Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 23, No. 9 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009* *September 2015*

In This Issue

Hubble Survey Unlocks Clues to Star Birth

See pg. 3 for article and photo descriptions.

Membership Renewals Due

09/2015	Catalano-Johnson & Family
	Lurcott, E.
10/2015	Baran
	Conrad
	Rosenblatt, Harriet
	Rosenblatt, Herb
11/2015	Buczynski
	Cavanaugh
	Giles
	Grinberg
	Holenstein
	Luttrell-Pollard
	Smith
	Taylor

Important September 2015 Dates

5th • Last Quarter Moon, 5:54 a.m.

13th • New Moon, 2:41 a.m.

21st • First Quarter Moon, 4:59 a.m.

23rd • Fall Equinox, 4:21 a.m.

27th • Full Moon, 10:50 p.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.

☼ **Friday, September 11, 2015**. CCAS Special Observing Session at Nottingham County Park, Nottingham, PA.

☼ **Saturday, September 19, 2015**. CCAS Special Observing Session at Hoopes Park, West Chester, PA.

Summer/Autumn 2015 Society Events

September 2015

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. Guest Speaker: Dr. Scott Engle from Villanova University, "What do you mean when you ask if a planet's habitable?"

10th-11th • The von Kármán Lecture Series: The Birth of Planets Around the Sun and Other Stars, at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

11th • CCAS Special Observing Session at Nottingham County Park, Nottingham, PA.

18th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

19th • CCAS Special Observing Session at Hoopes Park, West Chester, PA.

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

23rd • Autumnal Equinox, 4: 21 AM EDT: First day of fall.

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

October 2015

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

8th-9th • The von Kármán Lecture Series: Unveiling an Alien World: Dawn at Ceres at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

13th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. CCAS Speaker: John Conrad, NASA Ambassador.

16th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

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

21st-22nd • Orionids Meteor Shower Peaks.

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

Widener to Resume Viewing Sessions

by Mari Schaefer

[Editor's Note: This article appeared in the August 21st edition of the Philadelphia Inquirer.]

If you caught the star gazing bug during the recent Perseid meteor shower, you will be happy to know that the Widener University Observatory is to soon resume public viewing sessions.

The first event is to be at 8 p.m. Sept. 11, when astronomers of all levels are invited to check out the stars, planets, and everything else in space using the school's 12- and 16-inch computerized reflecting telescopes on the fifth floor of Kirkbride Hall, 17th and Walnut Streets, Chester.

The sessions are to run through the 2015-16 academic year on Monday nights and one Friday a month.

Participants are encouraged to register. Groups will be considered. For further sessions and information on how to register, go to www.widener.edu/stargazing or call 610-499-4003.

Astronomy Classes at Chester County Night School

by Mari Schaefer

CCAS has partnered with Chester County Night School to offer a six-week program meeting Monday nights at Rustin high school from 7:00 to 8:00 PM running from September 21th through October 26th. The cost for the courses is $59.00 per person. The course description is below.

"Been wondering what's out there — over your head in the evening sky? Learn about the night sky and the instruments used to peer deep into the heavens. Topics will include: Spaceship Earth; Our Moon: Phases and Faces; Other Kids on the Block; Star Charts and Planetarium Software; Using a Telescope; and, Beyond Naked-Eye Observing. This course will be taught by amateur astronomers from the Chester County Astronomical Society. Visit their website: www.ccas.us."

For more information, contact Kathy Buczynski, CCAS Education Chair.

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. Our guest speaker is Dr. Scott Engle from Villanova University. His presentation is entitled, "What do you mean when you ask if a planet's habitable?"

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.

Hubble Survey Unlocks Clues to Star Birth in Neighboring Galaxy

submitted by STScI, Baltimore, Maryland

In a survey of NASA's Hubble Space Telescope images of 2,753 young blue star clusters in the neighboring Andromeda Galaxy (M31), astronomers have found that M31 and our galaxy have a similar percentage of newborn stars based on mass.

By nailing down what percentage of stars have a particular mass within a cluster, or the Initial Mass Function (IMF), scientists can better interpret the light from distant galaxies and understand the formation history of stars in our universe.

The intensive survey, assembled from 414 Hubble mosaic photographs of M31, was a unique collaboration between astronomers and "citizen scientists," volunteers who provided invaluable help in analyzing the mountain of data from Hubble.

"Given the sheer volume of Hubble images, our study of the IMF would not have been possible without the help of citizen scientists," said Daniel Weisz of the University of Washington in Seattle.

Measuring the IMF was the primary driver behind Hubble's ambitious panoramic survey of our neighboring galaxy called the Panchromatic Hubble Andromeda Treasury (PHAT) program. Nearly 8,000 images of 117 million stars in the galaxy's disk were obtained from viewing Andromeda in near-ultraviolet, visible, and near-infrared wavelengths.

Stars are born when a giant cloud of molecular hydrogen, dust, and trace elements collapses. The cloud fragments into small knots of material that each precipitate hundreds of stars. The stars are not all created equally: Their masses can range from 1/12 to a couple hundred times the mass of our Sun.

Prior to Hubble's landmark survey of the star-filled disk of M31, astronomers only had IMF measurements made in the local stellar neighborhood within our galaxy. But Hubble's bird's-eye view of M31 allowed astronomers to compare the IMF among a larger-than-ever sampling of star clusters that are all at approximately the same distance from Earth, 2.5 million light-years. The survey is diverse because the clusters are scattered across the galaxy; they vary in mass by factors of 10, and they range in age from 4 million to 24 million years old.

To the researchers' surprise, the IMF was very similar among all the clusters surveyed. Nature apparently cooks up stars like batches of cookies with a consistent distribution from massive blue supergiant stars to small red dwarf stars. "It's hard to imagine that the IMF is so uniform across our neighboring galaxy given the complex physics of star formation," Weisz said.

Curiously, the brightest and most massive stars in these clusters are 25 percent less abundant than predicted by previous research. Astronomers use the light from these brightest stars to weigh distant star clusters and galaxies and to measure how rapidly the clusters are forming stars. This result suggests that mass estimates using previous work were too low because they assumed that there were too few faint low-mass stars forming along with the bright massive stars. This evidence also implies that the early universe did not have as many heavy elements for making planets because there would be fewer supernovae from massive stars to manufacture heavy elements for planet building. It is critical to know the star formation rate in the early universe — about 10 billion years ago — because that was the time when most of the universe's stars formed.

The PHAT star cluster catalog, which forms the foundation of this study, was assembled with the help of 30,000 volunteers who sifted through the thousands of images taken by Hubble to search for star clusters.

The Andromeda Project is one of the many citizen science efforts hosted by the Zooniverse organization. Over the course of 25 days, the citizen-scientist

(Continued on page 10)

Description of the images on the front page:

[Top] — This is a Hubble Space Telescope mosaic of 414 photographs of the nearest major galaxy to our Milky Way galaxy, the Andromeda galaxy (M31). The vast panorama was assembled from nearly 8,000 separate exposures taken in near-ultraviolet, visible, and near-infrared light. Embedded within this view are 2,753 star clusters. The view is 61,600 light-years across and contains images of 117 million stars in the galaxy's disk.

[Bottom-Left] — An enlargement of the boxed field in the top image reveals myriad stars and numerous open star clusters as bright blue knots. Hubble's bird's-eye view of M31 allowed astronomers to conduct a larger-than-ever sampling of star clusters that are all at the same distance from Earth, 2.5 million light-years. The view is 4,400 light-years across.

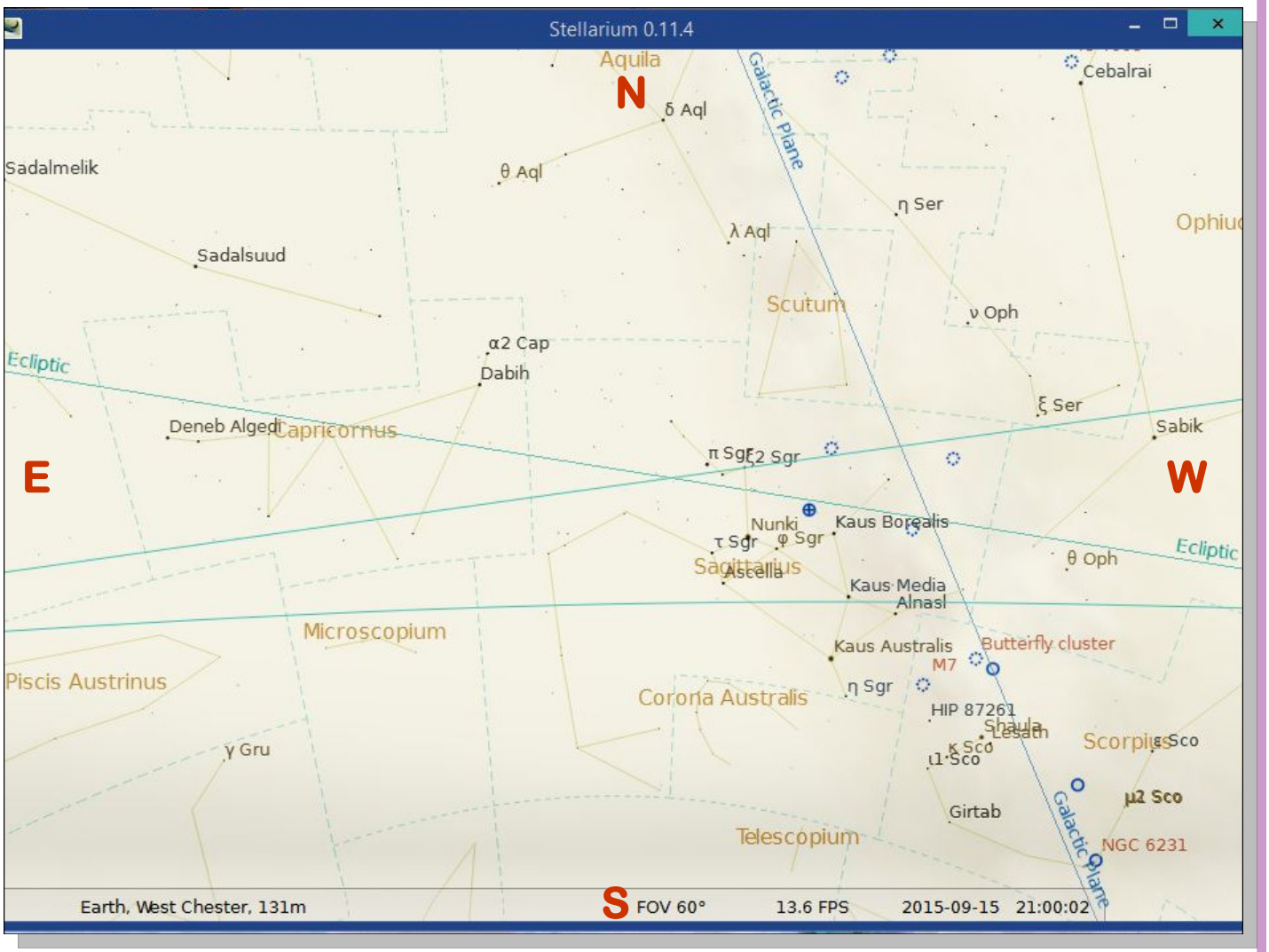
[Bottom-Right] — This is a view of six bright blue clusters extracted from the field. Hubble astronomers discovered that, for whatever reason, nature apparently cooks up stars with a consistent distribution from massive stars to small stars (blue supergiants to red dwarfs). This remains a constant across the galaxy, despite the fact that the clusters vary in mass by a factor of 10 and range in age from 4 million to 24 million years old. Each cluster square is 150 light-years across.

NASA/ESA/J. Dalcanton, B.F. Williams, and L.C. Johnson (Univ. of Washington)/the PHAT team/R. Gendler

The Sky Over Chester County

September 15, 2015 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
9/01/2015	6:00 a.m. EDT	6:28 a.m. EDT	7:32 p.m. EDT	8:00 p.m. EDT	13h 04m 13s
9/15/2015	6:14 a.m. EDT	6:41 a.m. EDT	7:10 p.m. EDT	7:37 p.m. EDT	12h 28m 22s
9/30/2015	6:29 a.m. EDT	6:56 a.m. EDT	6:45 p.m. EDT	7:12 p.m. EDT	11h 49m 14s

Moon Phases					
Last Quarter	9/05/2015	5:54 a.m. EDT	New Moon	9/13/2015	2:41 a.m. EDT
First Quarter	9/21/2015	4:59 a.m. EDT	Full Moon	9/27/2015	10:50 p.m. EDT

September 2015 Observing Highlights
by Don Knabb, CCAS Treasurer & Observing Chair

4	The Moon occults Aldebaran just before midnight
5	Last Quarter Moon
13	New Moon and partial solar eclipse (not visible to us)
18	The Moon is near Saturn
21	First Quarter Moon
21	The Lunar Straight Wall is visible
22	The Moon occults Rho Sagittarii around 7:15 p.m.
23	Fall Equinox
27	Full Moon, the Harvest Moon, and Lunar Eclipse

The best sights this month: The highlight of September is the total lunar eclipse on September 27th. We can see this event from start to finish if the weather cooperates. The Moon will also occult two stars during September: Aldebaran on the 4th just before midnight and Rho Sagittarii on the 22nd at 7:15 p.m.

Mercury: Mercury reaches greatest elongation on September 4th but remains very close to the horizon, being only 3 degrees high a half-hour after sunset.

Venus: Our sister planet shines brightly in the pre-dawn sky throughout September.

Mars: The red planet shines dimly in the pre-dawn sky, to the lower left of Venus.

Jupiter: Jupiter is also to the lower left of Venus in the pre-dawn sky.

Saturn: The ringed planet continues to be in good viewing position through September just as the sky turns dark. Throughout September Saturn is the only bright planet visible during the evening hours.

Uranus and Neptune: Neptune reached opposition on August 31st so it is best observed around midnight. Uranus is highest in the sky a few hours before dawn.

The Moon: Full moon occurs on September 27th. This full Moon is the Harvest Moon because it is the full Moon that occurs closest to the autumn equinox. In two years out of three, the Harvest Moon comes in September, but in some years it occurs in October. At the peak of harvest, farmers can work late into the night by the light of this Moon.

We have a total Lunar eclipse during the evening of September 27th and early hours of September 28th! We should see the first shadowing around 8:40 p.m. and the eclipse will conclude around 1:00 a.m.

The Moon will also occult two stars during September: Aldebaran on the 4th just before midnight and Rho Sagittarii on the 22nd at 7:15 p.m.

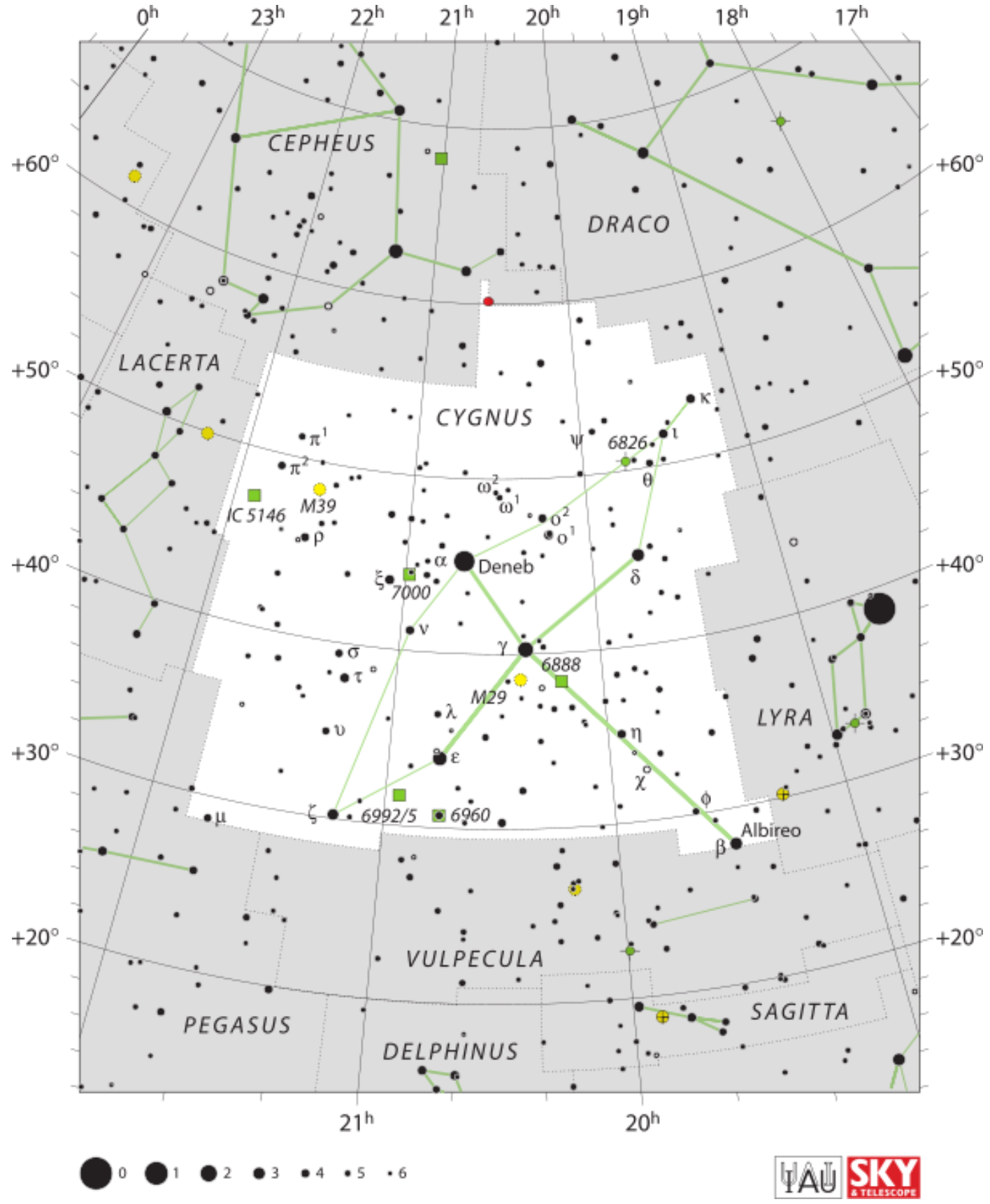
Constellations: Hercules and the Summer Triangle shine near the zenith throughout September with "the backbone of the night", the Milky Way, arching across the sky. Stay up a bit later and the autumn constellations will rise in the east, so look for the Great Square of Pegasus, Cassiopeia and Perseus.

Messier/deep sky: September is your last chance of 2015 to catch the Messier objects in the southern constellations of Sagittarius and Scorpius. If you can find a clear view of the southern horizon you can find M4, M6, M7, M17, M8, M22 and more! On the other side of the sky, if you stay out late, you can catch the star clusters in Auriga rising: M36, M37 and M38.

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

Meteor showers: The Epsilon Perseid meteor shower peaks on September 9th. This is a minor shower with only 5 meteors per hour predicted.

Through the Eyepiece: Albireo, the double star in Cygnus
by Don Knabb, CCAS Treasurer & Observing Chair



Eyepiece (Cont'd)

Photo credit: Richard Yandrick, http://cosmicimage.com/Alberio-5Min.jpg

During September look upward into the night sky while facing south and you cannot miss the Summer Triangle. Within the triangle is what is often considered the best double star in the sky, Albireo in Cygnus the Swan.

Cygnus, often informally termed the Northern Cross, represents the swan that Zeus, the Greek god, turned into during one of his romantic escapades. On early autumn evenings, Cygnus is high overhead, appearing to fly south along the bright sparkling band of the Milky Way.

Albireo is one of the most beautiful double stars, probably the finest in the night sky for small telescopes. The two components are known as Beta Cygni A and B. A is the primary member of the system, a golden yellow star shining at 3rd magnitude, while B is known as the companion, a fainter 5th-magnitude star with a beautiful bluish color.

Seen at even slight magnification, Albireo unfolds from a bright single point into a beautiful double star of strikingly different colors. At 380 light years distant, the two bright stars of Albireo are comparatively far from each other and take about 75,000 years to complete a single orbit. The brighter yellow star is itself a binary star system, but too close together to be resolved even with a telescope.

Albireo, also called Beta Cygni, is the fifth brightest star in the constellation Cygnus. Although it has the Bayer designation beta (normally the second brightest star in a constellation), it is fainter than three other stars in Cygnus.

Albireo is easy to find in the September sky. Find the Summer Triangle high in the southern sky, and then look for the "Northern Cross" shape of Cygnus. Albireo is marked on the chart below as beta β and represents the head of the swan.

Albireo is a great object to share with people at a public star party. Double stars are fun, but the amazing colors of the stars make Albireo a real crowd pleaser!

Information credits:

Dickinson, Terence 2006. Nightwatch: a practical guide to viewing the universe. Buffalo, NY. Firefly Books
http://en.wikipedia.org/wiki/Albireo
https://en.wikipedia.org/wiki/Cygnus_(constellation)
http://www.nightskyinfo.com/archive/albireo/
http://antwrp.gsfc.nasa.gov/apod/ap050830.html
Sky map credit: https://en.wikipedia.org/wiki/Cygnus_(constellation)

Solar Wind Creates—and Whips—a Magnetic Tail Around Earth

by Dr. Ethan Siegel

As Earth spins on its axis, our planet's interior spins as well. Deep inside our world, Earth's metal-rich core produces a magnetic field that spans the entire globe, with the magnetic poles offset only slightly from our rotational axis. If you fly up to great distances, well above Earth's surface, you'll find that this magnetic web, called the magnetosphere, is no longer spherical. It not only bends away from the direction of the sun at high altitudes, but it exhibits some very strange features, all thanks to the effects of our parent star.

The sun isn't just the primary source of light and heat for our world; it also emits an intense stream of charged particles, the solar wind, and has its own intense magnetic field that extends much farther into space than our own planet's does. The solar wind travels fast, making the 150 million km (93 million mile) journey to our world in around three days, and is greatly affected by Earth. Under normal circumstances, our world's magnetic field acts like a shield for these particles, bending them out of the way of our planet and protecting plant and animal life from this harmful radiation.

But for every action, there's an equal and opposite reaction: as our magnetosphere bends the solar wind's ions, these particles also distort our magnetosphere, creating a long magnetotail that not only flattens and narrows, but whips back-and-forth in the onrushing solar wind. The particles are so diffuse that collisions between them practically never occur, but the electromagnetic interactions create waves in Earth's magnetosphere, which grow in magnitude and then transfer energy to other particles. The charged particles travel within the magnetic field toward both poles, and when they hit the ionosphere region of Earth's upper atmosphere, they collide with ions of oxygen and nitrogen causing aurora. Missions such as the European Space Agency and NASA Cluster mission have just led to the first accurate model and understanding of equatorial magnetosonic waves, one such example of the interactions that cause Earth's magnetotail to whip around in the wind like so.

The shape of Earth's magnetic field not only affects aurorae, but can also impact satellite electronics. Understanding its shape and how the magnetosphere interacts with the solar wind can also lead to more accurate predictions of energetic electrons in near-Earth space that can disrupt our technological infrastructure. As our knowledge increases, we may someday be able to reach one of

(Continued on page 9)

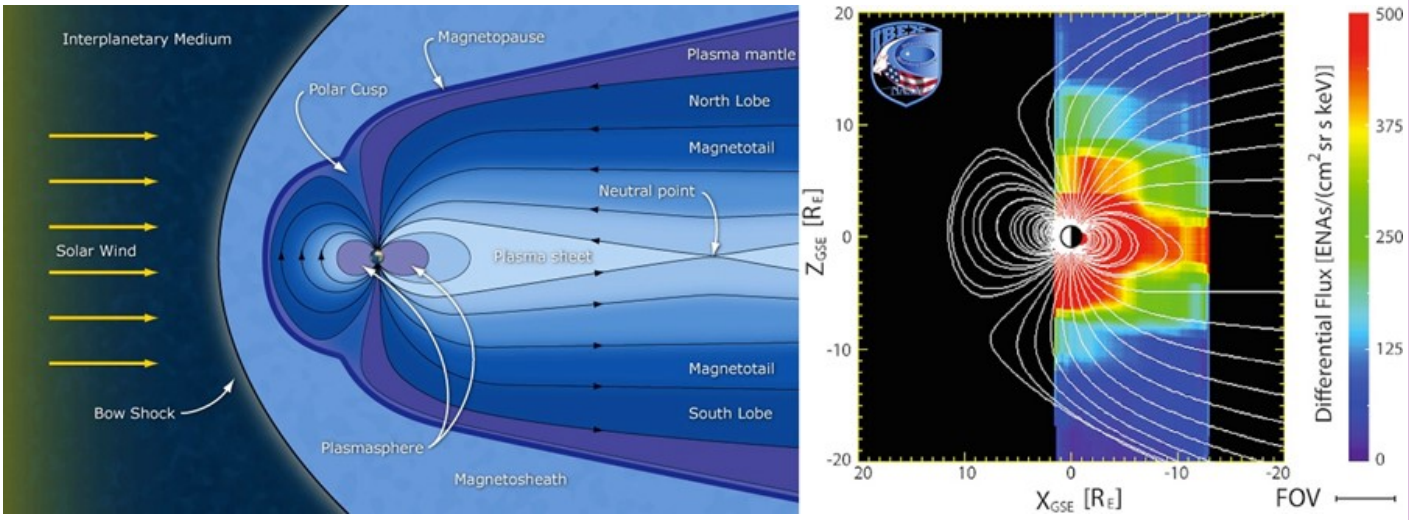


Image credit: ESA / C. T. Russell (L), of Earth's magnetic tail and its cause: the solar wind; Southwest Research Institute / IBEX Science Team (R), of the first image of the plasma sheet and plasmasphere created around Earth by the solar wind.

Space Place (Cont'd)

(Continued from page 8)

the holy grails of connecting heliophysics to Earth: forecasting and accurately predicting space weather and its effects. Thanks to the Cluster Inner Magnetosphere Campaign, Van Allen Probes, Mars Odyssey Thermal Emission Imaging System, Magnetospheric Multiscale, and Heliophysics System Observatory missions, we're closer to this than ever before.

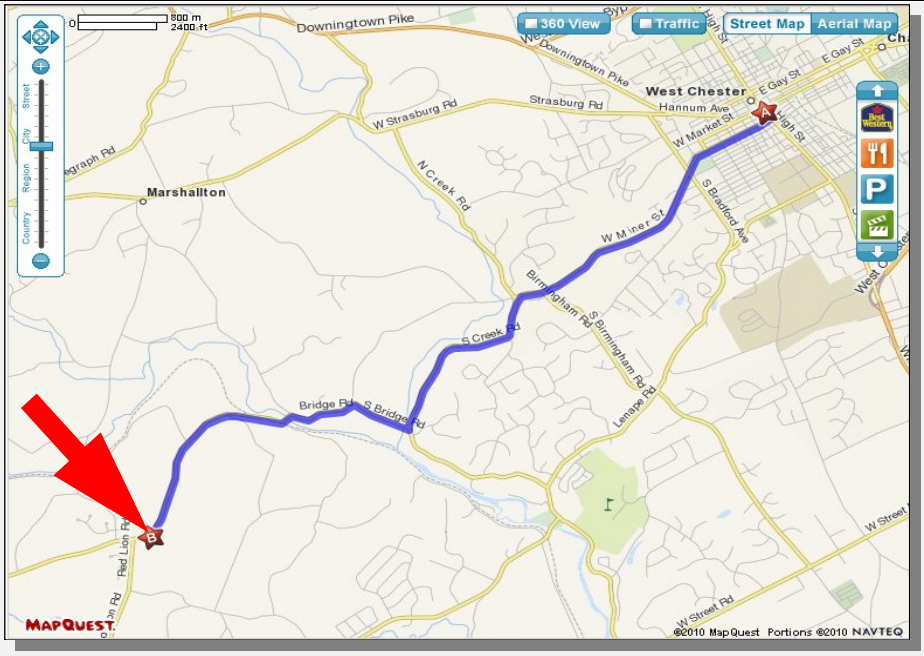
Kids can learn about how solar wind defines the edges of our solar system at NASA Space Place.
http://spaceplace.nasa.gov/interstellar

Bucktoe State Park Star Party

by Dave Hockenberry, CCAS Program Chair

Kathy Buczynski & Bea Mazziotta waiting for the evening star party at Bucktoe State Park Star Party to begin.

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.

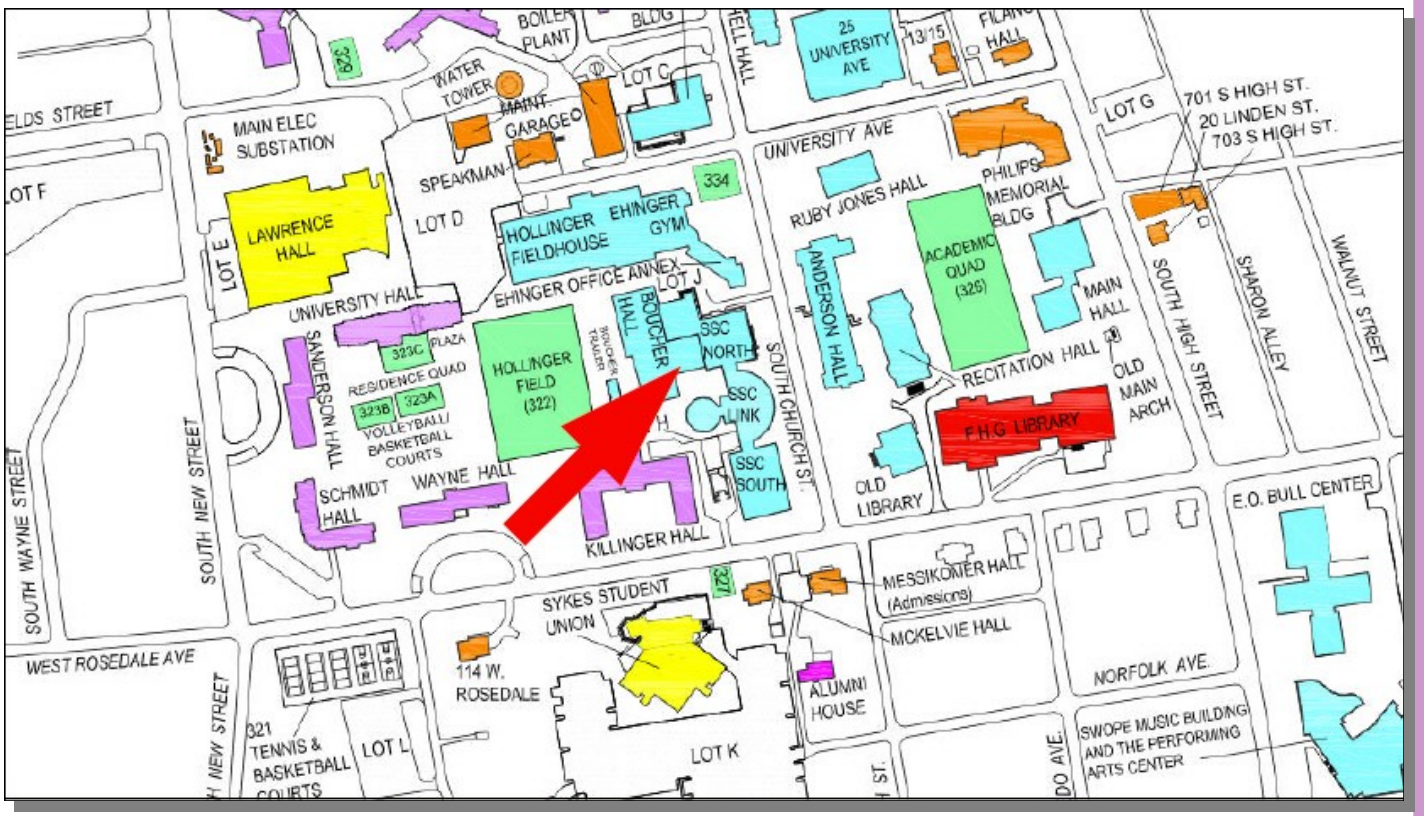
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route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

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).



Space Place (Cont'd)

(Continued from page 3)

volunteers submitted 1.82 million individual image classifications—based on how concentrated the stars were, their shapes, and how well the stars stood out from the background—which roughly represents 24 months of constant human attention. Scientists used these classifications to identify a sample of 2,753 star clusters, increasing the number of known clusters by a factor of six in the PHAT survey region. "The efforts of these citizen scientists open the door to a variety of new and interesting scientific investigations, including this new measurement of the IMF," Weisz said.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

August 2015 Financial Summary

Beginning Balance	$2,351
Deposits	$34
Disbursements	$320
Ending Balance	$2,075

New Member Welcome!

Welcome new CCAS member Sue Johnston from Downingtown, 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

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 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 (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 410-639-4329
Public Relations:	Deb Goldader 610-304-5303

CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

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

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178

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

*Sky & Tele*scope Magazine Group Rates

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

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

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

Astronomy Magazine Group Rates

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