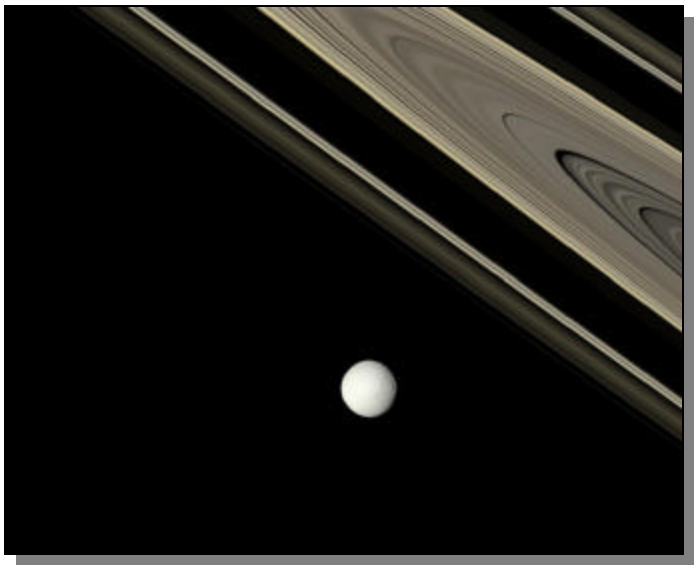
Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 16, No. 11 *November 2008*

In This Issue



A spectacular view of Saturn's rings and icy moon Tethys. Saturn's rings were imaged in their true colors by the Cassini probe in late October 2007. Photo courtesy of the Cassini Imaging Team, the Space Science Institute (SSI), JPL, ESA, and NASA.

Important November Dates

2nd • Daylight Savings Time ends 2 A.M. EDT, turn clocks back one hour.

5th • First Quarter Moon.

13th • Full Moon.

17th • Leonid meteor shower peaks in the early morning hours of November 17th. About 10 meteors per hour might be seen.

19th • Last quarter moon.

27th • New Moon.

CCAS Upcoming Nights Out

CCAS has several "nights out" in the first week of November. Members are encouraged to help out during these events any way they can.

Wednesday, November 5th at 7:00 p.m. we will host a night out at West Bradford Elementary School for about 25 girl scouts and various parents. This will be a big group so we need several telescopes for this event. West Bradford Elementary School is south of Thorndale, a few miles off Marshallton-Thorndale Road. If you can help out and need directions to the school just send Don Knabb an e-mail at observing@ccas.us or dknabb00@comcast.net.

Saturday, November 8th we have a night out at the house of the scoutmaster of a Girl Scout pack near Hibernia Park north of Coatesville. There will be about 7 girls and parents. The time and specific location for this event will be sent in a "members" e-mail. The skies should be quite dark at this location!

Fall/Winter Society Events

November 2008

5th • PA Outdoor Lighting Council monthly meeting.

11th • CCAS Monthly Meeting, Room 113, Boucher Building, West Chester University.

14th • West Chester University Planetarium Show: "Raining Stars".

28th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date November 29th).

December 2008

3rd • PA Outdoor Lighting Council monthly meeting.

9th • CCAS Holiday Party in West Chester, PA. The party is for CCAS members and their families and starts at 7:00 p.m. See the December 2008 edition of Observations for location and directions.

12th • West Chester University Planetarium Show: "Stories Your Astronomy Professor Never Told You".

26th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date December 27th).

Minutes of the October 14, 2008 meeting of the CCAS

- Video presentation: *Extra Solar Planets* DVD was shown.
- Program – John Hepler demonstrated the free planetarium software Stellarium.
- Constellation of the month – Perry Bickel presented Perseus.
- Website – John is considering adding some educational video clips to the website.
- Finance – no report.
- Observing – Upcoming events were reviewed and they are listed separately in this newsletter.
- Library – no report.
- Secretary – The minutes from this month's meeting will be published in the newsletter.
- Education – no report.
- Public Relations – no report.
- Newsletter – The newsletter continues to evolve with John Hepler as editor.
- Programs – The COM presentations are covered and most of the meetings have a program planned.
- Pennsylvania Outdoor Lighting Council – This is the Pennsylvania arm of the International Dark-Sky Association. Kathy Buczynski attends the monthly POLC meetings. The POLC needs examples of buildings that have good control of outdoor lighting. Kathy requests that if you are aware of any local buildings that exhibit especially good control of night lighting that you let her know which building.

CCAS Membership Information and Society Financials

Treasurer's Report

by Bob Popovich

Sept. 2008 Financial Summary

Beginning Balance	$1,636
Deposits	$110
Disbursements	$75
Ending Balance	$1,671

Welcome New Members!

This month we welcome a new family to the Society: The Linskens family: David and Jeffrey from 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:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

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

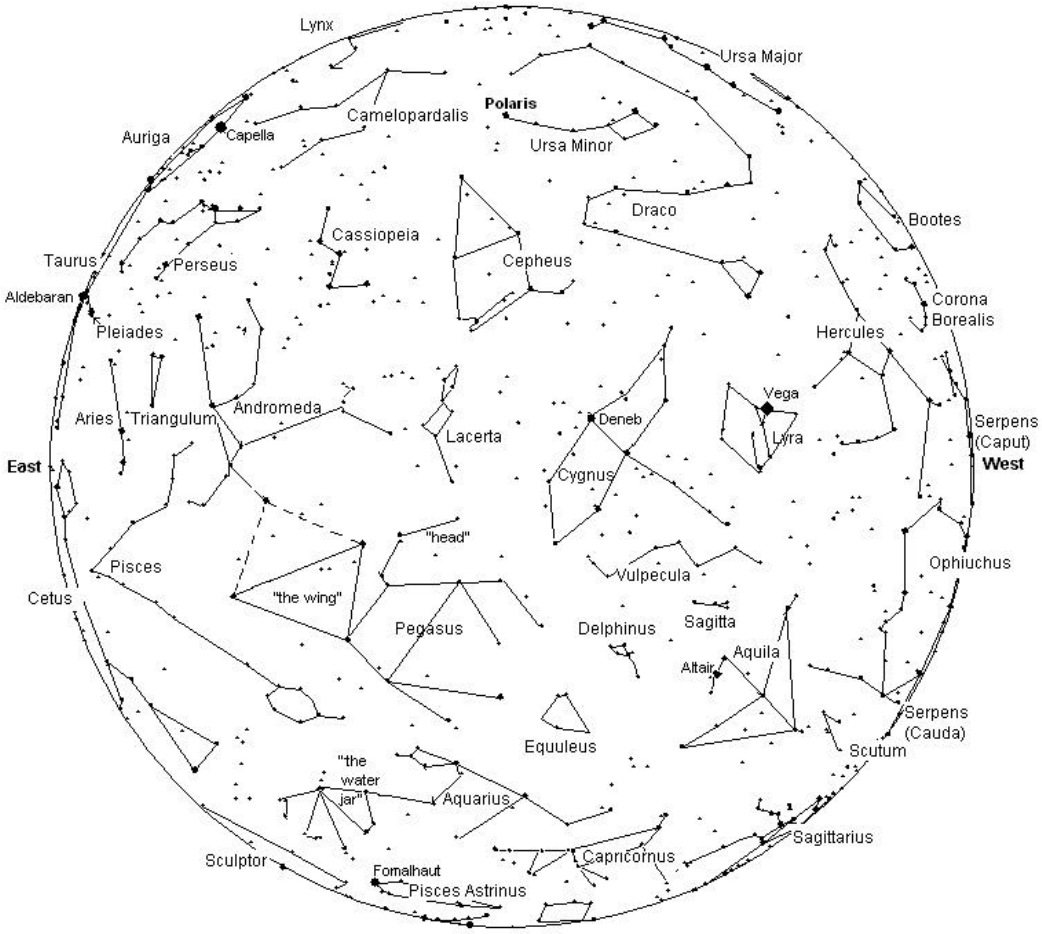
Membership Renewals Due

11/2008	Athens
	Buczynski
	Doubleday
	Hepler
	Hughes
	Murray
	O'Hara

The Sky Over Chester County

November 15, 2008 at 9:00 p.m. EDT

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



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

The faintest stars shown on this chart are fifth magnitude.

Date	Sunrise	Sunset	Moon Phases		
11/01/2008	7:32 a.m. EDT	6:00 p.m. EDT	First Quarter	11/06/2008	4:03 a.m. EST
11/15/2008	6:48 a.m. EST	4:46 p.m. EST	Full Moon	11/13/2008	6:17 p.m. EST
11/30/2008	7:04 a.m. EST	4:38 p.m. EST	Last Quarter	11/19/2008	9:31 p.m. EST
			New Moon	11/27/2008	4:55 p.m. EST

November Observing Highlights

by Don Knabb, CCAS Observing Chair

November 2	Daylight-saving time ends at 2:00 a.m.
November 3	The crescent Moon is to the lower left of Jupiter.
November 5	11:03 p.m. and the Southern Taurid meteor shower peaks
November 13	Full Moon, 1:17 a.m.
November 17	Leonid meteor shower peaks
November 19	Last quarter Moon, 4:31 a.m.
November 27	New Moon, 11:55 a.m.
November 30	Jupiter and Venus are close in the southwest with a thin crescent Moon nearby.

The Planets: Jupiter and Venus are brilliant in the evening sky and they will be getting closer to each other all month, culminating in a close pairing at month's end. Saturn is also visible in the early morning sky.

Mercury: November is not a good month for viewing Mercury. It is low in the dawn sky early in the month, then is lost in the glare of the Sun for the rest of the month and is behind the Sun on November 25th.

Venus: The "evening star" shines at a brilliant -4.0 magnitude in the southwest. As the month progresses Venus will pass near several stars in the constellation Sagittarius and is very close to the star at the top of the "teapot".

Mars: The Red Planet is too low in the glow of the sunset to be seen during November.

Jupiter: Jupiter is heading into the west as November progresses. At the start of the month Jupiter and Venus are 30° apart, but each day that gap lessens by 1°. On November 30th the two planets are only 2° apart and are joined by the crescent Moon. This will be a beautiful sight for naked eye and binocular observing – do not miss it! What a nice way to end the Thanksgiving holiday.

Saturn: Leo the Lion is stepping on Saturn with his hind feet during November as the ringed planet rises an hour or two after midnight. Saturn is less bright then we normally see it because the rings are nearly edge-on to our point of view.

Uranus and Neptune: Both gas giants can be seen just as the sky becomes dark. Use the finder charts at SkyandTelescope.com/UranusNeptune to aid your quest to see these gas giants.

Pluto: Pluto is too low at nightfall to be observed during November.

The Moon: Full moon is on November 13th at 1:17 a.m. This is the Full Beaver Moon. For Native Americans, the time of this full moon was the time to set beaver traps before the swamps froze, to ensure a supply of warm winter furs. It is sometimes also referred to as the Frosty Moon.

Constellations: During November the Great Square of Pegasus is now at "center stage". To the left of the great square, sweeping up to the left is the constellation Andromeda. Use your binoculars to find our neighbor galaxy, also named Andromeda. It is a large fuzzy spot located between the constellation Andromeda and Cassiopeia. And by 9 p.m. the beautiful Pleiades, that <u>really</u> <u>little</u> dipper is rising in the east ahead of Taurus the Bull.

Messier/Deep Sky: I always look forward to autumn for viewing the Double Cluster between Cassiopeia and Perseus. This is a really nice binocular object. Rising behind Perseus is the constellation Auriga and its three star clusters M36, M37 and M38. If you stay up for late night observing you can get an early view of M42, the Great Orion Nebula.

Comets: There are no bright comets in the sky during November but with the chart in the November issue of Astronomy magazine you should be able to find 8th magnitude comet 85P/Boethin using a telescope.

Meteor showers: The Leonid meteor shower peaks on November 17th, but only the brightest fireballs will outshine the bright gibbous Moon.

Although not as well know, the Southern Taurid meteor shower might put on a good display this year, with activity peaking on November 5th. The Moon will have set by the time the shower gets active and if you are lucky you could see a bright, slow moving fireball.

Looking Up: Sun Pillars and Sun Dogs

by Don Knabb, CCAS Observing Chair

I usually write an article for the newsletter that discusses something we can see in the night sky. But there are also interesting things to see during the day such as the Sun and the Moon. And, there is a broad group of things that we can see called atmospheric optical phenomena. These objects, or apparitions, are created by optical effects that occur between a light source such as the Sun or Moon or even Venus and atmospheric particles, normally ice particles.

The most commonly observed of these phenomena are sun pillars and sun dogs. Sun pillars are narrow columns of light apparently beaming directly up and sometimes downwards from the sun. They can be 5 -10º tall and occasionally even higher. When the air is cold and the Sun is rising or setting, falling ice crystals can reflect sunlight and create this unusual column of light. Ice sometimes forms flat, stop-sign shaped crystals as it falls from high-level clouds. Air resistance causes these crystals to lie nearly flat much of the time as they flutter to the ground. Sunlight reflects off crystals that are properly aligned, creating the sun pillar effect.

Above is a photo of a sun pillar that I took on October 18th in the Pocono Mountains at sunset.

Above is a morning sun pillar I took from our front yard in May of 2005.

Don't confuse a sun pillar with crepuscular rays. Those are the rays that you see when clouds have a break in them that allows sunlight to come through in a tight ray. They are common at the end of a thunderstorm just as the clouds are breaking up and the sun is peaking through.

Even more common are sun dogs, also called mock suns. These are luminous spots caused by the refraction of light by six-sided ice crystals in the atmosphere. These bright spots form in the solar halo at points that are 22 degrees on either side of the sun and at the same elevation as the sun. Often, two sun dogs can be seen (one on each side of the sun) simultaneously.

On page 7 is a photo I took of the bay at Ocean City, New Jersey. The sun dog is the bright spot in the cloud just to the right of the center of the picture. Other than the Sun, the other light spots in the picture are due to the camera optics.

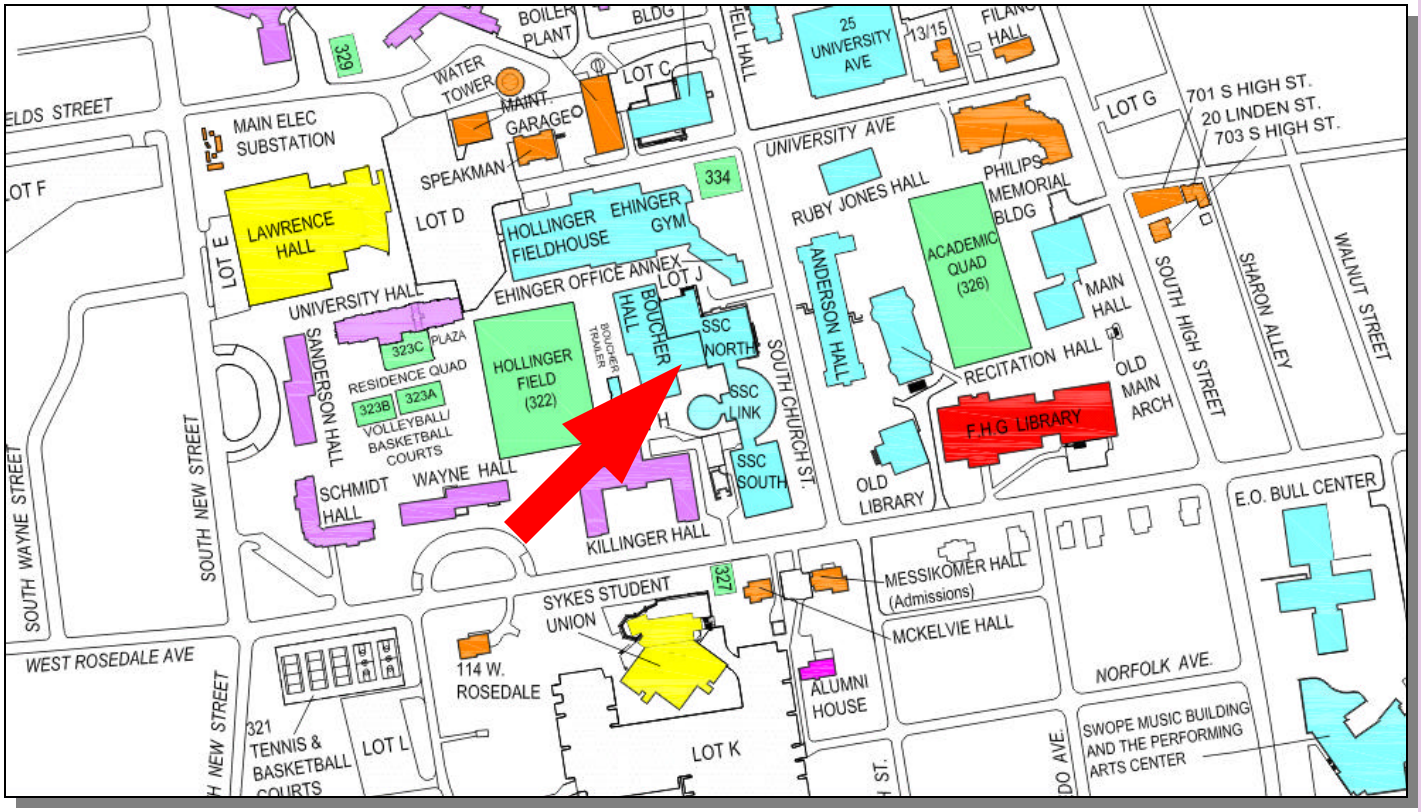
Sundogs typically, but not exclusively, appear when the sun is low, e.g. at sunrise and sunset, and the atmosphere is filled with ice crystal forming cirrus clouds They are often bright white patches of light looking much like the sun or a comet, and occasionally are confused with those phenomena. Sometimes

(Continued on page 7)

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 113 in Boucher Hall, 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).



Hands on Optics, located at 26437 Ridge Road in Damascus, Maryland, is hosting the 4th Annual Eastern Astronomy show on November 8, 2008. Representatives from Celestron, Meade, Coronado, Pentax, Takahashi, Denkemeier, and others, will be demonstrating their newest and innovative Telescopes, CCD Cameras, Binoculars, Microscopes, accessories and more. Free giveaway raffle prizes will be given out every half hour all day long! Participants must be present to win. No reservations are required. There will also be a "One-Day Only" sale with special pricing on many exciting products, starting when the store opens at 8 AM. Visit the company website (www.handsonoptics.com) and download a flyer of the schedule of events and directions, or call 1-866-726-7371.

PA Stargazing Site Makes National Geographic Magazine

Cherry Springs State Park is referenced in the November 2008 edition of ***National Geographic*** magazine. The cover story focuses on light pollution and its effects on both humans and animals.

In a follow up to the cover story, on page 152 of the same edition, a short article appears entitled "Star Chasing", and identifies four locations in the U.S. where conditions for stargazing are excellent:

- Death Valley National Park, California & Nevada.
- Natural Bridges National Monument, Utah
- Cherry Springs State Park, Pennsylvania
- Acadia National Park, Maine

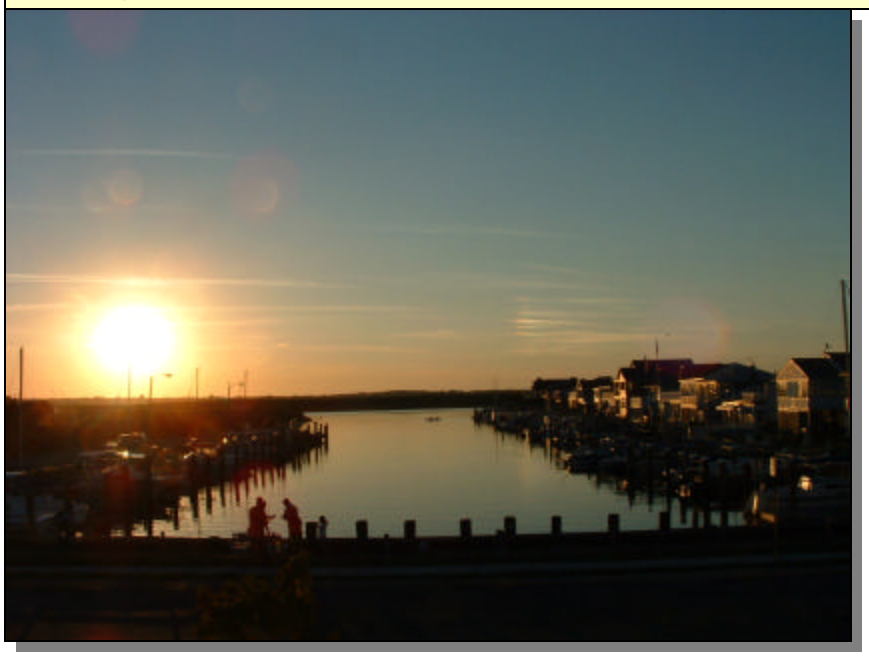
Hubble Legacy Archive Now Available Online

The **Hubble Legacy Archive** is a cooperative effort between the **Space Telescope Science Institute**, the **Canadian Astronomy Data Centre**, and the **Space Telescope-European Coordinating Facility**. HLA (hla.stsci.edu) is a repository of images from most of Hubble's observations and features an easy-to-use browser interface.

You can download individual files in JPEG format, or download the images in the astronomical standard format FITS. You'll need to convert the files into images; using special software, either for FITS-

(Continued on page 8)

Sun Dogs and Sun Pillars



http://en.wikipedia.org/wiki/Sun_dog
http://www.astrophysassist.com/wilobs/weathwin/sundog.htm

Sun Dog over bay in Ocean City, New Jersey.

http://www.atoptics.co.uk/halo/pillar.htm
http://www.badastronomy.com/bad/news/sun_pillar.html

Information credits:
http://antwrp.gsfc.nasa.gov/apod/ap010313.html

Sun dog taken in the Pocono Mountains

(Continued from page 5)

they exhibit a spectrum of color ranging from red closest to the sun to a pale bluish tail stretching away from the sun.

Above is a picture of a sun dog in the Pocono Mountains that I took a few hours before the first picture of the sun pillar.

You can see red on the right of the sun dog, toward the sun, and blue on the left side of the sun dog away from the sun.

So, keep looking up at the sky whether it be day or night. There is always something beautiful to see.

All photos by the author.

CCAS Video Resource Launched Online

One of the perquisites of working in the IT industry is discovering resources that can be re-used for other purposes. It's even better when they're free!

I came across a company called **ClipSyndicate** (www.clipsyndicate.com) which produces video clips from news agencies including **API**, **Agence France-Presse**, **Bloomberg.com**, and other media agencies.

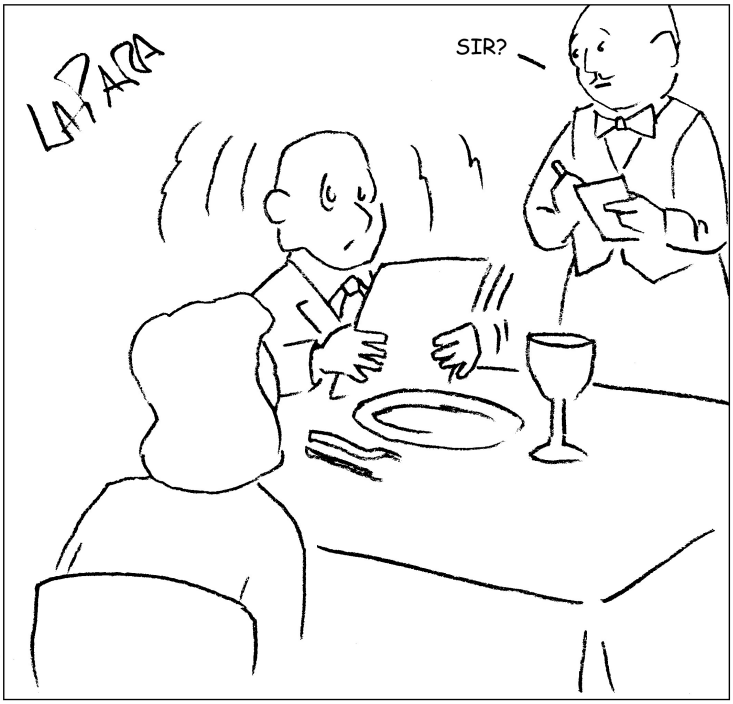
The site allows you to create "channels" based on criteria you select. As new clips are produced, they are added to the channel. For a start, I've created 6 channels, you can view them under '**Resources/Video Resources**' on our website. Expect these pages to change; I'm still working on the layout.

Hubble Legacy Archive Available

(Continued from page 7)

capable CCD cameras, including a program from **Image Reduction and Analysis Facility** (iraf.noao.edu), or a plug-in for **Adobe Photoshop** called FITS Liberator (www.spacetelescope.org/projects/fits_liberator). Both are free.

The HLA site features how-to information on using the archive, including an introductory movie. You can search by name for a celestial object; or select a field by entering its coordinates. If a view was taken through two or more filters, HLA will produce a color version of the image.



HERBERT FINDS HIMSELF IN THE GRIP OF QUANTUM UNCERTAINTY.

The Chemical Weather Report

Furnished by NASA Space Place

"Sunny tomorrow with highs in the mid-70s. There's going to be some carbon monoxide blowing in from forest fires, and all that sunshine is predicted to bring a surge in ground-level ozone by afternoon. Old and young people and anyone with lung conditions are advised to stay indoors between 3 and 5 p.m."

Whoever heard of a weather report like that?

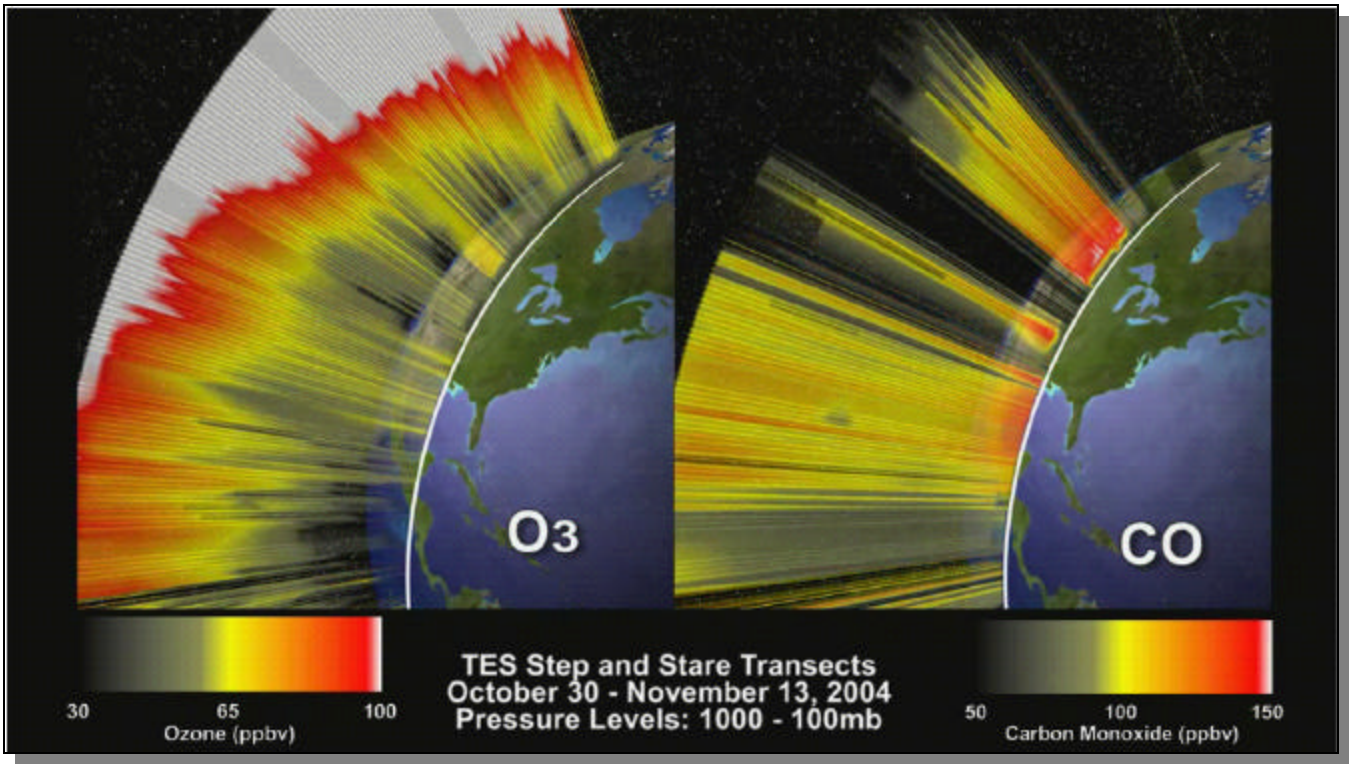
Get used to it. Weather reports of the future are going to tell you a lot more about the atmosphere than just how warm and rainy it is. In the same way that satellite observations of Earth revolutionized basic weather forecasting in the 1970s and 80s, satellite tracking of air pollution is about to revolutionize the forecasting of air quality. Such forecasts could help people plan around high levels of ground-level ozone—a dangerous lung irritant—just as they now plan around bad storms.

"The phrase that people have used is chemical weather forecasting," says Kevin Bowman of **NASA's Jet Propulsion Laboratory**. Bowman is a senior member of the technical staff for the Tropospheric Emission Spectrometer, one of four scientific sensors on NASA's **Aura satellite**.

Aura and other NASA satellites track pollution in the same way that astronomers know the chemical composition of stars and distant planetary atmospheres: using spectrometry. By breaking the light from a planet or star into its spectrum of colors, scientists can read off the atmosphere's gases by looking at the "fingerprint" of wavelengths absorbed or emitted by those chemicals. From Earth orbit, pollution-watching satellites use this trick to measure trace gases such as carbon monoxide, nitrogen oxide, and ozone.

However, as Bowman explains,

(Continued on page 10)



Example of visualization of data from the Tropospheric Emission Spectrometer. These frames are from an animation that steps through transects of the atmosphere profiling vertical ozone and carbon monoxide concentrations, combining all tracks of the Aura satellite during a given two week period.

The Chemical Weather Report

(Continued from page 9)

"Polar sun-synchronous satellites such as Aura are limited at best to two overpasses per day." A recent report by the **National Research Council** recommends putting a pollution-watching satellite into geosynchronous orbit—a special very high-altitude orbit above the equator in which satellites make only one orbit per day, thus seeming to hover over the same spot on the equator below. There, this new satellite, called **GEOCAPE (Geostationary Coastal and Air Pollution Events)**, would give scientists a continuous eye in the sky, allowing them to predict daily pollution levels just as meteorologists predict storms.

"NASA is beginning to investigate what it would take to build an instrument like this," Bowman says. Such a chemical weather satellite could be in orbit as soon as 2013, according to the NRC report. Weather forecasts might never be the same.

Learn more about the **Tropospheric Emission Spectrometer** at tes.jpl.nasa.gov. Kids can learn some elementary smog chemistry while making "Gummy Greenhouse Gases" out of gumdrops at spaceplace.nasa.gov/en/kids/tes/gumdrops.

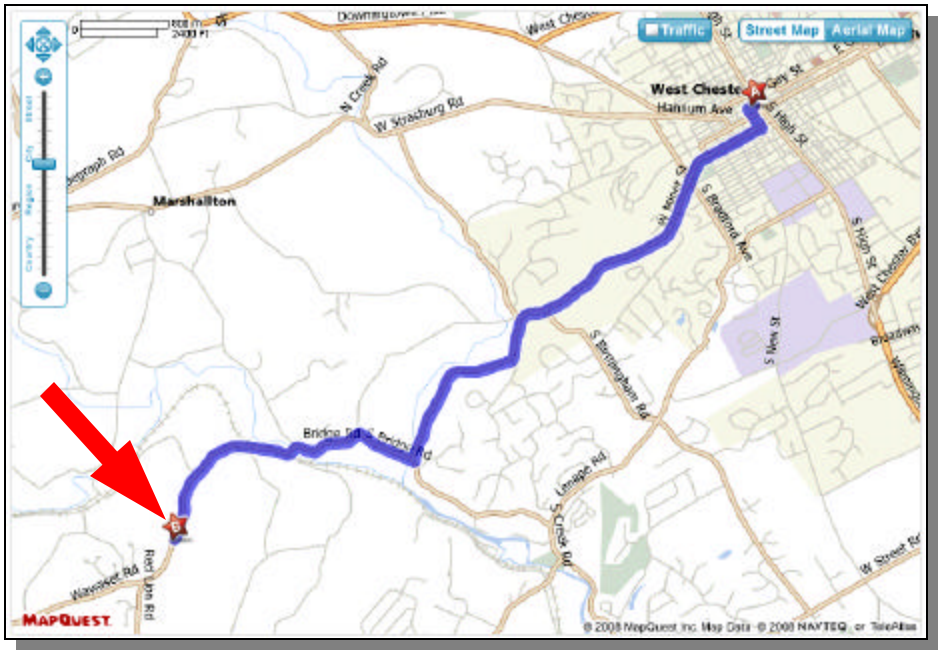
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

The Space Place Wins Award

The Space Place has won a "Fall 2008 Parents' Choice Recommended" award from the **Parents' Choice Foundation**, a non-profit organization whose mission is to provide parents with information to participate wisely in their children's learning outside the classroom. Twice each year, the foundation evaluates audio media, books, DVDs, magazines, software, television, toys, video games, and websites. It noted that The Space Place ". . . speaks directly to its audience of 8 -11 years olds in a playful and appropriate way and also offers relevant content for educators and adults. The site makes the science of earth and space exploration approachable and appealing to both aspiring scientists and kids who are just plain curious."

CCAS congratulates everyone who makes The Space Place so great!

CCAS Directions



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

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

Brandywine Valley Association

The monthly observing sessions (held year-round) are held at the Myrick Conservation Center of the Brandywine Valley Association.

To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn 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 up the farm lane to the left; it's about 800 feet or so to the top of the hill.

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 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:

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 **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:

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:

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**

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**

www.greenearthlighting.com

Local Astronomy-Related Stores

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

Skies Unlimited

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

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

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

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

www.spectrum-scientifics.com

CCAS Information Directory

CCAS Lending Telescopes

Contact Kathy Buczynski to make arrangements to borrow one of the Society's lending telescopes. CCAS members can borrow a lending telescope for a month at a time; longer if no one else wants to borrow it after you. Kathy's phone number is 610-436-0821.

CCAS Lending Library

Contact our Librarian, Linda Lurcott Fragale, to make arrangements to borrow one of the books in the CCAS lending library. Copies of the catalog are available at CCAS meetings, and on the CCAS website. Linda's phone number is 610-269-1737.

Contributing to *Observations*

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

Or mail the contribution, typed or handwritten, to:

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

Get CCAS Newsletters via E-mail

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

CCAS Website

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

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 copying copyrighted material! Give your contributions to John Hepler (484-266-0699) 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 "star nights" for school, scout, and other civic groups.

CCAS Executive Committee

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

President:	Kathy Buczynski 610-436-0821
Vice Pres:	Jim Anderson 610-857-4751
ALCor and Treasurer:	Bob Popovich 610-363-8242
Secretary:	Don Knabb 610-436-5702
Librarian:	Linda Lurcott Fragale 610-269-1737
Observing:	Don Knabb 610-436-5702
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 484-266-0699
Public Relations:	Deb Goldader 610-304-5303

CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

Check the Treasurer's Report in each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

Phone: 610-363-8242
e-mail: B2N2@verizon.net

*Sky & Tele*scope Magazine Group Rates

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

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

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders.

If you have **any** questions call Bob first **(610-363-8242).**

Astronomy Magazine Group Rates

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