



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 25, No. 9 **Three-Time** Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016 September 2017

In This Issue

CCAS Summer/Fall Events.....	2
Cassini's Grand Finale	
Approaches	2
September Meeting Agenda	2
What We Saw on August 21st	3
The Sky Over Chester County:	
September 2017	4
September 2017 Observing	
Highlights	5
CCAS Members Chase	
the Eclipse	6
<i>The Week's</i> Editorial	6
The Complex Dance.....	7
Through the Eyepiece:	
31, the Andromeda Galaxy	8
CCAS Directions:	
Brandywine Red Clay	
Alliance	9
Membership Renewals	10
New Member Welcome	10
CCAS Directions:	
WCU Map	10
Treasurer's Report.....	10
CCAS Information	
Directory.....	11-12

American Eclipse!



"Diamond Ring" phase of the solar eclipse taken on August 21, 2017, in St. Claire, Missouri by CCAS Member Pete LaFrance. See pages 3 and center pages 6 & 7 for more about our members' experiences traveling to parts of the country in the eclipse path. Or just staying "at home" but experiencing the eclipse at work.

Membership Renewals Due

09/2017	Armored Lurcott, E. Proko
10/2017	Conrad Johanson Lane Lester Rosenblatt Skelton Zandler
11/2017	Buczynski Cavanaugh Holenstein Luttrell & Pollard Taylor

September 2017 Dates

- 5th • Neptune is at opposition
- 6th • Full Moon, the Full Corn Moon or the Moose Calling Moon, 3:02 a.m. EDT
- 13th • Last Quarter Moon, 2:24 a.m. EDT
- 22nd • Fall Equinox, 4:01 p.m. EDT
- 21st • New Moon, 1:29 a.m. EDT
- 27th • First Quarter Moon, 10:53 p.m. EDT
- 28th • The Lunar Straight Wall (Rupes Recta) is visible



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, September 9, 2017** - Anson Nixon Park Star Party, 7:30-9:00 pm.
- ☼ **Saturday, September 23, 2017** - Nottingham Park Star Party, 7:30-9:30 p.m. — Registration required!
- ☼ **Wednesday, September 27, 2017** - Dalesford Crossing Star Party, 7:00-8:30 p.m.
- ☼ **Saturday, October 7, 2017** - Hoopes Park Star Party, 7:00-8:30 p.m.
- ☼ **Saturday, October 21, 2017** - Willistown Run-a-Muck, 6:00-8:00 p.m.

Summer/Autumn 2017 Society Events

September 2017

6th • 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.

9th • CCAS Special Observing Session at Anson Nixon Park, Kennett Square, PA. This event is scheduled from 7:30 p.m. to 9:00 p.m.

12th • CCAS Monthly Meeting starting at 7:30 p.m. in Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker: Gordon Richards, Ph.D., from Drexel University, will present "The LSST and Upcoming Discoveries."

15th-17th • CCAS Camping Trip to BMVO.

21st-22nd • The von Kármán Lecture Series: [A Volcanologist's Paradise](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

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

22nd • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

23rd • CCAS Special Observing Session, at Nottingham County Park, Nottingham, PA. The observing session is scheduled from 7:30 PM to 9:30 PM.

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

October 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.

10th • CCAS Monthly Meeting starting at 7:30 p.m. in Room 113, Merion Science Center (former Boucher Building), West Chester University. CCAS Member Speaker: John Conrad, NASA Solar System Ambassador.

19th-20th • The von Kármán Lecture Series: [Sink or Swim? Using Radar to Protect California's Water Supply](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

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

21st • CCAS Special Observing Session, [Willistown Conservation Trust Run-a-Muck](#). The observing session is scheduled for 6:30 – 8:00 p.m. The event is open only to registered participants.

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

Cassini's Grand Finale Approaches by NASA/Jet Propulsion Laboratory

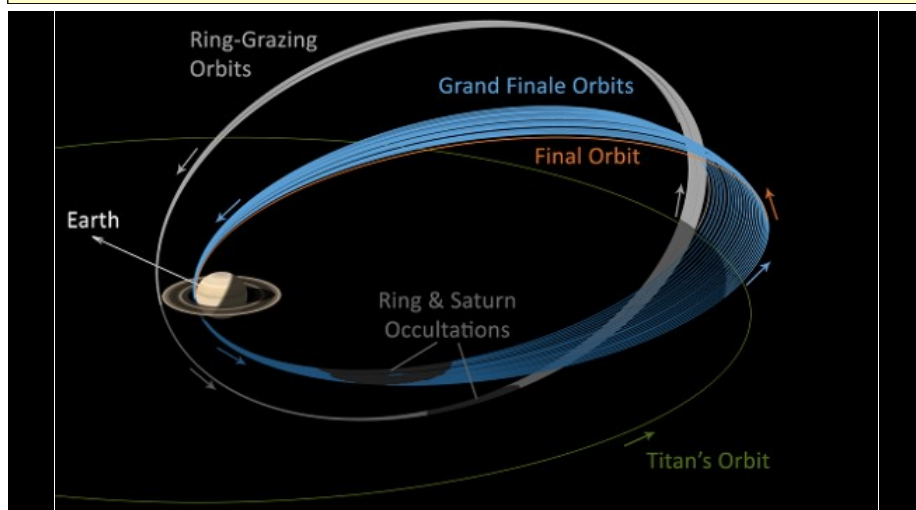


Image courtesy NASA/JPL

Since April 2017, NASA's Cassini spacecraft has been writing the final, thrilling chapter of its remarkable 20-year-long story of exploration: its Grand Finale. Every week, Cassini has been diving through the approximately 1,200-mile-wide (2,000-kilometer-wide) gap between Saturn and its rings. A final close flyby of the moon Titan on April 22 used the moon's gravity to reshape Cassini's trajectory so that the spacecraft leapt over the planet's icy rings to pass between the rings and Saturn. During 22 such passes over about five months, the spacecraft's altitude above Saturn's clouds varied from about 1,000 to 2,500 miles, thanks to occasional distant

passes by Titan that shifted the closest approach distance. At times, Cassini skirted the very inner edge of the rings; at other times, it skimmed the outer edges of the atmosphere. During its final five orbits, starting with orbit 288, its orbit passed through Saturn's uppermost atmosphere. On September 9, 2017, Cassini will look back at Earth as it passes behind the rings. The spacecraft will finally plunge directly into the planet on Sept. 15th. Estimated loss of communication will occur just before 8:00 a.m. EDT. For more details, visit <https://saturn.jpl.nasa.gov/mission/grand-finale/grand-finale-orbit-guide/>

September 2017 CCAS Meeting Agenda by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on September 12, 2017, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Our guest speaker is Gordon Richards, Ph.D., from Drexel University, who will present "The LSST and Upcoming Discoveries."

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 Fall 2017 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

What We Saw on August 21, 2017

Images courtesy John Hepler, Don Knabb, & Pete LaFrance

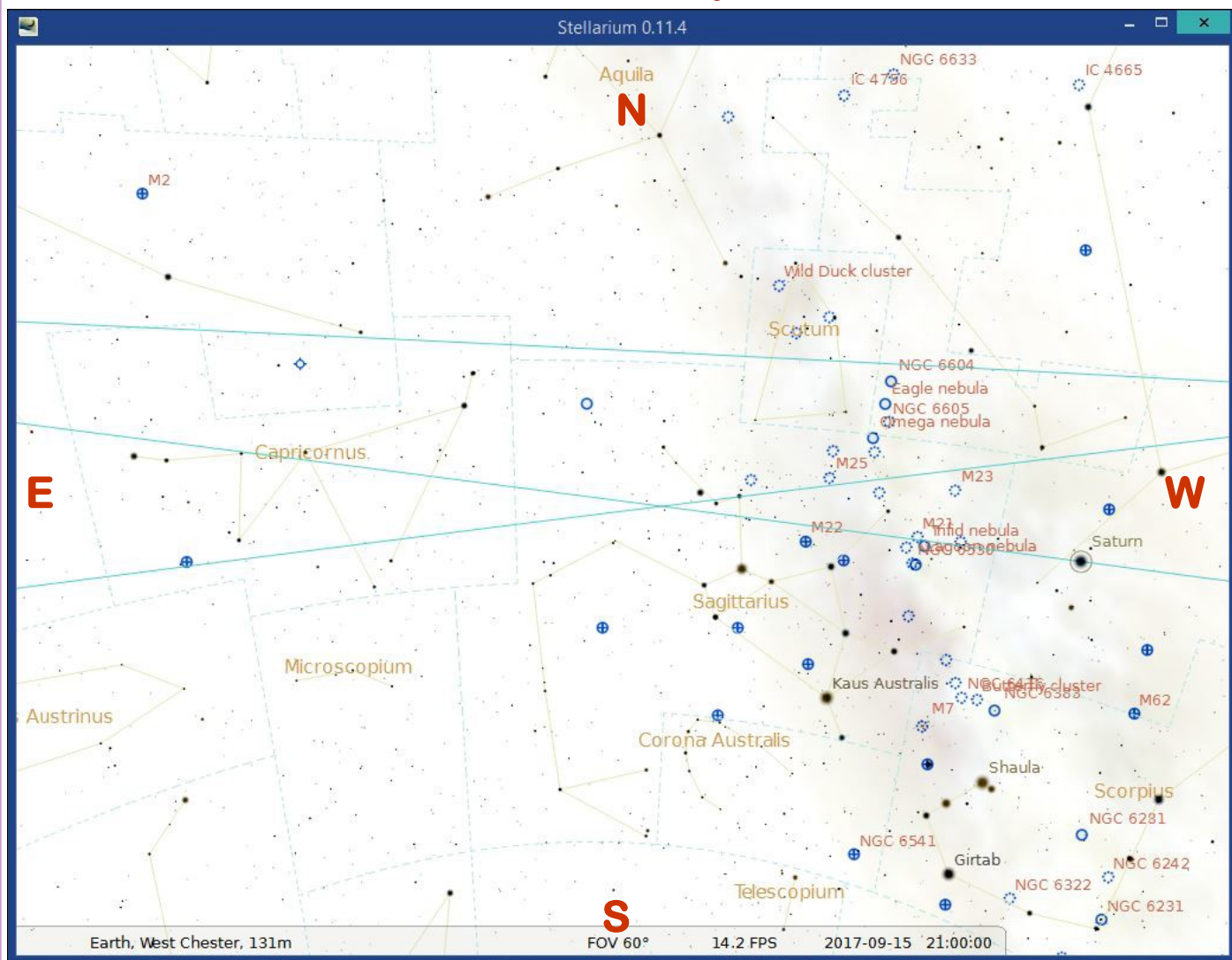


Images Left-to-Right, Top-to-Bottom: Washington College students wearing eclipse viewing glasses; best view of 79% coverage in Chestertown, Maryland; Setting up scopes in North Carolina; Pete LaFrance's montage of the eclipse in St. Claire, Missouri; Linda & Roger Taylor in the Great Smokey Mountains Park, North Carolina; Washington College students viewing the eclipse the "old school" method; Roger Taylor and park officers.

The Sky Over Chester County

September 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
9/01/2017	6:00 a.m. EDT	6:28 a.m. EDT	7:31 p.m. EDT	7:59 p.m. EDT	13h 02m 54s
9/15/2017	6:14 a.m. EDT	6:41 a.m. EDT	7:08 p.m. EDT	7:35 p.m. EDT	12h 27m 01s
9/30/2017	6:29 a.m. EDT	6:56 a.m. EDT	6:44 p.m. EDT	7:11 p.m. EDT	11h 47m 58s
Moon Phases					
Last Quarter	9/13/2017	2:24 a.m. EDT	Full Moon	9/06/2017	3:02 a.m. EDT
First Quarter	9/27/2017	10:53 p.m. EDT	New Moon	9/20/2017	1:29 a.m. EDT

September 2017 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

5	Neptune is at opposition
6	Full Moon, the Full Corn Moon or the Moose Calling Moon, 3:02 a.m.
13	Last Quarter Moon, 2:24 a.m.
20	New Moon, 1:29 a.m.
22	Fall equinox, 4:01 p.m.
26	The Moon is near Saturn
27	First Quarter Moon, 10:53 p.m.
28	The Lunar Straight Wall (Rupes Recta) is visible

The best sights this month: September is a quiet month for special events in the evening sky. There are a few nice pairings in the predawn sky, but nothing truly dramatic to justify lost sleep. Saturn continues to amaze us and anyone who sees it in the eyepiece of a telescope. The rings are near maximum tilt and the Cassini Division will be easily visible at medium magnification levels.

Mercury: To see the planet closest to the Sun you will need to get up before dawn and look low in the east during September.

Venus: The “morning star” continues to shine brightly before daybreak, rising around 4 a.m. at the start of September. If you look just before dawn on September 1st you will find Venus only 1 degree away from M44, The Beehive Cluster.

Mars: Mars has “come around the bend” and is visible low in the predawn sky during September.

Jupiter: The king of the planets is falling into the glow of the sunset and is only 10 degrees high not long after sunset. By the end of September Jupiter will be nearly lost from view as it goes on vacation for a month or two before appearing in the pre-dawn sky.

Saturn: Saturn is the highlight of the evening sky throughout September, shining at magnitude +0.5 in the southwest as the sky darkens.

Uranus and Neptune: Neptune, in the constellation Aquarius, reaches opposition on September 5th so it is high in the sky around midnight. Uranus is in the constellation Pisces, one constellation to the east of Neptune, and rises an hour or two after Neptune. Finder charts for these distant gas giants can be found at the website of Sky and Telescope magazine.

The Moon: The Moon is full on September 6th. This Full Moon is called the Full Corn Moon. This Full Moon corresponds with the time of harvesting corn. It is also called the Barley Moon, because it is the time to harvest and thresh ripened barley. Maybe we can call this the Full Beer Moon since beer is brewed from barley. Native Canadians called this the Moose Calling Moon.

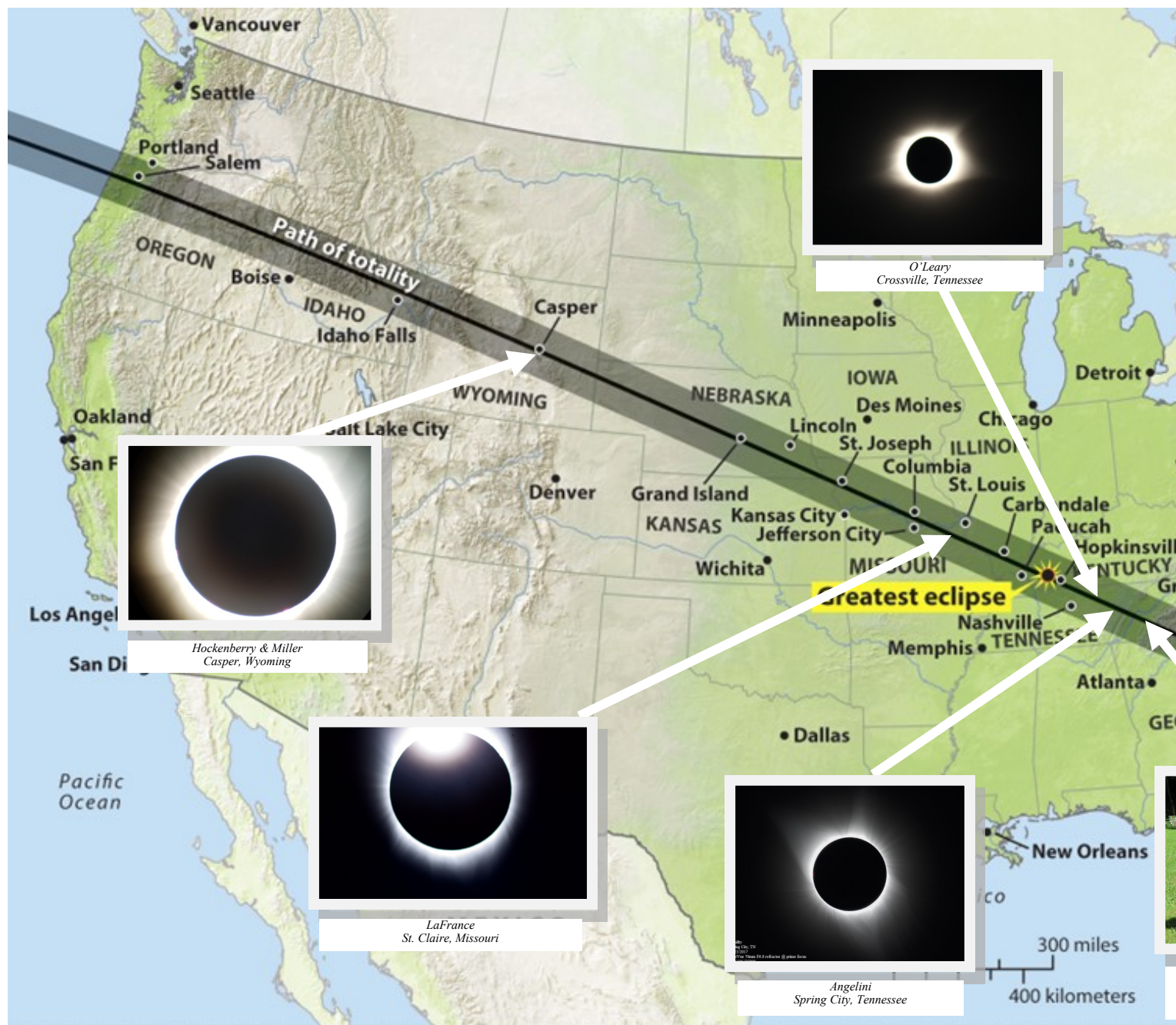
Constellations: Hercules and the Summer Triangle shine near the zenith throughout September with “the backbone of the night”, the Milky Way, arching across the sky. Stay up a bit later and the autumn constellations will rise in the east, so look for the Great Square of Pegasus, Cassiopeia and Perseus.

Messier/deep sky: We lose sight of the southern Messier objects as September moves on but the Andromeda galaxy makes up for that loss. What a sight that is – 2.5-million-year old light coming from a trillion stars! The Double Cluster in Perseus is a worthwhile target and late at night the clusters in Auriga rise out of the eastern horizon

Comets: There are no bright comets visible during September.

Meteor showers: September is a quiet month for meteors. The Aurigids peak in the early morning hours of September 1st, but calling 6 meteors per hour a peak is questionable. If you look in the predawn hours the Moon will have set, giving you the best view for “shooting stars”.

CCAS Members “Chase” the 2017 Solar Eclipse



Editor's Letter

by William Faulkner, Editor-in-Chief, *The Week*

We should all look up more often. Tens of millions of Americans pulled their heads out of their work and their cellphones this week to witness a rare total solar eclipse, which created an eerie midday twilight as it rolled 3,000 miles across the country, spooking the birds and cows and leaving vast crowds of normally crabby humans cooing and exclaiming like children. (See Talking Points.) Even for those of us who had to settle for a partial eclipse, it was thrilling—a re-

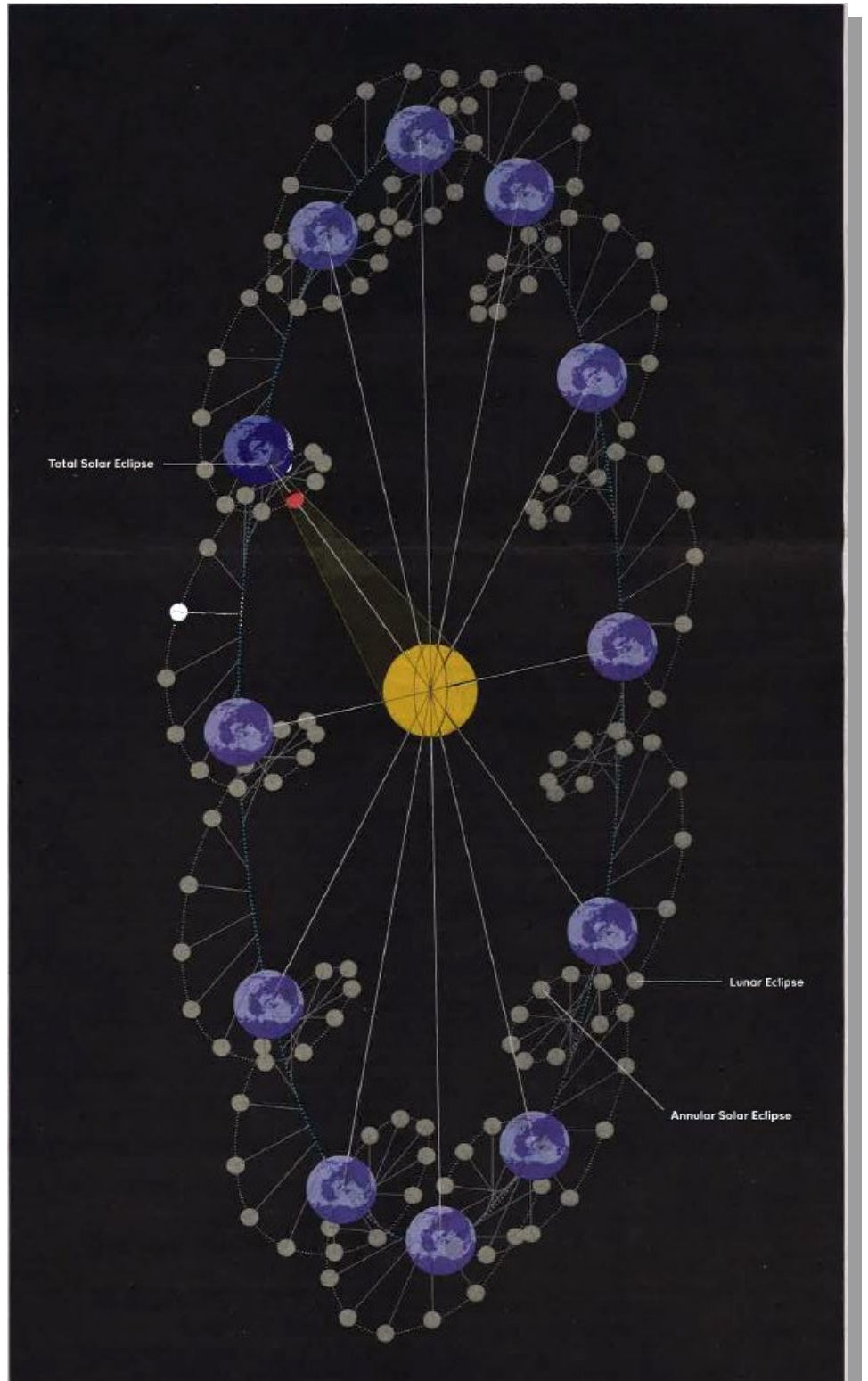
minder that we are passengers on a rock swinging through the solar system in a celestial dance choreographed by forces beyond our ken and our control. Awe is an uplifting emotion. It is good to feel small, to sense how brief and fragile our lives are in astronomical terms, to see that beyond the mundane lies a great mystery.

Like most people, I look up too infrequently. But seeing the sky always changes my mood for the

better. Look even when dawn and sunset light and starlight tinged with like windbl of depthless smolder in t (we now kn



The Complex Dance



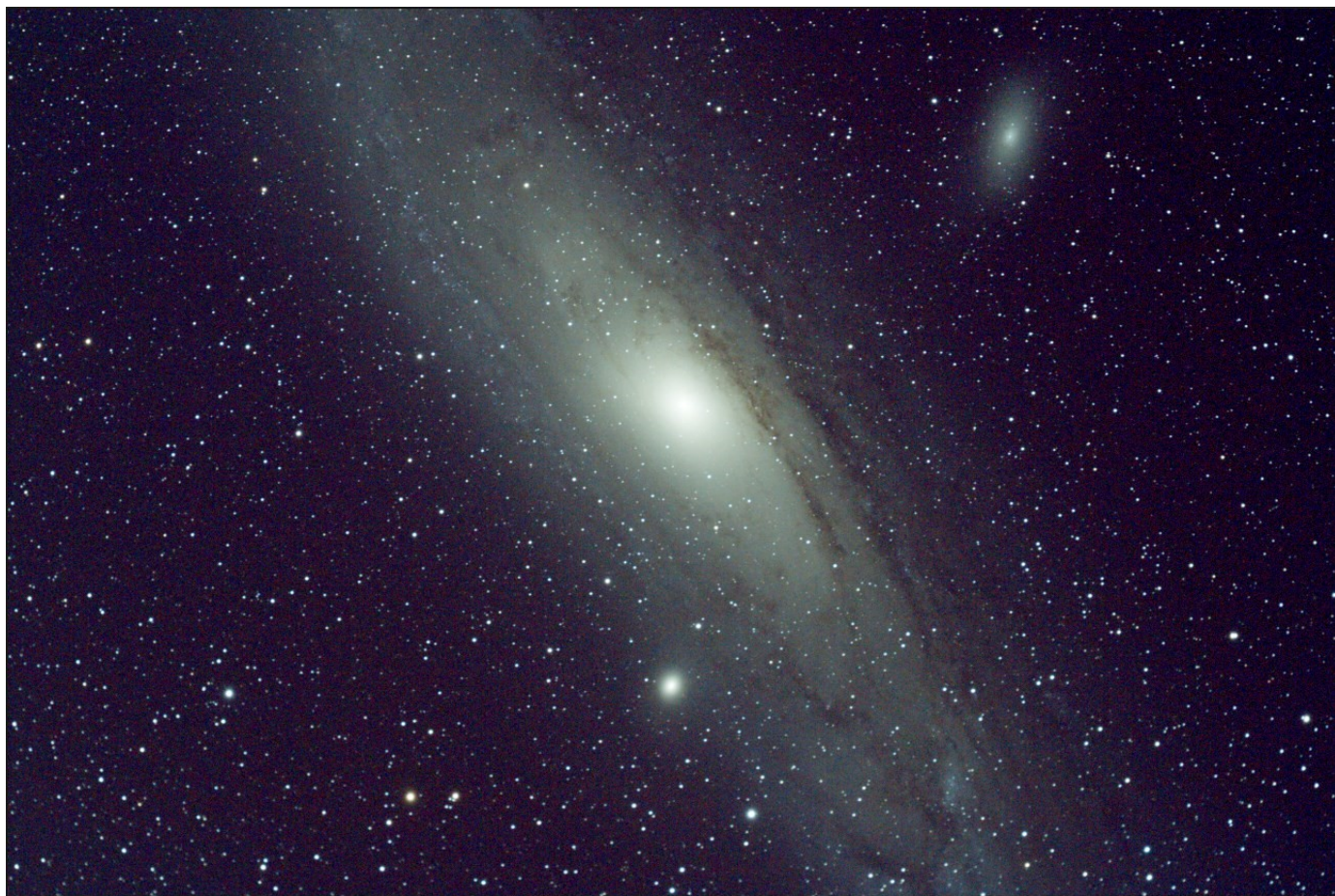
[Editor's Note:] The New York Times published a special paper-only section on the then-upcoming eclipse in the Sunday, August 6, 2017, edition of the paper. This graphic really caught my eye as it explained the complex "dance" the earth and moon do around each other as they orbit the sun. Why don't eclipses happen more frequently? Because the moon's orbit is elliptical, sometimes it is too far away to completely cover the sun. The moon's orbit is also roughly 5 degrees out of line with the earth's orbit around the sun, so the three bodies don't always line up perfectly to cause an eclipse. This year's eclipse is part of the [Saros cycle #145](#), which won't be repeated again until September 2, 2035, but this time over Asia. Graphic courtesy of Studio Joost Grootens.

pick up: The heavens are full of wonders
the moon isn't blocking the sun. Every
sunset is an astonishment of gorgeous
partling, shifting color. All day, clouds
gray, pink, and orange pass overhead
own thoughts, scudding across a canvas
blue. At night, countless stars silently
the black infinity, many or most of them
(now) orbited by their own necklace of

(Continued on page 10)

Through The Eyepiece: M31, the Andromeda Galaxy

by Don Knabb, CCAS Treasurer & Observing Chair



M31, the Andromeda Galaxy. Image credit: Don Knabb

If you stay up a bit late during September, you can find the Great Square of Pegasus rising in the east. If you look from there toward the North Star, you will run into the constellation Cassiopeia. When I see those two constellations in the sky I always want to grab my binoculars or telescope and look about half way between the northeast corner of the Great Square and Cassiopeia. Just a bit to the left of that line I scan for what I believe is the grandest fuzzy spot of all: The Andromeda Galaxy.

Don't we wish the view in our eyepiece was like this?

Unfortunately, it is not that clear. But with this image in mind, a cool clear September night, and a bit of time at the eyepiece you will get a familiarity with our neighbor galaxy that goes beyond just a large white center surrounded by fainter haze.

If you'd like a bit more help finding M31, as the Andromeda Galaxy is also known, here is a sky map of Andromeda the constellation:

The Andromeda Galaxy is a barred spiral galaxy, much like our own Milky Way Galaxy. When you look at the Androme-

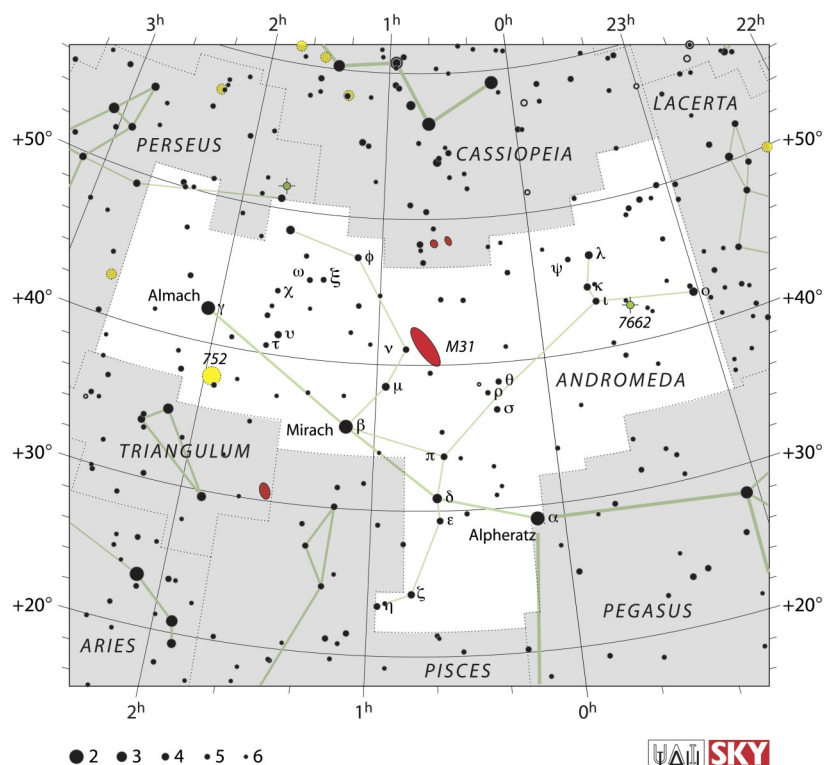
da Galaxy you are looking at a glow of light that is made up of one trillion stars that left Andromeda 2.5 million years ago.

The Andromeda Galaxy is easily visible to the naked eye in dark skies, although any pair of binoculars will make the view tremendously better. Even at a true dark sky location one only sees the central part of the galaxy, but the full angular diameter of the galaxy is seven times that of the full Moon! Wouldn't that be a sight to see!

Measurements suggest that the Andromeda Galaxy and the

(Continued on page 9)

Eyepiece (Cont'd)



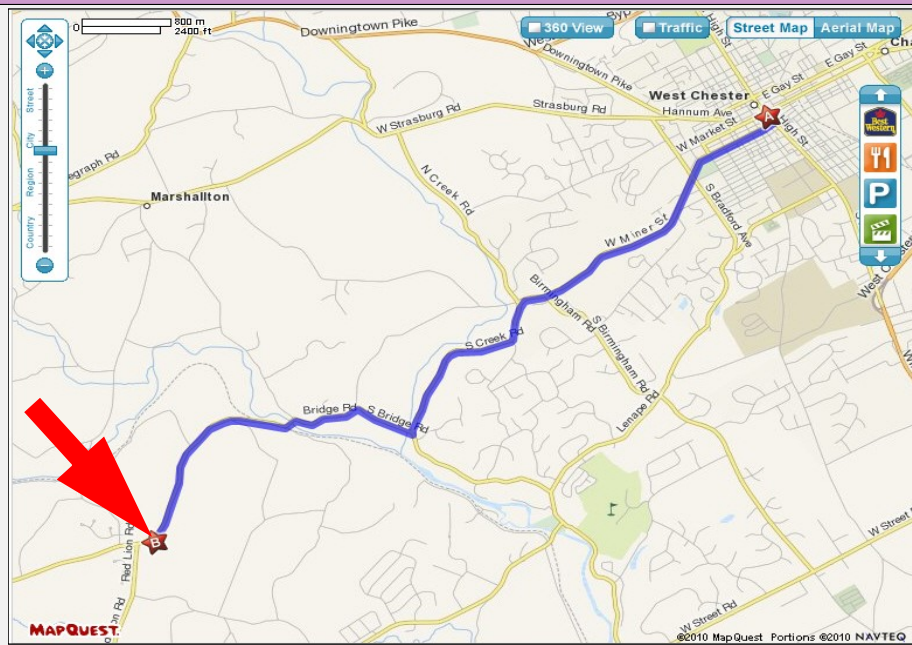
(Continued from page 8)

Milky Way are heading toward each other at 75 miles per second. Although it is not clear if there will actually be a collision, you should not lose sleep over this possibility since it will not occur for about 3 billion years.

Information credits:

- http://en.wikipedia.org/wiki/Andromeda_Galaxy
- Pasachoff, Jay M. 2000. A Field Guide to the Stars and Planets. New York, NY. Houghton Mifflin.
- Sky Safari Pro app
- Sky map credit: International Astronomical Union and Sky and Telescope magazine (Roger Sinnott & Rick Fienberg)

CCAS Directions



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).

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.

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).



Editorial (Cont'd)

(Continued from page 6)

swirling planets and moons. Is anyone looking back when you look up? Why is the universe so incomprehensibly vast, with billions of galaxies, each containing billions of stars? Wondering about such things is somehow comforting—a welcome departure from the news, Twitter, and Instagram. This week, a great darkness fell upon America, and it was easy to understand why eclipses terrified the ancients, who saw them as portents of doom. But then the sun returned, advising us: Light defeats darkness. This, too, shall pass.

CCAS Membership Information and Society Financials

Treasurer's Report by Don Knabb

August 2017 Financial Summary

Beginning Balance	\$1,083
Deposits	\$219
Disbursements	\$120
Ending Balance	\$1,182

New Member Welcome!

Welcome new CCAS members Alan & Susan Stein from Kennett Square, PA, and George & Amy Squire from 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>

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!

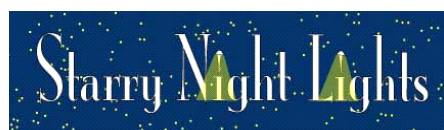
Anyone who spends much time outdoors, whether you're stargazing, or gardening, or whatever, needs to know about Lyme Disease and how to prevent it. You can learn about it at:

<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

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**.