Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 19, No. 1 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ¤ 2006 & 2009* *January 2011*

In This Issue

The Year 2011

Wishing all a joyful new year, members of the Cassini-Huygens team offer us their views of Saturn and the Cassini spacecraft. Image courtesy of NASA/JPL.

Membership Renewals Due

01/2011	Bronstein Lessley Smith Thota
02/2011	Calobrisi & Family Kalinowski & Family La Para Reimer
03/2011	Cini LaFrance DiSands Pearson & Family

Important January 2011 Dates

4th • New Moon 4:03 a.m.

3/4th • Quadrantid meteor shower peaks.

12th • First Quarter Moon 6:32 a.m.

19th • Full Moon 4:22 p.m.

26th • Last Quarter Moon 7:59 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.

¤ **Friday, March 11, 2011** - Greenwood Elementary School, near Longwood Gardens, PA.

¤ **Saturday, April 9, 2011** - Anson Nixon Park, Kennett Square, PA.

¤ **Friday, May 17, 2011** - Hoopes Park, West Chester, PA. Cohosted with the West Chester Recreation Department.

Winter 2011 Society Events

January 2011

5th • 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/).

7th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date January 8th).

11th • DVD Lecture Series: "The Mass Density of the Universe", 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.

11th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker, Charles Zarcone: "Solar Sights, Storms and Sounds." The meeting starts at 7:30 p.m.

20th • Open call for articles and photographs for the February 2011 edition of Observations.

26th • Deadline for newsletter submissions for the February 2011 edition of *Observations*.

February 2011

2nd • 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/).

4th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date February 5th). The observing session starts at sunset.

8th • DVD Lecture Series: "Einstein's Biggest Blunder?", 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.

8th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Meeting Theme: "Youth Night." Constellation of the Month: TBA.

11th • West Chester University Planetarium Show: "Black Holes Don't Suck," Schmucker Science Building. The 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 e-mail or visit the planetarium's webpage.

20th • Open call for articles and photographs for the March 2011 edition of Observations.

25th • Reservations start for the March 18th planetarium show at the WCU Planetarium. For more information, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

26th • Deadline for newsletter submissions for the March 2011 edition of *Observations*.

Minutes from the December 2010 CCAS Monthly Meeting

by Don Knabb, CCAS Secretary and Observing Chair

No minutes were taken as the annual CCAS Holiday Party took place on December 15th, 2010. The party was held at the 4 Dogs Tavern in West Chester, PA. See below for photos from the party. Thanks to Linda Lurcott Fragale for taking pictures!

January 2011 Guest Speaker

by Dave Hockenberry, CCAS Program Chair

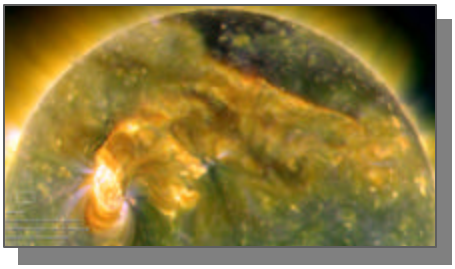

Photo courtesy of Astronomy Photograph of the Day

Our January 2011 guest speaker, Charles Zarcone, is a member of the Delaware Valley Amateur Association. He describes himself as "a guy who bought a solar telescope and is oriented to observing the Sun." His presentation is entitled "Solar Sights, Storms and Sounds." He includes a brief review of the interior of the Sun, and discusses the storms observed on the surface of the Sun. His presentation includes an audio presentation of the sounds emanating from two stars and concludes with a light and sound show.

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

2011 Spring Speaker Series

by Dave Hockenberry, CCAS Program Chair

Currently we have presentation speakers scheduled to speak at our monthly meetings. Our January (Charles Zarcone, UDel), March (Dr. John Gizis), and April (Jerry Lodriguss) sessions are scheduled. We are looking for speakers for the months of February and May, 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 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.

Rovers Set to Celebrate 7 Years on Red Planet

courtesy of Mike Wall, Space.com

As folks here on Earth prepare to mark the passage of another year, two NASA robots a world away are creeping up on a big milestone of their own: seven years on the surface of Mars.

The golf-cart-size rover Spirit landed on Mars on Jan. 4, 2004. Its twin, Opportunity, hit the planet's red dirt three weeks later, on Jan. 25. The rovers were originally supposed to tool around the Martian surface for a mere 90 days, looking for evidence of the planet's past water activity, but both have far outlasted their warranties.

In 2009, however, Spirit got trapped in soft sand and in March 2010, the rover stopped

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NASA Finds New Cracks on Shuttle Fuel Tank

courtesy of Denise Chow, Space.com

NASA has completed its latest round of X-ray scans on the space shuttle Discovery's external fuel tank, only to find more small cracks on the beleaguered tank's support beams, the space agency announced Thursday.

The four new cracks were discovered on the tops of three metal ribs on the back side of the tank's midsection, opposite from the Discovery orbiter. Shuttle program managers met on Thursday and elected to repair these fresh fractures in the same way that earlier cracks found on the tank were fixed. This work will likely begin Jan. 3, and is estimated to take two to three days.

"Any further work will be evaluated thoroughly early next week after additional data is reviewed," NASA officials said in a statement.

Discovery is currently slated to launch no earlier than Feb. 3 after months of delay. The shuttle's upcoming mission to the International Space Station will be the final flight of the workhorse orbiter before it is retired.

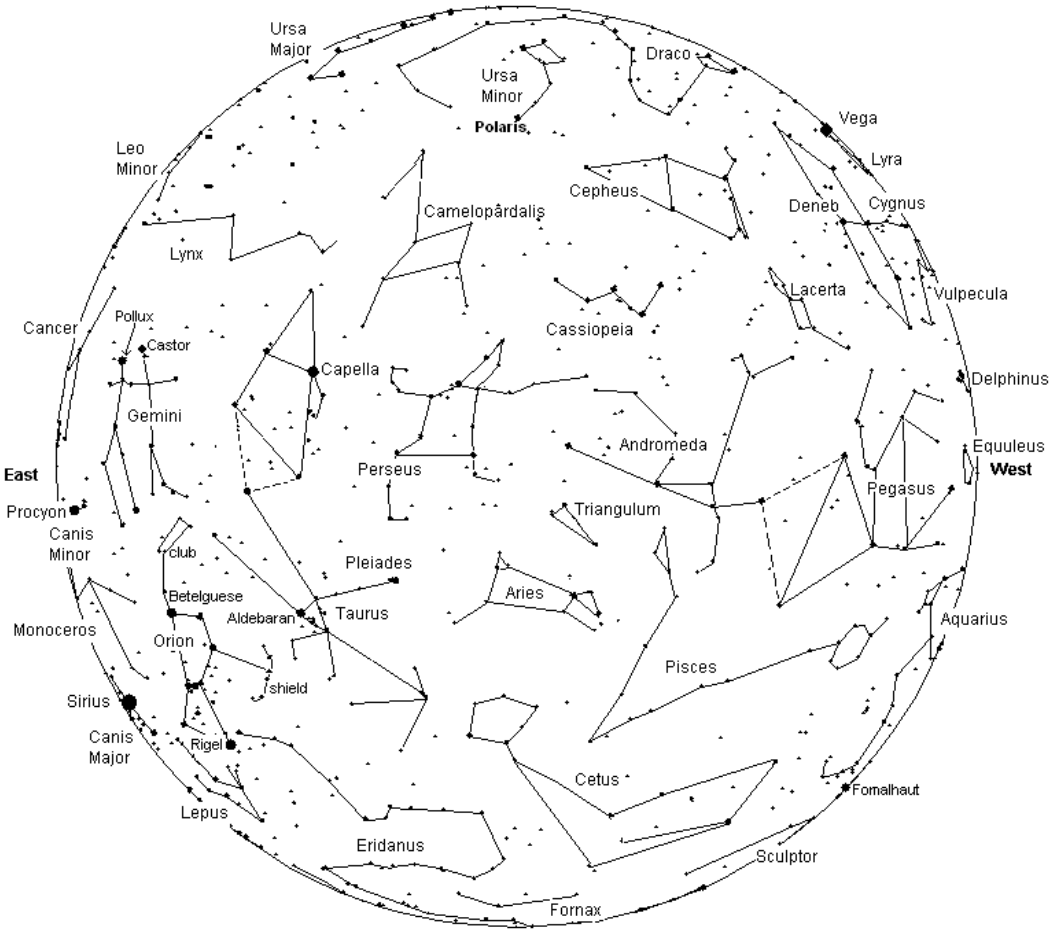
Attempts to launch Discovery on its final voyage in early November were delayed by weather, a gas leak and — ultimately — due to small cracks found in some of the 108 aluminum ribs in the so-called intertank part of

(Continued on page 7)

The Sky Over Chester County

January 15, 2011 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		
1/01/2011	7:22 a.m. EST	4:46 p.m. EST	First Quarter	1/12/2011	6:32 a.m. EST
1/15/2011	7:21 a.m. EST	5:00 p.m. EST	Full Moon	1/19/2011	4:22 p.m. EST
1/31/2011	7:10 a.m. EST	5:19 p.m. EST	Last Quarter	1/26/2011	7:59 a.m. EST
			New Moon	1/04/2011	4:03 a.m. EST

January 2011 Observing Highlights

by Don Knabb, CCAS Secretary & Observing Chair

January 2-5	Uranus is within ½ degree of Jupiter
January 4	The Quadrantid meteor shower peaks
January 4	New Moon, 4:03 a.m.
January 9, 10	Jupiter is very near the crescent Moon
January 12	First-quarter Moon, 6:32 a.m.
January 19	Full Moon, 4:22 p.m.
January 26	Last Quarter Moon, 7:59 a.m.

The Best Sights This Month: January starts off with a great meteor shower, the Quadrantids, on the evening of January 3. If the skies are clear this could be an excellent show, with no Moon to spoil the view. Beyond that, Jupiter continues to be an excellent target for naked eye gazing or zooming in with a telescope.

Mercury: Mercury is at greatest elongation on January 9th and can be viewed during the first two weeks of 2011. This small planet can be found far to Venus's lower left an hour before sunrise near a thin crescent Moon on January 2nd.

Venus: Venus continues to delight us as a brilliant object in the pre-dawn sky. Our sister planet is rising a rare 3 ¾ hours before the Sun on New Year's morning!

Mars: The red planet is too close to the Sun to be visible in January.

Jupiter: Jupiter is about halfway up the sky at sunset during January and is impossible to miss in the southern sky under the Great Square of Pegasus. By the end of the month Jupiter will be setting around 9:30, so enjoy the king of the planets while you can.

Saturn: Saturn is still an early morning target for a few months. In the middle of January the ringed planet rises around 11:30. As much as I love seeing Saturn, that is well past my bedtime!

Uranus and Neptune: Uranus is quite close to Jupiter, referred to as a conjunction, on the evenings of January 2 – 5. Use your telescope or binoculars and look north or northwest of Jupiter for a small green "star", which is Uranus. Neptune has now become difficult to find because it is so low on the horizon at sunset. Finder charts are available at skyandtelescope.com/uranusneptune.

The Moon: Full moon is on January 19th. According to Native Americans, this is the Full Wolf Moon. Amid the cold and deep snows of midwinter, the wolf packs howled hungrily outside Indian villages, so it was named the Full Wolf Moon. Sometimes it was also referred to as the Old Moon, or the Moon after Yule. Some called it the Full Snow Moon, but most tribes applied that name to the next full Moon.

Constellations: Just after it gets dark you can still catch the Summer Triangle as it dives below the horizon for its yearly vacation. On the main stage is Cassiopeia high in the sky with the Pleiades and Taurus the Bull taking the center position in the southern sky. Just a bit later Orion the Hunter and his dog Canis Major become the highlight of the clear winter sky. A bit later yet and Leo the Lion jumps out of the horizon from the east.

Messier/Deep Sky: During the winter months we are looking away from the center of the Milky Way, so the sky is not as full of deep sky wonders as during the summer. But, the sky is clear and there are still many beautiful objects for us to enjoy. Don't miss the trio of clusters in Auriga, and not far away is another nice cluster, M35, at the feet of the twins of Gemini. And below and behind Orion is Canis Major with the cluster M41, the Little Beehive, not far from the brightest star in the night sky, Sirius.

Comets: Comet Hartley 2 will still be visible early or late in January when the Moon is absent from the skies. There is a chart in the January issue of Astronomy magazine to help you find this faint fuzz ball in the vicinity of Sirius.

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Through the Eyepiece: M35, an Open Cluster in Gemini

by Don Knabb, CCAS Secretary & Observing Chair

Around 9 or 10 p.m. on January nights you will find the constellation Gemini the Twins high in the south to the upper left of Orion the Hunter, which puts it between Taurus the Bull and Cancer the Crab on the ecliptic. A nice binocular or telescopic object in Gemini is the open cluster M35.

M35 is easy to find using the star chart below. This cluster is near the foot of Castor, one of the twins of Gemini.

M35 covers an area approximately equal to the size of the full Moon, so it is a large object. It is easily visible in 50mm binoculars and is just visible to the naked eye at a dark sky observing site.

Because Messier 35 is large, you'll need low magnification to appreciate the size of this cluster in a telescope. It stands up well to a bit of moonlight and somewhat light polluted skies, but you will need around a 10? or larger telescope to really begin to notice its companion cluster, NGC 2158. In smaller telescopes with good conditions, it will appear as a faint nebulous patch.

In the photo taken by CCAS member Pete LaFrance you can see the large open cluster M35 in the middle and smaller NGC 2158 in the lower left of the picture.

Open clusters are formed when a giant molecular cloud collapses under its own weight and quickly fragments into the hundreds, even thousands of stars that make up a star cluster. Unlike many star clusters, M35 has no central condensation. In fact, many observers see an absence of stars or a "hole" near

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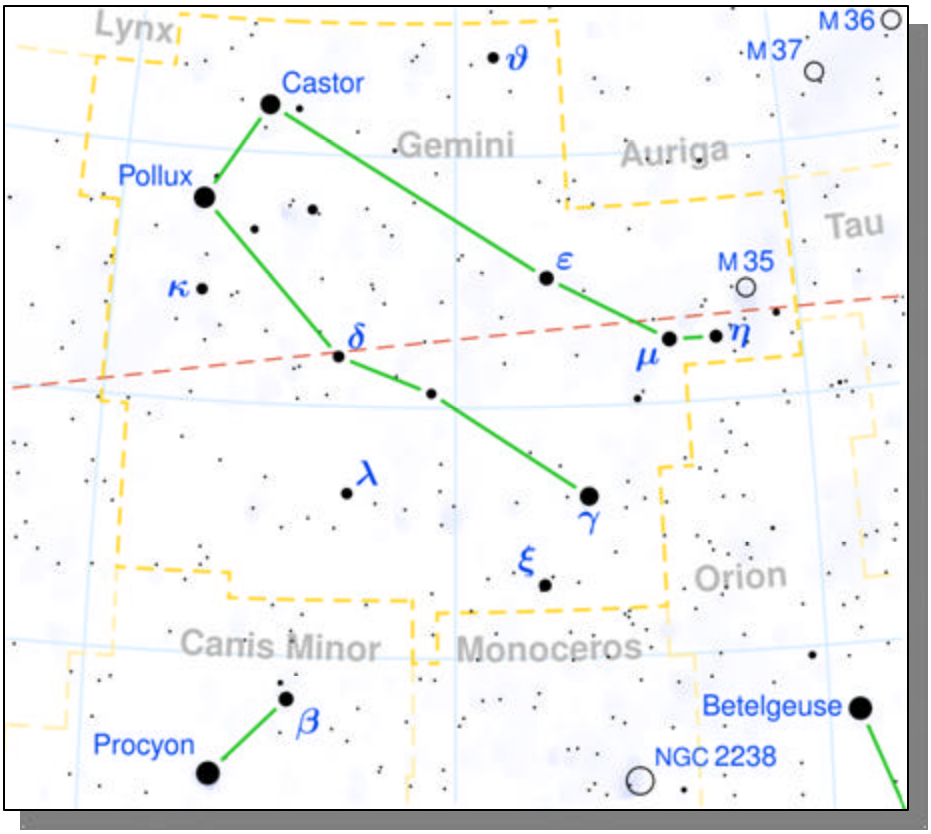


Gemini Constellation: M35 is located near the foot of Castor.

M35 & NGC 2158. Photo courtesy of CCAS member Pete LaFrance.

Shuttle (Cont'd)

The space shuttle Discovery was rolled back to the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida to allow crews to take X-ray scans beneath the foam insulation of all 108 support beams on Discovery's external tank. Photo: NASA/Frank Michaux

(Continued from page 3)

Discovery's 15-story external tank.

The intertank portion of the tank, as its name suggests, is between the vessel's liquid hydrogen and liquid oxygen propellant reservoirs. It also houses much of the tank's wiring and instrumentation.

Discovery rolled back to the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida last week so technicians could take a closer look at the orbiter's external tank. They took digital X-ray images of each of the 108 supports — known in NASA parlance as "stringers" — on the exterior of the intertank section.

Other small cracks had been found on two of these ribs – after Discovery's launch countdown on Nov. 5 — prompting a string of delays for closer analysis to determine the root cause.

While those previous cracks have since been repaired, shuttle program managers opted to postpone Discovery's final launch until February to give engineers more time to understand how the cracks developed, and whether they could pose future concerns.

NASA also conducted a so-called "tanking test" on Dec. 17, in which the shuttle's fuel tank was filled as it normally would

(Continued on page 12)

Through the Eyepiece (Cont'd)

(Continued from page 6)

the center of the cluster, which, with a little imagination, gives it the appearance of a sparkling sugar donut. Even a modest scope reveals curved strands of stars twisting about a sparse central region, like bursting fireworks on a dark summer night.

This wonderful star cluster was discovered by Philippe Loys de Chéseaux in 1745 and rediscovered again by John Bevis in 1750. However, we know it best as Messier Object 35 when it was penned into being by Charles Messier. Messier writes: "In the night of August 30 to 31, 1764, I have observed a cluster of very small stars, near the left foot of Castor, little distant from the stars Mu and Eta of that constellation. When examining this star cluster with an ordinary refractor of 3 feet, it seemed to contain nebulosity; but having examined it with a good Gregorian telescope which magnified 104 times, I have noticed that it is nothing but a cluster of small stars, among which there are some which are of more light."

So add M35 to your cold weather observing list. It should be easy to find as you hold your binoculars with your gloved hands!

Information credits:
http://en.wikipedia.org/wiki/Messier_35
http://seds.org/messier/m/m035.html
Astronomy magazine, January 2011, 10 Top Winter Binocular Treats by Phil Harrington
http://www.universetoday.com/34034/messier-35/
http://www.oneminuteastronomer.com/2009/03/09/messier-35/
http://en.wikipedia.org/wiki/File:Gemini_constellation_map.svg

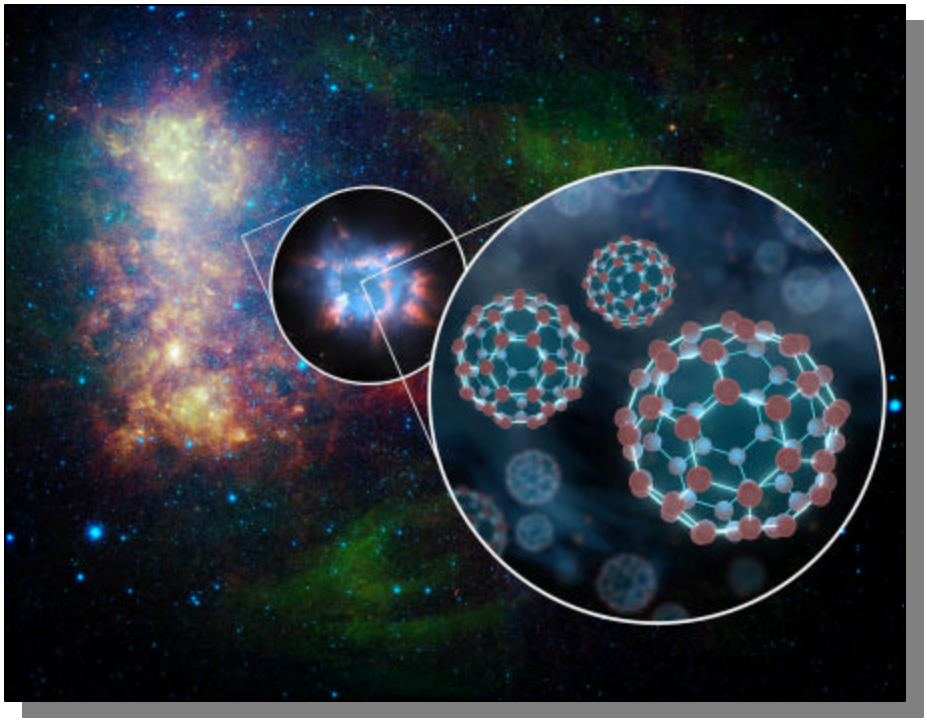
Astronomers Stumble onto Huge Space Molecules

by Trudy E. Bell & Dr. Tony Phillips

Deep in interstellar space, in a the swirling gaseous envelope of a planetary nebula, hosts of carbon atoms have joined together to form large three-dimensional molecules of a special type previously seen only on Earth. Astronomers discovered them almost accidentally using NASA's Spitzer Space Telescope.

"They are the largest molecules known in space," declared Jan Cami of the University of Western Ontario, lead author of a paper with three colleagues published in *Science* online on July 22, 2010, and in print on September 3.

Not only are the molecules big: they are of a special class of carbon molecules known as "fullerenes" because their structure resembles the geodesic domes popularized by architect Buckminster Fuller. Spitzer found evidence of two types of fullerenes. The smaller type, nicknamed the "buckyball," is chemical formula C_{60}, made of 60 carbon atoms joined in a series of hexagons and pentagons to form a spherical closed cage exactly like a black-and-white soccer ball. Spitzer also found a larger fullerene, chemical formula C_{70}, consisting of 70 carbon atoms in an elongated closed cage more resembling an oval rugby ball.



Superimposed on a Spitzer infrared photo of the Small Magellanic Cloud is an artist's illustration depicting a magnified view of a planetary nebula and an even further magnified view of buckyballs, which consist of 60 carbon atoms arranged like soccer balls.

Neither type of fullerene is rigid; instead, their carbon atoms vibrate in and out, rather like the surface of a large soap bubble changes shape as it floats through the air. "Those vibrations correspond to wavelengths of infrared light emitted or absorbed—and that infrared emission is what Spitzer recorded," Cami explained.

Although fullerenes have been sought in space for the last 25 years, ever since they were first identified in the laboratory, the astronomers practically stumbled into the discovery. Co-author Jeronimo Bernard-Salas of Cornell University, an expert in gas and dust in planetary nebulae, was doing routine research with Spitzer's infrared observations of planetary nebulae with its spectroscopy instrument. When he studied the spectrum (infrared signature) of a dim planetary nebula called Tc 1 in the southern-hemisphere constellation of Ara, he noticed several clear peaks he had not seen before in the spectra of other planetary nebulae.

"When he came to me," recounted Cami, an astrophysicist who specializes in molecular chemistry, "I immediately and intuitively knew it I was looking at buckyballs in space. I've never been that excited!" The authors confirmed his hunch by carefully

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Space Place (cont'd)

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comparing the Tc 1 spectrum to laboratory experiments described in the literature.

"This discovery shows that it is possible—even easy—for complex carbonaceous molecules to form spontaneously in space," Cami said. "Now that we know fullerenes are out there, we can figure out their roles in the physics and chemistry of deep space. Who knows what other complex chemical compounds exist—maybe even some relevant to the formation of life in the universe!" Stay tuned!

Learn more about this discovery at http://www.spitzer.caltech.edu.

For kids, there are lots of beautiful Spitzer images to match up in the Spitzer Concentration game at http://spaceplace.nasa.gov/en/kids/spitzer/concentration.

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

Observing (Cont'd)

(Continued from page 5)

Meteor Showers: Conditions are good for an excellent showing from the Quadrantid meteor shower during the late evening of January 3rd. This is the night of the new Moon, so moonlight will not wash out the shooting stars, which could number 100 per hour at the peak of activity. Let's hope this shower does not get clouded out as happened for the Geminid shower.

Nicholas's Humor Corner

by Nicholas La Para

CCAS Original Astrophotography

by Dave Hockenberry

M1 Crab nebula, Shot 10/10/2010, stack of 4 350 second images. Shot with Starlight Xpress SXVF H9C OSC camera through AstroTech AT8RC telescope, autoguided with Stellarvue 70m ED/Lodestar camera with MaxIm DL5. Stacked with MaxIm, stretched, calibrated and color adjusted i MaxIm.

Mars Rovers (Cont'd)

(Continued from page 3)

communicating with Earth. Still, mission scientists think the intrepid rover may wake up in the next few months. Meanwhile, Opportunity is still going strong, making its slow, steady way toward a huge crater called Endeavour.

In their nearly 2,500 days on the Martian surface, the two rovers have fundamentally changed scientists' understanding of Mars, finding lots of evidence that the Red Planet was once a much wetter, warmer place. Spirit and Opportunity have also paved the way for future rover missions by testing out technologies and showing just what is possible, researchers said.

Spirit's right front wheel stopped working in 2006, impelling mission scientists to drive the rover backward instead. The rover probably would not have gotten stuck in the sand — where it remains today — if all six wheels had been working properly, Callas said.

But the wonky wheel proved something of a blessing. It dug a shallow trench through the Martian soil as Spirit chugged along. In 2007, one of Spirit's drag-furrows exposed subsurface deposits of pure silica, which forms when hot water reacts with rocks.

"Not only was there liquid water on Mars, but there were energy sources coincident with that liq-

(Continued on page 11)

CCAS Original Astrophotography

by Liz Smith

DECEMBER 21, 2010 LUNAR ECLIPSE SHOTS - 10" Dobsonian with 25mm eyepiece and Kodak Powershot A1000IS. [A] positively *beautiful* night...clear and crisp! One shot was just strange, I think it's when my flash went off in the eyepiece but it came out rather cool, in my opinion! [It was] just me, out there all alone in my jammies (footies, no less) listening to the deer shuffling and crunching leaves around me (I hope!!) ...well worth the effort to get up!

Mars Rovers (Cont'd)

(Continued from page 10)

uid water," Callas said. "So you have a system that could potentially support an ecosystem."

Spirit and Opportunity were each designed to last about three months on the Martian surface, and to travel about 0.6 miles (1 kilometer). Spirit lasted more than six years, and could still wake up. To date, it has put about 4.8 miles (7.7 km) on its odometer, NASA officials said.

Opportunity has been roving for almost seven years now, covering about 16.5 miles (26.5 km) as of late December, scientists have said.

"You get what you pay for," Arvidson said. "They're just well-made American vehicles that have been thoroughly tested before launch."

Arvidson said that part of the rovers' legacy will be their tremendous longevity and the solid engineering that produced them, which should be instructive for future rover missions.

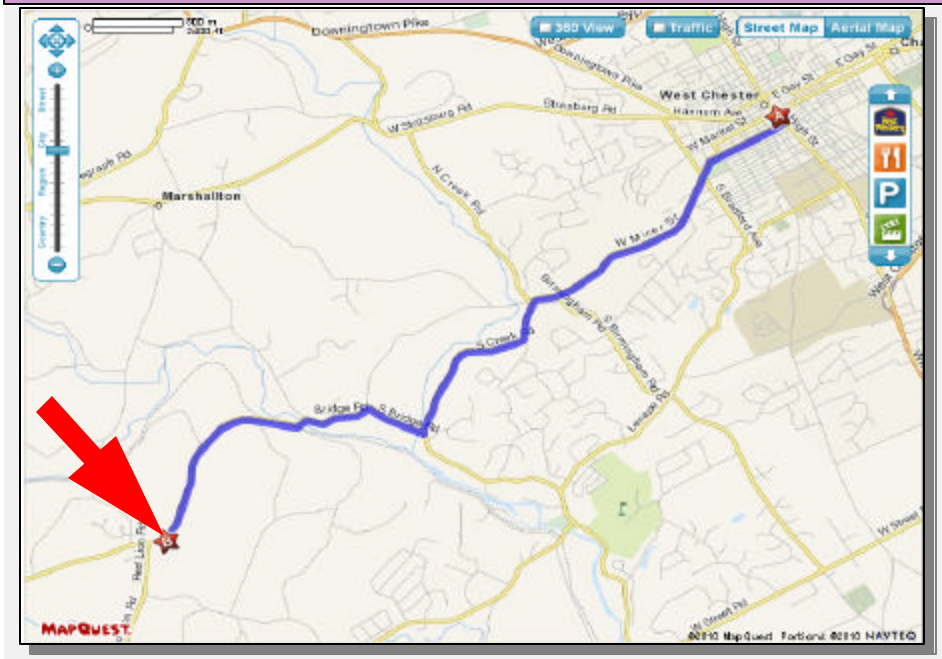
The crippled, trapped Spirit went silent on March 22, 2010, after failing to maneuver into a position that would slant its solar panels toward the sun over the course of the Martian winter. But now spring has arrived on Mars, and the rover team is holding out hope that Spirit will warm up, wake up and check in.

"We're listening now," Callas said. "We've been listening every day."

Despite continuing to boldly trek across the surface of Mars, Opportunity is showing some signs of its advanced age. So, will Opportunity make it to Endeavour, which is about 3.7 miles (6 km) away at this point? How much longer will the rover tool around the Red Planet's frigid, bone-dry surface?

It's anybody's guess, Callas and Arvidson said. But the rover has turned a 90-day mission into a seven-year marathon, so it's probably wise not to bet against it — or to count Spirit out.

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.

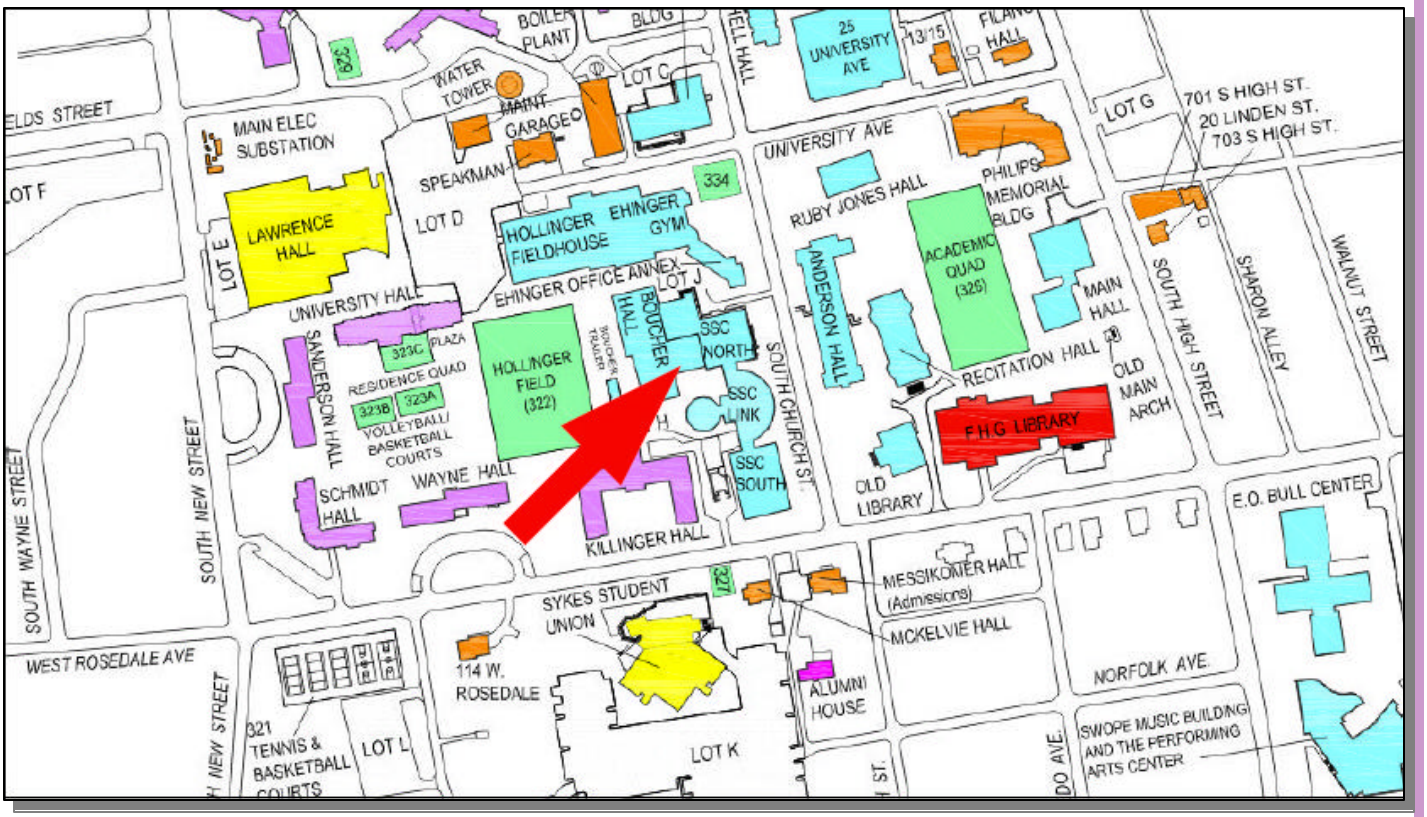
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route 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).



Shuttle (cont'd)

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be up until the final seconds before liftoff. Sensors that were installed on the tank recorded data as hundreds of thousands of gallons of cryogenic propellant was pumped into, and then drained from, the external tank. The sensors also monitored the tank's performance into the next day as it warmed to ambient temperature.

On its 39th and final flight, the shuttle Discovery will carry supplies to the International Space Station, including a storage room and humanoid robot helper, called Robonaut 2. Two spacewalks are also planned for the 11-day mission.

Discovery's STS-133 flight is one of two final scheduled missions before NASA's orbiter fleet is retired in 2011. The agency is retiring the space shuttle program in order to shift its focus toward future missions to an asteroid and Mars.

CCAS Membership Information and Society Financials

Treasurer's Report
by Bob Popovich

Nov. 2010 Financial Summary

Beginning Balance	$1,747
Deposits	$45
Disbursements	$0
Ending Balance	$1,792

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

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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

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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 **484-467-5562.**

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.**