet's surface than previously thought.

"We are excited to share these early discoveries, which help us better understand what makes Jupiter so fascinating," said Diane Brown, Juno program executive at NASA Headquarters in Washington. "It was a long trip to get to Jupiter, but these first results already demonstrate it was well worth the journey."

Juno launched on Aug. 5, 2011, entering Jupiter's orbit on July 4, 2016. The findings from the first data-collection pass, which flew within about 2,600 miles (4,200 kilometers) of Jupiter's swirling cloud tops on Aug. 27, are being published this week in two papers in the journal Science, as well as 44 papers in Geophysical Research Letters.

"We knew, going in, that Jupiter would throw us some curves," said Scott Bolton, Juno principal investigator from the Southwest Research Institute in San Antonio. "But now that we are here we are finding that Jupiter can throw the heat, as well as knuckleballs and sliders. There is so much going on here that we didn't expect that we have had to take a step back and begin to rethink of this as a whole new Jupiter."

Among the findings that challenge assumptions are those provided by Juno's imager, JunoCam. The images show both of Jupiter's poles are covered in Earth-sized swirling storms that are densely clustered and rubbing together.

"We're puzzled as to how they could be formed, how stable the configuration is, and why Jupiter's north pole doesn't look like the south pole," said Bolton. "We're questioning whether this is a dynamic system, and are we seeing just one stage, and over the next year, we're going to watch it disappear, or is this a stable configuration and these storms are circulating around one another?"

Another surprise comes from Juno's Microwave Radiometer (MWR), which samples the

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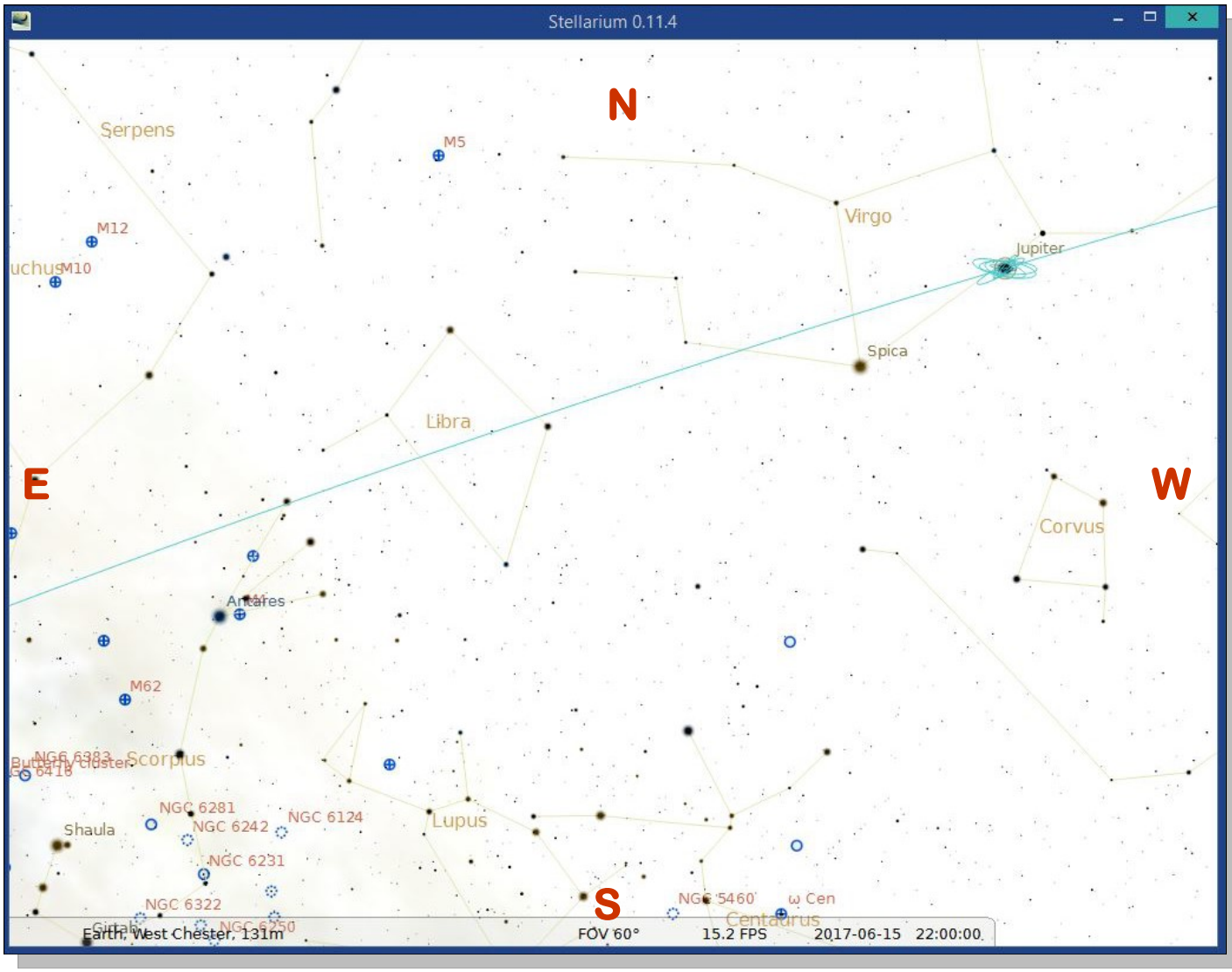
The Sky Over Chester County

June 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
6/01/2017	5:01 a.m. EDT	5:33 a.m. EDT	8:23 p.m. EDT	8:55 p.m. EDT	14h 49m 28s
6/15/2017	4:58 a.m. EDT	5:31 a.m. EDT	8:31 p.m. EDT	9:03 p.m. EDT	14h 59m 41s
6/30/2017	5:02 a.m. EDT	5:35 a.m. EDT	8:33 p.m. EDT	9:05 p.m. EDT	14h 57m 52s

Moon Phases					
First Quarter	6/01/2017	8:42 a.m. EDT	Full Moon	6/09/2017	9:09 a.m. EDT
Last Quarter	6/17/2017	7:32 a.m. EDT	New Moon	6/23/2017	10:30 p.m. EDT
First Quarter	6/30/2017	8:51 p.m. EDT			

June 2017 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

1	**First Quarter Moon, 8:42 a.m.**
2	**The Lunar Straight Wall (Rupes Recta) is visible**
3	**Two moon shadows are visible on Jupiter at 10:22 p.m.**
3	**The Moon is near Jupiter**
9	**Full Moon, the Full Strawberry Moon or the Trees Fully Leaved Moon, 9:09 a.m.**
10	**Only one of Jupiter's moons is visible at 10:57**
15	**Saturn is at opposition**
17	**Last Quarter Moon, 7:32 a.m.**
19	**Two moon shadows are visible in Jupiter at 10:05 p.m.**
21	**Summer solstice at 12:24 a.m.**
23	**New Moon, 10:30 p.m.**
30	**First Quarter Moon, 8:51 p.m.**

The best sights this month: Jupiter shines brightly in the south just after the sky darkens, and on both June 3rd and June 19th we can see a double moon shadow transit the planet. The jewel of the night sky, Saturn, is at opposition on June 15th so late in the evening it will be well up in the southeast. With the rings tilted near their maximum this is a wonderful sight in the eyepiece.

Mercury: Mercury is lost in the glare of the Sun all month.

Venus: The "morning star" shines like a beacon in the pre-dawn glow.

Mars: In June, we say goodbye to Mars after a nearly two year run of visibility. See you in the pre-dawn sky in a few months!

Jupiter: The king of the planets rules the evening sky, shining high in the south at nightfall. At high power look for the Great Red Spot. And during June we have two opportunities to see two moon shadows pass over Jupiter, on June 3rd and on June 19th. These are fun to watch but take good seeing and high magnification. June 10th is an odd evening for Jupiter with only one of its moons visible at 10:57 p.m.

Saturn: The ringed planet reaches opposition on June 14th so it rises around sunset and will be visible nearly all night. The rings are tilted close to their maximum and Saturn is at its closest to us for 2017, so it is a beautiful object in the eyepiece. For the least atmospheric interference look for Saturn near midnight.

Uranus and Neptune: Uranus and Neptune are not well placed for evening observing during June.

The Moon: Full Moon is on June 9th. Native Americans called this the Full Strawberry Moon. This name was universal to every Algonquin tribe. However, in Europe they called it the Rose Moon. Native Canadians called this the Trees Fully Leaved Moon.

Constellations: Ah, the summer sky. Yes, you must stay up later to see the stars but at least you won't be shivering! Say goodbye to Leo the Lion as he dives into the west. Look for Scorpius if you have a clear southern horizon and see the bright star Antares shining like a red heart in the big bug of summer. In the east, we have bright Vega in Lyra followed by the birds of summer: Cygnus the Swan and Aquila the Eagle.

Messier/deep sky: I know there are many nice other globular clusters, but M13 in Hercules is an amazing object if the skies are dark and clear. As astronaut Dave Bowman said when he looked into the monolith in orbit around Jupiter in the movie 2001, A Space Odyssey," Oh my God, it's full of stars!" That's how I feel when I get a good look at M13. Then look low in the south to find M8, the famous Lagoon Nebula and M17, the Omega Nebula, also called the Swan Nebula.

Comets: Comet Johnson (C/2015 V2) is making its first dive into the inner solar system and could reach 6th magnitude which will make for easy viewing in binoculars or a telescope. This comet will be visible all night during June. A sky map is in the June issue

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The Fizzy Seas of Titan

by Marcus Woo

With clouds, rain, seas, lakes and a nitrogen-filled atmosphere, Saturn's moon Titan appears to be one of the worlds most similar to Earth in the solar system. But it's still alien; its seas and lakes are full not of water but liquid methane and ethane.

At the temperatures and pressures found on Titan's surface, methane can evaporate and fall back down as rain, just like water on Earth. The methane rain flows into rivers and channels, filling lakes and seas.

Nitrogen makes up a larger portion of the atmosphere on Titan than on Earth. The gas also dissolves in methane, just like carbon dioxide in soda. And similar to when you shake an open soda bottle, disturbing a Titan lake can make the nitrogen bubble out.

But now it turns out the seas and lakes might be fizzier than previously thought. Researchers at NASA's Jet Propulsion Laboratory recently experimented with dissolved nitrogen in mixtures of liquid methane and ethane under a variety of temperatures and pressures that would exist

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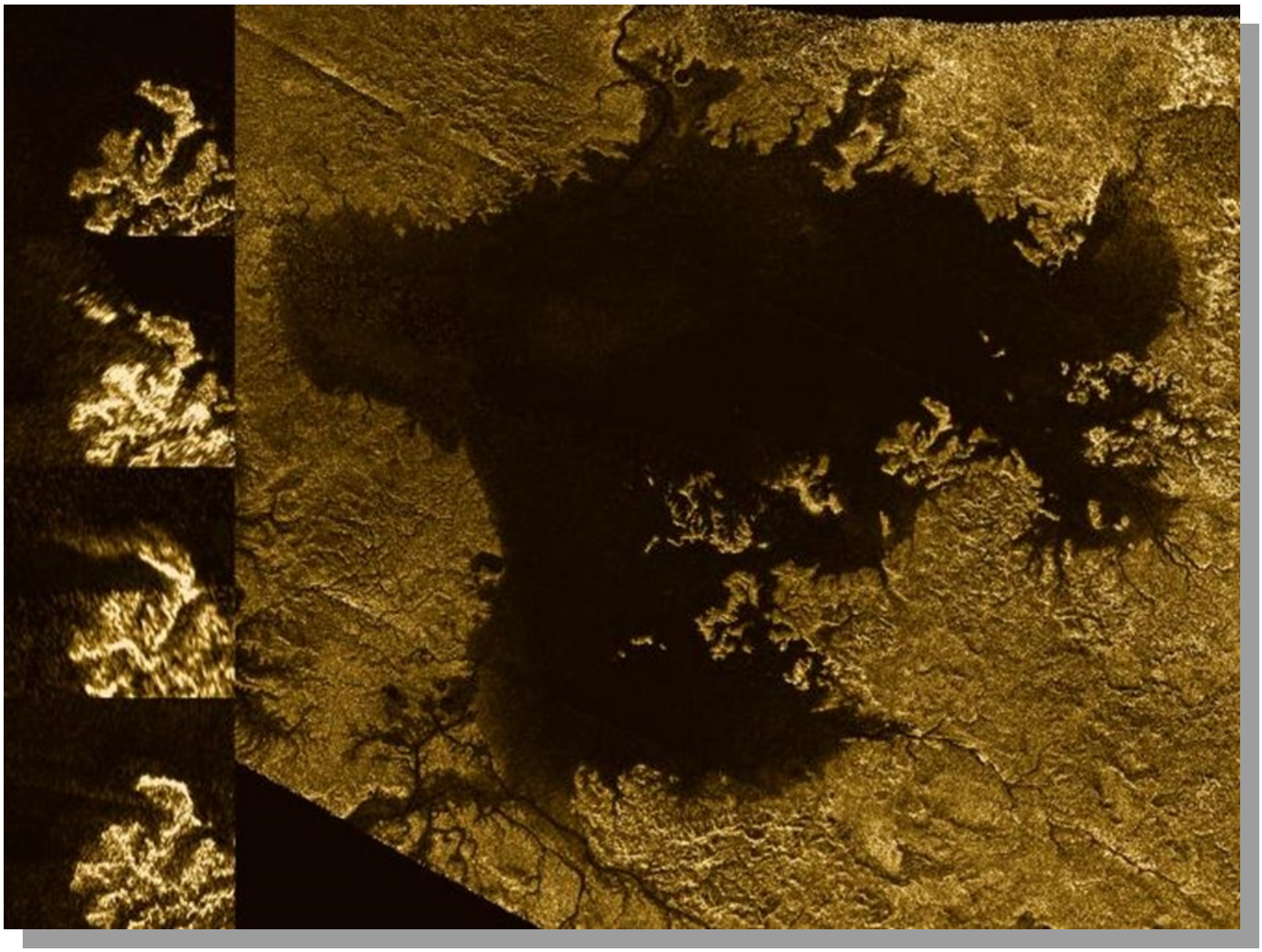

Caption: Radar images from Cassini showed a strange island-like feature in one of Titan's hydrocarbon seas that appeared to change over time. One possible explanation for this "magic island" is bubbles. Image credits: NASA/JPL-Caltech/ASI/Cornell

Space Place (Cont'd)

(Continued from page 6)

on Titan. They measured how different conditions would trigger nitrogen bubbles. A fizzy lake, they found, would be a common sight.

On Titan, the liquid methane always contains dissolved nitrogen. So when it rains, a methane-nitrogen solution pours into the seas and lakes, either directly from rain or via stream runoff. But if the lake also contains some ethane—which doesn't dissolve nitrogen as well as methane does—mixing the liquids will force some of the nitrogen out of solution, and the lake will effervesce.

"It will be a big frothy mess," says Michael Malaska of JPL. "It's neat because it makes Earth look really boring by comparison."

Bubbles could also arise from a lake that contains more ethane than methane. The two will normally mix, but a less-dense layer of methane with dissolved nitrogen—from a gentle rain, for example--could settle on top of an ethane layer.

In this case, any disturbance—even a breeze—could mix the methane with dissolved nitrogen and the ethane below. The nitrogen would become less soluble and bubbles of gas would fizz out.

Heat, the researchers found, can also cause nitrogen to bubble out of solution while cold will coax more nitrogen to dissolve. As the seasons and climate change on Titan, the seas and lakes will inhale and exhale nitrogen.

But such warmth-induced bubbles could pose a challenge for future sea-faring spacecraft, which will have an energy source, and thus heat. "You may have this spacecraft sitting there, and it's just going to be fizzing the whole time," Malaska says. "That may actually be a problem for stability control or sampling."

Bubbles might also explain the so-called magic islands discovered by NASA's Cassini spacecraft in the last few years. Radar images revealed island-like features that appear and disappear

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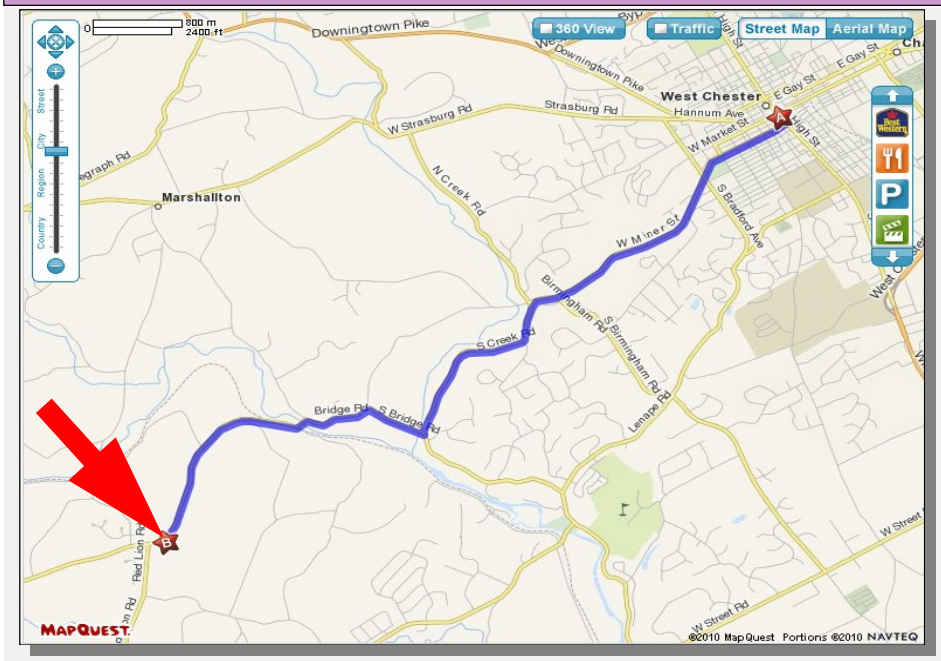
CCAS Directions



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: Saturn and the Magnificent Rings

by Don Knabb, CCAS Treasurer & Observing Chair

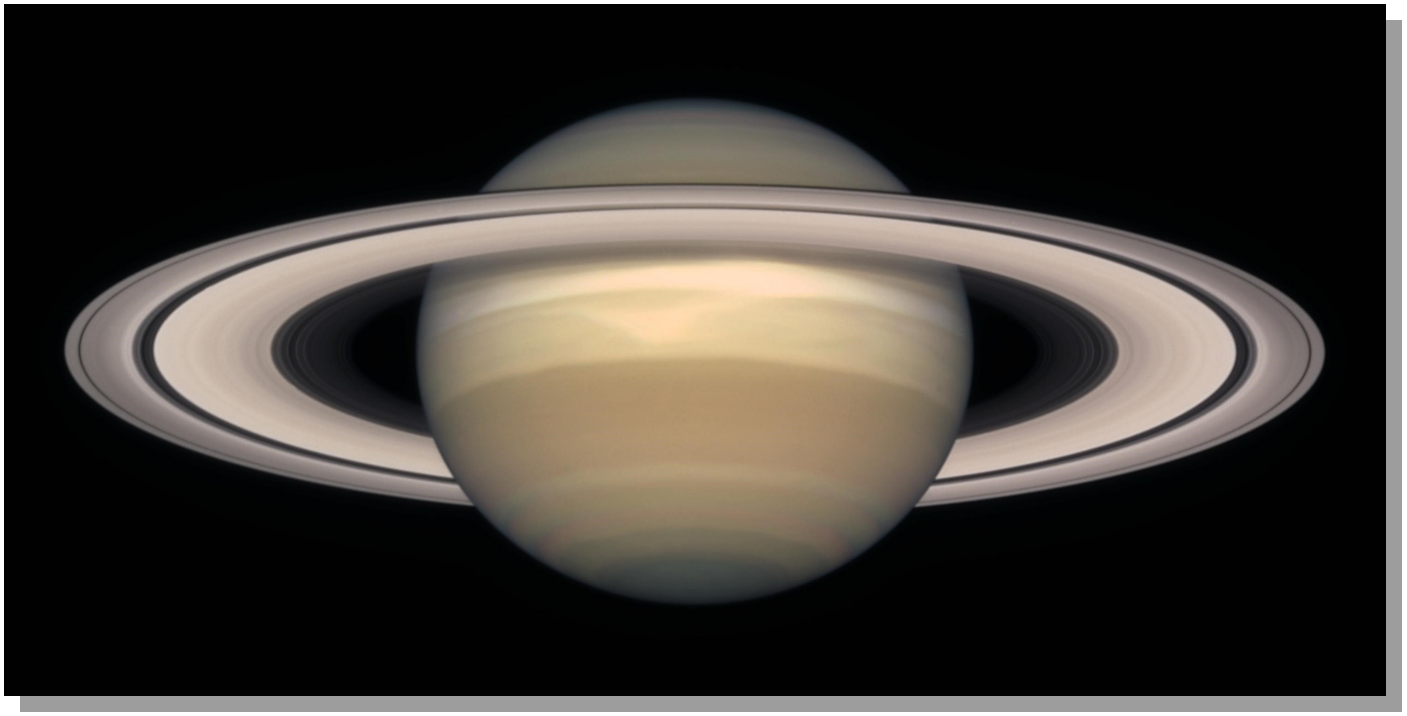


Image Credit: Saturn, NASA Hubble

For me, few objects compare with the sight of Saturn in a telescope. No picture can give you the same view as looking through the eyepiece at this amazing planet. If you want to get a "WOW!" from a new stargazer, just show them Saturn in a telescope.

Saturn is at opposition on June 15th and the viewing will continue to be excellent for several months. The most amazing feature of Saturn is of course its rings, so here are a few facts to provide some background for your observing.

Galileo described the rings as "handles" or large moons on either side of the planet. Two years later he was puzzled to discover the rings had disappeared. What happened is that Galileo happened to look at Saturn when the rings were edge on and they were invisible to his telescope.

Saturn's rings and equator are inclined by 27° to Saturn's orbit, so we see them from different aspects at different times, with the angle varying over a 30 -year period. During June, the rings are inclined at 26.5% from our point of view, so they are near the maximum inclination.

You'll need at least 30X to see the rings and more to see the structure of the rings. There are hundreds of individual rings, but the most prominent are the A, B and C rings. With a 100mm or 200mm scope you will be able to see the Cassini division, a gap between rings A and B, discovered in 1676 by (you guessed it) Giovanni Cassini. The C ring is the most difficult to see and usually requires good seeing and a telescope of at least 150mm. Also look for the shadow of the rings on Saturn and Saturn's shadow on the rings.

I recently observed Saturn with a 127mm refractor at 73X. Although I had to wait for those moments when the swirling of the atmosphere was calm, the Cassini division was easily seen.

The rings are truly huge, stretching from edge to edge the distance from Earth to the Moon. They consist of billions of particles that range in size from microscopic to huge boulders. Numerous studies indicate the rings are composed of ice, rock and dirt – that is they are made of "dirty snowballs" like tiny comets with diameters typically of only about 10 centimeters.

The rings of Saturn are incredibly thin in relation to their

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Eyepiece (Cont'd)

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overall size. Estimates of the thickness vary greatly, but one estimate for the average thickness is 20 meters. To understand how their thickness compares to their overall size, if the rings were as thick as a DVD disk the disk would be about 2 miles wide to be in proper proportion to the thickness!

There are two general theories about how Saturn's rings formed. One is that the rings are the material that was unable to congeal into a satellite. The other is that the rings formed when an existing satellite wandered to close to Saturn and was torn apart.

So enjoy this most intriguing of planets during the warm summer nights, and share the view with friends and family for a sight they will never forget.

Juno (Cont'd)

(Continued from page 3)

thermal microwave radiation from Jupiter's atmosphere, from the top of the ammonia clouds to deep within its atmosphere. The MWR data indicates that Jupiter's iconic belts and zones are mysterious, with the belt near the equator penetrating all the way down, while the belts and zones at other latitudes seem to evolve to other structures. The data suggest the ammonia is quite variable and continues to increase as far down as we can see with MWR, which is a few hundred miles or kilometers.

Prior to the Juno mission, it was known that Jupiter had the most intense magnetic field in the solar system. Measurements of the massive planet's magnetosphere, from Juno's magnetometer investigation (MAG), indicate that Jupiter's magnetic field is even stronger than models expected, and more irregular in shape. MAG data indicates the magnetic field greatly exceeded expectations at 7.766 Gauss, about 10 times stronger than the strongest magnetic field found on Earth.

"Juno is giving us a view of the magnetic field close to Jupiter that we've never had before," said Jack Connerney, Juno deputy principal investigator and the lead for the mission's magnetic field investigation at NASA's Goddard Space Flight Center in Greenbelt, Maryland. "Already we see that the magnetic field looks lumpy: it is stronger in some places and weaker in others. This uneven distribution suggests that the field might be generated by dynamo action closer to the surface, above the layer of metallic hydrogen. Every flyby we execute gets us closer to determining where and how Jupiter's dynamo works."

Juno also is designed to study the polar magnetosphere and the origin of Jupiter's powerful auroras -- its northern and southern lights. These auroral emissions are caused by particles that pick up energy, slamming into atmospheric molecules. Juno's initial observations indicate that the process seems to work differently at Jupiter than at Earth.

Juno is in a polar orbit around Jupiter, and the majority of each orbit is spent well away from the gas giant. But, once every 53 days, its trajectory approaches Jupiter from above its north pole, where it begins a two-hour transit (from pole to pole) flying north to south with its eight science instruments collecting data and its JunoCam public outreach camera snapping pictures. The download of six megabytes of data collected during the transit can take 1.5 days.

Space Place Cont'd)

(Continued from page 7)

over time. Scientists still aren't sure what the islands are, but nitrogen bubbles seem increasingly likely.

To know for sure, though, there will have to be a new mission. Cassini is entering its final phase, having finished its last flyby of Titan on April 21. Scientists are already sketching out potential spacecraft—maybe a buoy or even a submarine—to explore Titan's seas, bubbles and all.

To teach kids about the extreme conditions on Titan and other planets and moons, visit the NASA Space Place: https://spaceplace.nasa.gov/planet-weather/

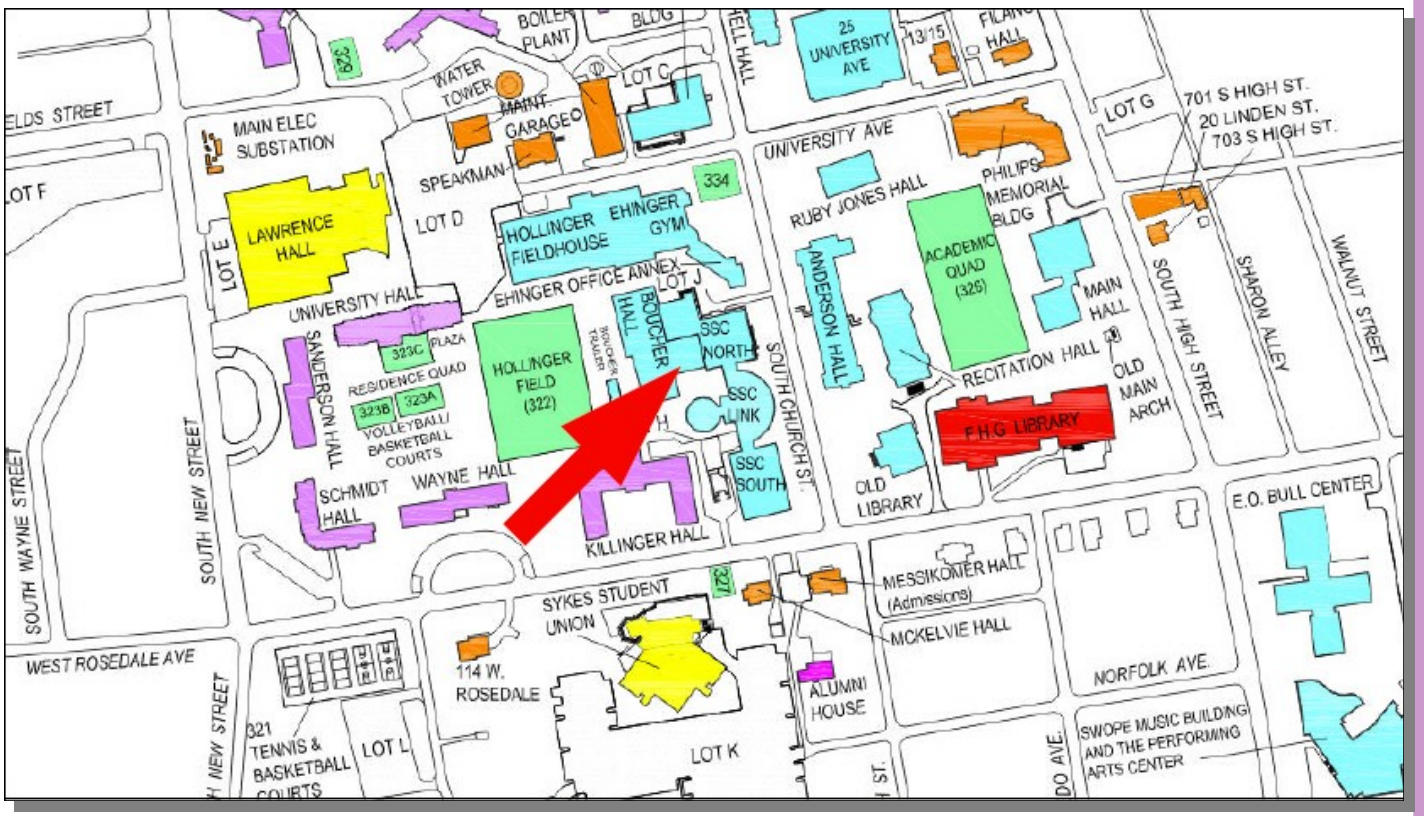
This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

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

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).



Minutes (Cont'd)

(Continued from page 5)

of Astronomy Magazine or use your favorite astronomy app to find this visitor from the depths of the solar system.

Meteor showers: There are no major meteor showers during June. If you do happen to see a very slow meteor late in the month it could be a Boötid meteor, but this shower is so sparse and unpredictable it cannot be called a meteor shower.

CCAS Membership Information and Society Financials

Treasurer's Report

by Don Knabb

May 2017 Financial Summary

Beginning Balance	$1,717
Deposits	$360
Disbursements	$740
Ending Balance	$1,337

New Member Welcome!

Welcome new CCAS members Linda Harris from Malvern, PA, and Jack McDevitt from Brunswick, GA. 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

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:

John Hepler
21103 Striper Run
Rock Hall, MD 21661

CCAS Newsletters via E-mail

You can receive the monthly newsletter (in full color!) via e-mail. All you need is a PC or Mac with an Internet e-mail connection. To get more information about how this works, send an e-mail request to John Hepler, the newsletter editor, at: **newsletter@ccas.us**.

CCAS Website

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

John welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work—no copyrighted material! Give your contributions to John Hepler at (410) 639-4329 or e-mail to webmaster@ccas.us

CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "nights out" for school, scout, and other civic groups.

CCAS Executive Committee

For further information on membership or society activities you may call:

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

CCAS Membership Information

The present membership rates are as follows:

REGULAR MEMBER……$25/year
SENIOR MEMBER…….$10/year
STUDENT MEMBER……..$ 5/year
JUNIOR MEMBER……..$ 5/year
FAMILY MEMBER…….$35/year

Membership Renewals

Check the Membership Renewals on the front of each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178

Phone: **610-436-5702**
e-mail: **treasurer@ccas.us**

*Sky & Tele*scope Magazine Group Rates

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

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

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders. If you have **any** questions call Don first at 610-436-5702.

Astronomy Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$34.00** which is much less than the individual subscription price of $42.95 (or $60.00 for two years). If you want to participate in this special Society discount offer, **contact our Treasurer Don Knabb.**