Observations

A Monthly Publication Of The CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 23, No. 6 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009* *June 2015*

In This Issue

Membership Renewals Due

06/2015	Hebding Mazziotta & Calobrisi
07/2015	Hockenberry & Miller Hunsinger Piehl
08/2015	Buki Knabb Family Lurcott, L.
09/2015	Catalano-Johnson & Family Lurcott, E.

CCAS at ChesLen Star Party

On May 23, 2015, CCAS participated in the Cheslen multi-club star party in Coatesville, PA, with fellow amateur astronomy societies Chesmont, DVAA, and BucksMont. (l. to r., Herb & Harriet Rosenblatt, Roger Taylor, Kathy Buczynski, Pete Kellerman, Dave Hockenberry, & Don Knabb. See pg. 11.

Important June 2015 Dates

2nd • Full Moon, 12:19 p.m.

9th • Last Quarter Moon, 11:41 a.m.

16th • New Moon, 10:05 a.m.

21st • The Summer solstice occurs at 12:38 p.m.

24th • First Quarter Moon, 7:02 a.m.

CCAS Upcoming Nights Out

CCAS has several "nights out" scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

☼ **Saturday, June 6, 2015**. CCAS special observing session at Anson Nixon Park in Kennett Square, PA.

☼ **Monday, July 20, 2015.** CCAS Special Observing Session for West Chester Recreation Space Exploration Day.

☼ **Saturday, August 8, 2015**. CCAS Special Observing Session at Bucktoe Creek Preserve. The observing session is scheduled for 8:30 to 10:00 PM.

Spring/Summer 2015 Society Events

June 2015

3rd • 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.

6th • CCAS special observing session at Anson Nixon in Kennett Square, PA.

18th-19h • The von Kármán Lecture Series: On Sea Ice, at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

19th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (rain date Saturday, June 20th). The observing session starts at sunset.

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

21st• Summer Solstice. First day of summer.

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

July 2015

1st • 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.

10th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date July 11th). The observing session starts at sunset.

16th-17th • The von Kármán Lecture Series: Discovery at Mars, at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

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

20th • West Chester Recreation Space Exploration Day.

25th • CCAS Summer Party at Barb & Don Knabb's home in West Chester, PA. The party is for CCAS members and their families starting at 6:00 p.m. See the July 2015 edition of Observations for more details about the party and for directions to Barb & Don's home.

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

28th-29th • Delta-Aquarid Meteor Shower Peaks.

Minutes from May 2015 Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor, president, welcomed 18 guests and members to the May 12, 2015 meeting of CCAS.
- Roger reported that the Hoopes Park Star Party sponsored by West Chester Parks and Recreation was a great success. Stella the Star Lady (Kathy B.) "enlightened" a group of Girl Scouts about the night sky so they could qualify for their astronomy badges. CCAS members were able to "disturb the peace" and share the partly cloudy night with the community, girl scouts and their parents. "It was a great night for a star party and a busy night for astronomy."
- We were also reminded that this is the last meeting for the 2014-2015 year and our next meeting will be in September 2015.
- Kathy B., our Education Chair, updated us on the planned Astronomy Classes at night school. She is asking for volunteers to help teach the classes. Please contact Kathy if you are able to help with the classes.
- Kathy also asked the club to nominate John Hepler for the Mabel Stern award for best astronomy club news letter. We all appreciate the hard work and dedication that John has given to produce an outstanding Club newsletter.
- Don Knabb, observing chair, announced that the 2015 CCAS summer picnic will be Saturday, July 25, 2015 at the Knabb residence. Details to be announced.
- Don reminded members of the upcoming Cheslan Star Party on May 23, 2015 on Cannery Road, Coatesville, PA. Multiple local

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September 2015 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on September 8, 2015, starting at 7:30 p.m. The meeting will be held in Room 112, Merion Science Center (former Boucher Building), West Chester University. CCAS President Roger Taylor will welcome members and the general public to the first meeting in our 2015-2016 season.

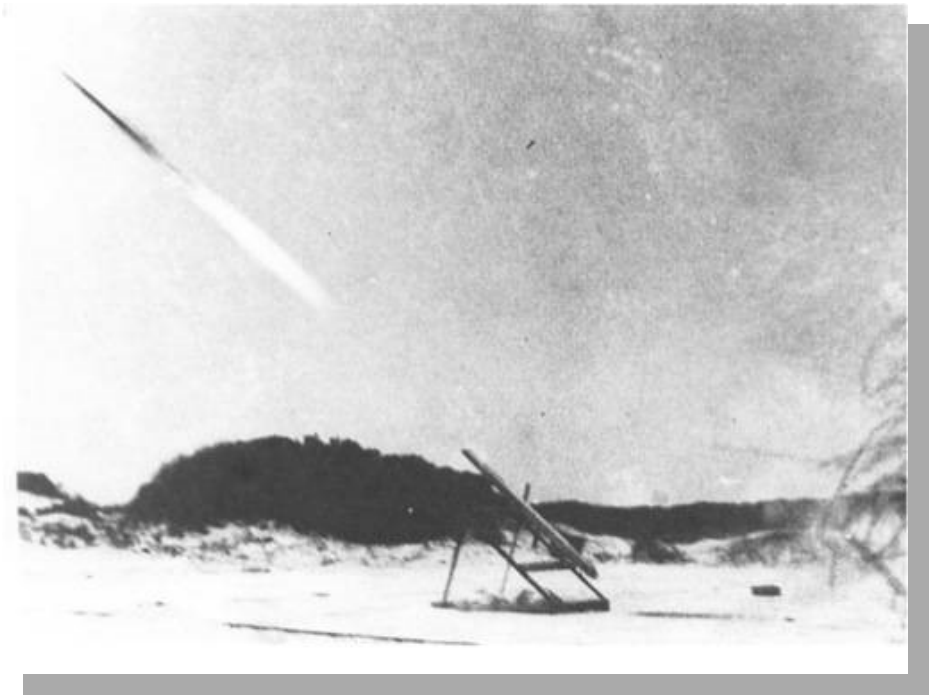
At this time we have not finalized the speaker for the meeting, but will notify members and the general public with updated information on the CCAS website and in future editions of the Observations newsletter.

Please note that inclement weather or changes in speakers' schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

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

NASA Celebrates 70th Anniversary of the Wallops Flight Facility

by John C. Hepler (additional material courtesy of NASA Wallops Flight Facility)

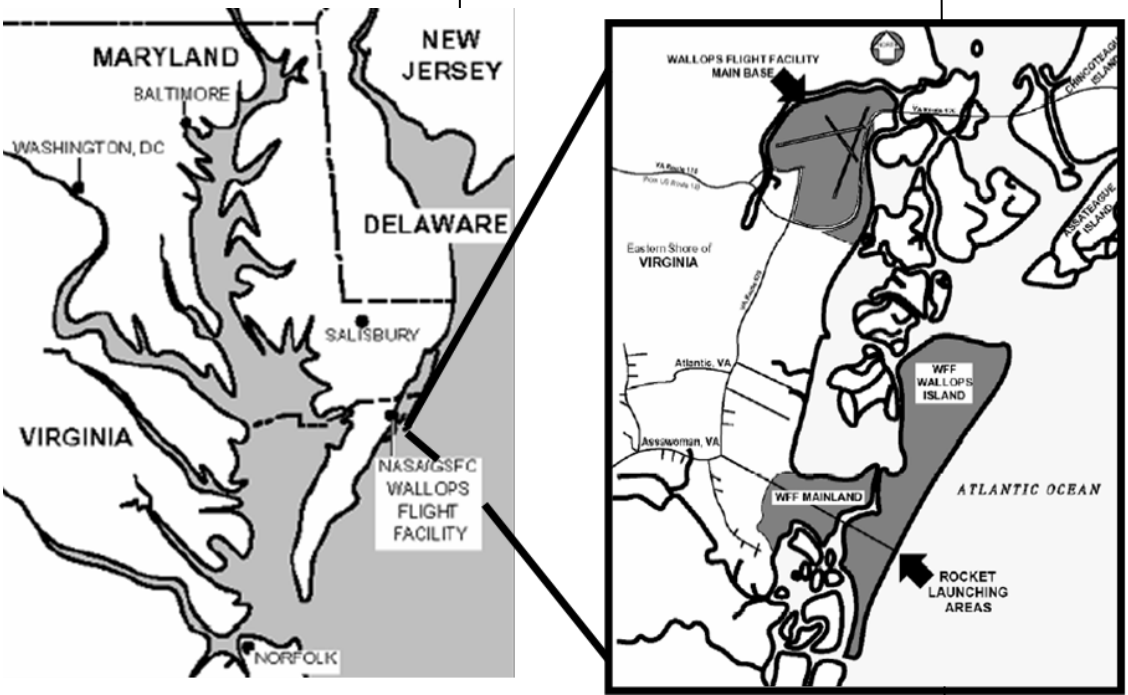


First launch from Wallops Flight Facility, June 27, 1945. Image courtesy of Wallops Flight Facility/ Goddard Space Flight Center.

Anyone up for a trip south? June 27, 2015, marks the 70th Anniversary of the first launch ever from NASA's Wallops Flight Facility on Virginia's Eastern Shore. Since then, the men and women of Wallops have launched literally thousands of rockets, hundreds of scientific balloons, and have logged thousands of flight hours in support of scientific investigations around the world.

In 1945, NASA's predecessor agency, the National Advisory Committee for Aeronautics (NACA), established a rocket launch site on Wallops Island under the direction of the Langley Research Center. The site was designated the Pilotless Aircraft Research Station and scientists conducted high-speed aerodynamic research to supplement wind tunnel and laboratory investigations into the problems of flight.

In 1958, Congress established NASA, which absorbed Langley Research Center and other NACA field centers and research facilities. At that time, the Pilotless Aircraft Research Station became a separate facility—Wallops Station—operating directly under NASA Headquarters in Washington, D.C.



Maps Courtesy of NASA

In 1959, NASA acquired the former Naval Air Station Chincoteague, and engineering and administrative activities were moved to this location. In 1974, the Wallops Station was named Wallops Flight Center. The name was changed to Wallops Flight Facility in 1981, when it became part of Goddard Space Flight Cen-

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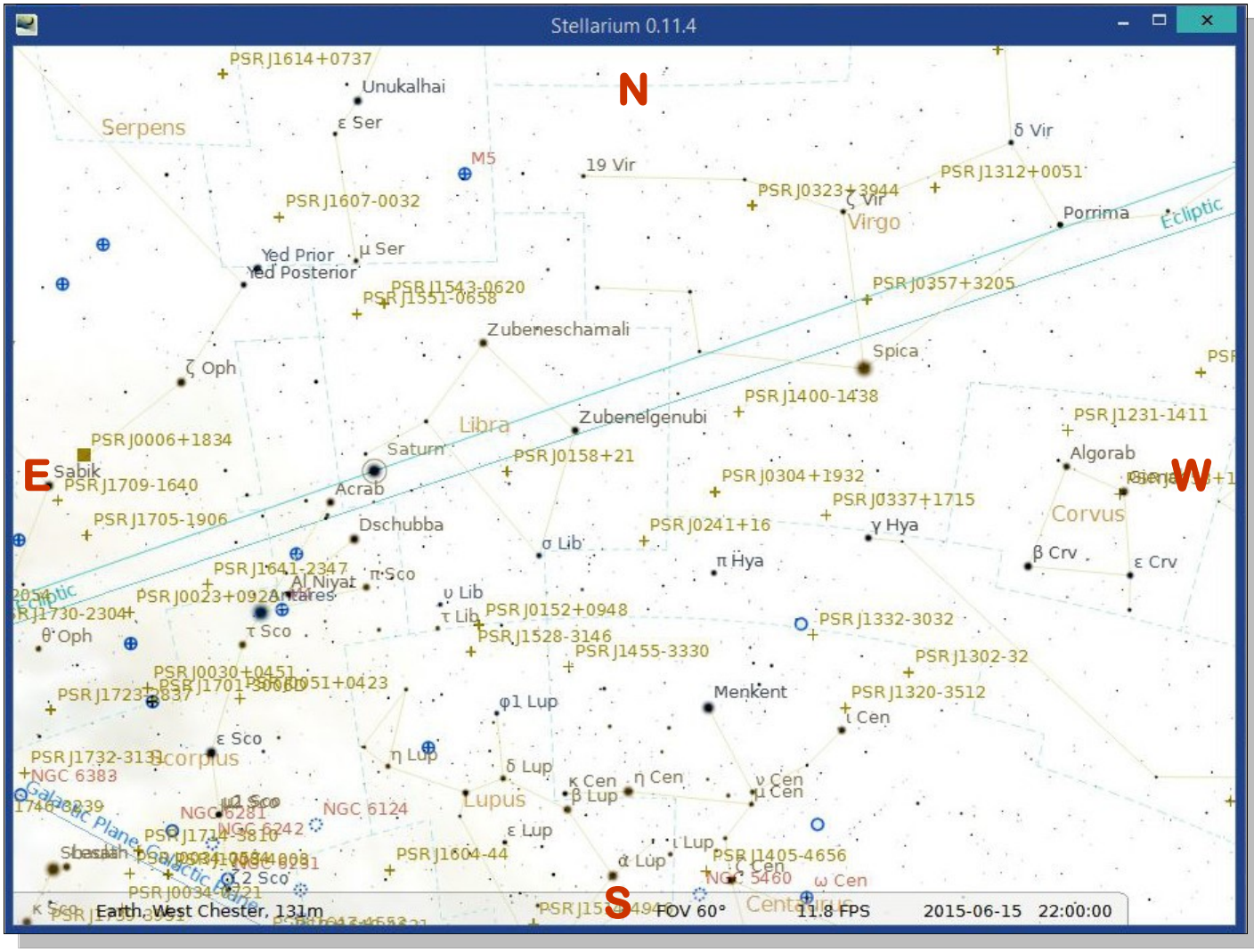
The Sky Over Chester County

June 15, 2015 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
6/01/2015	5:02 a.m. EDT	5:34 a.m. EDT	8:23 p.m. EDT	8:55 p.m. EDT	14h 48m 56s
6/15/2015	4:59 a.m. EDT	5:31 a.m. EDT	8:31 p.m. EDT	9:04 p.m. EDT	14h 59m 34s
6/30/2015	5:02 a.m. EDT	5:35 a.m. EDT	8:33 p.m. EDT	9:06 p.m. EDT	14h 58m 12s

Moon Phases					
Full Moon	6/02/2015	12:19 p.m. EDT	Last Quarter	6/09/2015	11:41 a.m. EDT
New Moon	6/16/2015	10:05 a.m. EDT	First Quarter	6/24/2015	7:02 a.m. EDT

June 2015 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

2	**Full Moon, the Strawberry Moon**
9	**Last Quarter Moon**
10-17	**Venus is near the Beehive Cluster**
16	**New Moon**
19	**A thin crescent Moon is below Venus and Jupiter**
21	**The Summer solstice occurs at 12:38 p.m.**
23	**The Lunar X is visible around 11:30 p.m.**
24	**First Quarter Moon**
24	**The Lunar Straight Wall is visible**
28	**The Moon is near Saturn**
30	**Venus and Jupiter are within 0.3 degrees of each other in the evening sky**

The best sights this month: The main event during June is the dramatic encounter between Venus and Jupiter. They close from a 20 degree separation at the beginning of June to an incredible 0.3 degree separation on June 30th. They are within 2 degrees for eight days! Be prepared to answer questions about "what are those bright stars in the sky?" from anyone who looks toward the west after sunset.

Mercury: June is not a good month for viewing Mercury.

Venus: Our sister planet has numerous close encounters on its way to meeting up with Jupiter at the end of the month. On the 1st it lines up with Castor and Pollux, on the 13th it is close by The Beehive Cluster and on June 19th and 20th Venus and Jupiter make a nice grouping with the Moon.

Mars: Mars passes behind the Sun on June 14th so it is not visible during June.

Jupiter: Jupiter continues to shine brightly as it heads for its conjunction with Venus at the end of the month. Enjoy the view of the king of the planets now because as the summer progresses we'll be pulling ahead in our race around the Sun and Jupiter will fade into the glow of the setting Sun before we know it.

Saturn: The ringed beauty continues to float near the claws of Scorpius the Scorpion and is visible nearly all night. The sight of Saturn brought out many "oohs and "aaaahs" at the ChesLen star party in late May.

Uranus and Neptune: Neither gas giant is in good position for viewing for the next several months.

The Moon: Full Moon is on June 2nd. The June full Moon was called the Full Strawberry Moon by Native American tribes. This name was universal to every Algonquin tribe. However, in Europe they called it the Rose Moon. The Full Moon in June stays quite low in the sky and really lights up the bright green leaves of the trees.

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: There are many wonderful deep sky objects to see during June. My favorites this time of year are the globular clusters. Look for M3 and M5 high overhead, then find M4 near Antares in Scorpius. Then seek M10 and M12 in Ophiuchus. Of course I cannot forget to mention the brightest globular cluster in northern skies, M13 in Hercules.

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

Meteor showers: In the early morning hours of June 27th you might catch a few meteors from the Boötid meteor shower. The meteors will appear to radiate from the constellation Boötes the Herdsman which is high in the sky during June. The best time to see these bits of comet dust is between 2 a.m. and dawn after the Moon sets.

Through the Eyepiece: Scorpius, the Big Bug of the Southern Sky

by Don Knabb, CCAS Treasurer & Observing Chair

Image credit: Stellarium.org

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.

(Continued on page 7)

Scorpius (Cont'd)

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

NGC 6231. Image credit: Dr. Stefan Binnewies and Josef Pöpsel, Capella Observatory, used with permission.

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One of my favorite constellations is Scorpius the Scorpion. Isn't it nice when a constellation actually looks like what it is named after? In Chester County it isn't easy to see the entire constellation Scorpius. If you find a clear view to the southern horizon from late June until mid-August you will see all of the upper part of the big bug and you should be able to catch most of the tail. The best view, when all of Scorpius is entirely above the horizon lasts just a few weeks, and then the tail slips below the tree line.

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. 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.

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The "G" in GOES is What Makes It Go

by Dr. Ethan Siegel

Going up into space is the best way to view the universe, eliminating all the distortionary effects of weather, clouds, temperature variations and the atmosphere's airflow all in one swoop. It's also the best way, so long as you're up at high enough altitudes, to view an entire 50 percent of Earth all at once. And if you place your observatory at just the right location, you can observe the same hemisphere of Earth continuously, tracking the changes and behavior of our atmosphere for many years.

The trick, believe it or not, was worked out by Kepler some 400 years ago! The same scientist who discovered that planets orbit the sun in ellipses also figured out the relationship between how distant an object needs to be from a much more massive one in order to have a certain orbital period. All you need to know is the period and distance of one satellite for any given body, and you can figure out the necessary distance to have any desired period. Luckily for us, planet Earth has a natural satellite—the moon—and just from that information, we can figure out how distant an artificial satellite would need to be to have an orbital period that exactly matches the length of a day and the rotational speed of Earth. For our world, that means an orbital distance of 42,164 km (26,199 miles) from Earth's center, or 35,786 km (22,236 miles) above mean sea level.

We call that orbit geosynchronous or geostationary, meaning that a satellite at that distance always remains above the exact same location on our world. Other effects—like solar wind, radiation pressure and the moon—require onboard thrusters to maintain the satellite's precisely desired position above any given point on Earth's surface. While geostationary satellites have been in use since 1963, it was only in 1974 that the Synchronous Meteorological Satellite (SMS) program began to monitor Earth's weather with them, growing into the Geostationary Operational Environmental Satellite (GOES) pro-

(Continued on page 9)

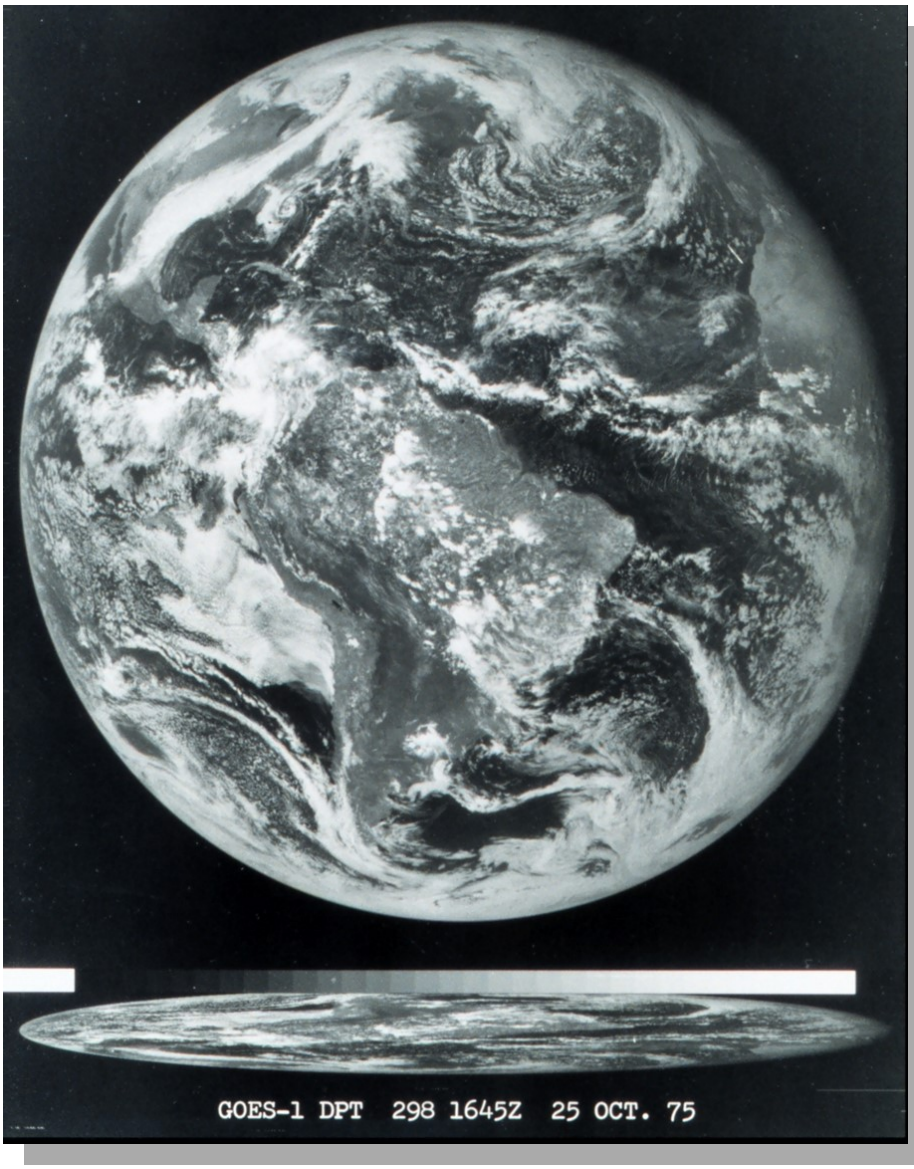


Image credit: National Oceanic and Atmospheric Administration, of the first image ever obtained from a GOES satellite. This image was taken from over 22,000 miles (35,000 km) above the Earth's surface on October 25, 1975.

GOES (Cont'd)

(Continued from page 8)

gram the next year. For 40 years now, GOES satellites have monitored the Earth's weather continuously, with a total of 16 satellites having been launched as part of the program. To the delight of NASA (and Ghostbusters) fans everywhere, GOES-R series will launch in 2016, with thrice the spectral information, four times the spatial resolution and five times the coverage speed of its predecessors, with many other improved capabilities. Yet it's the simplicity of gravity and the geostationary "G" in GOES that gives us the power to observe our hemisphere all at once, continuously, and for as long as we like!

Scorpius (Cont'd)

(Continued from page 7)

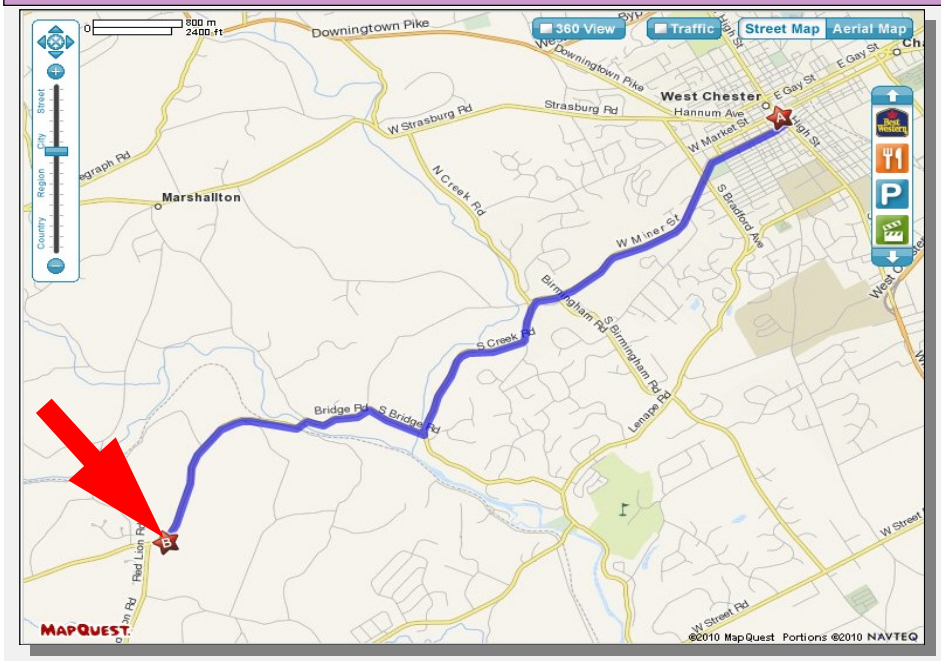
There are several excellent deep sky objects in this area of the sky. As you can see on the star chart, just to the right of Antares is M4. This is one of the largest and closest globular clusters in our sky and it is easy to find in any pair of binoculars. M4 is a swarm of several hundred thousand stars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

More challenging is M80, up and to the right of M4. It is fainter and smaller than M4. Off to the left (east) of Antares is M19, a compact globular cluster. If you are using a telescope and are patient, just point to Antares and wait 33 minutes for M19 to enter your field of view! Then turn your attention 5 degrees south to find another nice globular cluster, M62.

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. You really need to time it right and have a good view of the southern horizon to see this beautiful cluster.

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

CCAS Directions



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

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

Brandywine Valley Association

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

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

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

70th Anniversary (Cont'd)

(Continued from page 3)

ter.

Since its founding in 1945, there have been over 16,000 launches from the rocket testing range at Wallops in the quest for information on the flight characteristics of airplanes, launch vehicles, and spacecraft, and to increase the knowledge of the Earth's upper atmosphere and the environment of outer space. The launch vehicles vary in size and power from the small Super Loki meteorological rockets to orbital-class vehicles.

Wallops, its commercial partners, and the Eastern Shore community will celebrate the facility's 70th Anniversary with an Open House, free and open to the public, from 10 a.m. to 4 p.m., Saturday, June 27.

This is the first time the main base has been open to the public in five years. It promises to be a great day with events ranging from a 5-kilometer run (or walk) competition, tours of the launch facilities and mission areas, displays of aircraft and scientific balloons, plus live music and food.

The Lower Shore Amateur Astronomer's Club and the Delmarva Space Sciences Foundation will participate in the day's events with information tables set up in the exhibits area. More details, including the open house map and parking instructions, will follow on the NASA Wallops website in the coming weeks. In the meantime, a preliminary schedule is included on these pages.

Preliminary Schedule of Events
June 27, 2015

- 8 a.m. – Wallops Runway 5K Run/Walk (pre-registration is required; register here: http://go.nasa.gov/1HIVFcG)
- 9:30 a.m. – Awards Ceremony for Wallops Runway 5K Run/Walk
- 9:30 a.m. – Gates open to General Public
- 10 a.m. to 4 p.m. – Open House begins
- 10:30 a.m. – Opening Ceremony with NASA leadership as well as federal, state, and local officials in attendance
- 11 a.m. to 3 p.m. – Tours of Wallops Island launch facilities (pre-registration is required; *at this time, registration is sold out following enormous interest in this event--we are evaluating options for expanding the availability of this specific event*.)
- 11:30 a.m. to 3:30 p.m. – Special Presentations
  - Wallops History: 70 Years of Excellence: TJ Meyer, Associate Chief, Environmental Division
  - Programming 101: Nathan Riolo, Software and Engineering Branch
  - My Aerospace Career: Jay Pittman, Deputy Director for Strategy and Integration
  - How to Land a NASA Internship: Wallops Education Office
  - Fundamentals and Physics of Rocket Flight: Phil Eberpeaker, Chief, Sounding Rocket Program Office
  - Wallops and the Earth Science Connection: Walt Peterson, Science and Explorations Directorate, and Brian Campbell, Education and Public Outreach Specialist
  - How to Take the Perfect Launch Photo: Chris Perry, Brea Reeves, and Jamie Adkins from the Wallops Range Optical Systems Group
- TBD – T-34 Aerial Demonstration

All-day Activities:

- NASA and Mission Partner Exhibits featuring:
  - NASA Wallops' Range, Research and Project Support Aircraft, Scientific Balloons, Sounding Rockets, Earth Science, Environmental Division, Advanced Projects Office, Wallops Engineering Team, the Near Earth Network and more!
  - NASA's Goddard Spaceflight Center
  - NASA's Langley Research Center
  - Virginia Space and the Mid-Atlantic Regional Spaceport
  - Orbital ATK
  - LJT and Associates
  - U.S. Navy Environmental Team
  - U.S. Navy Field Carrier Landing Practice
  - Salisbury Zoo
  - James Webb Space Telescope
  - NASA Federal Credit Union
  - Maryland Science Center

70th Anniversary (Cont'd)

- U.S. Department of Agriculture
- Wallops Amateur Radio Club

- Static Display Aircraft: Wallops' C-130 Hercules, C-23 Sherpa, B-200, UH-1 Huey and T-34; the U.S. Navy's E-2 Hawkeye and C-2 Greyhound; United States Coast Guard aircraft and more!
- Scientific Balloon Static Display--Wallops' scientific balloons are as large as a football stadium!
- Robotics Demonstration
- Mission Area Tours: Range Control Center (E-106), Scientific Balloons (F-7), Sounding Rockets (F-10), Engineering Labs (E-109)
- Children's Activities: Model Rocket Launches at the NASA Visitors Center, Salisbury Zoo Demonstration, Engineering Challenge, and more

Entertainment:

- The U.S. Navy's All Brass Band
- Three Sheets
- Neil and Jessie
- Voices of Wallops, and more

Food Vendors:

- Burgers
- Hot dogs
- Pulled pork BBQ
- Grilled chicken
- Sausage
- Salads
- Subs
- Pizza

Moon and Stars Night at ChesLen Preserve a Success!

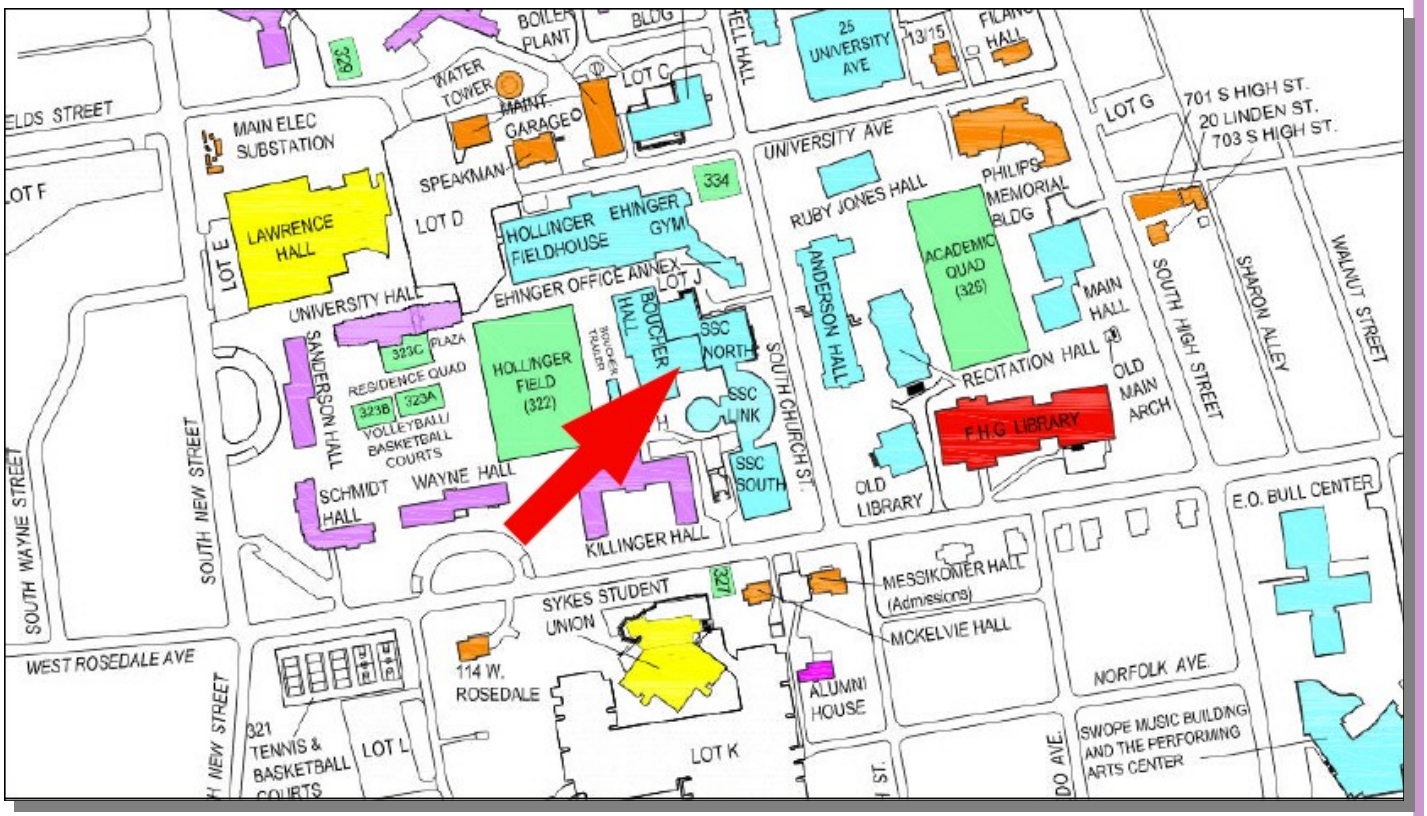
by Fred DeLucia, ChesMont Astronomical Society

The first dedicated astronomy event at the ChesLen Preserve on May 23rd, was a great success! 143 people attended with the participation by 23 members from 5 area astronomy clubs, the Bucks-Mont Astronomical Association, the ChesMont Astronomical Society, CCAS, Delaware Astronomical Society, and the Delaware Valley Amateur Astronomers. The NLT's Force of Nature Volunteers and management team did a superb job of preparing the grounds with freshly mowed grass, table set-up, snack table, sign-ins, raffle, parking, crowd direction, advertising and A/V utilities.

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 2)

astronomy clubs will be participating. It is a rain or shine event and more than 100 people have already registered.

- Anson Nixon Park Star Party in Kennett Square, PA is scheduled for June 6, 2015.
- Don Knabb then presented highlights of the night sky for the month of May with Stellarium.
- New Horizon is to arrive at Pluto in July and we are looking forward to an update from Dennis O'Leary, NASA Solar Ambassador, with the newly received data.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

May 2015 Financial Summary

Beginning Balance	$2,420
Deposits	$250
Disbursements	$144
Ending Balance	$2,526

New Member Welcome!

Welcome new CCAS member Monika Panger from Berwyn, 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

The Pennsylvania Outdoor Lighting Council has lots of good information on safe, efficient outdoor security lights at their web site:

http://www.POLCouncil.org

Find out about Lyme Disease!

Anyone who spends much time outdoors, whether you're stargazing, or gardening, or whatever, needs to know about Lyme Disease and how to prevent it. You can learn about it at:

http://www.LymePA.org

Take the time to learn about this health threat and how to protect yourself and your family. It is truly "time well spent"!

Good Outdoor Lighting Websites

One of the biggest problems we face in trying to reduce light pollution from poorly designed light fixtures is easy access to good ones. When you convince someone, a neighbor or even yourself, to replace bad fixtures, where do you go for good lighting fixtures? Check out these sites and pass this information on to others. Help reclaim the stars! And save energy at the same time!

Light pollution from poor quality outdoor lighting wastes billions of dollars and vast quantities of valuable natural resources annually. It also robs us of our heritage of star-filled skies. Starry Night Lights is committed to fighting light pollution. The company offers the widest selection of ordinance compliant, night sky friendly and neighbor friendly outdoor lighting for your home or business. Starry Night Lights is located in Park City, Utah.

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

http://www.starrynightlights.com

★ ★ ★ ★ ★

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

Phone: **484-291-1084**

https://www.lighthouse-lights.com/landscape-lighting-design/pa-west-chester/

Local Astronomy-Related Stores

Listing retail sites in this newsletter does not imply endorsement of any kind by our organization. This information is provided only as a service to our members and the general public.

Skies Unlimited is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, Stellarvue, Takahashi, Vixen, Losmandy and more.

Skies Unlimited
Suburbia Shopping Center
52 Glocker Way
Pottstown, PA 19465

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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
313 S. Queen St.
Chestertown, MD 21620

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 (443) 282-0619 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 443-282-0619
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.

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