



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 22, No. 2 Two-Time Winner of the Astronomical League's Mabel Sterns Award ☼ 2006 & 2009 February 2014

In This Issue

CCAS Winter 2014 Events	2
January 2014 Meeting Minutes	2
Nicholas's Humor Corner	2
February 2014 Meeting	
Agenda	3
The Sky Over Chester County:	
February 2014	4
February 2014 Observing	
Highlights	5
Through the Eyepiece: M109,	
Vacuum Cleaner Galaxy	6
Recent Additions to CCAS	
Lending Library	8
NASA Space Place	10
CCAS Directions: Brandywine	
Valley Association	11
CCAS Winter Party	12
Membership Renewals	12
New Member Welcome	12
CCAS Directions:	
WCU Map	12
Treasurer's Report	12
CCAS Information	
Directory	13-14

NGC 2683: Edge-On Spiral Galaxy



Image: Subaru Telescope, Hubble Space Telescope; Image Assembly, Processing, & Copyright: Robert Gendler. See p.3 for details.

Membership Renewals Due

02/2014	DiGiovanni Kalinowski & Family La Para
03/2014	Angelini End LaFrance Sterrett
04/2014	Armored Bower Caccamo Imburgia Richter

Important February 2014 Dates

- 01/30th** • New Moon, 4:39 p.m.
- 6th** • First Quarter Moon, 2:22 p.m.
- 10th** • Jupiter is near the moon.
- 14th** • Full Moon, 6:53 p.m.
- 22nd** • Last Quarter Moon, 12:16 p.m.
- 22nd** • Zodiacal light visible for next two weeks.



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, February 28, 2013.** CCAS monthly observing session at BVA. The observation session starts at dusk.
- ☼ **Friday, March 21, 2013.** CCAS monthly observing session at BVA. The observation session starts at dusk.
- ☼ **Saturday, March 22, 2013.** CCAS special observing session at Bucktoe Creek Preserve. The observation session starts at dusk.

Winter 2014 Society Events

February 2014

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.

7th • West Chester University Planetarium Show: "Andromeda: Our Galaxy Neighbor," in the Schmucker Science Building. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

8th • CCAS Winter Party.. The gathering starts at 6:00 p.m. at Don & Barb Knabb's home. See pg. 12 for details and coordinates.

11th • CCAS Monthly Meeting, **University Planetarium (Schmucker Science Center)**, West Chester University. The meeting starts at 7:30 p.m. Meeting Program: Members' Night (Open Forum).

13th-14th • The von Kármán Lecture Series: [The History and Future of Space Communications—Celebrating 50 Years of the NASA Deep Space, Jet Propulsion Laboratory, Pasadena, California](#). Live stream of free lecture presented by NASA & Caltech.

14th • Reservations start for the March 7th planetarium show at the WCU Planetarium.

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

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

28th • CCAS monthly observing session at BVA. The observation session starts at dusk.

March 2014

5th • 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.

11th • CCAS Monthly Meeting, Room 112, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: Ruth Davis, Professor of Astronomy & Physics at Penn State;

16th-17th • The von Kármán Lecture Series: [The Orbiting Carbon Observatory-2 and ISS-RapidScat](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

14th • Reservations start for the April 4th planetarium show at the WCU Planetarium.

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

21st • CCAS monthly observing session at BVA. The observation session starts at dusk.

22nd • CCAS special observing session at Bucktoe Creek Preserve. The observation session starts at dusk.

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

Minutes of the January 11, 2014 Meeting

by Ann Miller, CCAS Secretary

- President Roger Taylor welcomed 14 members and visitors to our January 14 meeting with the trivia question, "How many countries have a launch space program?"
- Don Knabb, our observing chair, presented our monthly "What is in the sky" with the Stellarium program.
- Dave Hockenberry, program chair, announced that the February meeting will be held in the West Chester University Planetarium. February is Members Night. Please bring any stories, equipment, pictures, or astro experiences that you would like to share with the group. Additionally, CCAS will be treated to a planetarium presentation with their new equipment by Dr. Karen Van Landingham. Dave also announced the rest of our spring lecture series.
- Scott Engel, PhD candidate in Astronomy at Villanova University, was our guest speaker. He presented "Little Ice Age"-the Sun-Earth Connection about solar activity and the earth atmosphere/weather interaction. We all wish Scott well as he defends his PHD this semester.

Nicholas's Humor Corner

by Nicholas La Para



February 2014 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on February 11, 2014, starting at 7:30 p.m. The meeting will be held in **West Chester University Planetarium** (Schmucker Science Center), West Chester University. The theme for our meeting on February 11th is a members' night, where members can share their research or ask for help from other members. Dr. Karen Vanlandingham will also demonstrate the new planetarium equipment.

Our upcoming meeting presenters are: March 11th - Ruth Davis, Professor of Astronomy & Physics at Penn State; April 8th - Tim Larson, Astronomy Professor at Penn State Bran-

dywine; and May 13th - John Conrad, CCAS member and NASA Solar System Ambassador.

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

We are looking for presenters for future meetings in 2014. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

Cover Photo Details

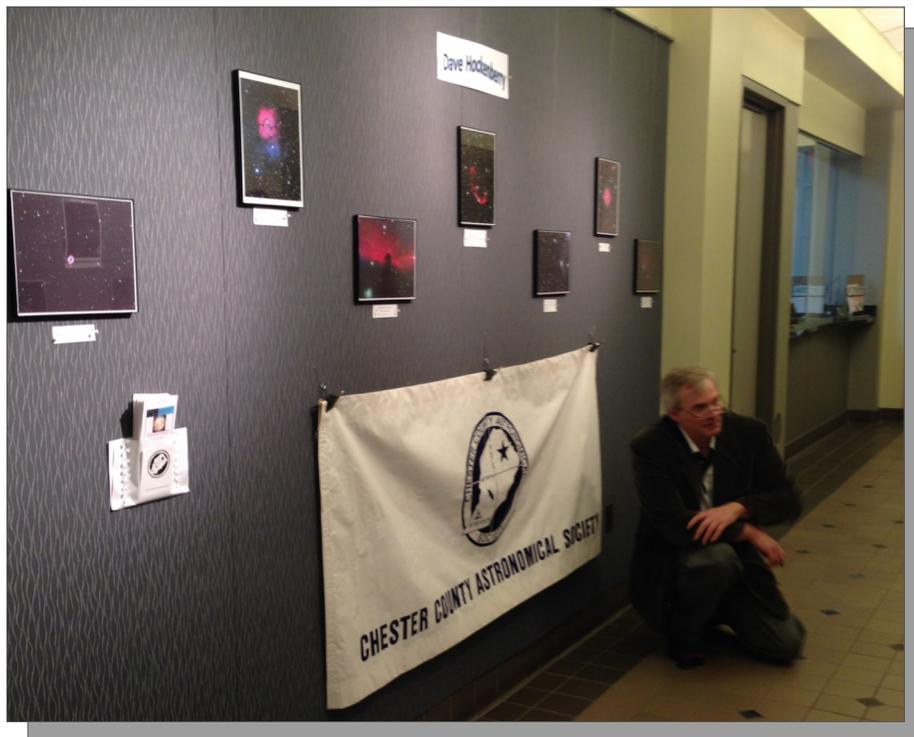
Submitted by APOD

Does spiral galaxy NGC 2683 have a bar across its center? Being so nearly like our own [barred Milky Way Galaxy](#), one might guess it has. Being so nearly edge-on, however, it is hard to tell. Either way, this gorgeous island universe, cataloged as [NGC 2683](#), lies a mere 20 million light-years distant in the northern constellation of the Cat ([Lynx](#)).

NGC 2683 is seen nearly edge-on in this cosmic vista combining data and images from the ground-based [Subaru telescope](#) and the space-based [Hubble Space Telescope](#). More distant galaxies are seen scattered in the background. Blended light from a large population of old yellowish stars forms the remarkably bright galactic core. Starlight silhouettes the dust lanes along winding spiral arms, dotted with the telltale blue glow of young star clusters in this galaxy's star forming regions.

CCAS Astrophotography Display at West Goshen Township Building

by Kathy Buczynski, CCAS Education Chair



CCAS member Dave Hockenberry poses with his photo display.

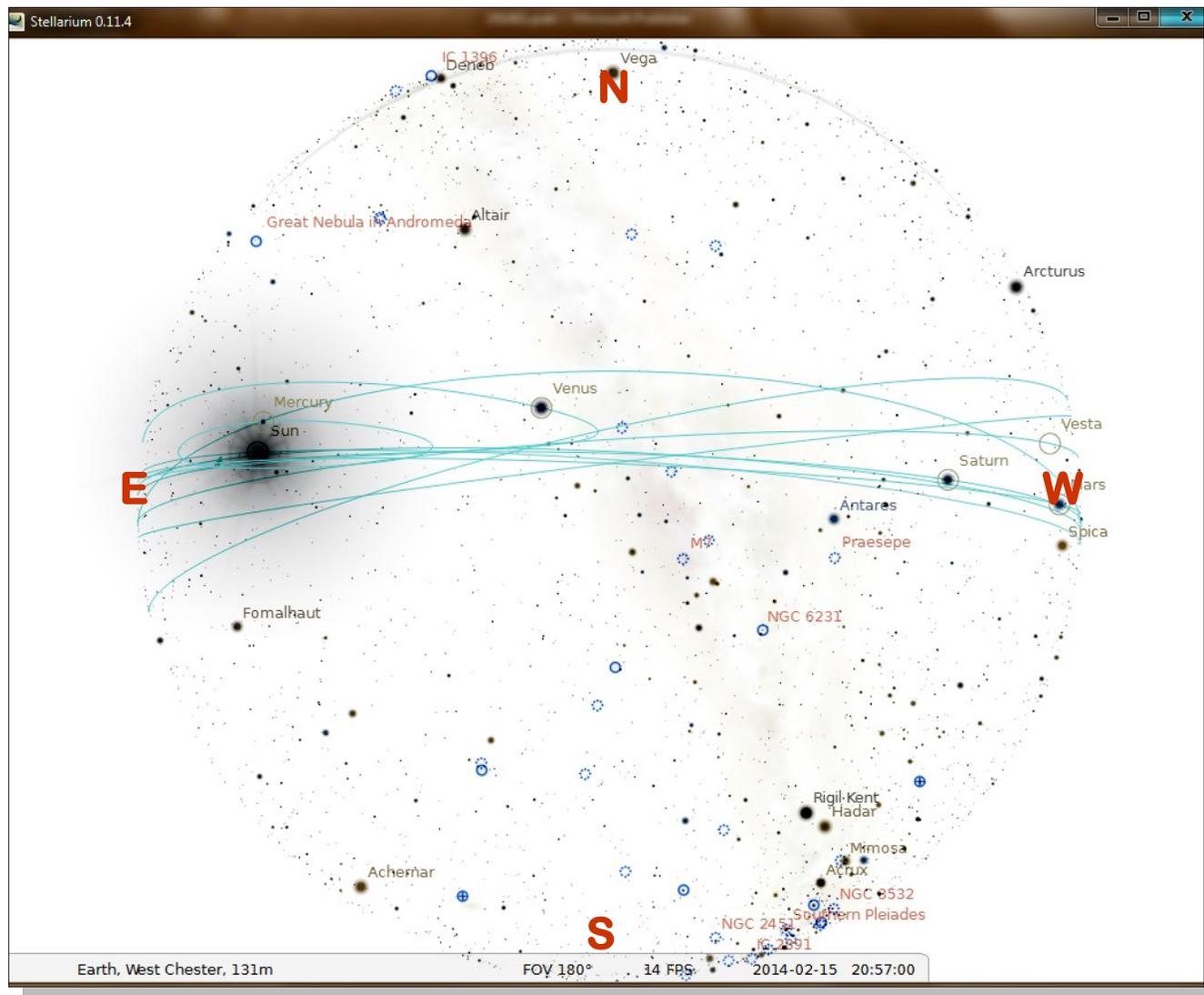
During the months of November and December, 2013, the West Goshen Township administration hosted a local photography/art exhibit. The Chester County Astronomical Society was invited to participate in the event. CCAS members Dave Hockenberry, Pete LaFrance, Don Knabb, and Kathy Buczynski displayed their fine work as part of the show.

On November 18, 2013, the township administration held an open reception from 7:00 to 8:00 PM for the public to discuss the photographs and the night sky.

The Sky Over Chester County

February 15, 2014 at 9:00 p.m. ET

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



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
02/01/2014	6:40 a.m. EST	7:09 a.m. EST	5:20 p.m. EDT	5:49 p.m. EST	10h 10m 52s
02/15/2014	6:26 a.m. EST	6:53 a.m. EST	5:37 p.m. EDT	6:04 p.m. EST	10h 43m 09s
02/28/2014	6:08 a.m. EST	6:35 a.m. EST	5:51 p.m. EDT	6:19 p.m. EST	11h 15m 57s

Moon Phases

New Moon	01/30/2014	4:39 p.m. EST	Full Moon	02/14/2014	6:53 p.m. EST
First Quarter	02/06/2014	2:22 p.m. EST	Last Quarter	02/22/2014	12:16 p.m. EST

February 2014 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

1	Mercury is below the thin crescent Moon
6	First-quarter Moon
6	The Lunar X is visible around 11:50 p.m.
7	The Lunar Straight Wall is visible
10	Jupiter is near the Moon
14	Full Moon
22	Last Quarter Moon
22	The zodiacal light is visible for the next two weeks

The best sights this month: Jupiter shines like a beacon in the southeast just after darkness falls. If it is not too cold, it is definitely worth setting up a telescope to zoom in and look for some details in the bands of clouds on the surface of Jupiter. And although the nights are cold, sunset is early, so we can dress warmly and go outside with a pair of binoculars to enjoy the many Messier objects in the winter sky.

Mercury: The first few days of February are excellent for viewing the planet closest to the Sun. On February 1st you can find Mercury about 45 minutes after sunset by finding the thin crescent Moon and looking directly below it. You will find Mercury a bit more than half way to the horizon.

Venus: Venus is now the “morning star”, rising about 2 hours before the Sun in the eastern sky.

Mars: The red planet rises around 11:00 p.m. at the beginning of February and brightens considerably by the end of the month. The best viewing of Mars is an hour or two before dawn when it is highest in the sky.

Jupiter: Jupiter was at opposition in early January and it continues to be visible all night. The king of the planets is in excellent viewing position around 9 p.m.

Saturn: Saturn rises around 1:30 a.m. at the beginning of the month and is highest in the sky just before dawn.

Uranus and Neptune: Although one might be able to find Uranus at the end of evening twilight, both the outer gas giants are very low in the sky. Neptune goes behind the Sun on February 23rd, so we cannot see this distant planet during February.

The Moon: Full moon is on February 14th. According to Native Americans this is the Full Snow Moon since the heaviest snow usually falls during this month. Some tribes also referred to this Moon as the Full Hunger Moon, since harsh weather conditions in their areas made hunting very difficult.

Constellations: During February, if it is warm enough, I enjoy staring for a long time toward the south to enjoy the constellations with bright stars. This includes Taurus with Aldebaran, Orion with Betelgeuse and Rigel, Canis Major with Sirius and Canis Minor with Procyon. Betelgeuse, Sirius and Procyon make up the Winter Triangle.

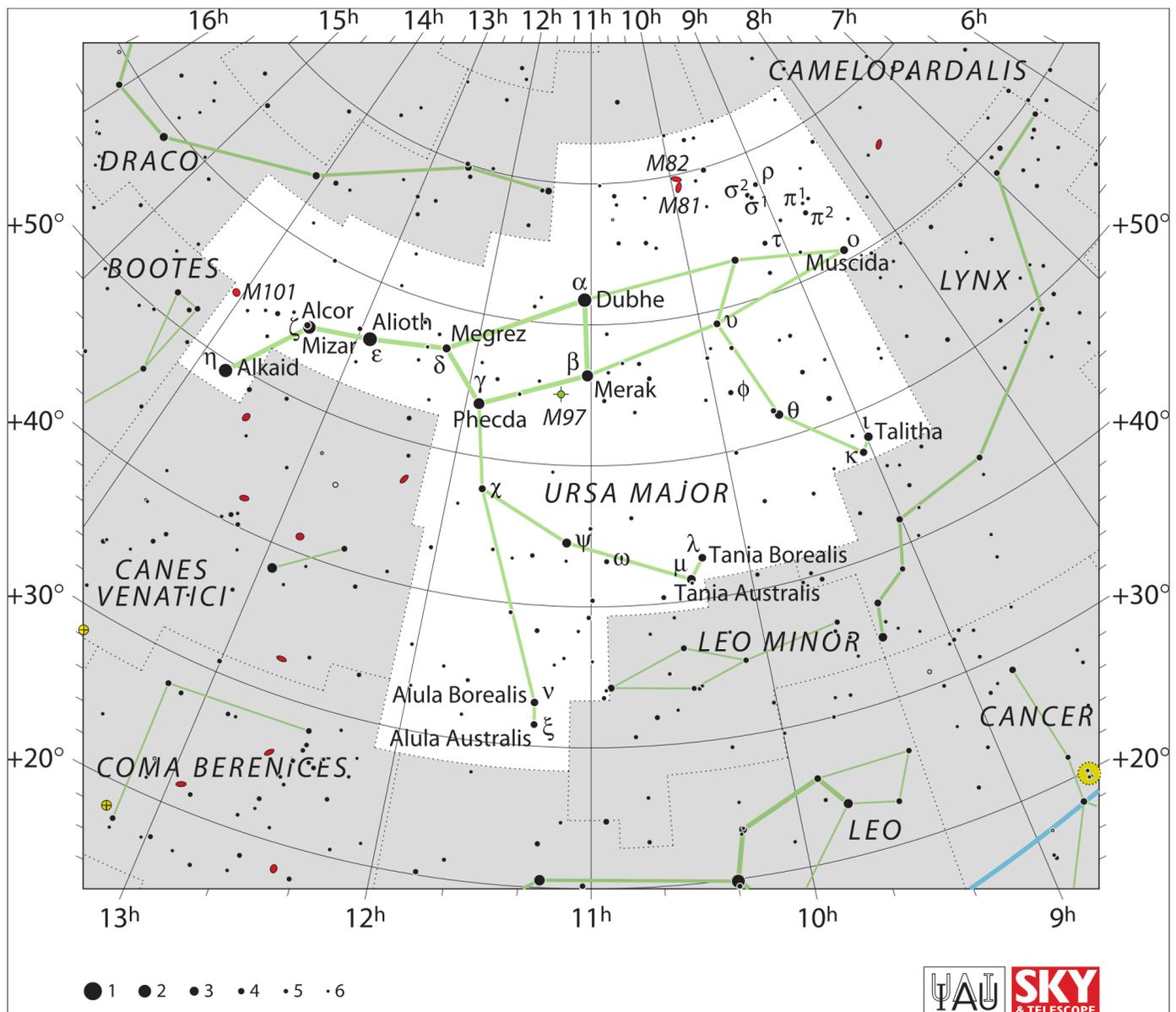
Messier/deep sky: Studying deep sky objects during the chill nights of February can be a challenge. But, there are many wonderful deep sky sights in these cold winter skies. Carry your summer lounge chair outside, lay a blanket on it and wrap yourself in a sleeping bag. Dress REAL warmly, grab your binoculars and just stare at the beautiful Pleiades. The star clusters in Auriga are almost directly overhead, well positioned for viewing through the minimum amount of atmosphere. M41, an open cluster of stars, is just below Sirius. Then look to the east and find the Beehive in Cancer before you freeze!

Comets: There are no bright comets in the sky during February.

Meteor showers: There are no major meteor showers during February.

Through the Eyepiece: M109, the Vacuum Cleaner Galaxy

by Don Knabb, CCAS Treasurer & Observing Chair



Sky map credit: http://en.wikipedia.org/wiki/File:Ursa_Major_IAU.svg

During the deep winter, I am always encouraged by the sight of Leo the Lion jumping out of the eastern horizon late in the evening. But to see Leo clearly one must stay up quite late and it is so cold during February. What Leo means to me is that galaxy time is approaching, and with it warmer weather.

But we don't need to wait until

April to see galaxies. One that is easily found and observed during February is M109, also called the Vacuum Cleaner Galaxy. Why is it called the Vacuum Cleaner Galaxy? This name was proposed by Devon J. Moore, who writes: "The name I've suggested was the Vacuum Cleaner Galaxy for a few reasons. The first being a cyclonic looking galaxy, so I named it after a cyclonic vacuum

cleaner. The second is... well... I like vacuum cleaners... go figure)."

M109, also known as NGC 3992, is found just below the Big Dipper's bowl in the northern constellation Ursa Major, the Great Bear. Although it is not shown on the sky map of

(Continued on page 7)

Eyepiece (Cont'd)



Image copyright ©2003-2013 by Robert Franke <http://bf-astro.com/> This image appeared as the Astronomy Picture of the Day on May 23, 2013.

(Continued from page 6)

Ursa Major, it is just to the left of the star named Phecda, the bottom-rear star of the Big Dipper. In the sky, M109 will be just below Phecda because the Dipper is pointing straight up during February.

But just because it is easy to find doesn't mean it is easy to see! Although it is considered rather large, the outer spiral arms are quite faint and only the bright central bar and nucleus region show well to smaller telescopes. Messier 109 will require dark, clear skies and at least mid-sized

aperture to begin seeing details. In telescopic views, its striking central bar gives the galaxy the appearance of the Greek letter "theta", θ , a common mathematical symbol representing an angle. M109 is the brightest galaxy in the M109 Group, a large group of galaxies that may contain over 50 galaxies. In the image, M109 is joined by three foreground stars. The three small, fuzzy bluish galaxies also on the scene, identified left to right as UGC 6969, UGC 6940 and UGC 6923, are satellite galaxies of the larger M109.

Messier 109 was discovered by Pierre Méchain in 1781. In 1783 Charles Messier catalogued it as his 109th object. William Herschel found this galaxy independently on April 12, 1789, and cataloged it as H IV.61. He incorrectly misclassified it as a planetary nebula. He writes: "Considerably bright. Irregularly formed. Extended meridionally [along the Meridian, i.e. North-South]. Little brighter Nucleus. With faint branches 7 or 8' long, and 5 or 6' broad." His son John would also go on to

(Continued on page 11)

Recent Additions to the CCAS Lending Library

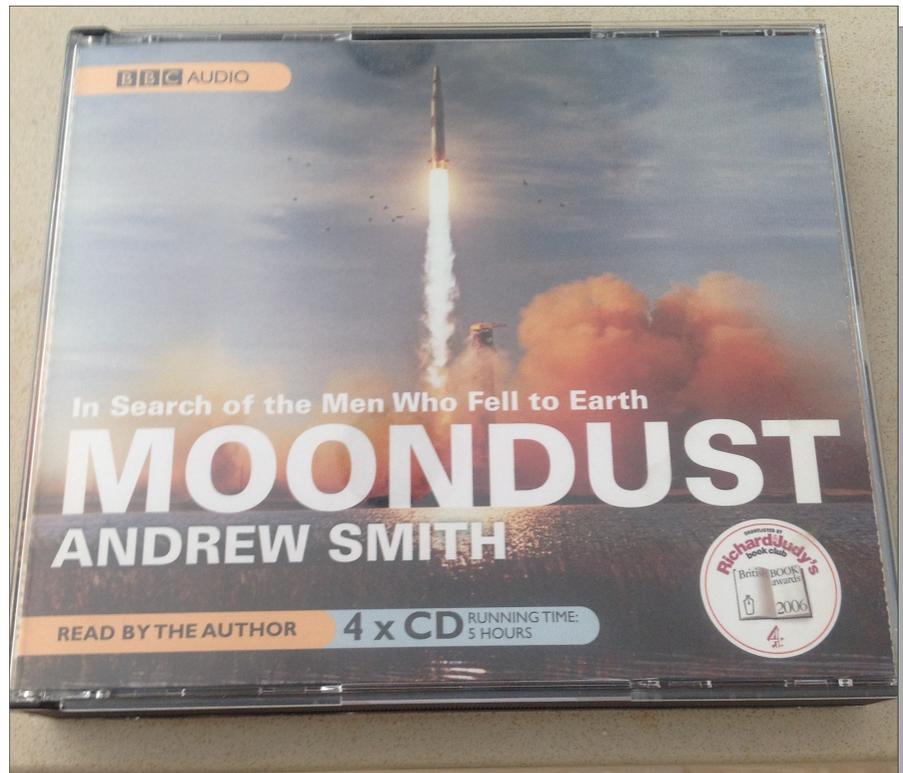
by Barb Knabb, CCAS Librarian

Thanks to the generosity of several members of the CCAS, we have two nice additions to the CCAS lending library.

Moondust: In Search of the Men Who Fell to Earth, by Andrew Smith. Liz Smith donated this set of 4 audio CDs to the CCAS many months ago. This audio book is read by the author. Written in 2005, Andrew Smith realized that of the astronauts who walked on the Moon, only nine were still alive. One day there will be none. So he set out to find and interview the remaining moonwalkers to find out how the experience changed them.

Don and I listened to quite a bit, but not this entire book during a long drive. We enjoyed it immensely and recommend it to anyone who would like to enhance their understanding of the Apollo project.

In addition to this audio book the lending library DVD collection has grown dramatically. Ann Miller and Dave Hockenberry have donated a series that was collected and distributed by Astronomy Magazine called *The Infinite Cosmos Series*. This is large collection (46 DVDs!) that was originally produced by The History Channel as their Universe series, or by the A&E network or as PBS NOVA presentations. We have previewed several and they are very well produced.



New Audio CD Addition to the CCAS Lending Library

The range of topics is amazing! There is a base set of disks and 7 subsets. Some of the titles sound like science fiction movies! But then, reality is often stranger than fiction.

The base set includes the following titles:

- * When Space Changed History
- * Mars the Red Planet
- * Saturn: Lord of the Rings
- * Finding Life Beyond Earth
- * The Search for Cosmic Clusters
- * Biggest Blasts
- * Secrets of the Sun
- * Life and Death of a Star
- * Liquid Universe
- * Microscopic Universe

The GALAXIES REVEALED edition includes:

- * Milky Way
- * Monster of the Milky Way
- * Parallel Universes
- * Einstein's Dream
- * Runaway Universe
- * Eclipse of the Century
- * Cosmic Holes
- * Welcome to the 11th Dimension
- * Time Travel
- * Strangest Things

The PLANETS AND MOON edition includes:

- * Mars: The New Evidence
- * Hunt for Ringed Planets
- * The Day the Moon was Gone
- * UFOs – the Real Deal
- * Alien Moons

(Continued on page 9)

CCAS Library (cont'd)



New Video DVD Additions to the CCAS Lending Library

(Continued from page 8)

- * Alien Planets
- * Mysteries of the Moon
- * Jupiter the Giant Planet

The COSMIC DANGERS edition includes:

- * Nemesis: The Sun's Evil Twin
- * Magnetic Storm
- * Worst Days on Planet Earth
- * Death Stars
- * It Fell From Space
- * Deadly Comets and Meteors
- * Cosmic Collisions

The SPECIAL EDITION set includes:

- * Ride the Comet

- * Extreme Energy
- * The Journey to Palomar
- * Asteroid Attack

The SPACE MISSIONS edition includes:

- * Columbia: Space Shuttle Disaster
- * Phoenix Mars Mission: Ashes to Ice
- * Exploring Space: The Quest for Life

The BEST OF THE COSMOS edition includes:

- * Dark Future of the Sun
- * Crash Landing on Mars
- * Seven Wonders of the Solar System

The DISCOVER THE UNIVERSE edition includes:

- * How Big, How Far, How Fast

If you would like to borrow the Moondust audio book or any of the Infinite Cosmos DVDs, please send an e-mail to librarian@ccas.us to make arrangements to pick up any of the items. I can also bring them to a club meeting or observing event.

Surprising Young Stars in the Oldest Places in the Universe

by Dr. Ethan Siegel

Littered among the stars in our night sky are the famed deep-sky objects. These range from extended spiral and elliptical galaxies millions or even *billions* of light years away to the star clusters, nebulae, and stellar remnants strewn throughout our own galaxy. But there's an intermediate class of objects, too: the *globular star clusters*, self-contained clusters of stars found in spherically-distributed halos around each galaxy.

Back before there were any stars or galaxies in the universe, it was an expanding, cooling sea of matter and radiation containing regions where the matter was slightly more dense in some places than others. While gravity worked to pull more and more matter into these places, the pressure from radiation pushed back, preventing the gravitational collapse of gas clouds below a certain mass. In the young universe, this meant no clouds smaller than around a few hundred thousand times the mass of our Sun could collapse. This coincides with a globular cluster's typical mass, and their stars are some of the oldest in the universe!

These compact, spherical collections of stars are all less than 100 light-years in radius, but typically have around 100,000 stars inside them, making them nearly 100 times denser than our neighborhood of the Milky Way! The vast majority of globular clusters have extremely few heavy elements (heavier than



helium), as little as 1% of what we find in our Sun. There's a good reason for this: our Sun is only 4.5 billion years old and has seen many generations of stars live-and-die, while globular clusters (and the stars inside of them) are often *over 13 billion years*

old, or more than 90% the age of the universe! When you look inside one of these cosmic collections, you're looking at some of the oldest stellar swarms in the known universe.

Yet when you look at a high-resolution image of these relics from the early universe, you'll find a sprinkling of hot, massive, apparently *young* blue stars! Is there a stellar fountain of youth inside? Kind of! These massive stellar swarms are so dense -- especially towards the

(Continued on page 11)



Globular Cluster NGC 6397. Credit: ESA & Francesco Ferraro (Bologna Astronomical Observatory) / NASA, Hubble Space Telescope, WFPC2.

Space Place (cont'd)

(Continued from page 10)

center -- that mergers, mass siphoning and collisions between stars are quite common. When two long-lived, low-mass stars interact in these ways, they produce a hotter, bluer star that will be *much* shorter lived, known as a *blue straggler star*. First discovered by Allan Sandage in 1953, these young-looking stars arise thanks to stellar cannibalism. So enjoy the brightest and bluest stars in these globular clusters, found right alongside the oldest known stars in the universe!

Learn about a recent globular cluster discovery here: <http://www.nasa.gov/press/2013/september/hubble-uncovers-largest-known-group-of-star-clusters-clues-to-dark-matter>.

Kids can learn more about how stars work by listening to The Space Place's own Dr. Marc: <http://spaceplace.nasa.gov/podcasts/en/#stars>.

Observing (Cont'd)

(Continued from page 7)

add it to his catalog on February 17, 1831 when he writes: "Bright; Large; very suddenly brighter to the Middle; round; 3' diameter. Fine object."

Between the 1920s through the 1950s, it was considered that Messier objects over 103 were not official, but in later years the additions became more widely accepted. David H. Levy mentions the modern 110 object catalog while Sir Patrick Moore gave the original to 104 but has M105-M109 listed as an addendum. By the late 1970s all 110 objects are commonly used among astronomers as they still are today.

It is also by far the most distant object in the Messier Catalog, followed by M91.

So there is no need to wait for "galaxy season" to seek out these distant "island universes". With the Big Dipper as your guide M109 is an excellent target as a preview of the many galaxies to see later in spring.

Information credits:

Pasachoff, Jay M. 2000. A Field Guide to the Stars and Planets. New York, NY. Houghton Mifflin.

Dickinson, Terence 2006.

Nightwatch: a practical guide to viewing the universe. Buffalo, NY. Firefly Books

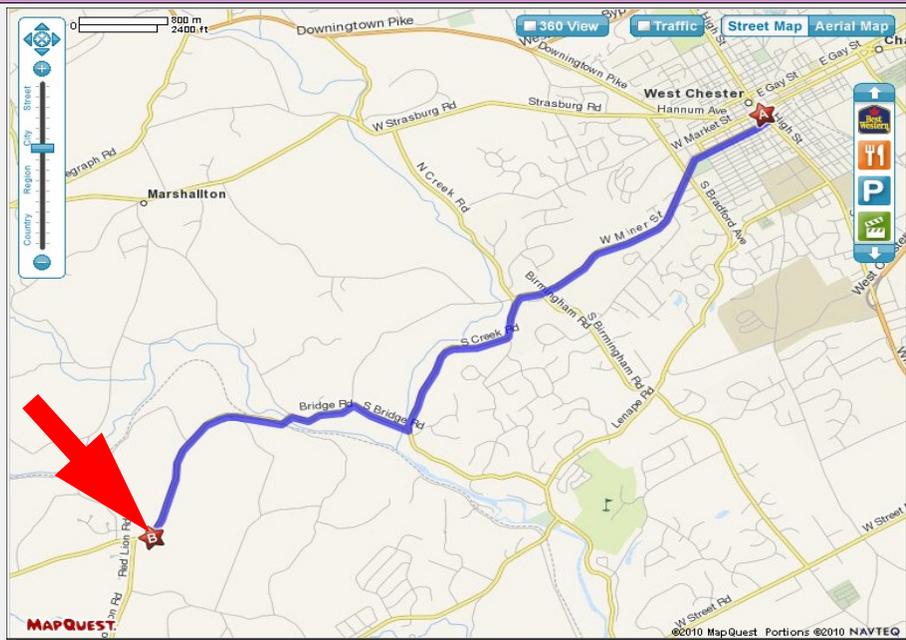
<http://apod.nasa.gov/apod/ap130523.html>

http://en.wikipedia.org/wiki/Messier_109

<http://www.universetoday.com/50202/messier-109/>

<http://messier.seds.org/m/m109.html>

CCAS Directions



Brandywine Valley Association

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

<http://brandywinewatershed.org/>

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

Brandywine Valley Association

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

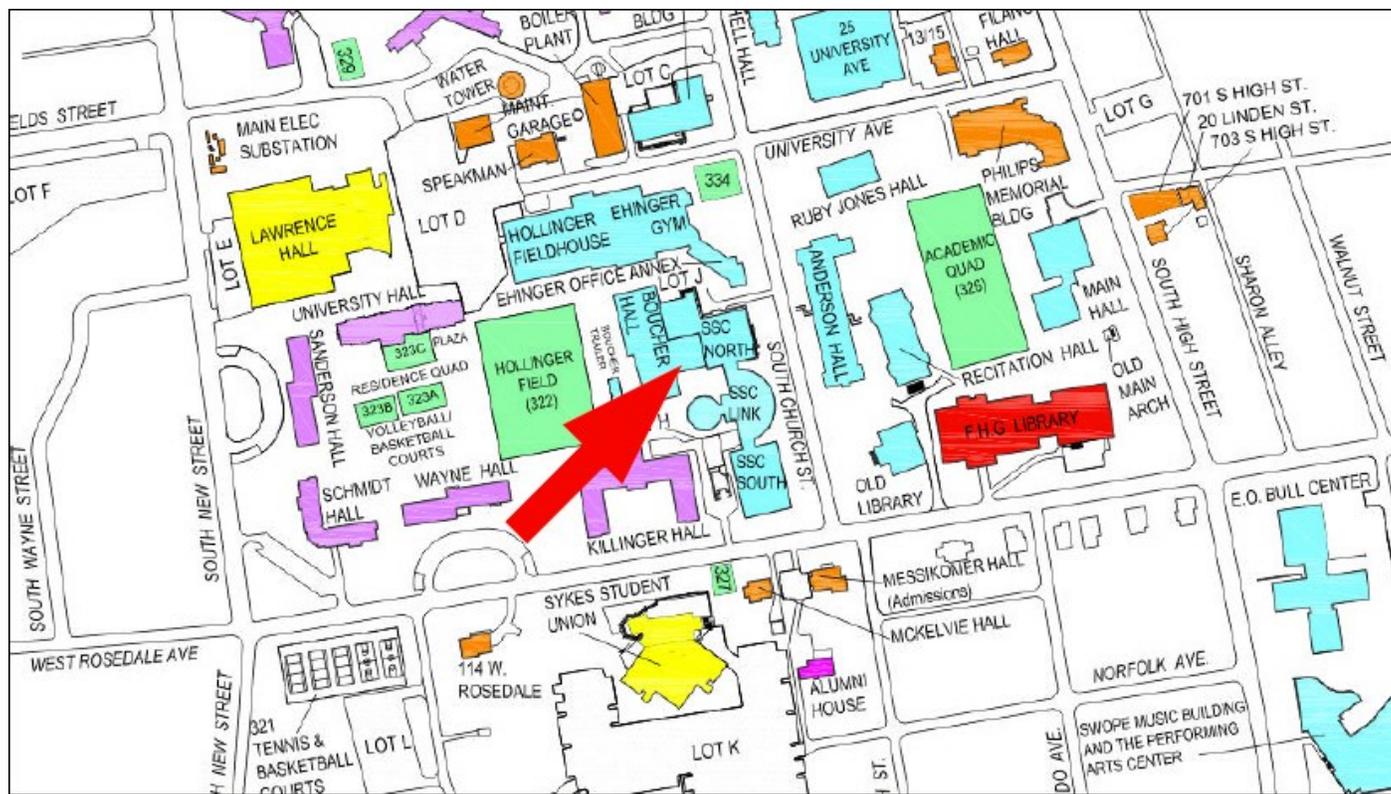
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn left off Route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

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

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 112 in Merion Science Center (formerly the Boucher Building), attached to the Schmucker Science Center. The Schmucker Science Center is located at the corner of S. Church St & W. Rosedale Ave. Parking is generally available across Rosedale in the Sykes Student Union parking lot (Lot K).



CCAS Winter Party

Barb and Don Knabb have graciously offered once again to host our end-of-year holiday party. Members and their families are invited to their home on February 8, 2014, at 6 p.m. The address is 988 Meadowview Lane and their phone number is 610-436-5702. A Google Maps search will provide good directions to their house. Their home is at the end of a cul-de-sac and 988 is on the mailbox. They have a long driveway and the house has the garage facing the street.

Please RSVP to dknabb00@comcast.net so they know how much food to plan. They will have sandwiches and snacks and beer and wine.

CCAS Membership Information and Society Financials

Treasurer's Report by Don Knabb

Jan. 2014 Financial Summary

Beginning Balance	\$1,831
Deposits	\$140
Disbursements	<u>\$0</u>
Ending Balance	\$1,971

New Member Welcome!

Welcome new CCAS members Charles McElwee of West Chester, PA. We're glad you decided to join us under the stars! Clear skies to you!

Membership Renewals

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

Don Knabb
988 Meadowview Lane
West Chester PA 19382

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

Join the Fight for Dark Skies!

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

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

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

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

<http://www.darksky.org>

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

Dark-Sky Website for PA

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

<http://www.POLCouncil.org>

Find out about Lyme Disease!

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

<http://www.LymePA.org>

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

CCAS Event Information

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

Good Outdoor Lighting Websites

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



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

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

<http://www.starrynightlights.com>



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

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

Phone: 512-944-7354

<http://www.greeneearthlighting.com>

Local Astronomy-Related Stores

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



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

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

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

<http://www.skiesunlimited.net>



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CCAS Information Directory

CCAS Lending Telescopes

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

CCAS Lending Library

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

Contributing to *Observations*

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

Or mail the contribution, typed or handwritten, to:

John Hepler
2115 Lazor St.
Apt. 227
Indiana, PA 15701

CCAS Newsletters via E-mail

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

CCAS Website

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

John welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work; no copyrighted material! Give your contributions to John Hepler at (724) 801-8789 or e-mail to webmaster@ccas.us

CCAS Purpose

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

CCAS Executive Committee

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

President:	Roger Taylor 610-430-7768
Vice President:	Liz Smith 610-842-1719
ALCor, Observing, and Treasurer:	Don Knabb 610-436-5702
Secretary:	Ann Miller 610-558-4248
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 724-349-5981
Public Relations:	Deb Goldader 610-304-5303



CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

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

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178
Phone: 610-436-5702
e-mail: treasurer@ccas.us

Sky & Telescope Magazine Group Rates

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

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

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 Don first at 610-436-5702.

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 Don Knabb**.