



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 22, No. 4

Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009

April 2014

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Helix Nebula



Image credit: NASA / JPL-Caltech

Membership Renewals Due

04/2014	Armored Bower Caccamo Imburgia Richter
05/2014	Cline Fletcher Long O'Hara
06/2014	Hebdig Kovacs Mazziotta & Calobrisi

Important April 2014 Dates

- 7th** • First Quarter Moon, 4:31 a.m.
- 14th** • Total lunar eclipse after mid-night.
- 15th** • Full Moon, 3:43 a.m.
- 22nd** • Lyrid Meteor Shower peaks.
- 22nd** • Last Quarter Moon, 3:52 a.m.
- 29th** • New Moon, 2:15 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, April 5, 2014.** CCAS special observing session at Anson Nixon Park, Kennett Square. The observing session is from 8:00 to 9:30 PM.

☼ **Saturday, April 26, 2014** - CCAS Special Observing Session with local Cub Scouts Troup, Hibernia Park, Coatesville, PA.

☼ **Saturday, May 10, 2014** .Spring Star Party at Hoopes Park, West Chester, PA. Co-sponsored with the West Chester Department of Recreation. The free public event is scheduled for 7:30 PM to 9:30 PM.

Spring 2014 Society Events

April 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.

4th • CCAS monthly observing session at BVA. The observation session starts at dusk.

5th • CCAS special observing session at Anson Nixon Park, Kennett Square. The observation session is scheduled from 8:00 to 9:30 PM.

8th • CCAS Monthly Meeting, Room 112, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: Dr. Tim Lawlor, Professor of Physics at Penn State, Brandywine Campus.

10h-11th • The von Kármán Lecture Series: "[For the Benefit of All Mankind: The JPL Technology Transfer Program](#)," Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

11th • Reservations start for the May 2nd planetarium show at the WCU Planetarium.

20th • Open call for articles and photographs for the May 2014 edition of [Observations](#).

26th • Deadline for newsletter submissions for the May 2014 edition of [Observations](#).

May 2014

2nd • West Chester University Planetarium Show: "Black Holes Don't Suck," in the Schmucker Science Building. The show starts at 7 p.m. For more information and reservations, visit the WCU Public Planetarium Shows webpage.

2nd • CCAS monthly observing session at BVA. The observation session starts at dusk.

7th • 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.

10th • CCAS Special Night Out at Hoopes Park, West Chester, PA. The free public event starts at sunset.

13th • CCAS Monthly Meeting, Room 112, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. John Conrad, CCAS member and NASA Solar System Ambassador.

22nd-23rd • The von Kármán Lecture Series: [Putting the 'P' in 'JPL'--The Past, Present, and Future of Propulsion](#) 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 June 2014 edition of [Observations](#).

26th • Deadline for newsletter submissions for the June 2014 edition of [Observations](#).

Minutes of the March 11, 2014 Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor welcomed 14 members and guests to our March meeting. Roger announced that May 10 is National Observing Day and our club will host a star party at Hoopes Park on that day. He also reminded us that a selection of videos from the club library had been brought to the meeting by Barb Knabb, our librarian, that could be signed out by club members.
- David Hockenberry, program chair introduced our guest speaker, Dr. Ruth Daly, professor of physics at Penn State/Berks Campus. Dr. Daly presented "Black Holes in the universe."
- Don Knabb, our observing chair, presented an overview of the night sky in March/April with the Stellarium program. He reminded us over the April 15th lunar eclipse.
- It was decided to cancel BVA for March 21 and to consolidate our efforts for the March 22 Bucktoe Star Party. Roger Taylor asked for volunteers to assist him with the star party.

Nicholas's Humor Corner

by Nicholas La Para



April 2014 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on April 8, 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 is Dr. Tim Lawlor, Astronomy Professor at Penn State, Brandywine Campus. Dr. Lawlor will present his research on early universe stars.

On May 13th, John Conrad, CCAS member and NASA Solar System Ambassador will be our speaker.



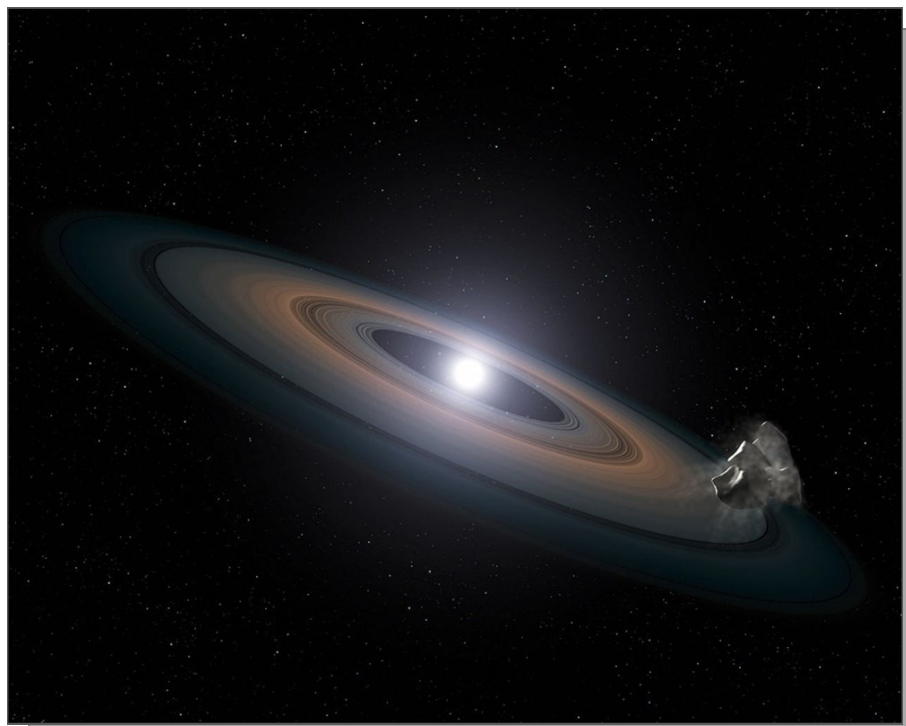
Dr. Tim Lawlor

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.

Scientists Solve Riddle of Celestial Archaeology

courtesy of University of Leicester & Royal Astronomical Society, United Kingdom



Artist's impression of debris around a white dwarf star.
NASA/ESA/STScI/G. Bacon (STScI)

Leicester and University of Arizona investigated hot young white dwarfs — the superdense remains of Sun-like stars that ran out of fuel and collapsed to about the size of Earth.

Astronomers know that many hot white dwarfs' atmospheres, essentially composed of pure hydrogen or pure helium, are contaminated by other elements like carbon, silicon, and iron. What they didn't know, however, was the origins of these elements, known in astronomical terms as metals. "The precise origin of the metals has remained a mystery, and extreme differences in their abundance between stars could not be explained," said Barstow. "It was believed that this material was 'levitated' by the intense radiation from deeper layers in the

(Continued on page 7)

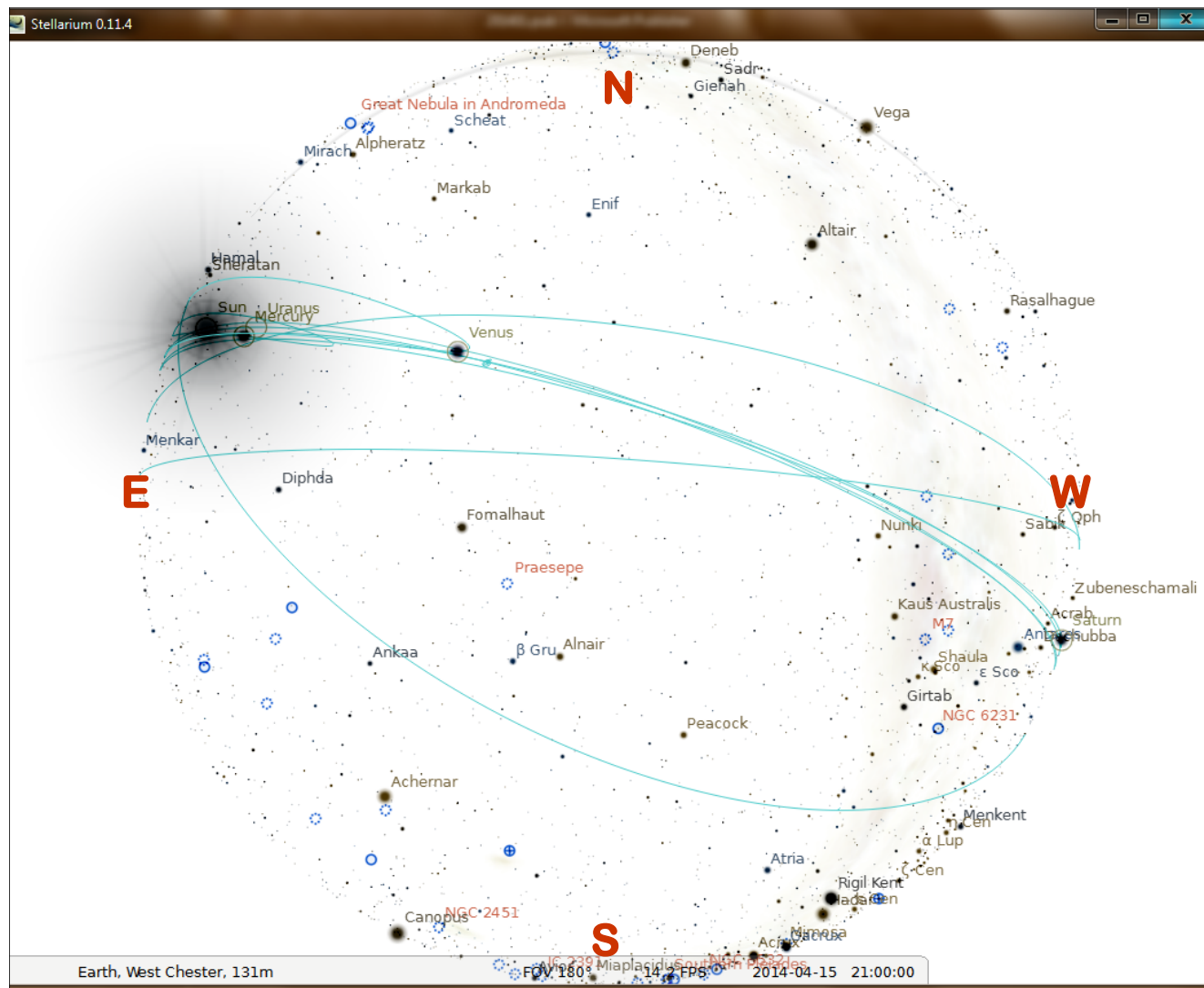
A decades-old space mystery has been solved by an international team of astronomers led

by Martin Barstow from the University of Leicester, England. Scientists from the University of

The Sky Over Chester County

April 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
04/01/2014	6:17 a.m. EDT	6:45 a.m. EST	7:25 p.m. EDT	7:52 p.m. EST	12h 40m 09s
04/15/2014	5:55 a.m. EDT	6:23 a.m. EDT	7:39 p.m. EDT	8:07 p.m. EDT	13h 16m 06s
04/30/2014	5:33 a.m. EDT	6:02 a.m. EDT	7:54 p.m. EDT	8:24 p.m. EDT	13h 52m 09s
Moon Phases					
First Quarter	04/07/2014	4:31 a.m. EDT	Full Moon	04/15/2014	3:43 a.m. EDT
New Moon	04/29/2014	2:15 p.m. EDT	Last Quarter	04/22/2014	3:52 a.m. EDT

April 2014 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

3	The Moon occults the double star Delta 1 Tau at 10:20 p.m.
7	First-quarter Moon
7	The Lunar Straight Wall is visible
7	The Lunar X is visible at 4 a.m.
8	Mars is at opposition
14	The Moon is near Spica and Mars
14	Total lunar eclipse after midnight
15	Full Moon
16/17	The Moon is near Saturn
22	Last Quarter Moon
22	The Lyrid meteors peak
29	New Moon

The best sights this month: Jupiter, Mars and a total Lunar Eclipse make April a “stellar” month for star gazing. To be honest, I must mention that the eclipse is at 3 a.m., but try to at least take a peek out the window!

Mercury: Mercury is not in a good position for viewing during April.

Venus: The “morning star” rises just a bit before morning twilight begins, shining bright at magnitude -4.3.

Mars: The red planet is opposite the Sun on April 8th, so it will be visible all night. It will be high in the sky from 11 p.m. until 2 a.m. when it will present a nice view in a telescope.

Jupiter: If you are looking for an object to view while the evening sky is still bright with the fading sunset, that object is Jupiter. It will be high in the south just as the sky darkens. Watch for the Galilean satellites to pass in front of or behind Jupiter, it is a sight you will never forget.

Saturn: The ringed planet is rising around 9:30 during April, but is best viewed much later when it is

high in the sky. Saturn will be quite bright because the rings are tilted at 22 degrees from edge-on.

Uranus and Neptune: Neither gas giant is in favorable position for viewing during April.

The Moon: Full moon is on April 15th. I suppose there will be enough light from the Moon for you to finish your tax return! Native Americans called this the Full Pink Moon. This name came from the herb moss pink, or wild ground phlox, which is one of the earliest flowers of the spring. Other names for this full Moon are the Full Sprouting Grass Moon and among coastal tribes the Full Fish Moon because this was the time that the shad swam upstream to spawn.

Constellations: We say good-bye to the winter constellations as April progresses. But the spring constellations are here to enjoy and if you are up late you will even see the Summer Triangle peaking over the eastern horizon. In the east we have bright Arcturus in Boötes, followed by Corona Borealis the Northern Crown. If you are up a bit later you will see Hercules rising. Leo the Lion is at center stage and Ursa Major is high overhead.

Messier/deep sky: April is a good month to go galaxy hunting. Look for M64 in Coma Berenices, M51, M81 and M82 in Ursa Major and M104 near bright Spica in Virgo. Of course, you will need to go hunting on a night with no bright Moon.

Comets: There are no bright comets in the sky during April. But, if you use at least a 3 inch telescope (and larger if possible) from a dark sky site, you can find Comet PANSTARRS (C/2012 K1) at the start or end of April when the Moon is absent from the sky. A sky map is in the current issue of Astronomy magazine. Comet PANSTARRS passes near the constellations Ursa Major, Bootes and Canes Venatici and glows at 9th magnitude.

Meteor showers: The Lyrid meteor show peaks in the early morning hours of April 22nd. You should be able to see 10 to 20 bright, fast meteors at the peak of the shower.

Through the Eyepiece: Mars, The Red Planet

by Don Knabb, CCAS Treasurer & Observing Chair

Mars reaches opposition (the point in its orbit where it is opposite the Sun in our sky) on April 8th and is closest to Earth on April 14th. It will shine as brightly as Sirius, the brightest star in the night sky. This is the brightest that Mars is since the 2007 opposition. But Mars will not be very high in the sky, so wait for a night that is clear with a steady atmosphere to have the best view of Mars.

Mars, the fourth planet from the Sun in the Solar System is named after Mars, the Roman god of war. It is also referred to as the "Red Planet" because of its reddish appearance as seen from Earth. Before humans had telescopes, fear and foreboding rose whenever a blood-red dot looped its way across an otherwise still sky.

Mars is a rocky or terrestrial planet, with a thin atmosphere. Its surface features are reminiscent both of the impact craters of the Moon and the volcanoes, valleys, deserts and polar ice caps of Earth.

If it was not for the high radiation levels, with a good scuba suit and a warm winter jacket you could walk around on the surface of Mars. Are there places on Earth that are similar to Mars? Yes, the Canadian arctic for example, where Mars astronaut suits have been tested. Or perhaps Death Valley, California where we find geologic features similar to Mars.



Image source: Hubble Space Telescope, 2007 opposition

Mars is home to Olympus Mons, the highest known mountain in the solar system, and of Valles Marineris, the largest canyon. In addition to its geographical features, Mars' rotational period and seasonal cycles are likewise similar to those of Earth.

To observe Mars you really do not need a sky chart. Just go outside around 9:00 p.m. and look toward the southeast. You will immediately see why Mars is called the Red Planet.

It is hard to know how much detail we'll be able to see during this opposition. The dust storms on Mars are hard to predict. If

conditions are good, you might be able to glimpse the northern ice cap using a 6 inch or larger telescope under good viewing conditions. Take your time at the eyepiece. The more you look, the more you will see as the atmospheric conditions change.

Information sources:

<http://mars.jpl.nasa.gov/extreme/>

<http://en.wikipedia.org/wiki/Mars#Viewing>

Riddle (Cont'd)

(Continued from page 3)
star.”

Now the researchers have discovered that many of the stars show signs of contamination by rocky material, the leftovers from a planetary system.

The researchers surveyed 89 white dwarfs using the Far Ultraviolet Spectroscopic Explorer to obtain their spectra (dispersing the light by color) in which the “fingerprints” of carbon, silicon, phosphorous, and sulphur can be seen when these elements are present in the atmosphere.

“We found that in stars with pol-

luted atmospheres, the ratio of silicon to carbon matched that seen in rocky material, much higher than found in stars or interstellar gas,” said Barstow.

“The new work indicates that around one-third of all hot white dwarfs are contaminated in this way, with the debris most likely in the form of rocky minor planet analogs,” he continued. This implies that a similar proportion of stars like our Sun, as well as stars that are a little more massive like Vega and Fomalhaut, build systems containing terrestrial planets. This work is a form of celestial archaeology where we are studying the ‘ruins’ of rocky planets and/or their build-

ing blocks, following the demise of the main star.

“The mystery of the composition of these stars is a problem we have been trying to solve for more than 20 years. It is exciting to realize that they are swallowing up the leftovers from planetary systems, perhaps like our own, with the prospect that more detailed follow-up work will be able to tell us about the composition of rocky planets orbiting other stars,” said Barstow.

The study also points to the ultimate fate of Earth billions of years from now — ending up as a contamination within the white dwarf Sun.

A New Nova Shines in Cygnus

by Michael E. Bakich, *Astronomy Magazine*



Image Credit: Gianluca Masi/the Virtual Telescope Project

On March 31 at approximately 19h UT, two Japanese astronomers, Koichi Nishiyama, of Kurume and Fujio Kabashima of Miyaki, reported the discovery of a possible nova, temporarily designated PNV

J20214234+3103296. The pair had seen the magnitude 10.9 object on two 40-second unfiltered exposures they captured with a CCD camera attached to a 105mm f/4 camera lens.

Approximately seven hours later, at 2h40m UT April 1, astronomers Gianluca Masi, Francesca Nocentini, and Patrick Schmeer at the Virtual Telescope Project imaged the region with a pair of remotely controlled telescopes. They provided optical and spectroscopic evidence that the new object was, indeed, a nova.

The object’s coordinates are 20h21m43s right ascension and 31°03'29" declination (equinox 2000.0). This position is roughly equidistant from two naked-eye stars: 39 Cygni, which shines at magnitude 4.4, and 41 Cygni, which glows slightly brighter at magnitude 4.0.

Old Tool, New Use: GPS and the Terrestrial Reference Frame

by Alex H. Kasprak

Flying over 1300 kilometers above Earth, the Jason 2 satellite knows its distance from the ocean down to a matter of centimeters, allowing for the creation of detailed maps of the ocean's surface. This information is invaluable to oceanographers and climate scientists. By understanding the ocean's complex topography—its barely perceptible hills and troughs—these scientists can monitor the pace of sea level rise, unravel the intri-



cacies of ocean currents, and project the effects of future climate change.

But these measurements would

be useless if there were not some frame of reference to put them in context. A terrestrial reference frame, ratified by an international group of scientists, serves that purpose. “It’s a lot like air,” says JPL scientist Jan Weiss. “It’s all around us and is vitally important, but people don’t really think about it.” Creating such a frame of reference is more of a challenge than you

(Continued on page 9)



Artist's interpretation of the Jason 2 satellite. To do its job properly, satellites like Jason 2 require as accurate a terrestrial reference frame as possible. Image courtesy: NASA/JPL-Caltech.

Space Place (cont'd)

(Continued from page 8)

might think, though. No point on the surface of Earth is truly fixed.

To create a terrestrial reference frame, you need to know the distance between as many points as possible. Two methods help achieve that goal. Very-long baseline interferometry uses multiple radio antennas to monitor the signal from something very far away in space, like a quasar. The distance between the antennas can be calculated based on tiny changes in the time it takes the signal to reach them. Satellite laser ranging, the second method, bounces lasers off of satellites and measures the two-way travel time to calculate

distance between ground stations.

Weiss and his colleagues would like to add a third method into the mix—GPS. At the moment, GPS measurements are used only to tie together the points created by very long baseline interferometry and satellite laser ranging together, not to directly calculate a terrestrial reference frame.

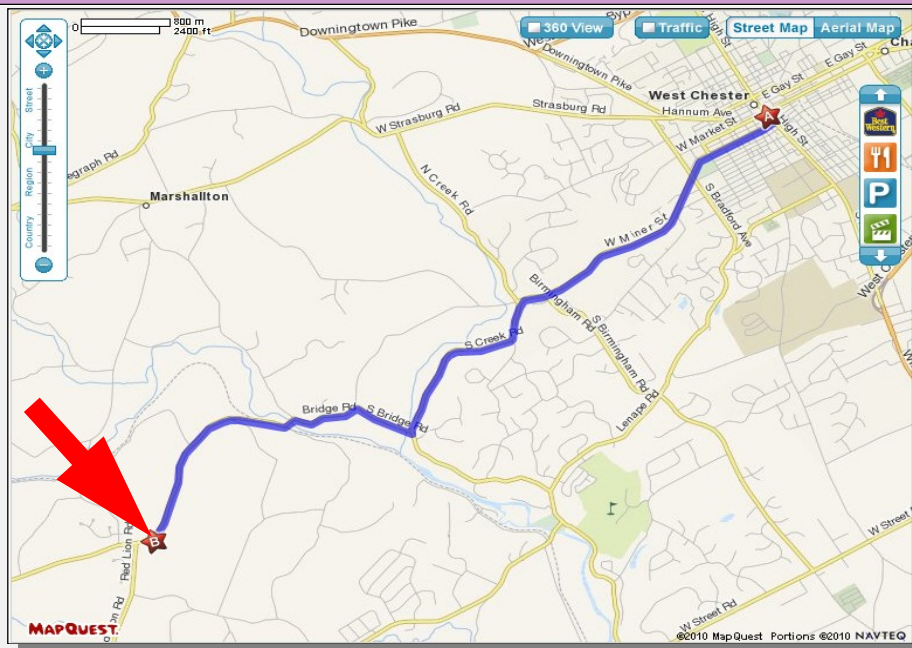
“There hasn’t been a whole lot of serious effort to include GPS directly,” says Weiss. His goal is to show that GPS can be used to create a terrestrial reference frame on its own. “The thing about GPS that’s different from very-long baseline interferome-

try and satellite laser ranging is that you don’t need complex and expensive infrastructure and can deploy many stations all around the world.”

Feeding GPS data directly into the calculation of a terrestrial reference frame could lead to an even more accurate and cost effective way to reference points geospatially. This could be good news for missions like Jason 2. Slight errors in the terrestrial reference frame can create significant errors where precise measurements are required. GPS stations could prove to be a vital and untapped resource in the quest to create the most accurate terrestrial reference frame possi-

(Continued on page 10)

CCAS Directions



Brandywine Valley Association

1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090

<http://brandywinewatershed.org/>

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

Brandywine Valley Association

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

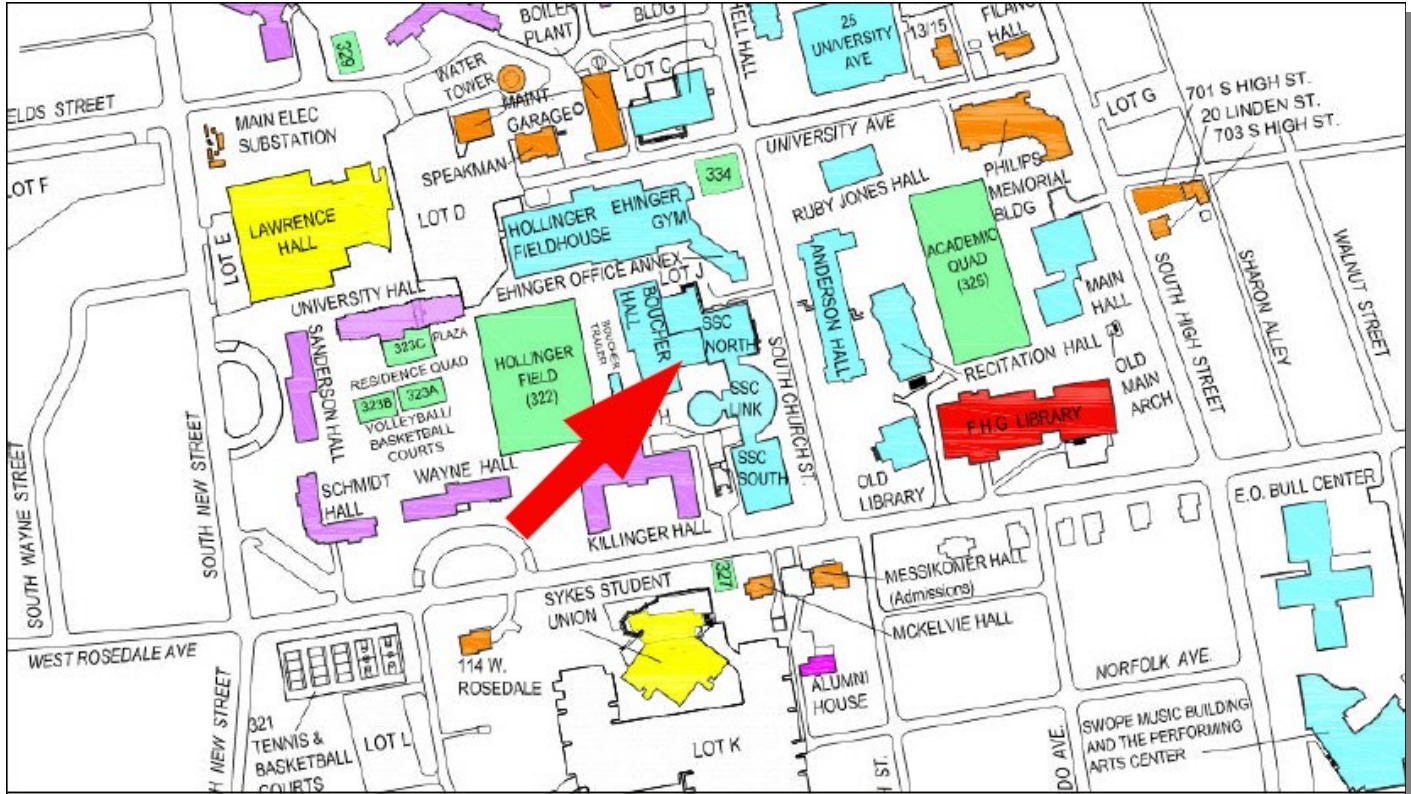
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route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

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

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).



Eye piece (Cont'd)

(Continued from page 9)

ble. "The thing about GPS," says Weiss, "is that you are just so data rich when compared to these other techniques."

You can learn more about NASA's efforts to create an accurate terrestrial reference frame here: <http://space-geodesy.nasa.gov/>.

Kids can learn all about GPS by visiting <http://spaceplace.nasa.gov/gps> and watching a fun animation about finding pizza here: <http://spaceplace.nasa.gov/gps-pizza>.

CCAS Membership Information and Society Financials

Treasurer's Report by Don Knabb

March 2014 Financial Summary

Beginning Balance	\$2,021
Deposits	\$55
Disbursements	\$0
Ending Balance	\$2,076

New Member Welcome!

Welcome new CCAS members Donald Miller of Downingtown, PA. We're glad you decided to join us under the stars! Clear skies to you!

Membership Renewals

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

Don Knabb
988 Meadowview Lane
West Chester PA 19382

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

CCAS Information Directory

Join the Fight for Dark Skies!

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

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

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

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

<http://www.darksky.org>

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

Dark-Sky Website for PA

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

<http://www.POLCouncil.org>

Find out about Lyme Disease!

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

<http://www.LymePA.org>

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

CCAS Event Information

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

Good Outdoor Lighting Websites

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



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

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

<http://www.starrynightlights.com>



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

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

Phone: 512-944-7354

<http://www.greeneearthlighting.com>

Local Astronomy-Related Stores

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



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

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

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

<http://www.skiesunlimited.net>



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

4403 Main Street
Philadelphia, PA 19127

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

Hours:

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

<http://www.spectrum-scientifics.com>

CCAS Information Directory

CCAS Lending Telescopes

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

CCAS Lending Library

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

Contributing to *Observations*

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

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 & Telescope Magazine Group Rates

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

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

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