Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 18, No. 12 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ¤ 2006 & 2009* *December 2010*

In This Issue

Happy Holidays!

Photo courtesy of Phil Plait, Bad Astronomy Blog / Discover Magazine

Membership Renewals Due

12/2010	Constante Goll Gupta Hardie, Jr. Jafar
01/2011	Bronstein Lessley Smith Thota
02/2011	Calobrisi & Family Kalinowski & Family La Para Reimer

Important December 2010 Dates

5th • New Moon 12:36 p.m.

13th • First Quarter Moon 8:59 a.m.

13th-14th • Geminid meteor shower peaks.

21st • Full Moon 3:13 a.m.

21st • Lunar Eclipse 2:41 - 3:17 a.m.

27th • Last Quarter Moon 11:18 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, December 17, 2010** - Lower Merion Conservancy's Winter Solstice Celebration, The event will run from 6:00-8:00 p.m. in Rolling Hill Park. For more information, contact Lindsay Smith, Education Director at Lower Merion Conservancy, 1301 Rose Glen Road, Gladwyne, PA 19035, 610-645-9030 ext. 102.

Fall/Winter 2010/2011 Society Events

December 2010

2nd • PA Outdoor Lighting Council monthly meeting, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website (http://www.polcouncil.org/).

10th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date December 11th).

10th • West Chester University Planetarium Show, "The Final Frontier," Schmucker Science Building, Show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via the planetarium's webpage.

15th • CCAS Holiday Party in West Chester, PA. The party is for CCAS members and their families and starts at 6:30 p.m. See page 7 location and directions.

17th • Lower Merion Conservancy Winter Solstice Celebration, 6:00-8:00 PM. Lower Merion Conservancy, 1301 Rose Glen Road, Gladwyne, PA 19035,

20th • Open call for articles and photographs for the January 2011 edition of Observations.

26th • Deadline for newsletter submissions for the January 2011 edition of *Observations*.

January 2011

5th • PA Outdoor Lighting Council monthly meeting, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website (http://www.polcouncil.org/).

7th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date January 8th).

11th • DVD Lecture Series: "The Mass Density of the Universe", half-hour video presentation of a lecture by Professor Alex Filippenko, UC Berkeley. Room 113, Merion Science Center (former Boucher Building), West Chester University. The presentation immediately precedes the monthly meeting and starts at 7:00 p.m.

11th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker, Charles Zarcone: "Solar Sights, Storms and Sounds." The meeting starts at 7:30 p.m.

20th • Open call for articles and photographs for the February 2011 edition of Observations.

26th • Deadline for newsletter submissions for the February 2011 edition of *Observations*.

Minutes from the November 2010 CCAS Monthly Meeting

by Don Knabb, CCAS Secretary and Observing Chair

- Approximately 15 members were in attendance.
- DVD presentation: *When Geometry is Destiny* was shown.
- Program – Dr. Beth Willman, PhD, Haverford College presented "*On (Nearly) Invisible Galaxies*"
- Constellation of the Month: Dave Hockenberry presented Triangulum. We need volunteers to present constellations for the next few meetings.

The Library is Open!

by Barb Knabb, CCAS Librarian

CCAS Lending Library

The CCAS lending library is open for business after relocating this past summer. Don't forget that CCAS members have free access to all the books, videos, and magazines currently on our shelves. We have a wide assortment of books covering a variety of astronomical topics, including guides to telescopes, binoculars, and other hardware; beginner, intermediate, and advanced guides to stargazing; historical non-fiction; maps, charts and catalogues; and Sky & Telescope Magazines from 1955 through 2006. We also have a series of historical videos on past NASA interplanetary missions. To borrow a book, map, or video, contact me via e-mail at librarian@ccas.us or by phone at (610) 436-5702.

January 2011 Guest Speaker

by Dave Hockenberry, CCAS Program Chair

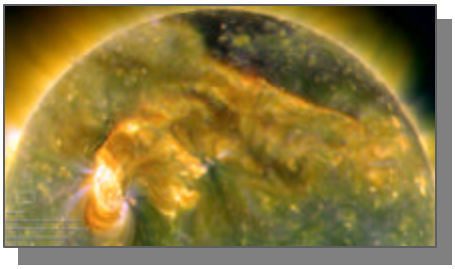

Photo courtesy of Astronomy Photograph of the Day

Our January 2011 guest speaker, Charles Zarcone, is a member of the Delaware Valley Amateur Association. He describes himself as "a guy who bought a solar telescope and is oriented to observing the Sun." His presentation is entitled "Solar Sights, Storms and Sounds." He includes a brief review of the interior of the Sun, and discusses the storms observed on the surface of the Sun. His presentation includes an audio presentation of the sounds emanating from two stars and concludes with a light and sound show.

Please note that inclement weather or changes in speakers' schedules may affect the program. In the event there is a change to the program, CCAS members will be notified via e-mail with as much advance notice as possible.

2011 Spring Speaker Series

by Dave Hockenberry, CCAS Program Chair

Currently we have presentation speakers scheduled to speak at our monthly meetings. Our January (Charles Zarcone, UDel) and April (Jerry Lodriguss) sessions are scheduled. We are looking for speakers for the months of February, March, and May, 2011. If you have any suggestions for future speakers, or are interested in being a speaker yourself, please contact Dave Hockenberry at programs@ccas.us.

We are also looking for Constellation of the Month (COM) presenters for the 2011 season. COM is a great way to learn the night sky and a useful tool if you are pursuing one of the Astronomical League's observing club awards. Participating is easy! Contact Kathy Buczynski at vp@ccas.us for a COM template to fill out.

The Christmas Tree Cluster

courtesy of La Sila Observatory, Chile

A collection of stars in the constellation Monoceros (the Unicorn), the Christmas Tree Cluster was discovered by William Herschel in the late 18th century. Photo taken using the Wide Field Imager (WFI) attached to the 2.2-meter Max-Planck Society/ESO telescope at the La Silla observatory in Chile.

An Invitation to Present

submitted by Lowell Lyon, ALCON 2011 Co-Chair

The national conventions of the Astronomical League or ALCons (Astronomical League Convention) take place yearly at different locations around the country.

ALCON 2011 is unique in that it is the first time that the national gathering will focus on personal observing under very dark skies. It is also the first time that an ALCON convention will be held at a National Park, Bryce Canyon National Park in southern Utah to be exact. Bryce Canyon is known for some of the darkest skies in the lower 48 States.

We want to take advantage of amateur astronomers that have specialized knowledge and/or skills relating to personal observing that would be of interest to conference attendees. Some suggested topics are: 1) Use of filters; 2) Celestial mechanics; 3) Observing session tools and techniques; 4) CCD/Astrophotography; 5) Eyepiece design and uses; 6) Specific observing programs for double stars, galaxy clusters, planetary nebula, etc.; 7) Maximizing GO-TO technology; 8) Observing programs outside the Messier Catalogue; 9) Planning with computer software; 9) Solar observing techniques; and 10) More ideas?

We invite participation from your club members to help with presentations and/or workshops

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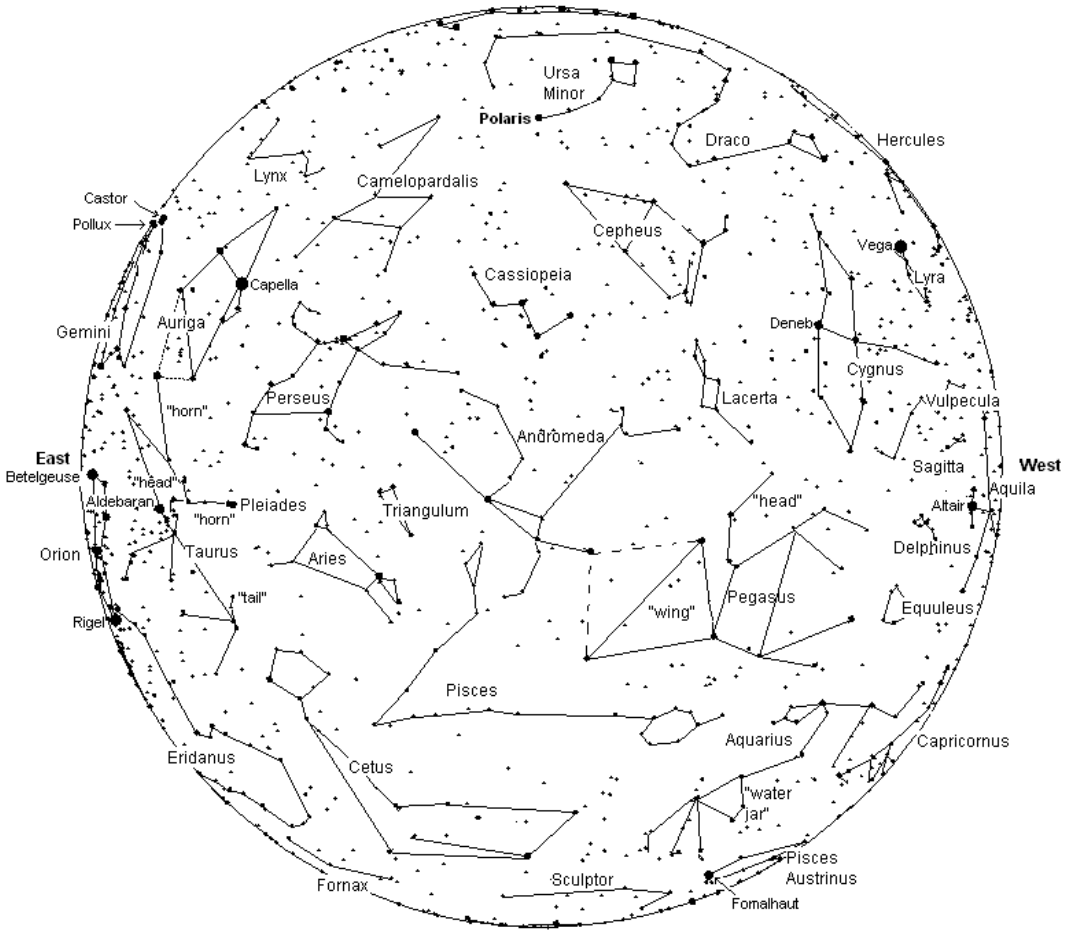
The Sky Over Chester County

December15, 2010 at 9:00 p.m. EST

Note: the constellation stick figures used on the chart above were adapted from the book *The Stars: A New Way to See Them*, by H. A. Rey. This excellent guide to learning the constellations can be purchased at many area book stores, or from online booksellers.



This chart was produced using *Guide 8.0* skymapping software by Project Pluto, Bowdoinham, Maine

The faintest stars shown on this chart are fifth magnitude.

Date	Sunrise	Sunset	Moon Phases		
12/01/2010	7:03 a.m. EST	4:36 p.m. EST	First Quarter	12/13/2010	8:59 a.m. EST
12/15/2010	7:15 a.m. EST	4:36 p.m. EST	Full Moon	12/21/2010	3:13 a.m. EST
12/31/2010	7:22 a.m. EST	4:45 p.m. EST	Last Quarter	12/27/2010	11:18 p.m. EST
			New Moon	12/05/2010	12:36 p.m. EST

December 2010 Observing Highlights

by Don Knabb, CCAS Secretary & Observing Chair

December 5	New Moon, 12:36 p.m.
December 13	First-quarter Moon, 8:59 a.m.
December 13-14	The Geminid meteor shower peaks
December 13	The Lunar Straight Wall is visible tonight
December 18	Use binoculars to see the Pleiades near the Moon tonight
December 20-21	A total lunar eclipse is visible from 1:30 a.m. to 5:00 a.m.
December 21	Full Moon, 3:13 a.m.
December 21	Winter starts at 6:39 p.m., the longest night of the year
December 27	Last Quarter Moon, 11:18 p.m.

The Best Sights This Month: If you are willing to get up in the middle of the night you can see the first total eclipse of the Moon in almost three years during the early morning hours of December 21st. A more accessible event is the annual Geminid meteor shower on the night of December 13/14.

Mercury: The best opportunity to see Mercury is at the end of December in the pre-dawn sky.

Venus: At the start of December Venus rises more than 3 hours before the Sun and is impossible to miss in the glow before the dawn.

Mars: Mars is so far away it can only be viewed with a telescope or binoculars about a half hour after sunset. Nonetheless, if you want to see a rare event then seek out the red planet on December 6th when it is occulted by a thin crescent Moon or on December 13th when it is very close to Mercury.

Jupiter: The king of the planets continues to put on a great show during December. Look for this gem of the sky just after it gets dark when Jupiter will be high in the sky. I spent quite a bit of time looking at Jupiter during November and seeing the dark band on the planet and the dance of the 4 bright Galilean moons is better than watching a movie. Well, it is quieter anyway.

Saturn: The ringed planet is rising around 2 a.m. during December, but is best observed before the sky brightens with the dawn because it is high in the sky at that time.

Uranus and Neptune: Uranus continues to hang out with Jupiter through December. Neptune rises a couple of hours ahead of Jupiter and Uranus so it is reasonably high in the sky as the glow of the sunset fades. Finder charts are available at skyandtelescope.com/uranusneptune.

The Moon: Full Moon is on December 21st, the same night as the total lunar eclipse, of course. This is the Full Cold Moon; or the Full Long Nights Moon. It is also sometimes called the Moon before Yule. The term Long Night Moon is appropriate because the midwinter night is indeed long, and because the Moon is above the horizon for a long time. The midwinter Full Moon has a high trajectory across the sky because it is opposite a low Sun.

The lunar eclipse begins at 2:41 a.m., reaches the mid-point at 3:17 a.m. and ends at 3:52 a.m. So if you get up for a trip to the litter box in the middle of the night, glance out the window and look for the typical red colored Moon that occurs during a full lunar eclipse. That red color on the Moon comes from all the sunrises and sunsets that ring the Earth at that time!

Constellations: Even though winter begins this month we can still see the Summer Triangle dipping into the west just after it gets dark. But look to the east and you will see the constellations that make it worth dressing warmly and spending some time outside during the cold December nights. Bright Capella in Auriga is high in the east over the "V" of Taurus the Bull. Just behind Taurus is Orion the Hunter, the most easily recognized constellation of the winter months.

Messier/Deep Sky: There is so much to see in the December sky you won't be lacking targets if Santa brought you any new astronomy equipment! If it is

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Through the Eyepiece: M78, a Reflection Nebula in Orion

by Don Knabb, CCAS Secretary & Observing Chair

During the winter months it seems that my eyes and telescope or binoculars are drawn to Orion as if it were an optical magnet. The large size and distinctive shape of Orion just begs for close examination. I've spent a great deal of time staring into M42, the Great Orion Nebula and I always look at the chain of stars that make a distinct "S" shape between the center and right stars of the hunter's belt.

My next target when the weather cooperates will be M78, the brightest diffuse reflection nebula in the sky. M78 is part of the large cloud of gas and dust that is centered on M42. As a reflection nebula, M78 is a cloud of interstellar dust which shines in the reflected and scattered light of bright blue stars within the cloud.

M78 is easy to find on a dark night using binoculars or a telescope. As you can see in the sky map of Orion below, just find Orion's belt and scan up and left at a 90 degree angle to the belt. M78 is about a thumb's width away from Alnitak, the eastern star of the three bright stars that make up Orion's belt (left in the map). But you won't see this object with your naked eyes.

Visually, M78 resembles a faint comet. It is just visible in binoculars under good conditions, as a very dim patch. Small telescopes show it to be remarkably bright and you will see the two stars within the nebula as can be

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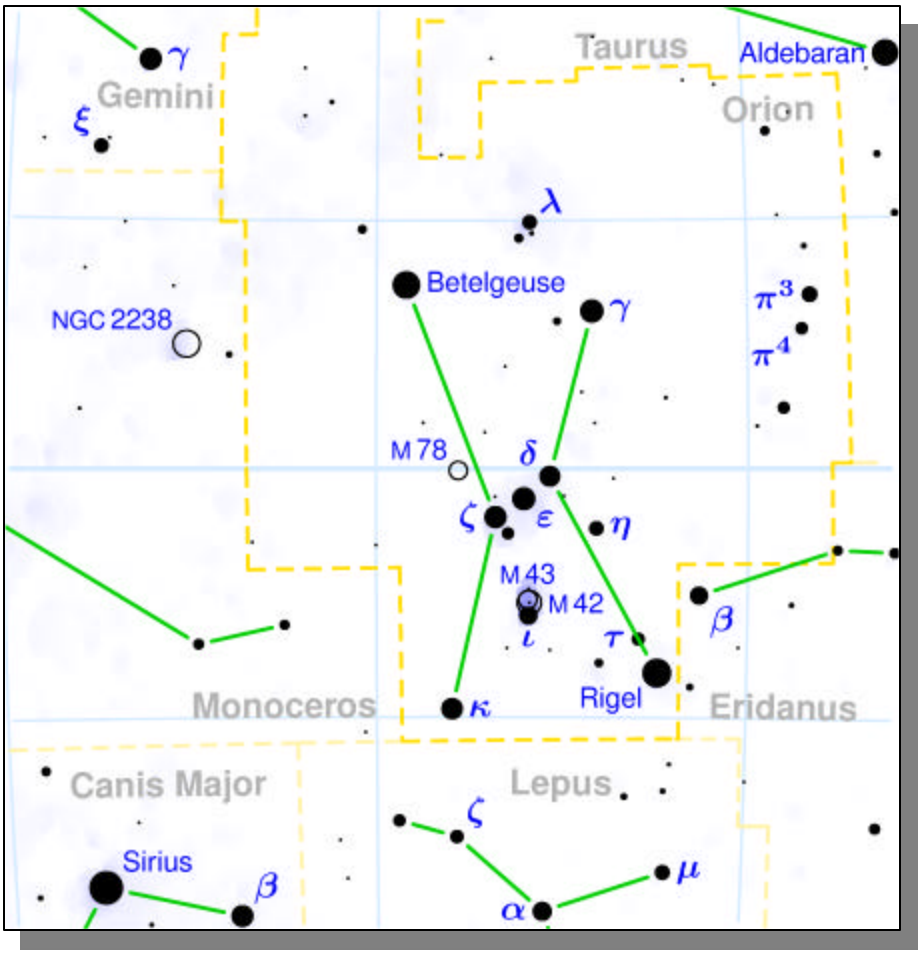

Orion Constellation: M78 is located near the hunter's belt.

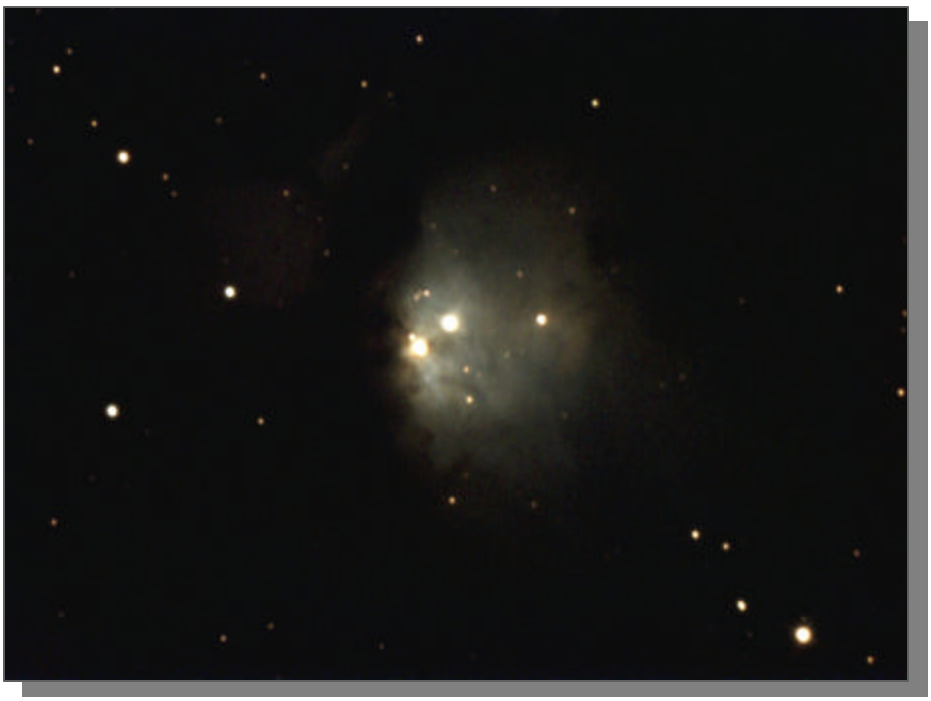

Photo courtesy of CCAS member Dave Hockenberry.

Observing (Cont'd)

(Continued from page 5)

not too cold there is a long list of beautiful objects in easy reach of even a small telescope or any pair of binoculars. First look for the Andromeda galaxy high in the south, then head east to the three open clusters in Auriga. Use a low power eyepiece in your telescope and zoom in to the Pleiades, although they are better captured in binoculars. Then look nearly straight up and find the Double Cluster in Perseus.

Comets: Comet Hartley 2 will still be visible early in the month when the Moon is absent from the skies. There are finder charts at skyandtelescope.com under the Celestial Objects section.

Meteor Showers: This is a great year to see the Geminid meteor shower, one of the most reliable meteor showers of the year. The peak is on the night of December 13/14 when the Moon is at first quarter and will set just after midnight. Up to 120 meteors per hour are possible from this shower.

Annual CCAS Holiday Party

Ho Ho Ho! Join us on Wednesday, December 15th, 2010, for our annual holiday party. CCAS members and their families will get together to celebrate the holiday season at the Four Dogs Tavern, starting at 6:30 P.M. The tavern is located beside the Marshallton Inn. For the tavern's address & directions, call (610) 692-4367, or visit the official website at http://www.marshaltoninn.com/.

Through the Eyepiece (Cont'd)

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seen in Dave Hockenberry's photo (preceding page).

When telescope size increases, brighter areas are revealed as stars and the visible nebula size itself increases. For larger telescopes, be sure to look for adjoining nebula NGC 2071 to the northeast, NGC 2067 in the northwest and very faint NGC 2064 located southwest. M78 doesn't hold up well to moonlight conditions.

So add M78 to your list of targets for cold but clear winter nights. With Orion's belt as a guide to find it you will not get too cold while seeking this faint fuzzy of the winter night sky!

Information credits:
http://en.wikipedia.org/wiki/Messier_78
http://www.seds.org/messier/m/m078.html
http://www.universetoday.com/39296/messier-78/

CCAS Original Astrophotography

by Gaston Baudat

Photo taken from my backyard observatory at Glenmoore PA 19343 on Saturday November 13th, 2010. Scope: Takahashi FSQ-85ED apochromat at f/5.3. Guider: C11 at f/10 + SBIG remote guider head. Mount: CGE. Imager: SBIG ST4000XCM at -20C.14 x 3 = 42 minutes of total exposure. Processing: Maxim DL.

Advanced Astrophotography Workshop at Mt. Lemmon SkyCenter

text & photos by Dave Hockenberry and Ann Miller

In September 2010, Ann and I attended a course at the Mt. Lemmon SkyCenter. This was an advanced astrophotography image processing course held at the University of Arizona's Mt. Lemmon SkyCenter, taught by Adam Block. I had ordered his instructional DVD series earlier this summer, and had just started working though the tutorials when I received an e-mail and a subsequent phone call from Adam. Would I be interested in attending his workshop? Registration so far was sparse, and he was looking for potential students for the course.

Boy, was I interested. It seems like every time I open the pages of Sky & Telescope, Astronomy Magazine, or any of my other Astro periodicals I see Block's photographs. They are, in a word, stunning. My wife has long been after me to take a course in astrophotography since I first started putting cameras on the back of my telescope 4 years ago. For some reason I never seemed to be able to get away for NEAF workshops, Jim Burnell's class in New York, or any of the other venues. I suppose she got tired of my complaints and grousing after frustrating nights of astrophotography with nothing to show for my efforts.

But this time for once my work schedule didn't interfere. So we registered ourselves for the course, booked two airline tickets for Tucson, and I started furiously working though as much of the DVD material as I could. This was an exciting prospect, as Mt. Lemmon is one of several observatory sites owned and operated by the University of Arizona. Kitt Peak is certainly the best known of these sites, but Mt. Lemmon sits in a different location about 40 miles as the crow flies from Tucson. A former military radar surveillance installation, it was purchased by the University after the radar station was decommissioned. One of the radar towers still stands on the site, surrounded by about 8 domes and working telescopes. It sits at an elevation of 9100 feet, and is right in the middle of an Arizona State Park forest.

Mount Lemmon SkyCenter, University of Arizona

Mt. Lemmon hosts several programs for the public, from a five hour SkyNights introduction to astronomy to 4-day overnight SkyIsland camps for kids to daytime programs every third Saturday during warm months for solar observing and nature programs. For more information about the programs offered here visit the official website at www.skycenter.arizona.edu .

Our course started Thursday morning at the airport where the group met and then proceeded to the Steward Observatory Mirror Lab (covered in the October 2010 edition of *Observations*). After touring the mirror lab we went for an informal lunch where we all got to meet each other and get acquainted. Eleven people were registered for the workshop, and some spouses were also along for the trip. After lunch we headed for the mountains. This was a great ride, moving through picturesque Southwestern deserts with large groves of tall cactus and 90+ degree heat up into very cool mountain pine forests where the temperature got down into the low 40's at night. The SkyCenter

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Advanced Astrophotography (Cont'd)

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is rather isolated, as observatory sites tend to be. We needed to go through 2 gates to get onto the grounds, first through the State Park gates and then through the SkyCenter gates. There is little else around the site, and the nearest (very) small town is about 30 minutes away by car. The surrounding forest is gorgeous, and several trails passed right by the Sky Center.

On arrival we met Adam's only assistant for the course, Dale Cupp. An accomplished astrophotographer in his own right, Dale helped maintain and use the 24 inch RC Optical telescope Adam uses, taught some of the course material, and saw to the needs of everybody on the mountain. He even did some of the cooking. Dale gave us a hearty greeting, and announced "Welcome to Astrophotography Boot Camp." Coming from a career ex-military officer, he meant it.

We quickly realized that much of the rest of the weekend was going to be spent with our noses in our laptops. Adams method uses very carefully obtained and refined luminance images as a base, only using red, green, and blue frames to "color" the luminance image. We were required before arriving at the course to either purchase or download a free trial version of CCD Stack. It was assumed that we already knew the fundamentals of obtaining and processing LRGB images. This course taught us how to make the most of processing software to achieve the best results. We first explored CCD Stack, with data provided to us of Adam's images of IC 1274. Adam *loves* this program, and there were a lot of routines to learn. He uses this not only for aligning, registering, and combining (stacking) images, but of particular interest was its "Deconvolve" algorithms. He demonstrated the superiority of CCD stack to deconvolve programs from MaxIm and AIP for Windows. Bloated, "overstretched" stars shrank like magic into round, pleasing shapes.

As expected, the bulk of our time was spent learning Photoshop. This monster software suite is an absolute essential for image processing. It was expected that we all knew the basics of histogram manipulations, LRGB merges, and basic tools like clone stamp. Much of our time was spent learning how to use layer masks, specialized filters, blur tools, and curve routines to squeeze the most out of each pixel.

He also spent a great deal of time on color adjustments and balance. I have often wondered how better amateur astrophotos showed such vibrant colors, and thought it was simply the light gathering capacity of large mirror telescopes. Large mirrors help, but they are only part of the story. Much of what we see in really good processed images has more to do with the colorization choices the image processor makes. The Photoshop section of the course was the most exhaustive, and exhausting.

Our typical day started at 7:00 AM with breakfast, and by 9 AM we were busy with our computers. After a quick lunch break we were back in our computers until dinner, then more processing until about 9 PM. At this point we would usually take a break and head out to the telescope for some visual observing, and also to collect some fresh data! For two nights we collected images of IC 63, and spent much of the rest of the weekend using the data we gathered to assemble an image. This was exciting, as when we did our processing routines the image improvements were obvious. Equally obvious was how badly things looked when we screwed up! The "instant feedback" was a great part of this learning experience.

Even more interesting was how at the end each student, and instructor, wound up with a final product that differed from everybody else's. Adam took great delight in pointing out where and at what point in the processing chain we made choices and decisions that affected the outcome. Indeed, this to a large degree underscored the "personality" of each person. I include my own final image of IC 63, but Adam's much better final version can be found at

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Blue Rings Around Red Galaxies

by Trudy E. Bell & Dr. Tony Phillips

Beautiful flat rings around the planet Saturn are one thing—but flat rings around entire galaxies?

That is the astonishing discovery that two astronomers, Samir Salim of Indiana University at Bloomington and R. Michael Rich of UCLA described in the May 10, 2010, issue of *The Astrophysical Journal Letters.*

"For most of the twentieth century, astronomers observing at visible wavelengths saw that galaxies looked either 'red and dead' or 'blue and new,'" explained Salim. Reddish galaxies were featureless, shaped mostly like balls or lentils; bluish ones were magnificent spirals or irregular galaxies.

Elliptical galaxies looked red, astronomers reasoned, because they had mostly old red giant stars near the end of their life cycles, and little gas from which new stars could form. Spiral and irregular galaxies looked blue, however, because they were rich in gas and dust that were active nurseries birthing hot, massive, bluish stars.

At least, that's how galaxies appear in visible light.

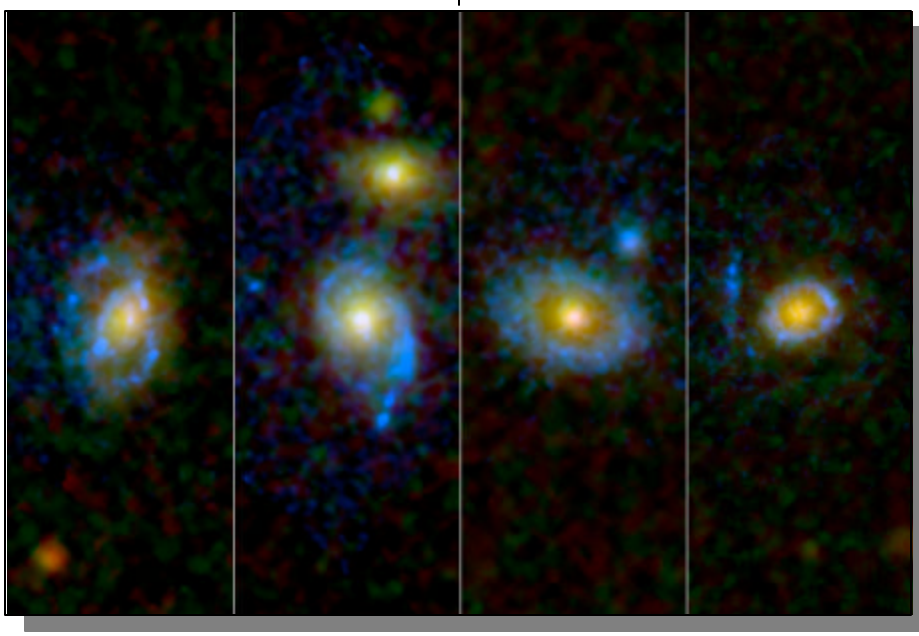
As early as the 1970s, though, the first space-borne telescopes sensitive to ultraviolet radiation (UV) revealed something mysterious: a few red elliptical galaxies emitted "a surprising ultraviolet excess," said Rich. The observations suggested that some old red galaxies might not be as "dead" as previously supposed.

To investigate, Salim and Rich used NASA's Galaxy Evolution Explorer satellite to identify 30 red elliptical galaxies that also emitted the strongest UV. Then they captured a long, detailed picture of each galaxy using the Hubble Space Telescope.

"Hubble revealed the answer," says Salim. The UV radiation was emitted by enormous, flat bluish rings that completely surrounded each reddish galaxy, reminiscent of the rings of Saturn. In some cases, the bluish rings even showed a faint spiral structure!

Because the bluish UV rings looked like star-forming spiral arms and lay mostly beyond the red stars at the centers of the elliptical galaxies "we concluded that the bluish rings must be made of hot *young* stars," Salim continued. "But if new stars are still being formed, that means the red-and-dead galaxies must have acquired some new gas to make them."

How does a galaxy "acquire some gas?" Salim speculates that it was an act of theft. Sometimes galaxies have close encounters. If a gas-rich irregular galaxy passed close to a gas-poor elliptical galaxy, the gravity of the elliptical galaxy could steal some gas.



The Galaxy Evolution Explorer UV space telescope helped to identify red elliptical galaxies that also emitted the strongest UV. These are detailed, long-exposure Hubble Space Telescope images of four of these galaxies that capture the UV-emitting rings and arcs indicative of new star formation.

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Space Place (cont'd)

(Continued from page 10)

Further studies by Galaxy Evolution Explorer, Hubble and other telescopes are expected to reveal more about the process. One thing is certain, says Rich: "The evolution of galaxies is even more surprising and beautiful than we imagined."

The press release is available at http://www.galex.caltech.edu/newsroom/glx2010-03f.html. The full published article is "Star Formation Signatures in Optically Quiescent Early-Type Galaxies" by Samir Salim and R. Michael Rich, *The Astrophysical Journal Letters* 714: L290–L294, 2010 May 10.

Point the kids to the Photon Pile-up Game at http://spaceplace.nasa.gov/en/kids/galex/photon, where they can have fun learning about the particle nature of light.

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

Have a safe and happy holiday season!

Nicholas's Humor Corner

by Nicholas La Para

CCAS Original Astrophotography

by Dave Hockenberry

NGC 925 in Triangulum. Barred spiral about 45 million light years distant. Shot with Starlight Xpress H9C camera, stack of 13 10-minute images through Astrotech AT8RC telescope at 1650mmFL, Losmandy G11 mount. Autoguided with SX Lodestar camera and MaxIm DL5. Stacked/calibrated with MaxIm using SD Mask, all other stretch/color adjustment with Photoshop Cs3.

Advanced Astrophotography (cont'd)

IC 63, courtesy of Adam Block

The group at the 24 inch RC telescope observing Jupiter in the daytime

(Continued from page 9)

www.caulumobservatory.com/gallery .

During imaging runs, we went back to the classroom and would continue working on processing techniques until people either went to bed or we were finished with our imaging runs, flat frames, darks and bias frames. This was usually at about 3 or 4 in the morning. There was a large diversity of ability and experience in our group, and I found that some of the best teaching and informative sessions occurred at the wee hours of the morning. At 7 AM we would get up and do it all over again. Sometimes we would take breaks for other observing activities like solar or daytime astronomy, but for the most part we were in the classroom. I quickly discovered that my poor laptop with its 1 gig of RAM was woefully inadequate to the tasks being thrown at it. These images are huge, ranging from 8 to 15 megapixels each, and some of the routines called for very complex transformations/computations on multiple images simultaneously. This could take many minutes on my poor old machine. Those with more robust laptops fared better.

Adam did include, for the first time he said, an hour long section devoted to one-shot color camera images. It was quite clear from the outset that he doesn't think much of these cameras, and he has his reasons. A Bayer array on a one-shot camera needs four different-colored pixels to do what a single pixel can do in a monochrome black-and-white CCD camera. Resolution is thus lost with a Bayer array. Furthermore, Bayer array images need to be color converted before many CCD Stack or Photoshop stretches/transformations can be performed, limiting the number of really useful techniques that can be applied. Otherwise too many artifacts become glaringly evident, and these are not easily fixed. This was tough for me, as my favorite imaging cameras to

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Advanced Astrophotography (Cont'd)

(Continued from page 12)

this point have been one shot color cameras with very high grade scientific chips. But my monochrome cameras aren't cooled, and Adam pointed out to me that it is almost impossible to use uncooled CCD cameras of either type to get any kind of decent images. He suggested that I change my gear.

So do I recommend this course?

Yes. The price of the course was about $900.00, and included lodging, all meals, all course handouts and instruction, and if desired transportation in the "group van" to the mountain. It does NOT include Block's instructional DVD series. As mentioned, CCD Stack software was a course requirement, but if not purchased it could be downloaded as a free trial 20 days before the course. The accommodations are dorm-style rooms which were clean and quite serviceable. The food was tasty and plentiful, although it disappeared quickly when the sessions resumed. Dale kept the coffee pot continuously updated, and I found Adam to be a gifted and enthusiastic teacher.

The site is remote, so anybody in the group who wasn't involved with the course had limited options for activities. There were plenty of hiking trails in the nearby forest, and a hummingbird banding project operates on the premises. Ann actually got to hold a hummingbird in her hand, a right sociable bird that didn't fly off until given a drink of sugar water. Those into nature photography can find plenty of subjects. Indeed, a local red-tail hawk put on quite a display for us while we were there. I would recommend to those not in the classes to be sure to bring along your own entertainment, books, DVD's and the like to pass the time.

I think I also learned, as a result of attending this workshop, just how deep this "rabbit hole" of astrophotography goes. I had a chance to image and process pictures with the best telescopes, mounts, cameras, and gear under some of the best seeing conditions on the planet. I now know why Adam Block's images look like they do. But I also learned what I need to do to in order to get up to the next level in my own photographic efforts. I was not planning to take the course when I did, and think I would have gotten much more out of it if I had time to really work through and learn the instructional DVD series first. When I go again, it will be after I have digested *all* of his DVD lessons and the workshop material. And next time, I take my parallelogram binocular tripod in the suitcase – those skies are nothing short of stupendous!

Red tail Hawk, Photo Taken by Ann Miller

DVD Review: Mystery in the Sky

by Fred De Lucia

Free Flow Media has issued the DVD "Mystery in the Sky" a documentary by Guustaaf Damave, who also wrote, edited and directed. It is a two-part overview of the eclipsing binary star Epsilon Aurigae, which has puzzled astronomers for over 150 years due to its 27-year cycle where for two years it dims and then returns to its former brightness apparently due to something dark that passes in front of it. Each part of "Mystery in the Sky" is approximately 30 minutes, so it neatly lends itself to a classroom or a young audience that is eager to learn about a mysterious phenomenon that is actually visible with the naked eye.

The DVD is part an outreach project part and part science education. It solicits the assistance of the general public and amateur astronomers to help measure the light curve of Epsilon Aurigae so to provide data that may ultimately define what the dark mass is that eclipses the binary. Demonstrating how the eclipse conceivably occurs through striking computer animation, the science behind it is readily accessible by anyone. There is an array of talking heads, as one would expect in a science program, but here they are quite enthusiastic about the project. They provide the necessary information on how to observe the star, record and report observations through the Citizen Sky Project (http://www.citizensky.org/) and the American Association of Variable Star Observers (http://www.aavso.org/vstar/). They clearly make the point that anyone can do this to make a real contribution to science.

So, the question that arises is, "Why can't professional astronomers do this?" It's because professional instruments are far too sophisticated to make the necessary observations. Off-the-shelf telescopes and the human eye can do a far better job of observing the characteristics of Epsilon Aurigae and gathering the data necessary for reporting. Mention is also made of the Galaxy Zoo, the comet hunters and the sunspot cycles, all of which have had significant assistance from amateurs further supporting the "anyone can do this" approach.

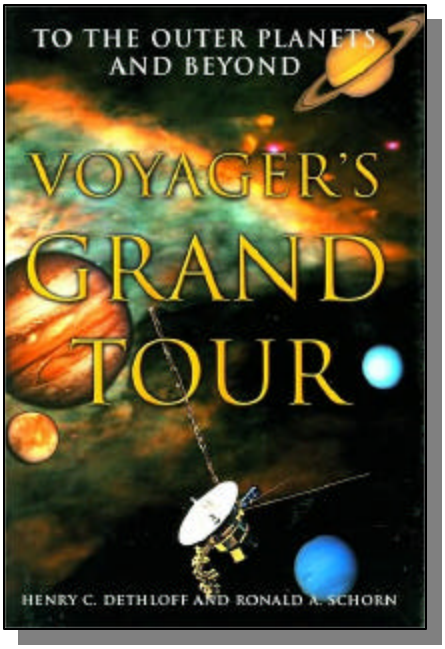
The second part of the program has the speakers addressing how their passion for astronomy began, why science needs more emphasis in schools, the contributions of graduate students on what Epsilon Aurigae might be and why help is necessary from the amateur community in observing the light curve.

With a sprinkling of clever quotes from Albert Einstein, creative use of computer animation accompanied by easy to un-

(Continued on page 15)

Book Review: Voyager's Grand Tour

courtesy of Book News, Inc.



Dethloff (history, Texas A & M U.) and Schorn (physics and astronomy, Texas A & M U.) tell the story of the Voyager 1 and Voyager 2 spacecrafts' Grand Tour of the outer planets. They begin by recounting the inception of the idea of planetary exploration and its transformation into reality, and then examine the story of Voyager science—experiments selection, how effective Voyager has been in planetary scientific exploration, the knowledge gained about the Earth's space and planetary environment, and what might be learned as the mission continues. Academic but accessible to the general reader.

"A rare planetary alignment, a visionary team, and two space probes have transformed our knowledge of the solar system - and beyond. Every 176 years,

(Continued on page 15)

DVD Review (Cont'd)

(Continued from page 14)

derstand narration, the novice is not only entertained by the program but is educated in the basics of star formation and hopefully, by its conclusion, inspired to pursue the material in greater depth.

An "Extra" feature on the DVD that's approximately 5 minutes in length is the "Citizen Sky Planetarium Show", a concise easily understood overview of variable stars with emphasis on Epsilon Aurigae.

The DVD can be ordered from the usual sources.

To comment on this review contact Fred De Lucia at fred-world@comast.net

Book Review (cont'd)

(Continued from page 14)

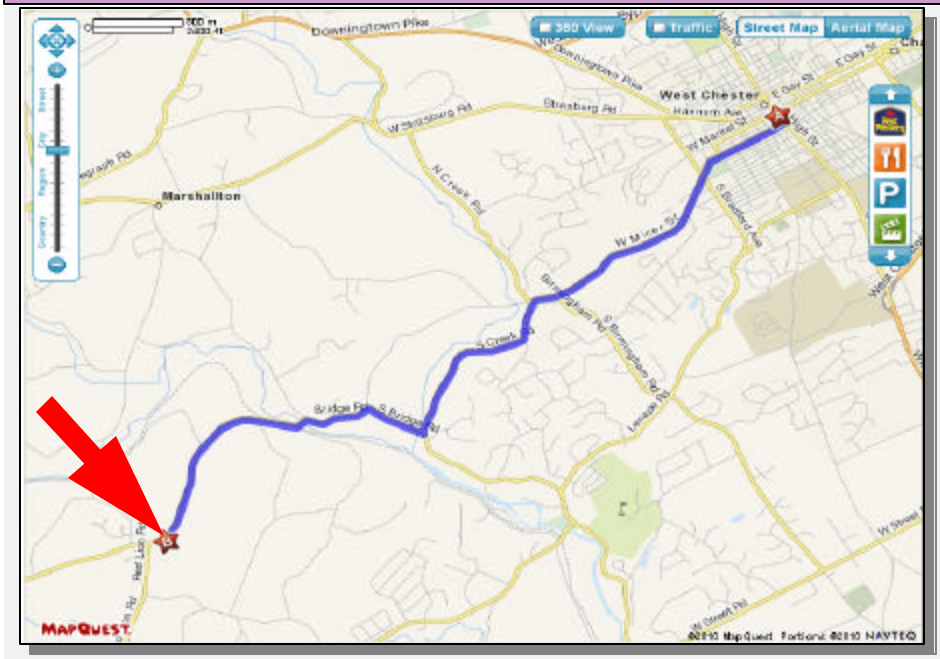
Earth and the outer planets gather on one side of the sun, allowing close observation in a single flight, or Grand Tour. To exploit this alignment, the Voyager team developed the so-called gravity assist that essentially sling-shot Voyager 1 and 2 from planet to planet."

"Since their 1977 launch, the probes have discovered strange new worlds and transmitted streams of revolutionary data and eye-popping images that have exploded long-held theories and raised new questions about our solar system."

With unfettered access to NASA archives and imagery, and interviews with Voyager scientists and engineers, Dethloff and Schorn have produced the only comprehensive account of one of man's foremost scientific and engineering achievements. Readers are invited into Voyager's inner circle, conceiving, launching, and directing the craft as it discovers rings around Jupiter, geysers on Triton, and intriguing possibilities of extra-terrestrial life.

[Editor's Note: I was reading this book prior to the start of the semester. I'm looking forward to finishing it — when the semester is over in a few weeks! What I found the most fascinating was the numerous attempts to launch the project starting back in the 1960s. I remember well the launches and subsequent planetary visits, but I never knew all the backstory.]

CCAS Directions



Brandywine Valley Association

The monthly observing sessions (held year-round) 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).

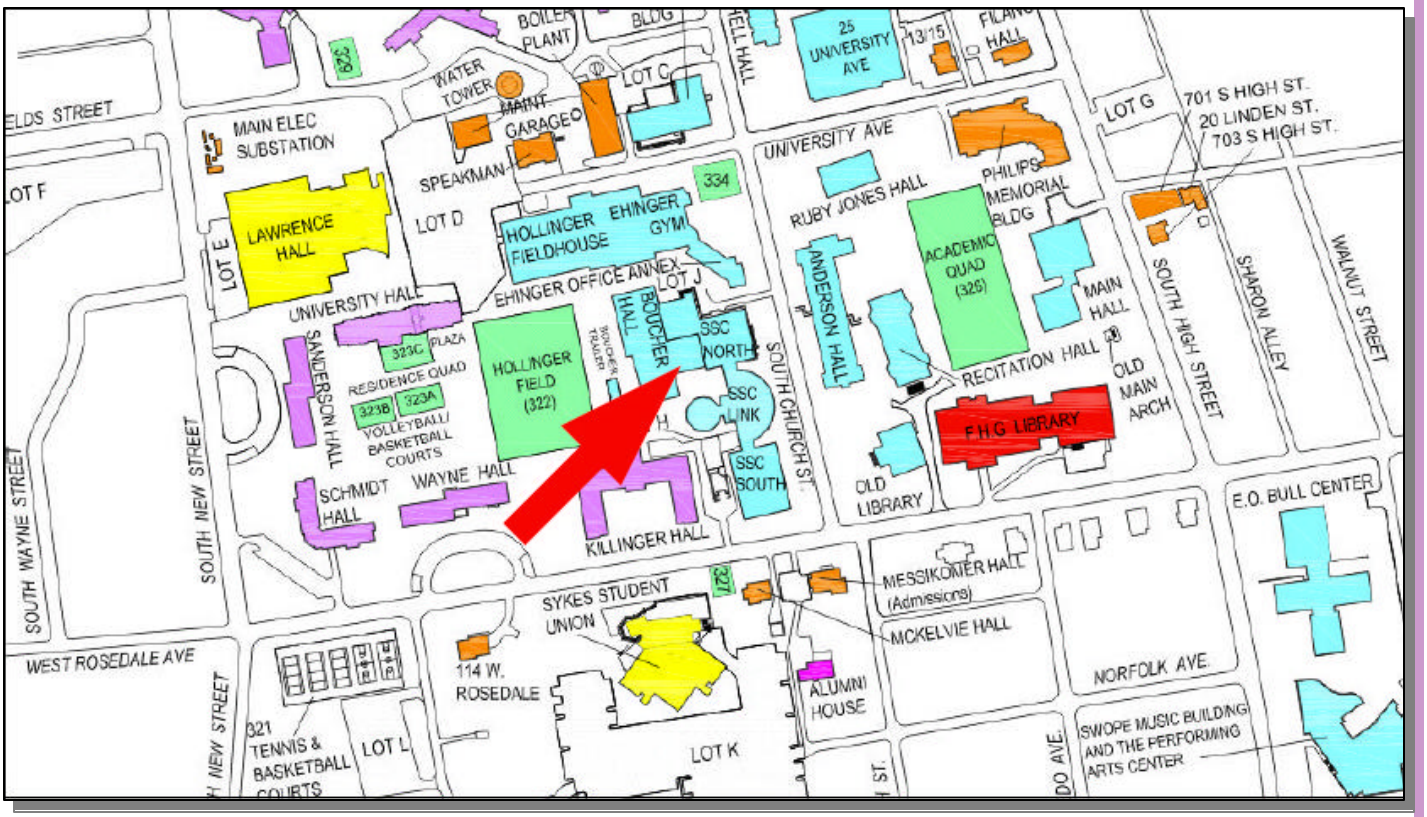
Brandywine Valley Association
1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090
http://brandywinewatershed.org/

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.

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).



Lovell Lecture (Cont'd)

(Continued from page 3)

at this convention as guest speakers. We have blocked out a limited number of 45-50 minute time segments during the days of the convention. We will have full access to any audio-visual equipment needed. If there is anyone interested in becoming involved, please email or write to let us know of your availability and requirements. We look forward to hearing from you!

Lowell Lyon, ALCON 2011 Co-Chair
bolide@sisna.com
www.astroleague.org

CCAS Membership Information and Society Financials

Treasurer's Report
by Bob Popovich

Oct. 2010 Financial Summary

Beginning Balance	$1,678
Deposits	$135
Disbursements	$66
Ending Balance	$1,747

New Member Welcome!

Welcome new CCAS member Ernest Bogusch 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:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

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 society. 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 Kathy Buczynski 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. Kathy's phone number is 610-436-0821.

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 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 (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 Pres:	Kathy Buczynski 610-436-0821
ALCor and Treasurer:	Bob Popovich 484-467-5562
Secretary and Observing:	Don Knabb 610-436-5702
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 724-801-8789
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 Treasurer's Report in 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:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

Phone: 484-467-5562
e-mail: B2N2@verizon.net

*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 Bob Popovich.

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 Bob first at **484-467-5562.**

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 Bob Popovich.**