



# Observations

A Monthly Publication Of The  
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 21, No. 3      Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009      March 2013

## In This Issue

CCAS Winter/Spring 2013 Events ...	2
February 2013 Meeting Minutes .....	2
Nicholas's Humor Corner.....	2
Help Us Purchase	
a Planetarium Chair .....	2
March 2013 Speaker.....	3
CCAS T-Shirts & Sweatshirts for Sale .....	3
The Sky Over Chester County: March 2013 .....	4
March 2013 Observing Highlights .....	5
NASA's Space Place .....	6
Babes in Arms .....	7
CCAS Directions: Brandywine Valley Association.....	7
Through the Eyepiece: An oasis in space: NGC 7731 .....	8
Landsat Legacy.....	9
Membership Renewals .....	10
New Member Welcome.....	10
CCAS Directions: WCU Map.....	10
Treasurer's Report.....	10
CCAS Information Directory ....	11-12

## Babes in Arms



M83, The Southern Pinwheel Galaxy. See pg. 9 for more information.  
Image credit: NASA, ESA, and the Hubble Heritage Team (STScI/AURA)

## Important March 2013 Dates

- 4th** • Last Quarter Moon, 4:53 p.m.
- 10th** • Daylight Savings Time begins; set clocks ahead one hour.
- 11th** • New Moon, 3:51 p.m.
- 19th** • First Quarter Moon, 1:27 p.m.
- 27th** • Full Moon, 5:28 a.m.



## CCAS Upcoming Nights Out

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

- ☼ **Saturday, March 16, 2013.** Spring Star party. Co-sponsored with the [West Chester Department of Recreation](#) in Hoopes Park, West Chester. The observing session will be in the field near the pavilion. Session is scheduled for 7:30 PM to 9:30 PM.
- ☼ **Saturday, March 30, 2013.** [Bucktoe Creek Preserve](#) Star Party, Kennett Square, PA. For more information, contact our Observing Chair, [Don Knabb](#).

## Membership Renewals Due

03/2013	Angelini End LaFrance Smith, Laurie
04/2013	Bower Imburgia Richter
05/2013	Cline & Family Long, Vic, Jr. Weiss & Family

## Winter/Spring 2013 Society Events

### March 2013

**1st** • West Chester University Planetarium Show: "Walking on the Moon," in the Schmucker Science Building. The show starts at 7 p.m. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

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

**8th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date March 9th). The observing session starts at sunset.

**12th** • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. Guest Speaker: Caroline Herschel, as portrayed by Lynn King.

**15th** • Reservations start for the April 5th planetarium show at the WCU Planetarium.

**16th** • Hoopes Park Star Party, West Chester. Event held from 7:30 PM to 9:30 PM.

**20th** • Open call for articles and photographs for the April 2013 edition of [Observations](#).

**20th** • Vernal Equinox: First day of Spring.

**26th** • Deadline for newsletter submissions for the April 2013 edition of [Observations](#).

**30th** • [Bucktoe Creek Preserve](#) Star Party, West Chester. Event held from 7:30 PM to 9:30 PM.

### April 2013

**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.

**5th** • West Chester University Planetarium Show: "Other Earths," in the Schmucker Science Building. The show starts at 7 p.m. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

**8th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date March 9th). The observing session starts at sunset.

**9th** • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. Guest Speaker: Paul Halpern, PhD, will discuss his new book "The Edge of the Universe," current state of Cosmology.

**12th** • Reservations start for the May 3rd planetarium show at the WCU Planetarium.

**12th** • CCAS Special Observing Session, Springton Manor Farm. The observing session is scheduled for 8:00 PM to 9:30 PM.

**20th** • CCAS Special Observing Session, Anson Nixon Park, Kennett Square. The observing session is scheduled for 8:00 PM to 9:30 PM.

**20th** • Open call for articles and photographs for the April 2013 edition of [Observations](#).

**20th** • [Spring Astronomy Day](#).

**26th** • Deadline for newsletter submissions for the May 2013 edition of [Observations](#).

## Minutes from the February 12, 2013 CCAS Monthly Meeting by Ann Miller, CCAS Secretary

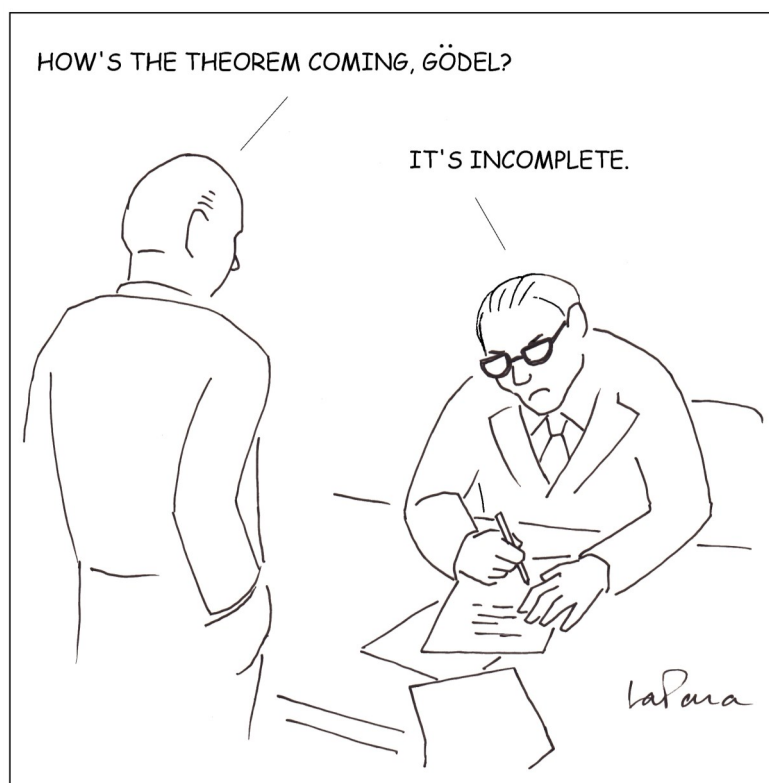
- President Roger Taylor welcomed many new guests and members. 22 people were in attendance.
- Don Knabb presented the monthly Stellarium guide to February skies.
- Program chair gave an update for upcoming speakers for the rest of the 2013 calendar year.
- Scott Engle, PhD candidate at Villanova University, presented "Living With or Near a Red Dwarf Star – How do M class stars age and how do their Planets like it?"

## Help CCAS Purchase a Seat in the New WCU Planetarium by Roger Taylor, CCAS President

As reported in last month's newsletter, we want to support the WCU planetarium renovation by participating in the "Take a Seat Among the Stars" campaign. Through this campaign we can purchase a seat in the new planetarium for \$500. We are looking for donations from CCAS members to help cover the cost of the seat. All members who participate will be given a certificate from the club.

Send all donations to Don Knabb, at 988 Meadowview Lane, West Chester, PA, 19382. Checks need to be written to The Chester County Astronomical Society.

## Nicholas's Humor Corner by Nicholas La Para



## CCAS T-Shirts and Sweatshirts Still Available

by Kathy Buczynski, CCAS Education Chair



Barb Knabb modeling one of the great CCAS Hooded Jackets

A few members were asking about the CCAS logo sweatshirts and t-shirts because once you saw the ones we had on our first order, everyone was envious. (Check out Barb Knabb in her sweatshirt on the photo

above.) Barb is wearing a large that was washed and shrunk slightly so fits more like a medium - notice she is wearing a shirt and a sweater under it. I ordered a medium last time and it was way too big.

T-shirt/Long Sleeve T-Shirt, Sweatshirt Order:

Name: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Style:	Price:	Quantity	Size	Total
T-Shirt	\$7.50 ea	_____	_____	_____
LS T-Shirt	\$9.50 ea	_____	_____	_____
Sweatshirt	\$35.00 ea	_____	_____	_____
Grand Total				_____

Enclose payment (check or money order) made payable to CCAS and mail to address below by **Friday, March 8.**

Don Knabb  
988 Meadowview Lane  
West Chester, PA 19382-2178

## March 2013 Speaker

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on March 12, 2013, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Our guest speaker is Lynn King, who will perform as Caroline Herschel.

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 our meetings in April and May of this year, along with the sessions this coming autumn. If you are interested in presenting, or know someone who would like to participate, please contact me at [programs@ccas.us](mailto:programs@ccas.us).

The sweatshirts are very heavy, fleece-lined and the t-shirts are short and long sleeved of a good mix of cotton/poly. They are navy blue with a white CCAS logo.

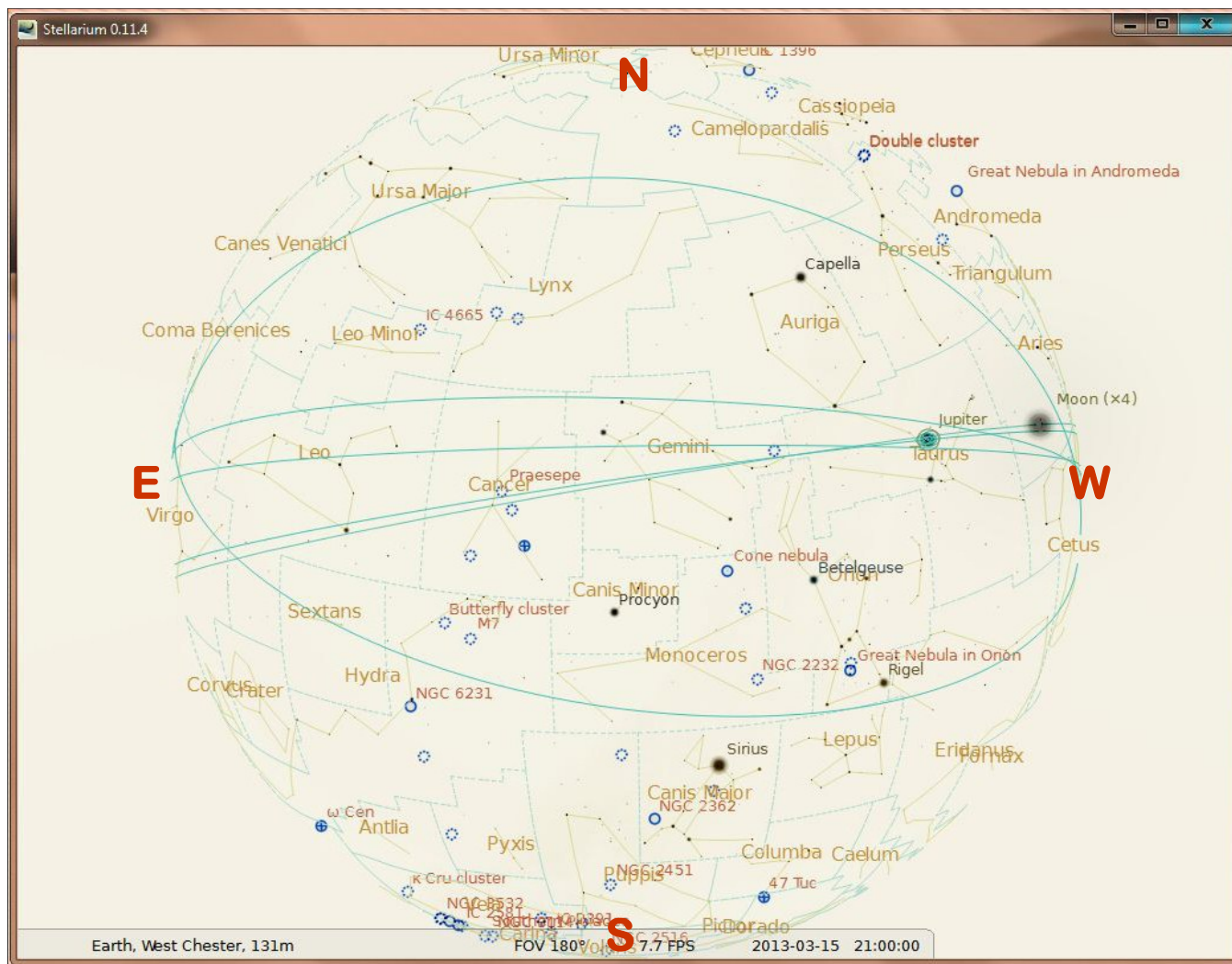
The t-shirts are \$7.50, the long-sleeved t shirts are \$9.50 and the sweatshirts are \$35.00.

If you are interested in ordering, please fill out the form attached and mail it with your check or money order made out to CCAS the address below by Friday, March 8. We need at least 12 items for a minimum order.

# The Sky Over Chester County

March 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](http://www.stellarium.org).



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
3/01/2013	6:06 a.m. EST	6:34 a.m. EST	5:33 p.m. EST	6:20 p.m. EST	11h 19m 10s
3/15/2013	6:45 a.m. EDT	7:12 a.m. EDT	7:08 p.m. EDT	7:35 p.m. EDT	11h 55m 57s
3/31/2013	6:19 a.m. EDT	6:46 a.m. EDT	7:24 p.m. EDT	7:51 p.m. EDT	12h 38m 10s

Moon Phases					
Last Quarter	3/04/2013	4:53 p.m. EST	First Quarter	3/19/2013	1:27 p.m. EDT
New Moon	3/11/2013	3:51 p.m. EDT	Full Moon	3/27/2013	5:28 a.m. EDT

## March 2013 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

3	<b>The zodiacal light is visible in the west for the next two weeks</b>
4	<b>Last Quarter Moon</b>
10	<b>Daylight Saving Time begins</b>
11	<b>New Moon</b>
19	<b>First-quarter Moon</b>
20	<b>The Spring Equinox occurs</b>
20	<b>The Lunar Straight Wall is visible</b>
27	<b>Full Moon</b>
28	<b>The Moon is near Saturn</b>

**The best sights this month:** Comet PanSTARRS should be the highlight of the March skies as it becomes visible low in the glow of the sunset around March 7<sup>th</sup>. The best viewing should be from March 12<sup>th</sup> to the 17<sup>th</sup>. Comets are very hard to predict and we've been let down by many that were expected to brighten as they neared the Sun, so I am hoping Comet PanSTARRS will put on a good show.

I'll be checking the view from West Chester University's South Campus parking lot above the tennis courts. There is a fairly good western horizon at that location. I'll send out a note to the membership if I can see this traveler from the outer solar system.

**Mercury:** After Mercury's good show last month it is not easily observed during March.

**Venus:** Venus is below the horizon during March and will reappear as "the evening star" in May.

**Mars:** Faint Mars is very difficult to observe during March as it sinks into the glow of the sunset. Although Mars will appear in the early morning hours later this year it will not be an evening object until 2014.

**Jupiter:** Jupiter continues to be one of the highlights of the evening observing hours. We are beginning to pull away from Jupiter in our orbit around the Sun but the king of the planets remains fairly

high in the sky and is a joy to observe in binoculars or a telescope.

**Saturn:** The ringed planet is rising around 10:30 p.m. as March begins but by the end of the month it will be rising only an hour after twilight ends. The best observing time is after midnight when Saturn is high in the southern sky.

**Uranus and Neptune:** The opportunity to observe these distant gas giants is behind us until late in 2013.

**The Moon:** Full moon is on March 27<sup>th</sup>. According to Native Americans this is the Full Worm Moon. As the temperature begins to warm and the ground begins to thaw, earthworm casts (poops) appear. The more northern tribes knew this Moon as the Full Crow Moon, when the cawing of crows signaled the end of winter; or the Full Crust Moon, because the snow cover becomes crusted from thawing by day and freezing at night.

**Constellations:** Early in the evening the "big guy" Orion dominates the sky in the southwest, with bright Capella in Auriga nearly overhead. Leo the Lion is in the southeast and as the night progresses you can see some spring constellations rising such as Bootes, Corona Borealis and Hercules.

**Messier/deep sky:** There are many wonderful deep sky sights as winter turns to spring. The star clusters in Auriga are heading toward the western horizon but are still well positioned for viewing through the minimum amount of atmosphere early in the evening. Later in the night look overhead to find the galaxies M81 and M82 in Ursa Major. And use your binoculars to look for M35 in Gemini, an open star cluster containing several hundred stars in an area the size of the full Moon.

**Comets:** Comet PanSTARRS should be visible in the glow of the sunset from March 7<sup>th</sup> through the end of the month. There are sky charts in Sky and Telescope magazine and Astronomy magazine to

*(Continued on page 10)*

## Tackling the Really BIG Questions

by Diane K. Fisher

How does NASA get its ideas for new astronomy and astrophysics missions? It starts with a Decadal Survey by the National Research Council, sponsored by NASA, the National Science Foundation, and the Department of Energy. The last one, *New Worlds, New Horizons in Astronomy and Astrophysics* was completed in 2010. It defines the highest-priority research activities in the next decade for astronomy and astrophysics that will “set the nation firmly on the path to answering profound questions about the cosmos.” It defines space- and ground-based research activities in the large, midsize, and small budget categories.

The recommended activities are meant to advance three science objectives:

1. Deepening understanding of how the first stars, galaxies, and black holes formed,
2. Locating the closest habitable Earth-like planets beyond the solar system for detailed study, and
3. Using astronomical measurements to unravel the mysteries of gravity and probe fundamental physics.

For the 2012-2021 period, the highest-priority large mission recommended is the Wide-field Infrared Survey Telescope (WFIRST). It would orbit the second Lagrange point and perform wide-field imaging and slitless spectroscopic surveys of

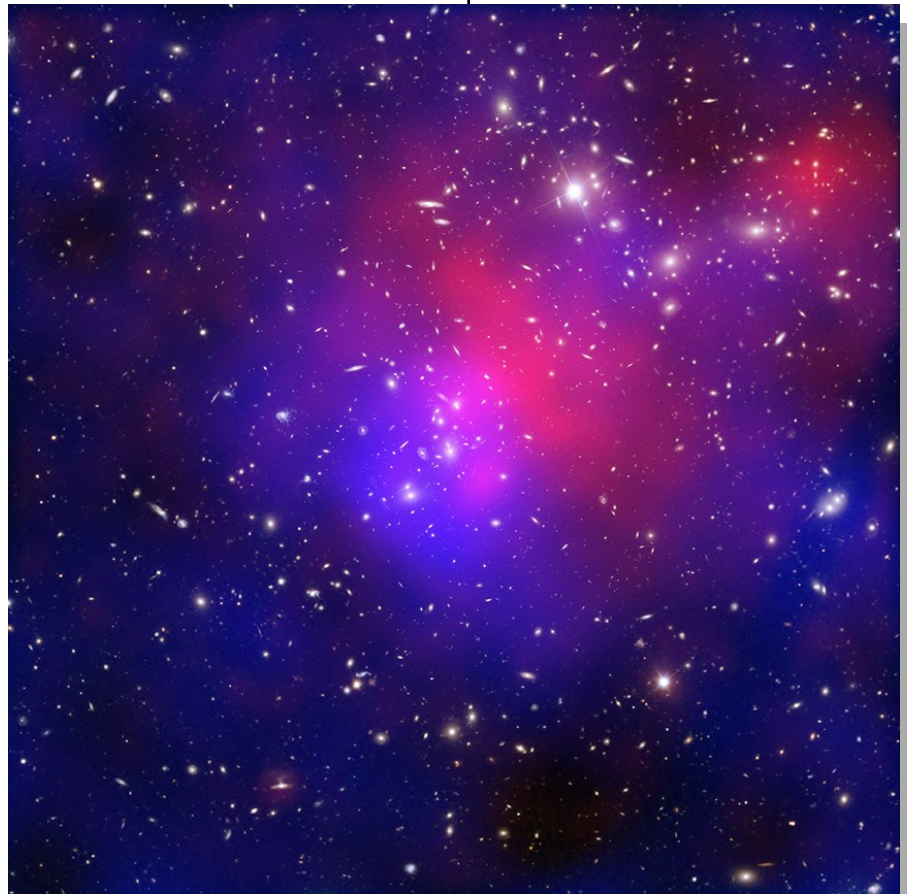


the near-infrared sky for the community. It would settle essential questions in both ex-

oplanet and dark energy research and would advance topics ranging from galaxy evolution to the study of objects within the galaxy and within the solar system. Naturally, NASA's strategic response to the recommendations in the decadal survey must take budget constraints and uncertainties into account.

The goal is to begin building this

*(Continued on page 7)*



*Clusters of galaxies collide in this composite image of “Pandora’s Cluster.” Data (in red) from NASA’s Chandra X-ray Observatory show gas with temperatures of millions of degrees. Blue maps the total mass concentration (mostly dark matter) based on data from the Hubble Space Telescope (HST), the European Southern Observatory’s Very Large Telescope (VLT), and the Japanese Subaru telescope. Optical data from HST and VLT also show the constituent galaxies of the clusters. Such images begin to reveal the relationship between concentration of dark matter and the overall structure of the universe.*

## Space Place (cont'd)

(Continued from page 6)

mission in 2017, after the launch of the James Webb Space Telescope. But this timeframe is not assured. Alternatively, a different, less ambitious mission that also address the Decadal Survey science objectives for WFIRST would remain a high priority. The Astrophysics Division is also doing studies of moderate-sized missions, including: gravitational wave mission concepts that would advance some or all of the science objectives of the Laser Interferometer Space Antenna (LISA), but at lower cost; X-ray mission concepts to advance the science objectives of the International X-ray Observatory (IXO), but at lower cost; and mission concept studies of

probe-class missions to advance the science of a planet characterization and imaging mission.

For a summary of NASA's plans for seeking answers to the big astrophysics questions and to read the complete Astrophysics Implementation Plan (dated December 2012), see <http://science.nasa.gov/astrophysics/>.

For kids, find lots of astrophysics fun facts and games on The Space Place, <http://spaceplace.nasa.gov/menu/space/>.

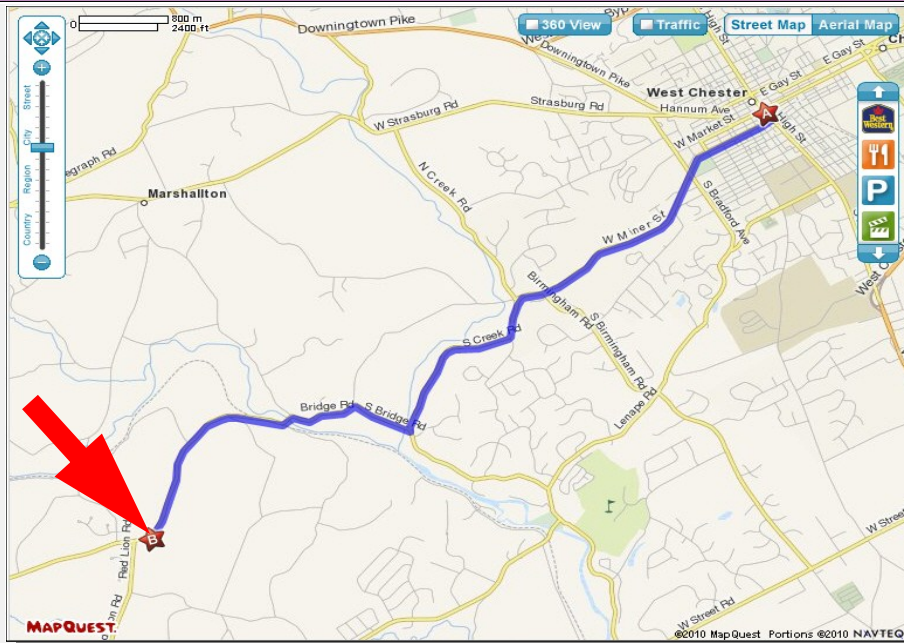
*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

## Babes in Arms

The Hubble Space Telescope has been a cutting-edge instrument since 1990 because of periodic servicing by shuttle astronauts who repaired Hubble's faults and upgraded its instruments. In 2009, Hubble received the Wide Field Camera 3, a high-quality optical and near-infrared imager. This WFC3 image of a portion of the Southern Pinwheel Galaxy (M83) shows dark dust lanes curving out from the nucleus (top) to form a spiral arm. Along the edges of the lanes, clusters of newborn stars, only a few million years old, are bursting out of their dusty cocoons and producing bubbles of reddish glowing hydrogen gas. Radiation from these fledgling

*(Continued on page 10)*

## 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: An oasis in space: NGC 7731, The Deer Lick group of galaxies

by Don Knabb, CCAS Treasurer & Observing Chair

Galaxies are defined as large groupings of stars, dust, and gas held together by gravity. They vary greatly in size and shape. Most of the objects we know of in space are contained within galaxies. They contain stars, planets, moons, comets, asteroids, nebulae, dust, neutron stars, and black holes. Many probably even contain large amounts of unseen dark matter. Since most of the space between galaxies is thought to be empty, a galaxy is essentially an oasis in space. Our own solar system is

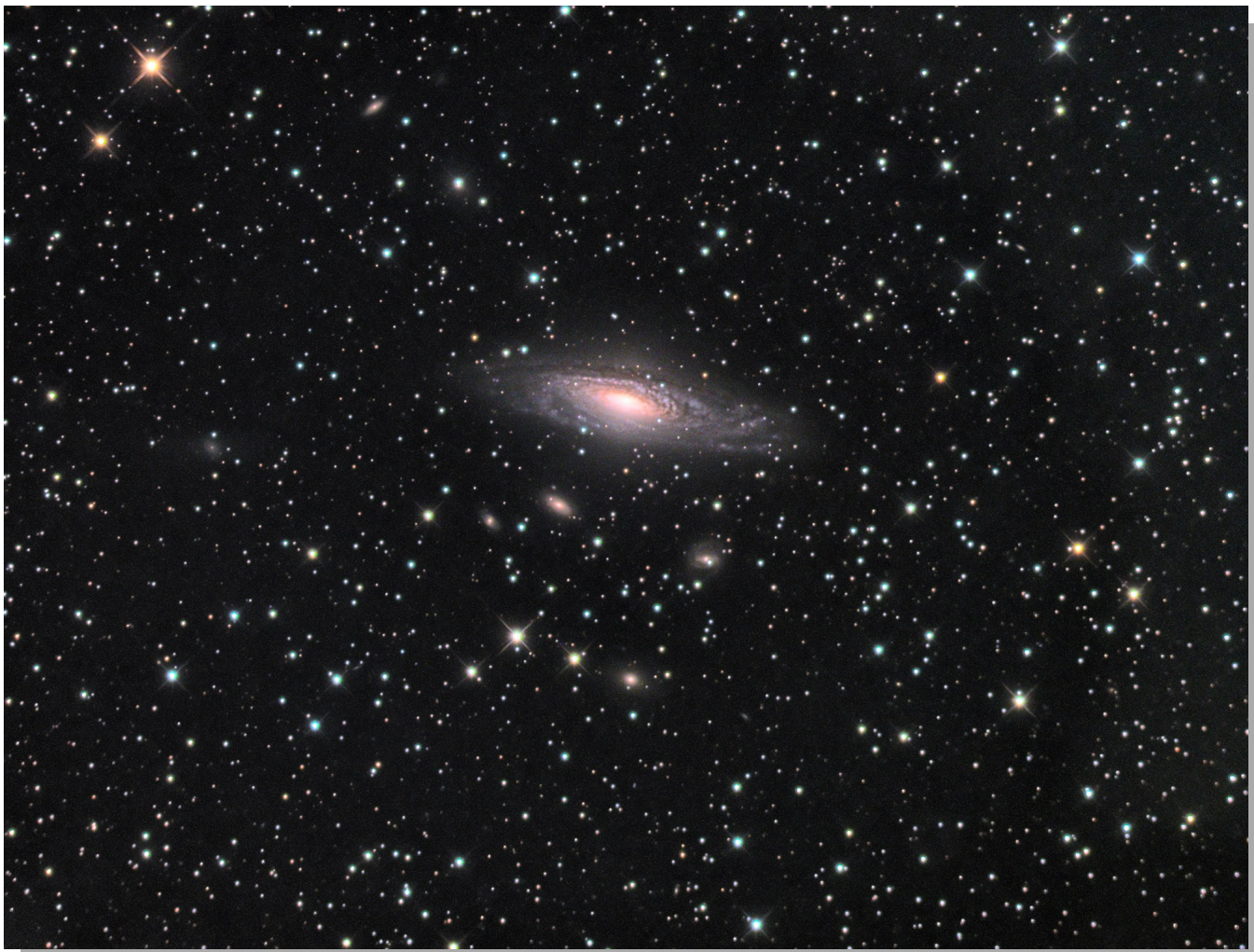
located within a galaxy.

Big, beautiful spiral galaxy NGC 7331 is often touted as an analog to our own Milky Way. About 50 million light-years distant in the northern constellation Pegasus, NGC 7331 was recognized early on as a spiral nebula and is actually one of the brighter galaxies not included in Charles Messier's famous 18th century catalog. Since the galaxy's disk is inclined to our line-of-sight, long telescopic exposures often result in an image that evokes a

strong sense of depth, as can be seen in CCAS member Dave Hockenberry's photo below.

The effect is further enhanced in this well-framed view by the galaxies that lie beyond this gorgeous island universe. The background galaxies are about one tenth the apparent size of NGC 7331 and so lie roughly ten times farther away. Their strikingly close alignment on the sky with NGC 7331 occurs just by

*(Continued on page 9)*



*Image Credit: CCAS Member Dave Hockenberry*



## Eye-piece (Cont'd)

(Continued from page 8)

chance. The visual grouping of galaxies is also known as the Deer Lick Group. Reportedly, Tom Lorenzin (author of "*1000+ The Amateur Astronomers' Field Guide to Deep Sky Observing*") gave the name to the NGC 7331 group in honor of Deer Lick Gap, just off the Blue Ridge Parkway in the mountains of North Carolina, where he once had an especially fine view of this group of galaxies.

NGC 7331 is Located in Pegasus, 38 million light-years distant. It was discovered by musician-astronomer William Herschel in 1784 and was later one of the first nebulous objects to be described as "spiral" by William Parsons.

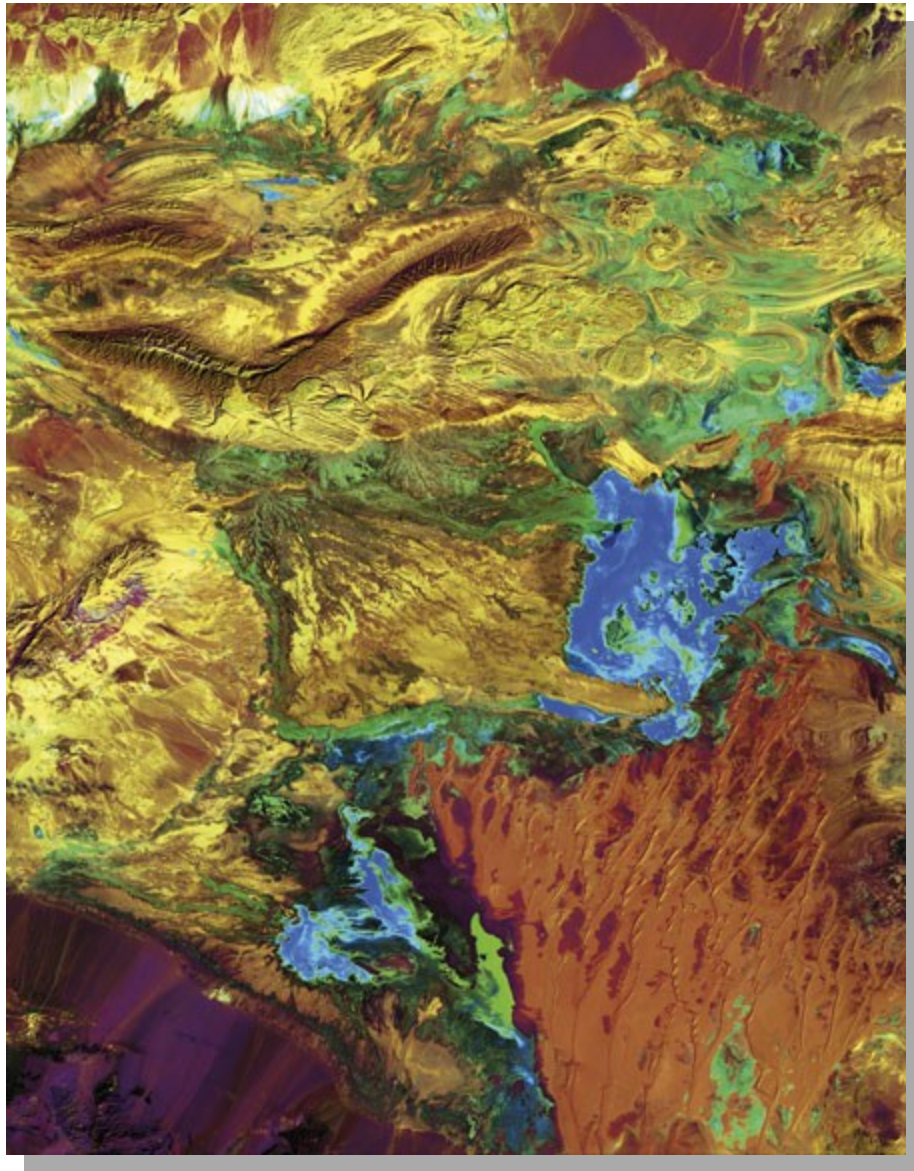
Information sources:

Sky Safari Pro planetarium software  
<http://apod.nasa.gov/apod/ap080712.html>  
[http://panther-observatory.com/gallery/deepsky/doc/NGC7331\\_cass.htm](http://panther-observatory.com/gallery/deepsky/doc/NGC7331_cass.htm)  
<http://www.seasky.org/celestial-objects/galaxies.html>  
<http://www.1000plus.com/2000plus/tp230.html#b22371>

Image Information: Shot 10/17/12, 10/22/12, 11/8/12, and 11/10/12 with a QSI 583 wsg camera through an AT8RC telescope at 1625 mm FL. Autoguided with SX Lodestar camera, SX Adaptive Optics unit and MaxIm DL. Image capture with MaxIm DL Pro. 480 minutes Luminance frames (32 subexposures 15 minutes each), 110 minutes each Red, Green and Blue frames (11 subexposures 10 minutes each) through AstroDon RGB filters. Images calibrated, stacked, hot pixel removal, Luminance deconvolution, and RGB merge in CCD-Stack. Lum-RGB merge and further adjustments in Photoshop CS5. Background noise and gradient adjustment with Noise Ninja and Gradient XTerminator. FITS Liberator courtesy of ESA.

## Landsat Legacy

*courtesy of The Year in Space*



*Image credit: USGS EROS Center / US Dept of Interior / NASA*

Landsat Legacy NASA's Landsat program, begun in 1972, was the first series of orbiting spacecraft designed to monitor Earth's land masses. The third Landsat satellite was launched into near-polar orbit thirty-five years ago on March 5, 1978, and it captured multi-spectral images of Earth for five years. Since 1999, Landsat 7 has built on that legacy, capturing informative—and stunning—multi-spectral images like this montage of landforms in Iran's largest desert, the Dasht-e Kavir, or Great Salt Desert. The almost uninhabited region covers an area of more than 77,000 square kilometers (29,730 square miles) and is a mix of dry streambeds, desert plateaus, mudflats, and salt marshes. Extreme heat, dramatic daily temperature swings, and violent storms are the norm in this inhospitable place.

## 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)*

help you find this fuzz ball from the outer solar system.

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

### M83 (Cont'd)

*(Continued from page 7)*

stars blows away surrounding gas, revealing the bright blue stars within. Older stars, not nearly so blue, appear throughout the scene.

### CCAS Membership Information and Society Financials

#### Treasurer's Report by Don Knabb

##### Feb 2013 Financial Summary

Beginning Balance	\$1,609
Deposits	\$80
Disbursements	<u>\$0</u>
Ending Balance	\$1,689

#### New Member Welcome!

Welcome new CCAS member Stan Lurcott of 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](mailto: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!



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 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.greeneearthlighting.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 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](mailto: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](mailto: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](mailto: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:

<b>President:</b>	Roger Taylor 610-430-7768
<b>Vice President:</b>	Liz Smith 610-842-1719
<b>ALCor, Observing, and Treasurer:</b>	Don Knabb 610-436-5702
<b>Secretary:</b>	Ann Miller 610-558-4248
<b>Librarian:</b>	Barb Knabb 610-436-5702
<b>Program:</b>	Dave Hockenberry 610-558-4248
<b>Education:</b>	Kathy Buczynski 610-436-0821
<b>Webmaster and Newsletter:</b>	John Hepler 724-349-5981
<b>Public Relations:</b>	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](mailto:treasurer@ccas.us)

### Sky & Telescope 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**.

