Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 22, No. 6 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009* *June 2014*

In This Issue

Membership Renewals Due

06/2014	Hebding Kovacs Mazziotta & Calobrisi
07/2014	Hockenberry & Miller Hunsinger Piehl
08/2014	Knabb & Family Lurcott, Linda
09/2014	Catalano-Johnson & Family Lurcott, Edwin

Planetary Nebula Abell 36

Image Credit & Copyright: Adam Block, Mt. Lemmon SkyCenter, Univ. Arizona

Important June 2014 Dates

5th • First Quarter Moon, 4:40 p.m.

9th-10th • Moon is near Saturn

13th • Full Moon, 12:12 a.m.

19th • Last Quarter Moon, 2:39 p.m.

21st • Summer Solstice, 6:51 a.m.

27th • New Moon, 4:09 a.m.

CCAS Upcoming Nights Out

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

☼ **Saturday, August 30, 2014**. Star Party at Bucktoe Creek Preserve, Kennett Square, PA. Preserve members & the general public pay a small fee; CCAS members participate for free. The event is scheduled for 8:00 PM to 9:30 PM.

☼ **Saturday, October 18, 2014**. CCAS special observing session at Anson Nixon Park, Kennett Square. The observing session is from 8:00 to 9:30 PM.

Spring/Summer 2014 Society Events

June 2014

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

6th • CCAS monthly observing session at BVA. The observation session starts at dusk.

19th-20th • The von Kármán Lecture Series: Europa: The Challenges of Exploring a Cold, Distant World, at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the July 2014 edition of Observations.

21st • Summer Solstice (6:51 a.m. EDT): First day of summer.

26th • Deadline for newsletter submissions for the July 2014 edition of Observations.

July 2014

2nd • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

18th • CCAS monthly observing session at BVA. The observation session starts at dusk.

19th-20th • The von Kármán Lecture Series: Revealing Saturn: Cassini's Tenth Year , at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the August 2014 edition of Observations.

26th • Deadline for newsletter submissions for the August 2014 edition of Observations.

28th-29th • Delta-Aquarid Meteor Shower Peaks - The Delta Aquarids can produce about 20 meteors per hour at their peak. The radiant point for this shower will be in the constellation Aquarius. The last quarter moon will be around for the show and may hide some of the fainter meteors. Best viewing is usually to the east after midnight.

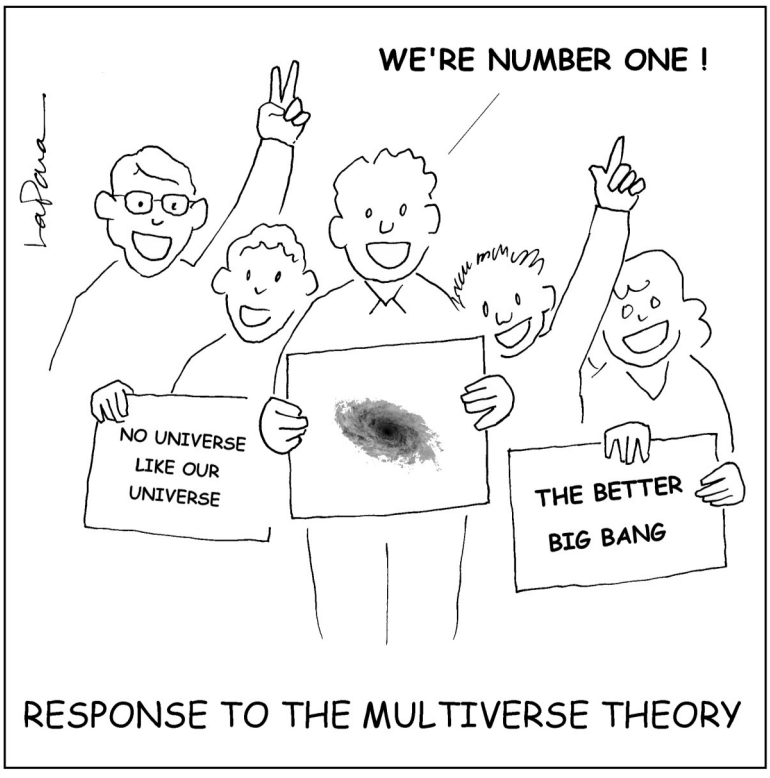
Minutes of the May 13, 2014 Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor welcomed members and guests to the May 13, 2014 meeting. Kathy Buczynski returned from Florida to bring us some warm weather and hopefully clear skies.
- Roger announced that our summer picnic will be on Saturday, August 9, 2014 at the home of Don and Barb Knabb. More details to follow.
- Upcoming star parties will be at Bucktoe Preserve, Hoopes Park and Anson Nixon Park with dates to be announced. Watch the newsletter.
- Don Knabb reported on the Star Party at Hibernia Park last month for the Cub Scouts and Boy Scouts. The event was well attended with particular favorite sky features being the Great Cluster of Hercules, Jupiter, and Mars.
- Don also presented Stellarium for May. He reminded the club of the upcoming meteor showers in Camelopardis on May 24, 2014.
- Dave Hockenberry introduced our club member and speaker for the evening, John Conrad. John is a NASA/JPL Solar System Ambassador. He presented "Latest Information on ALL of the Solar System." The focus of the evening's talk was Main Belt Comets and Active Asteroids. Our group was particularly wowed by the slide- Earth is a "Water World". It can be found athttp://ga.water.usgs.gov/edu/earthhowmuch.html.
- Our next monthly meeting will be in Room 113 in Merion Science Center on Tuesday, September 9, 2014. Our speaker will be Jamie Holder, PhD from the University of Delaware. He will speak on "Gamma Ray Bursts and High Energy Particle Astronomy."

Nicholas's Humor Corner

by Nicholas La Para



NASA's WISE Findings Poke Hole in Black Hole "Doughnut" Theory

by Jet Propulsion Laboratory

A survey of more than 170,000 supermassive black holes, using NASA's Wide-field Infrared Survey Explorer (WISE), has astronomers reexamining a decades-old theory about the varying appearances of these interstellar objects.

The unified theory of active supermassive black holes, first developed in the late 1970s, was created to explain why black holes, though similar in nature, can look completely different. Some appear to be shrouded in dust, while others are exposed and easy to see.

The unified model answers this question by proposing that every black hole is surrounded by a dusty, doughnut-shaped structure called a torus. Depending on how these "doughnuts" are oriented in space, the black holes will take on various appearances. For example, if the doughnut is positioned so that we see it edge-on, the black hole is hidden from view. If the doughnut is observed from above or below, face-on, the black hole is clearly visible.

However, the new WISE results do not corroborate this theory. The researchers found evidence that something other than a doughnut structure may, in some circumstances, determine whether a black hole is visible or hidden. The team has not yet determined what this may be, but the results suggest the unified, or doughnut, model does not have all the answers.

"Our finding revealed a new feature about active black holes we never knew before, yet the details remain a mystery," said Lin Yan of NASA's Infrared Processing and Analysis Center (IPAC), based at the California Institute of Technology in Pasadena. "We hope our work will inspire future studies to better understand these fascinating objects."

Every galaxy has a massive black hole at its heart. The new study focuses on the "feeding" ones, called activesupermassive black holes, or active galactic nuclei. These black holes gorge on surrounding gas material that fuels their growth.

With the aid of computers, scientists were able to pick out more than 170,000 active supermassive black holes from the WISE data. They then measured the clustering of the galaxies containing both hidden and exposed black holes — the degree to which the objects clump together across the sky.

If the unified model were true, and the hidden black holes are simply blocked from view by doughnuts in the edge-on configuration, then researchers would expect them to cluster in the same way as the exposed ones. According to theory, since the doughnut structures would take on random orientations, the black holes should also be distributed randomly. It is like tossing a bunch of glazed doughnuts in the air — roughly the same percentage of doughnuts always will be positioned in the edge-on and face-on positions, regardless of whether they

(Continued on page 6)

September 2014 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on May 13, 2014, starting at 7:30 p.m. The meeting will be held in Room 112, Merion Science Center (former Boucher Building), West Chester University. Our guest speaker will be Jamie Holder, PhD, from the University of Delaware. He will speak on "Gamma Ray Bursts and High Energy Particle Astronomy."

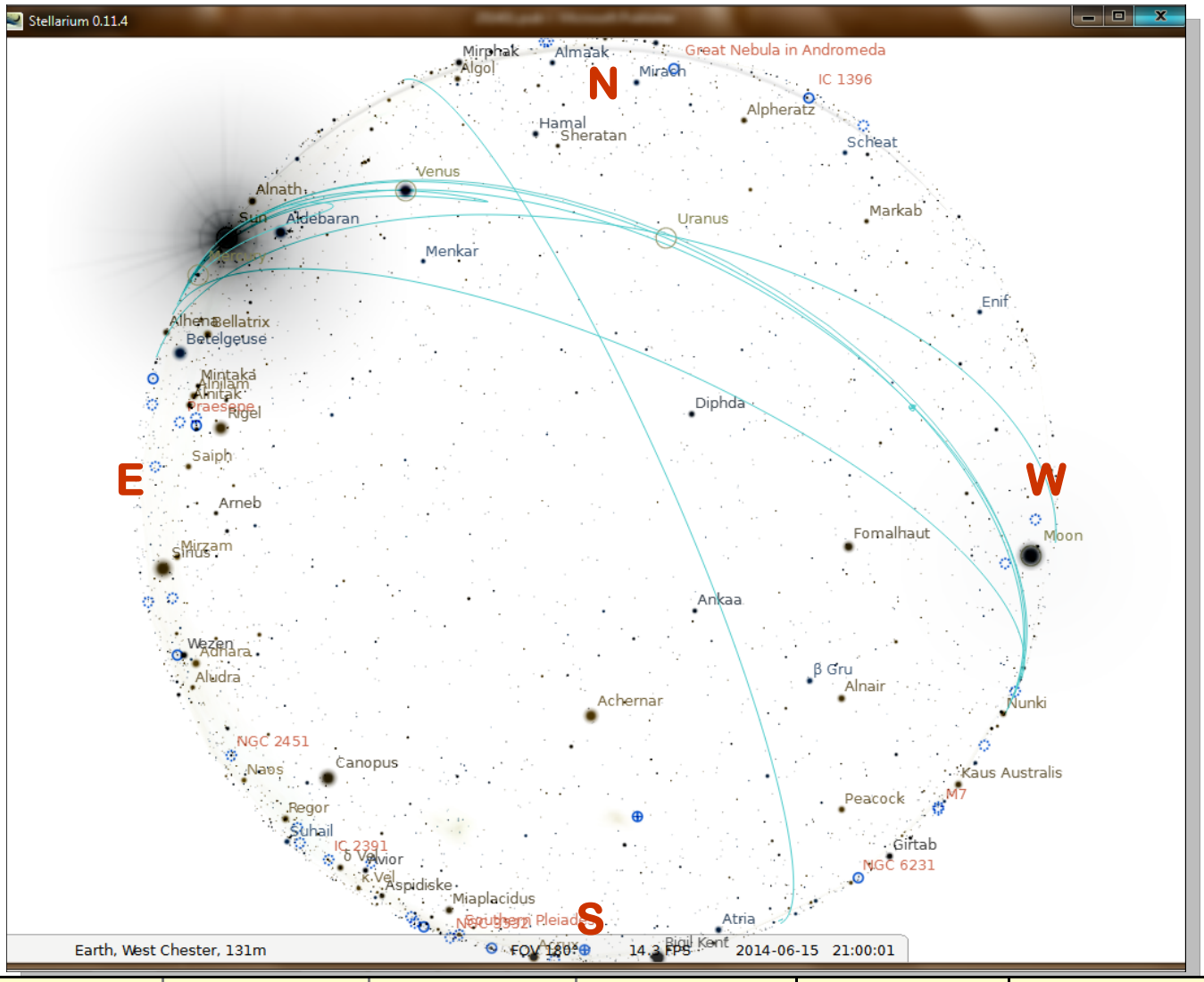
Please note that inclement weather or changes in speakers' schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

We are looking for presenters for future meetings in our 2014-2015 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

The Sky Over Chester County

June 15, 2014 at 9:00 p.m. ET

Note: This screen capture is taken from Stellarium, the free planetarium software available for download at www.stellarium.org.



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
06/01/2014	5:02 a.m. EDT	5:34 a.m. EST	8:23 p.m. EDT	8:55 p.m. EST	14h 49m 13s
06/15/2014	4:59 a.m. EDT	5:31 a.m. EDT	8:31 p.m. EDT	9:04 p.m. EDT	14h 59m 39s
06/30/2014	5:03 a.m. EDT	5:35 a.m. EDT	8:33 p.m. EDT	9:06 p.m. EDT	14h 58m 05s

Moon Phases					
First Quarter	06/05/2014	4:40 p.m. EDT	Full Moon	06/13/2014	12:12 a.m. EDT
Last Quarter	06/19/2014	2:39 p.m. EDT	New Moon	06/27/2014	4:09 a.m. EDT

June 2014 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

5	**First-quarter Moon, 4:40 p.m.**
7	**The Moon is near Mars and Spica**
9, 10	**The Moon is near Saturn**
13	**Full Moon, 12:12 a.m.**
19	**Last Quarter Moon, 2:39 p.m.**
20	**The Moon passes close to Uranus in the pre-dawn sky**
21	**Summer solstice, 6:51 a.m.**
24	**The Moon and Venus are close in morning twilight**
27	**New Moon, 4:09 a.m.**
29	**Jupiter is very low in the west to the right of a thin crescent Moon**

The best sights this month: Jupiter, Mars and Saturn will fill your eyes or the eyepiece of your telescope during June. You can see all three bright planets naked eye while the glow of the sunset fades, then zoom in with a telescope for spectacular views. Increase the magnification until the image gets a little fuzzy, then back down a step for the best view. And be patient, the swirls of the warm June evenings will make the image waver but you will find moments when the image suddenly becomes clear.

Mercury: Mercury is not in a favorable viewing position during June.

Venus: Venus continues to shine in the hours before dawn, and will for several months.

Mars: The red planet is beginning to fall behind Earth in our race around the Sun but still shines high and bright in the June sky. In late May, I could still see surface features on the planet's disk, but look soon since Mars is getting smaller and dimmer as the weeks go by.

Jupiter: Jupiter is steadily falling further into the west as day turns to night but it remains a beautiful sight in the eyepiece of a telescope. The perpetual dance of the Galilean moons is always a joy to observe. Barb and I recently observed Jupiter with the four bright moons on one side of the planet, and two were so close I thought the telescope was just out of focus. Within an hour the scene had changed!

Saturn: Saturn is in excellent viewing position during June and I just cannot get enough time at the eyepiece staring at the ringed beauty. In late May I was able to see faint banding on Saturn's surface and the Cassini Division, the gap between the main inner and outer rings, was clearly visible. Share a telescopic view of Saturn with neighbors and friends and you will give them a gift they will never forget.

Uranus and Neptune: If you want to see the outer gas giants during June you'll need to get up an hour or two before dawn. On June 20th the Moon is close to Uranus.

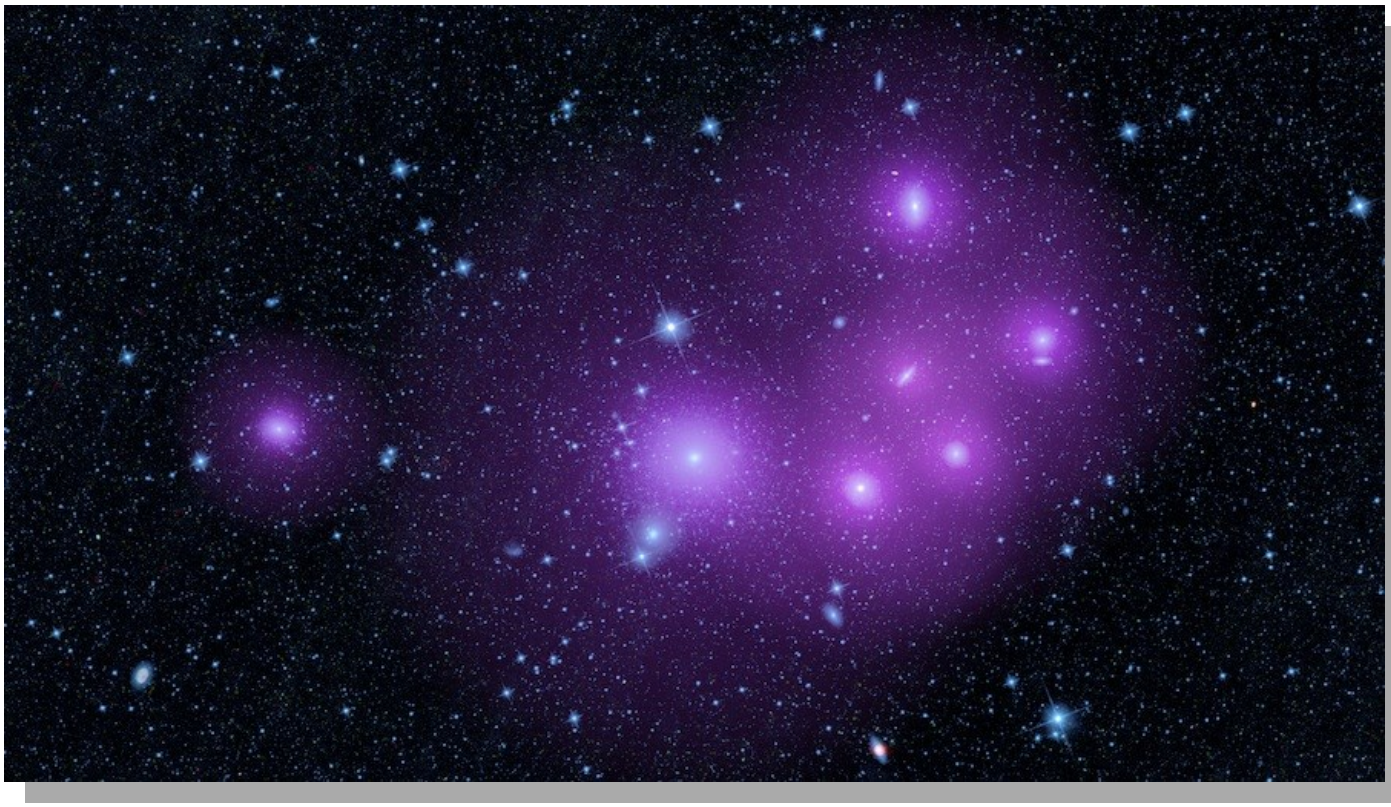
The Moon: Full moon is on June 13th. The June full Moon was called the Full Strawberry Moon by Native American tribes. This name was universal to every Algonquin tribe. However, in Europe they called it the Rose Moon.

During summer the Earth leans toward the Sun placing it high in our sky and bringing us warm days and late sunsets. The tilt of the Earth also places the Moon low in the night sky. I always enjoy the way the low, full Moon lights up the trees, more from the side than from above.

Constellations: Sunset is so late during June that we need to stay up late to see the stars, but the warm nights and the fireflies make it worth the effort. Leo the Lion is running into the west as if he is fleeing from Hercules in the east. And if you stay up a bit later look to the south for bright red Antares in the constellation Scorpius the Scorpion. Bright Arcturus in Boötes shines like a beacon at the top of a triangle it makes with Saturn and Mars.

(Continued on page 11)

WISE (Cont'd)



This enhanced image shows galaxies clumped together in the Fornax cluster, located 60 million light-years from Earth. The picture was taken by WISE, but has been artistically enhanced to illustrate the idea that clumped galaxies will, on average, be surrounded by larger halos of dark matter (represented in purple). NASA/JPL-Caltech

(Continued from page 3)

are tightly clumped or spread far apart.

But WISE found something totally unexpected. The results showed the galaxies with hidden black holes are more clumped together than those of the exposed black holes. If these findings are confirmed, scientists will have to adjust the unified model and come up with new ways to explain why some black holes appear hidden.

"The main purpose of unification was to put a zoo of different kinds of active nuclei under a single umbrella," said Donoso. Now, that has become increasingly complex to do as we dig deeper into the WISE data."

Another way to understand the WISE results involves dark matter. Dark matter is an invisible substance that dominates matter in the universe, outweighing the regular matter that makes up people, planets, and stars. Every galaxy sits in the center of a dark matter halo. Bigger halos have more gravity and, therefore, pull other galaxies toward them.

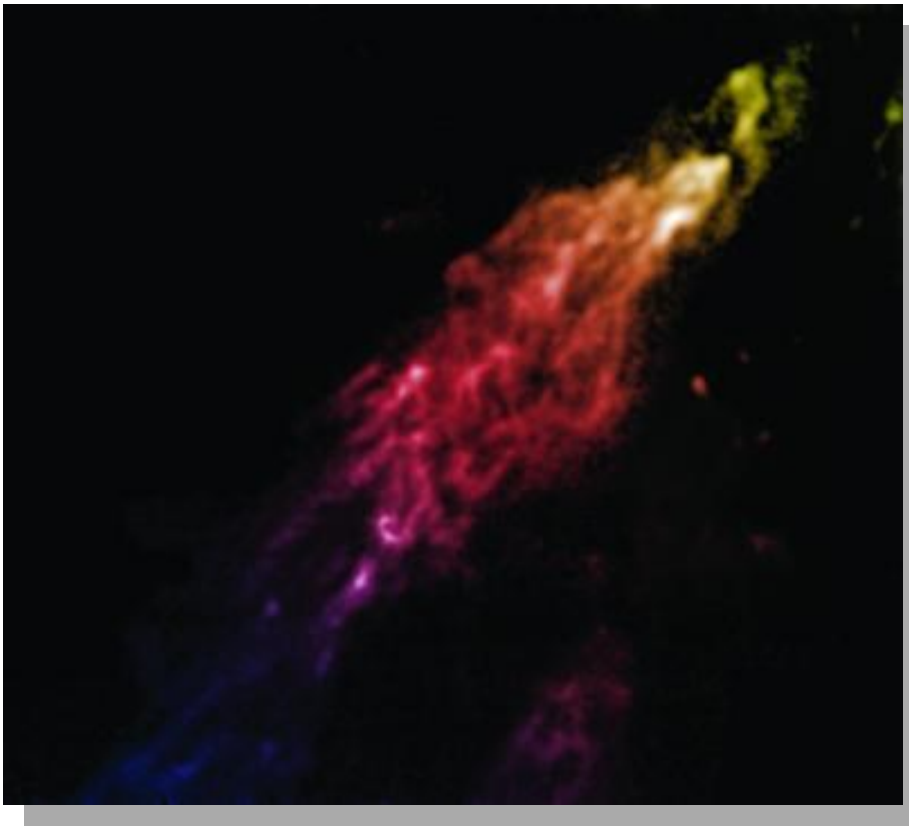
Because WISE found that the obscured black holes are more clustered than the others, the researchers know those hidden black holes reside in galaxies with larger dark matter halos. Though the halos themselves would not be responsible for hiding the black holes, they could be a clue about what is occurring.

"The unified theory was proposed to explain the complexity of what astronomers were seeing," said Stern. "It seems that simple model may have been too simple. As Einstein said, models should be made 'as simple as possible, but not simpler.'"

Scientists still are actively combing public data from WISE, which was put into hibernation in 2011 after scanning Earth's entire sky twice. WISE was reactivated in 2013, renamed NEOWISE, and given a new mission to identify potentially hazardous near-Earth objects.

Failed Dwarf Galaxy Survives Galactic Collision Thanks to Full Dark-Matter Jacket

submitted by NRAO, Socorro, New Mexico



This is a false-color image of the Smith Cloud made with data from the Green Bank Telescope (GBT). Image courtesy of NRAO/AUI/NSF

Like a bullet wrapped in a full metal jacket, a high-velocity hydrogen cloud hurtling toward the Milky Way appears to be encased in a shell of dark matter, according to a new analysis of data from the National Science Foundation's Robert C. Byrd Green Bank Telescope (GBT). Astronomers believe that without this protective shell, the high-velocity cloud (HVC) known as the Smith Cloud would have disintegrated long ago when it first collided with the disk of our Galaxy.

If confirmed by further observations, a halo of dark matter could mean that the Smith Cloud is actually a failed dwarf galaxy, an object that has all the right stuff to form a true galaxy, just not enough to produce stars.

Previous studies of the Smith Cloud revealed that it first passed through our Galaxy many millions of years ago. By reexamining and carefully modeling the cloud, astronomers now believe that the Smith Cloud contains and is actually wrapped in a substantial "halo" of dark matter -- the gravitationally significant yet invisible stuff that makes up roughly 80 percent of all the matter in the Universe.

"Based on the currently predicted orbit, we show that a dark matter free cloud would be unlikely to survive this disk crossing," observed Jay Lockman, an astronomer at the National Radio Astronomy Observatory in Green Bank, West Virginia, and one of the coauthors on the paper. "While a cloud with dark matter easily survives the passage and produces an object that looks like the Smith Cloud today."

The Milky Way is swarmed by hundreds of high-velocity clouds, which are made up primarily of hydrogen gas that is too rarefied to form stars in any detectable amount. The only way to observe these objects, therefore, is with exquisitely sensitive radio telescopes like the GBT, which can detect the faint emission of neutral hydrogen. If it were visible with the naked eye, the Smith Cloud would cover almost as much sky as the constellation Orion.

Most high-velocity clouds share a common origin with the Milky Way, either as the leftover building blocks of galaxy formation or as clumps of material launched by supernovas in the disk of the Galaxy. A rare few, however, are interlopers from farther off in space with their own distinct pedigree. A halo of dark matter would strengthen the case for the Smith Cloud being one of these rare exceptions.

Currently, the Smith Cloud is about 8,000 light-years away from the disk of our Galaxy. It is moving toward the Milky Way

(Continued on page 12)

Through the Eyepiece: Globular Cluster M5 in Serpens

by Don Knabb, CCAS Treasurer & Observing Chair

Photo credit: Brent Crabb, astrophotographer

Globular clusters are among my favorite deep sky objects. On a dark night they stand out against the background in even the smallest binoculars, and if you are fortunate enough to view one of the larger globular clusters in an 8 inch or larger reflecting telescope you can get lost in the cloud of stars in the eyepiece.

During June, Messier 5, also known as NGC 5904, is in excellent position for comfortable viewing during the late evening. I say late evening because it is at least 9:30 until the glow of the Sun fades from the sky. You will find M5 in the southern sky, about half way between the horizon and the zenith, so if you use binoculars, a refractor or a reflector you won't need to strain your neck to get a good view of this beauty of the night sky.

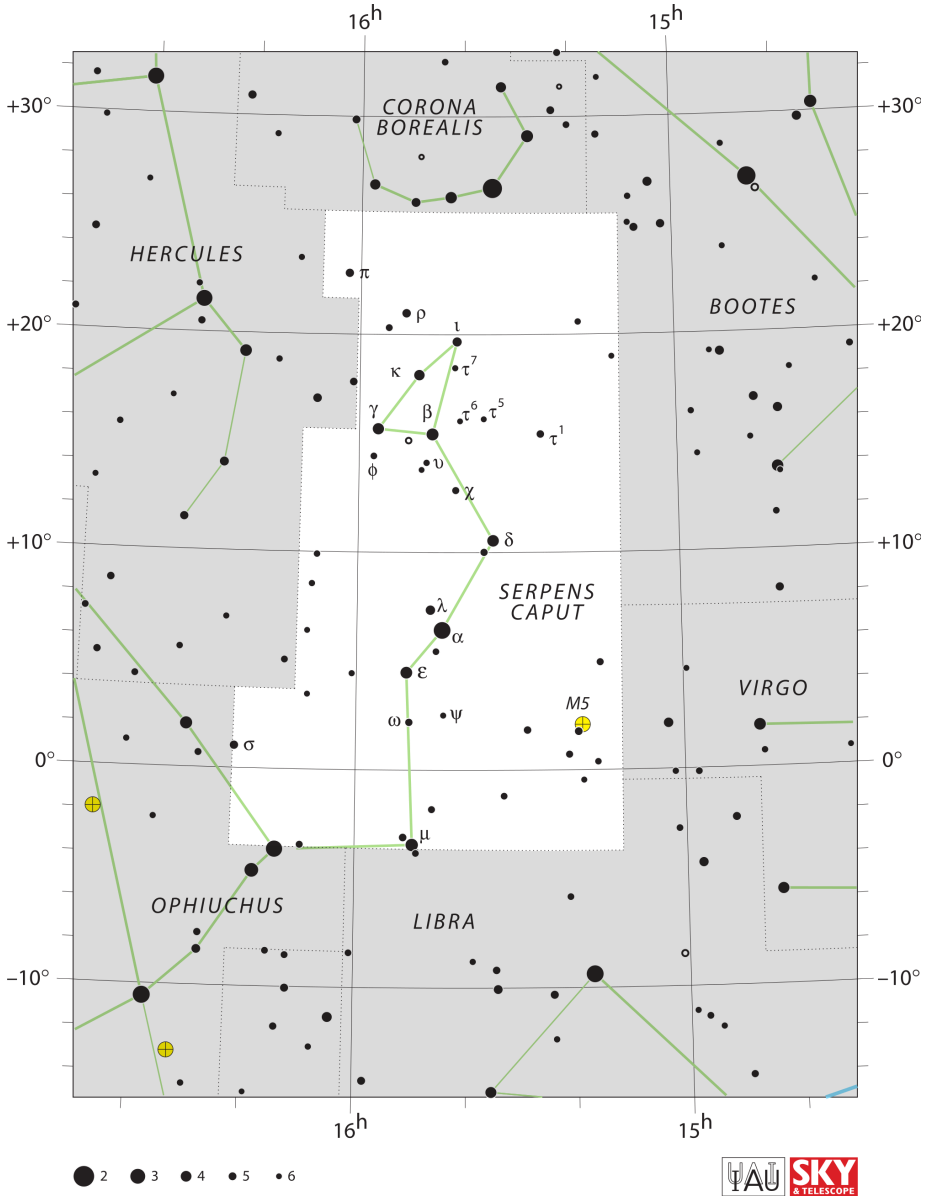
In late May I stared into M5 for a long time on a dark night with a 12 inch Dobsonian telescope. I was especially fortunate to be using a binoviewer. Although I enjoy the bright view through a wide field eyepiece, the comfort of viewing with both eyes open makes long views of any object more enjoyable.

Above is a photo of M5 taken by Brent Crabb, an amateur astronomer and astrophotographer from Orange County, California.

A globular cluster is a spherical collection of stars that orbits a galaxy as a satellite. They can contain anywhere from ten thousand to a million stars. These stars orbit the collective center of mass of the cluster in a veritable bee hive of motion, and the cluster itself orbits the Milky Way as a distinct object, occasionally plunging right through the main disk and out the other side. Although the cluster appears extremely dense, the distance between individual stars is actually quite large. As a result, stars within them rarely collide, and globular clusters survive relatively unscathed by their

(Continued on page 9)

Eyepiece (Cont'd)



http://en.wikipedia.org/wiki/File:Serpens_Caput_IAU.svg

(Continued from page 8)

passage through the galaxy's disk.

M5 was discovered by Gottfried Kirch in 1702 when he was observing a comet. Charles Messier found it in 1764 and thought it a nebula without any stars associated with it. William Herschel resolved individual stars in the cluster in 1791, counting roughly 200 of them.

M5 has an angular size of 17.4 arc minutes and is located within the borders of the constellation Serpens. It is 24,500 light years from the planet Earth which makes it the 52nd furthest Messier object from Earth.

M5 is, under extremely good conditions, just visible to the naked eye as a faint "star" near the star 5 Serpentis. Binoculars or small telescopes will identify this fine cluster as non-stellar while larger telescopes will start to show individual stars, of which the brightest are of apparent magnitude 12.2. The Peterson Field Guided to Stars and Planets calls M5 "one of the finest in the sky"!

Spanning 165 light-years across, M5 is one of the larger globular clusters known. It is also one of the older globulars within the Milky Way Galaxy. The cluster contains more than 100,000 stars, up to perhaps 500,000 according to some estimates.

Use the star chart at left to find M5. Or, wait until around 10:00 pm for it to be fully dark and find Arcturus high in the southwest. Then find red Antares low in the south. M5 is about 1/3 of the way along an imaginary line from Arcturus to Antares.

Information credits:

Pasachoff, Jay M. 2000. A Field Guide to the Stars and Planets. New York, NY. Houghton Mifflin.
Dickinson, Terence 2006. Nightwatch: a practical guide to viewing the universe. Buffalo, NY. Firefly Books
http://en.wikipedia.org/wiki/Messier_5
http://www.absoluteastronomy.com/messier_objects/m5.htm
http://www.seds.org/messier/m/m005.html

The Hottest Planet in the Solar System

by Dr. Ethan Siegel

When you think about the four rocky planets in our Solar System—Mercury, Venus, Earth and Mars—you probably think about them in that exact order: sorted by their distance from the Sun. It wouldn't surprise you all that much to learn that the surface of Mercury reaches daytime temperatures of up to 800 °F (430 °C), while the surface of Mars never gets hotter than 70 °F (20 °C) during summer at the equator. On both of these worlds, however, temperatures plummet rapidly during the night; Mercury reaches lows of -280 °F (-173 °C) while Mars, despite having a day comparable to Earth's in length, will have a summer's night at the equator freeze to temperatures of -100 °F (-73 °C).

Those temperature extremes from day-to-night don't happen so severely here on Earth, thanks to our atmosphere that's some 140 times thicker than that of Mars. Our average surface temperature is 57 °F (14 °C), and day-to-night temperature swings are only tens of degrees. But if our world were completely airless, like Mercury, we'd have day-to-night temperature swings that were *hundreds* of degrees. Additionally, our average surface temperature would be significantly colder, at around 0 °F (-18 °C), as our atmosphere functions like a blanket: trapping a portion of the heat radiated by our planet and making the entire atmosphere more uniform in temperature.

But it's the *second* planet from the Sun -- Venus -- that puts the rest of the rocky planets' atmospheres to shame. With an atmosphere **93 times as thick as Earth's**, made up almost entirely of carbon dioxide, Venus is the ultimate planetary greenhouse, letting sunlight in but hanging onto that heat with incredible effectiveness. Despite being nearly twice as far away from the Sun as Mercury, and hence only receiving 29% the sunlight-per-unit-area, the surface of Venus is a toasty 864 °F (462 °C), with *no difference* between day-and-night temperatures! Even though Venus takes hundreds of Earth days to rotate, its winds circumnavigate the entire planet every four days (with speeds of 220 mph / 360 kph), making day-and-night temperature differences irrelevant.

(Continued on page 11)

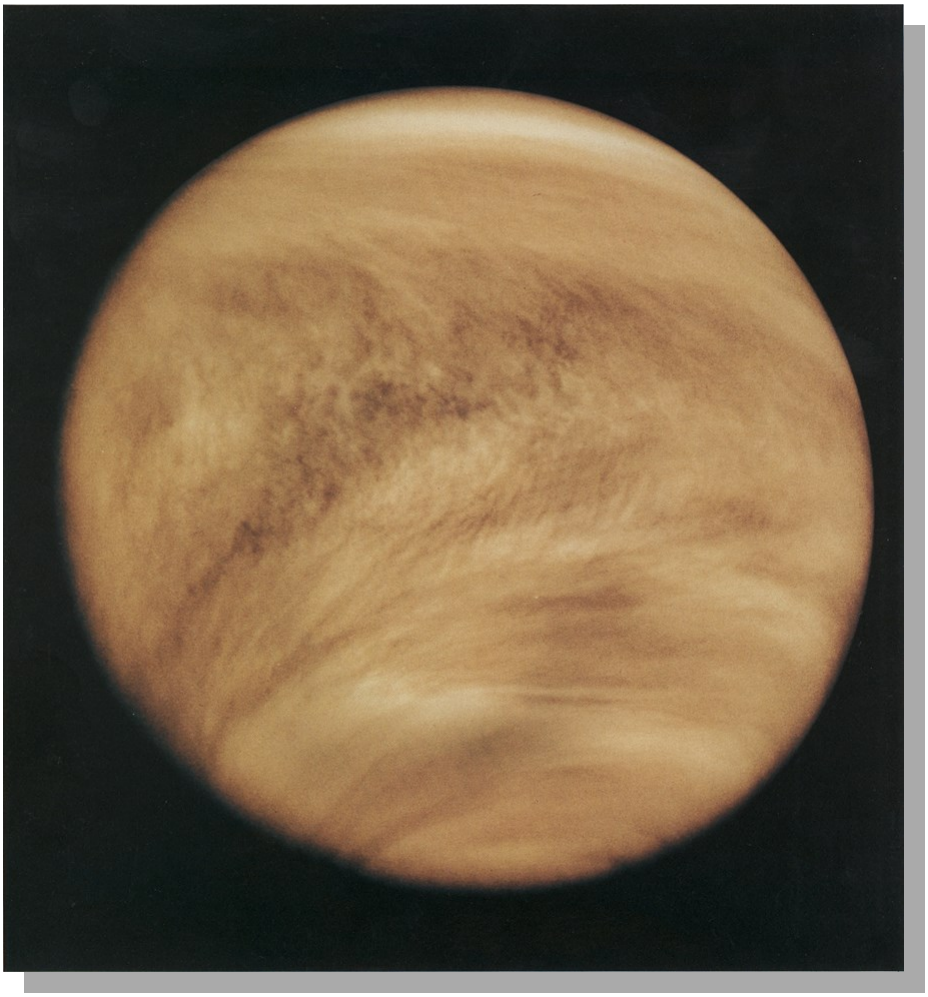


Image credit: NASA's Pioneer Venus Orbiter image of Venus's upper-atmosphere clouds as seen in the ultraviolet, 1979.

Space Place (cont'd)

(Continued from page 10)

Catch the hottest planet in our Solar System all spring-and-summer long in the pre-dawn skies, as it waxes towards its full phase, moving away from the Earth and towards the opposite side of the Sun, which it will finally slip behind in November. A little atmospheric greenhouse effect seems to be exactly what we need here on Earth, but as much as Venus? No thanks!

Check out these "10 Need-to-Know Things About Venus": http://solarsystem.nasa.gov/planets/profile.cfm?Object=Venus.

Kids can learn more about the crazy weather on Venus and other places in the Solar System at NASA's Space Place: http://spaceplace.nasa.gov/planet-weather.

Eyepiece (Cont'd)

(Continued from page 5)

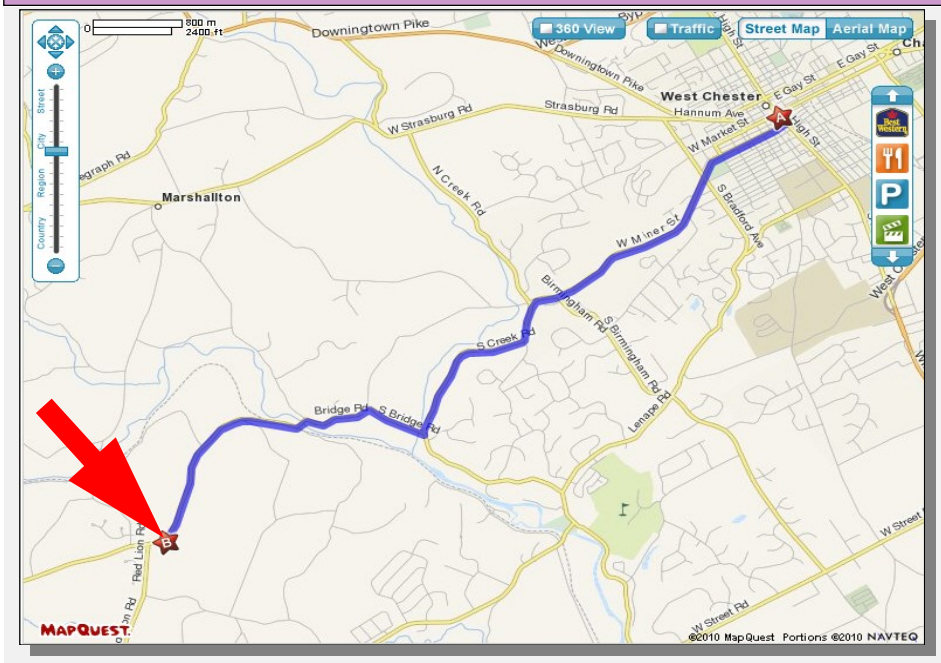
Messier/deep sky: There are many wonderful deep sky objects to see during June. My favorites this time of year are the globular clusters. Look for M3 and M5 high overhead, then find M4 near Antares in Scorpius. Then seek M10 and M12 in Ophiuchus. Of course I cannot forget to mention the brightest globular cluster in northern skies, M13 in Hercules.

Comets/asteroids: There are no bright comets in the June skies. But, June is an excellent opportunity to see an asteroid! In fact, it is a great time to see TWO asteroids. Ceres and Vesta, the two brightest asteroids of the main asteroid belt between Mars and Jupiter, are close in the sky and are in an ideal position for viewing during June. They are not far from Mars in the sky so you can see these minor planets just after the sky fully darkens.

You will find a sky map to locate Ceres and Vesta in the May issue of Astronomy Magazine.

Meteor showers: There are no major meteor showers during June. If you do happen to see a very slow meteor late in the month it could be a Boötid meteor, but this shower is so sparse and unpredictable it cannot be called a meteor shower.

CCAS Directions



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

BVA was founded in 1945 and is committed to promoting and protecting the natural resources of the Brandywine Valley through educational programs and demonstrations for all ages.

Brandywine Valley Association

The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Valley Association.

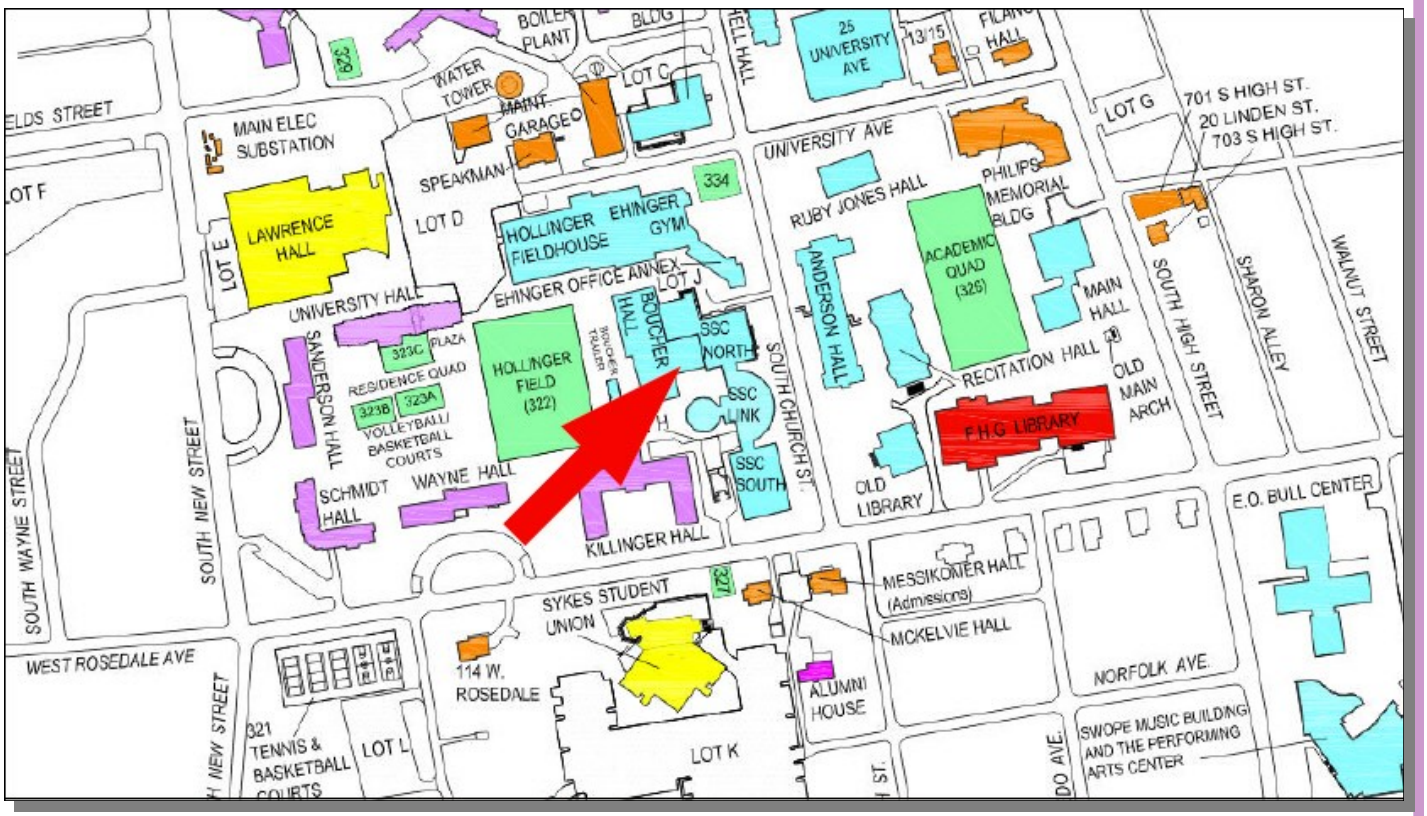
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route 842 into the parking lot by the office: look for the signs to the office along Route 842. From that parking lot, go left through the gate and drive up the farm lane about 800 feet to the top of the hill. The observing area is on the right.

If you arrive after dark, *please turn off your headlights and just use parking lights* as you come up the hill (so you don't ruin other observers' night vision).

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 112 in Merion Science Center (formerly the Boucher Building), attached to the Schmucker Science Center. The Schmucker Science Center is located at the corner of S. Church St & W. Rosedale Ave. Parking is generally available across Rosedale in the Sykes Student Union parking lot (Lot K).



(Continued from page 7)

at more than 150 miles per second and is predicted to impact again in approximately 30 million years.

"If confirmed to have dark matter this would in effect be a failed galaxy," said Nichols. "Such a discovery would begin to show the lower limit of how small a galaxy could be." The researchers believe this could also improve our understanding of the Milky Way's earliest star formation.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

May 2014 Financial Summary

Beginning Balance	$2,176
Deposits	$20
Disbursements	$0
Ending Balance	$2,196

New Member Welcome!

Welcome new CCAS members John P. Cunningham at Lincoln University. We're glad you decided to join us under the stars! Clear skies to you!

Membership Renewals

You can renew your CCAS membership by writing a check payable to "Chester County Astronomical Society" and sending it to our Treasurer:

Don Knabb
988 Meadowview Lane
West Chester PA 19382

The current dues amounts are listed in the *CCAS Information Directory*. Consult the table of contents for the directory's page number in this month's edition of the newsletter.

CCAS Information Directory

Join the Fight for Dark Skies!

You can help fight light pollution, conserve energy, and save the night sky for everyone to use and enjoy. Join the nonprofit International Dark-Sky Association (IDA) today. Individual memberships start at $30.00 for one year. Send to:

International Dark-Sky Association
3225 North First Avenue
Tucson, AZ 85719

Phone: **520-293-3198**
Fax: **520-293-3192**
E-mail: **ida@darksky.org**

For more information, including links to helpful information sheets, visit the IDA web site at:

http://www.darksky.org

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

Dark-Sky Website for PA

The Pennsylvania Outdoor Lighting Council has lots of good information on safe, efficient outdoor security lights at their web site:

http://www.POLCouncil.org

Find out about Lyme Disease!

Anyone who spends much time outdoors, whether you're stargazing, or gardening, or whatever, needs to know about Lyme Disease and how to prevent it. You can learn about it at:

http://www.LymePA.org

Take the time to learn about this health threat and how to protect yourself and your family. It is truly "time well spent"!

CCAS Event Information

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

Good Outdoor Lighting Websites

One of the biggest problems we face in trying to reduce light pollution from poorly designed light fixtures is easy access to good ones. When you convince someone, a neighbor or even yourself, to replace bad fixtures, where do you go for good lighting fixtures? Check out these sites and pass this information on to others. Help reclaim the stars! And save energy at the same time!

Starry Night Lights

Light pollution from poor quality outdoor lighting wastes billions of dollars and vast quantities of valuable natural resources annually. It also robs us of our heritage of star-filled skies. Starry Night Lights is committed to fighting light pollution. The company offers the widest selection of ordinance compliant, night sky friendly and neighbor friendly outdoor lighting for your home or business. Starry Night Lights is located in Park City, Utah.

Phone: **877-604-7377**
Fax: **877-313-2889**

http://www.starrynightlights.com

★ ★ ★ ★ ★

Green Earth Lighting
Formerly
Outdoor Lighting Associates

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

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

Phone: **512-944-7354**

http://www.greenearthlighting.com

Local Astronomy-Related Stores

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

Skies UNLIMITED

Skies Unlimited is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, Stellarvue, Takahashi, Vixen, Losmandy and more.

Skies Unlimited
Suburbia Shopping Center
52 Glocker Way
Pottstown, PA 19465

Phone: **610-327-3500** or **888-947-2673**
Fax: **610-327-3553**

http://www.skiesunlimited.net

★ ★ ★ ★ ★

Spectrum Scientifics
Quality Science Products for All Ages

Located in Manayunk, Spectrum Scientifics educates and entertains customers with an array of telescopes, microscopes, binoculars, science toys, magnets, labware, scales, science instruments, chemistry sets, and much more.

4403 Main Street
Philadelphia, PA 19127

Phone: **215-667-8309**
Fax: **215-965-1524**

Hours:
Tuesday thru Saturday: 10AM to 6PM
Sunday and Monday: 11AM to 5PM

http://www.spectrum-scientifics.com

CCAS Information Directory

CCAS Lending Telescopes

Contact Don Knabb to make arrangements to borrow one of the Society's lending telescopes. CCAS members can borrow a lending telescope for a month at a time; longer if no one else wants to borrow it after you. Don's phone number is 610-436-5702.

CCAS Lending Library

Contact our Librarian, Barb Knabb, to make arrangements to borrow one of the books in the CCAS lending library. Copies of the catalog are available at CCAS meetings, and on the CCAS website. Barb's phone number is 610-436-5702.

Contributing to *Observations*

Contributions of articles relating to astronomy and space exploration are always welcome. If you have a computer, and an Internet connection, you can attach the file to an e-mail message and send it to: **newsletter@ccas.us**

Or mail the contribution, typed or handwritten, to:

John Hepler
2115 Lazor St.
Apt. 227
Indiana, PA 15701

CCAS Newsletters via E-mail

You can receive the monthly newsletter (in full color!) via e-mail. All you need is a PC or Mac with an Internet e-mail connection. To get more information about how this works, send an e-mail request to John Hepler, the newsletter editor, at: **newsletter@ccas.us**.

CCAS Website

John Hepler is the Society's Webmaster. You can check out our Website at:

http://www.ccas.us

John welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work; no copyrighted material! Give your contributions to John Hepler at (724) 801-8789 or e-mail to webmaster@ccas.us

CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "nights out" for school, scout, and other civic groups.

CCAS Executive Committee

For further information on membership or society activities you may call:

President:	Roger Taylor 610-430-7768
Vice President:	Liz Smith 610-842-1719
ALCor, Observing, and Treasurer:	Don Knabb 610-436-5702
Secretary:	Ann Miller 610-558-4248
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 724-349-5981
Public Relations:	Deb Goldader 610-304-5303

CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

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

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178

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

*Sky & Tele*scope Magazine Group Rates

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

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

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

Astronomy Magazine Group Rates

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