



# Observations

A Monthly Publication Of The  
**CHESTER COUNTY ASTRONOMICAL SOCIETY**

Vol. 17, No. 11 Two-Time Winner of the Astronomical League's Mabel Sterns Award  $\#$  2006 & 2009 November 2009

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## CCAS Upcoming Nights Out

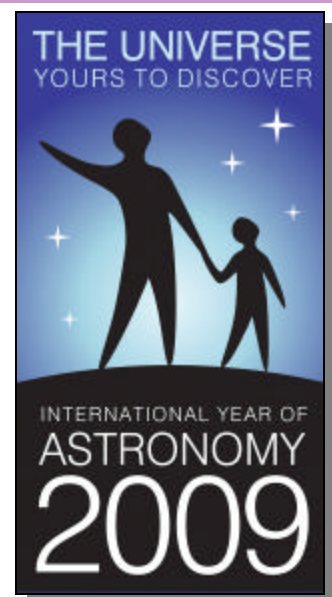
CCAS has several "nights out" over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

- $\times$  Friday, November 13th, we are hosting a private night out at Goshen Friends School. We expect 50-75 students from the ages of 3 to 11, accompanied by parents, so we'll need everyone who is available to help out with this large event. More details will follow via a member e-mail distribution.
- $\times$  Friday, December 18th, the Lower Merion Conservancy will be having their annual Winter Solstice Celebration from 7:00-9:00 p.m. at Rolling Hill Park in Gladwyne. The organization has asked us to participate again this year in this well-attended event. Last year the event turned into a Full Moon party in January after it was rained out in December.

**Save the date! The CCAS Annual Holiday Party will be held on December 8th, 2009, from 6:00 to 9:00 p.m., at the Popovich residence. Bob and Betsy request the pleasure of your company at their home at 416 Fairfax Drive in Exton. Contact them via e-mail at [b2n2@verizon.net](mailto:b2n2@verizon.net), or by phone at (484) 467-5562, by November 30th to let them know if you will be attending. Cheers!**

## Important November 2009 Dates

- 1st** • Daylight Savings Time ends 2:00 a.m. ET.
- 2nd** • Full Moon at 7:14 p.m.
- 9th** • Last Quarter Moon at 3:56 p.m.
- 16th** • New Moon at 7:14 p.m.
- 17th** • Leonid Meteor Shower Peaks in the Early Morning Hours.
- 24th** • First Quarter Moon, 9:39 p.m.



## Membership Renewals Due

11/2009	Athens Buczynski Holenstein O'Hara
12/2009	Diaz Houser Swishen Triolo Zibinski
01/2010	Bronstein

## Autumn 2009 Society Events

### November 2009

4th • PA Outdoor Lighting Council monthly meeting, Bucktown Branch of National Penn Bank, 1111 Ridge Rd, (Rt. 23 just west of Rt. 100) in South Coventry Township, PA, 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>).

6th • "No Night without a Telescope" Event, WCU Academic Quad (Between Recitation and Main Halls). 6:00—8:00 PM.

10th • DVD Lecture Series: "Black Holes—Abandon Hope, Ye Who Enter", 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.

10th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Featured speaker: Dr. Karen Vanlandingham, "Killer Rocks from Outer Space". Constellation of the Month (COM): Aquarius, presented by Dave Hockenberry. The meeting starts at 7:30 p.m.

13th • CCAS hosts a private night out at Goshen Friends School.

13th • "No Night without a Telescope" Event, WCU Academic Quad (Between Recitation and Main Halls). 6:00—8:00 PM.

13th • West Chester University Planetarium Show, "Spectacular Saturn", Schmucker Science Building, Show starts at 7 p.m. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

20th • Open call for articles and photographs for the December 2009 edition of Observations.

20th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date November 21st). The observing session starts at sunset.

20th • "No Night without a Telescope" Event, WCU Academic Quad (Between Recitation and Main Halls). 6:00—8:00 PM.

20th • Reservations start for the December 11th planetarium show at the WCU Planetarium. For more information, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

26th • Deadline for newsletter submissions for the December 2009 edition of Observations.

### December 2009

2nd • PA Outdoor Lighting Council monthly meeting, Bucktown Branch of National Penn Bank, 1111 Ridge Rd, (Rt. 23 just west of Rt. 100) in South Coventry Township, PA, 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>).

8th • CCAS Holiday Party. The party is for CCAS members and their families and starts at 7:00 p.m. See the December 2009 edition of Observations for location and directions.

11th • West Chester University Planetarium Show, "Our Amazing Sun", Schmucker Science Building, Show starts at 7 p.m. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

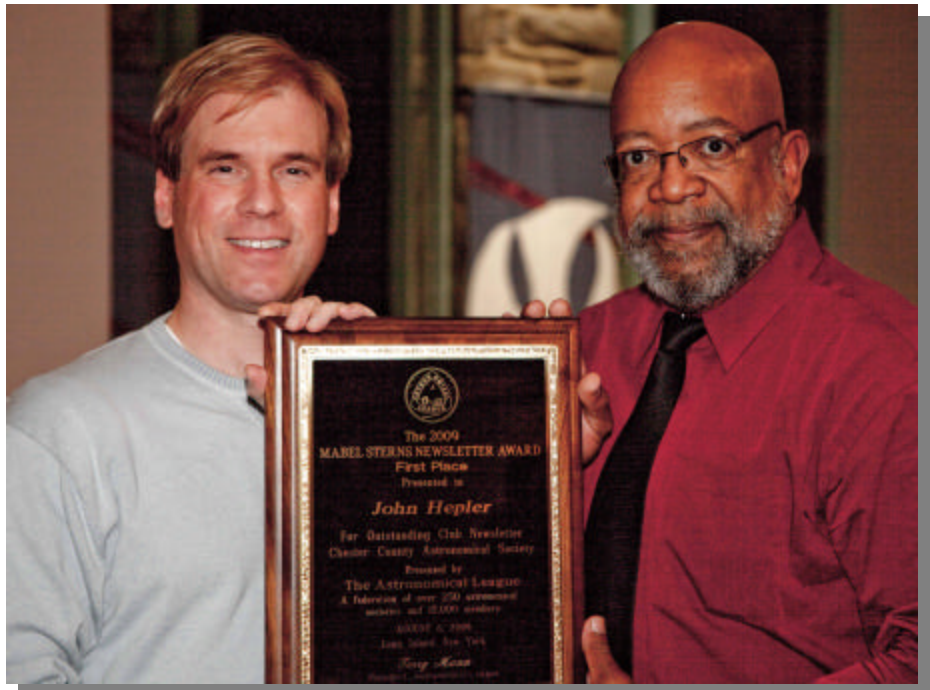
18th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date December 19th). The observing session starts at sunset.

20th • Open call for articles and photographs for the January 2010 edition of Observations.

26th • Deadline for newsletter submissions for the January 2010 edition of Observations.

## Mabel Sterns Award Presentation

by Roger Taylor, CCAS President



After the lecture by Dr. Ed Devinney on October 14th, CCAS President Roger Taylor presented John Hepler with the Astronomical League's 2009 Mabel Sterns Award for newsletter editing. This is the second time CCAS has won this award.

## CCAS Original Astrophotography: NGC1977

by Dave Hockenberry



NGC1977, the Running Man Nebula in Orion, shot 10/20/09, stack of 11 five-minute images, through Televue NP102is, with SXVF H9C color camera, autoguided with Meade LX200R 'scope, autoguided, stacked, and color adjusted with Maxim DL5, minor color balance adjusted in Photoshop CS3.



## November 2009 Meeting Guest Speaker

by John Hepler, CCAS Webmaster & Newsletter Editor

WCU professor Dr. Karen Vanlandingham is our guest speaker on November 10th, 2009. Her presentation is entitled, "Killer Rocks from Outer Space." Her presentation will answer the questions, "How often do meteors impact the Earth? What are your chances, personally, of getting hit by one? Do you really have to worry about going to jury duty next week?"

She will discuss the origin of asteroids, meteors and comets, Earth's encounters with them (past, present and future), and what they can tell us about the solar system.



She earned her B.S. in Physics from New Mexico Institute of Mining and Technology and a Ph.D. in Astronomy from Arizona State University.

Dr. Vanlandingham worked for

Columbia University at its Biosphere 2 Center where she taught in the Universe Semester program for 5 years. She worked briefly teaching introductory astronomy classes at the University of Arizona. In 2005 she joined the faculty of the Department of Geology and Astronomy at West Chester University.

She is the director of Project ASTRO WCU, a program designed to pair up astronomers with K-12 teachers to improve astronomy teaching in the classroom. Her research areas are interacting binary stars, isolated magnetic white dwarfs, and astronomy education.

## More Volunteers Needed for "No Night without a Telescope"

by Kathy Buczynski, CCAS Vice President

As reported in the last two month's editions of *Observations*, West Chester University is taking part in a local program involving area colleges called "No Night Without a Telescope" to celebrate the IYA. The program started on Friday October 23rd and is continuing every Friday until November 20th. Dr. Bob Thornton, Dr. Karen Vanlandingham, and Dr. Marc Gagne have portable telescopes set up on the lawn of the WCU Quad from 6:00 to 8:00 PM, where anyone will be able to look through telescopes at Jupiter, star clusters, the Moon, and more. CCAS members have been invited to participate in the program.

So far we have had volunteers

from CCAS for the events on October 23rd and November 6th. We still need volunteers for November 13th (when we also have a large private night out scheduled at Goshen Friends' School) and November 20th.

This is a great opportunity to en-



Telescopes will be set up on campus in the academic Quad between the main library and Ruby Jones Hall.

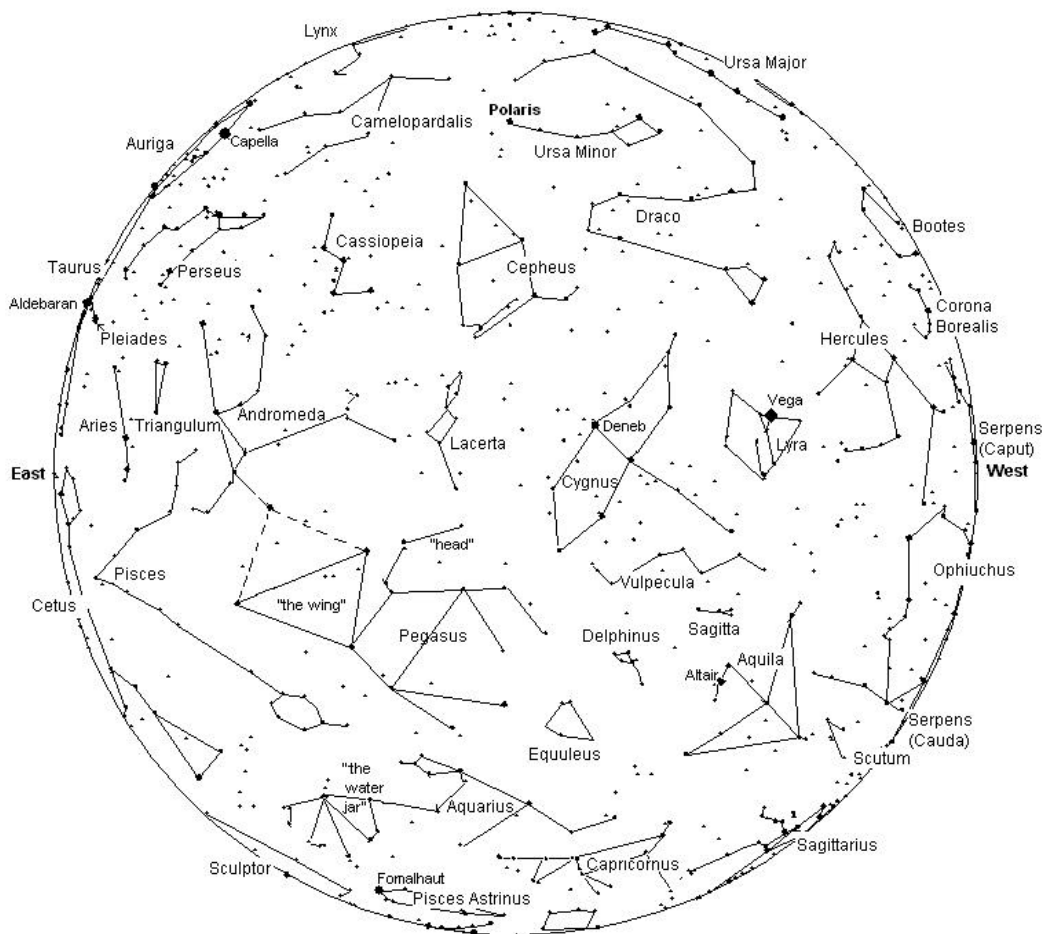
gage WCU students and the public in the wonders of the night sky. Perhaps we can even encourage them to join CCAS!

In the case of clouds or rain, WCU astronomers either open the West Chester University Planetarium, or have a public presentation in the Merion Science Center. Notification as to whether the events are outside or inside is posted on the official site (<http://courses.wcupa.edu/rthornton/nnwtblack.htm>) by 5:00 PM each Friday.

If you want to participate in any of the remaining nights, or want more details about the program, contact Bob Thornton at (610) 436-2614 or via e-mail at [rthornton@wcupa.edu](mailto:rthornton@wcupa.edu).

### The Sky Over Chester County November 15, 2009 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		
11/01/2009	6:30 a.m. EST	4:58 p.m. EST	First Quarter	11/24/2009	9:39 p.m. EST
11/15/2009	6:46 a.m. EST	4:44 p.m. EST	Full Moon	11/02/2009	7:14 p.m. EST
11/30/2009	7:02 a.m. EST	4:36 p.m. EST	Last Quarter	11/09/2009	3:56 p.m. EST
			New Moon	11/16/2009	7:14 p.m. EST

## November 2009 Observing Highlights

by Don Knabb, CCAS Observing Chair

November 1	Mars passes through the Beehive cluster in the early morning hours
November 1	Daylight Saving time ends at 2:00 a.m.
November 2	Full Moon 2:14 p.m.
November 3	The Moon is very near the Pleiades
November 9	Last quarter Moon 10:56 a.m.
November 16/17	The Leonid meteor shower peaks
November 16	New Moon 2:14 p.m.
November 24	First quarter Moon 4:39 p.m.

**The Planets:** Jupiter continues to be the only planet visible during the evening observing hours, but it is a wonderful sight in the south just after the Sun sets. To see any other naked eye planet you need to stay up quite late or get up before dawn.

**Mercury:** There are no viewing opportunities for Mercury during November. Darn!

**Venus:** Venus is unmistakable in the east as you go out to pick up your paper. Our sister planet is sinking lower in the twilight each day as it races away from us in our dance around the Sun.

**Mars:** The Red Planet is in the constellation Cancer the Crab and rises just before midnight during November. During the night of October 31/November 1 Mars drifts across the Beehive Cluster. I hope it doesn't get stung!

**Jupiter:** Viewing conditions for the king of the planets continues to be excellent during November. At a recent star party at Hoopes Park in West Chester the only object penetrating the thin clouds was Jupiter, and people lined up to see the big guy with his small herd of moons.

**Saturn:** The ringed planet is slowly climbing higher in the early morning sky, rising about 4 hours ahead of the Sun.

**Uranus and Neptune:** Both of the outer gas giants

continue to be visible in the evening sky. Neptune is quite close to Jupiter and Uranus is one constellation to the east. Finder charts are in the September issue of Sky and Telescope magazine and also on the Sky and Telescope web site.

**Pluto:** The tiny, distant "ex-planet" sets too early to be seen during November.

**The Moon:** Full moon is on November 2nd at 2:14 p.m. This is the Full Beaver Moon. For Native Americans, the time of this full moon was the time to set beaver traps before the swamps froze, to ensure a supply of warm winter furs. It is sometimes also referred to as the Frosty Moon, but I don't think they were referring to the snowman, even though the Moon kind of looks like the head of a snowman. On November 3<sup>rd</sup> the Moon is very near the Pleiades.

**Constellations:** It seems amazing, but if you go out for the paper just before dawn you will see our friend Orion the Hunter in the south. Since I don't spend any more time than necessary outside in the morning on a work day, instead I look to the sky in the evening, which is getting longer as we approach the "dark days" of November and December. There are many delightful objects in the sky for our viewing pleasure such as the setting Summer Triangle, the Great Square of Pegasus, Queen Cassiopeia overhead and the Pleiades rising in the east. So before the cold nights of the winter arrive, spend some time outside during November when the air is clear and crisp.

**Messier/deep sky:** My list of deep sky objects for November starts with M31, the Andromeda Galaxy. After gazing at those billions and billions of stars (no, Carl Sagan never did actually say that!) I look high in the sky toward the Double Cluster in Perseus. Then I gaze upon the jewels of the sky, the Pleiades cluster and after that head east to the open clusters of Auriga, M36, M37 and M38. It doesn't get any better than this!

**Comets:** There are no reasonably bright comets to

*(Continued on page 7)*

## Through the Eyepiece: M34, An Open Cluster in Perseus

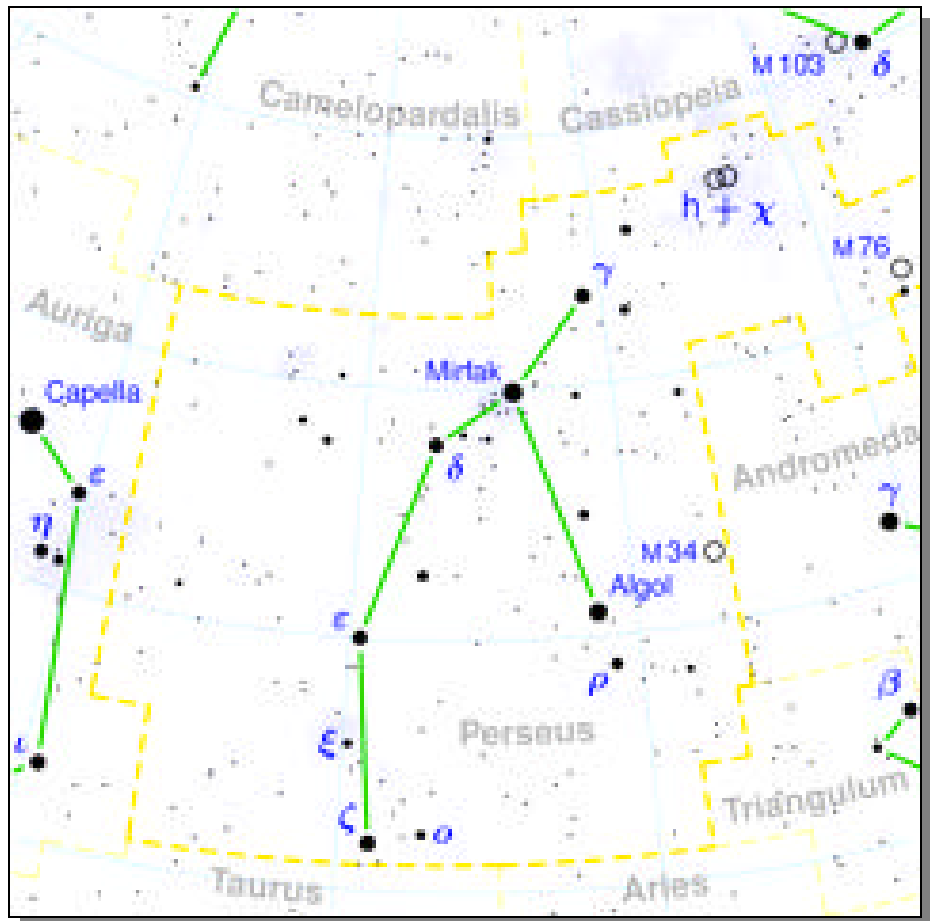
by Don Knabb, CCAS Observing Chair

While you are cruising around the area of the sky that includes the Andromeda Galaxy, the Double Cluster in Perseus and the Pleiades in Taurus, look for M 34, an open cluster just to the northwest of the famous variable star Algol in Perseus.

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

Messier 34 (also known as M 34 or NGC 1039) is an open cluster in the constellation Perseus. It was probably discovered by Giovanni Batista Hodierna before 1654 and is included by Charles Messier in his catalog of comet-like objects in 1764. Messier described it as, "A cluster of small stars a little below the parallel of  $\delta$  (Andromendae). In an ordinary telescope of 3 feet one can distinguish the stars."

Open clusters are very important objects in the study of stellar evolution. Because the stars are all of very similar age and chemical composition, the effects of other more subtle variables on the properties of stars are much more easily studied than they are for isolated stars. A number of open clusters, such as the Pleiades, Hyades or the Alpha Persei Cluster are readily visible for the naked eye. Some others, such as the Double Clus-



Sky map credit: [http://en.wikipedia.org/wiki/File:Perseus\\_constellation\\_map.png](http://en.wikipedia.org/wiki/File:Perseus_constellation_map.png)

ter, are barely perceptible without instruments, while many more can be seen in binoculars

(Continued on page 7)



M34 Photo credit: CCAS member Pete LaFrance

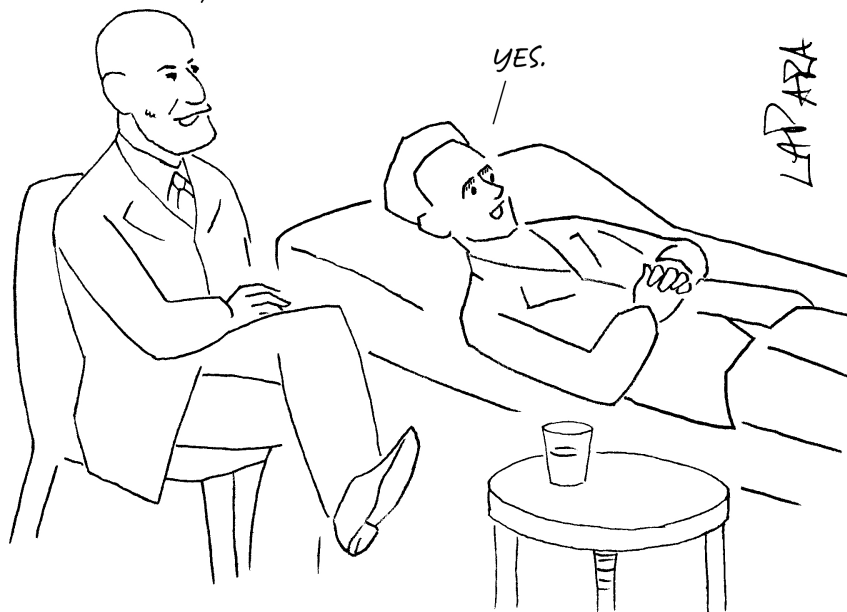


## Nicholas's Cartoon Corner

by Nicholas La Para

### FREUD MEETS HEISENBERG

SO, HERR PROFESSOR, IS THE GLASS HALF-FULL OR HALF EMPTY?



## Follow the Space Place on Twitter!

by Colleen Barboza, Space Place Coordinator

Now you can find the Space Place on Twitter! Did you ever wonder what happened in space twenty years ago today? Well, Space Place did and we're tweeting these amazing pieces of space trivia and history to all of our followers!

Go to <http://twitter.com/nasaspaceplace> and sign up to follow us on twitter. The early bird gets the worm! We have a very limited number of Earth Science Week packets, and we'd love to share them, particularly with our NASA Space Place Twitter fans. After signing up, please send us an e-mail as well as your snail mail, and we will ship out your Earth Science Week packets immediately. Don't forget to include your contact information (name, address and club name).

We hope to hear from you soon, so Tweet away!

## Observing (Cont'd)

(Continued from page 5)  
view during November.

**Meteor showers:** The Leonid meteor shower peaks in the early morning hours of November 17<sup>th</sup>. It is very hard to predict meteor shower activity, but there is a chance of an outburst that may produce up to 100 meteors per hour. This is most likely between 1:30 a.m. and dawn on November 17<sup>th</sup>.

**Spring Forward & Fall Back...** as the old saying goes! **Early Sunday morning, November 1st, daylight savings time ends (at 2:00 a.m. to be precise). Don't forget to turn your clocks back one hour!**

## M34 (Cont'd)

(Continued from page 6)  
or telescopes.

M34 can be found with the naked eye under good conditions as a faint nebulous patch. It is probably beyond perception in Chester County skies without binoculars. But it is resolved into stars even in 10x50 binoculars and is best at low magnifications in telescopes. About 20 brighter stars, filling a 10' area, are surrounded by a larger number of fainter outlying members. Larger amateur instruments show a total of about 80 stars. Many stars are arranged in pairs.

I've included a picture of M 34 taken by CCAS member Pete LaFrance in this article.

You can view more of Pete's astrophotography at <http://www.plafrance.org/>.

So add M 34 to your observing list for November. It is not one of the more famous star clusters but it is a beautiful cluster worthy of your attention.

Information credits

<http://www.seds.org/messier/m/m034.html>  
[http://en.wikipedia.org/wiki/Messier\\_34](http://en.wikipedia.org/wiki/Messier_34)  
[http://en.wikipedia.org/wiki/Open\\_clusters](http://en.wikipedia.org/wiki/Open_clusters)

**Staring at Lightning**  
by Jet Propulsion Laboratory

There's something mesmerizing about watching a thunderstorm. You stare at the dark, dramatic clouds waiting for split-second bursts of brilliant light — intricate bolts of lightning spidering across the sky. Look away at the wrong time and (FLASH!) you miss it.

Lightning is much more than just a beautiful spectacle, though. It's a window into the heart of the storm, and it could even provide clues about climate change.

Strong vertical motions within a storm cloud help generate the electricity that powers lightning. These updrafts are caused when warm, moist air rises. Because warmth and lightning are inextricably connected, tracking long-term changes in lightning fre-

quency could reveal the progress of climate change.

It's one of many reasons why scientists want to keep an unwavering eye on lightning. The best way to do that? With a satellite 35,800 km overhead.

At that altitude, satellites orbit at just the right speed to remain over one spot on the Earth's surface while the planet rotates around its axis — a "geostationary" orbit. NASA and NOAA scientists are working on an advanced lightning sensor called the Geostationary Lightning Mapper (GLM) that will fly onboard the next generation geostationary operational

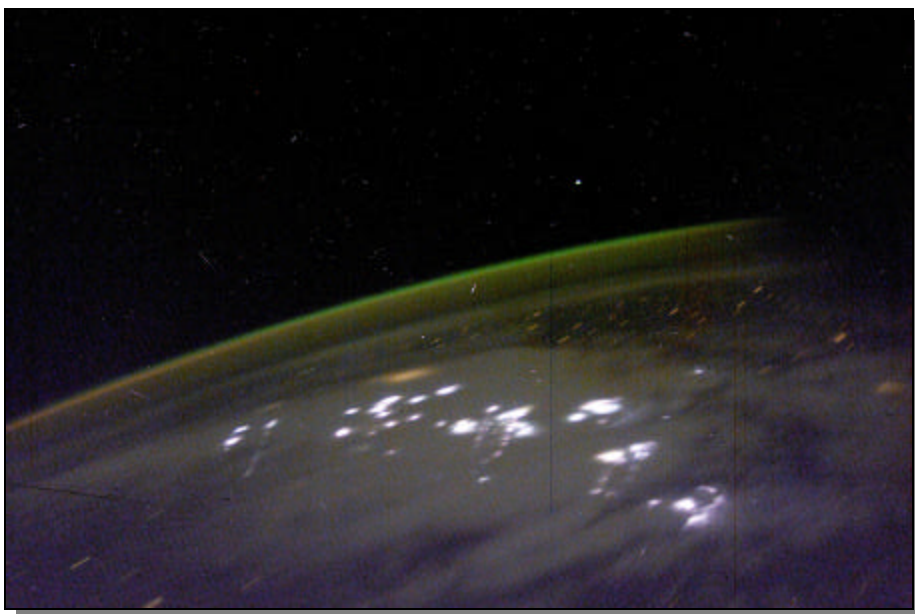
environmental satellite, called GOES-R, slated to launch around 2015.

"GLM will give us a constant, eye-in-the-sky view of lightning over a wide portion of the Earth," says Steven Goodman, NOAA chief scientist for GOES-R at NASA's Goddard Space Flight Center. Once GLM sensors are flying on GOES-R and its sister GOES-S, that view will extend 18,000 km from New Zealand, east across the Pacific Ocean, across the Americas, and to Africa's western coast.

With this hemisphere-scale view, scientists will gather an unprecedented amount of data on how lightning varies from place to place, year to year, and even decade to decade. Existing lightning sensors are either on the ground — which limits their geographic range — or on satellites that orbit much closer to Earth. These satellites circle the Earth every 90 minutes or so, quickly passing over any one area, which can leave some awkward gaps in the data.

Goodman explains: "Low-Earth orbit satellites observe a location such as Florida for only a minute at a time. Many of these storms occur in the late afternoon, and if the satellite's not overhead at that time, you're going to miss it."

*(Continued on page 9)*



*The Geostationary Lightning Mapper (GLM) on the next generation of GOES satellites will detect the very rapid and transient bursts of light produced by lightning at near-infrared wavelengths. This image was taken from the International Space Station and shows the Aurora Australis and lightning.*



## CCAS Original Astrophotography: M27, The Dumbbell Nebula

by Dave Hockenberry



M27, the Dumbbell Nebula in Vulpecula. Taken 10/4/09. Stack of 13 images, 5 minutes each, Meade 10" Lx200R focal reduced F/6.3, with Starlight Xpress SXVF H9C color camera, autoguided with Stellarvue 70 mm refractor, stacked and autoguided with Maxim DL, curve stretched and slight color adjustment with Photoshop CS3.

## Lightning (cont'd)

(Continued from page 8)

GLM, on the other hand, won't miss a thing. Indeed, in just two weeks of observations, GLM is expected gather more data than NASA's two low-Earth orbiting research sensors did in 10+ years.

The new data will have many uses beyond understanding climate change. For example, wherever lightning flashes are abundant, scientists can warn aircraft pilots of strong turbulence. The data may also offer new insights into the evolution of storms and prompt improve-

ments in severe weather forecasting.

Staring at (FLASH!) Did you miss another one? The time has come for GLM.

Want to know how to build a weather satellite? Check the "how to" booklet at [http://scijinks.gov/weather/technology/build\\_satellite](http://scijinks.gov/weather/technology/build_satellite).

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

## Metanexus Lecture Review

by John Hepler

Last month, our regular meeting session was rescheduled so CCAS members could attend a free lecture by Dr. Ed Devinney, President of the Board of Directors of the Metanexus Institute and Visiting Astronomy & Physics Professor at Villanova University.

The event was held on Wednesday, October 14th, at the Bryn Mawr Presbyterian Church. Dr. Devinney spoke for approximately 45 minutes. His lecture, *Our Weird Universe: Can We Ever Hope To Understand It?*, was a lively overview of the history of mankind's understanding of the Universe and how it has become more "weird" over time as we have learned more about it.

The highlight of the speech was Dr. Devinney's use of the "weird-o-meter" to measure the strange nature of the Universe as we have come to understand it. Those Society members who attended agreed that it was an enjoyable evening for the audience and for the speaker himself.

Visit <http://metanexus.net/magazine/tabid/68/id/10898/Default.aspx> to learn more about the lecture series, entitled "Science and Spirit". You can also call (484) 592-0304 or e-mail the institute at [info@metanexus.net](mailto:info@metanexus.net).



Dr. Ed Devinney Speaking at the Bryn Mawr Presbyterian Church on 10/14/09.

## A Learning Space for Learning About Space

by Alissa Walker, contributor to Edutopia, The George Lucas Foundation

In the middle of the Mojave Desert, about 100 miles northeast of Los Angeles, students in the Mission Control room are monitoring a rocket in oblong orbit around Earth and the Moon and dutifully reporting their observations to the National Aeronautics and Space Administration. The fully operational space center is just one of the many student-run programs at the **Lewis Center for Educational Research's Academy for Academic Excellence**, a K-12 charter school in Apple Valley.

In this series of smart, low-slung buildings nestled against a rocky outcropping, there are endangered fish to check on, sick tortoises to tend, and native plants to cultivate in the greenhouse. Surrounded by surprisingly lush grounds of native plants and synthetic grass along the Mojave River, the Lewis Center for Educational Research, serving some 1,300 students at the academy, is an oasis in more ways than one: The modern buildings blend seamlessly into the landscape; the brick in the walls reflects the speckled pattern of nearby rocks. Large steel-framed windows bring in natural light and provide vistas onto the desert floor and the stunning blue sky.

And inside, a commitment to real-world learning is taken to soaring heights -- literally, into space -- with spectacular results.

Rick Piercy, president and CEO of the Lewis Center school,

strides confidently across the blooming campus (which is on a unique freshwater marsh on the Mojave River) wearing a black button-down shirt embroidered with the colorful logo of NASA's LCROSS (the **Lunar Crater**



Connecting with the Cosmos: A 34-meter-diameter radio telescope is the centerpiece of the Lewis Center curriculum.

Photo Credit: Courtesy of the Lewis Center for Educational Research

**Observation and Sensing Satellite**) program. This observatory-turned-charter school located in a parched corner of California is essentially his baby. The astronomy enthusiast and former park ranger organized the center around his own passion for science and his conviction that education works best in the context of constructive collaboration.



Connecting with the Cosmos: Demonstrating student pride.

Photo Credit: Courtesy of the Lewis Center for Educational Research

"Aesthetically, it's a very pleasing place to be," says Piercy, "but we want kids to understand that learning goes on forever. This way of educating kids -- getting them involved in these hands-on experiments, getting them involved with real scientists and engineers and mathematicians, working with NASA -- really improves their education, because it becomes relevant."

### *To Infinity and Beyond*

In 1985, Piercy was a kindergarten teacher at nearby Mojave Mesa Elementary School, where he replaced his afternoon remedial-reading classes with the Young Astronauts Program, a brainchild of the Reagan administration.

"I had 30 kids every day who knew the principal's office better than he did," he remembers. "These kids were just wild. But when we started doing all this hands-on science, their behavior was great, because they were tactile, kinesthetic learners."

That winter, Halley's Comet swung through our corner of the solar system on its 76-year orbit, and Piercy planned an evening star party for the Young Astronauts and their families, thinking a handful would show. On that frigid winter night, more than 200 eager skywatchers stayed up until 2 a.m., peering through the school district's ancient telescope.

(Continued on page 11)



## Learning Space (cont'd)

(Continued from page 10)

Piercy decided that if astronomy could so enthrall students after just a few hours of lessons each week, an observatory on campus would inspire even more passion for learning. The superintendent told Piercy that if he raised all the money, on his own time, he could have one.

In five years -- with events like fun runs named the Race for Space, along with private and in-kind donations, and the support of lawmakers such as U.S. representative Jerry Lewis, who made important contacts (and for whom the school would eventually be named) -- Piercy and his team raised \$1.2 million in cash

to build what was then called the Apple Valley Science and Technology Center.

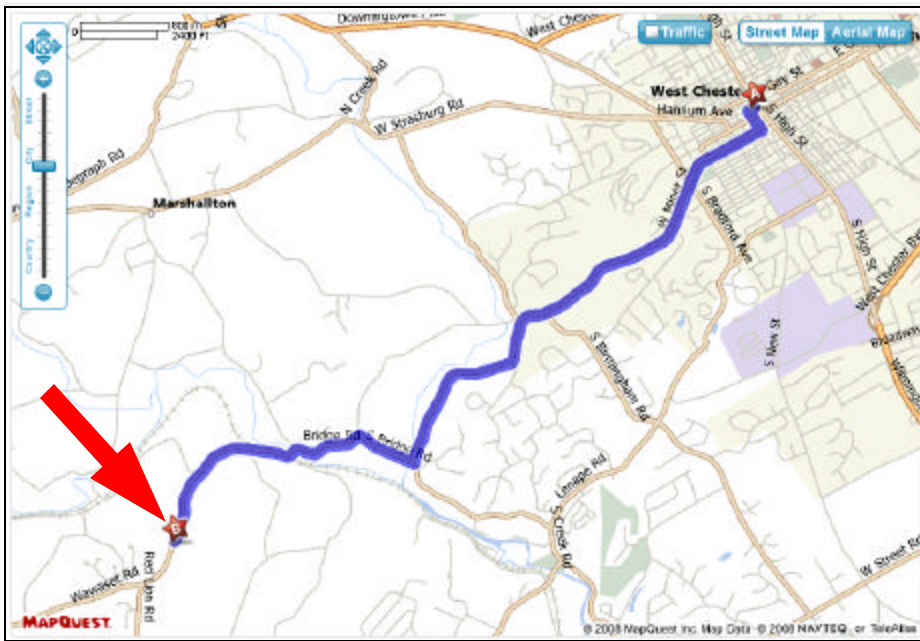
The university-quality observatory, which now has three telescopes, became an instant draw for field trips and night-sky events, luring more than 150,000 students from other schools over the next five years. Using his time-honored acquisition tactics -- a method he describes as "Just ask" -- Piercy was also able to procure a U.S. Air Force T-38 airplane (the type NASA pilots use for training) and a T-40 Link flight simulator used by USAF pilots. (The \$350,000 machine arrived after Piercy called the Pentagon for help.)

The district was so impressed with Piercy that an assistant superintendent suggested he open a charter school -- a new concept at the time. In spring 1997, the district board of education granted a charter, and Piercy and four other staff, bolstered by a \$750,000 line of credit from a local bank, opened the school doors.

Piercy then wrote proposals for two state bills authored by a local state assembly member, which bestowed several state grants that enabled them to purchase 150 acres along the Mjave River and to expand the program in 1998 into the Lewis Center. In addition to the 1,300

(Continued on page 12)

## 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 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).



## Learning Space (Cont'd)

*(Continued from page 11)*

students enrolled in the K-12 program, it has 3,000 more on a waiting list. Even though the students are accepted at random, they have the highest test scores in San Bernardino County.

But that wasn't quite enough for Piercy, who was tipped off about a radio telescope being decommissioned at Goldstone, a part of NASA's deep-space network located about 70 miles away, outside of Barstow. The telescope, 34 meters in diameter and weighing nearly a million pounds, had been used for various lunar missions, and Piercy wondered whether the students could find a way to use it. He contacted Congressman Jerry Lewis, who helped facilitate a meeting with Daniel Goldin, then administrator of NASA.

For the first time in the history of the space program, a \$12 million radio telescope was turned over to a school. It was renamed the GAVRT, the **Goldstone Apple Valley Radio Telescope**.

"That telescope would have just rotted in the desert," says Goldin, whose career spanned three presidents and 62 shuttle launches. "I saw an incredible opportunity. We had a group of very enthusiastic people at the Jet Propulsion Laboratory that would build the tech-

nical bridge to the students. There was no reason the students couldn't direct the pointing of the telescope and evaluate the data."

Any school can participate in the GAVRT program or even take part in NASA's new **Lunar Reconnaissance Orbiter (LRO)** program, but Piercy notes that principals don't need a NASA connection to bring science into their schools. "All schools are in places with scientists -- just go to the phone company, the gas company, the water company," he says. Principals can also tap local industry for community partnerships.

At Lewis, a local concrete company donated the greenhouse where students cultivate native plants so they can replant areas disturbed by mining. The fish ponds actually started as a student's science project, and they are now recipients of a grant from the U.S. Fish & Wildlife

Service. The tortoise habitat was built in cooperation with the local Home Depot. And none of the school's programs would be possible if it wasn't for the support of dozens of local volunteer organizations, from the California Turtle and Tortoise Club to the High Desert Astronomical Society.

"I think every school needs to find its niche," says Piercy, who launched another charter school, the **Norton Space & Aeronautics Academy**, in nearby San Bernardino in August 2008. The bottom line, he explains, is that once you've founded it, any school can do what the Lewis Center has done for its students.

### *Mini Mission Control*

The GAVRT project has since taken control of a more modern telescope and half of another. Schools in 37 states and 14 countries take part in the project, exposing 48,000 students, as well as their teachers, to a special curriculum around NASA's programs and real-life missions. From the Mission Control computer lab, students have participated in the Cassini mission, designed to collect information on Saturn and Jupiter, and have mapped potential landing spots for Opportunity, the JPL-deployed rover that has been col-



Spaceship Stars: A student in the school's Mission Control center monitors a mission for NASA.

*Photo Credit: Courtesy of the Lewis Center for Educational Research*

*(Continued on page 13)*

## Learning Space (Cont'd)

(Continued from page 12)

lecting data on Mars since 2004.

This year, NASA brought the GAVRT onboard to help with its launch of the Lunar Crater Observation and Sensing Satellite, in which a Centaur rocket will crash into the polar region of the moon to search for water. "We've tracked things for other spacecraft," says Piercy, "but this is the first time a school has served as the mission-control center for the tracking."

This concept of participatory exploration not only provides actual, real-time data for teachers to demonstrate but also gives kids a sense of ownership. "One of the things you realize is that by making the students part of the mission, it becomes their mission," says Brian Day, education and public-outreach lead at NASA's Ames Research Center, who brought Lewis Center students down to a launch in Florida last June. NASA is working on another mission involving students: a detailed photographic atlas captured by the LRO, which reached the moon on June 23.

"Students will be able to receive the images and help categorize the landforms," says Day. "They'll help build the database."

### **Back on Earth**

Mission Control isn't the only



Greening the Desert: The campus along the Mojave River provides a learning landscape by using drought-tolerant plants and synthetic grass.

Photo Credit: Courtesy of the Lewis Center for Educational Research

part of the school built to enable experience-based learning, says architect Gaylaid Christopher, who designed the Mojave River campus and specializes in educational design at Architecture for Education, his Pasadena, California, firm. "There's such passion from teachers and students, and we've really talked about how the building can reinforce their learning," he says.

Completed in 2000, the new Lewis Center campus is a research-based, sustainable design that acknowledges and preserves the fragile ecosystem. Even the structure is part of learning at Lewis: Students give tours about the area's natural history and conduct environmental research there.

The centerpiece of the complex is the main technology building, a 32,000-square-foot structure funded by a \$4.5 million state grant that came after Piercy was introduced to then California

governor Gray Davis. The two-story brick-and-stucco building blends seamlessly into the landscape. The curved stucco walls reference the dwellings of its Native American predecessors (whose inhabitants left artifacts and petroglyphs nearby). The flexible spaces are meant to be easily convertible between uses, and it feels like every possible inch of wall space is transformed into a teaching

moment, whether it's a student mural or an exhibition on local water issues.

A focus on technology is evident beyond Mission Control, a two-story lab set up much like NASA's legendary rooms, with a curved wall, projection screens, videoconferencing, and a glassed-in viewing platform for spectators. Regular classrooms feature technology walls, where whiteboard panels slide away to reveal a complete audiovisual kit of projectors, sound equipment, and computers. Interactive whiteboards are used in parts of the school for real-time collaboration with schools across the country. A massive production studio has blue screen and green screen capabilities and several Mac-equipped editing suites.

Students produce everything from reports on their NASA-based work to funky music videos. Outside, there's a simulated planet -- Rox-1, a sandy, red-

(Continued on page 14)

## Learning Space (Cont'd)

*(Continued from page 13)*

tinted land formation with a charcoal-colored cave, perfect for driving the Lewis Center's rovers around or for extracting mineral samples.

### *Sharing the Wealth*

Besides being a scientific wonderland for students, the Lewis Center has brought technology and worldwide attention to a rural area that wouldn't have been exposed to it otherwise. Its observatory events, lectures, and mission demonstrations engage and educate local residents. Teachers from other schools train here in the GAVRT program as well as in other high tech skills. And it's helping the next generation to be more competitive, according to Deborah Gaidzik, the teacher who runs the space-science program at Lewis.

"When you're moving part of an 850,000-pound telescope with a mouse and talking to a NASA scientist, that's pretty different from reading it out of a book," she says. "When these kids are applying to colleges or for scholarships, that will make a difference between them and another student."

Chase Bains, a recent graduate who's headed to Oregon State University to major in mechanical engineering after being accepted to nine colleges, believes

listing the GAVRT projects on his résumé -- as well as a recommendation from Congressman Jerry Lewis -- made the difference. "They were pretty amazed that we were able to do what we did as young as we are," he says. "I got a lot of comments from admissions counselors who were really impressed."

Piercy's philosophy of "letting kids do what adults thought only they were qualified for" applies to the school's expansion, an ambitious move that will require a



Wall of Fame: The Mission Control viewing area is lined with space-exploration memorabilia, including items from NASA scientists and astronauts.

*Photo Credit: Courtesy of the Lewis Center for Educational Research*

massive capital campaign.

Piercy looked to the students to drive the design through workshops held in collaboration with architect Gaylaird Christopher.

In a series of sketches prepared from their ideas, it's evident the school is training more than scientists -- these are big thinkers who understand the concepts of

learning. The students envisioned a climbing wall where footholds are marked with math equations that students must solve before they ascend. A hallway will teach time with gigantic interactive pendulums and hourglasses. The lunch area will be a pavilion where students sit in the belly of a model blue whale.

Alicia Scarberry recently graduated from the Lewis Center's academy after transferring to the school during her junior year. She was a GAVRT intern who traveled to Florida to watch the LCROSS launch, and now says she's committed to a science career.

"It was the greatest thing I've ever done," she gushes as she leads a tour around the grounds, pointing out the national-park-quality kiosks she designed and built for the fish habitat, where students are trying to educate residents about the rare local tui chub. "Before I came to this school, I never even thought I could be a scientist. Now I know I can be part of NASA."

Alissa Walker is a Los Angeles freelancer whose work has appeared in *Fast Company*, *I.D.*, *Print*, and *Dwell*.

This article was also published in the October 2009 issue of *Edutopia* magazine as "Out-of-This-World Learning".



## Spring 2010 CCAS Speaker Series

by Dave Hockenberry, CCAS Program Chair



### January 12th, 2010

Dr. Marc Gagné, West Chester University ☉ "*X-Ray Observations of Deep Space Galaxy Clusters*"

Associate professor of astronomy and interim chair of the University's Department of Geology and Astronomy, Dr. Gagné is particularly interested in the clusters of young stars, specifically those that have only lived for a tiny fraction of their lifetime. He studies low-mass and high-mass stars, and in particular, he focuses on x-rays and on infrared emissions of young stars. Dr. Gagné uses high-resolution images and high-resolution spectra from NASA's Chandra X-ray Observatory in his research.

How Dr. Gagné got involved in astronomy: "I was a high school math and physical science teacher in Gabon, Central Africa. The skies were clear and dark and I really saw the stars for the first time. I found a star guide in a pile of old books a Peace Corps volunteer had left - I was hooked. I went to grad school to study astronomy soon after my three years in Africa - and here I am."



### May 11th, 2010

Dr. Beth Willman, Haverford College ☉ "*On (Nearly) Invisible Galaxies*"

Beth Willman, who received her B.A. in astrophysics at Columbia University and a Ph.D. in astronomy at the University of Washington, has been a James Arthur Fellow at the Center for Cosmology and Particle Physics, and a Clay Fellow at the Harvard-Smithsonian Center for Astrophysics. Beth's research focus is Near Field Cosmology. She specializes in searching for and studying the least luminous galaxies in the known Universe.

### April 13th, 2010

Dr. Dave Klassen, Rowan University ☉ "*Mars and the Martian Atmosphere*"



My instructional goal is to educate the general college level student population in the subjects of physics and astronomy. My research goals are to continue my near-infrared monitoring program of Mars searching for, tracking, and measuring the water content of the condensate clouds. I plan to use these images to contribute to the understanding of the Mars water and carbon-dioxide cycles and the total Mars water budget.



### February 9th, 2010

Mike Turco ☉ "*Solar Activity and Global Warming*"

Former CCAS President Mike Turco is a professional engineer in six states and holds a diploma from the American Academy of Environmental Engineers.

Mike has a BS in Chemical Engineering, an MS in Environmental Engineering, and an MBA—all from Drexel University.



### March 9th, 2010

Rod Mollise ☉ "*The Past, Present, and Future of the Schmidt Cassegrain Telescope*"

"Uncle" Rod Mollise is familiar to amateur astronomers as the author of numerous books and magazine articles on every aspect of astronomy, amateur and professional. He is most well-known, however, for his books on Schmidt Cassegrain Telescopes, SCTs, especially his latest one, Choosing and Using a New CAT (Springer), which has become the standard reference for these popular instruments. Look for "Uncle" Rod on numerous online forums, too, especially his popular blog, *Uncle Rod's Astro Blog*. He is also one of the editors of the acclaimed online double star magazine, The University of South Alabama's *The Journal of Double Star Observations*.

We are still looking for volunteers to give the Constellation of the Month presentations for each meeting. Contact Dave Hockenberry at [programs@ccas.us](mailto:programs@ccas.us) to volunteer for a constellation and meeting.

## Winter Solstice Celebration

by Don Knabb, CCAS Observing Chair & Secretary

The Lower Merion Conservancy is holding its annual **Winter Solstice Celebration on Friday, December 18th, 2009**, from 7:00-9:00 p.m. at Rolling Hill Park in Gladwyne. They have asked us to we can participate again this year in this well-attended event.

Last year the event turned into a Full Moon party in January after it was rained out in December. The crowd was very appreciative of our club providing telescopes for lunar viewing. And Derrick Pitts was there too! I don't know if he will attend the event this year.

**We are looking for members to volunteer to help at the event.** We were a big hit last January and we want to be sure that there are enough members with telescopes or mounted binoculars participating again this year. I know it is a popular weekend for family and work parties, so if you can't help out at this party is certainly understandable.

If you are able to help and willing to commit to be at the event with a telescope or mounted binoculars, we would like to hear from you. Please contact me at (610) 436-5702, or via e-mail at [observing@ccas.us](mailto:observing@ccas.us), if you are interested in helping out.

To learn more about the Lower Merion Conservancy and its mission, visit the organization's website at <http://www.lmconservancy.org/>, or call (610) 645-9030.

## CCAS Original Astrophotography: M33, The Triangulum Galaxy

by Dave Hockenberry



M33 - "Pinwheel" (although the professional astronomers reserve that name for M101 - what do THEY know...) in Triangulum. Shot through TeleVue NP102is APO refractor, with Starlight Xpress H9C color camera, stack of 13 5-minute images. Autoguided with Meade LX200R telescope and Maxim DL5. Stacked and processed with Maxim DL5/SD Mask, curve and color adjusted in Photoshop Cs3. Shot 10/19/09.

## Sharing the Mabel Sterns Award

by John Hepler, CCAS Webmaster & Newsletter Editor

I wanted to reserve some space in this edition to thank everyone who has contributed articles and photographs for the newsletter over the past 15 months.

Winning the Astronomical League's Mabel Sterns Award my first year as newsletter editor was a big surprise for me. I spent the better part of the year experimenting with the design and layout of the newsletter and not thinking about any competition or award.

I share this award with the Society's entire membership, as the

newsletter is a collaboration and reflects our commitment to public outreach and education.

We should all be proud that CCAS has won the Mabel Sterns award twice in 4 years (thanks Jim!), and that our website won the AL award in 2005. Three major awards, plus a feature article in the AL magazine *Reflector*. Not bad for a 65-member organization.

While IYA2009 is almost over, let's keep up the good work and show other astronomical societies how it's done!

## Upcoming 2010 Alt-Az Initiative Conference in Hawaii

submitted by Russell M. Genet, Ph.D.

The **2010 Alt-Az Telescopes, Instrumentation, and Astronomical Research Conference** will be held February 5th through the 11th, 2010, at the Makaha Resort in Oahu, Hawaii. The conference will cover many topics including Alt-Az telescope design and instrumentation as well as "lightbucket" science and research as a form of education.

The conference will launch with an evening keynote talk on February 5th. February 6th and 7th will consist of morning and afternoon presentations as well as evening plenary talks. Afternoons will be free for golf, beach

time, sightseeing, or just relaxing with family and friends. Two days of workshops and additional talks will follow on February 8th and 9th.

As with last year's conference, there will be an optional post-conference insider's tour of the Gemini telescope & observatory on Mauna Kea.

February 10th will act as a day for relaxation and travel between the conference on Oahu and the insider's Gemini tour on Hawaii (the "big island") on February 11th. The group size for the tour is strictly limited so assignments will be made on a first come,

first serve basis, from those who register for both the conference and the tour. Rooms at the Makaha Resort go fast, so reserve your room right away. Visit <http://www.AltAzInitiative.org> for information, reservations, and registration. For more information about the Makaha Resort, see [www.MahakaResort.net](http://www.MahakaResort.net).

The Alt-Az Initiative is a catalyst for the development of low cost, lightweight, modest aperture (2 m or less) research telescopes with, so far, 2 conferences, 11 workshops (and counting), 12 tech initiatives, 1 tech demo telescope, several papers (including one for the National Academy of Sciences), and two books, *Small Telescope and Astronomical Research* (late 2009) and *Lightweight Alt-Az Telescope Developments* (mid 2010), in the editing process, to its credit.

Come join the members of the Alt-Az Initiative in Hawaii as they explore the exciting new high-tech frontiers of amateur telescope making, lightbucket and small telescope science, and research as education. Bring your family along for a relaxing winter vacation in the sun.

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*Russell M. Genet, Ph.D., is a Research Scholar in Residence at California Polytechnic State University; Adjunct Professor of Astronomy, Cuesta College; and Associate Editor of Amateur Astronomy magazine. He can be reached via e-mail at [russmgenet@aol.com](mailto:russmgenet@aol.com), or by phone at (805) 438-3305.*

## CCAS Original Astrophotography: Great Orion Nebula

by Dave Hockenberry



Great Orion Nebula - I call this shot "The Comma before the Storm." The heart of Orion nebula shot 10/20/09, through TeleVue NP 102is, with SX H9C color camera. Stack of 10 90-second images plus 10 2-minute images. Autoguided with Meade Lx200R 'scope and Maxim DL5 software. Stacked and median processed, color adjusted with Maxim DL5, Curves and channel balanced with Photoshop.



## 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).



### New Librarian Needed

by Linda Lurcott Fragale, CCAS Librarian

Many Society members already know that one of my passions is making jewelry (and a big thank you again to those who have attended my shows). I have decided to pursue this passion and relocate to the West Coast and continue formal study in fine jewelry design.

I plan on moving after the holidays and thus will be no longer available to act as the Society's librarian. If you are interested in taking over the position, please contact me at (610) 269-1737 or via e-mail at [librarian@ccas.us](mailto:librarian@ccas.us).

### CCAS Membership Information and Society Financials

#### Treasurer's Report

by Bob Popovich

#### September 2009 Financial Summary

Beginning Balance	\$1,46
Deposits	\$140
Disbursements	\$154
Ending Balance	\$1,432

#### Welcome New Members!

This month we welcome Mr. Christopher Hardie, Jr. of West Chester, PA.

We're glad you decided to join us again 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.

## 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 society. 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 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, Linda Lurcott Fragale, 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. Linda's phone number is 610-269-1737.

### 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**  
500 W. Rosedale Ave.  
Apt. A-3 Trinity Bldg.  
West Chester, PA 19382

### 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 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 (484-266-0699) 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 "star nights" 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 Pres:</b>	Kathy Buczynski 610-436-0821
<b>ALCor and Treasurer:</b>	Bob Popovich 484-467-5562
<b>Secretary and Observing:</b>	Don Knabb 610-436-5702
<b>Librarian:</b>	Linda Lurcott Fragale 610-269-1737
<b>Program:</b>	Dave Hockenberry 610-558-4248
<b>Education:</b>	Kathy Buczynski 610-436-0821
<b>Webmaster and Newsletter:</b>	John Hepler 484-266-0699
<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 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](mailto:B2N2@verizon.net)**

### 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 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 **610-363-8242**.

### 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**.