Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 25, No. 12 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *December 2017*

In This Issue

Holiday Wishes

Membership Renewals Due

12/2017	Bogard Bogusch Kozik O'Leary
01/2018	Caruso Holmstrom Kellerman Kovac Linskens McElwee Stocker
02/2018	DiGiovanni Scovill Toth

December 2017 Dates

3rd • The Full Long Nights Moon, or the Full Cold Moon, or the Great Moon, 10:46 a.m. EST

10th • Last Quarter Moon, 2:51 a.m. EST

14th • Geminid meteors peak tonight, best around 1:00 a.m. EST

18th • New Moon, 1:30 a.m. EST

21st • Winter solstice

22nd • Ursid meteors peak tonight

26th • First Quarter Moon, 4:20 a.m. EST

In Memoriam

Our friend and fellow stargazer, Herbert "Pat" Rosenblatt, left us on October 30, 2017. We will miss him greatly at our events.

Autumn/Winter 2017 Society Events

December 2017

1st • Plush Mills Assisted Living facility lecture and Moon viewing, 7:00-8:30 p.m.

6th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

9th • CCAS Holiday Party at the Hockenberry-Miller home, 1477 Valley Road, Glen Mills, PA, 19342. See page 3 for details about directions, parking, and food/drinks.

14th-15th • The von Kármán Lecture Series: Weight Watching from Space: Tracking Earth's water cycle with GRACE Follow-On, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

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

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

January 2018

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.

9th • CCAS Monthly Meeting starting at 7:30 p.m. in Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker: Paul Halpern, "The Quantum Labyrinth: How Richard Feynman and John Wheeler Revolutionized Time and Reality."

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

25th-26th • The von Kármán Lecture Series: Explorer 1's 60th Anniversary: A Celebration of Six Decades of Earth Science Discoveries, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

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

Minutes from the November 14, 2017, CCAS Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor welcomed 23 members and guests to the November 14, 2017 meeting of the Chester County Astronomical Society.
- Roger informed our club that we were one member shy this evening. Roger asked that we share a moment of silence to remember Herb Rosenblatt as "we cast his soul to the stars."
    - Don Knabb shared pictures and memories of Herb.
    - He will be greatly missed at meetings, star parties, and monthly observing sessions.
- Don Knabb gave a recap of observing sessions for this past month. 25 people attended the BRC monthly observing session and he thanked everyone for a great turnout. Our club also hosted a star party at the Willistown Run-a-muck Event.
- Don then shared the night sky using Sky Safari Pro for the months of November and December.
- Our next meeting will occur on Saturday, December 9th, 2017 at 6pm at the home of members, David Hockenberry and Ann Miller, for our annual holiday party or Saturnalia.
- David Hockenberry introduced our evening's speaker, club member Phil Rossomondo. Phil presented "Interstellar Space Travel: Why We Must Ultimately Leave Earth and Our Solar System."
    - Phil opened with the quote: "I am enough of the artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited. Imagination circles the world." Albert Einstein.
    - Phil presented reasons we must leave our solar system and the scientific study that to enable that end.

January 2018 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

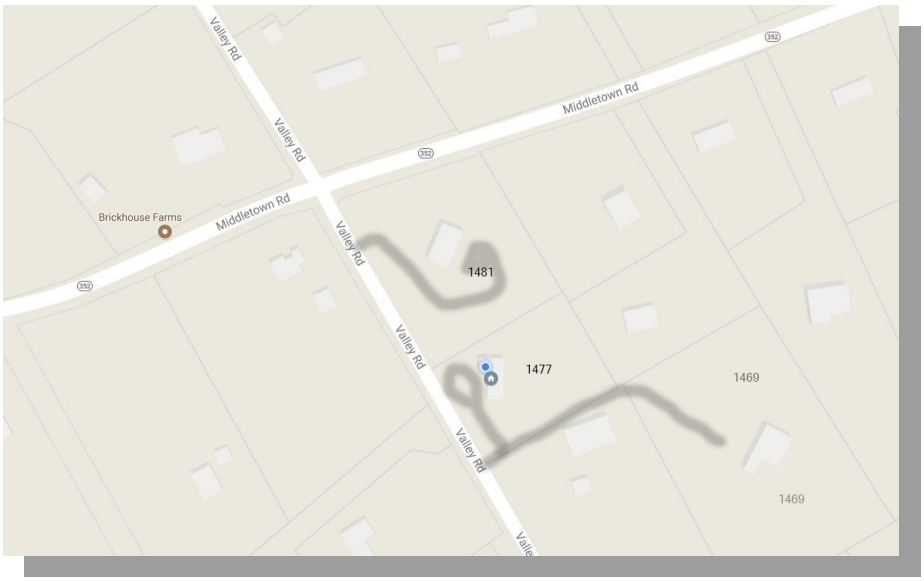
Our next meeting will be held on January 9, 2018, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Our Speaker: Paul Halpern. He will present "The Quantum Labyrinth: How Richard Feynman and John Wheeler Revolutionized Time and Reality."

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

CCAS 2017 Holiday Party

by Ann Miller, CCAS Secretary



The CCAS holiday gathering will be held at the home of David Hockenberry and Ann Miller on Saturday, December 9, 2017 at 6 pm. Our address is 1477 Valley Road, Glen Mills, PA 19342. We will provide sandwiches and drinks. We would welcome any appetizers, salads, or desserts to share.

See the map above for information on parking. There is no street parking along Valley Road. Our paved driveway is to the left off of a shared access road and is circular. If you miss this driveway, the road will become gravel for the 1469 residence. Do not block or park on the 1469 driveway. **Also, please do not drive over the central portion of our driveway circle because it contains a buried propane tank.**

Our next door neighbor, Maude Stowers at 1481 Valley Road, has graciously offered that we can use her driveway for extra parking. Stone pillars mark the entrance to her driveway. If you park there, proceed to behind her garage to park. The gate of her fence will be open to walk to our house and we will have lighting to mark the path. Any questions or problems, do not hesitate to call and we will assist with parking. **Our home phone is 610-558-4248.**

CCAS Original Astrophotography

by Dave Hockenberry, CCAS Program Chair

NGC 7129, also known as the Rose Bud Nebula. Image acquired with a QSI 583wsg camera on a Hyperion 12.5 Astrograph and AP 1200 mount. Guiding with SX Lodestar camera and SX Active Optics unit.

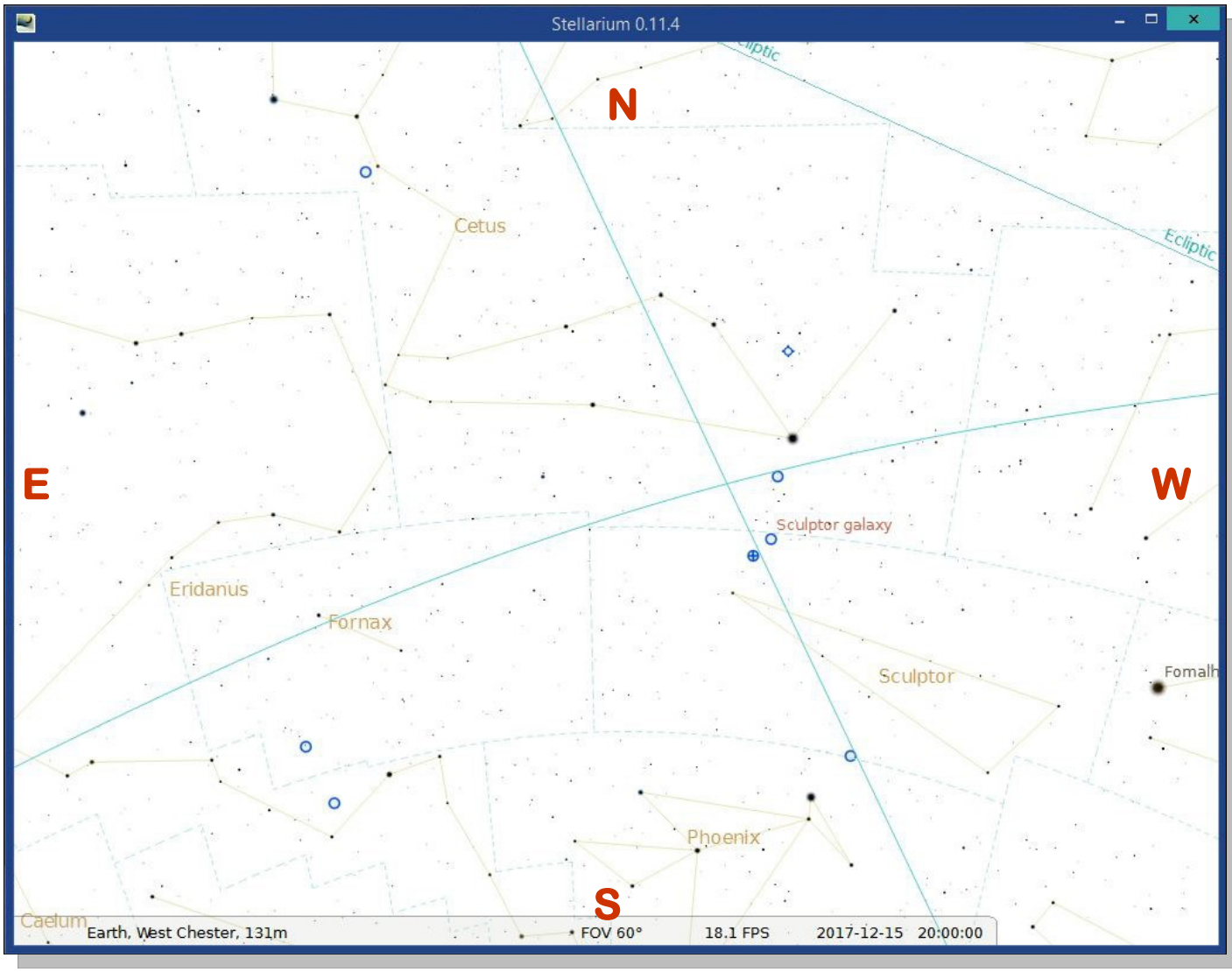
Image capture and observatory control with MaxIm DL Pro. Stack of 8 hours Lum, 2 hours 20 minutes of Red, 2 hours 20 minutes of Green, and 3 hours of Blue filer images with AstroDon Gen 2 broadband filters. Image processing with CCDStack, Photoshop Cs5, and PhotoNinja.

NGC 7129 is a reflection and emission nebula in the constellation Cepheus, approximately 3,300 light years distance from Earth. The reflection portion of the nebula is number 146 on the Van den Bergh list. The small star cluster powering this nebula complex is very young, perhaps less than 1 million years old.

The Sky Over Chester County

December 15, 2017 at 8:00 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
12/01/2017	6:33 a.m. EST	7:03 a.m. EST	4:36 p.m. EST	5:06 p.m. EST	9h 32m 39s
12/15/2017	6:44 a.m. EST	7:15 a.m. EST	4:36 p.m. EST	5:07 p.m. EST	9h 21m 10s
12/31/2017	6:51 a.m. EST	7:22 a.m. EST	4:45 p.m. EST	5:15 p.m. EST	9h 23m 17s

Moon Phases					
			Full Moon	12/03/2017	10:46 a.m. EST
Last Quarter	12/10/2017	2:51 a.m. EST	New Moon	12/18/2017	1:30 a.m. EST
First Quarter	12/26/2017	4:20 a.m. EST			

December 2017 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

3	**The Full Long Nights Moon, or the Full Cold Moon, or the Great Moon, 10:46 a.m. EST**
10	**Last Quarter Moon, 2:51 a.m. EST**
14	**Geminid meteors peak tonight, best around 1:00 a.m. EST**
18	**New Moon, 1:30 a.m. EST**
21	**Winter solstice, 11:23 a.m. EST**
22	**Ursid meteors peak tonight**
26	**First Quarter Moon, 4:20 a.m. EST**
26	**The Lunar Straight Wall (Rupes Recta) is visible**
30	**The Moon occults Aldebaran this evening**

The best sights this month: The Geminid meteor shower on the night of December 13/14 is the highlight of December. Also turn your eyes skyward on December 30th when the Moon occults Aldebaran in Taurus the Bull.

Mercury: December is not a good month for observing Mercury because the tiny planet passes in front of the Sun on December 13th and reappears in the morning sky around December 20th.

Venus: Venus is dropping into the glow of the pre-dawn Sun early in the month and is lost from view until late January since it passes behind the Sun on January 9th.

Mars: The red planet rises several hours before the Sun and is currently in the constellation Virgo but will cross into Libra on December 21st, the day of the winter solstice.

Jupiter: Jupiter shines brightly in the pre-dawn sky all month, rising about 2 hours before the Sun by the end of the month.

Saturn: The ringed beauty is lost from view during December as it passes behind the Sun on December 21st.

Uranus and Neptune: Both Uranus and Neptune continue to be in good position for evening viewing during December.

The Moon: Full Moon occurs on December 3rd. This full Moon is often referred to as the Full Long Night's Moon; or the Full Cold Moon. It is also sometimes called the Moon before Yule. The term Long Night's Moon is appropriate because the mid-winter night is indeed long, and because the Moon is above the horizon for a long time. The midwinter full Moon has a high trajectory across the sky because it is opposite a low Sun. Native Canadians called this full moon the Great Moon.

Constellations: Although the temperatures are dropping, December is a wonderful time of the year for naked eye star gazing and constellation viewing. You can make great progress on the Astronomical League Constellation Hunters Club pin because as early as 6:00 several of the summer constellations are still visible such as Hercules, Lyre, Cygnus and Aquila. Then go out again at 9:00 to catch some winter constellations such as Auriga, Taurus and Orion, then take one more trip around midnight and you will see the early spring constellations such as Cancer, Gemini and even Leo the Lion leaping up from the eastern horizon.

Messier/deep sky: The Orion Nebula leads the list for first light with any new equipment you get for Christmas, but don't forget the three open clusters in Auriga, M35 in Gemini and M44, the Beehive in Cancer, if you stay out late. Also, with Cassiopeia high in the sky this is a great time of year to see the open cluster NGC 457, also called the Owl Cluster or the ET Cluster. It really does look like the ET with bright eyes and his arms outstretched.

Comets: There are no bright comets visible during December, but if you want an observing challenge, Comet PANSTARRS (C/2016 R2) will be passing between the constellations Taurus and Orion during December. A finder chart is in the December issue of Astronomy magazine. The comet is only shining (if you can use that word for such a dim fuzz ball) at magnitude 10, so use the largest scope you can find to seek out this dim visitor from the Oort Cloud.

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Through The Eyepiece: M1, the Crab Nebula

by Don Knabb, CCAS Treasurer & Observing Chair

The Crab Nebula, M1, is the object that led Charles Messier to create his now famous catalog of objects that should not be mistaken for a comet. In 1758 while hunting for comet Halley on its first predicted return he found the Crab Nebula, and noticed that, unlike a comet, it did not move. Messier wrote in his logbook "It is a whitish light, elongated like a candle flame". He goes on to explain "this nebula had such a resemblance to a comet that I endeavored to find others, so that astronomers would not confuse these same nebulas with comets just beginning to shine". The nebulous remnant was first discovered by John Bevis in 1731 and Messier later acknowledged the earlier discovery by Bevis.

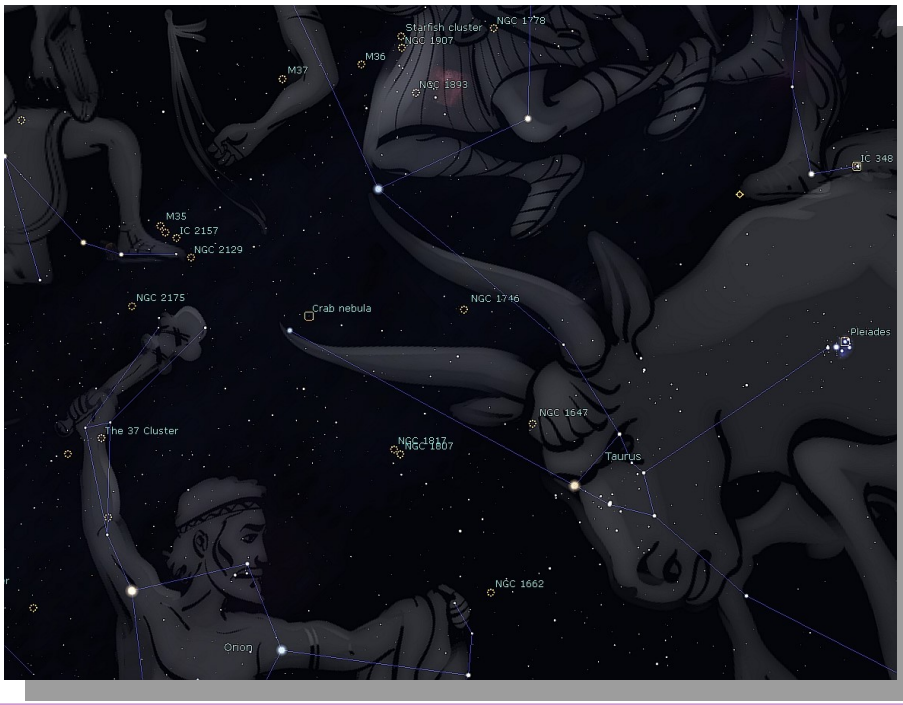
One can see why M1 might be mistaken for a comet by looking at this photograph taken by Brent Crabb (really, his name has nothing to do with the Crab Nebula) from Orange County, California. The Crab Nebula looks like a faint comet without a tail.

The Crab Nebula is visible only with a telescope, between the horns of Taurus the Bull in winter skies. The nebula can be easily seen under clear dark skies, but can equally easily get lost in the background illumination that we experience in Chester County. Under good conditions M1 is just visible as a dim patch in 7x50 or 10x50 binoculars. With a little more magnification, it is seen as a nebulous oval patch, surrounded by haze as in the photograph above. In telescopes starting with 4-inch aperture, some detail in its shape becomes apparent. Only under excellent conditions and with larger telescopes, starting at about 16 inches aperture, suggestions of the filaments and fine structure may become visible.

Crab Nebula. Image Credit: Brent Crab

M1 is not hard to find using the chart below that I created using Stellarium planetarium software.

(Continued on page 7)



Eyepiece (Cont'd)

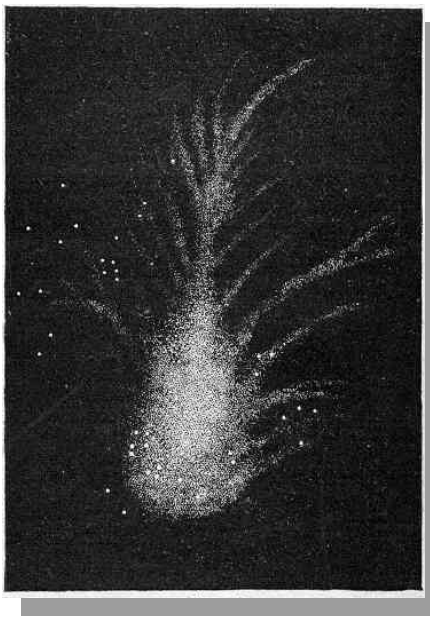


Image credit: William Parsons, 3rd Earl of Rosse - http://messier.seds.org/more/m001_rosse.html

(Continued from page 6)

The Crab Nebula is the shattered remains of a star that exploded in 1054 A.D. This supernova explosion was first recorded by Chinese and Japanese observers. For weeks this supernova was the brightest star-like object in the sky. It was about four times brighter than Venus, or about magnitude -6. It was reported to be visible in daylight for 23 days!

It is thought that this nebula was christened the "Crab Nebula" because of a drawing made by Lord Rosse about 1844. Lord Rosse erroneously thought the ragged filaments protruding from the nebula were unresolved chains of stars. You might remember Dave Hockenberry and Ann Miller visited the site of Lord Rosse' Leviathan telescope that was equipped with a 6-foot mirror, the largest telescope in the world at that time. Lord Rosse used a 3-foot telescope for the drawing below previous to building Leviathan. He later observed the Crab Nebula with Leviathan in an attempt to resolve the nebula's filaments into stars, but was of course unable to do so since the filaments are part of the nebula, not chains of stars.

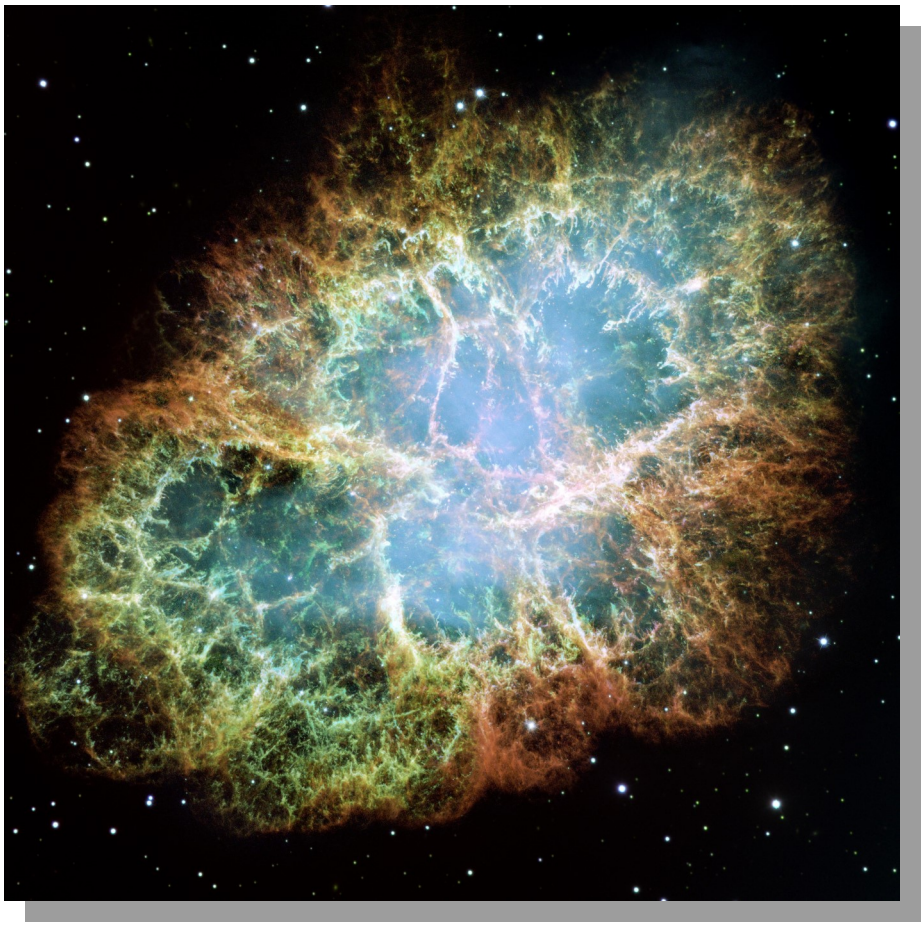


Image credit: NASA/ESA/JPL/Arizona State Univ.

The nebula consists of the material ejected in the supernova explosion, which has been spread over a volume approximately 10 light years in diameter, and is still expanding at the very high velocity of about 1,800 km/sec.

On November 9, 1968, a pulsating radio source, the Crab Pulsar was discovered in M1 by astronomers of the Arecibo Observatory 300-meter radio telescope in Puerto Rico. It has now been established that this pulsar is a rapidly rotating neutron star. It rotates about 30 times per second! The neutron star is an extremely dense object, denser than an atomic nucleus, concentrating more than one solar mass in a volume 30 kilometers across. This energy source is 100,000 times more energetic than our sun.

To the left is an incredible photograph of the Crab Nebula. This composite image was assembled from 24 individual exposures taken with the NASA Hubble

(Continued on page 9)

Studying Storms from the Sky

by Teagan Wall

The United States had a rough hurricane season this year. Scientists collect information before and during hurricanes to understand the storms and help people stay safe. However, collecting information during a violent storm is very difficult.

Hurricanes are constantly changing. This means that we need a lot of really precise data about the storm. It's pretty hard to learn about hurricanes while inside the storm, and instruments on the ground can be broken by high winds and flooding. One solution is to study hurricanes from above. NASA and NOAA can use satellites to keep an eye on storms that are difficult to study on the ground.
In Puerto Rico, Hurricane Maria was so strong that it knocked out radar before it even hit land. Radar can be used to predict a storm's path and intensity—and without radar, it is difficult to tell how intense a storm will be. Luckily, scientists were able to use information from a weather satellite called GOES-16, short for *Geostationary Operational Environmental Satellite – 16*.

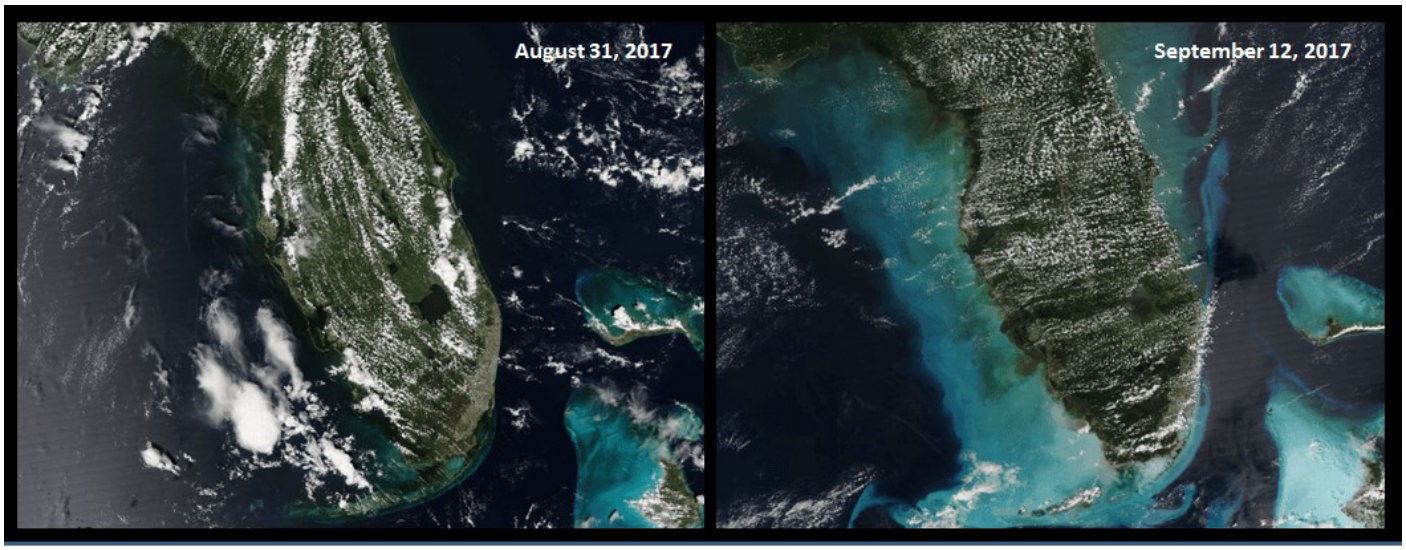
The "G" in GOES-16 stands for geostationary. This means that the satellite is always above the same place on the Earth, so during Hurricane Maria, it never lost sight of the storm. GOES-16's job as a weather satellite hasn't officially started yet, but it was collecting information and was able to help.

From 22,000 miles above Earth, GOES-16 watched Hurricane Maria, and kept scientists on the ground up to date. Knowing where a storm is—and what it's doing—can help keep people safe, and get help to the people that need it.

Hurricanes can also have a huge impact on the environment—even after they're gone. To learn about how Hurricane Irma affected the Florida coast, scientists used images from an environmental satellite called Suomi National Polar-orbiting Partnership, or Suomi-NPP.

One of the instruments on this satellite, called VIIRS (Visible Infrared Imaging Radiometer Suite), took pictures of Florida before and after the Hurricane.
Hurricane Irma was so big and powerful, that it moved massive amounts of dirt, water and pollution. The information captured by VIIRS can tell scientists how and where these particles are moving in the water. This can help with recovery efforts, and help us design better ways to prepare for hurricanes in the future.

(Continued on page 9)



Caption: These images of Florida and the Bahamas were captured by a satellite called Suomi-NPP. The image on the left was taken before Hurricane Irma and the image on the right was taken after the hurricane. The light color along the coast is dirt, sand and garbage brought up by the storm. Image credit: NASA/NOAA

Space Place (Cont'd)

(Continued from page 8)

By using satellites like GOES-16 and Suomi-NPP to observe severe storms, researchers and experts stay up to date in a safe and fast way. The more we know about hurricanes, the more effectively we can protect people and the environment from them in the future.

To learn more about hurricanes, check out NASA Space Place: https://spaceplace.nasa.gov/hurricanes/

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!

Crescent Moon at Longwood Gardens

by Barb & Don Knabb

We visited the Christmas display at Longwood Gardens on November 23, 2017. The crescent moon added to the holiday display.

Eyepiece (Cont'd)

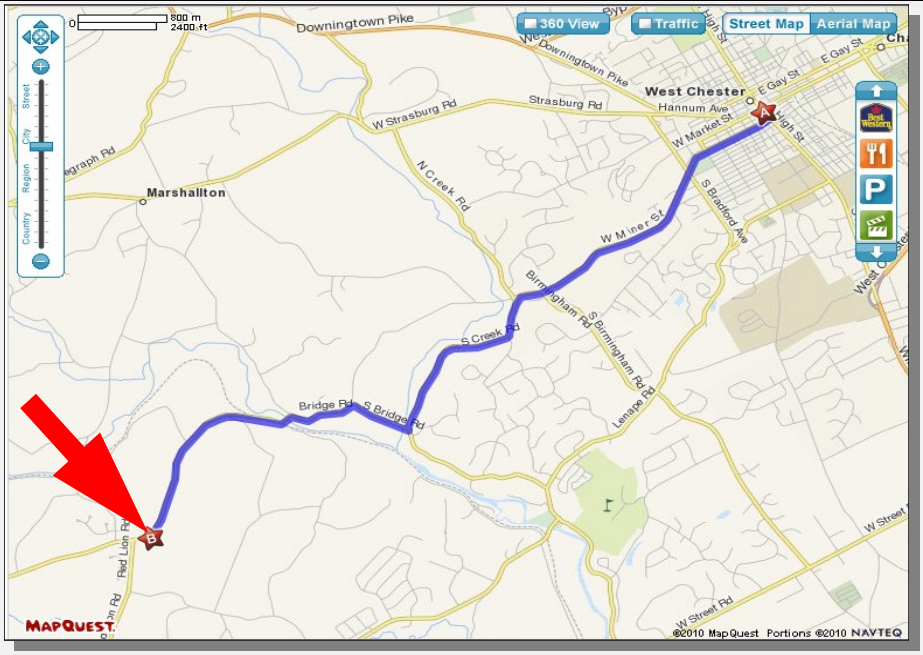
(Continued from page 7)

Space Telescope's Wide Field and Planetary Camera 2. It is one of the largest images taken by Hubble and is the highest resolution image ever made of the entire Crab Nebula.

Information credits:

- Raymo, Chet. 1982. *365 Starry Nights*. New York, NY. Fireside/Simon & Schuster
- http://www.seds.org/messier/m/m001.html
- http://en.wikipedia.org/wiki/Crab_Nebula
- http://astro.nineplanets.org/twn/n1952x.html

CCAS Directions



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

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

Brandywine Red Clay Alliance

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

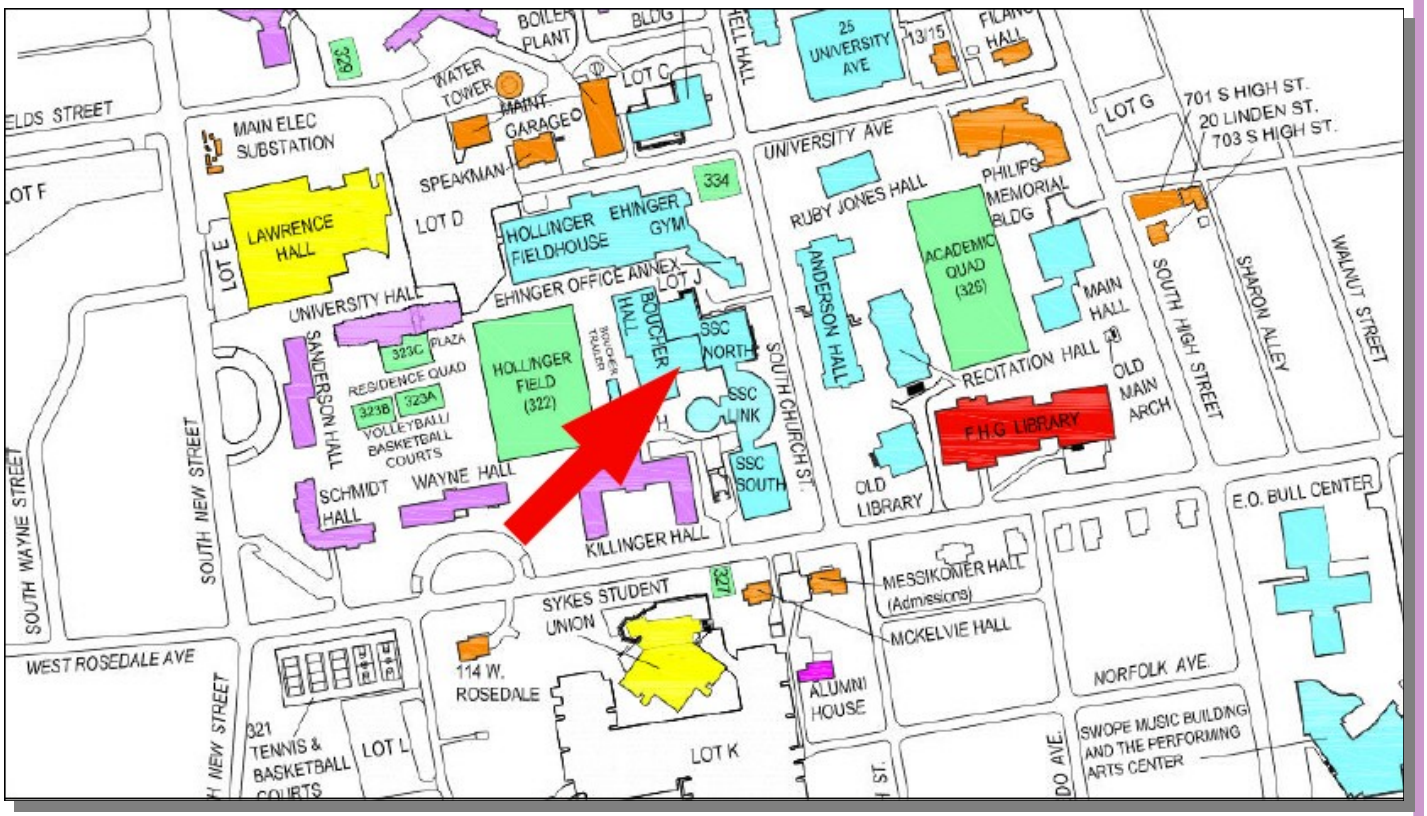
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BRC property, turn left off Route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

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

CCAS Directions

West Chester University Campus

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



Observing (Cont'd)

(Continued from page 5)

Meteor showers: This is a great year to see the Geminid meteor shower, one of the most reliable meteor showers of the year. The peak is on the night of December 13/14 and a thin crescent Moon doesn't rise until 3:30 a.m. Up to 120 "shooting stars" per hour are possible from this shower.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

Nov. 2017 Financial Summary

Beginning Balance	$1,347
Deposits	$194
Disbursements	$293
Ending Balance	$1,268

New Member Welcome!

Welcome new CCAS members Keith Baker from Glen Mills, PA, Kathy McNeal & Walt Talunas also from West Chester, PA, Ed Damerau from West Chester, PA, and Ralph Marshall from Sarasota, FL. We're glad you decided to join us under the stars! Clear skies to you!

Membership Renewals

You can renew your CCAS membership by writing a check payable to "Chester County Astronomical Society" and sending it to our Treasurer:

Don Knabb
988 Meadowview Lane
West Chester PA 19382

The current dues amounts are listed in the *CCAS Information Directory*. Consult the table of contents for the directory's page number in this month's edition of the newsletter.

CCAS Information Directory

Join the Fight for Dark Skies!

You can help fight light pollution, conserve energy, and save the night sky for everyone to use and enjoy. Join the nonprofit International Dark-Sky Association (IDA) today. Individual memberships start at $30.00 for one year. Send to:

International Dark-Sky Association
3225 North First Avenue
Tucson, AZ 85719

Phone: **520-293-3198**
Fax: **520-293-3192**
E-mail: **ida@darksky.org**

For more information, including links to helpful information sheets, visit the IDA web site at:

http://www.darksky.org

Dark-Sky Website for PA

PENNSYLVANIA OUTDOOR LIGHTING COUNCIL

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

http://www.POLCouncil.org

Find out about Lyme Disease!

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

http://www.LymePA.org

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

Good Outdoor Lighting Websites

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

Starry Night Lights

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

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

http://www.starrynightlights.com

★ ★ ★ ★ ★

LIGHTHOUSE OUTDOOR LIGHTING

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

Phone: **484-291-1084**

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

Local Astronomy-Related Stores

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

Skies UNLIMITED

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

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

Phone: **610-327-3500** or **888-947-2673**
Fax: **610-327-3553**

http://www.skiesunlimited.net

★ ★ ★ ★ ★

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.

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