



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 24, No. 2 Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009 February 2016

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MWC 922: The Red Square Nebula



What could cause a nebula to appear square? No one is quite sure. The hot star system known as MWC 922, however, appears to be embedded in a nebula with just such a shape. Image Credit & Copyright: Peter Tuthill (Sydney U.) & James Lloyd (Cornell)

February 2016 Dates

- 2nd** • The Moon is near Mars and Saturn in the pre-dawn sky.
- 8th** • New Moon, 9:38 a.m.
- 15th** • First Quarter Moon, 2:46 a.m.
- 22nd** • Full Moon, 1:19 p.m.
- 28th** • The Zodiacal light is visible after evening twilight for the next two weeks.



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.

☼ **Friday, March 25th, 2016** - CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session starts at sunset.

☼ **Friday, April 8th, 2016** - CCAS Monthly Observing Session, Myrick Conservancy Center, Brandywine Red Clay Alliance. The observing session starts at sunset.

Membership Renewals Due

02/2016	La Para Macaleer
03/2016	Angelini Sterrett
04/2016	Hepler Imburgia Ruch
05/2016	Cunningham

Winter 2016 Society Events

February 2016

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, Merion Science Center, Rm 112, West Chester University. The meeting starts at 7:30 p.m. CCAS member Frank Angelini, Sr., about amateur astronomer participation in the AAVSO SIDs (Sudden Ionospheric Disturbances) program.

11th-12th • The von Kármán Lecture Series: [The Europa Mission](#), at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

19th • West Chester University Planetarium Show: "Killer Rocks from Outer Space." The show starts at 7 p.m. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

20th • Open call for articles and photographs for the March 2016 edition of [Observations](#).

26th • Deadline for newsletter submissions for the March 2016 edition of [Observations](#).

March 2016

2nd • 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.

8th • CCAS Monthly Meeting, Merion Science Center, Rm 112, West Chester University. The meeting starts at 7:30 p.m. CCAS Member Speaker & NASA Solar Ambassador Dennis O'Leary will update us on the latest data from the New Horizons flyby of Pluto.

18th • West Chester University Planetarium Show: "Other Earths." The show starts at 7 p.m. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

20th • Open call for articles and photographs for the April 2016 edition of [Observations](#).

24th-25th • The von Kármán Lecture Series: [In the Blink of the Eye: What 10 Years at Mars Can Tell Us About the Planet](#), at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

26th • Deadline for newsletter submissions for the April 2016 edition of [Observations](#).

Minutes from the January 12, 2016, Society Meeting

by Ann Miller, CCAS Secretary

- Newly engaged Vice President Liz Smith (congratulations to Liz and Gordon), welcomed 24 members and guests to the January 12, 2016, meeting of the CCAS.
- Liz asked the new members to introduce themselves to our group. Welcome to Eric Holmstrom, Bruce Ruggeri, Tom Caldwell, Andy Moynihan, and Charlie Gallagher.
- Don Knabb, observing chair, reviewed the highlights of the January night sky using the Sky Safari Pro app. Comet Catalina will be visible in the early morning sky around 4:50am this week. This will be Comet Catalina's only pass by earth.
- Don also announced that there are already 10 star parties scheduled for 2016. Watch for details in Observations.
- Don announced on behalf of Kathy Buczynski that the West Chester Night School Astronomy Class will be given again this spring by CCAS members. More details to come.
- David Hockenberry, program chair, announced the upcoming speakers programs for the spring.
 - The February program will be presented by CCAS member Frank Angelini, Sr., about amateur astronomer participation in the AAVSO SIDs (Sudden Ionospheric Disturbances) program.
 - The March program will be presented by Dennis O'Leary, NASA Solar Ambassador and CCAS member, about the New Horizon mission.
 - April and May will be presented by astronomy professors from Haverford College.
- January's meeting was Members Night.
- Don Knabb started with reviewing several sky observing apps that he has tried for computers, tablets, and phones.
- Don also reminded members to join the CCAS Yahoo Users Group hosted by Pete Kellerman. Don showed the group some of the pictures and

(Continued on page 9)

February 2016 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on January 12, 2016, starting at 7:30 p.m. The meeting will be held in Room 112, Merion Science Center (former Boucher Building), West Chester University. CCAS Member Speaker: Frank Angelini, Sr., will present amateur astronomer participation in the AAVSO SIDs (Sudden Ionospheric Disturbances) program.

Please note that inclement weather or changes in speakers'

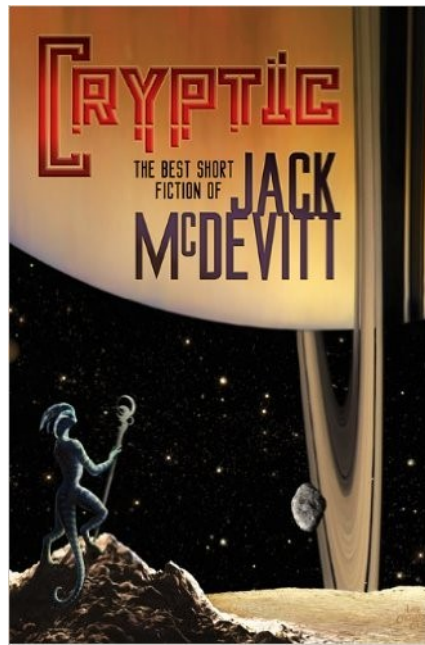
schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

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

Book Review: *Cryptic*, by Jack McDevitt
by Don Knabb, CCAS Treasurer & Observing Chair

Here is a review of *Cryptic*, a collection of short science fiction stories by Jack McDevitt. Although this is not a book about astronomy, it contains several stories that involve space travel and outer space adventure.

Jack McDevitt is an American science fiction author whose writing frequently deals with attempts to make contact with alien races or investigating the traces they have left behind. McDevitt's first published story was "The Emerson Effect" in *The Twilight Zone Magazine* in 1981. McDevitt is a former Eng-



lish teacher, naval officer, Philadelphia taxi driver, customs officer and motivational trainer. His novel *Seeker* won the 2006 Nebula Award for Best Novel, given by the Science Fiction and Fantasy Writers of America. McDevitt has been nominated for the Nebula Award sixteen times.

Cryptic is a collection of 38 short stories that span the timeframe from 1982 to 2008. Some are quite short and there are a few that are a bit longer, but most are a nice length so that I could read several at a sitting.

I found this book to be thoroughly enjoyable. I won't say all the stories are great, but they were all at least good, and many were excellent. The flavor of McDevitt's writing brings to mind some of the classic science fiction writers such as Isaac Asimov and Arthur C. Clarke.

Many of these stories will bring a quiet smile to your face. The stories in *Cryptic* cover topics such as time travel, space exploration and galactic conflict. But several of the stories are also very "down to Earth", not science fiction exactly, but good stories nonetheless.

In print, the book is 450 pages – quite a hefty volume. I read the book in iBook form on my iPad, but it is also available on a Kindle or in the Kindle app on an iPad for a very reasonable \$5. So if you want to have some lighthearted fun, give *Cryptic* a try. I don't think you will be disappointed if you are a science fiction fan!

CCAS Original Astrophotography: NGC660
by Dave Hockenberry

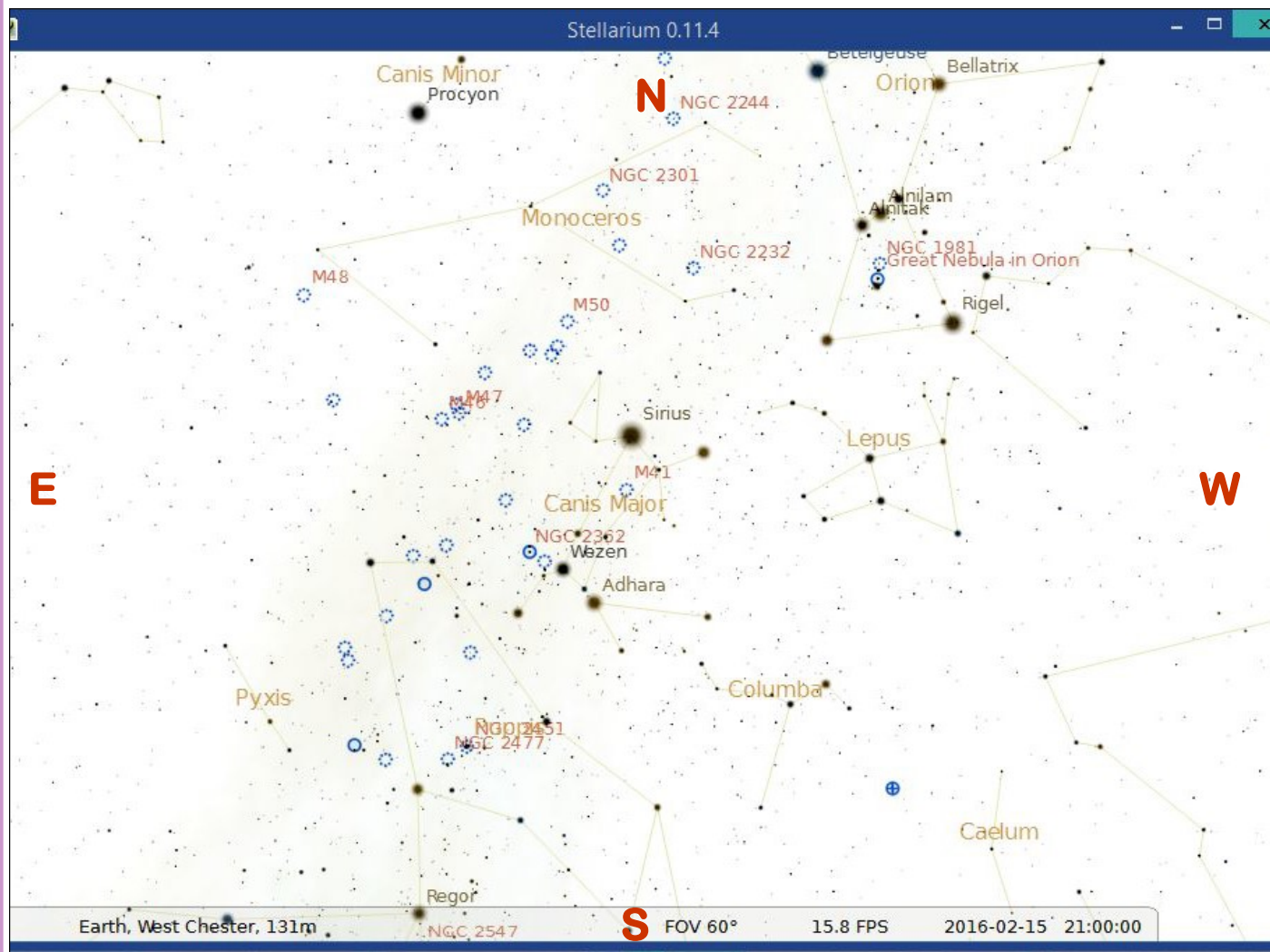


This is a Polar Ring galaxy in Pisces, an unusual type of galaxy of which there are only a dozen or so known. Even among Polar Ring galaxies NGC660 is atypical, as the rings are inclined to almost 45 degrees from the main galaxy plane and apparently stable. Various sources place NGC660 at between 20 and 30 million light years distance. Image shot through a Hyperion 12.5" telescope with a QSI 583wsg CCD camera. Autoguided with Lodestar X2 guiding camera and SXAO LF Active Optics unit. Driven on an AP 1200 mount. Image capture, observatory and guiding/AO control with MaxIm DL. Images calibrated and stacked, Lum image deconvolved and RGB creation in CCDStack. L-RGB merge and further adjustments in Photoshop CS5. Total of 12.75 hours Lum (15 minute subexposures), 4 hours Green, 7 hours Red, and 4.5 hours Blue filters (all color subs 10 minutes).

The Sky Over Chester County

February 15, 2016 at 9:00 p.m. ET

Note: This screen capture is taken from Stellarium, the free planetarium software available for download at www.stellarium.org.



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
2/01/2016	6:41 a.m. EST	7:09 a.m. EST	5:19 p.m. EST	5:48 p.m. EST	10h 09m 50s
2/15/2016	6:26 a.m. EST	6:54 a.m. EST	5:36 p.m. EST	6:04 p.m. EST	10h 41m 59s
2/29/2016	6:08 a.m. EST	6:35 a.m. EST	5:52 p.m. EST	6:19 p.m. EST	11h 17m 17s

Moon Phases					
New Moon	2/08/2016	9:38 a.m. EST	First Quarter	2/15/2016	2:46 a.m. EST
Full Moon	2/22/2016	1:19 p.m. EST	Last Quarter	3/01/2016	6:10 p.m. EST

February 2016 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

2	The Moon is near Mars and Saturn in the pre-dawn sky
6	The Moon, Mercury and Venus form a triangle in the pre-dawn sky
8	New Moon
15	First Quarter Moon
21	Regulus in Leo the Lion is near the Moon
22	Full Moon, the Snow Moon
23	The Moon is close to Jupiter in the evening sky
28	The Zodiacal light is visible after evening twilight for the next two weeks

The best sights this month: Most of the action in February is in the pre-dawn sky with Mercury, Venus, Mars and Saturn visible. Jupiter rises in the early evening and will be high in the sky near midnight. And before Comet Catalina departs the neighborhood use binoculars to find it high in the pre-dawn sky.

Mercury: Mercury is well placed for viewing in the early morning sky all month. Look for Mercury, Venus and the Moon to form a triangle on February 6th.

Venus: Our sister planet continues to be the brilliant “morning star” in the pre-dawn sky. Venus and Mercury are very close on February 13th.

Mars: The red planet rises near 1 a.m. and can be found between the bright stars Spica and Antares.

Jupiter: The king of the planets is rising in the early evening throughout February and will be close to the Moon on February 23rd. Watch the dance of the four Galilean moons as they move hour by hour, night by night.

Saturn: Saturn remains a pre-dawn object for several months.

Uranus and Neptune: The outer gas giants are falling into the glow of the fading sunset and will not be in favorable viewing position for several months.

The Moon: The Moon is full this month on February 22nd. According to Native Americans this is the *Full*

Snow Moon since the heaviest snow usually falls during this month. Some tribes also referred to this Moon as the *Full Hunger Moon*, since harsh weather conditions in their areas made hunting very difficult.

The Moon dances with various planets and stars as the month progresses. In the morning sky on the 2nd it is near Mars and Saturn, then on the 6th it forms a triangle with Mercury and Venus. Then in the evening sky on the 21st it is near Regulus in Leo the Lion and on the 23rd it approaches Jupiter.

Constellations: During February, if it is warm enough, I enjoy staring for a long time toward the south to enjoy the constellations with bright stars. This includes Taurus with Aldebaran, Orion with Betelgeuse and Rigel, Canis Major with Sirius and Canis Minor with Procyon. Betelgeuse, Sirius and Procyon make up the Winter Triangle.

Messier/deep sky: Grab your binoculars to search the February sky for deep sky objects since binoculars have nearly zero set up time compared to a cold telescope. The hardest part of telescopic viewing during the cold months is setting up and putting a telescope away. It’s hard to handle a telescope and tripod wearing gloves so the cold metal parts chill your hands to the bone very quickly. Binoculars however, once you get them focused, can be easily handled with gloves on your hands. And even a small pair of binoculars will bring many deep sky objects within view.

Look for the three open clusters in Auriga – they might be in one field of view, or nearly so. Then find one of my favorites, the Beehive, in Cancer the Crab. Then aim at Orion’s belt and see the beautiful “S” curve of stars on the right side of his belt.

Comets: I was happy to finally see Comet Catalina with binoculars and a telescope in early January. I could not detect a tail, but there was a bright nucleus surrounded by a large fuzzy glow. You can find this visitor from the outer solar system throughout February. It begins the month near Polaris and ends the month near Kemble’s Cascade in Camelopardalis. A finder chart is in the February issue of *Astronomy* or at skyandtelescope.com.

Meteor showers: There are no major meteor showers during February.

Through the Eyepiece: Messier 41, the Little Beehive Cluster in Canis Major

by Don Knabb, CCAS Treasurer & Observing Chair

Messier 41 (also known as M41 or NGC 2287) is an open cluster in the Canis Major constellation. It was discovered by Giovanni Batista Hodierna before 1654 and was perhaps known to Aristotle about 325 BC. M41 lies about four degrees almost exactly south of Sirius (the brightest star in the night sky). The cluster itself covers an area around the size of the full moon. It contains about 100 stars including several red giants.

Here is Charles Messier's observation of M41: "In the night of January 16 to 17, 1765, I have observed below Sirius and near the star Rho of Canis Major a star cluster; when examining it with a night refractor, this cluster appeared nebulous; instead, there is nothing but a cluster of small stars." Following suit, other historical astronomers also observed M41 – including Sir John Herschel to include it in the NGC catalog. While none found it particularly thrilling... their notes range from a "coarse collection of stars" to "very large, bright, little compressed".



Star map generated with Stellarium

Walter Scott Houston, an American popularizer of amateur astronomy who wrote the "Deep-Sky Wonders" column in *Sky and Telescope* magazine from 1946 to 1993, describes the appearance of the cluster in small telescopes: "Many visual observers speak of seeing curved lines of stars in M41. Although they seem inconspicuous on

photographs, the curves stand out strongly in my 10-inch reflecting telescope, and the bright red star near the center of the cluster is prominent."

M41 is easy to find in the winter sky. It will be low in the south during February, under Sirius in Canis Major. Above is

(Continued on page 7)

The open cluster Messier 41



Photo credit: Atlas Image obtained as part of the Two Micron All Sky Survey (2MASS), a joint project of the University of Massachusetts and the Infrared Processing and Analysis Center/California Institute of Technology, funded by the National Aeronautics and Space Administration and the National Science Foundation.

(Continued from page 6)

a sky map I generated using Stellarium, the free planetarium software.

Because Messier 41 is a large star cluster, remember to use

lowest magnification to see as much of the cluster as possible. Higher magnification can always be used once the star cluster is identified to study individual members. M41 is quite bright and easily resolved and makes a

wonderful target for urban skies and moonlit nights!

An open cluster is a group of up to a few thousand stars that were formed from the same giant molecular cloud and are still loosely gravitationally bound to each other in contrast to globular clusters which are very tightly bound by gravity.

Open clusters are very important objects in the study of stellar evolution. Because the stars are all of very similar age and chemical composition, the effects of other more subtle variables on the properties of stars are much more easily studied than they are for isolated stars. A number of open clusters, such as the Pleiades, Hyades or the Alpha Persei Cluster are readily visible with the naked eye. Some others, such as the Double Cluster, are barely perceptible without instruments, while many more can be seen in binoculars or telescopes.

To the left is a picture of M41 from the Two Micron All-Sky Survey (2MASS). This collection of images was a survey of the whole sky in three infrared wavebands. The observations for the survey were taken between 1997 and 2001, at Mt. Hopkins, Arizona for the Northern Hemisphere.

Information credits:

http://en.wikipedia.org/wiki/Open_clusters

https://en.wikipedia.org/wiki/Messier_41

<http://www.ipac.caltech.edu/2mass/>

<http://www.universetoday.com/34750/messier-41/>

The Loneliest Galaxy in the Universe

by Dr. Ethan Siegel

Our greatest, largest-scale surveys of the universe have given us an unprecedented view of cosmic structure extending for tens of billions of light years. With the combined effects of normal matter, dark matter, dark energy, neutrinos and radiation all affecting how matter clumps, collapses and separates over time, the great cosmic web we see is in tremendous agreement with our best theories: the Big Bang and General Relativity. Yet this understanding was only possible because of the pioneering work of Edwin Hubble, who identified a large number of galaxies outside of our own, correctly measured their distance (following the work of Vesto Slipher's work measuring their redshifts), and discovered the expanding universe.

But what if the Milky Way weren't located in one of the "strands" of the great cosmic web, where



galaxies are plentiful and ubiquitous in many different directions? What if, instead, we were located in one of the great "voids" separating the vast majority of galaxies? It would've taken telescopes and imaging technology far more advanced than Hubble had at his disposal to even detect a single galaxy beyond our own, much less dozens, hundreds or millions, like we have today. While the nearest galaxies to us are only a few million light years distant, there are voids so large that a galaxy located at the center of one might not see another for a hun-

dred times that distance.

While we've readily learned about our place in the universe from observing what's around us, not everyone is as fortunate. In particular, the galaxy MCG+01-02-015 has not a single known galaxy around it for a hundred million light years in all directions. Were you to draw a sphere around the Milky Way with a radius of 100 million light years, we'd find hundreds of thousands of galaxies. But not MCG+01-02-015; it's the loneliest galaxy ever discovered. Our Milky Way, like most galaxies, has been built up by mergers and accretions of many other galaxies over billions of years, having acquired stars and gas from a slew of our former neighbors. But an isolated galaxy like this one has only the matter it was born with to call its own.

(Continued on page 9)



Image credit: ESA/Hubble & NASA and N. Gorin (STScI); Acknowledgement: Judy Schmidt, of the loneliest void galaxy in the known: MCG+01-02-015.

Space Place (Cont'd)

(Continued from page 8)

Edwin Hubble made his universe-changing discovery using telescope technology from 1917, yet he would have found absolutely zero other galaxies at all were we situated at MCG+01-02-015's location. The first visible galaxy wouldn't have shown up until we had 1960s-level technology, and who knows if we'd have continued looking? If we were such a lonely galaxy, would we have given up the search, and concluded that our galaxy encompassed all of existence? Or would we have continued peering deeper into the void, eventually discovering our unusual location in a vast, expanding universe? For the inhabitants of the loneliest galaxy, we can only hope that they didn't give up the search, and discovered the entire universe.

Minutes (Cont'd)

(Continued from page 2)

information already posted on the site.

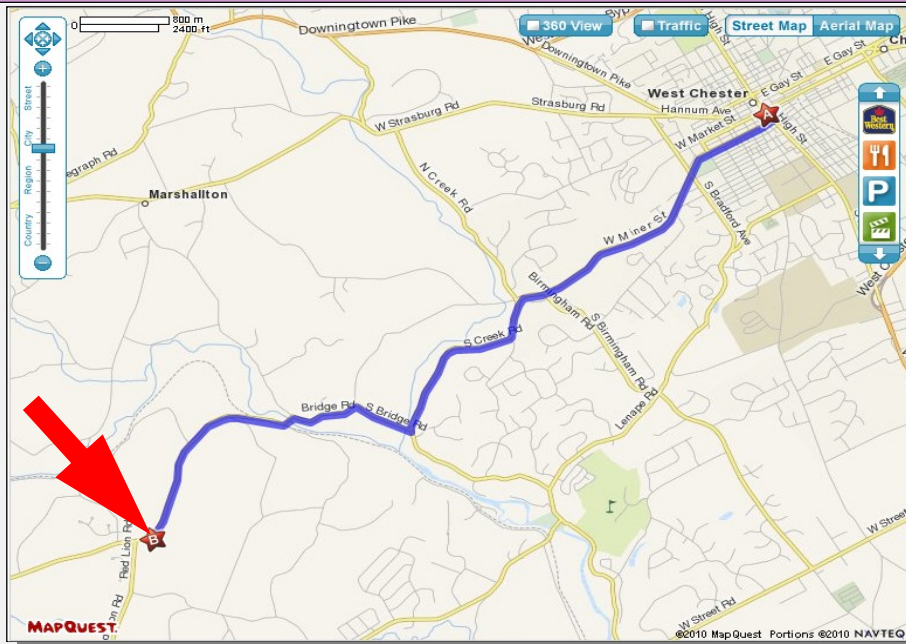
- Steve Leiden shared 3 astronomy books with the group. First, *The Science of Interstellar* by Kip Thorne with forward by Christopher Nolan which is a companion to the movie "Interstellar". Kip Thorne is the Feynman Professor of Theoretical Physics Emeritus at Caltech and executive producer for "Interstellar." Second, *Deep-Sky Wonders*, a tour of the universe and sky by Sue French, who is a monthly columnist for *Sky and Telescope* magazine. The book includes her columns with "100 in-depth tours of the deep sky." Third, *The Arp Atlas of Peculiar Galaxies*, by Jeff Kanipe and Dennis Webb.
- Dave Hockenberry explained how he was introduced to the

Team Viewer program by Herb Rosenblatt at the annual CCAS Holiday Party. He is now using that program to remotely control his observatory telescope during astroimaging runs.

- Next Dave gave an overview of his image processing technique using CCD Stack and Photoshop. He also showed his new Atmospheric Dispersion Corrector to the group. The ADC is used by both visual and photographic planetary and lunar observers to correct atmospheric instability and refraction especially at low position with regard to the horizon.
- Pete Kellerman shared the results of his yearly review of introductory level telescopes offered by department store retailers, including Kmart, Walmart, Kohl's, and Dick's Sporting Goods. He pur-

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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.

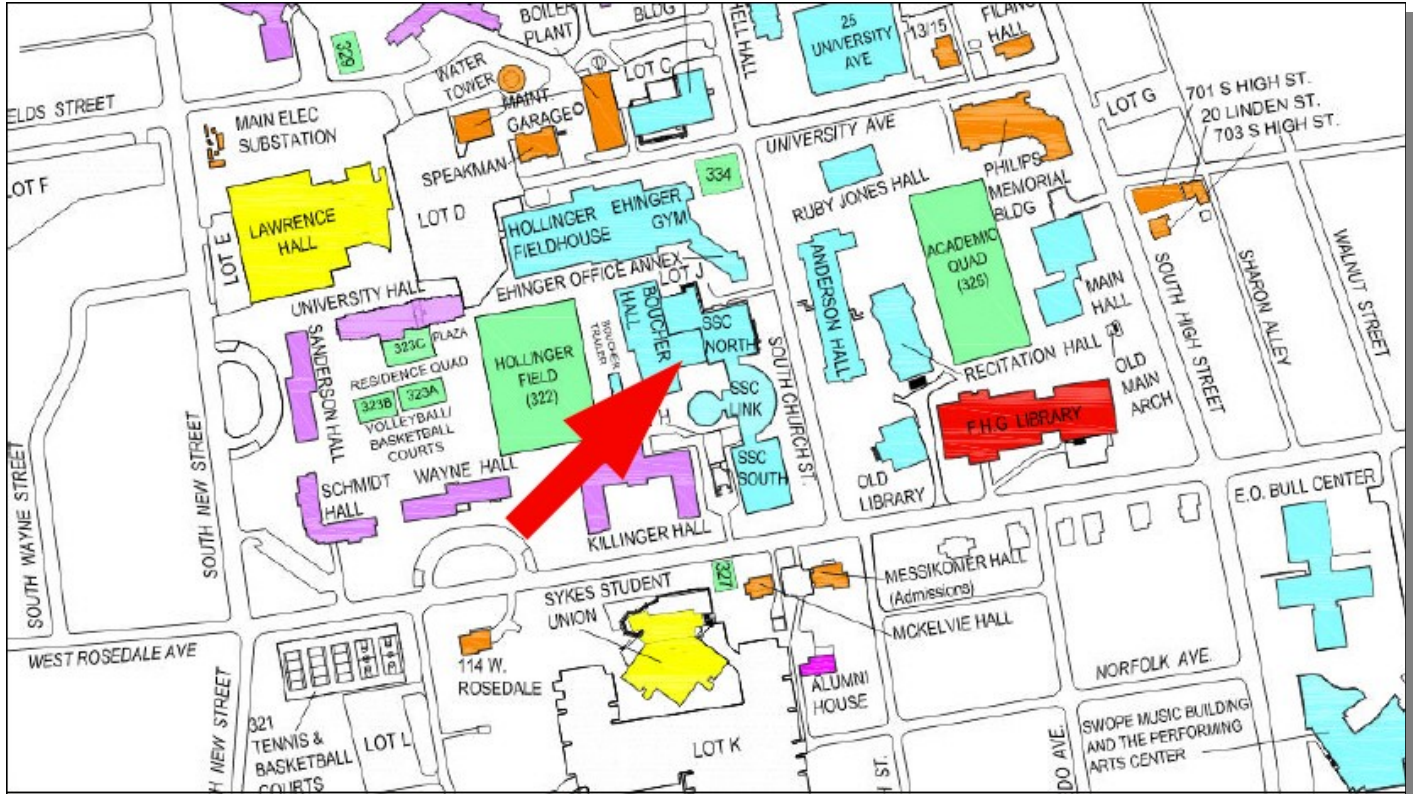
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route 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).

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 9)

chased a Tasco 49NT from Walmart for about \$15. The finder scope was the best feature but the refractor gave a poor image. The best was a Celestron with an altazimuth tripod from Kohl's. Pete disassembles the purchased scopes and finds many assembly errors being the cause of poor quality results of their images. He uses this information to help new observers use the gear that they receive as holiday presents.

- Liz Smith concluded our meeting encouraging our youngest members to share their ideas for future meeting topics. They expressed interest in the topics of origins of the universe and cosmology.

CCAS Membership Information and Society Financials

Treasurer's Report

by Don Knabb

Jan. 2016 Financial Summary

Beginning Balance	\$2,599
Deposits	\$198
Disbursements	\$0
Ending Balance	\$2,797

New Member Welcome!

Welcome new CCAS member Charles Gallagher from Oxford, Mike Munson from Landenberg, and Bruce Ruggeri from West Chester. 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.

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

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

<http://www.skiesunlimited.net>



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 Stripper 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:

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Vice President:	Liz Smith 610-842-1719
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Secretary:	Ann Miller 610-558-4248
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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:

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STUDENT MEMBER.....\$ 5/year
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Don Knabb
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Phone: 610-436-5702
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