



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

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Two-Time Winner of the Astronomical League's Mabel Sterns Award # 2006 & 2009

May 2011

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Hubble Looks at the Cat's Eye Nebula (NGC 6543)



Photo courtesy of NASA, ESA, HEIC, and The Hubble Heritage Team (STScI/AURA)

Membership Renewals Due

| | |
|---------|--|
| 05/2011 | Fletcher Kutta Long, Jr. |
| 06/2011 | Hebding Kovacs Siskind |
| 08/2011 | Given & Family Knabb & Family Loving & Family Lurcott Fragale Morgan |

Important May 2011 Dates

- 3rd** • New Moon 2:51 a.m.
- 6th** • Eta Aquarid meteor shower peaks.
- 10th** • First Quarter Moon 4:22 p.m.
- 11th** • Venus and Jupiter are only ½ degree apart in the pre-dawn sky.
- 17th** • Full Moon 7:09 a.m.
- 24th** • Last Quarter Moon 2:52p.m.



CCAS Upcoming Nights Out

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

- ☒ **Saturday, May 7, 2011** - Spring National Astronomy Day. Hoopes Park, West Chester, PA. Cohosted with the West Chester Recreation Department.
- ☒ **Saturday, October, 2011** - Fall National Astronomy Day. Anson Nixon Park, Kennett Square, PA.

Spring/Summer 2011 Society Events

May 2011

4th • PA Outdoor Lighting Council monthly meeting starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

6th • West Chester University Planetarium Show: "Venus: The Evening Star", Schmucker Science Building, Show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via [e-mail](#) or visit the planetarium's [webpage](#).

7th • National Astronomy Day.

7th • CCAS Monthly Observing Session, Night Out at Hoopes Park, West Chester. The free public event is co-hosted with the West Chester Recreation Department. The observing session starts at sunset.

10th • DVD Lecture Series: "Ripples in the Cosmic Background Radiation", halfhour 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.

10th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: Dr. Ross Fadley, Haverford College. "Gravitational Lensing & Dark Matter."

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

26th • Deadline for newsletter submissions for the June 2011 edition of [Observations](#).

June 2011

1st • PA Outdoor Lighting Council monthly meeting starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

3rd • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date June 4th). The observing session starts at sunset.

10th • DVD Lecture Series: "The Stuff of the Cosmos", halfhour 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.

10th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. The meeting starts at 7:30 p.m. Guest Speaker: Guest Speaker: Jerry Lodriguss: "Secrets of DSLR Astrophotography."

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

26th • Deadline for newsletter submissions for the June 2011 edition of [Observations](#).

Minutes from the April 2011 CCAS Monthly Meeting by Don Knabb, CCAS Secretary and Observing Chair

- Approximately 14 members were in attendance.
- DVD presentation: Afterglow of the Big Bang was shown.
- Program – Program Chair Dave Hockenberry made a presentation concerning the Astronomical League Arp Peculiar Galaxies observing club.
- Constellation of the Month – Observing Chairperson Don Knabb presented the constellation Corvus the Crow.

CCAS Original Astrophotography by Gaston Baudat



Target: M33, Triangulum Galaxy, 66 minutes of total exposure (22 x 3 minutes) at -20 degrees C.
Date & place: November 28th 2010 at Glenmoore (PA).
Scope: Takahashi FSQ 85-ED.
Mount: Celestron CGE
Imager: SBIG ST4000 XCM
Guider: SBIG remote guider head
Processing: Dark, flat, bias frame calibration and pre-processing on Maxim -DL. Final image processing on Photoshop.

Upcoming CCAS Elections

by John Hepler, CCAS Webmaster & Newsletter Editor

Every two years, CCAS holds officer elections for the positions of president, vice president, secretary, and treasurer. These four positions form the core of our Society and are endowed with specific responsibilities.

In this article, we will first review the election process and the responsibilities of the elected officials. Subsequently we will look at the members involved in the election process. Special mention is also given to the positions appointed by the president.

According to the Society's constitution, available on our website at <http://www.ccas.us>, the election process is defined below (please note, with the cancellation of the February meeting due to inclement weather, we are effectively one month behind in our meeting calendar).

"In an election year, an election committee consisting of three (3) members, one acting as chairperson, shall be appointed by the president on or before the March meeting for the purpose of selecting candidates for the offices. Names of the candidates shall be presented in writing to the Society at the April meeting. All candidates must agree to serve if elected. Nominations may be accepted from the floor at the April meeting."

"In an election year, the election committee shall conduct the

election and announce the results to the Society during the May meeting. If only one person is nominated for any office the secretary shall cast one vote for the election of that person. The newly elected officers shall be installed at the June meeting."

Duties of the elected officers are described in the following paragraphs.

"The president shall preside over all meetings. The president shall appoint the chairperson of all committees and be an ex-officio member of all committees except the election committee. The president shall be responsible for the functioning of all committees."

"The vice president shall perform all the duties of the president in the absence of the president, and function as chair of the executive committee."

"The secretary shall keep minutes of all meetings. The secretary shall also conduct, or delegate responsibility for, the correspondence of the Society and be responsible for the distribution of newsletters and notices as directed by the president."

"The treasurer shall hold in a bank account all moneys belonging to the Society. A written financial statement including a copy of the current bank statement and a record of all expenses paid shall be presented by the treasurer at each meeting

and a copy given to the secretary.

The treasurer shall keep an updated list of all members, the status of their dues, and current addresses, and furnish the other officers a copy of that list upon request."

Of particular note this year, due to life changes of the current members serving in these positions, it is important that the offices of vice president and treasurer are filled. Both our current president, Roger Taylor, and secretary, Don Knabb, have offered to run again unless someone else expresses an interest in these positions.

All regular members in good standing may vote in the election. Honorary members, student members, and junior members may not participate in the election process.

Chair positions, including webmaster, newsletter editor, observing, education, public relations, librarian, and programs are not elected positions. The president appoints these positions to serve for the duration of his/her term.

If you are interested in running for office, or wish to serve on the election committee, please contact the executive committee at exec@ccas.us, or plan to attend the monthly meeting scheduled on Tuesday, May 10, 2011.

Telescope Review – Lunt Solar Systems LS60THa Imaging System

by Dave Hockenberry, CCAS Program Chair

Most of us in the amateur astronomy community started our hobby because of a fascination of the stars. Beautiful pinpoints of twinkling lights hung like jewels in the dome of the night sky, beckoning to our curiosity and wonderment. It is also familiar to many of us the frustration we feel when after a gorgeous, cloudless day our anticipation of a nights observing gets dashed by an attack of nighttime clouds. ARRGGHHH!

But what if we could turn the tables on those high fluffy clouds that try to sneak in overhead at dusk? A solar telescope is one means to do precisely that! After all, our Sun is a star like any other even if it is really close. And it is the ONLY star that human beings can actually appreciate any surface detail on. Astronomers have several ways to directly observe the sun directly without ruining their eyesight. These vary from filters attached in front of the main objective lens to Herschel Wedge devices that replace the diagonal at the back of the scope, or even combinations of the two. Filters can even be chosen to view in specific wavelengths in order to bring out whatever desired features of the sun we wish to observe.

For those of us who are lazy, and don't want to adapt filters or wedges to our nighttime rigs, Lunt Solar Systems provides telescopes that are designed for only one purpose – solar obser-



vation. These are specially designed packages with etalons built into a refractor tube, with main filters already installed in front of the objective and integrated into the rear diagonal at the back. These telescopes come ready to use right out of the box. Lunt sells several sizes of these, in varying configurations of filters and accessories depending on what the buyer wants. Solar refractor sizes can be purchased from 35 mm to 152 mm objective diameter, and for the dedicated solar telescopes one can get it configured with a single objective filter or can order a “double stack” option for greater surface detail. Lunt also sells stand-alone filters and adapters for pre-existing refractors if you want to convert your nighttime scope for solar observing.

Being one of the lazy types, I went for the complete solar package. Ann ordered the LS60 THa telescoped configured as an “Imaging Package.” This package includes a 60 mm refractor with an objective filter permanently integrated into the front of the telescope, a blocking/trimming filter that takes the place of a diagonal at the rear of the scope, a tube clamshell for quick and easy mounting of adapter plates/tripod attachment, a pressure tuner that fine tunes

the etalons built into and extending from the side of the telescope tube, a Crayford-style focuser, and a TeleVue “Sol Searcher” that takes the place of a finder scope. The imaging package also includes a separate LS50F additional objective filter that screws onto the permanent filter on the front so that the user can “double stack” the objective filter for greater visual and especially photographic surface details. Single stack configurations make solar prominences brighter and easier to see along the edge of the sun's disc, while double stacking really makes the surface details of the photosphere pop

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May 2011 Guest Speaker

by Dave Hockenberry, CCAS Program Chair

Our May 2011 guest speaker is Dr. Ross Fadley, Haverford College. His presentation is entitled “Gravitational Lensing & Dark Matter.”

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

We are looking for presenters for our fall 2011 season. If you are interested in presenting or know someone who would be an interesting guest speaker, please contact Dave Hockenberry.

NASA Looks for Education Partners

submitted by Dave Nagel, t.h.e. Journal

NASA is seeking collaborators to help with its education goals in the areas of science, technology, engineering, and math (STEM). The space agency posted an announcement late last week calling for "unfunded collaborations with organizations to enhance its ability to achieve its strategic goals, outcomes and objectives as they relate to education."

Among the objectives of the collaborations are:

- Helping to improve STEM education through teacher professional development and the adoption of education technology in schools;
- Partnering with education organizations—schools, museums, and other providers of formal and informal education—to disseminate NASA materials to promote STEM;

- Helping to prepare, recruit, and retain students in higher education, both graduate and undergraduate, in STEM disciplines;
- Creating and providing STEM-focused educational resources;
- Contributing to STEM education policies and strategies;
- Expanding opportunities for participating in NASA programs; and
- Providing "clear, accurate, timely, and consistent information that is readily available and suitable for a diverse audience."

Eligibility for partnerships is open to all organizations in the United States, including governmental agencies. Evaluations of proposals will be based in part on how well the submitting organizations mesh with NASA's mission and vision; how well the

proposals will help broaden NASA's reach and help it achieve its goals outlined in its [2011 strategic plan](#); and quality of the metrics for measuring the success of the proposals.

Responses can be submitted through the remainder of 2011.

Further details about the request for collaboration, including complete criteria for evaluating proposals, can be found at http://www.nasa.gov/offices/education/about/NASA_Seeks_Collaborators.html. NASA's broader education resource portal can be accessed <http://www.nasa.gov/offices/education/about/index.html>.

To view the official announcement, visit http://www.nasa.gov/pdf/533755main_Partnership_Announcement.pdf.

Space Shuttle Endeavour to Launch No Earlier Than May 16, 2011

courtesy of NASA

NASA managers have retargeted space shuttle Endeavour's launch to no earlier than Monday, May 16. After a meeting on Friday, they also extended the length of Endeavour's STS-134 mission to the International Space Station from 14 to 16 days. If Endeavour launches on May 16, liftoff would be at 8:56 a.m. EDT.

At 3 p.m. on Monday, May 9, NASA Space Shuttle Program

Launch Integration Manager Mike Moses and Shuttle Launch Director Mike Leinbach will hold a news conference at Kennedy Space Center in Florida to discuss the progress of repairs since Endeavour's launch postponement on April 29. The news conference will air live on NASA Television and online at www.nasa.gov/ntv.

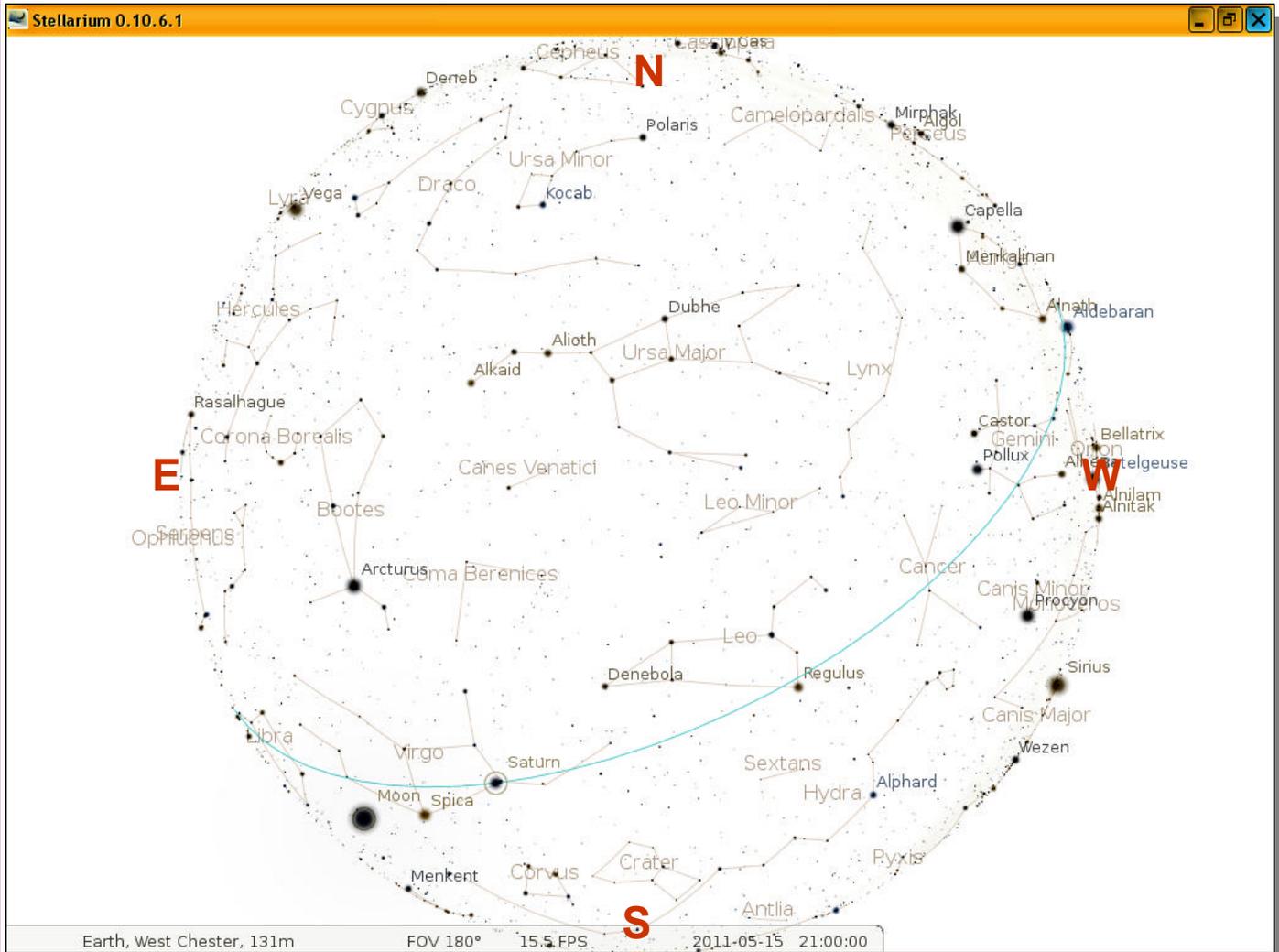
Launch attempts are available through May 26. May 21 is the

only day a launch is not an option because it would lead to a May 23 docking with the space station. May 23 is when three of the space station's Expedition 27 crew members undock and return home in their Soyuz spacecraft. Managers reviewed the STS-134 mission timeline and determined the Endeavour crew can accomplish all objectives even with the departure of the three station crew members.

The Sky Over Chester County

May 15, 2011 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 |
|-----------|-----------------------|---------------|---------------|---------------------|---------------|
| 5/01/2011 | 5:32 a.m. EDT | 6:01 a.m. EST | 7:55 p.m. EST | 8:24 p.m. EDT | 13h 54m 01s |
| 5/15/2011 | 5:15 a.m. EDT | 5:46 a.m. EDT | 8:09 p.m. EDT | 8:40 p.m. EDT | 14h 23m 10s |
| 5/31/2011 | 5:02 a.m. EDT | 5:34 a.m. EST | 8:22 p.m. EST | 8:55 p.m. EDT | 14h 48m 03s |

| Moon Phases | | | | | |
|---------------|-----------|---------------|--------------|-----------|---------------|
| First Quarter | 5/10/2011 | 4:22 p.m. EDT | Last Quarter | 5/24/2011 | 2:52 p.m. EDT |
| Full Moon | 5/17/2011 | 7:09 a.m. EDT | New Moon | 5/03/2011 | 2:51 a.m. EDT |

May 2011 Observing Highlights

by Don Knabb, CCAS Secretary & Observing Chair

- May 3 New Moon, 2:51 a.m.
- May 6 Eta Aquarid meteor shower peaks
- May 7-15 In the pre-dawn sky watch Mercury, Venus and Jupiter as their arrangement changes each day
- May 10 First-quarter Moon, 4:33 p.m.
- May 11 Venus and Jupiter are only ½ degree apart in the pre-dawn sky
- May 17 Full Moon, 7:09 a.m.
- May 24 Last Quarter Moon, 2:52 p.m.

The Best Sights This Month: Saturn was at opposition on April 4th so it continues to delight us throughout May. If you don't mind getting up before dawn there is an incredible show of planets with Mercury, Venus, Mars and Jupiter in the east during the first three weeks of May. The best observing is between May 7th and the 15th. On May 11th Venus and Jupiter are only ½ degree apart and Mars and Mercury are not far away.

Mercury: Mercury is quite low in the pre-dawn sky, so use binoculars to find this dim planet during May.

Venus: Our sister planet is impossible to miss in the pre-dawn sky, shining at magnitude -3.8.

Mars: The red planet is low and dim in the pre-dawn sky during May, so if you are searching for Mercury with your binoculars use them also to see Mars.

Jupiter: Jupiter is rising out of the glow of the dawn as May progresses and is higher than Venus by month's end.

Saturn: Although Saturn is past peak brightness it is now better positioned in the sky for evening viewing. The rings are tilted at 8 degrees to us so you can easily see the gap between the planet and the rings and with a closer look you can find the Cassini Division, the dark gap that separates the two brightest rings.

Uranus and Neptune: Uranus and Neptune will be in much better viewing position later in the year when they enter the evening sky.

The Moon: Full Moon is on the morning of May 17th so it will be large and bright that evening and the previous evening. Native Americans called this the Full Flower Moon. In most areas, flowers are abundant everywhere during this time, thus, the name of this Moon. Other names include the Full Corn Planting Moon, or the Milk Moon.

One of my favorite sights on the Moon is the Bay of Rainbows, or Sinus Iridum. Look for this large feature in the northwestern quadrant on May 12 when lunar sunrise occurs on this area of the Moon.

Constellations: Spring is here, and with it the Big Dipper is high overhead. Follow the arc to bright Arcturus and find Boötes. Just to its left is the Northern Crown, Corona Borealis. Leo is easy to find just after sunset looking due south. And bright Vega in Lyra is rising as the night gets a bit later. Stay out later still and watch Cygnus the Swan fly above the eastern horizon.

Messier/Deep Sky: It is once again globular cluster time! M3 is high overhead during May. Take a look at the glow of 500,000 stars in your eyepiece! And stay up a bit later as M13, the Great Globular Cluster in Hercules rises in the east. M13 contains several hundred thousand stars, perhaps a million!

Comets: There are no bright comets visible during May.

Meteor Showers: Comet Halley leaves a trail of debris as it passes through the solar system, and the Eta Aquarid meteors are that debris, as are the Orionids of October. Conditions for us in the northern hemisphere are not optimum for this shower but is worth taking a look in the pre-dawn sky at the peak of the shower on May 6th or a day before or after that peak.

Lunt (Cont'd)

(Continued from page 4)

out. Bandpass in the double stacked arrangement is listed as less than 0.5 Angstroms at 656 nanometers (read – detailed hydrogen). List price for the Imaging Package is \$2,642.00 US. The hardware, with the exception of the Sol Searcher, is entirely manufactured and assembled at their production facility in Arizona.

What does NOT come as part of the package are any eyepieces, adapter plates to connect the tube to a mount, or a tripod. Lunt does sell adapter plates for a variety of mounts including Vixen, Losmandy, TeleVue, and other popular tripods. Lunt also sells a Zoom eyepiece specifically designed for their scopes that goes from 7.2 to 21.5 mm. Also available are other items such as focal reducers, camera adapters and the like.

My system took several months to arrive from the time of order from Skies Unlimited, our local Lunt dealer. It came in two boxes, one with the telescope and most of the accessories, and another box containing the double stack LS50F filter. Each comes in its own very sturdy metal case with excellent padding and latches as part of the package. These high quality cases are more than up to heavy travel abuse, such as airline transportation. Basic printed instructions on getting started are provided in the telescope case, but more detailed instructions are available on-line for



Lunt Solar Systems LS60THa Solar Telescope

download. I had also pre-ordered an adapter plate to connect the solar scope to an iOptron “Cube” GoTo mount. The fit and finish of the system was impressive, and the color scheme a pleasure to look at. Set-up takes about 60 minutes from first looking at the instructions.

First light with a solar telescope takes some doing. The first thing that needs to be done is to equalize the pressure in the pressure tuner, a large metal piston that sits off the side of the telescope. This is a screw-type piston that in transport can sometimes lose pressure, making the etalons in the solar scope difficult to tune. Unscrewing the top I immediately heard a slight hiss, then screwed the cap back on. This proved somewhat challenging at first, as the resistance spring is very well greased and the spring is stiff.

Next, the mounting plate was easily attached to the provided tube clamshell and mounted on the iOptron. This is a lightweight scope in single stack configuration so balance was a snap. It was then outside to get first light! After the iOptron took a GPS reading and slewed to the sun, the next challenge was to get the Sol Searcher dialed in. One can get close by standing in front of the telescope and adjusting the rig so that the shadow of the front filter falls symmetrically on the tube clamshell. This placed the disc of the sun within the eyepiece field of view, but very out of focus. I had to loosen the set screws that hold the diagonal/rear blocking and trimming filter and withdraw the rather long tube out about half-way. This brought the disc into rough focus. After centering, it was an easy job to put the small circle of the sun in the

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Lunt (Cont'd)



CCAS member Ann Miller wearing an Astro Hoodie while observing the Sun

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Sol Searcher onto the pale screen. I have not had to adjust it since.

Next chore was to tune the etalons with the pressure tuner. This is a bit of “guess and by gosh” but when you get close the surface details pop into view. It took me about 4 or 5 complete turns of the piston to get close, then after refocus and fine tuning the image looked sharp. I was told by Bob Black at Skies Unlimited that occasionally they have to pull the top off the piston if barometric pressure changes a whole lot in order to get crisp focus. Since my original pressure tune I haven’t needed to repeat the process, but it only takes a minute or two.

Now I could enjoy a good look at the sun! Since I grew up in the dark and ancient times where we were always told “never look at

the sun through a telescope or permanent eye damage can result” it was a real thrill to be looking right at the solar disc. What a treat! Sunspots were easily visible, and several prominences were easy to spot at the solar limb. After a prolonged solar minimum, the sun has been kicking up quite a show in recent months.

Next, I screwed on the additional LS50F filter to the front in a “double stack” arrangement. The very first thing I noticed was that the iOptron was complaining, making worse whining noises than usual. Indeed the tracking was putrid, so I had to shut down the Cube and rebalance the telescope with the additional filter on the front. On restarting the Cube and synching on the sun, the Cube was happy once again. The second filter also needs to be tuned, and a brass knurl on the filter itself is used for this.

When I first looked through the eyepiece I was seeing three solar discs, so to tune the second filter the knurl is moved until the two “ghost” discs on either side of the main image move out of the field of view. NOW I could really see fine surface detail, like rice in a bowl of tomato soup. Sunspots become much sharper as well. The solar prominences, as expected, became much dimmer. But the single stack arrangement can be quickly returned to in about 3-4 minutes time.

The instructions that come with the hardware give sound advice – wear a hat and some sun-screen. True, it is the end of winter and a paleface like me needs all the vitamin D I can get. But watching the sun is mesmerizing and one can get a quick sunburn if not careful. The hat is also a good idea as it really is very distracting to have a brilliant light encroaching on the eyepiece when trying to let subtle solar surface details come to your eye. This is especially true for the double stack configuration, as the image is rather dark and the field of view through the eyepiece is cut down by about 20%. Indeed, CCAS member Ann Miller is shown solving this problem with the Astro Hoodie (purchased by several of our Club members recently) in the photo above. The other thing to be careful of is the habit that all astro observers get over the years of looking up the scope tube when an im-

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Looking Up: Mizar and Alcor, the famous double star in The Big Dipper

by Don Knabb, CCAS Secretary & Observing Chair

At any star party there are a few classic objects to see in the sky. One of those objects is the double star Mizar and Alcor in the Big Dipper. It seems that The Big Dipper, that most famous of all asterisms in Ursa Major, is almost always in the sky for our star parties. With a low horizon one can always see Ursa Major in the sky. It is a circumpolar constellation. That is, from our latitude, Ursa Major never sets. Yes, it is low in the sky during the winter months, but star parties are few during those cold months.

At a star party it is always fun to point to the Big Dipper and tell people there is a double star right in front of them that they might not know about. Anyone with reasonable eyesight, if they look closely, will then see that the 2nd star from the end of the Big Dipper's handle is indeed a double star. Those stars are Mizar and Alcor.

To the right is a picture taken by Jerry Lodriguss, a famous local astrophotographer and author who will be making a presentation at our June CCAS meeting.

There is quite a collection of mythology concerning Mizar and Alcor.

Mizar and Alcor together are sometimes called the "Horse and Rider." Native Americans named these stars the Squaw and the Papoose. In Japanese mythology, Alcor is known as the lifespan star or "jumyouboshi" as it was



Image courtesy of Jerry Lodriguss

believed that one who could not see this star would pass away by year's end.

There are two stories that link Alcor to The Pleiades in Taurus. The Pleiades are often called the Seven Sisters. But it is quite difficult to see more than six stars in this beautiful cluster with the naked eyes. What became of the Lost Pleiad? One story is that the seventh sister was taken away by Mizar, one of the seven brothers of the Big Dipper, and there she remains, little Alcor, at his side. Another story that is Greek in origin suggests Alcor was once part of the Pleiades and that Alcor was the Lost Pleiad Electra, which had wandered here from her companions and became Alopex, the Fox.

The ability to resolve the two stars with the naked eye is often quoted as a test of eyesight. Mizar shines at magnitude 2.2

while Alcor is quite a bit dimmer at magnitude 4.0.

Mizar and Alcor lie three light-years apart, and though their proper motions show they move together (they are both members of the Ursa Major Moving Group), it was long believed that they did not form a true binary star system, but simply a double star. The pair of Mizar and Alcor are actually much more than a simple double star. It is actually a collection of 6 stars, although not all of these are within the reach of amateur level telescopes.

Mizar is a prime target for someone with a new telescope, as the components are an easy 14 seconds of arc apart, the two taking at least 5000 years to make their orbit about each other. More remarkably, each of these two

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Mizar & Alcor (cont'd)

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components is AGAIN double. The brighter of the two (magnitude 2.27) contains a very close pair a mere 7 or 8 thousandths of a second of arc apart (an angle made by a penny at a distance of 300 miles) that has an orbital period of 20.5 days. The fainter of them (magnitude 3.95) contains a pair with a period of about half a year. Mizar is thus actually a quartet of stars, a double-double.

In 2009, it was reported by astronomer Eric Mamajek and collaborators that Alcor actually is itself a binary, consisting of Alcor A and Alcor B, and that this binary system is most likely gravitationally bound to Mizar, bringing the full count of stars in this complex system to six.

So at our next star party, or anytime you gaze upward at the Big Dipper, tell someone the story of these stars that at first glance look like one star, but with closer inspection are actually two that can be seen with the naked eye by most people on a reasonably clear night. And with really close inspection by high powered telescopes it is revealed that there are really six stars in the group.

Information credits:

Raymo, Chet. 1982. *365 Starry Nights*. New York, NY. Simon & Schuster

[http://en.wikipedia.org/wiki/Mizar_\(star\)](http://en.wikipedia.org/wiki/Mizar_(star))

<http://www.astropix.com/HTML/>

[C_SPRING/BIGDIP.HTM](http://www.astropix.com/HTML/C_SPRING/BIGDIP.HTM)

<http://stars.astro.illinois.edu/sow/mizar.html>

<http://stars.astro.illinois.edu/sow/alcor.html>

Lunt (Cont'd)

(Continued from page 9)

age gets blurry or something seems wrong. We all do this at night, but unconsciously doing this with full sunlight in your face can not only be an unpleasant surprise, it can also damage your vision. A good floppy hat with a broad brim sure helps protect me from myself!

Solar observing is great fun, but of course the Lunt Imaging System scope was purchased with photography in mind. So I couldn't resist getting out the Meade LPI Webcam for a first attempt at solar photography. This is also fun, but not so easy as I anticipated. Webcams working over USB connections into a computer don't go very far unless you have a signal booster, so I immediately discovered how hard it is to see a computer screen in broad sunlight! Focusing is hard enough without squinting at a barely visible screen. So if you want to take pictures, you need either (a) a large box to shade your computer monitor at scopeside, or (b) a powered USB connection

to run your computer inside. I chose the box, as focus is easier to attain when you are near the scope. First attempt at some "stack on the fly" pictures are shown below.

Having a solar scope really enhances my observing experience, and the Lunt is a pleasure to use. This rig is somewhat pricier than its competitors like Coronado (now owned by Meade). The fit and finish of this unit makes it a pleasure to own. It is also expensive, and on a budget it may be more worthwhile to purchase the filters alone and mount them on an already existing refractor. But the convenience factor cannot be overstated. I can pick up the whole thing with one hand, plug in the iOptron outside, and be tracking and observing in less than two minutes. Wow!! For those who wish to further enhance their solar observing, different band filters like Calcium-K are also manufactured by Lunt. Overall I highly recommend this telescope to those who wish to explore "daytime astronomy." For those interested in serious photography this is also a great scope, but I would not recommend using a flyweight easily disturbed mount like the Cube. A sturdier mount, or piggy backed on to a heavier rig, is a better choice for fine detail photographic work.



First attempt at some "stack on the fly" pictures

(Continued on page 13)

Cosmic Recount

by Dr. Tony Phillips

News flash: The Census Bureau has found a way to save time and money. Just count the biggest people. For every NBA star like Shaquille O’Neal or Yao Ming, there are about a million ordinary citizens far below the rim. So count the Shaqs, multiply by a million, and the census is done.

Could the Bureau really get away with a scheme like that? Not likely. Yet this is just what astronomers have been doing for decades.

Astronomers are census-takers, too. They often have to estimate the number and type of stars in a distant galaxy. The problem is, when you look into the distant reaches of the cosmos, the only stars you can see are the biggest and brightest. There’s no alternative. To figure out the total population, you count the super-massive Shaqs and multiply by

some correction factor to estimate the number of little guys.

The correction factor astronomers use comes from a function called the “IMF”—short for “initial mass function.” The initial mass function tells us the relative number of stars of different masses. For example, for every 20-solar-mass giant born in an interstellar cloud, there ought to be about 100 ordinary sun-like stars. This kind of ratio allows astronomers to conduct a census of all stars even when they can see only the behemoths. Now for the *real* news flash: The initial mass function astronomers have been using for years might be wrong.

NASA’s Galaxy Evolution Explorer, an ultraviolet space telescope dedicated to the study of

galaxies, has found proof that small stars are more numerous than previously believed.

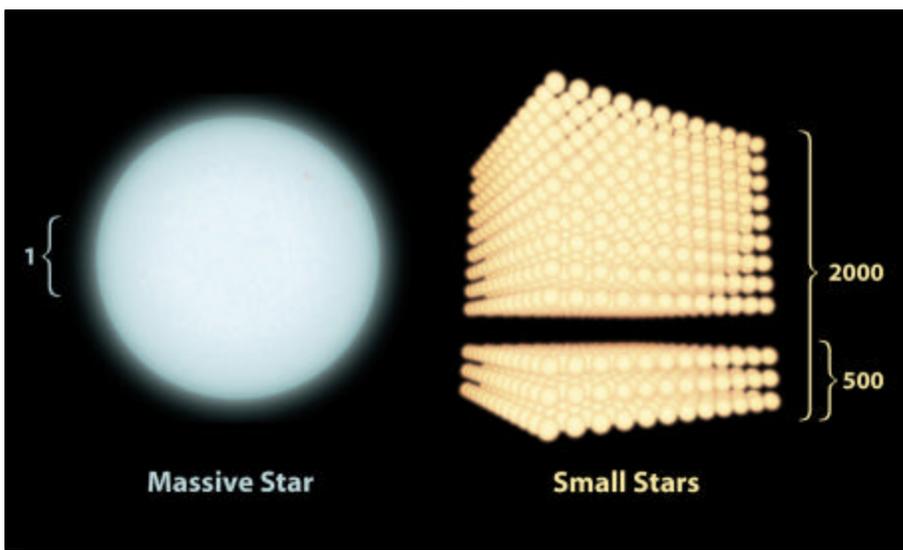
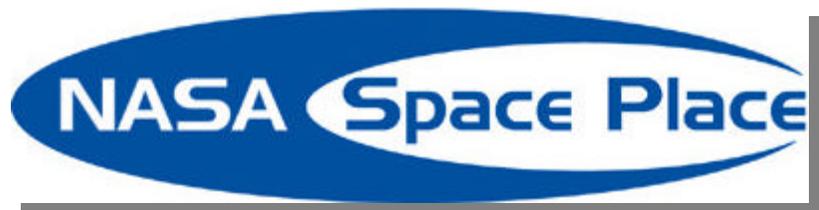
“Some of the standard assumptions that we’ve had—that the brightest stars tell you about the whole population—don’t seem to work, at least not in a constant way,” says Gerhardt R. Meurer who led the study as a research scientist at Johns Hopkins University, Baltimore, Md. (Meurer is now at the University of Western Australia.)

Meurer says that the discrepancy could be as high as a factor of four. In other words, the total mass of small stars in some galaxies could be four times greater than astronomers thought. Take that, Shaq!

The study relied on data from Galaxy Evolution Explorer to sense UV radiation from the smaller stars in distant galaxies, and data from telescopes at the Cerro Tololo Inter-American Observatory to sense the “H-alpha” (red light) signature of larger stars. Results apply mainly to galaxies where stars are newly forming, cautions Meurer.

“I think this is one of the more important results to come out of the Galaxy Evolution Explorer mission,” he says. Indeed, astronomers might never count

(Continued on page 14)



Astronomers have recently found that some galaxies have as many as 2000 small stars for every 1 massive star. They used to think all galaxies had only about 500 small stars for every 1 massive star.

Nicholas's Humor Corner
by Nicholas La Para

ASTRONOMY NEWS

GRAVITY REPEALED!

- * In a surprise coalition, Democrats and Republicans combined to repeal the law of gravity.
- * Republicans: "Gravity is too expensive."
- * Democrats: "This solves the problem of overweight once and for all."

LAPARA

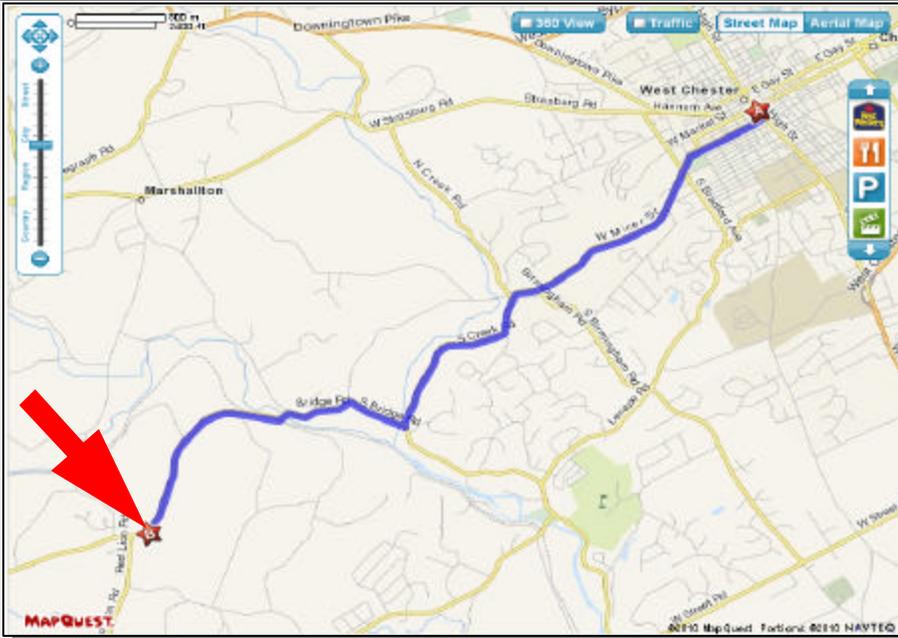
Lunt (Cont'd)

(Continued from page 11)

For more information about Lunt Solar telescopes check out their web site at www.luntsolarsystems.com.

For those interested, Chuck Zarcone of Delaware Valley Amateur Astronomers organizes a "Solar Saturday" once a month during the Spring through Fall months. Different makes and sizes of telescopes are used at these events, and DVAA encourages anybody interested to stop on by and join the fun. Check the DVAA web site for their Solar Saturday schedule.

CCAS Directions



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.

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.

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

CCAS Directions

West Chester University Campus

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



Space Place (Cont'd)

(Continued from page 12)
stars the same way again.

Find out about some of the other important discoveries of the Galaxy Evolution Explorer at <http://www.galex.caltech.edu/>. For an easy-to-understand answer for kids to “How many solar systems are in our galaxy?” go to The Space Place at: <http://tiny.cc/I2KMa>

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

CCAS Membership Information and Society Financials

Treasurer's Report by Bob Popovich

March 2011 Financial Summary

| | |
|-------------------|---------|
| Beginning Balance | \$1,469 |
| Deposits | \$165 |
| Disbursements | \$178 |
| Ending Balance | \$1,456 |

New Member Welcome!

Welcome new CCAS members Quinn Swearigen of Kennett Square, PA, and Dmitry Znamsky of West Chester, PA.

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

Membership Renewals

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

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.

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

Contributing to Observations

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

Or mail the contribution, typed or handwritten, to:

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

CCAS Newsletters via E-mail

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

CCAS Website

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

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

CCAS Purpose

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

CCAS Executive Committee

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

| | |
|----------------------------------|----------------------------------|
| President: | Roger Taylor 610-430-7768 |
| Vice Pres: | Kathy Buczynski 610-436-0821 |
| ALCor and Treasurer: | Bob Popovich 484-467-5562 |
| Secretary and Observing: | Don Knabb 610-436-5702 |
| Librarian: | Barb Knabb 610-436-5702 |
| Program: | Dave Hockenberry 610-558-4248 |
| Education: | Kathy Buczynski 610-436-0821 |
| Webmaster and Newsletter: | John Hepler 724-801-8789 |
| Public Relations: | Deb Goldader 610-304-5303 |



CCAS Membership Information

The present membership rates are as follows:

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

Membership Renewals

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

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

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

Sky & 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 **484-467-5562**.

Astronomy Magazine Group Rates

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