



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 25, No. 1 **Three-Time** Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016 January 2017

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Clouds of Andromeda



Image Credit & Copyright: Rogelio Bernal Andreo (Deep Sky Colors) See [APOD site](http://APOD.org) for details.

Membership Renewals Due

01/2017	Holmstrom Kellerman Kovacs Linskens McElwee
02/2017	DiGiovanni Gallagher La Para Munson Ruggeri
03/2017	Angelini Fulton Sterrett

January 2017 Dates

- 2nd-3rd** • The Quadrantid meteor shower peaks
- 5th** • First quarter Moon, 2:46 p.m. EST
- 12th** • Full Moon, the Full Wolf Moon, 6:33 a.m. EST
- 19th** • Last quarter Moon, 5:13 p.m. EST
- 27th** • New Moon, 7:07 p.m. EST
- 31st** • Venus, Mars and the Moon form a triangle at twilight



CCAS Upcoming Nights Out

CCAS has several special “nights out” scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

- ☼ **Saturday, April 1, 2017** - CCAS Special Observing Session, Hoopes Park West Chester, PA, from 8:00 to 9:30 p.m. This event is open to the general public.
- ☼ **Saturday, April 29, 2017** - CCAS Special Observing Session celebrating International Astronomy Day, Nottingham County Park, Nottingham, PA, from 8:00 to 10:00 p.m. This event is open to the general public.

Winter 2017 Society Events

January 2017

4th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

6th • Reservations open for the January 27th planetarium show. To make a reservation, visit the [WCU Public Planetarium Shows](#) webpage.

10th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. CCAS Guest Speaker: Phil Rossomando from the [Planetary Society](#).

12th-13th • The von Kármán Lecture Series: [Exoplanets: The Quest for Strange New Worlds](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the February 2017 edition of [Observations](#).

26th • Deadline for newsletter submissions for the February 2017 edition of [Observations](#).

27th • West Chester University Planetarium Show: "Mars & Venus: Our Planetary Neighbors" in the Schmucker Science Building. The show starts at 7 p.m. and runs approximately one hour in length. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

February 2017

1st • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

3rd • Reservations open for the February 24th planetarium show. To make a reservation, visit the [WCU Public Planetarium Shows](#) webpage.

10th • Penumbral lunar eclipse starts at 5:34 p.m., maximum eclipse at 7:43 p.m.; eclipse ends at 9:53 p.m.

9th-10th • The von Kármán Lecture Series: [Glacial Ice Melt and Sea Level Rise](#), at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

14th • CCAS Monthly Meeting, Room 112, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. CCAS Member Speaker: John Conrad, NASA Solar System Ambassador, "Cassini-Huygens to Saturn and Titan."

20th • Open call for articles and photographs for the March 2017 edition of [Observations](#).

24th • West Chester University Planetarium Show: "A Star is Born," in the Schmucker Science Building. The show starts at 7 p.m. and runs approximately one hour in length. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

26th • Deadline for newsletter submissions for the March 2017 edition of [Observations](#).

CCAS Original Astrophotography by Steve Leiden



The Saturn Nebula or NGC 7009 is a planetary nebula in the constellation Aquarius. The nebula is 1 degree west of the star Nu Aquarii. It appears as a blueish-green nebula in my C11. It is compact and fairly bright. It was discovered by William Herschel in 1782, and was one of his earliest discoveries in his sky survey.

The Saturn Nebula gets its name from its superficial resemblance to the planet Saturn with its rings nearly edge-on to the observer. It was so named by Lord Rosse in the 1840s. The Saturn Nebula is a complex planetary nebula including a halo, jet-like streams, multiple shells, ansae ("handles"), and small-scale filaments and knots.

The central star, a very hot bluish dwarf with a temperature of 55,000 K, has an absolute magnitude of +1.5, which equates to a luminosity of about 20 solar

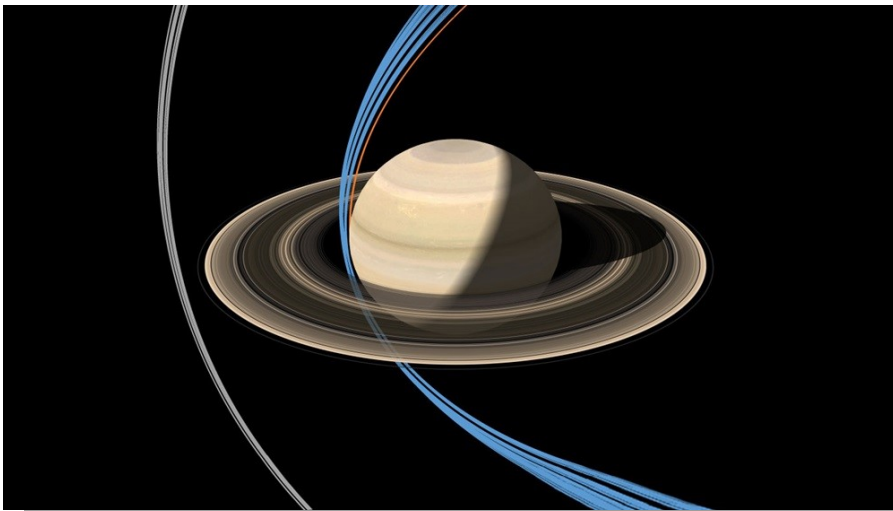
luminosities. This strong ultraviolet irradiation from the central star creates the characteristic fluorescent green tint of the nebula via the radiation of doubly ionized oxygen. The object overall has a radial velocity of 28 miles per second towards the Earth.

Photographed through a Celestron Ultima11 on a CGEM-DX mount using 4 unguided 60 second sub-exposures taken with a Canon 450D using BackyardEOS. The images were calibrated, preprocessed, aligned/stacked and post-processed using Nebulosity V4.1.

Right Ascension	21 ^h 04 ^m 10.877 ^s
Declination	-11° 21' 48.25"
Distance	2000-4000 ly
Apparent Magnitude (V)	8.0
Apparent Dimensions (V)	41" x 35"

Cassini Dives Through Saturn's Rings

by Allen Zeyher, *Astronomy Magazine*



This graphic shows the closest approaches of Cassini's final two orbital phases. Ring-grazing orbits are shown in gray (at left); Grand Finale orbits are shown in blue. The orange line shows the spacecraft's September 2017 final plunge into Saturn. Image: NASA/JPL-Caltech

Zippering along at 47,000 miles an hour, the Cassini spacecraft made its first dive through the rings of Saturn on December 11 as part of the “ring-grazing” phase of its mission. The little spacecraft will spend the next 20 weeks studying the most spectacular sight in our solar system, with special focus on the F ring.

Cassini entered its ring-grazing orbit on Nov. 30 at the farthest point in the orbit. Its nearest ap-

proach to Saturn is about 5,000 miles outside the F ring.

To enter its ring-grazing orbit, Cassini got a gravitational boost from the moon Titan, a maneuver Cassini has employed many times since its arrival at the Saturn system in 2004. In fact, Titan has been instrumental in shaping and prolonging Cassini's mission.

“Titan is quite large, and so every time we fly by, it bends our trajectory,” says Earl Maize, Cassini project manager for NASA's Jet Propulsion Laboratory in Pasadena, Calif. The moon gives a boost of 500-700 meters per second to the little spacecraft, comparable to the main engine burn used to insert Cassini into Saturn's orbit. “So we've essentially had 125 massive main engine burns, and we've used that to tour around. We couldn't possibly have carried enough fuel to do what we've done with the gravity assist we get from Titan.”

From its orbit close to the F ring, Cassini will be able to obtain unprecedented views of the complicated behavior within the F, A, and B rings. The F ring alone presents plenty to watch. The thin, outermost discrete ring of Saturn orbits about 140,000 kilometers from the planet's center and features spiral strands and channels. The ring particles are shepherded by two tiny

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January 2017 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on January 10, 2017, starting at 7:30 p.m. The meeting will be held in Room 112, Merion Science Center (former Boucher Building), West Chester University. Our guest speaker will be Phil Rossomando from the Planetary Society.

In February, John Conrad, NASA Solar System Ambassador, will present “Cassini-Huygens to Saturn and Titan.”

For our March meeting, Gordon Richards, PhD from Drexel University will present “The LSST and Upcoming Discoveries.” In April, CCAS Member Denis O'Leary will be our featured speaker. For our meeting in May, Ed Guinan, PhD, from Villanova University will present “Proxima Centauri B – Is Anybody Home at our Closest Star?”

Please note that inclement weather or changes in speakers'

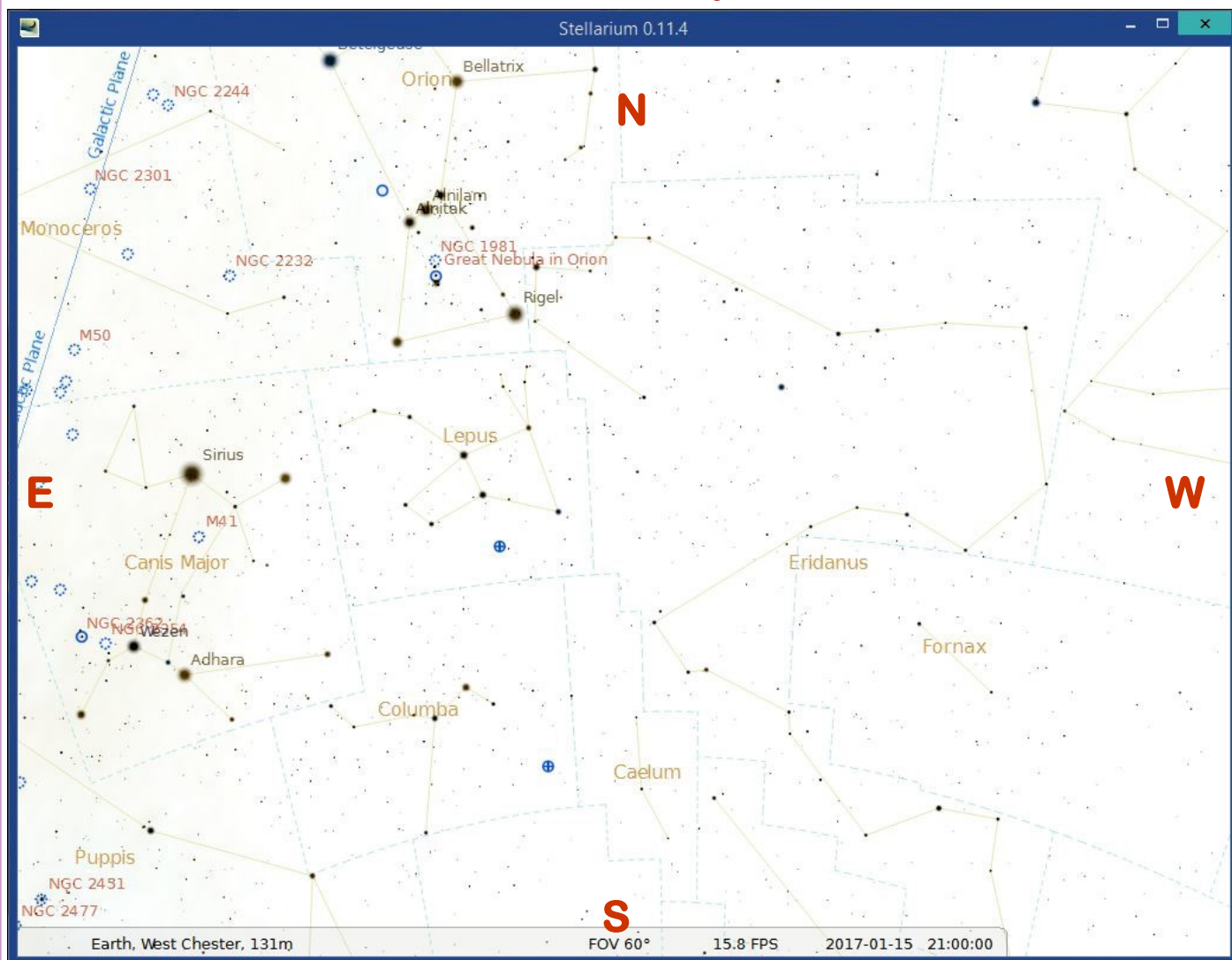
schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

As for future meetings, we are looking for presenters for our spring 2017 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

The Sky Over Chester County

January 15, 2017 at 9:00 p.m. ET

Note: This screen capture is taken from Stellarium, the free planetarium software available for download at www.stellarium.org.



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
1/01/2017	6:52 a.m. EST	7:22 a.m. EST	4:47 p.m. EST	5:17 p.m. EST	9h 24m 06s
1/15/2017	6:50 a.m. EST	7:20 a.m. EST	5:00 p.m. EST	5:31 p.m. EST	9h 39m 55s
1/31/2017	6:41 a.m. EST	7:10 a.m. EST	5:19 p.m. EST	5:48 p.m. EST	10h 09m 19s
Moon Phases					
First Quarter	1/05/2017	2:46 p.m. EST	Full Moon	1/12/2017	6:33 a.m. EST
Last Quarter	1/19/2017	5:13 p.m. EST	New Moon	1/27/2017	7:07 p.m. EST

January 2017 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

2	Venus, Mars and the Moon line up at twilight
2/3	The Quadrantid meteors peak to-night
5	First quarter Moon, 2:46 p.m. EST
6	The Lunar Straight Wall is visible to-night
8/9	The Moon is near Aldebaran
12	Full Moon, the Full Wolf Moon, 6:33 a.m. EST
19	Last quarter Moon, 5:13 p.m. EST
27	New Moon, 7:07 p.m. EST
28	Look for a thin crescent Moon low in the west after sunset
31	Venus, Mars and the Moon form a triangle at twilight

The best sights this month: If we have clear skies on the night of January 2/3, take a look for the Quadrantid meteor shower. The wonderful Geminid shower was clouded out in December, so here is a chance to see some shooting stars. Although the peak of this shower is brief, you can see up to 120 meteors per hour and I have seen some spectacular displays during this meteor shower. Also, at the start of the month and at the end of the month we can see a nice grouping of a crescent Moon, Mars and Venus in the southwest as twilight falls.

Mercury: Mercury is in the pre-dawn sky during January.

Venus: Venus is at greatest eastern elongation on January 12th so it will be in the sky a full 4 hours after sunset during most of January. It shines like a bright beacon in the western sky and is easily visible just shortly after sunset.

Mars: The red planet continues to hang out in the constellation Aquarius through January, never far from Venus. And on the night of January 1st Venus and Neptune are only 0.2 degree apart! At the beginning and end of January Mars, Venus and the Moon make a nice grouping in the sky just after sunset.

Jupiter: Jupiter rises in the middle of the night and is high in the sky near dawn.

Saturn: Saturn is low in the eastern sky before dawn through January.

Uranus and Neptune: Neptune has a close encounter with Mars on January 1st as mentioned above. Uranus is high in the west-southwest after nightfall. Finder charts can be found at skyandtelescope.com.

The Moon: Full Moon occurs on January 12th. 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: Auriga, Taurus, Orion and Gemini are the highlights of the January skies. But the nights are so long that you can see many “summer” constellations setting early in the evening and many “spring” constellations rising if you stay up late. Dress warmly and sit in your lounge chair and see how many constellations you can record toward the Constellation Hunter club.

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: There are no bright comets in the sky during January.

Meteor showers: The Quadrantid meteor shower peaks in the early morning hours of January 3rd. This is the briefest meteor shower of the year, so if you want to see these shooting stars you need to go out after midnight and watch the skies. The Moon won’t cause any interference so this could be an excellent meteor shower.

Through the Eyepiece: M35, an open cluster in Gemini

by Don Knabb, CCAS Treasurer & Observing Chair

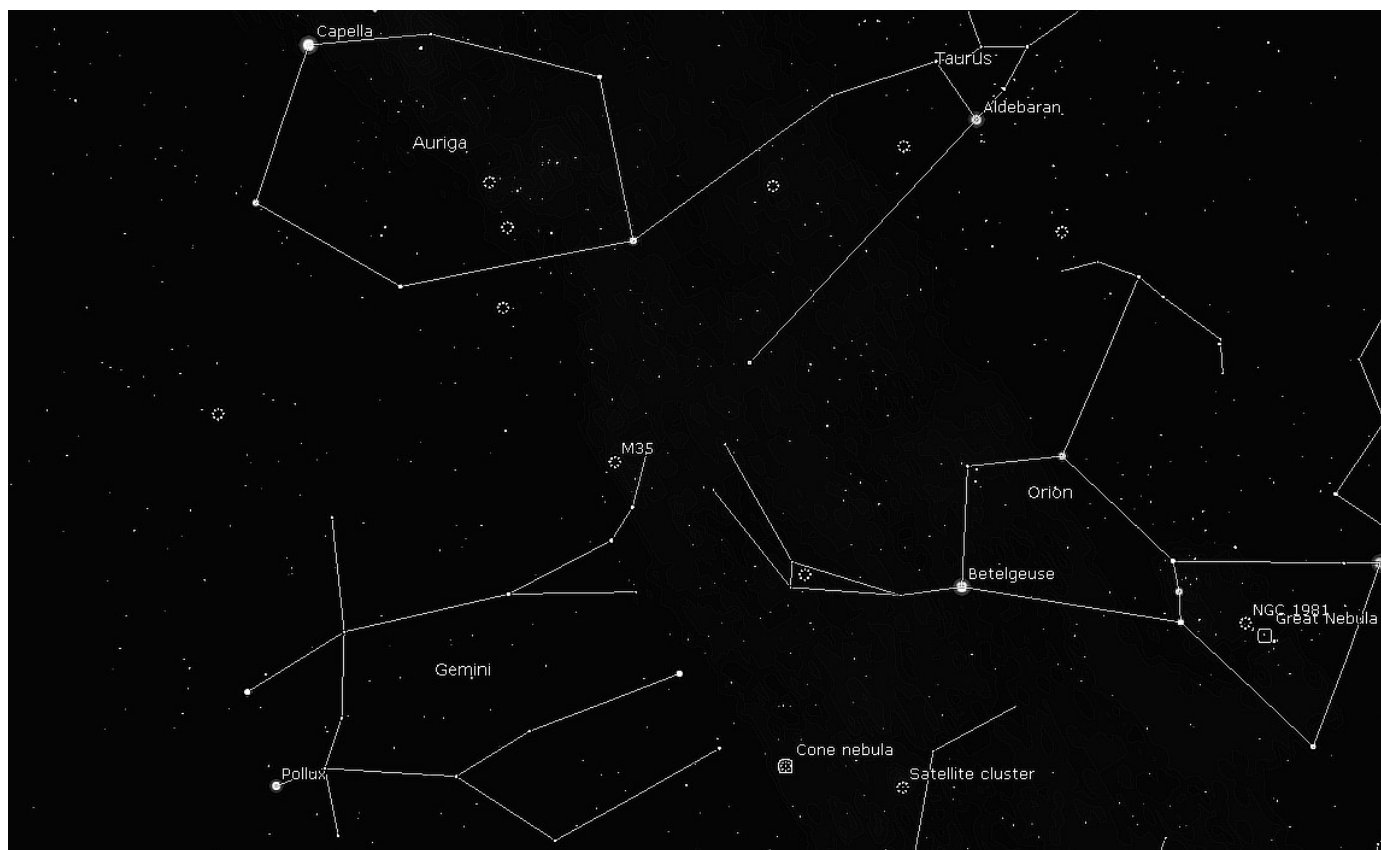


Image credit: Image created using Stellarium planetarium software and IrfanView image editing software

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, also known as NGC 2168.

M35 is easy to find using the star chart above. 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 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 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.

(Continued on page 7)

Eye-piece (cont'd)

(Continued from page 6)

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

Cassini Cont'd

(Continued from page 3)

moonlets, Prometheus inside the ring orbit and Pandora outside. When bodies within the F ring collide, they create dust that is ejected as streamers.

"There's probably, we're hoping, enough particles that we can get a good sampling of the F ring particles or any gases coming off and directly measure their composition," says Linda Spilker, Cassini project scientist at the Jet Propulsion Laboratory.

Cassini will sample the dust particles outside the F ring using the Cosmic Dust Analyzer, which

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Image credit: CCAS Member Pete La France

Big Science in Small Packages

by Marcus Woo

About 250 miles overhead, a satellite the size of a loaf of bread flies in orbit. It's one of hundreds of so-called CubeSats—spacecraft that come in relatively inexpensive and compact packages—that have launched over the years. So far, most CubeSats have been commercial satellites, student projects, or technology demonstrations. But this one, dubbed MinXSS ("minks") is NASA's first CubeSat with a bona fide science mission.

Launched in December 2015, MinXSS has been observing the sun in X-rays with unprecedented detail. Its goal is to better un-



derstand the physics behind phenomena like solar flares – eruptions on the sun that produce dramatic bursts of energy and radiation.

Much of the newly-released ra-

diation from solar flares is concentrated in X-rays, and, in particular, the lower energy range called soft X-rays. But other spacecraft don't have the capability to measure this part of the sun's spectrum at high resolution—which is where MinXSS, short for Miniature Solar X-ray Spectrometer, comes in.

Using MinXSS to monitor how the soft X-ray spectrum changes over time, scientists can track changes in the composition in the sun's corona, the hot outermost layer of the sun. While the sun's visible surface, the photosphere, is about 6000 Kelvin

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Astronaut Tim Peake on board the International Space Station captured this image of a CubeSat deployment on May 16, 2016. The bottom-most CubeSat is the NASA-funded MinXSS CubeSat, which observes soft X-rays from the sun—such X-rays can disturb the ionosphere and thereby hamper radio and GPS signals. (The second CubeSat is CADRE — short for CubeSat investigating Atmospheric Density Response to Extreme driving - built by the University of Michigan and funded by the National Science Foundation.) Credit: ESA/NASA

Space Place (Cont'd)

(Continued from page 8)

(10,000 degrees Fahrenheit), areas of the corona reach tens of millions of degrees during a solar flare. But even without a flare, the corona smolders at a million degrees—and no one knows why.

One possibility is that many small nanoflares constantly heat the corona. Or, the heat may come from certain kinds of waves that propagate through the solar plasma. By looking at how the corona's composition changes, researchers can determine which mechanism is more important, says Tom Woods, a solar scientist at the University of Colorado at Boulder and principal investigator of MinXSS: "It's helping address this very long-term problem that's been

around for 50 years: how is the corona heated to be so hot."

The \$1 million original mission has been gathering observations since June.

The satellite will likely burn up in Earth's atmosphere in March. But the researchers have built a second one slated for launch in 2017. MinXSS-2 will watch long-term solar activity—related to the sun's 11-year sunspot cycle—and how variability in the soft X-ray spectrum affects space weather, which can be a hazard for satellites. So the little-mission-that-could will continue—this time, flying at a higher, polar orbit for about five years.

(Continued on page 10)

Cassini (Cont'd)

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incorporates a mass spectrometer to determine the dust's composition.

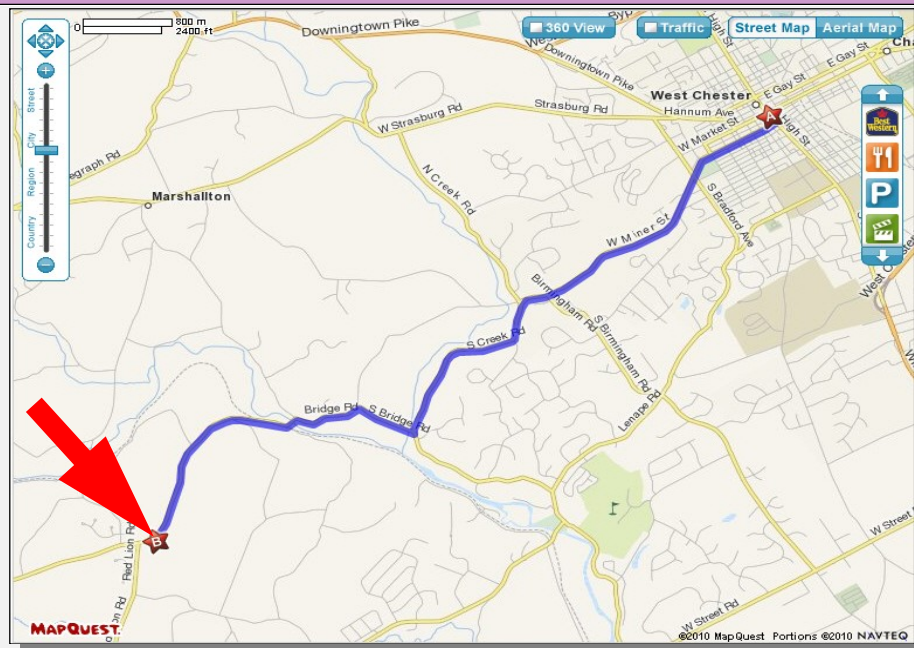
Cassini will also get a good view of the "propellers" in the outer part of the A ring, which is the next inside the F ring. Propellers are created by small objects that are not quite massive enough to clear a gap in the ring around them.

The spacecraft will end its mission with a final plunge into Saturn's atmosphere on Sept. 15.

Read the [complete article](#) online at [Astronomy.com](#).

For more information visit [NASA JPL Cassini-Huygens Mission](#).

CCAS Directions



Brandywine Red Clay Alliance

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

<http://brandywinewatershed.org/>

BRC 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 Red Clay Alliance

The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Red Clay Alliance.

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 BRC 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).

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>

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"!

Good Outdoor Lighting Websites

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



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

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

<http://www.starrynightlights.com>



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

Phone: 484-291-1084

<https://www.lighthouse-lights.com/landscape-lighting-design/pa-west-chester/>

Local Astronomy-Related Stores

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



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

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

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

<http://www.skiesunlimited.net>



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

4403 Main Street
Philadelphia, PA 19127

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

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

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

CCAS Information Directory

CCAS Lending Telescopes

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

CCAS Lending Library

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

Contributing to *Observations*

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

Or mail the contribution, typed or handwritten, to:

John Hepler
21103 Stripper Run
Rock Hall, MD 21661

CCAS Newsletters via E-mail

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

CCAS Website

John Hepler is the Society's Webmaster. You can check out our Website at: <http://www.ccas.us>

John welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work—no copyrighted material! Give your contributions to John Hepler at (410) 639-4329 or e-mail to webmaster@ccas.us

CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "nights out" for school, scout, and other civic groups.

CCAS Executive Committee

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

President:	Roger Taylor 610-430-7768
Vice President:	Liz Smith 610-842-1719
ALCor, Observing, and Treasurer:	Don Knabb 610-436-5702
Secretary:	Ann Miller 610-558-4248
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 410-639-4329
Public Relations:	Deb Goldader 610-304-5303

CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

Check the Membership Renewals on the front of each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178

Phone: 610-436-5702
e-mail: treasurer@ccas.us

Sky & Telescope Magazine Group Rates

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

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