



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

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Happy Holidays!
Photo courtesy of Don Knabb

CCAS Upcoming Nights Out

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

- ✦ Friday, December 18th, the Lower Merion Conservancy will be having their annual Winter Solstice Celebration from 7:00-9:00 p.m. at Rolling Hill Park in Gladwyne. The organization has asked us to participate again this year in this well-attended event. Last year the event turned into a Full Moon party in January after it was rained out in December. See page 3 for more information.

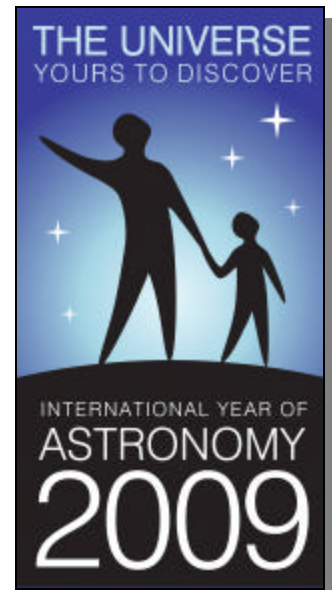
Important December 2009 Dates

- 2nd** • Full Moon 2:30 a.m.
- 8th** • Last quarter Moon 7:13 p.m.
- 9th** • Last Quarter Moon at 3:56 p.m.
- 14th** • The Geminid meteor shower peaks in the early morning hours.
- 16th** • New Moon 7:01 a.m.
- 21st** • Winter begins at the solstice at 12:47 p.m.
- 24th** • First quarter Moon 12:36 p.m.
- 31st** • Full Moon 2:13 p.m., a "blue moon".



Membership Renewals Due

12/2009	Diaz Houser Swishen Triolo Zibinski
01/2010	Bronstein
02/2010	Bastian Calobrisi & Family La Para Reimer



Winter 2009-10 Society Events

December 2009

2nd • PA Outdoor Lighting Council monthly meeting, Bucktown Branch of National Penn Bank, 1111 Ridge Rd, (Rt. 23 just west of Rt. 100) in South Coventry Township, PA, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website (<http://www.polcouncil.org/>).

8th • CCAS Holiday Party. The party is for CCAS members and their families and starts at 7:00 p.m. See page 16 for location and directions.

11th • West Chester University Planetarium Show, "Our Amazing Sun", Schmucker Science Building, Show starts at 7 p.m. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

18th • CCAS Monthly Observing Session, held in conjunction with the Lower Merion Conservancy, which will be having its annual Winter Solstice Celebration from 7:00-9:00 p.m. at Rolling Hill Park in Gladwyne.

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

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

January 2010

4th • PA Outdoor Lighting Council monthly meeting, Bucktown Branch of National Penn Bank, 1111 Ridge Rd, (Rt. 23 just west of Rt. 100) in South Coventry Township, PA, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website (<http://www.polcouncil.org/>).

12th • DVD Lecture Series: "The Quest for Black Holes", half-hour video presentation of a lecture by Professor Alex Filippenko, UC Berkeley. Room 113, Merion Science Center (former Boucher Building), West Chester University. The presentation immediately precedes the monthly meeting and starts at 7:00 p.m.

12th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Featured speaker: Dr. Marc Gagné, "X-Ray Observations of Deep Space Galaxy Clusters". Constellation of the Month (COM): Aquarius, presented by Dave Hockenberry. The meeting starts at 7:30 p.m.

15th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date January 16th). The observing session starts at sunset.

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

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

Minutes from the November 2009 Monthly CCAS Meeting

by Don Knabb, CCAS Secretary & Observing Chair

- Approximately 20 members were in attendance.
- Video presentation: The lecture "Black Holes - Abandon Hope All Ye Who Enter" on DVD was shown.
- Program – "Killer Rocks from Outer Space", by Dr. Karen Vanlandingham.
- Constellation of the month – the presentation was postponed to the January meeting due to the extended question and answer session with Dr. Vanlandingham.
- Roger Taylor presented two needs that the club is currently challenged by:
 - Pennsylvania Outdoor Lighting Council – We need a volunteer to replace Kathy Buczynski. If someone could attend at least 6 meetings a year this would be sufficient.
 - Library – Linda Fragale is moving out of the area so we need a volunteer to house and manage the CCAS library. The library requires about a 6-foot-wide bookshelf that is several shelves high.
- Department reports:
 - Education – Due to the amount of time that Project Astro is taking Kathy Buczynski will not be able to manage the spring classes this year.
 - Finance – A special deal with several "give-aways" is being offered by Sky and Telescope until the 15th of December. Please let Bob Popovich know as soon as possible if you are attending the CCAS holiday party.
 - Observing – There is a star party at Goshen Friends School on Friday, November 13 and one at Lower Merion Conservancy on Friday, December 18 in Gladwyne.
 - Website & Newsletter – no report (John Hepler is in class Tuesday nights & can't participate this autumn).
 - Library – As mentioned above, we need a new librarian and a place to house the library.
 - Secretary – There were no minutes from the last meeting because the regular meeting was not held.
 - Public Relations – no report.
 - Programs – All Programs are scheduled for all the meetings through May 2010. Volunteers for the Constellation of the Month presentations are needed for the February through May monthly meetings.

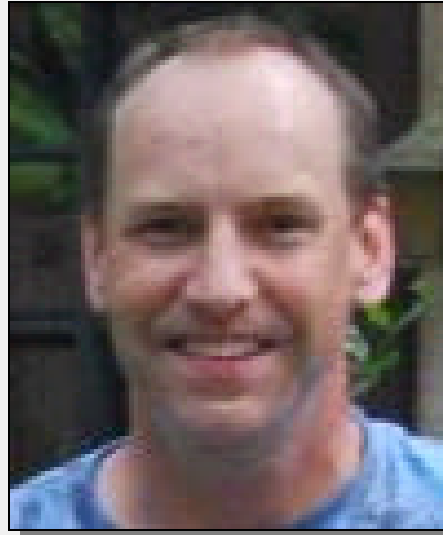
January 2010 Meeting Guest Speaker

by John Hepler, CCAS Webmaster & Newsletter Editor



Dr. Marc Gagné will be our guest speaker at our monthly meeting scheduled on January 12th, 2010. His presentation is entitled, "*X-Ray Observations of Deep Space Galaxy Clusters*".

Dr. Gagné is an associate professor of astronomy and the interim department chair of West Chester University's Department of Geology and Astronomy. He is particularly interested in the clusters of young stars, specifically those that have only lived for a tiny fraction of their lifetime. He studies low-mass and high-mass stars, and in particular, he focuses on x-rays and on



infrared emissions of young stars. Dr. Gagné uses high-resolution images and high-resolution spectra from NASA's

Chandra X-ray Observatory in his research.

How did Dr. Gagné get involved in astronomy?

"I was a high school math and physical science teacher in Gabon, Central Africa. The skies were clear and dark and I really saw the stars for the first time. I found a star guide in a pile of old books a Peace Corps volunteer had left - I was hooked. I went to grad school to study astronomy soon after my three years in Africa - and here I am."

Winter Solstice Celebration

by Don Knabb, CCAS Observing Chair & Secretary

The Lower Merion Conservancy is holding its annual **Winter Solstice Celebration on Friday, December 18th, 2009**, from 7:00-9:00 p.m. at Rolling Hill Park in Gladwyne. They have asked us to participate again this year in this well-attended event.

Last year the event turned into a Full Moon party in January after it was rained out in December (let's hope we don't have a repeat of last year's weather on the 18th!). The crowd was very appreciative of our club providing telescopes for lunar viewing. And Derrick Pitts was there too! I don't know if he will attend the event this year.

We are looking for members to volunteer to help at the event.

We were a big hit last January and we want to be sure that there are enough members with telescopes or mounted binoculars participating again this year. I know it is a popular weekend for family and work parties, so if you can't help out at this party is certainly understandable.



Seasons Greetings

If you are able to help and willing to commit to be at the event with a telescope or mounted binoculars, we would like to hear from you. Please contact me at (610) 436-5702, or via e-mail at observing@ccas.us, if you are interested in helping out.

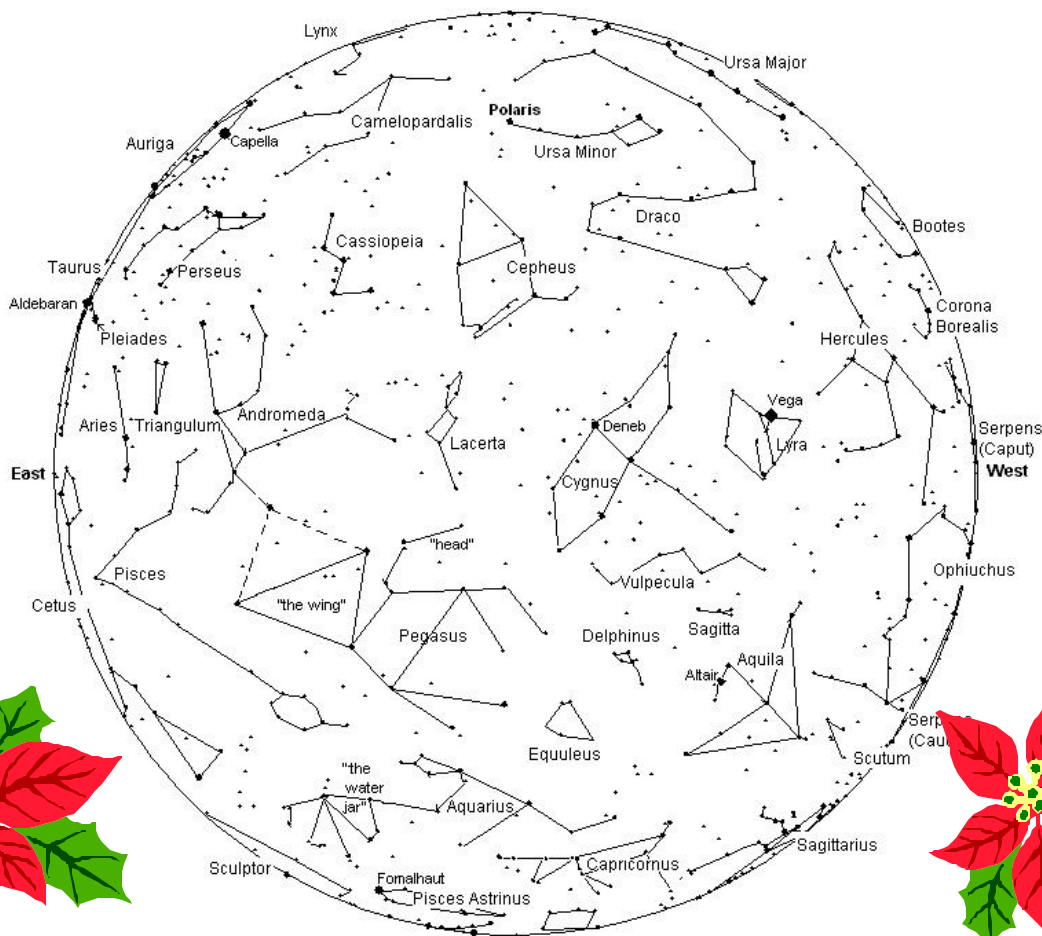
To learn more about the Lower Merion Conservancy and its mission, visit the organization's website at <http://www.lmconservancy.org/>. The mailing address and contact numbers are:

Lower Merion Conservancy
1301 Rose Glen Road
Gladwyne, PA 19035
(P) 610.645.9030
(F) 610.645.9031

The Sky Over Chester County

December 15, 2009 at 9:00 p.m. EST

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



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

The faintest stars shown on this chart are fifth magnitude.

Date	Sunrise	Sunset	Moon Phases		
12/01/2009	7:03 a.m. EST	4:36 p.m. EST	First Quarter	12/24/2009	12:36 p.m. EST
12/15/2009	7:15 a.m. EST	4:36 p.m. EST	Full Moon	12/02/2009	2:30 a.m. EST
12/31/2009	7:22 a.m. EST	4:45 p.m. EST	Last Quarter	12/09/2009	7:13 a.m. EST
			New Moon	12/16/2009	7:01 a.m. EST
			Blue Moon	12/31/2009	2:13 p.m. EST

December 2009 Observing Highlights

by Don Knabb, CCAS Observing Chair



December 2	Full Moon 2:30 a.m.
December 7	The day of the earliest sunset.
December 8	Last quarter Moon 7:13 p.m.
December 13/14	The Geminid meteor shower peaks.
December 16	New Moon 7:01 a.m.
December 19/23	Mercury is at its highest point in the evening sky.
December 21	Winter begins at the solstice at 12:47 p.m.
December 21	Jupiter and Neptune are less than 0.6 degrees apart in the sky.
December 24	First quarter Moon 12:36 p.m.
December 28	The waxing gibbous Moon covers some of the Pleiades from 7 p.m. to 10 p.m.
December 31	Full Moon 2:13 p.m., a "blue moon"

The Planets: Planetary viewing is excellent during December with Jupiter well placed for viewing during the evening hours and Mars and Saturn rising at a reasonable time for those who stay up late during winter vacation.

Mercury: After being quite shy last month, Mercury is in good position for viewing during mid December. The best viewing is a few days before and after December 18th.

Venus: Our sister planet is rapidly running away from us around the Sun and is lost in the glow of the dawn by the end of the month. Is it something we said?

Mars: The show is beginning for the Red Planet! After Jupiter sets in the early evening the only objects in the sky brighter than Mars are the Moon and Sirius. Mars rises about 4 hours after sunset by mid-month and doubles in brightness through December. By month's end, with clear, steady skies and high magnification one should be able to see surface features such as the polar ice cap.

Jupiter: Set up your telescope to view Jupiter just after it gets dark while it is high in the sky and enjoy the dance of the 4 bright moons that Galileo first saw 400 years ago.

Saturn: The ringed planet rises just before midnight by the end of the month but the best time for viewing is just before dawn when it is high in the sky. Well, maybe that's the best time for *you* to view Saturn, but for me it is the best time to view my pillow.

Uranus and Neptune: On December 21st Neptune is less 0.6 degrees from Jupiter in the evening sky. This is the last conjunction between these two gas giants for 13 years. You'll need clear skies and high magnification to see this distant blue world. Uranus is much easier to see and is highest in the sky just after it gets dark, south of the Circlet of Pisces. Finder charts for both gas giants are in the September issue of Sky and Telescope magazine and also on the Sky and Telescope web site.

Pluto: Pluto cannot be viewed during December because its position in the sky is too close to the Sun.

The Moon: December has two full Moons, so we call the 2nd one a "blue Moon". The first full Moon of December is called the Full Cold Moon. Full moon names date back to Native Americans of what is now the northern and eastern United States. Those tribes kept track of the seasons by giving distinctive names to each recurring full moon. The 2nd full Moon of December is called the Full Long Night Moon because at this time of year nights are at their longest and darkest.

Constellations: During December we finally say goodbye to our friend the Summer Triangle, who has hung around in the sky like the last guest at a New Year's Eve party. Taurus the Bull is in the south and bright Capella in Auriga is high overhead by 10 p.m. And mighty Orion is well above the horizon with his faithful hunting dog Canis Major not far behind.

Messier/Deep Sky: High in the December sky I often look at Cassiopeia for NGC 457, also known as the Owl Cluster or the ET Cluster because the star cluster has two bright "eyes" and outstretched arms and legs. Not far away is the star cluster M52, which is beautiful in binoculars. Of course I won't miss a chance to gaze at M42, the Orion Nebula. If the seeing is good I will zoom in to the center of the nebula to see the Trapezium, a quartet of hot, young stars (were they in the Twilight movie?) that produce ultraviolet radiation that causes the nebula gas to glow.

(Continued on page 7)

Through the Eyepiece: M41, An Open Cluster in Canis Major

by Don Knabb, CCAS Observing Chair



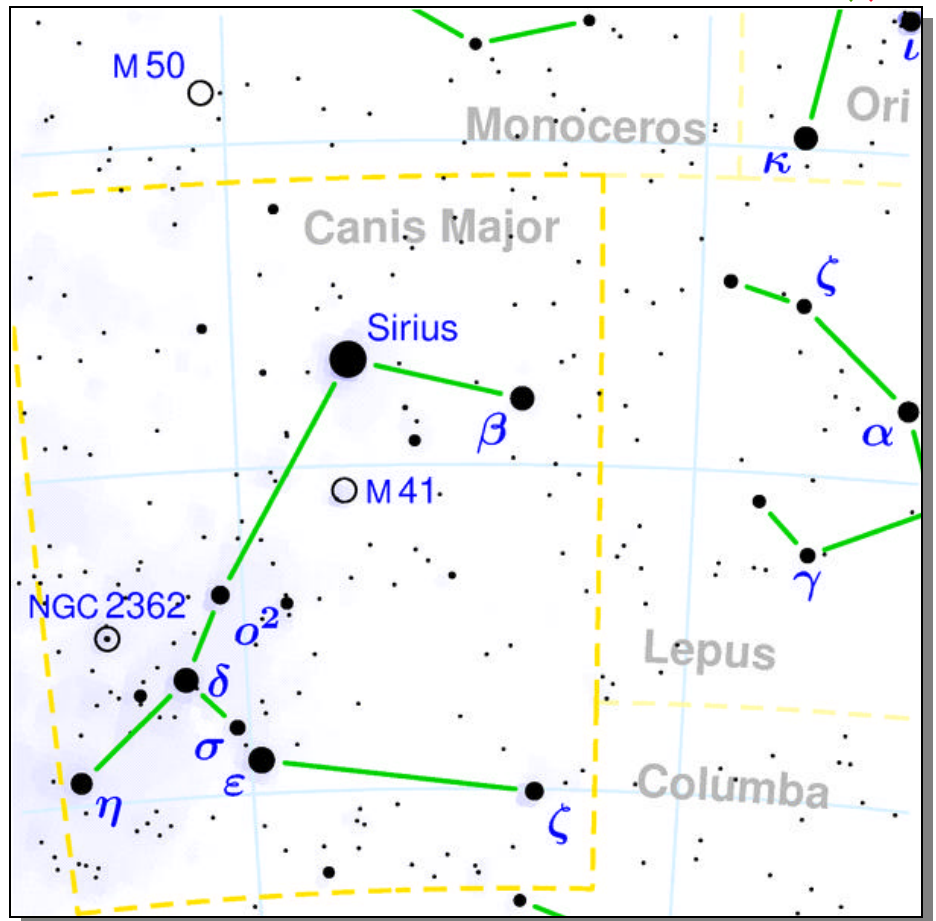
During December I often gaze at the bright winter constellations in the south. After enjoying the sight of Orion the Hunter I look to the southeast for his trusty hunting dogs Canis Major and Canis Minor. Canis Major contains Sirius, the brightest star in the night sky, known as the "dog star".

Nearly exactly south of Sirius at an angular distance of 4 degrees, a bit less than the width of your middle three fingers held at arms length, is an open cluster of stars called Messier 41 or NGC 2287.

Messier 41 contains about 100 stars including several red giants, the brightest being a spectral type K3 giant near the cluster's center. This star is about 700 times more luminous than our Sun! The cluster is moving away from us and its age is estimated at between 190 and 240 million years old. Here is a picture taken as part of the Two Micron All Sky Survey, a joint project of the University of Massachusetts and the Infrared Processing and Analysis Center/California Institute of Technology, funded by NASA and the National Science Foundation.

Some sources mention that M41 was possibly recorded by Aristotle about 325 B.C. This would make it the "faintest object recorded in classical antiquity" (from Burnham). However, this identification is uncertain.

Giovanni Batista Hodierna was the first to catalog it some time before 1654, and it got generally known after John Flamsteed's independent rediscovery of Febru-



Sky map credit: http://en.wikipedia.org/wiki/File:M41_canis_major.png

ary 16, 1702, who remarks "Near this star (12 CMa), there is a cluster." It was independently found

again by Le Gentil in 1749, and apparently by Charles Messier, who added it to his catalog on January 16, 1765 and gave it the designation Messier 41 that we use today.



M41 Photo credit: 2MASS/NASA

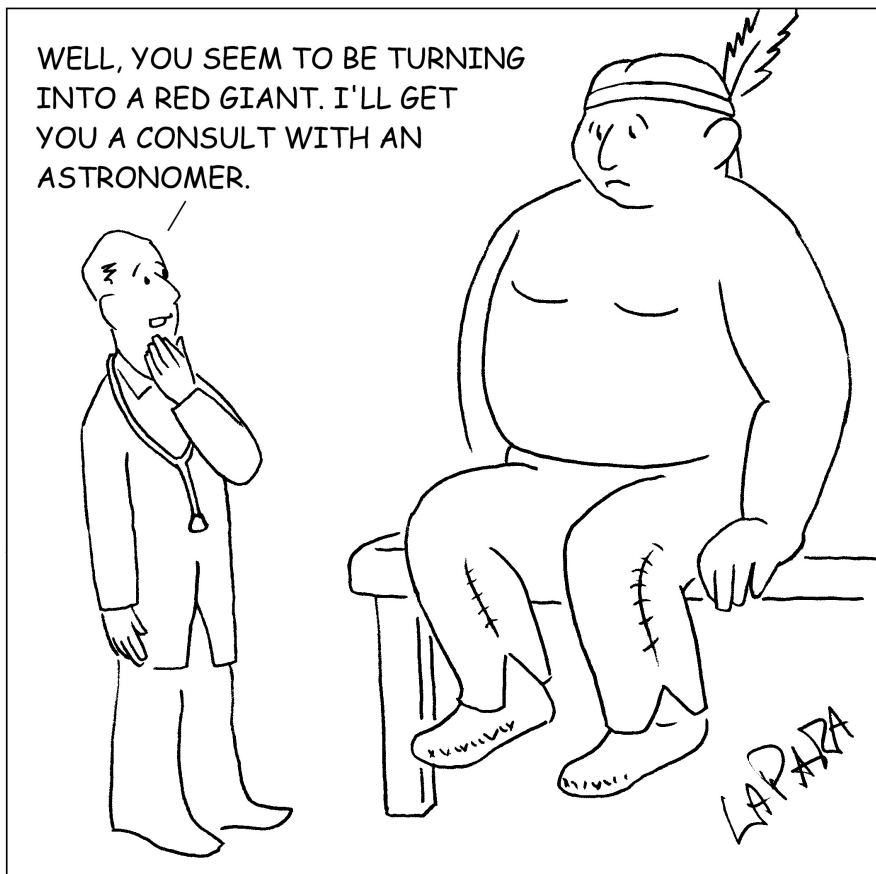
I prefer to view M41 with high power binoculars or with a telescope fitted with a low power, wide field of view eyepiece. But any pair of binoculars will be full of stars when you aim them at M41, so enjoy the show before you get too cold on a clear winter night.

Information credits

<http://www.seds.org/messier/m/m041.html>
http://en.wikipedia.org/wiki/Messier_41

Nicholas's Cartoon Corner

by Nicholas La Para



Observing (Cont'd)

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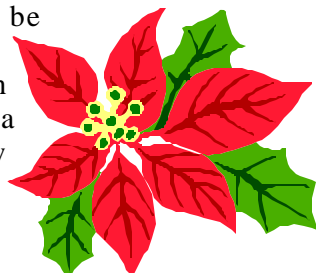
Comets: There are no reasonably bright comets to view during December.

Meteor showers: This year is a great year to view the Geminid meteor shower because the Moon is nearly new for the shower peak on December 13/14. The only problem is that this is a Sunday night/Monday morning peak and most of us need to go to work on Monday morning.

But, I have seen some excellent Geminids during the evening hours between 9 p.m. and 10 p.m. in years past. It is Barb's and my personal goal to have all our Christmas shop-

ping finished before the Geminid shower which takes away a little of the unavoidable holiday stress. And if our shopping isn't done by then, I guess my wish upon a falling star is to be finished before Christmas!

Up to 120 meteors per hour could be seen at the peak, which is predicted to be around 1 a.m. on December 14th. That sounds like it may be worth going in to work a few hours late.



A Poem: Telescope and Nature

by Ekam Noor Singh

My Father inspired me
And I made a Telescope,
To see Celestial Object magnified,
There is great Scope.

Never to see Sun
Through Telescope directly,
Safe to see an image
On screen indirectly.

See the Moon
On full moon day, King of Night,
Amazing Craters
So beautiful and bright.

How beautiful are Stars
And Rings of Saturn when seen,
Look at the night Sky
You shall also be keen.

Eclipses are strange hide and seek
When seen screened and magnified,
Transit of Venus and visits of
Comets
Makes enjoyment multiplied.

See My Very Excellent Mother
Just Showed Us Nine Planets,
Mercury, Venus, Earth, Mars
Jupiter, Saturn, Uranus, Neptune
and Pluto

All planets.

Sky and Nature is full of Beauty
And Greatness of God's Play,
Whose Smile Kindles this Earth and
Universe
In Every Time's lay.

Ekam

June 25th, 2009
Ekam Noor Singh
9th -B, Doon International School,
Sec 69, Mohali
India

A Cosmic Crash

by Patrick Barry and Dr. Tony Phillips

Two small planets hurtle toward each other at 22,000 miles per hour. They're on a collision course. With unimaginable force, they smash into each other in a flash of light, blasting streams of molten rock far out into space.

This cataclysmic scene has happened countless times in countless solar systems. In fact, scientists think that such collisions could have created Earth's moon, tilted Uranus on its side, set Venus spinning backward, and sheared the crust off Mercury.

But witnessing such a short-lived collision while pointing your telescope in just the right direction would be a tremendous



stroke of luck. Well, astronomers using NASA's Spitzer space telescope recently got lucky.

"It's unusual to catch such a collision in the act, that's for sure," said Geoffrey Bryden, an astronomer specializing in extrasolar planet formation at NASA's Jet Propulsion Laboratory and a member of the science team that made the discovery.

When Bryden and his colleagues pointed Spitzer at a star 100 light-years away called HD 172555, they noticed something strange. Patterns in the spectrum of light coming from nearby the star showed distinctive signs of

silicon monoxide gas — huge amounts of it — as well as a kind of volcanic rock called tektite. It was like discovering the wreckage from a cosmic car crash. The silicon monoxide was produced as the high-speed collision literally vaporized huge volumes of rock, which is made largely of silicon and oxygen.

The impact also blasted molten lava far out into space, where it later cooled to form chunks of tektite. Based on the amount of silicon monoxide and tektites, Bryden's team calculated that the colliding planetary bodies must have had a combined mass more than twice that of Earth's moon. The collision probably happened between 1,000 and 100,000 years ago — a blink of an eye in cosmic terms.

The scientists used the Spitzer space telescope because, unlike normal telescopes, Spitzer detects light at invisible, infrared wavelengths. "Spitzer wavelengths are the best wavelengths to identify types of rock," Bryden says. "You can pin down which type of rock, dust, or gas you're looking at."

Bryden says the discovery provides further evidence that planet-altering collisions are more common in other star systems than people once thought. The "crash-bang" processes at

(Continued on page 9)



Artist's rendering of cosmic collision involving two objects whose combined mass was at least twice that of our Moon. Discovered using the Spitzer Space Telescope in the planetary system of a star called HD 172555 100 light-years away.

CCAS Original Astrophotography: NGC7635

by Dave Hockenberry



NGC 7635, the Bubble Nebula in Cassiopeia. Shot 10/26/09, stack of 14 5-minute images, through TeleVue NP101is with Starlight Xpress SXVF H9C color camera, no filters. Autoguiding 'scope Meade LX200R. Stacked, autoguided, SD mask processed and color adjusted with Maxim DL5 software. Some of the open cluster M52 is visible in the lower left hand corner. Frankly, it was the star field in this picture that made my jaw drop more than the Bubble itself. I sure didn't see all those stars when looking visually through my Panoptic lens!!

Cosmic Crash (cont'd)

(Continued from page 8)

work in our own solar system may indeed be universal. If so, Spitzer has a front row seat on a truly smashing show.

See Spitzer Space Telescope's brand new Web site at <http://spitzer.caltech.edu/>. Kids can learn about infrared light and see beautiful Spitzer images by playing the new Spitzer Concentration game at <http://spaceplace.jpl.nasa.gov/en/kids/spitzer/concentration>.

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

More Holiday Images

by Don Knabb



*Christmas at Longwood Gardens, 2009.
With the moon filling in for a star!*

Exactly What is a Blue Moon?

by John Hepler

[Editor's note: Both Don and I have made reference to this month's second full moon. I pondered the meaning of "blue moon" and the origin of the term. Read below an abridged definition from Wikipedia.org.]

A blue moon is a full moon that is not timed to the regular monthly pattern. Most years have twelve full moons which occur approximately monthly, but in addition to those twelve full lunar cycles, each calendar year contains an excess of roughly eleven days. The extra days accumulate, so that every two or three years (on average about every 2.7154 years), there is an extra full moon. The extra moon is called a "blue moon."

The earliest recorded English usage of the term "blue moon" was in 1528 in a pamphlet violently attacking the English clergy, entitled "Rede Me and Be Not Wrothe" (Read me and be not angry): "Yf they say the mone is belewe / We must believe that it is true" (*If they say the moon is blue, we must believe that it is true*).

An alternative interpretation uses the other Old English meaning of belewe (which can mean "blue" or "betrayal"). The church was responsible for the calendar and used the complex computus to calculate the important date of Easter, which is based on the full moon. Lent falls before Easter, starting at the beginning of the Lent moon cycle (late winter moon). The next moon is the egg moon (early spring moon), and Easter usually falls on the first Sunday after the full egg moon. Every one to three years, the Lent and egg moons would come too early. The clergy would have to tell people whether the moon was the Lent moon or a false one, which they may have called a "betrayal moon".

Historically, moons were given folk names, twelve each year, to help people to prepare for different times of the year and the related weather and crop needs. Names varied with locality and culture, often with descriptive names

(Continued on page 16)

Starstuff: Pox or Plague on Mars?

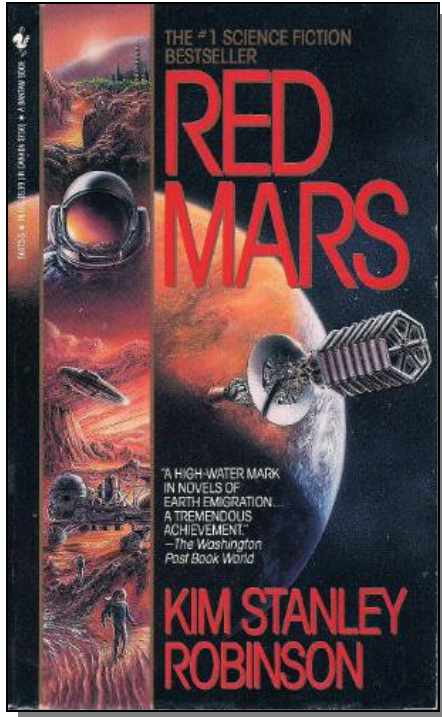
by Roger Taylor, CCAS President



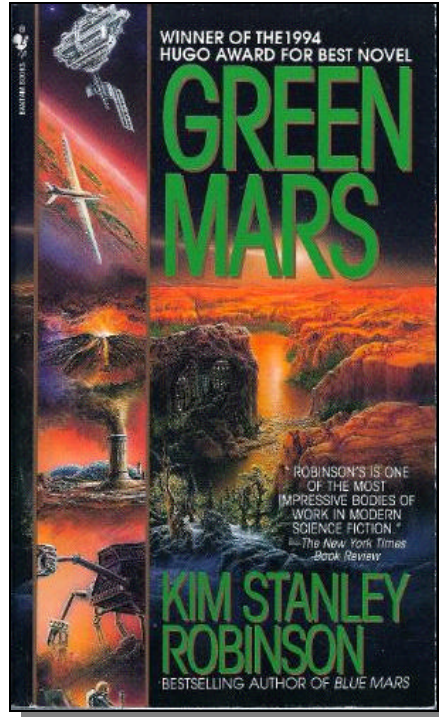
I am reading a fascinating bit of Science fiction. It is the beginning of a series of books that outline the hypothetical future exploration and colonization of Mars. The Author Kim Stanley Robinson has crafted a fast-

extant for our perusal, use, exploration and ultimate exploitation, then your thought processes might lead you down the path in one direction. On the other hand, if you are of the school of the “look, but don’t touch” or the “

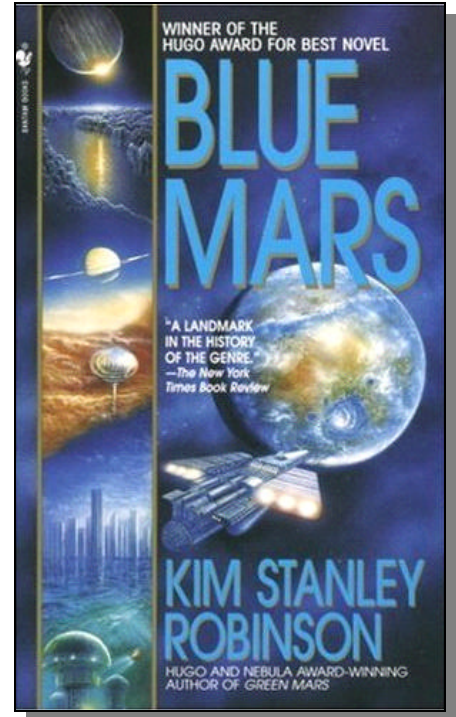
greater protection from the radiation that bombards Mars now. A higher moisture content would make Mars more hospitable to more organisms. Perhaps biogenetically engineered organisms to breakdown Martian rock into



Red Mars Book Cover, Kim Stanley Robinson, published 12/31/1992



Green Mars Book Cover, Kim Stanley Robinson, published 2/28/1994



Blue Mars Book Cover, Kim Stanley Robinson, published 5/31/1996

paced tightly woven story that keeps the reader engaged. The books themselves are called Red Mars, Green Mars and Blue Mars. In this futuristic tale, a hundred colonists are chosen to start human habitation on Mars.

I suppose that it never really occurred to me that there might be some moral issues with such travels to our neighboring world. What might those be, you say? Well, it depends upon your school of thought, as most moral issues seem to. If you are of the persuasion that the universe is

do no harm” school the road you would choose might be different.

Let’s posit that we have the technology to go to Mars, and in the future we go and would like to stay there. We know that the atmosphere is too thin to breath, that the temperatures too frigid and, at best, the planet too arid. All in all, what we might call inhospitable. Let’s say that since we’ve gotten all the way to the Red planet and we have the technology, should we go about doing a planetary makeover. More atmosphere might provide

something more useful could be introduced. The same hypothetical technology that got us there in the first place might tempt us to divert the orbit of a comet or two to crash land on the red planet to provide water. An interesting thought, that more than one scientist postulates was the source of water for our own planet. How about covering the Martian Polar Regions with dark material to promote melting the ice caps?

(Continued on page 11)

Starstuff (cont'd)

(Continued from page 10)

The question might then be if you could, would you? Do we own all the worlds of the universe? The Galileo space probe to Jupiter revealed that one of the planets major moons Europa, very likely has water beneath its icy exterior. If that ice or water were found to contain organisms, micro or otherwise, would we be right in taking the water as our own anyway? Would that be like stealing land back on good old Earth? Hmmm. That water sure would make the trip out a lot easier since we would only have to carry enough water for a one way trip. Would it be all right to leave any space "garbage" behind? It's awfully

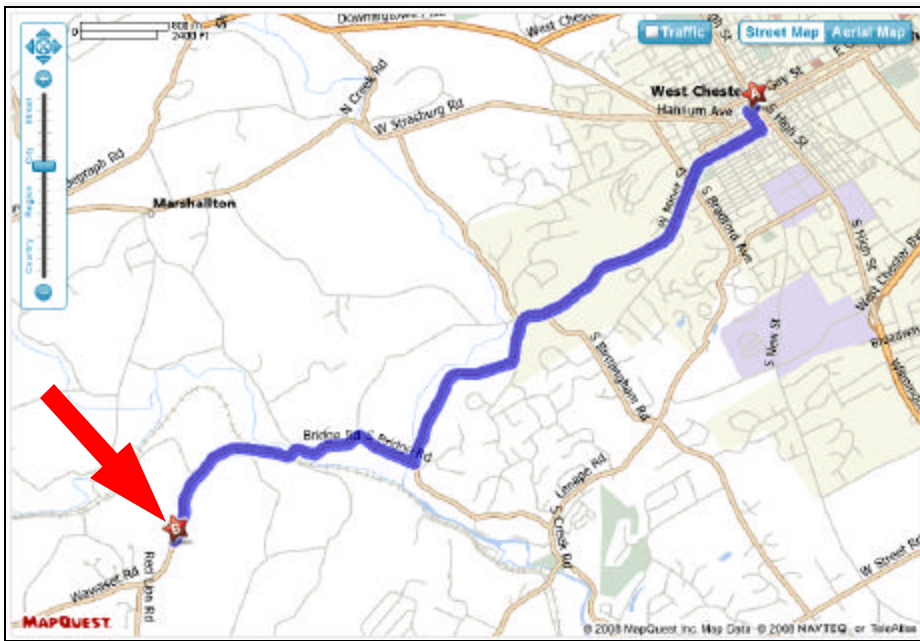
expensive to take it back with us.

These musings may seem to deal with things in the far future, but not necessarily. Since the early space program, all nations have been characteristically sterilized any object that was/is to land on another body in space. There are actually treaties to that effect that are administered through the United Nations. Back in 1968, the late Carl Sagan was one of the architects of the treaties, as well one of the folks instrumental in raising consciousness about the problem of contaminating other planets with Earth organisms. This problem has been given the name "Forward Contamination". There is a "Backward Contamination" as

well. Most people actually didn't know that the astronauts who went to the Moon were placed, along with their cargo of rocks, in isolation until they were deemed safe to be back in contact with Earthlings again. I wonder how careful we'll have to be if astronauts have an extended stay on Mars?

I don't pretend to have the answers to the questions that I posed earlier, but these are questions that I think deserve answers. Will this controversy spawn a group of "planet huggers"? I don't know. Perhaps we should think about what it might mean to be stewards of our own Solar system.

CCAS Directions



Brandywine Valley Association

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

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

Brandywine Valley Association

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

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

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

Project Astro 2009-2010: First Visits

by Russell Kathy Buczynski, CCAS Vice President & Education Chair



Author's note: Due to the file size of this article, my email to John did not make the November newsletter. Since that time I have visited Penn Wood Elementary two more times. The articles that follow this one in this newsletter are abbreviated descriptions of those visits with some pictures of my time there.

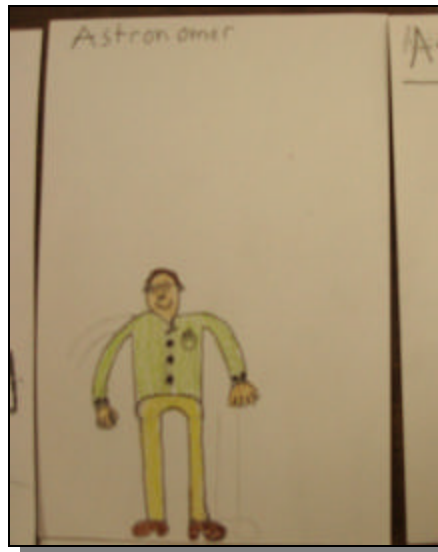
Project Astro is a program started by the Astronomical Society of the Pacific that pairs an astronomer (amateur or professional) with a school or classroom; see http://www.astrosociety.org/education/astro/project_astro.html. Karen VanLandingham of West Chester University applied for grants to start the program here and this is the inaugural year.

Karen held a workshop in August for the astronomers and teachers to meet. In the two-day workshop, we met our Project Astro partners and participated in astro-related activities that we might take into the classroom, including building scale models of the solar system, creating phases of the moon exercises, and even some observing.

My teacher-partner is Andy Davis. He is the gifted teacher for the Penn Wood Elementary School in West Chester. His services are needed throughout the school but he decided that the fourth grade classes would benefit the most in this program.

Unlike many of the partnerships, when I go into the classroom it's actually three different classes that I participate in. I'm fortunate because I'll know that all of

the fourth graders are getting the benefit of having this special aspect of their curriculum throughout the year. Andy and I decided on 6 visits during the school year including a trip to the planetarium in May and a Night Out tentatively scheduled for November. I hope to be reporting on all of them; the first two are about the Sun.



*Note the pens in the pocket.
I'll need a pocket protector.*



I guess I'll have to get myself a lab coat!!!

On September 25th I made my first visit to Penn Wood. Our objective was to discuss the path the Sun takes across the sky, view the Sun with a projection

and discuss everyday things that are named after things in the sky. But in the time before my first visit, Mr. Davis asked the students to describe what an astronomer would look like.

Luckily it was a beautiful day and we were able to take the classes outside. The first part of the lesson was to explain the difference between a reflecting telescope and a refracting telescope.

Because the sky was clear that day we got a chance to do a solar projection. Much to my surprise, we saw two sunspots that were very small but visible. (SOHO showed a third sunspot but too small for us to see in the projection.)

As Andy held the projection I demonstrated how the Earth turns while the Sun shines onto it. All the children used the right-hand rule to remember which way the Earth turns. Pretty soon the projection was getting smaller and smaller without either of us moving the telescope. What was happening!!!!???

When we started the lesson, Andy stood on a piece of plywood and I marked where his ears were with the two sticks. At the end of the lesson and the discussion of the Sun moving across the sky (er, umh, the Earth spinning on its axis), we can see that his shadow has moved.

(Continued on page 13)

Project Astro (Cont'd)

(Continued from page 12)

And finally we discussed many things that are named after objects in the sky. Sun's day, Moon's day and Saturn's day were easy answers. But did you know that Tiw's day is named for the Anglo Saxon god of war? (In Latin, *Dies Martes* or Mars' Day.) Ask me about the others sometime.

Andy has also taken on year-long observational exercises with his students. One of the exercises is an Analemma. Every Friday at noon, they mark the spot on the ground where the tip of a stake has cast its shadow. By the end of the school year, the figure 8 of the Analemma should be apparent. The other exercise involves drawing the western horizon at their home and noting where the Sun sets. When plotted in regular intervals, the students will be able to see how the Sun changes position during the year.

This is something I wanted to do since I joined CCAS in 1994. I'm so glad to be a part of this program and look forward to visiting Penn Wood Elementary throughout the year.

Next time – October 30: More discussions about the Sun. What are the parts of the Sun? What does it give us here on Earth? How does the size of the sun compare to the size of the Earth and how far away is it? Discuss scale models.



Explaining the difference between reflecting and refracting telescopes.



Solar projection, with two visible solar flares!



Measuring the rotation of the earth using sticks.



Demonstrating how the earth turns as the sun shines on it.

Project Astro (Cont'd)

Visit to Penn Wood Elementary, October 30th, 2009.



On this day we continued our discussion of the Sun. Mr. Davis first compared the characteristics of a candle to those of the Sun. The students were gathered around and discussed features like heat and light, color and size.

Then, I gave a presentation about the Sun using some still pictures and videos that I obtained from NASA. The students seemed awed by the fact that the Sun is not just a simple ball of gas. We talked about how the Sun created rainbows and sun dogs here on Earth and many features of the Sun including Coronal Mass Ejections and Solar Prominences.

Finally, we did a scale model of the Sun and the Earth. If the Sun is a 9" ball, how big is the Earth?

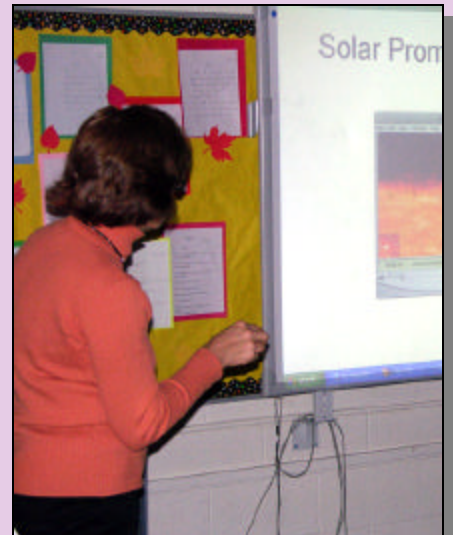
Answer: a peppercorn

See photo in lower right, Andy is holding the ball, and the children standing beside him are holding the "planets".

Next time – November 23, 2009. The Moon: Critique an existing model of the Sun/Earth/Moon system; what's wrong with it and what's right with it? What are some of the features on the surface? How does the Moon compare to the size of the Earth?



The students were gathered around and discussed features like heat and light, color and size.



Andy helped me run the program and I pointed out features of the photos and videos.



Project Astro (Cont'd)



The Earth is very close to the Sun in this model but Mr. Davis was sure to discuss that if the model was to scale it would be too big to bring into the classroom.



Visit to Penn Wood Elementary, November 23rd, 2009.

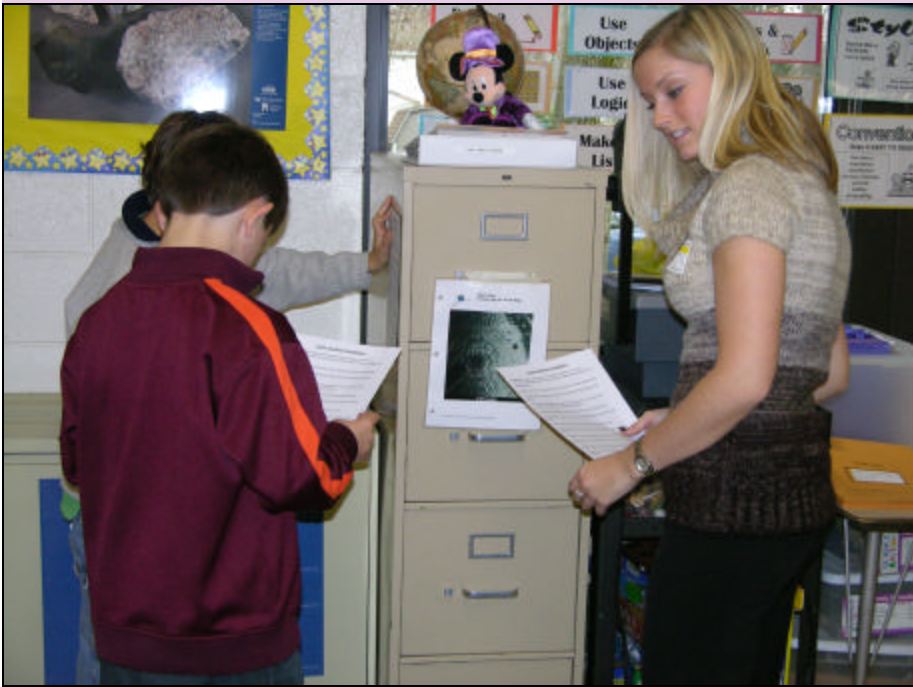


November 23rd was the first day we were talking about the Moon. After a quick review of my last visit we began to discuss what was wrong and right with a Sun/Earth/Moon model. (I think this is one of the very important lessons that Mr. Davis and the other fourth grade teachers are involved in: Critical thinking. The model is great for showing some feature but it certainly wasn't to scale. That point is driven home in most lessons I've been involved in.)

Then the conversation moved to the Moon. Mr. Davis talked about Galileo's drawing of the Moon and how he observed it. Now it was time for the students to do their own observations. Given a list of terms like crater, rille, maria and highlands, the students got a chance to look closely at Apollo photographs of the Moon.

Although we weren't able to include this activity with all the classes while I was there, some of the students got to scale the Moon if the Earth was the size of a racket ball.

Next time – January 22, 2010. More on the Moon: What are the faces we see on the Moon? How do we describe the Moon in terms of observing it? Is there a dark side? What are phases and how are they created?



The terms were sometimes difficult. Here a fourth grader is encouraged by Allysa Videon, an education student from West Chester University who joined us for this session.



Blue Moon (Cont'd)

(Continued from page 9)

such as harvest moon, growing moon, snow moon, and egg moon. Most years have 12 moons (giving 12 names), but in the years with thirteen full moons the monthly "seasons" would be expected to come too early – for example, hens would not recommence laying their eggs by the fourth full moon since it was still too cold – so the early moon was named a "blue moon". This then re-aligned the rest of the year's moons and "seasons".

In the 19th and early 20th centuries, the Maine Farmer's Almanac listed blue moon dates for farmers. These correspond to the third full moon in a quarter of the year when there were four full moons (normally a quarter year has three full moons). Names are given to each moon in a season: For example, the first moon of summer is called the early summer moon, the second is called the midsummer moon, and the last is called the late summer moon. When a season has four moons the third is called the blue moon so that the last can continue to be called the late moon.

The division of the year into quarters starts with the nominal vernal equinox on or around March 21.[7] This is close to the astronomical season but follows the Christian computus used for calculations of Easter, which places each equinox evenly between the summer and winter solstices to calculate seasons rather than using the actual equinox.

The March 1946 Sky and Telescope article "Once in a Blue Moon" by James Hugh Pruett misinterpreted the 1937 Maine Farmer's Almanac. "Seven times in 19 years there were — and still are — 13 full moons in a year. This gives 11 months with one full moon each and one with two. This second in a month, so I interpret it, was called Blue Moon." Widespread adoption of the definition of a "blue moon" as the second full moon in a month followed its use on the popular radio program StarDate on January 31, 1980.

CCAS Original Astrophotography: C14, The Double Cluster

by Dave Hockenberry



C14 - the "Double Cluster" in Perseus (NGC 884 and NGC 869) shot 11/18/09 with SXVF H9C color camera through TeleVue NP101is, stack of 48 70-second images. Autoguided with Meade LX200R and Lodestar guide camera, Maxim DL guiding software. Stacked and median filtered, color adjusted with Maxim DL. Some hot pixel removal in Photoshot CS3.

CCAS Annual Holiday Party

by Bob Popovich, CCAS Treasurer



Betsy and I request the pleasure of your company at our home on December 8th, 2009, to celebrate the holiday season from 6:00 to 9:00 p.m. For those of you with GPS, our address is:

**416 Fairfax Drive
Exton, PA 19341**

Directions to our home: Northbound on rte. 100 on route 100 in Exton, take the Marchwood Rd. / Ship Rd. exit. Turn left at the top of the exit and cross route 100 (in the direction of the Exton Diner). If you are traveling southbound on route

100, take the Marchwood Rd. / Ship Rd. exit and turn right onto Marchwood Road (do not cross route 100!).

On Marchwood Road, you'll pass the Marchwood Shopping Plaza on the left, then turn left onto Concord Ave., then the 2nd right onto Fairfax Dr. Our home is on the left side of the street.

Our number is (484) 467-5562 if you get lost. We hope to see you all that evening. Happy holidays to all CCAS members and their families!

Astrophotography Equipment Review: Starlight Xpress Lodestar Autoguiding CCD Camera

by Dave Hockenberry, CCAS Program Chair

Imaging the night sky continues to be one of the most explosive growth markets for amateur astronomers. Indeed, today's astrophotographers have never had it better. The CCD camera revolution has brought astrophotography within easy reach of even casual observers, a far cry from the days only 15-20 years ago when astro-imaging was the exclusive province of a small dedicated crowd using very expensive cameras, film, and the resources to have their own dark room for developing.

But throughout the evolution of modern astro imaging one problem has remained essentially unchanged - ACCURATE TRACKING. Many solutions have been tried and used to keep targets as still as possible to prevent blurry images. In the old days on-axis flip mirrors and extra eyepieces with hand controls were (patiently!) used by film photographers to manually track images hour after hour to yield good results, but one slip could ruin hours of tedious work in just a second or two.

The advent of the CCD camera and high-powered fast portable computers changed everything. Today, the most common solution to the autoguiding task involves the use of an accessory telescope rigidly mounted to the imaging telescope, with an accessory "guiding" camera dedicated to one task - tracking celestial objects within pixel-level accuracy.

The good news for astro imagers is that dark rooms and cervical neck strain from hunching over guiding eyepieces are (gratefully!) a thing of the past. What has resulted, however, is that the plethora of equipment needed for astrophotography has moved from the darkroom out to the telescope and to the computers dedicated to the tasks of imaging, guiding, and telescope control. A modern rig for imaging often looks like a Gatling gun choked with cables and counterweights! Anything that can make the gear simpler, lighter, and more accurate is a welcome relief.

This problem has been squarely addressed by the Starlight Xpress company, a British manufacturer of CCD cameras.



Known principally in the industry for using extremely low thermal noise Sony scientific-grade CCD chips in their camera line, Starlight Xpress also started using these chips in their line of dedicated guiding cameras. Initially engineered primarily for their own system of off-axis guiding equipment, they departed from their original design two years ago to develop a small, extremely lightweight guiding camera that would use no more power than that provided by a computer USB cable, have extreme photon sensitivity

to be able to detect and lock onto rather faint stars, and to have the capacity for direct integration into telescope drive mounts or other CCD cameras as well as through computer software.

The result was the Lodestar. At less than 50 grams and no bigger than a cheap 9mm eyepiece this "mighty mite" took the imaging community by storm, and demand for this product has remained high since its introduction. But don't let the small size fool you. This guiding camera has photon sensitivity to spare, and can lock on to faint stars more easily than cameras many times its size. Utilizing a Sony IXC429 AL Exview chip, this autoguider is thermally quieter and has a better signal/noise ratio than many dedicated imaging cameras on the market today. Even without active cooling it takes this chip more than an hour to saturate with dark current pixel noise. The dimensions of the chip are not large at 6.4 X 4.75 mm (752 X 580 pixels), about the size of a "standard" imaging chip 10 years ago. It reads out its images in a full 16 bit format fully compatible with FITS data, but can also handle JPEG, TIFF and BMP. Default mode is FITS. Image download time is fast through the USB 2.0 output, less than a quarter of a second. The camera also comes with a generously long USB cable and an even longer 4-pin autoguider output cable for direct input to either a compatible

(Continued on page 18)

CCD Camera (Cont'd)

(Continued from page 17)

telescope mount or into a compatible camera or off-axis guider system. The Lodestar does not come with operating software on a CD. Rather, it can "find" its software over the Internet when initially plugged into a computer USB port or the software can be manually downloaded from Starlight Xpress' web site. The system gain the manufacturer lists for the Lodestar's system response is 0.9 electrons per ADU (analog to digital units, the numerical pixel value in a CCD camera), phenomenal for a chip of this size. Lodestar is available through dealer network only, and currently costs about \$800.00 US with minor variations in exchange rate between the dollar and Pound Sterling. So this autoguiding camera boasts some impressive numbers, but carries a steep price tag.

So how does it perform? I received the Lodestar as a birthday gift from my (very supportive!!) wife as a birthday present while vacationing in Paris. However, I didn't get the camera right away. She had placed her order for it over a month before my actual birthday, but the camera was so back ordered it didn't arrive for almost three months after the order was placed! Just as well, as I didn't have to carry it around France on vacation. When it did arrive, I found myself laughing out loud at how tiny it is out of the box.

It comes with a good USB 2.0 cable and a 4-pin autoguider cable, and a single small sheet of paper with minimal instructions on how to start off and load the software. On my Windows XP system it loaded itself and initiated everything flawlessly, probably the most hassle free in-

stallation of new hardware I have ever loaded onto a computer. This could possibly be due to the fact that I already had Starlight Xpress software on the system for my SXVF H9C camera, but the Lodestar software IS different and registers under a separate file. I had to manually set up a shortcut for my Desktop, as the automated setup doesn't include this step. The camera control/autoguiding window is somewhat complex at first glance, but as long as you keep looking up to down then left to right the organization of the functions start to make intuitive sense.

This is good because the operating instructions included in the software are very minimalist and "bare bones," leaving the owner to figure out many of the commands and particular subroutines on his or her own. Some of the software is quite convenient - there is even a special radio button for Meade LX200 if your are plugging the autoguider cable directly into a mount of this type. Some of the software is inconvenient, especially regarding focusing. It would have been nice if they had included a "continuous" picture/download function for focusing with a focusing mask or using maximum pixel values, but one can get around this by using the controls available and doing the images manually. Focus is not critical for autoguiding, but the sharper the focus the less interpolation the software needs to do to cal-



Picture of the Lodestar camera next to the author's 9mm Nagler Eyepiece

(Continued on page 19)

CCD Camera (Cont'd)

(Continued from page 18)

culate variance. For me, it took a good 4 hours of playing with the camera and the software before I felt like I was ready to image with it.

I first tried using the autoguiding software that came with the camera and plugging directly into my Meade LX200R base to test the unit. I did this purposefully as the Meade has a focal length of 2500 mm - MUCH longer than normally used for a guiding scope. I randomly chose a patch of sky and took a 1 second star field image to locate a guide star. A near-full moon was out, to further push the limits of the camera. A star field emerged, with a couple of somewhat bright stars and a few very faint ones. I picked the faintest one I could see and chose it as the star to "lock" onto. The software immediately told me that the star was too faint, to choose another star. Disappointed, I then chose one of the brighter stars and executed the guiding software. This time it locked on right away, and I watched as the guide star moved continually away to the left of the center of the target circle. This was somewhat expected, as unless you run the calibration routine (of which there are no instructions included in the manual, by the way!) you have to tweak the settings manually. SX does make this easy, however, with "Flip X" and "Flip Y" buttons next to the display. One touch of the "Flip X" control and the star moved right back to the

center of the target in about 20 seconds and stayed there. The tracking error display showed a variance of about 5-7 pixels, which may seem like a lot but at this long focal length those numbers are VERY acceptable and give good tracking for photographic purposes. As I was watching, however, I noticed that the 4-pin cable that connects the camera to the telescope base was showing wires behind where the adapter plugs into the camera. The adapter is a VERY cheap and thin piece of plastic, and VERY small. It is easily torqued into a deformed state by the weight of the cable itself. One can easily purchase a better cable at any Radio Shack, but I chose instead to buttress the connector/cable joint with some electrician's tape and it worked quite well. I then went back to Autostar Suite (the planetarium/control software for my Meade telescope) to see what magnitude star I had successfully and unsuccessfully locked on to get an idea of how well the camera was living up to its reputation. The star I was locked on was so faint it didn't even show on my planetarium software!! I slewed back and forth, went from known stars back to where I had been just to confirm this result. WOW!!

Now much happier, I disconnected the camera from the Meade base, put away the 4-pin cable, and initiated MaxIm DL (my usual telescope/camera control and imaging software). It turns out that MaxIm, Astroart,

and other major control software suites include support software for the Lodestar camera and it came right up when prompted in MaxIm. I then went to the same star and initiated MaxIm's calibration software and got the same result as I did with the SX native software. It wouldn't lock on the faintest stars in the field, but was quite happy with magnitude 8-10 stars with a slightly longer exposure time of 2 seconds. Once locked onto a mag. 8.6 star, the autoguiding errors were somewhat less than the SX software, averaging about 3-4 pixels. So the MaxIm software seemed superior for guiding and tracking.

Happy with this, I then put my imaging camera on to the Televue NP 101is telescope piggybacked to the Meade. This, by the way, is the opposite of how imaging/guiding cameras are usually deployed. Usually a small short focal length guiding scope is used for guiding and imaging done through the longer focal length scope. Theoretically one would get greater accuracy guiding with a longer focal length, as the guiding software would be correcting a smaller absolute area of sky. But the average guiding camera software including the Lodestar corrects at sub-pixel levels, so the guiding telescope can have 1/4 or less the focal length of the imaging telescope and still guide quite adequately for photographic purposes.

(Continued on page 20)

CCD Camera (Cont'd)

(Continued from page 19)

I then proceeded to have one of the best imaging nights of my life. I had previously been using Meade DSI cameras for autoguiding and even tried an Orion Starshoot camera. With Lodestar I never once shot a dark frame to subtract from the guiding images because the CCD chip is so thermally quiet the software was never presented with a significant hot pixel, much less fooled by one. With other cameras finding a suitable guide star was always a chore, especially when guiding through the Meade cameras. Less than magnitude 4 stars simply wouldn't lock or calibrate adequately, so the imaging pictures got framed depending on which nearby star I could lock onto, not where I wanted to frame the object in the imaging camera. The Lodestar does such a better job that I feel like I don't have to hunt around for a suitable guide star. It really does live up to its reputation and advertising claims. It also weights so much less than the Meade DSI cameras that tweaking the balance of the rig front to back wasn't even an issue. My photography has definitely taken a big step forward with this tiny little wonder.

In summary then this reviewer wholeheartedly recommends the Lodestar autoguiding camera for anyone interested in deep sky astrophotography. Its small size and sensitive, quiet chip make it a pleasure to use. It is a flexible

unit, and can go through most major control software suites like MaxIm or through supported telescope bases or even through other guiding cameras in an off-axis guiding setup. The native software, should you chose to use it, is reasonably well organized and laid out intuitively. Personally I find I prefer to use the MaxIm control software, but options are nice to have.

There are some minuses to this camera that need to be mentioned. The instruction manual that comes with the camera is far from complete, which may render significant portions of the native software unusable for

some. The 4-pin cable, while plenty long, has a very cheaply constructed adapter going into the back of the camera and either needs buttressing or replacement if an operator wants to use it heavily. And then there is the price. At more than 700 bucks, this little camera IS expensive, so cost may put it out of the reach of many potential users. There are plenty of other guiding cameras at less than a third the cost of the Lodestar which for many users do an adequate job under most circumstances. I find myself wondering if I didn't have such a generous wife willing to buy this little beauty as a birthday present whether my

(Continued on page 22)

CCAS Original Astrophotography: NGC2024

by Dave Hockenberry



NGC2024 - the Flame Nebula in Orion. Shot 10/26/09 with Starlight Xpress SXVF H9C color camera, stack of 11 five-minute images, through Televue NP101is APO refractor, autoguided with Meade LX200R and Maxim DL5. Images stacked and processed with MaxIm DL 5, stretched and adjusted with MaxIm.

Software Review: Starmap Pro for the iPhone 3GS

by Don Knabb



As a new owner of an iPhone I have been playing around with all the free astronomy applications, or *apps* as they are called. There is a tremendous range of fun and useful apps available for download at no cost. However, I recently decided to upgrade to Starmap Pro, for which I paid \$18.99. Please note that I have no connections to the makers of Starmap Pro and this is not a paid endorsement for the app, just a review from a novice user.

That being said, this app is fantastic! The iPhone 3GS has a built in compass and level that the software uses to determine what direction you are holding the phone and how high in the sky you have it pointed. So, as you sweep around the sky the display moves to show the part of the sky you are actually look-

ing at, as shown in the picture in the lower left.

You can view in portrait or landscape mode and there is a night vision mode that uses only red illumination, but I have found that a little difficult to use, it's just not bright enough.

With just a pinch and spread of your fingers you can zoom into any area of the screen as shown in the image below.

You can zoom in very far to a single star or deep sky object and by touching the object you get information about it.

One feature I really like is the "best things to see tonight" screen as shown in the lower right. This screen gives you a list of what is in the sky and what

times the objects are visible. A tap of the screen will give you information on the object and then another tap will lead you to it on the star map.

Starmap Pro includes approximately 2 ½ million stars and 25,000 objects. It has far too many features for me to go into in this review. For more information you can go to their website: <http://www.star-map.fr/index1.html>. One cute function that is included is a red flashlight mode.

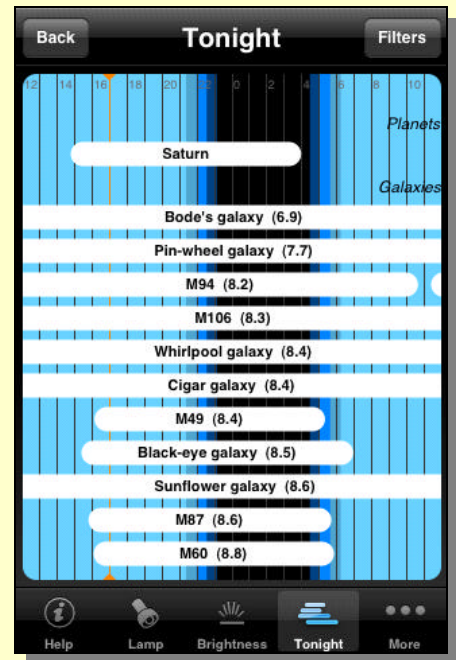
So, if you have an iPhone 3GS and \$18.99 to spend I assure you that you will have a lot of fun and find this app very useful when you are under the stars. Now if I can only get it to work with gloves on!



As you sweep around the sky, the display moves to show the part of the sky you are looking at.



You can zoom into any area of the screen as shown in the image below.



The "Best Thing to See Tonight" feature gives you a list of what's visible & the best viewing time.

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 113 in Merion Science Center (formerly the Boucher Building), attached to the Schmucker Science Center. The Schmucker Science Center is located at the corner of S. Church St & W. Rosedale Ave. Parking is generally available across Rosedale in the Sykes Student Union parking lot (Lot K).



CCD Camera (Cont'd)

(Continued from page 20)

stingy, cheap nature would have overruled my desire for a superior guiding camera. The Lode-star is also in high demand, which means that even if you want to shell out the money for this unit you may have a significant wait before you get it in your hands. Overall, however, I believe that anybody that does obtain the Loadstar will be extremely pleased with their purchase.

For more info visit the manufacturer's website at www.starlight-xpress.co.uk

CCAS Membership Information and Society Financials

Treasurer's Report by Bob Popovich

October 2009 Financial Summary

Beginning Balance	\$1,432
Deposits	\$225
Disbursements	<u>\$0</u>
Ending Balance	\$1,657

Welcome New Members!

This month we welcome Ed Goll and the Bashir Jafar family, both from West Chester, PA, and Marion Constante, from Malvern, PA.

We're glad you decided to join us again under the stars! Clear Skies to you!

Membership Renewals

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

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

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

CCAS Information Directory

Join the Fight for Dark Skies!

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

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

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

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

<http://www.darksky.org>

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

Dark-Sky Website for PA

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

<http://www.POLCouncil.org>

Find out about Lyme Disease!

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

<http://www.LymePA.org>

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

CCAS Event Information

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

Good Outdoor Lighting Websites

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



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 society. 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>



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

4403 Main Street
Philadelphia, PA 19127

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

Hours:

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

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

CCAS Information Directory

CCAS Lending Telescopes

Contact Kathy Buczynski to make arrangements to borrow one of the Society's lending telescopes. CCAS members can borrow a lending telescope for a month at a time; longer if no one else wants to borrow it after you. Kathy's phone number is 610-436-0821.

CCAS Lending Library

Contact our Librarian, Linda Lurcott Fragale, 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. Linda's phone number is 610-269-1737.

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
500 W. Rosedale Ave.
Apt. A-3 Trinity Bldg.
West Chester, PA 19382

CCAS Newsletters via E-mail

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

CCAS Website

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

John welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work; no copyrighted material! Give your contributions to John Hepler (484-266-0699) 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 "star nights" for school, scout, and other civic groups.

CCAS Executive Committee

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

President:	Roger Taylor 610-430-7768
Vice Pres:	Kathy Buczynski 610-436-0821
ALCor and Treasurer:	Bob Popovich 484-467-5562
Secretary and Observing:	Don Knabb 610-436-5702
Librarian:	Linda Lurcott Fragale 610-269-1737
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 484-266-0699
Public Relations:	Deb Goldader 610-304-5303



CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

Check the Treasurer's Report in each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

Phone: 484-467-5562
e-mail: B2N2@verizon.net

Sky & 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 Bob Popovich.

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders.

If you have **any** questions call Bob first at **610-363-8242**.

Astronomy Magazine Group Rates

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