Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 21, No. 8 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009* *August 2013*

In This Issue

Membership Renewals Due

08/2013	Harp Knabb Lurcott, Linda Zimmer
09/2013	Catalano & Family Lurcott, Ed
10/2013	Conrad Gonzalez Leiden Payne Toth Vence

M51 in Pegasus

Image by Dave Hockenberry. See pg. 11 for details.

Important August 2013 Dates

6th • New Moon, 5:51 p.m.

14th • First Quarter Moon, 6:57 a.m.

12th • Perseid Meteor Shower Peaks.

20th • Full Moon, 9:45 p.m.

28th • Last Quarter Moon, 5:35 a.m.

CCAS Upcoming Nights Out

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

☼ **Friday, August 9, 2013.** CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

☼ **Saturday, August 24, 2013.** Bucktoe Creek Preserve Star Party.

☼ **Friday, September 13, 2013.** CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

Summer/Fall 2013 Society Events

August 2013

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

9th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date August 10th). The observing session starts at sunset.

15th • The von Kármán Lecture Series: Curiosity's First Year on Mars, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

16th • Reservations start for the September 6th planetarium show at the WCU Planetarium. For more information, visit the WCU Public Planetarium Shows webpage.

20th • Open call for articles and photographs for the September 2013 edition of Observations.

24th • CCAS Special Observing Session, Bucktoe Creek Preserve.

26th • Deadline for newsletter submissions for the September 2013 edition of Observations.

September 2013

4th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

6th • West Chester University Planetarium Show: "The Galactic Center," in the Schmucker Science Building. The show starts at 7 p.m. and runs approximately one hour in length. For more information and reservations, visit the WCU Public Planetarium Shows webpage.

10th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: Mark Devlin, PhD Physics at the University of Pennsylvania. "Where did Half of the Starlight of the Universe Go?" Discussion of NASA BLAST experiments from high altitude balloon mounted submillimeter wavelength telescopes.

13th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date August 10th). The observing session starts at sunset.

13th • Reservations start for the October 4th planetarium show at the WCU Planetarium. For more information, visit the WCU Public Planetarium Shows webpage.

15th • The von Kármán Lecture Series: Telexploration: How video game technologies can take NASA to the next level, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the September 2013 edition of Observations.

24th • CCAS Special Observing Session, Bucktoe Creek State Park.

26th • Deadline for newsletter submissions for the September 2013 edition of Observations.

Cassini Probe Sees Earth & Moon from Saturn

by Clara Moskowitz, SPACE.com Assistant Managing Editor

NASA unveiled spectacular portraits of Earth and its moon from billions of miles away in images captured on Friday, July 19th, by the team behind the agency's Cassini spacecraft at Saturn.

In the photos from Saturn, Earth appears as a tiny pinprick of light amid the haunting rings and glowing sphere of Saturn, which Cassini has been orbiting since 2004. Though the picture doesn't show it, more than 20,000 people on Earth waved at Saturn at just the time the photo was taken, as NASA had coordinated a plan to involve as many Earthlings as possible in the portrait.

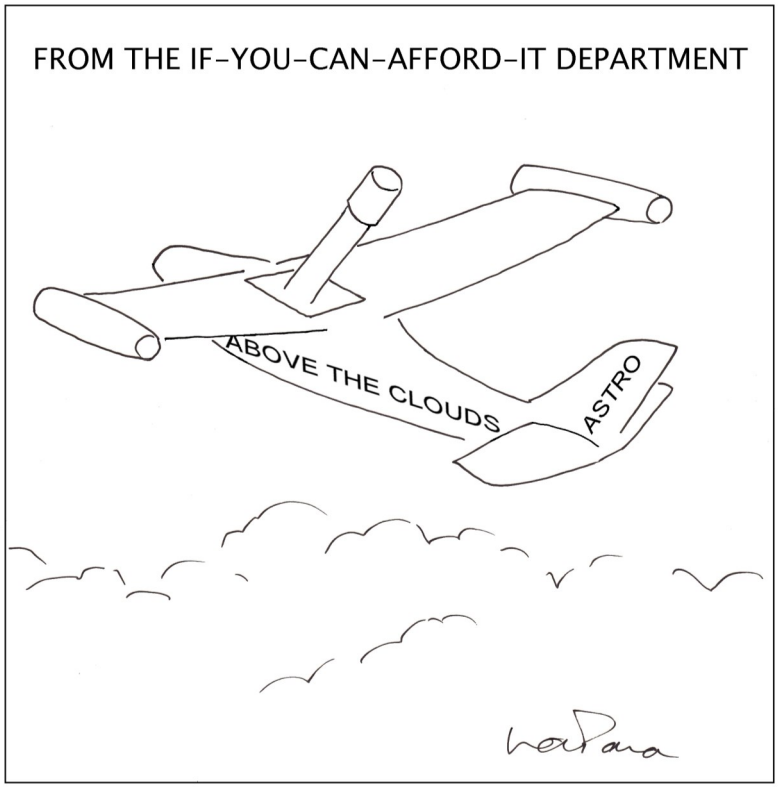
(Continued on page 3)

Earth & Moon as seen from Saturn

Image courtesy NASA/JPL-Caltech/Space Science Institute

Nicholas's Humor Corner

by Nicholas La Para



Speakers for Autumn 2013 CCAS Meetings

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on September 10, 2013, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker: Mark Devlin, PhD Physics at the University of Pennsylvania. "Where did Half of the Starlight of the Universe Go?" Discussion of NASA BLAST experiments from high altitude balloon mounted submillimeter wavelength telescopes.

On October 8, 2013, we welcome Paul Evenson, PhD from the University of Delaware Physics and Astronomy Department. He will present "The Construction and Operation of the Ice Cube Neutrino Observatory at the South Pole."

Dave Goldberg, PhD from Drexel University Physics and Astronomy, will be our guest speaker at the November 12th meeting. His topic is not settled yet, but will either be about his research in Gravitational Lensing or on his new book "Symmetry - the Universe in the Rear View Mirror."

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

Cassini (Cont'd)

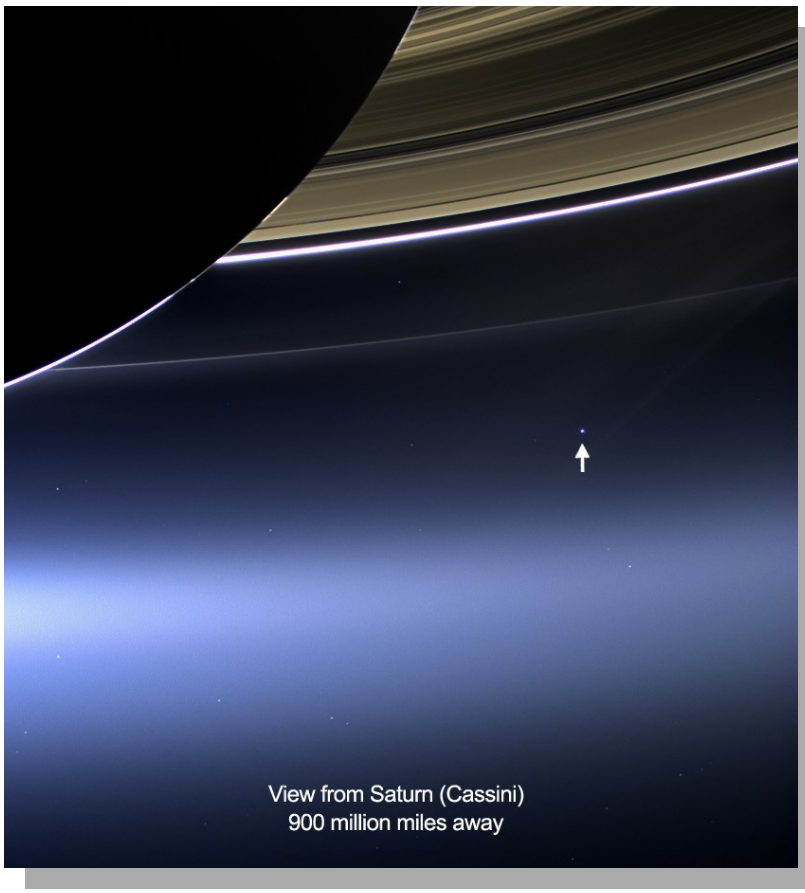


Image Courtesy NASA/JPL-Caltech/Space Science Institute

(Continued from page 2)

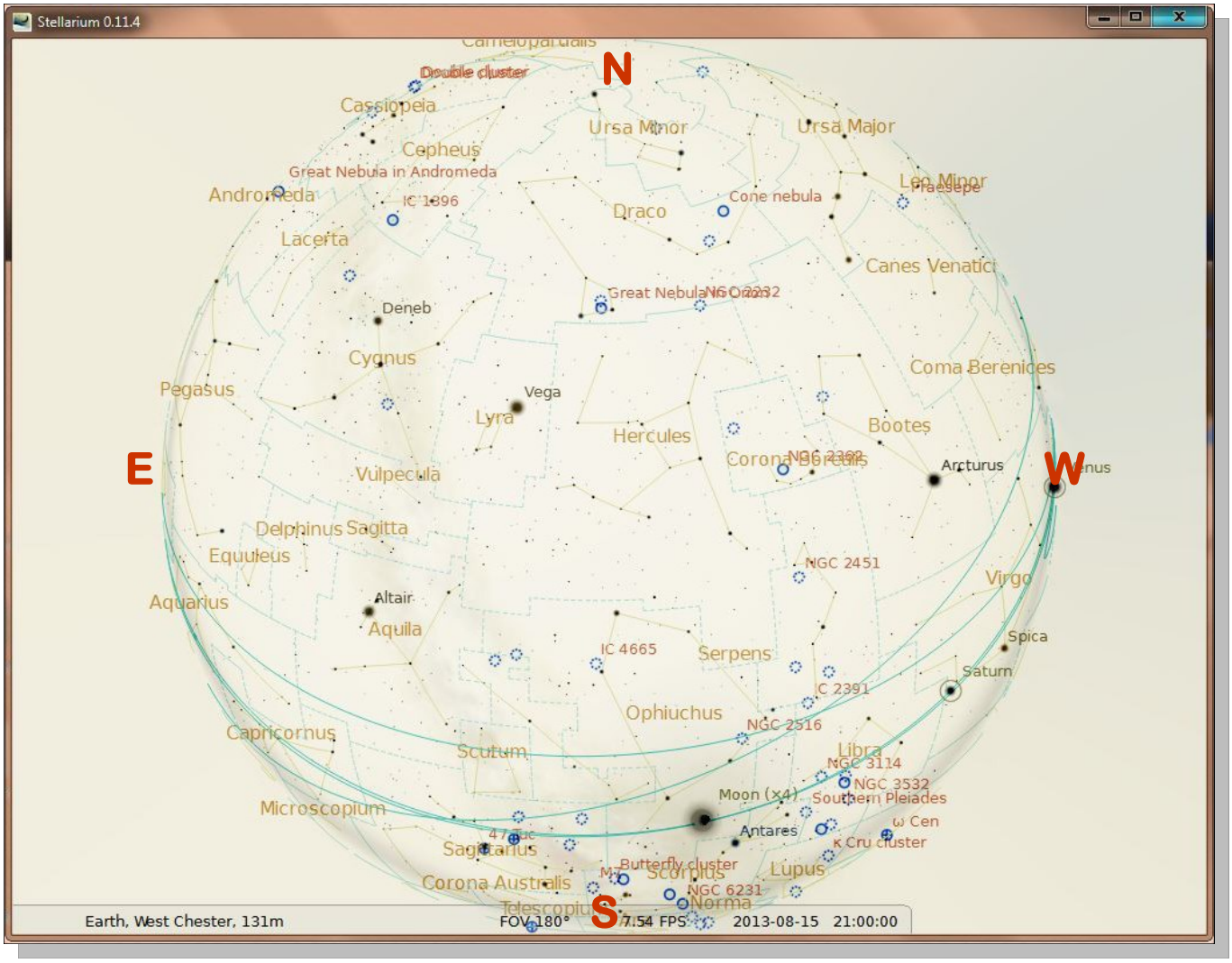
The cosmic picture took advantage of a total eclipse of the sun from Saturn, which allowed Cassini's sensitive cameras to image Earth without being damaged from looking directly toward the sun, which appears to lie very close to our planet from the perspective of Saturn. The photo shows Earth from a vantage point of 898 million miles away.

"We can't see individual continents or people in this portrait of Earth, but this pale blue dot is a succinct summary of who we were on July 19," Linda Spilker, Cassini project scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif., said in a statement. "Cassini's picture reminds us how tiny our home planet is in the vastness of space, and also testifies to the ingenuity of the citizens of this tiny planet to send a robotic spacecraft so far away from home to study Saturn and take a look-back photo of Earth."

The Sky Over Chester County

August 15, 2013 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
8/01/2013	5:29 a.m. EDT	5:59 a.m. EDT	8:14 p.m. EDT	8:44 p.m. EDT	14h 14m 36s
8/15/2013	5:44 a.m. EDT	6:13 a.m. EDT	7:57 p.m. EDT	8:26 p.m. EDT	13h 44m 18s
8/31/2013	6:00 a.m. EDT	6:28 a.m. EDT	7:33 p.m. EDT	8:01 p.m. EDT	13h 05m 31s

Moon Phases					
New Moon	8/06/2013	5:51 p.m. EDT	Full Moon	8/20/2013	9:45 p.m. EDT
First Quarter	8/14/2013	6:57 a.m. EDT	Last Quarter	8/28/2013	5:35 a.m. EDT

August 2013 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

6th	**New Moon**
12th	**The Moon is close to Spica**
12th	**The Perseid meteor shower peaks**
13th	**The Moon is near Saturn**
14th	**First-quarter Moon**
20th	**Full Moon**
27th	**Neptune is at opposition**
28th	**Last Quarter Moon**

The best sights this month: During August we continue to enjoy the delights in the southern sky in the constellations Scorpius and Sagittarius. The Perseid meteor shower peaks in the pre-dawn sky of August 12th. Come back outside that same evening as the last light of the sunset fades to see a nice line up that starts with Venus, then scan to the left to see Spica, the Moon, Saturn and finally Antares.

Mercury: If you are an early riser you can find Mercury about 10 degrees high in the east before dawn during the first few days of August.

Venus: The "evening star" shines brightly about 10 degrees high in the west throughout August.

Mars: The red planet is an early morning object for many more months shining at a fairly dim magnitude 1.6.

Jupiter: By the end of August the king of the planets is rising around 2 a.m. and shines at a bright magnitude -2.0.

Saturn: Saturn is still the highlight of the evening sky through August. It can be found to the left of Spica high in the south as soon as darkness falls. At a star party at the end of July at Nottingham County Park we shared the view of Saturn with an enthusiastic group of star gazers and many exclamations of "Oh Wow!" were heard that evening.

Uranus and Neptune: Neptune reaches opposition on the night of August 26/27, so it will be in excellent viewing position all night. Uranus is trailing Neptune by about 2 hours but you can find both of them high in the sky around midnight. You can find a sky map to help you locate these gas giants at skypub.com/urnep, the website of Sky and Telescope magazine.

The Moon: Full moon occurs on August 20th. This Full Moon is called the Full Sturgeon Moon by Native Americans. The fishing tribes are given credit for the naming of this Moon, since sturgeon, a large fish of the Great Lakes were most readily caught during this month. A few tribes knew it as the Full Red Moon because as the Moon rises it appears reddish through the sultry haze of summer.

Constellations: The Summer Triangle rules the night sky after you stare at the wonders in the southern sky. Find a driveway, put down a sleeping bag and feel the heat of the sun come back out of the driveway, warming your back as you stare upward at Cygnus as it flies down the Milky Way. It's easy to hold binoculars straight up if you are lying on your back. Scan between Aquila and Lyra with your binoculars to find the Coat Hanger Cluster. Then just drink in the stars of our home galaxy.

Messier/deep sky: M13 and M92, bright globular clusters in Hercules are nearly overhead so they are in a great position for viewing with binoculars or a telescope. Not far away is M57, the Ring Nebula in Lyra. This is a fairly faint object that is best viewed with averted vision in binoculars or a small telescope. Do not miss the southern Messier objects in Scorpius and Sagittarius while we have the chance to see them. That part of the sky is filled with incredible objects that are visible for only a short time from Chester County.

Comets: There are no bright comets in the sky during August. But, we can start building our anticipation for Comet ISON later this year!

(Continued on page 10)

Inventing Astrophotography: Capturing Light Over Time

by Dr. Ethan Siegel

We know that it's a vast Universe out there, with our Milky Way representing just one drop in a cosmic ocean filled with hundreds of billions of galaxies. Yet if you've ever looked through a telescope with your own eyes, unless that telescope was many feet in diameter, you've probably never seen a galaxy's spiral structure for yourself.

In fact, the very closest large galaxy to us—Andromeda, M31—wasn't discovered to be a spiral until 1888, despite being clearly visible to the naked eye! This crucial discovery wasn't made at one of the world's great observatories, with a world-class telescope, or even by a professional astronomer; it was made by a humble amateur to whom we all owe a great scientific debt.

Beginning in 1845, with the unveiling of Lord Rosse's 6-foot (1.8 m) aperture telescope, several of the nebulae catalogued by Messier, Herschel and others were discovered to contain an internal spiral structure. The extreme light-gathering power afforded by this new telescope allowed us, for the first time, to see these hitherto undiscovered cosmic constructions. But there was another possible path to such a discovery: rather than collecting vast amounts of light through a giant aperture, you could collect it *over time*, through the newly developed technology of photography.

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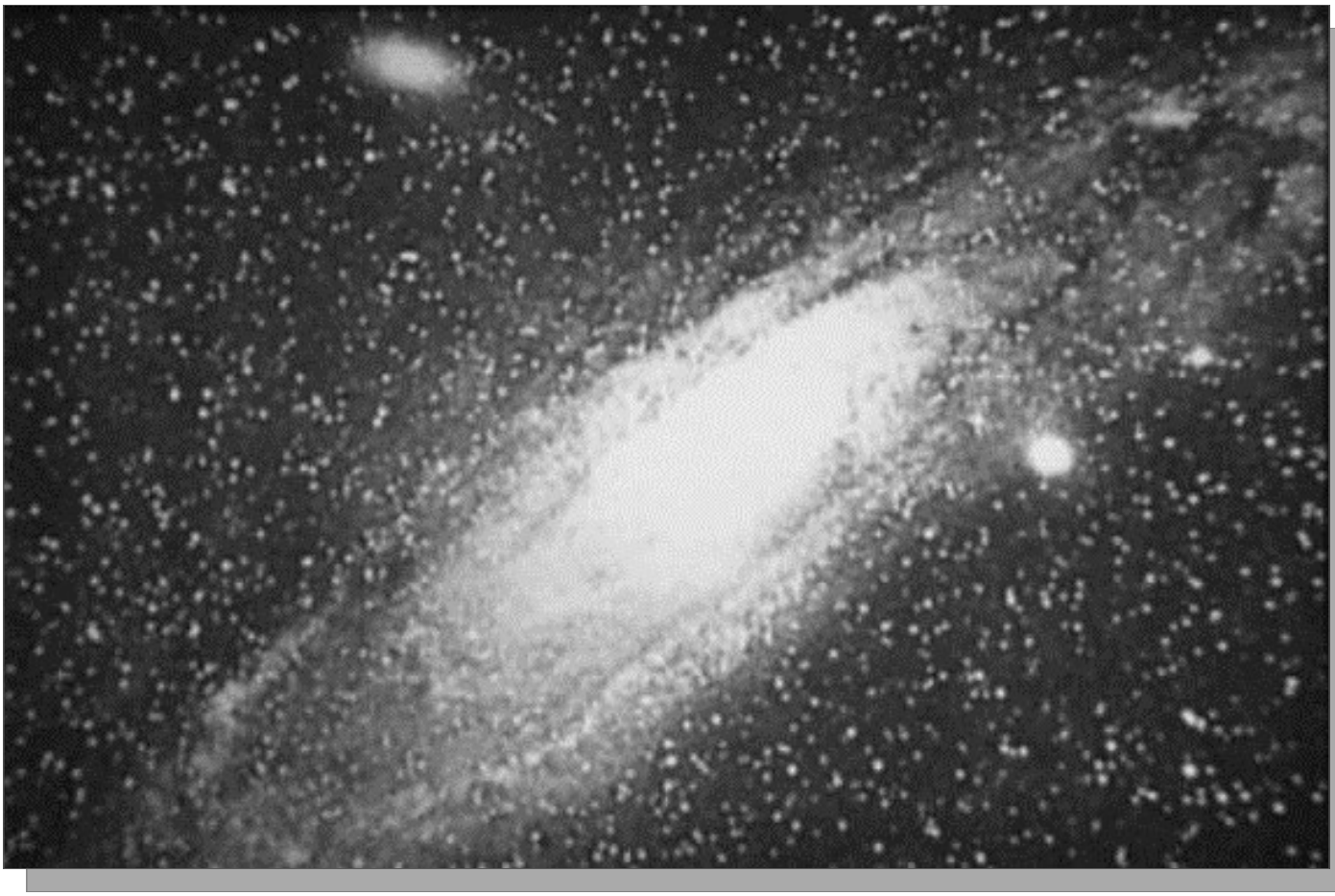


Great Nebula in Andromeda, the first-ever photograph of another galaxy. Image credit: Isaac Roberts, taken December 29, 1888, published in *A Selection of Photographs of Stars, Star-clusters and Nebulae*, Volume II, The Universal Press, London, 1899.

Space Place (cont'd)

(Continued from page 6)

During the latter half of the 19th Century, the application of photography to astronomy allowed us to better understand the Sun's corona, the spectra of stars, and to discover stellar and nebulous features too faint to be seen with the human eye.

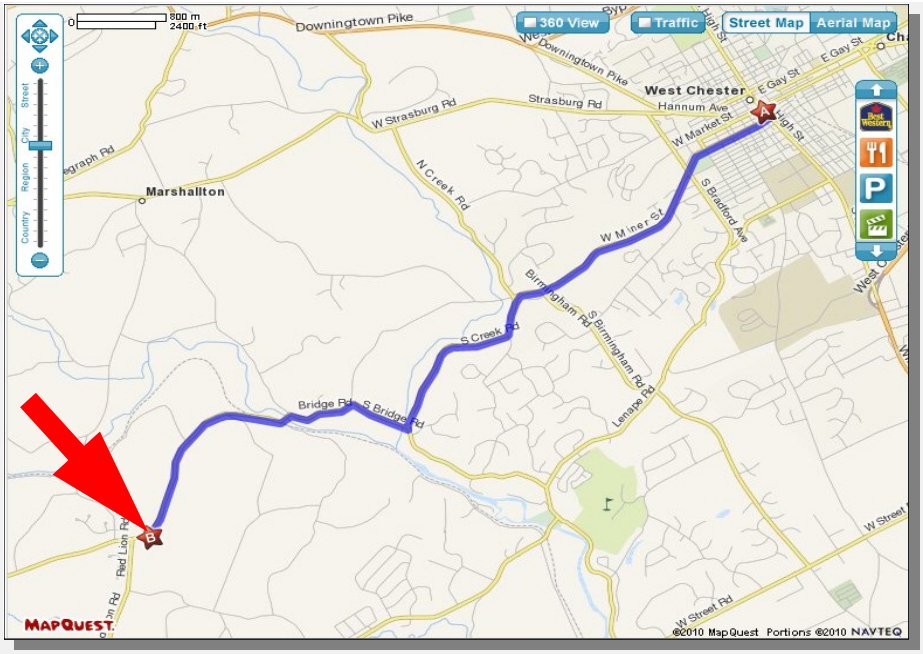
Working initially with a 7-inch refractor that was later upgraded to a 20-inch reflector, amateur astronomer Isaac Roberts pioneered a number of astrophotography techniques in the early 1880s, including "piggybacking," where his camera/lens system was attached to a larger, equatorially-mounted guide scope, allowing for longer exposure times than ever before. By mounting photographic plates directly at the reflector's prime focus, he was able to completely avoid the light-loss inherent with secondary mirrors. His first photographs were displayed in 1886, showing vast extensions to the known reaches of nebulosity in the Pleiades star cluster and the Orion Nebula.

But his greatest achievement was this 1888 photograph of the Great Nebula in Andromeda, which we now know to be the first-ever photograph of another galaxy, and the first spiral ever discovered that was oriented closer to edge-on (as opposed to face-on) with respect to us. Over a century later, Andromeda looks practically identical, a testament to the tremendous scales involved when considering galaxies. If you can photograph it, you'll see for yourself!

Astrophotography has come a long way, as apparent in the Space Place collection of NASA stars and galaxies posters at http://spaceplace.nasa.gov/posters /#stars.

This article was provided through the courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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).

Through the Eyepiece: The Heavenly Harp, Ring Nebula and Coat Hanger Cluster

by Don Knabb, CCAS Treasurer & Observing Chair

During August if you look nearly straight up you will find the bright star Vega in the constellation Lyra the Lyre. A lyre is a harp-like musical instrument of ancient Greece and this constellation resembles a harp somewhat. On a dark night you can see a parallelogram of stars with bright Vega at the northwest corner. There are many interesting features in this area of the sky. Preferably use a Dobsonian telescope since you will be looking nearly straight up in the sky, but any type of telescope will do if you have been practicing yoga.

The first object I'll mention is not even on the star chart above, but if you draw a line from Vega through M56 and go that much further and down a bit you will find the Coat Hanger Cluster. And yes, it looks just like one (although it may be upside down)! More officially called Brocchi's Cluster, this asterism, or grouping of stars, was first described as far back as 964. In the 1920's D. F. Brocchi created a map of this object for use in calibrating photometers.

Photos do not do this cluster justice. Grab your binoculars and sweep from Altair (the southeast star of the summer triangle) toward Vega. You'll need to lean way back so you might want to try this sitting down. If you've not seen this cluster before be prepared to let a "wow" slip out. It turns out that this is not a true cluster of stars, just a chance alignment of stars, but it is one of the most fun objects in the sky to share with friends new to astronomy.

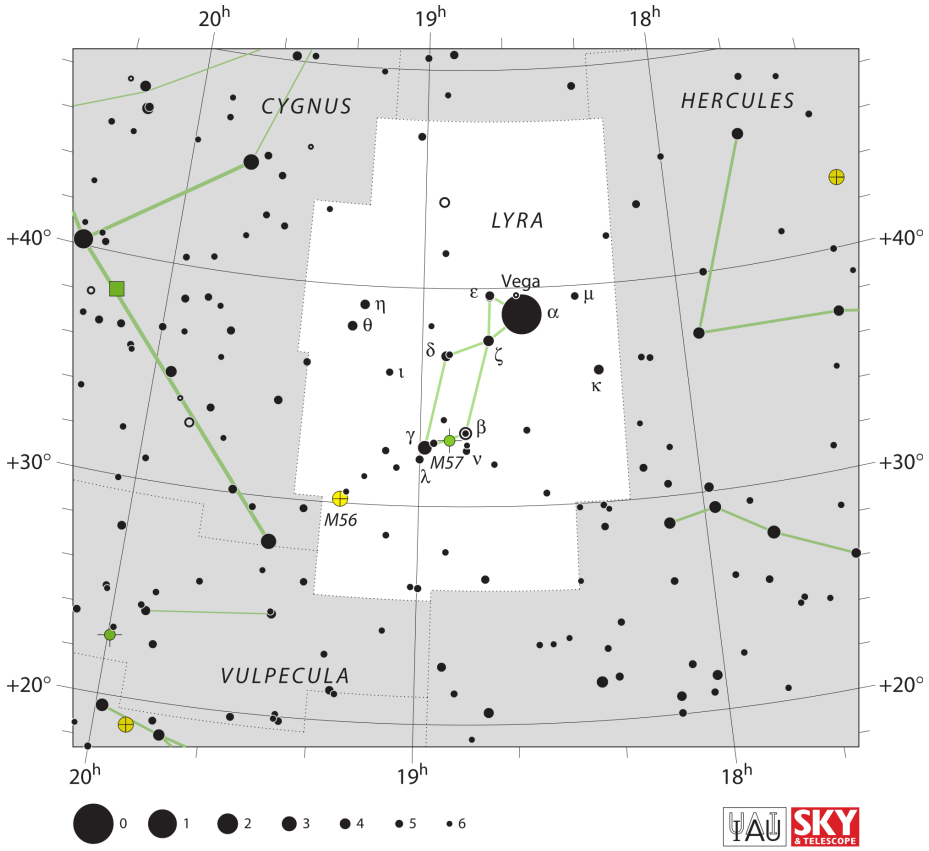


Image source: http://en.wikipedia.org/wiki/File:Lyra_IAU.svg

Next on my list of objects in this area of the sky is "the double double" star in Lyra. To the upper left of Vega in the chart above you will find Epsilon Lyra. With binoculars you can "split" this star into a double, but you'll need a telescope to go deeper and split each of that pair further into doubles themselves. So, it's a pair of pairs, the sky's most spectacular double double.

There is also an interesting variable star in Lyra. Beta Lyra is actually two suns orbiting each other and when one passes in front of the other the apparent brightness changes from week to week. This variable nature of the star can be easily observed if you compare it to its neighbor Gamma Lyra to its left.

Lastly, just between the two stars mentioned above is M57, the Ring Nebula. Although we need the Hubble telescope to get the kind of picture shown below, the Ring Nebula is still a wonderful sight in a telescope and looks like a little cosmic smoke ring. M57 is the most famous of the planetary nebula. It is a shell of gas expanding from a central star in its death

(Continued on page 9)

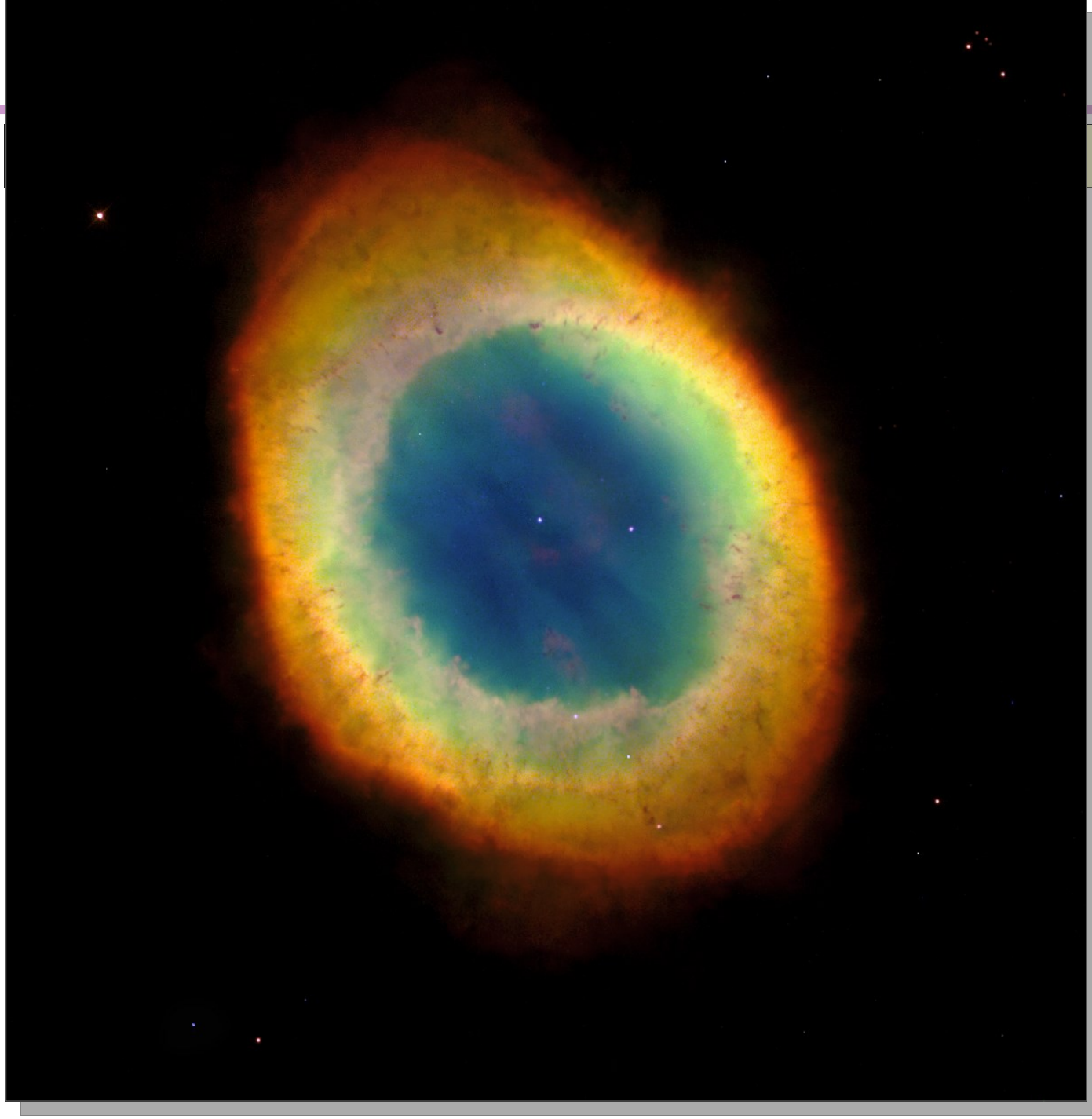


Image source: http://en.wikipedia.org/wiki/Image:M57_The_Ring_Nebula.JPG

(Continued from page 8)

throes. The central star is a blue dwarf that blew off its outer layers. This is the end that is predicted for our sun perhaps 5 billion years from now.

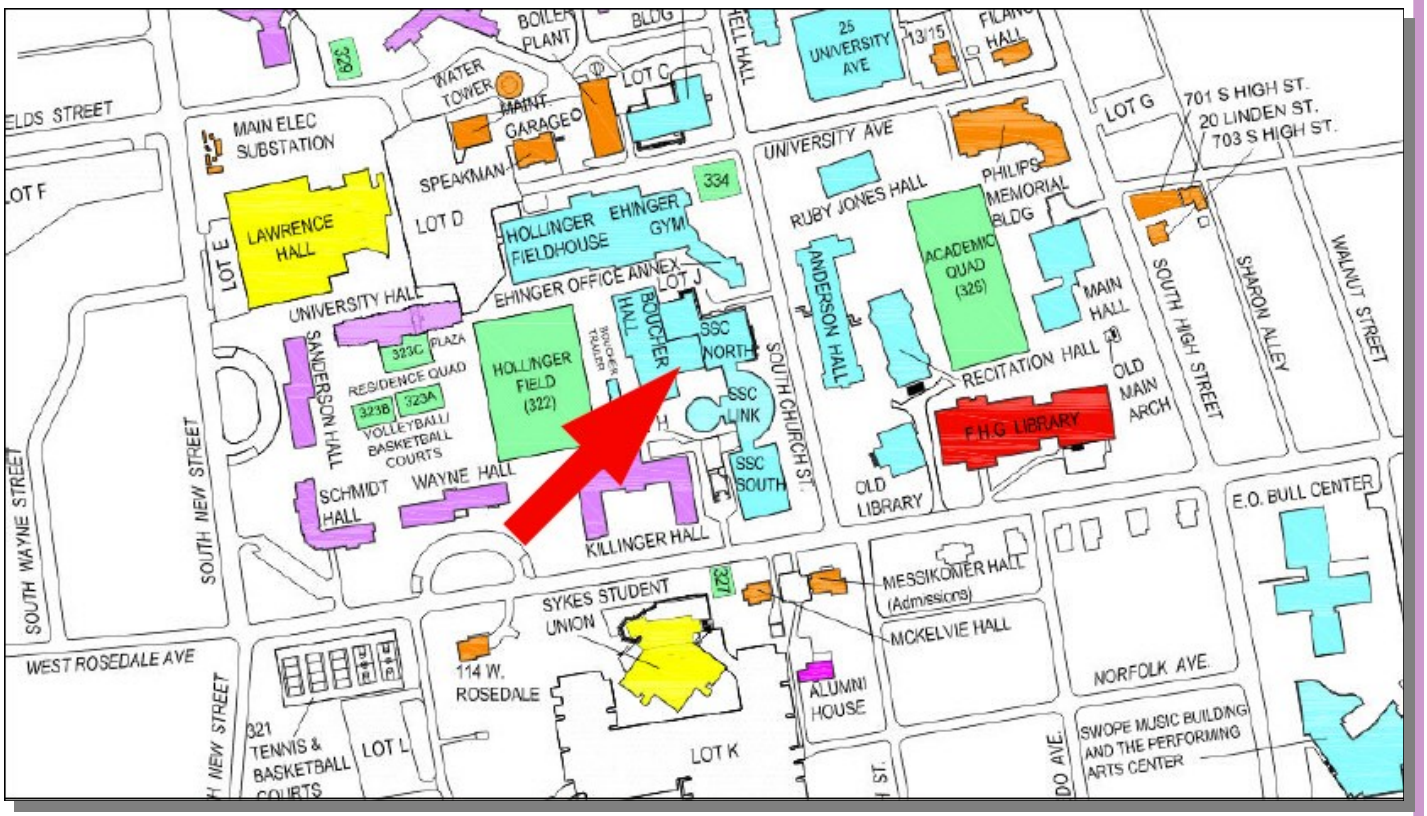
CCAS Original Astrophotography
by Dave Hockenberry, CCAS Program Chair

Image Credits Page 1: M15 in Pegasus. Shot 7/17/13 with a QSI 583 wsg camera through Hyperion 12.5" telescope at 2650 mm FL. Autoguided with SX Lodestar and SX Adaptive Optics unit. Image acquisition and autoguided with Maxim DL Pro. Images Dark/Bias subtracted, stacked, and RGB creation in CCDStack. L-RGB merge and further adjustments in Photoshop CS5. Stack of 15 20-second Luminance frames, and 15 30-second Red, Green, and Blue frames each with Astrodon filters. No Flat frames applied. FITS Liberator courtesy of ESA. M15 is one of the more dense globular clusters known. It lies at about 33,000 light-years from us and contains about 100,000 stars. It even sports its own central small black hole! It is a Summer favorite of both visual observers and photographers.

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 113 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: The Perseid meteor shower goes on for many days with the peak being predicted to be in the pre-dawn hours of August 12th. The Moon will set around 11:00 p.m. so it will not spoil the show. Up to 100 meteors per hour can be expected at the peak of the shower. My favorite Perseids are ones that occur just after dark when the radiant is low in the sky and meteors enter the atmosphere at a shallow angle, flying far across the sky.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

June 2013 Financial Summary

Beginning Balance	$1,275
Deposits	$760
Disbursements	$785
Ending Balance	$1,250

New Member Welcome!

Welcome new CCAS members Richard Hunsinger of West Chester, 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

Note that our CCAS Webmaster John Hepler has a link to the IDA home page set up on our Society's home page at **http://www.ccas.us**.

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"!

CCAS Event Information

We've set up a special phone number you can dial to find out if our monthly observing session and other scheduled events will be held or postponed. Call **610-436-0829** after 5 PM ET to hear a recording to find out the latest news.

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

★ ★ ★ ★ ★

Green Earth Lighting
Formerly
Outdoor Lighting Associates

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

Green Earth Lighting LLC
620 Onion Creek Ranch Rd
Driftwood, Texas 78619

Phone: **512-944-7354**

http://www.greenearthlighting.com

Local Astronomy-Related Stores

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

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
2115 Lazor St.
Apt. 227
Indiana, PA 15701

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 (724) 801-8789 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
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