Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 20, No. 12 Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009 December 2012

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Best Wishes for a Happy & Healthy 2013!

Important December 2012 Dates

6th • Last Quarter Moon, 10:32 p.m.

12th • New Moon, 3:42 a.m.

13th-14th • Geminid Meteor Shower Peaks

20th • First Quarter Moon, 12:19 a.m.

28th• Full Moon, 5:22 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.

☼ **Thursday, December 20, 2013.** The Fugett Middle School will be having a star party at BVA from 7:00 to 9:30 PM. Any help from the club members will be greatly appreciated.

☼ **Saturday, March 16, 2013**. Spring Star party. Co-sponsored with the West Chester Department of Recreation in Hoopes Park, West Chester. The observing session will be in the field near the pavilion. Session is scheduled for 7:30 PM to 9:30 PM.

Winter 2012 - 2013 Society Events

December 2012

5th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website.

6th • The von Kármán Lecture Series: GRAIL Unwraps the Moon , Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

7th • West Chester University Planetarium Show: "Twinkle, Twinkle, Little Star," in the Schmucker Science Building. The show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, visit the planetarium's webpage.

14th • CCAS Holiday Party. The party is for CCAS members and their families and starts at 7:00 p.m. See the December 2012 edition of *Observations* for location and directions.

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

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

January 2013

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

8th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. Speaker: TBA.

17th • The von Kármán Lecture Series: Probing the Dark Sector with Euclid, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

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

20th • The Fugett Middle School will be having a star party at BVA from 7:00 to 9:30 PM. Any help from the club members will be greatly appreciated.

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

Minutes from the November 13, 2012 CCAS Monthly Meeting

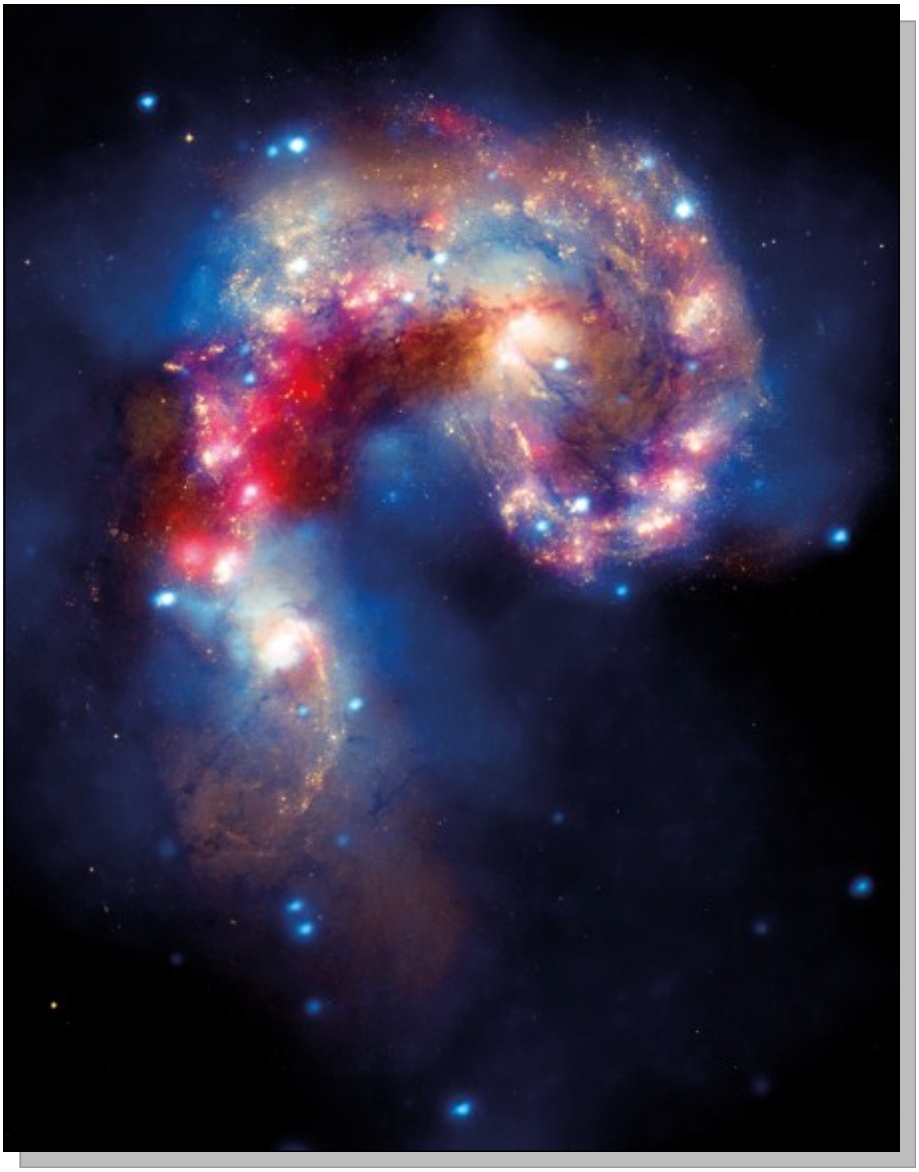
by Ann Miller, CCAS Secretary

- Program Chair welcomed 18 members for the November meeting.
- Reminder that the Xmas party date was changed to FRIDAY, 12/14/12, at the home of Don and Barb Knabb. If the weather is clear, Telescopes will also be "invited."
- Dennis O'Leary is reaching out for help with his Project Astro Class. He will be running an observing session for the Fugett Middle School, West Chester School District. Specific Date and place to be announced.
- Program Chair announced upcoming CCAS meeting speakers including astronomy professors Karen VanLandingham, Marc Gagne, and a special presentation by "Caroline Herschel" for our March meeting. Also scheduled is a "Youth Night" for our May meeting.
- Don Knabb presented November Highlights with a new planetarium software suite, Sky Safari Pro.
- Don also announced the November BVA session, weather permitting.
- CCAS member Frank Angelini presented "The Trials, Tribulations, and Triumphs of Building my Le Quattro Stella Observatory."
- Evening concluded with a discussion about binocular/telescope repair, and an exciting antique telescope find at Longwood Gardens.

Nicholas's Humor Corner

by Nicholas La Para

Antennae Galaxies
by NASA



The collision of Antennae Galaxies, about 62 million light-years away, was captured by three space telescopes. This composite image combines data from the Chandra X-ray Observatory (blue), the Hubble Space Telescope (gold and brown), and the Spitzer Space Telescope (red). The Antennae galaxies take their name from the long antenna-like "arms" seen in wide-angle views of the system. These features were produced by tidal forces generated in the collision. The collision, which began more than 100 million years ago and is still occurring, has triggered the formation of millions of stars in clouds of dust and gas in the galaxies. The most massive of these young stars have already sped through their evolution in a few million years and exploded as supernovas.

Image credit: NASA / ESA / SAO / CXC / JPL-Caltech / STScI

CCAS Annual Holiday Party
by Don Knabb

Instead of a regular meeting in December, we celebrate our year of astronomy with a holiday party. This year the party will be held at Barb and Don Knabb's house on Friday, December 14th at 7 p.m. The address is 988 Meadowview Lane and phone number is 610 436 5702. Please RSVP to dknabb00@comcast.net so we know how much food to plan. We'll have sandwiches and snacks and beer and wine.

If you are able, please bring along something to share. (Doesn't have to be for the "whole" group though. It is likely we will end up with way to much food otherwise.)

Spouses and families are invited. Please assure your significant other that we will have more than astronomy to talk about!

If it is a clear night we might even set up a telescope in the observing circle or on the deck. We hope to see you!

Upcoming Star Party
by Dennis O'Leary

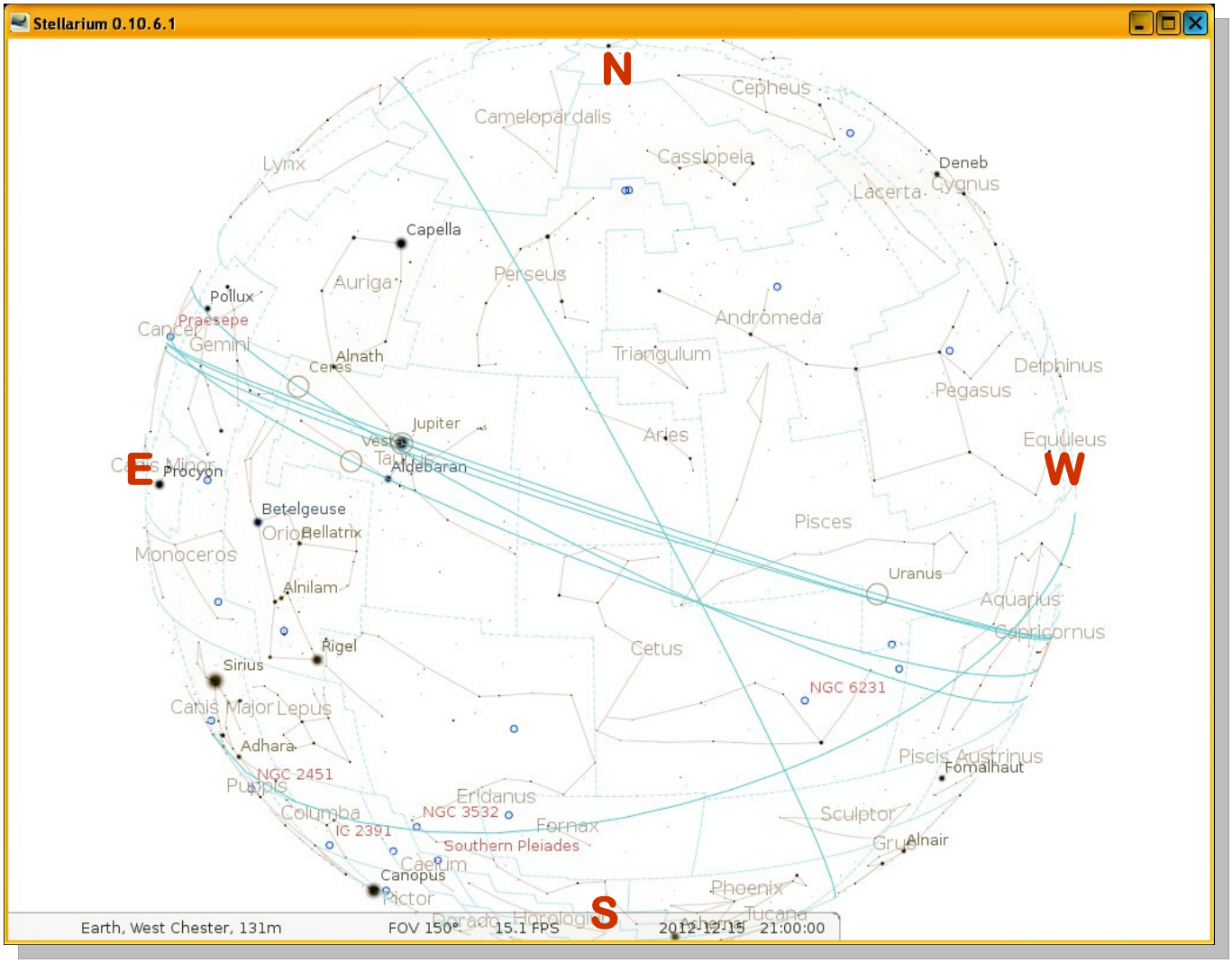
The Fugett Middle School will be having a star party at BVA on Thursday, December 20th from 7:00 to 9:30 PM.

Any help from the club members will be greatly appreciated.

The Sky Over Chester County

December 15, 2012 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
12/01/2012	6:34 a.m. EDT	7:04 a.m. EST	4:36 p.m. EDT	5:06 p.m. EST	9h 32m 20s
12/15/2012	6:45 a.m. EST	7:16 a.m. EST	4:37 p.m. EST	5:07 p.m. EST	9h 21m 02s
12/31/2012	6:52 a.m. EST	7:22 a.m. EST	4:46 p.m. EST	5:16 p.m. EST	9h 23m 22s

Moon Phases					
Last Quarter	12/06/2012	10:32 p.m. EST	First Quarter	12/20/2012	12:19 a.m. EST
New Moon	12/13/2012	3:42 a.m. EST	Full Moon	12/28/2012	5:22 a.m. EST

December 2012 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

2	**Jupiter is at opposition**
4	**Mercury rises 1 ½ hours before the Sun so it will be easy to find in the pre-dawn sky**
6	**Last Quarter Moon**
8/9	**Vesta, the brightest asteroid, is at opposition**
13	**New Moon**
13	**The Geminid meteor shower peaks**
20	**First-quarter Moon**
21	**Winter solstice**
28	**Full Moon**

The best sights this month: December has several interesting events to look for. Firstly, try to catch the Geminid meteor shower. This could be an especially good year for Geminid watching since the peak of the shower is the same night as the New Moon. All month we can see brilliant Jupiter shining brightly in the sky and on Christmas night it is only about 1 degree from the nearly Full Moon. Finally, if you arise before dawn on December 10th you will see a beautiful line-up in the predawn sky starting with Spica and stepping down to Saturn, the Moon, Venus and Mercury.

Mercury: December is the best month of this year to see Mercury if you care to rise before dawn to add this elusive planet to your list of observed planets. December 4th is the best day, when Mercury reaches greatest elongation from the Sun, rising 1 ½ hours before dawn.

Venus: Venus sits below Spica and Saturn during December. By the end of the month Venus is beginning to sink into the glow of the sunrise. The Moon, Venus, Mercury, Saturn and Spica join to create a wonderful sight in the pre-dawn sky from December 9th to the 11th.

Mars: The opportunity for good observing of the red planet is now behind us until next year. Yes, you can still find Mars low in the southwest at dusk, but it is so low in the sky that you will need binoculars to find it.

Jupiter: Jupiter is at opposition on December 2nd, so it is well positioned for viewing all night, but especially after 9 p.m. when it gets fairly high in the sky. The king of the planets shines at a brilliant magnitude -2.8! Jupiter and the Moon give us a beautiful sight on Christmas night when they are very close in the sky.

Saturn: The ringed planet is visible in the pre-dawn sky all month, rising at 4 a.m. at the start of the month and at 2:30 by month's end.

Uranus and Neptune: Both of these distant gas giants are well positioned for telescopic viewing just after the sky becomes fully dark. Sky maps to locate these planets can be found at skypub.com, the website of Sky and Telescope magazine.

The Moon: Full moon is on December 28th. This is the Full Cold Moon; or the Full Long Nights Moon. It is also sometimes called the Moon before Yule. The term Long Night Moon is appropriate because the midwinter night is indeed long, and because the Moon is above the horizon for a long time. The midwinter full Moon has a high trajectory across the sky because it is opposite a low Sun.

Constellations: Ah, December skies. It's cold enough to be quite clear, but not the freezing, bone chilling cold of January and February. It seems odd to go outside after sunset and still see the Summer Triangle, but indeed there it is diving into the west. But in December my eyes look to the southeast to see the Pleiades and Taurus rising with wonderful Orion not far behind. Clear December skies, a warm coat; life is good!

Messier/deep sky: With Cassiopeia high in the sky this is a great time of year to see the open cluster NGC 457, also called the Owl Cluster or the ET Cluster. It really does look like the ET with bright

(Continued on page 9)

It Takes More Than Warm Porridge to Make a Goldilocks Zone

by Diane K. Fisher

The "Goldilocks Zone" describes the region of a solar system that is just the right distance from the star to make a cozy, comfy home for a life-supporting planet. It is a region that keeps the planet warm enough to have a liquid ocean, but not so warm that the ocean boils off into space. Obviously, Earth orbits the Sun in our solar system's "Goldilocks Zone."

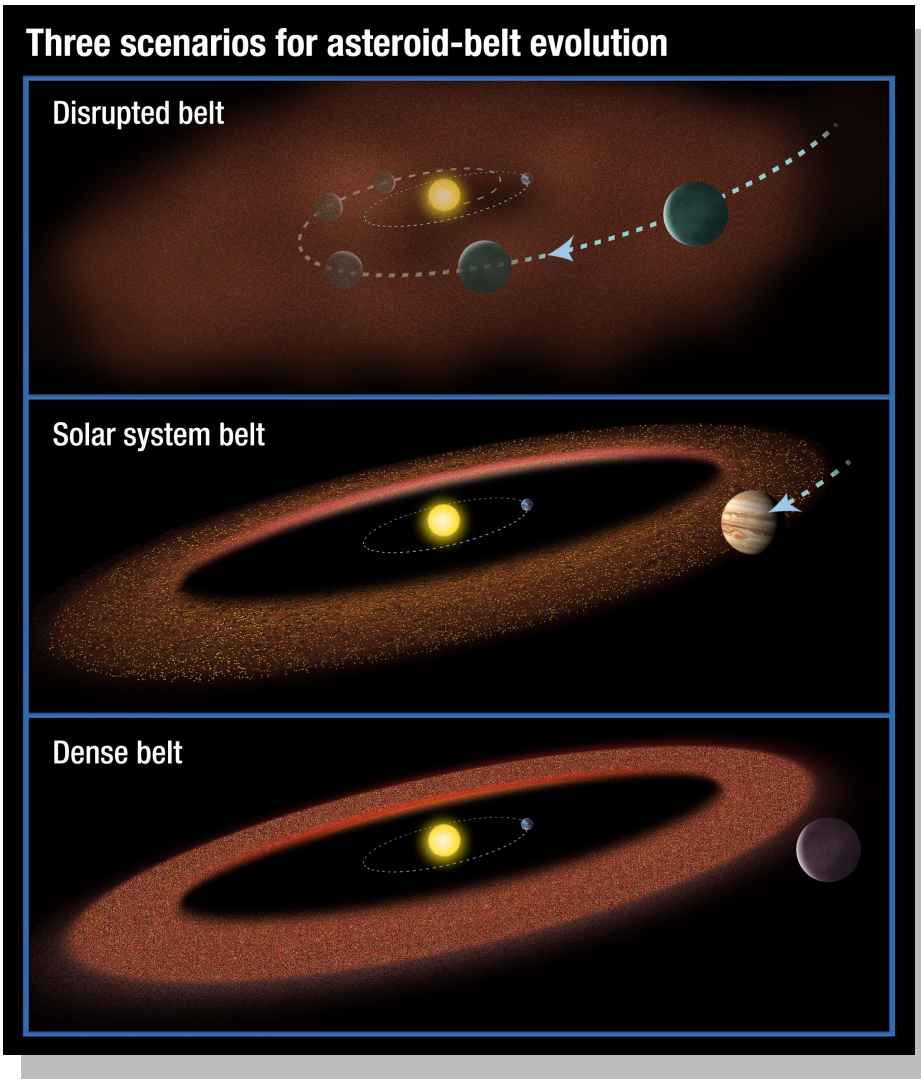
But there are other conditions besides temperature that make our part of the solar system comfortable for life. Using infrared data from the Spitzer Space Telescope, along with theoretical models and archival observations, Rebecca Martin, a NASA Sagan Fellow from the University of Colorado in Boulder, and astronomer Mario Livio of the Space Telescope Science Institute in Baltimore, Maryland, have published a new study suggesting that our solar system and our place in it is special in at least one other way.

This fortunate "just right" condition involves Jupiter and its effect on the asteroid belt.

Many other solar systems discovered in the past decade have giant gas planets in very tight orbits around their stars. Only 19 out of 520 solar systems studied have Jupiter-like planets in orbits beyond what is known as the "snow line"—the distance from the star at which it is cool enough for water (and ammonia and methane) to condense into ice. Scientists believe our Jupiter formed a bit farther away from the Sun than it is now. Although the giant planet has moved a little closer to the Sun, it is still beyond the snow line.

So why do we care where Jupiter hangs out? Well, the gravity of Jupiter, with its mass of 318 Earths, has a profound effect on everything in its region, including the asteroid belt. The asteroid belt is a region between Mars and Jupiter where millions of mostly rocky objects (some water-bearing) orbit. They range in size from dwarf planet Ceres at more than 600 miles in diameter to grains of dust. In the early solar system, asteroids (along

(Continued on page 7)



Our solar system is represented by the middle scenario, where the gas giant planet has migrated inward, but still remains beyond the asteroid belt.

Bolometer (cont'd)

(Continued from page 6)

with comets) could have been partly responsible for delivering water to fill the ocean of a young Earth. They could have also brought organic molecules to Earth, from which life eventually evolved.

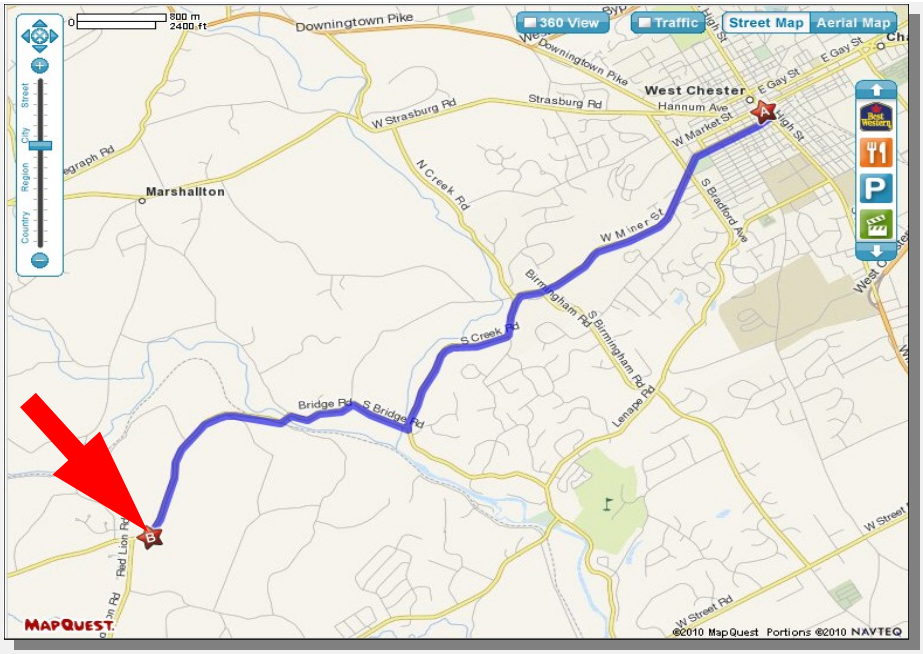
Jupiter's gravity keeps the asteroids pretty much in their place in the asteroid belt, and doesn't let them accrete to form another planet. If Jupiter had moved inward through the asteroid belt toward the Sun, it would have scattered the asteroids in all directions before Earth had time to form. And no asteroid belt means no impacts on Earth, no water delivery, and maybe no life-starting molecules either. Asteroids may have also delivered such useful metals as gold, platinum, and iron to Earth's crust.

But, if Jupiter had not migrated inward at all since it formed father away from the Sun, the asteroid belt would be totally undisturbed and would be a lot more dense with asteroids than it is now. In that case, Earth would have been blasted with a lot more asteroid impacts, and life may have never had a chance to take root.

The infrared data from the Spitzer Space Telescope contributes in unexpected ways in revealing and supporting new ideas and theories about our universe. Read more about this study and other Spitzer contributions at spitzer.caltech.edu. Kids can learn about infrared light and enjoy solving Spitzer image puzzles at space-place.nasa.gov/spitzer-slyder.

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

CCAS Directions



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

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

Brandywine Valley Association

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

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

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

Through the Eyepiece: Jupiter, King of the Planets

by Don Knabb, CCAS Treasurer & Observing Chair

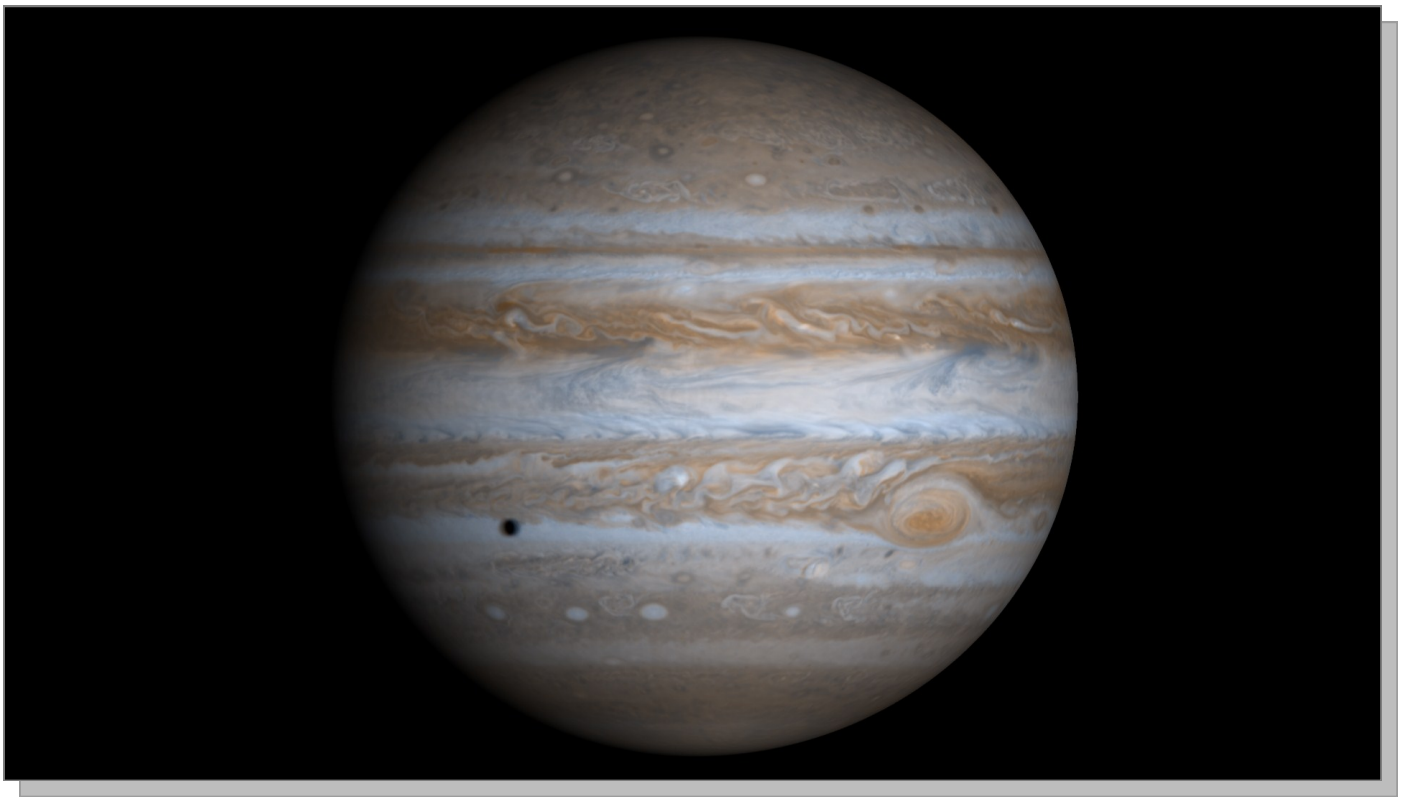


Image credit: http://solarsystem.nasa.gov//multimedia/gallery/Full_Disk_Jupiter1.jpg

If you step outside on a clear, cold December evening and look at the eastern sky the first thing you will see is Jupiter shining brightly. At the November star gazing night at Brandywine Valley Association the king of the planets filled several eyepieces and we gazed for minutes at a time at this beautiful ball of gas. As the evening began we saw three of the Galilean moons off to one side of the planet, and then Dave Hockenberry caught the fourth moon "coming 'round the bend" from behind the planet. The view through Dave's Questar was indeed amazing.

Jupiter is at opposition on December 2nd, which means it is opposite the Sun in our sky and therefore rises at sunset and sets around sunrise. It is highest overhead at midnight, but is in good viewing position from around 8 p.m. onward.

Jupiter is the fifth planet from the Sun and is the largest one in the solar system. It is a huge ball of hydrogen and helium without any solid continents like we have here on Earth. If Jupiter were hollow, more than one thousand Earths could fit inside. It also contains more matter than all of the other planets combined. It is believed that beneath all that gas lays a small rocky core covered by metallic hydrogen (what a weird idea – metallic hydrogen…….).

What we see when we look at Jupiter through a telescope is a quilt of multicolored clouds with ever changing dark and light bands. The most prominent area of interest on the surface of Jupiter is the Great Red Spot, a salmon-colored oval vortex that has been observed for centuries. The Great Red Spot is larger than our entire planet.

Jupiter is the fourth brightest object in the sky (after the Sun, the Moon and Venus). It has been known since prehistoric times as a bright "wandering star". In 1610 when Galileo first pointed a telescope at the sky he discovered Jupiter's four large moons Io, Europa, Ganymede and Callisto (now known as the Galilean moons) and recorded

(Continued on page 9)

Eyepiece (Cont'd)

(Continued from page 8)

their motions back and forth around Jupiter. This was the first discovery of a center of motion not apparently centered on the Earth. It was a major point in favor of Copernicus's heliocentric theory of the motions of the planets. Galileo's outspoken support of the Copernican theory got him in trouble with the Inquisition.

Today anyone can repeat Galileo's observations (without fear of retribution). Even the smallest telescope will reveal Jupiter's four largest satellites, three of which are larger than our own Moon. The motion of these satellites is fascinating to watch and under good conditions with at least a 60mm telescope you can sometimes see the shadow of a moon on Jupiter's surface. And at latest count, there are 63 known satellites in orbit around Jupiter!

Jupiter radiates more energy into space than it receives from the Sun. The interior of Jupiter is hot, around 20,000 degrees C. The heat is generated by the slow gravitational compression of the planet. Jupiter does NOT produce energy by nuclear fusion as in the Sun; it is much too small and its interior is too cool to ignite nuclear reactions. Jupiter is just about as large in diameter as a gas planet can be. If more material were to be added, it would be compressed by gravity such that the overall radius would increase only slightly. A star can be larger only because of its internal (nuclear) heat source. But Jupiter would have to be at least 80 times more massive to become a star.

Jupiter has rings like Saturn's, but much fainter and smaller. They were totally unexpected and were only discovered when two of the Voyager 1 scientists insisted that after traveling 1 billion km it was at least worth a quick look to see if any rings might be present. Everyone else thought that the chance of finding anything was nil, but there they were.

Jupiter and science fiction: Yes, Jupiter has been a movie star! In the movie *2010: The Year We Make Contact*, the follow up to *2001: A Space Odyssey*, we follow a group of American and Russian astronauts as they travel to Jupiter to investigate the mysterious monolith. As the movie closes, the aliens who built the monolith replicate millions of monoliths on Jupiter to increase its mass to the point that it collapses under its own gravity and bursts into nuclear fusion and becomes a second star in our sky. The new star was created to supply energy to a newly formed intelligent life form on Jupiter's moon Europa.

So do not miss the show that Jupiter is putting on this winter. If any object in the night sky is worth getting dressed warmly to view, it is Jupiter!

Observing (cont'd)

(Continued from page 5)

eyes and his arms outstretched.

The Andromeda Galaxy is at ideal viewing position early in the evening so aim your binoculars or telescope at our nearest galaxy neighbor. Keep in mind that the fuzzy spot you are seeing is 2.5 million light years away and contains a trillion stars!

Comets: There are no bright comets in the sky during December.

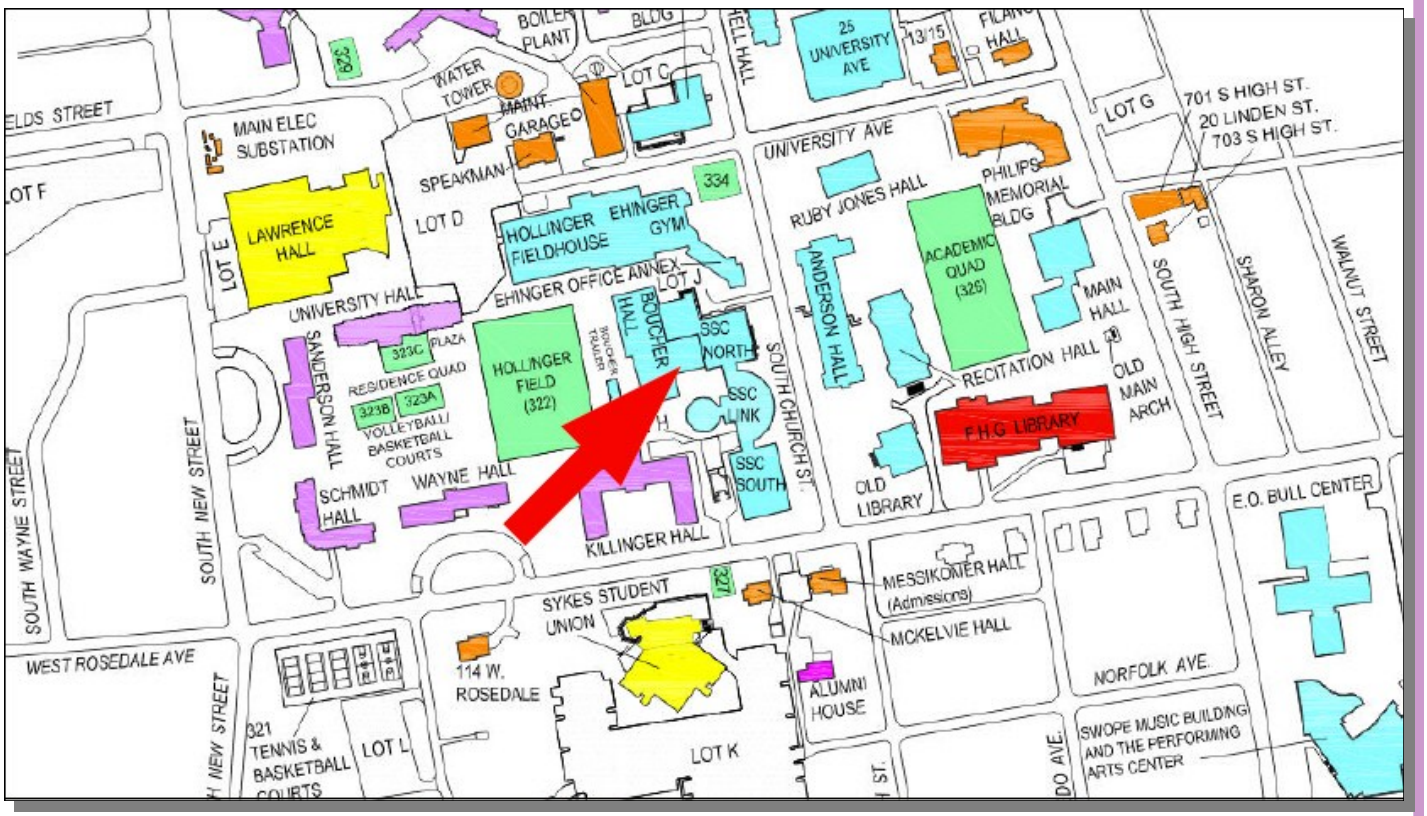
Meteor showers: This is a great year to see the Geminid meteor shower, one of the most reliable meteor showers of the year. The peak is on the night of December 13/14 when the Moon is new. Up to 120 "shooting stars" per hour are possible from this shower.

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

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).



Happy Holidays!

Illuminated trees with the moon as a star at Longwood Gardens, photo courtesy of Don Knabb

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

Nov 2012 Financial Summary

Beginning Balance	$1,467
Deposits	$200
Disbursements	$0
Ending Balance	$1,667

New Member Welcome!

Welcome new CCAS member Anthony DiGregorio of West Chester.

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
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