Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 18, No. 10 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ¤ 2006 & 2009* *October 2010*

In This Issue

Membership Renewals Due

10/2010	End Hardie, Jr.
11/2010	Athens Hepler Holenstein O'Hara
12/2010	Constante Goll Gupta Hardie, Jr. Jafar

Beautiful Shot of Discovery's Final Roll Out

provided by NASA, submitted by Thaddeus Picklo

A stunning photo from Larry Tanner, a USA KSC employee, who took the picture the night of Discovery's Final rollout to the pad on September 21, 2010.

Important October 2010 Dates

7th • New Moon 2:44 p.m.

8th • Draconid Meteor Show Peaks

14th • First Quarter Moon 5:27 p.m.

20th • Comet 103P/Hartley 2 is at its closest approach to Earth

22nd • Full Moon 9:37 p.m.

30th • Last Quarter Moon 8:46 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, October 16, 2010** - Night Out in Hoopes Park, West Chester. The event is cohosted with the West Chester Department of Recreation.

¤ **Friday, November 5, 2010** - Night Out at Springton Manor, Glenmoore.

Fall 2010 Society Events

October 2010

6th • PA Outdoor Lighting Council monthly meeting, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website (http://www.polcouncil.org/).

8th • West Chester University Planetarium Show, "The Expanding, Accelerating Universe," Schmucker Science Building, Show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via the planetarium's webpage (http://geology.wcupa.edu/planetarium).

8th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date October 9th). The observing session starts at sunset.

12th • DVD Lecture Series: "The Age of the Universe," half-hour video presentation of a lecture by Professor Alex Filippenko, UC Berkeley. Room MER113, Merion Science Center (former Boucher Building), West Chester University. The presentation immediately precedes the monthly meeting and starts at 7:00 p.m.

12th • CCAS Monthly Meeting, Room MER113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: CCAS member Vic Long, Jr., "Telescope Restoration."

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

22nd • Reservations start for the October 10th planetarium show at the WCU Planetarium. For more information, please contact Dr. Karen Vanlandingham, Planetarium Director, via the planetarium's webpage (http://geology.wcupa.edu/planetarium).

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

November 2010

4th • PA Outdoor Lighting Council monthly meeting, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website (http://www.polcouncil.org/).

5th • CCAS Monthly Observing Session, Night Out at Springton Manor, Glenmoore, PA.

9th • DVD Lecture Series: "When Geometry is Destiny," half-hour video presentation of a lecture by Professor Alex Filippenko, UC Berkeley. Room 113, Merion Science Center (former Boucher Building), West Chester University. The presentation immediately precedes the monthly meeting and starts at 7:00 p.m.

9th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker, Dr. Beth William, PhD, Haverford College: "On (Nearly) Invisible Galaxies." The meeting starts at 7:30 p.m.

12th • West Chester University Planetarium Show, "Raining Stars", Schmucker Science Building, Show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via the planetarium's webpage (http://geology.wcupa.edu/planetarium).

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

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

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

Minutes from the September 2010 CCAS Monthly Meeting

by Don Knabb, CCAS Secretary and Observing Chair

- Approximately 15 members were in attendance.
- DVD presentation: The Paradox of the Dark Night Sky was shown.
- Program – Dr. David Klassen, Professor of Physics and Astronomy at Rowan University presented "Discovering Water on Mars". This was an interesting presentation that was followed by a question and answer session.
- Don Knabb reviewed upcoming observing events.
- Kathy Buczynski reviewed her Project Astro project that is entering its 2nd year.

Anson Nixon Night Out a Success!

by Don Knabb

(photo courtesy of Roy Kalinowksi)

Thanks to everyone who came out to Anson Nixon Park on September 18th, 2010, to help with the night out, your help was greatly appreciated and this event would not have been a success without your help!

What a great event! I estimated between 60 and 80 enthusiastic folks came out to see the night sky. For a long time there was a line at least 20 people deep to see Jupiter, who was showing off all his moons. And speaking of moons, our own Luna was incredible. I heard quite a few people exclaim "WOW" or "OH MY" as they gazed at our bright companion.

Our next night out is scheduled for Saturday, October 16th at Hoopes Park in West Chester. I hope to see you there!

2010-2011 Speaker Series

by Dave Hockenberry, CCAS Program Chair

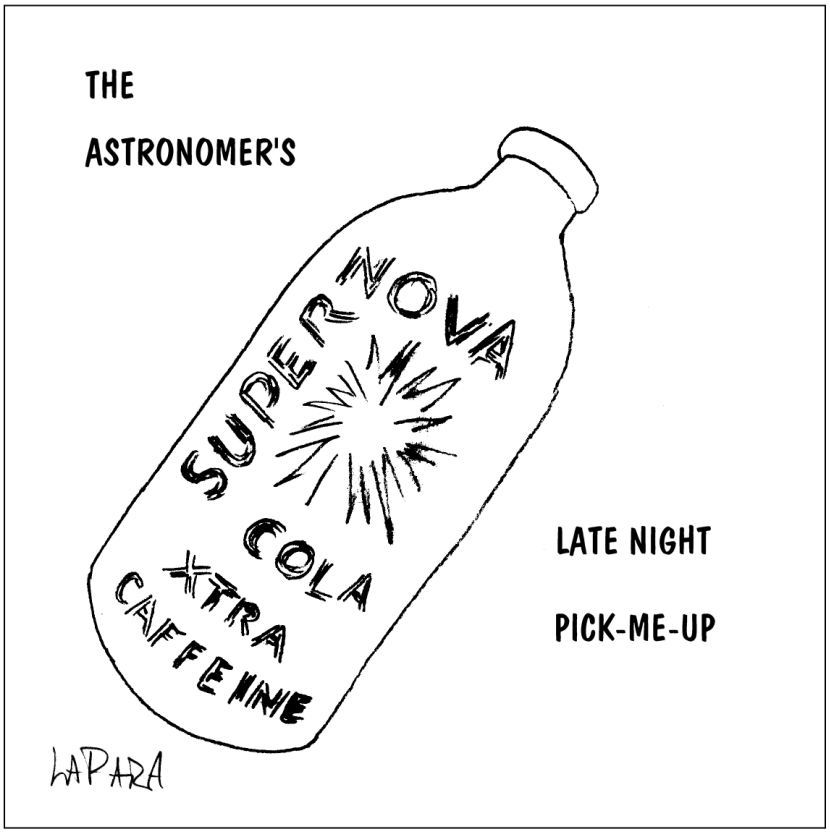
We are looking for speakers for our 2010-2011 season. We have CCAS member Vic Long, Jr. scheduled to speak at our meeting this month, and Dr. Beth Willman will join us at our November meeting. We need speakers for our meetings in 2011.

If you have any suggestions for future speakers, or are interested in being a speaker yourself, please contact Dave Hockenberry at programs@ccas.us.

We are also looking for Constellation of the Month (COM) presenters for the 2010-2011 season. COM is a great way to learn the night sky and a useful tool if you are pursuing one of the Astronomical League's observing club awards. Participating is easy! Contact Kathy Buczynski at vp@ccas.us for a COM template to fill out.

Nicholas's Cartoon Corner

by Nicholas La Para



October 2010 CCAS Member Speaker

by Dave Hockenberry

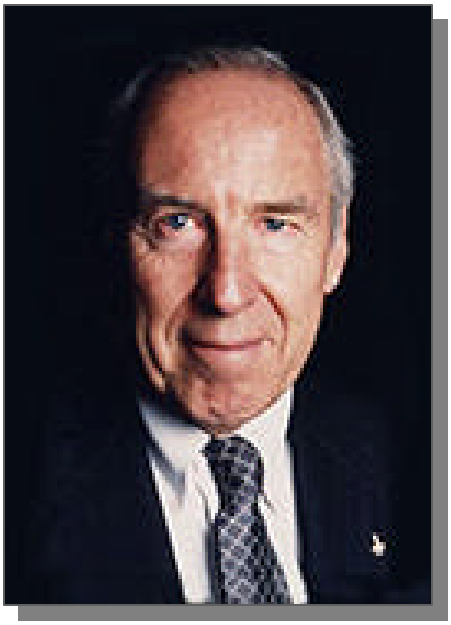
While scheduling a program featuring outside speakers allows for a variety of member interests to be explored, having members speak about their interests themselves is always a special treat.

This month, CCAS member Vic Long, Jr., talks about vintage Japanese telescopes and why he likes them. He'll also relate his experiences restoring a 1960 Sans and Streiffe 76.2mm refractor.

Vic, one of our technology gurus, has presented on astrophotography in the past. His presentations always make everything seem easy!

From "CCAS-West": Former Astronaut Jim Lovell at IUP

by John Hepler, CCAS Webmaster & Newsletter Editor



Captain James Lovell, Jr. will speak at IUP on November 1, 2010

November 1, 2010
7:30 p.m.–9:30 p.m.
Fisher Auditorium, IUP Performing Arts Center

Captain James Lovell, Jr., commander of the 1970 Apollo 13 space mission, will be the speaker at the third annual First Commonwealth Endowed Lecture at Indiana University of Pennsylvania.

For more information, visit 2010 First Commonwealth Lecture: Captain James Lovell, Jr.

Captain James Lovell, Jr., commander of the 1970 Apollo 13

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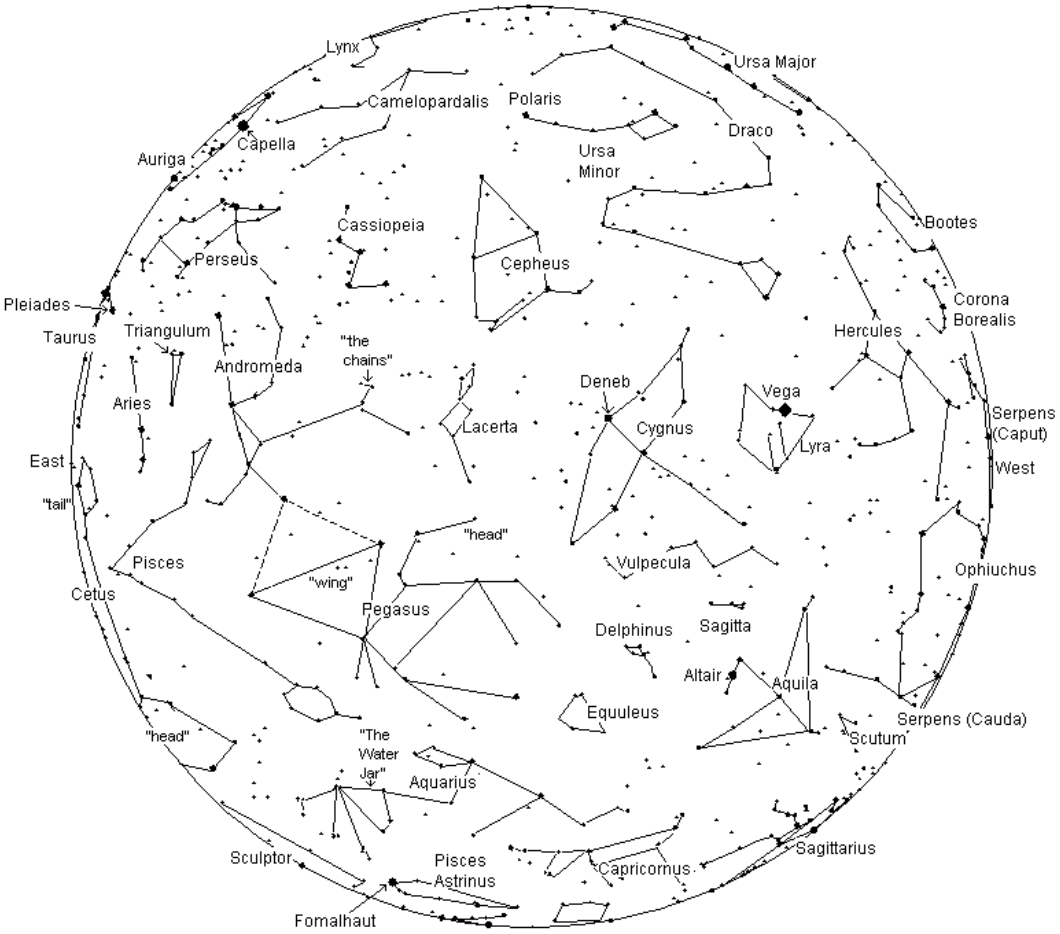
The Sky Over Chester County

October 15, 2010 at 9:00 p.m. EST

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



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

The faintest stars shown on this chart are fifth magnitude.

Date	Sunrise	Sunset	Moon Phases		
10/01/2010	6:57 a.m. EDT	6:43 p.m. EDT	First Quarter	10/14/2010	5:27 p.m. EDT
10/15/2010	7:11 a.m. EDT	6:21 p.m. EDT	Full Moon	10/22/2010	9:37 p.m. EDT
10/31/2010	7:29 a.m. EDT	5:59 p.m. EDT	Last Quarter	10/30/2010	8:46 p.m. EDT
			New Moon	10/07/2010	10:44 p.m. EDT

October 2010 Observing Highlights

by Don Knabb, CCAS Secretary & Observing Chair

October 6-20	The zodiacal light is visible in the eastern pre-dawn sky
October 7	New Moon, 2:44 p.m.
October 8	The Draconid meteor shower peaks
October 9	Venus and Mars are low in the west after sunset with a crescent Moon
October 14	First-quarter Moon, 5:27 p.m.
October 19	Jupiter is below the Moon
October 20	Comet 103P/Hartley 2 is at its closest approach to Earth and is at its peak brightness
October 21	The Orionid meteor shower peaks
October 22	Full Moon, 9:37 p.m.
October 30	Last Quarter Moon, 8:46 a.m.

The best sights this month: This will be an excellent month for gazing into the void! Jupiter will be big and bright all month and we have a comet in our skies! I plan to use binoculars to find Comet Hartley 2 on October 7th to 9th when it will be near the beautiful double cluster. The Moon will be absent from the skies on those nights and if we are lucky we might catch a glimpse of Hartley 2 with our naked eyes from a dark sky site.

Mercury: Mercury is not in good position for observing during October.

Venus: Venus is diving into the glow of the Sun during October. But if you can find Venus in your telescope you will have a nice view of its crescent phase. You'll need a viewing location with a low western horizon.

Mars: The red planet is well past optimal viewing for 2010, but if you try you might glimpse it low in the glow of the sunset. Forget Mars until next summer, look at Jupiter and Uranus instead!

Jupiter: The king of the planets shines at magnitude -2.9, an unmistakable bright light in the eastern sky as sunset fades. Jupiter reaches its highest point in the sky in the late evening and that is the best time for telescopic viewing. If you stay up until 1:30 a.m. on October 31st (hey, it's a Saturday night, go for it!) you can see the shadows of Ganymede and Europa cross Jupiter's disk. That sounds like a great Halloween treat!

Saturn: The ringed planet has moved into the morning sky. So if you can put together a telescope when you are half awake you will see that the rings are beginning to open up from their nearly straight line earlier this year. Or, like me, wait until next spring to see Saturn at a more reasonable hour. I'd rather stay up late than get up early!

Uranus and Neptune: Uranus is easy to find near Jupiter during October. At high magnification you can see the pale green disk of this distant gas giant. Neptune is reasonably high in the sky as the glow of the sunset fades. Finder charts are available at http://skyandtelescope.com/uranusneptune.

The Moon: The October full Moon is the first full Moon after the Harvest Moon and it is called the Hunter's Moon. The Hunter's Moon is so named because plenty of moonlight is ideal for hunters shooting migrating birds in Northern Europe, and the name is also said to have been used by Native Americans as they tracked and killed their prey by autumn moonlight, stockpiling food for the winter ahead

Constellations: High up in the sky we still see the Summer Triangle overhead. Look to the left of the large triangle and you'll find another geometric shape in the sky, the Great Square of Pegasus. And a bit toward the east and nearly overhead is the constellation Cassiopeia in the shape of a large "W". According to Greek myths, Cassiopeia was the Queen of Ethiopia. Her husband, Cepheus the King is honored by the constellation that is in the shape of a house just to the west of Cassiopeia.

Messier/Deep Sky: The deep sky highlight of this time of year for me is the Andromeda Galaxy, M31. You don't need to be up late to catch the wonderful Double Cluster in Perseus and the compact star cluster M34 is just a bit to the south, also in Perseus. Stay up until 10:00 and you can see the star clusters in Auriga rising: M36, M37 and M38.

Comets: Comet Hartley 2 could be a naked eye comet from a dark sky site when it is at its closest approach to Earth on October 20th. But because the Moon will be full on October 22nd you will have a better chance of seeing it a week before or after its closest approach. Even if Hartley 2 does not reach naked eye brightness it will be an excellent binocular or telescopic object throughout the month. Look for it high in the sky on October 7th to 9th when it will be close to the Double Cluster. The October issues of Astronomy and Sky and Telescope have finder charts for this ball of ice and rocks.

Meteor Showers: There are two meteor showers during October. The first is the Draconid meteor shower, hitting

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Through the Eyepiece: Comet Hartley 2

by Don Knabb, CCAS Secretary & Observing Chair

During October we are presented with a rare treat: a bright comet! By bright, I don't mean as bright as a planet, or perhaps not even as bright as a nebula such as the Orion Nebula. But, since a comet that is possibly a naked eye object is quite rare, I think it is reasonable to call Comet Hartley 2 a bright comet. We only get to see a few comets such as this every decade. I recall Comet Hale-Bopp as one of the best, and Comet Holmes was a real surprise, becoming very bright three years ago in Perseus. Who knows, Hartley 2 might surprise us.

Comet Hartley 2, officially designated 103P/Hartley, is a small periodic comet with an orbital period of 6.46 years. It was discovered by Malcolm Hartley in 1986 at the Schmidt Telescope Unit in Siding Spring, Australia. Its diameter is estimated to be 1.2 to 1.6 km.

To the right is a picture of Comet Hartley 2 taken on September 20th by Michael Jaeger of Austria. You can see many beautiful comet images on Michael's web site at http://www.cometpieces.at/. Michael began photographing comets in 1982 and has observed more than 500 comets.

Comet Hartley 2 passes closest to Earth on October 20th, when it is only 1/10 of an astronomical unit (the distance from the Earth to the Sun) from us. But because the Moon will be bright that night and for several nights around that date I plan to seek this visitor from the solar system from October 7th to the 9th when it will be near the Double Cluster in Perseus. This will be a great target for our observing session at Brandywine Valley Association on October 8th!

Photo credit: Michael Jaeger

You can find charts to show you where to look for Comet Hartley 2 in the October issue of Astronomy magazine and in Sky and Telescope magazine. Or go to the Sky and Telescope web site at http://www.skyandtelescope.com/observing/home/102632669.html for a sky map.

What will the comet look like? Comets are surprising objects in many ways. After all, they are loosely bound balls of ices from the outer solar system. Sometimes, comets appear without warning, but Comet Hartley 2 has been expected for many years. The brightness and appearance of this comet – or any comet – never follows a predictable forecast. Don't be surprised if Comet Hartley 2 exceeds or falls short of expectations.

You will need a dark sky to see Hartley 2. Through binoculars it should look like a smudge of light against the dark sky background or it may look like a faint, fuzzy star. Or it may exhibit a discernable tail. Only time will tell. The element of suspense always accompanies the return of a comet to Earth's sky. That's one reason they are fun to see!

There is a planned flyby of Hartley 2 by the Deep Impact spacecraft with a closest approach of 700 kilometers on November 4, 2010. So after our chance to see Hartley 2 with our own eyes has

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A Guided Tour through the Steward Observatory Mirror Lab

submitted by Dave Hockenberry & Ann L. Miller

On a recent visit to Tucson, Arizona we had the opportunity as part of an advanced astrophotography course to take a tour of the University of Arizona's Steward Mirror Lab. With ground-based observatories making significant headway in the last decade, we were eager to see this state-of-the-art facility in action.

Space based telescopes have stolen many of astronomy's headlines since Hubble started obtaining good images, but adaptive optics and other innovations have made the new generation of large mirror telescopes not only competitive, but now have even greater capacity than Hubble in much of the visible spectrum.

The Steward Mirror Lab was started in 1980 as a project to improve and expand mirror production. Prior to this, large observatory mirrors were almost always ground out of enormous slabs of poured glass. This process was not only time-consuming and tedious, but also very prone to systemic failures that could easily make the blank unusable. A single blank for a large mirror could take literally years from initial molds and pouring to finished grinding and polishing, making this a very expensive undertaking. As an outgrowth of the U. of Arizona Optics Lab, ways were sought not only to make these huge objects lighter, but also to make the shaping and polishing more efficient and cost effective. The original project sought to accomplish this in several ways. First, they pioneered honeycomb designs into the glass molds. This not only used much less glass and made the blank lighter, but the finished mirror would also take less time to thermally equilibrate with surrounding air. Second, rather than grinding the desired mirror shape out of a flat disk, an apparatus was designed to spin the molten glass on a large turntable kiln. By controlling the pour and the rate of spin, a desired mirror shape could be approximated before grinding and polishing ever begins, saving tremendous amounts of time. Third, grinding and polishing apparatus design needed to be automated and computer controlled for more precision on the surface of the finished mirror.

In undertaking the construction of the Mirror Lab, the University chose to place it underneath their football stadium! This was chosen for several reasons. It was decided early on that the facility had to be on or near the main university, as a remote location was unsuitable to the optics department. Space in the city of Tucson, despite the surrounding desert, is limited as the city is flanked by several state parks, a large Air Force base, and several airplane storage/graveyard facilities that take up many square miles. Placing the Mirror Lab underneath the stadium might seem counterintuitive, given all the potential noise and vibrations a major college football game can generate. But in truth the stadium is empty most of the time, and the kilns and centrifuges of the mirror lab were designed and built with vibration isolation to avoid these problems. (*See Photo 1*)

Our docent who gave the tour

(Continued on page 10)

Photo 1: The University of Arizona Optics Lab under the Wildcats Stadium

The Hunt is On!

by Carolyn Brinkworth

The world of astronomy was given new direction on August 13, 2010, with the publication of the Astro2010 Decadal Survey.

Astro2010 is the latest in a series of surveys produced every 10 years by the National Research Council (NRC) of the National Academy of Sciences. This council is a team of senior astronomers who recommend priorities for the most important topics and missions for the next decade.

Up near the top of their list this decade is the search for Earth-like planets around other stars—called "extrasolar planets" or "exoplanets" —which has become one of the hottest topics in astronomy.

The first planet to be found orbiting a star like our Sun was discovered in 1995. The planet, called "51 Peg b," is a "Hot Jupiter." It is about 160 times the mass of Earth and orbits so close to its parent star that its gaseous "surface" is seared by its blazing sun. With no solid surface, and temperatures of about 1000 degrees Celsius (1700 Fahrenheit), there was no chance of finding life on this distant world.

Since that discovery, astronomers have been on the hunt for smaller and more Earth-like planets, and today we know of around 470 extrasolar planets, ranging from about 4 times to 8000 times the mass of Earth.

This explosion in extrasolar planet discoveries is only set to get bigger, with a NASA mission called Kepler that was launched last year. After staring at a single small patch of sky for 43 days, Kepler has detected the definite signatures of seven new exoplanets, plus 706 "planetary candidates" that are unconfirmed and in need of further investigation. Kepler is likely to revolutionize our understanding of Earth's place in the Universe.

We don't yet have the technology to search for life on exoplanets. However, the infrared Spitzer Space Telescope has detected molecules that are the basic building blocks of life in two exoplanet atmospheres. Most extrasolar planets appear unsuitable for supporting life, but at least two lie within the "habitable zone" of their stars, where conditions are theoretically right for life to gain a foothold.

We are still a long way from detecting life on other worlds, but in the last 20 years, the number of known planets in our Universe has gone from the 8 in our own Solar System to almost 500. It's clear to everyone, including the Astro2010 decadal survey team, that the hunt for exoplan-

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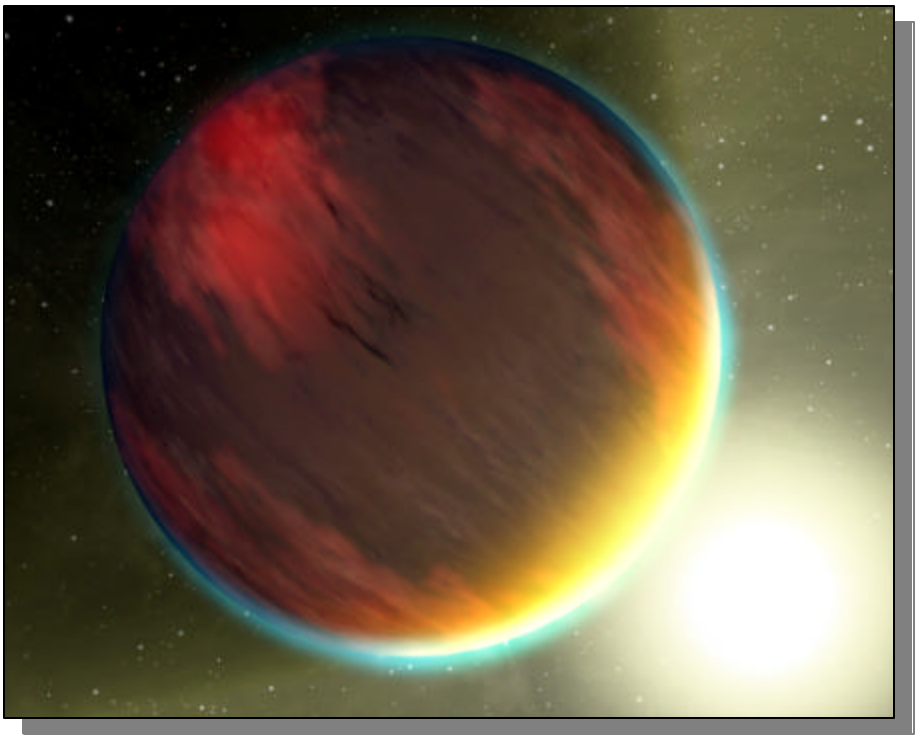

Artist's rendering of hot gas planet HD209458b. Both the Hubble and Spitzer Space Telescopes have detected carbon dioxide, methane, and water vapor—in other words, the basic chemistry for life—in the atmosphere of this planet, although since it is a hot ball of gas, it would be unlikely to harbor life.

Lovell at IUP (cont'd)

(Continued from page 3)

space mission, will be the speaker at the third annual First Commonwealth Endowed Lecture at IUP.

The lecture, in conjunction with Ideas and Issues lecture series, will be November 1, 2010, at 7:30 p.m. in the Performing Arts Center's Fisher Auditorium. The program is free and open to the community.

Lovell is most famous for his role in the American space age and for his calm and careful command of Apollo 13. He articulated the five-word message, "Houston, we have a problem," which quickly became a part of the American lexicon. Through teamwork and decisive leadership, Lovell and his crew modified the lunar module into an effective lifeboat to safely return to Earth.

Lovell was chosen in September 1962 for the space program following extensive experience as a naval aviator and test pilot. He executed various commands in the Gemini Mission Program, including serving as backup pilot for the Gemini 4 flight and pilot on the history-making Gemini 7 flight, which saw the first rendezvous of two manned spacecraft in 1965. He was also the backup commander for the Gemini 9 flight, and in 1966, he commanded the Gemini 12 spacecraft, successfully concluding the Gemini program.

At the program's close, Lovell became command module pilot and navigator for the epic six-day journey on Apollo 8, the maiden voyage to the moon, during which he and his fellow crew members were the first humans to leave the Earth's gravitational influence.

He was backup commander to Neil Armstrong for the Apollo 11 lunar landing mission. His fourth and final flight was on the perilous Apollo 13 mission in 1970. When the cryogenic oxygen system failed, Lovell and his crew's emergency activation and operation of the lunar module systems conserved both electrical power and water in sufficient supply to ensure their survival.

In 1973, Lovell left the space program to join the Bay-Houston Towing Company. He became president and chief executive officer of Bay-Houston Towing in 1975 and then joined Fisk Telephone Systems as company president. The company was acquired by Centel Corporation in 1980, and Lovell became executive vice president. Today, he is president of Lovell Communications, a business devoted to disseminating information about the U.S. space program.

In 1994, Lovell and Jeff Kluger wrote *Lost Moon*, the story of the Apollo 13 mission. In 2000, the book was re-released as *Apollo 13: Anniversary Edition*, to celebrate the thirtieth anniversary of the mission. In 1995, the film version of the best-seller *Apollo 13* was released. Lovell also appeared in several segments of Tom Hanks' *From the Earth to the Moon*, an HBO documentary miniseries that aired in the spring of 1998.

Lovell attended the University of Wisconsin and graduated from the U.S. Naval Academy, the University of Southern California Aviation Safety School, and the Harvard Business School's Advanced Management Program. He has received honorary doctorates from Blackburn University, Mary Hardin-Baylor College, Milwaukee School of Engineering, Rockhurst College, Susquehanna University, Washington & Jefferson College, Western Michigan University, and William Patterson College.

His awards and honors include Harmon, Collier, and Goddard aerospace trophies; the Presidential Medal of Freedom; the French Legion of Honor; NASA Distinguished and Exceptional service medals; the Navy Distinguished Service Medal; two Navy Distinguished Flying Crosses; and the Congressional Space Medal of Honor. He is also a fellow in the Society of Experimental Test Pilots.

The inaugural presentation in the First Commonwealth Endowed Lecture Series in October 2008 featured political commentators James Carville and Mary Matalin. The series continued in 2009 with Pulitzer Prize-

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Guided Tour (Cont'd)

(Continued from page 7)

was a retired gentleman who volunteers his time to the Lab. He was very knowledgeable and helpful, and we thought very patient with the thousands of questions he was getting bombarded with from this group of eager astrophotography geeks. We were taken to a conference room and shown a DVD about the Mirror Lab and current/future projects the facility is making currently. Samples of the honeycomb glass were available for us to view.

We then were taken through the production facility. This was a bit of a thrill, as the Lab is currently working on the mirrors for the Magellan Telescope scheduled to go on line in 2016. On completion this will be the worlds largest telescope, made up of six 20-meter mirrors surrounding a central seventh mirror. The first of these mirrors is now under fabrication.

We were able to see the entire production facility from a high catwalk that goes between the two main work areas. The first we viewed was the polishing room. The machine that does the polish to the glass is a multiple pneumatically controlled piston disc. It is computer controlled, and can achieve an accuracy unimagined when the Palomar Mirror was built. (*See Photo 2*)

In the pouring/centrifuge room, the single large red turntable serves not only as a kiln to melt the glass, but also as a slow cooler. Once the glass has been melted and poured into the honeycomb mold, it is then spun to shape and the slowly cooled over a period of about three months so that the mirror fixes in its final state. This not only ensures proper shape, but allows time for defects and small bubbles within the glass to slowly work out towards the edge where they will not be part of the working mirror surface. An operator stays in the control room of this amazing machine 24-7 while a mirror is being cooled. (*See Photo 3*)

On the wall in the stairwell going up into the office area is an artists rendition, to scale, of the future Magellan Telescope. Al-

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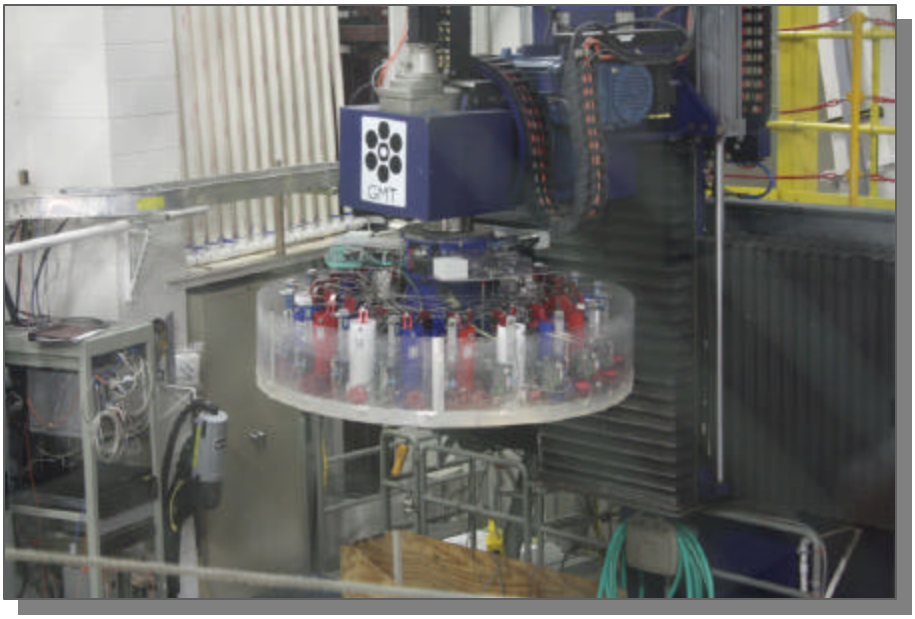


Photo 2: The Pneumatically Controlled Polishing Machine

Photo 2: The Kiln in the Pouring/Centrifuge Room

Guided Tour (Cont'd)

(Continued from page 10)

though supposedly going on line in 2016, our tour guide said that this was somewhat optimistic. A more probable date 2-5 years later was suggested. All the same, it was exciting to see this work in progress, and when it does eventually start acquiring images we have the satisfaction of seeing the process in its infancy. Already Steward Lab mirrors are powering the LBT (Large Binocular Telescope) which boasts even greater resolution that Hubble's best performance, even with its recent upgrades. When Magellan with its next generation of adaptive optics starts gathering images it will be most interesting to compare the images it gathers to the next generation of space-based instruments like the upcoming Webb.

One of the interesting aspects of the mirrors created here is that the final reflective surface is not actually applied until the mirror is mounted inside its intended telescope. When the glass is set in place, an inflatable "tent" is placed over the mirror on site and ionized aluminum is spread across the surface in a controlled manner. When the process is complete the inflatable tent is removed and the telescope is ready to go. This means that the technicians from the Mirror Lab get to travel to many remote locations in order to finish their product.

So if any of our readers find themselves in the Tucson area and want an interesting tour not normally listed on the usual travel destinations for this city, be sure to look into touring the Steward Mirror Lab. Tours are arranged in advance so be sure to call ahead by at least 4 weeks if possible. The tours are free, and groups are encouraged. We not only recommend this wholeheartedly, but would definitely go again if a chance presents itself. For a look into the future, we close with a picture of Ann Miller inspecting the artists scale rendition of the future Magellan behemoth. (*See Photo 4*)

Photo 4: Ann Miller and Artist's Mockup of the Magellan Telescope.

Through the Eyepiece (Cont'd)

(Continued from page 6)

passed we can watch for images from NASA.

Information credits:

http://www.skyandtelescope.com/observing/home/102632669.html
http://en.wikipedia.org/wiki/103P/Hartley
http://earthsky.org/astronomy-essentials/comet-hartley-2-might-be-2010s-brightest-comet

Space Place (cont'd)

(Continued from page 8)

ets is only just beginning, and the search for life is finally underway in earnest.

Explore Spitzer's latest findings at http://www.spitzer.caltech.edu. Kids can dream about finding other Earths as they read "Lucy's Planet Hunt" at http://spaceplace.nasa.gov/en/kids/storybooks/#lucy.

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

Weekend Iridescence

Article & Photos by Liz Smith

I was sailing the weekend of September 24th, 2010, on the Chesapeake (North East, MD) with my friend on his boat, Indigo, and was able to capture Iridescence in the sky just above the mast!!! The camera did not do it justice as it was truly magnificent to see...you could only see it with sunglasses on so I actually covered my camera with the sunglasses and then altered the pictures a bit to really show what we had the pleasure of observing that Friday night.

What is Iridescence exactly? According to the British website http://www.atoptics.co.uk/droplets/irid1.htm, "iridescence" is defined as:

"When parts of clouds are thin and have similar size droplets, diffraction can make them shine with colours like a corona. In fact, the colours are essentially corona fragments. The effect is called cloud iridescence or irisation, terms derived from Iris, the Greek personification of the rainbow.

The usually delicate colours can be in almost random patches or bands at cloud edges. They are only organised into coronal rings when the droplet size is uniform right across the cloud. The bands and colours change or come and go as the cloud evolves. They occur most often in altocumulus, cirrocumulus and especially in lenticular

(Continued on page 13)

Lovell at IUP (Cont'd)

(Continued from page 9)

winning author and investigative reporter Bob Woodward.

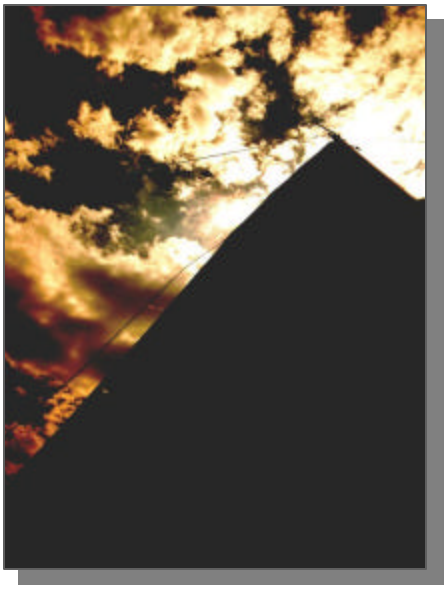
[Editor's Note: I am in class Monday evenings until 8:30; I am going to try to get out an hour early that evening to attend. I will try to find out if a "meet & greet" session is planned for either before or after the lecture.

If anyone is interested in coming out to attend the lecture, here are links to several local hotels:

- Hampton Inn Indiana
- Quality Inn & Suites
- Holiday Inn Indiana
- Comfort Inn Indiana

I hope to see some CCAS people at the lecture!]

Iridescence (Cont'd)



(Continued from page 12)

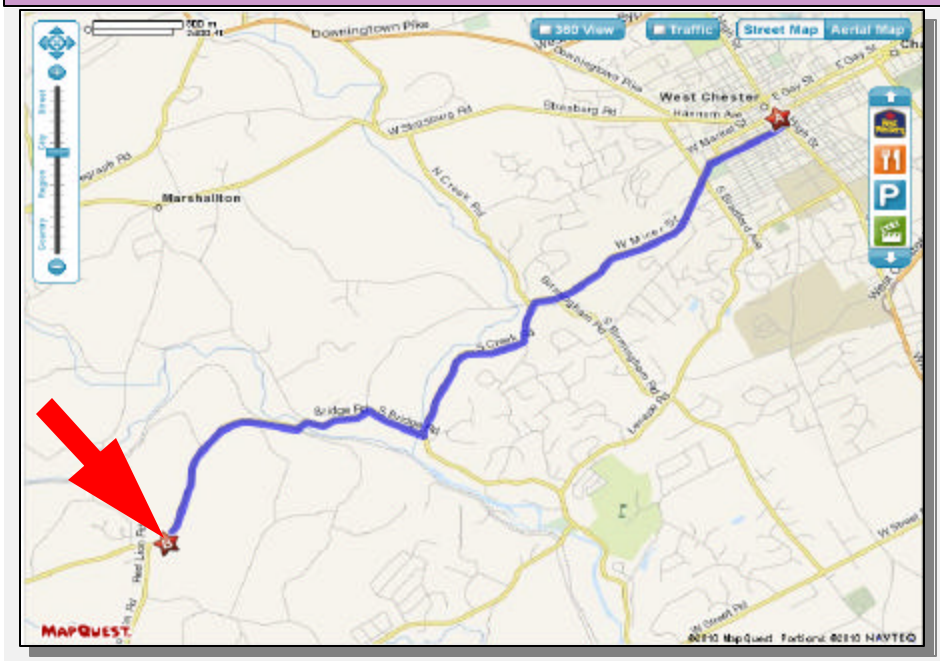
clouds. Iridescence is seen mostly when part of a cloud is forming because then all the droplets have a similar history and consequently have a similar size.

Sometimes iridescence can be seen far from the sun but is most frequent near to it. As for coronas, search safely by hiding the sun behind a building and, even better, also viewing the reflection of the sky in water.

Very much rarer iridescence is that of nacreous or mother-of-pearl clouds. They can glow very brightly and are far higher than ordinary Tropospheric clouds. Iridescence is also seen in rocket exhaust trails."

By the way, my friend's daughter's name is, of all things, Iris!

CCAS Directions



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

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

Brandywine Valley Association

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

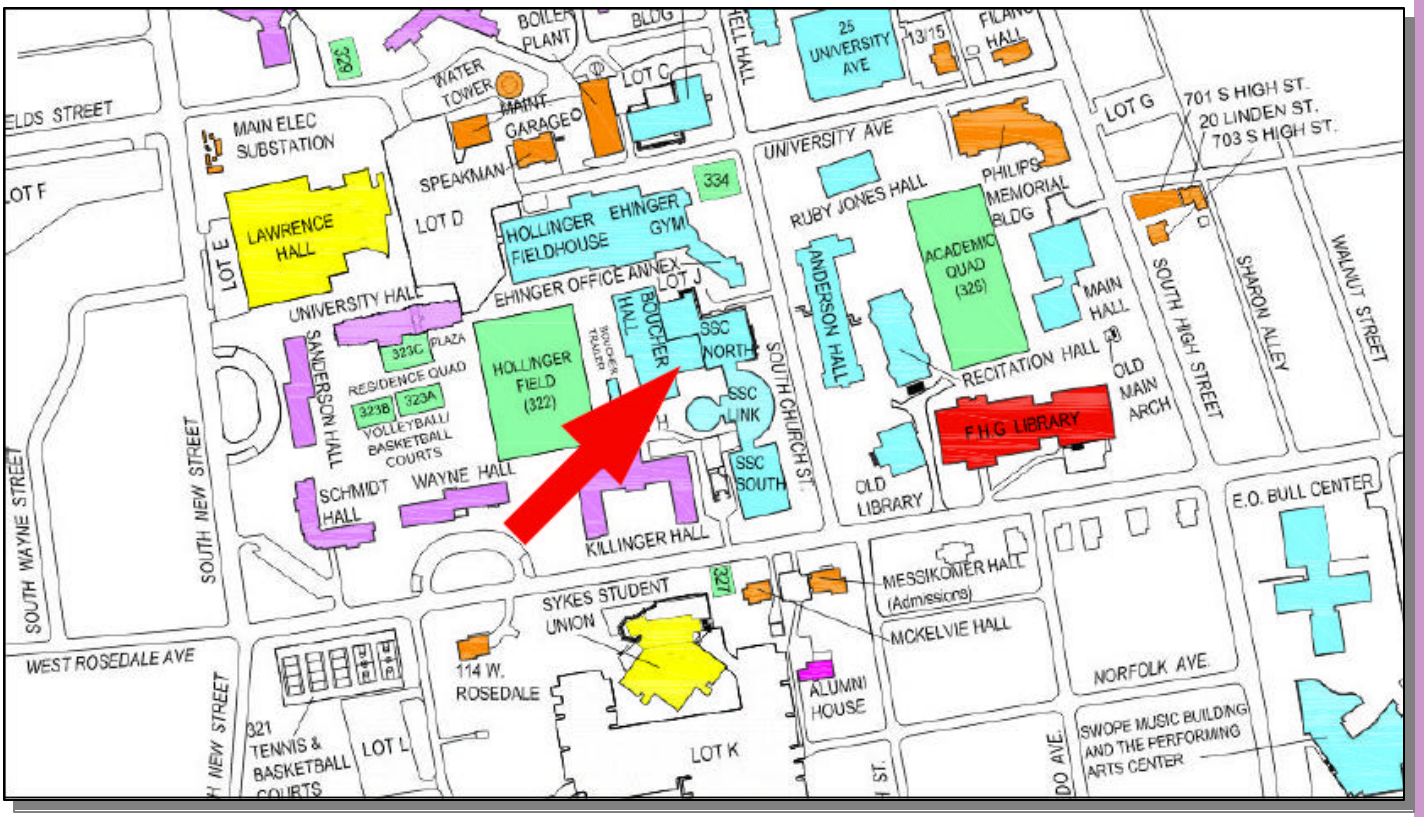
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route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

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

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).



Observing (Cont'd)

(Continued from page 5)

its peak on October 8th. This is a day past new Moon so the sky will be dark and you might see 10 to 30 meteors per hours. These meteors move slowly compared to most meteors so you should be able to tell them apart from typical sporadic meteors. The other meteor shower during October is the Orionid meteor shower. This shower is at its peak on October 21st, but that is only one day before the full Moon so most of these meteors will be drowned out by the bright moonlight. The Orionid meteors are dust grains from Comet Halley's many trips through the solar system.

CCAS Membership Information and Society Financials

Treasurer's Report
by Bob Popovich

August 2010 Financial Summary

Beginning Balance	$1,474
Deposits	$70
Disbursements	$37
Ending Balance	$1,508

New Member Welcome!

Welcome new CCAS members Sundar & Prashant Arunapuram of West Chester, PA, and Michael Catalano-Johnson & family from Malvern, 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:

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.

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 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**

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 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, 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 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 (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 Pres:	Kathy Buczynski 610-436-0821
ALCor and Treasurer:	Bob Popovich 484-467-5562
Secretary and Observing:	Don Knabb 610-436-5702
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 724-801-8789
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: 484-467-5562
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 at **610-363-8242.**

Astronomy Magazine Group Rates

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