



# 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 2013

## In This Issue

CCAS Spring/Summer	
2013 Events .....	2
April 2013 Meeting Minutes .....	2
Nicholas's Humor Corner.....	2
May 2013 CCAS Meeting .....	3
Skylab Launched 40 Years Ago .....	3
Gamma Rays "Wow" Astronomers.....	3
The Sky Over Chester County:	
May 2013 .....	4
May 2013 Observing	
Highlights .....	5
Le Quattro Stelle—An Update .....	6
Anson Nixon Star Party	
a Success! .....	9
NASA's Space Place .....	10
CCAS Directions: Brandywine	
Valley Association.....	11
Through the Eyepiece:	
Melotte 111, the Coma	
Cluster of Stars .....	12
Membership Renewals .....	14
New Member Welcome.....	14
CCAS Directions:	
WCU Map.....	14
Treasurer's Report .....	14
CCAS Information Directory .....	15-16

## Dual-Scope Mount



CCAS Member Frank Angelini describes the latest updates to his backyard observatory and the dual-scope mount he constructed for his refractor and new SCT on pp. 6-8.

## Important May 2013 Dates

- 5th-6th** • Eta-Aquarid Meteor Shower Peaks.
- 9th** • New Moon, 8:29 p.m.
- 18th** • First Quarter Moon, 12:35 a.m.
- 25th** • Full Moon, 12:25 a.m.
- 31st** • Last Quarter Moon, 2:59 p.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.

☼ **Friday, May 17, 2013.** CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

☼ **Friday, June 14, 2013.** CCAS Monthly Observing Session, Myrick Conservancy Center, BVA. The observing session starts at sunset.

## Membership Renewals Due

05/2013	Cline & Family Long, Vic, Jr. Weiss & Family
06/2013	Hebding Kovacs Siskind
07/2013	Hockenberry / Miller
08/2013	Harp Knabb Lurcott, Linda Zimmer

## Spring/Summer 2013 Society Events

### May 2013

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

**3rd** • West Chester University Planetarium Show: "Spectacular Saturn," in the Schmucker Science Building. The show starts at 7 p.m. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

**9th** • The von Kármán Lecture Series: [Radar Imaging of Near Earth Asteroids](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

**14th** • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. Meeting Program: Youth Night. TJ Piccolo and Hunter Ralls will present their research projects.

**17th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date May18th). The observing session starts at sunset.

**20th** • Open call for articles and photographs for the June 2013 edition of [Observations](#).

**26th** • Deadline for newsletter submissions for the June 2013 edition of [Observations](#).

### June 2013

**5th** • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

**14th** • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date May15th). The observing session starts at sunset.

**20th** • The von Kármán Lecture Series: [Forecasting Quakes: Facts, Myths and Possibilities](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

**20th** • Open call for articles and photographs for the June 2013 edition of [Observations](#).

**21st** • Summer Solstice (1:04 AM EDT) - The North Pole of the earth will be tilted toward the Sun, which will have reached its northernmost position in the sky and will be directly over the Tropic of Cancer at 23.44 degrees north latitude. This is the first day of summer (summer solstice) in the northern hemisphere and the first day of winter (winter solstice) in the southern hemisphere.

**26th** • Deadline for newsletter submissions for the June 2013 edition of [Observations](#).

## Minutes from the April 9, 2013, CCAS Monthly Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor, president, greeted 19 members and guests. He thanked all who participated in the successful but cold Bucktoe Star Party.
- Don Knabb, observing chair, announced upcoming star parties at Springton Manor on April 12 and at Anson Nixon Park in Kennett Square on April 20. He followed with a monthly sky tour on Stellarium.
- Our speaker for the evening was introduced by program chair, David Hockenberry. Dr. Paul Halpern, professor of Physics at the University of the Sciences, presented "Edge of the Universe" cosmology over the last century. Dr. Halpern also signed copies of his most recent book of the same name.

## Nicholas's Humor Corner

by Nicholas La Para



## May 2013 CCAS Meeting

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on April 9, 2013, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Meeting Program: Youth Night. TJ Picclo and Hunter Ralls will present their research projects.

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

We are looking for presenters for our meetings in the 2013-2014 season. If you are interested in presenting, or know someone who would like to participate, please contact me at [programs@ccas.us](mailto:programs@ccas.us).

## Skylab Launched 40 Years Ago

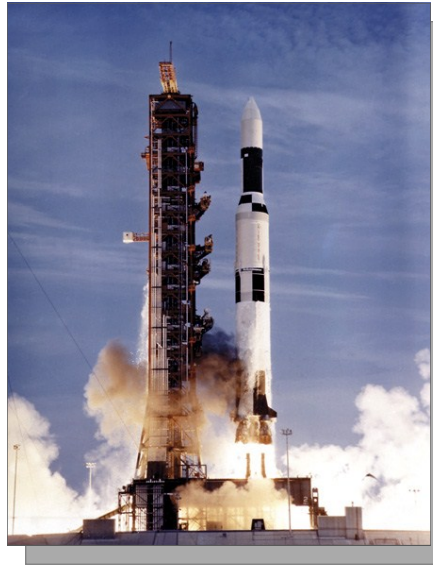


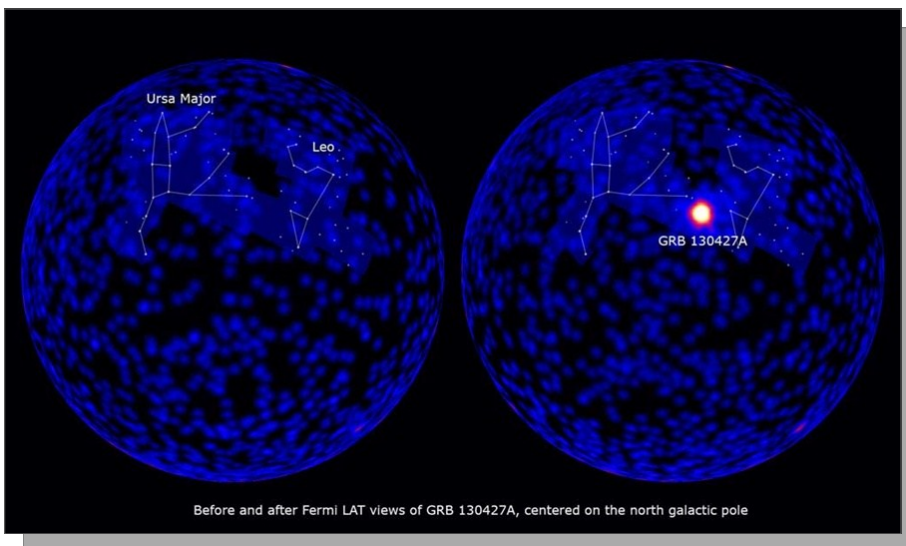
Image courtesy of NASA

Tuesday, May 14, 2013, marks the 40th anniversary of the launch of Skylab, America's first space station. During its launch, the unmanned Skylab was severely damaged when turbulence caused a sun shield and a solar panel to tear loose. Another solar panel was unable to deploy.

A week later, the first Skylab crew was launched, and over the course of several days they were able to deploy the remaining solar panel and install a makeshift sunshade, thus ensuring a useful life for the station, which was as large as a three-bedroom house. Astronauts Charles Conrad, Joseph Kerwin and Paul Weitz spent twenty-eight days onboard Skylab, doubling Gemini 7's 1965 space endurance record.

Skylab included the Apollo Telescope Mount, which was a multi-spectral solar observatory, Multiple Docking Adapter (with two docking ports), Airlock Module with EVA hatches, and the Orbital Workshop, the main habitable volume. Electrical power came from solar arrays, as well as fuel cells in the docked Apollo CSM. The rear of the station included a large waste tank, pro-

## Gamma Rays from Distant Star "Wow" Astronomers



A record-setting blast of gamma rays from a dying star in a dis-

tant galaxy has wowed astronomers around the world. The

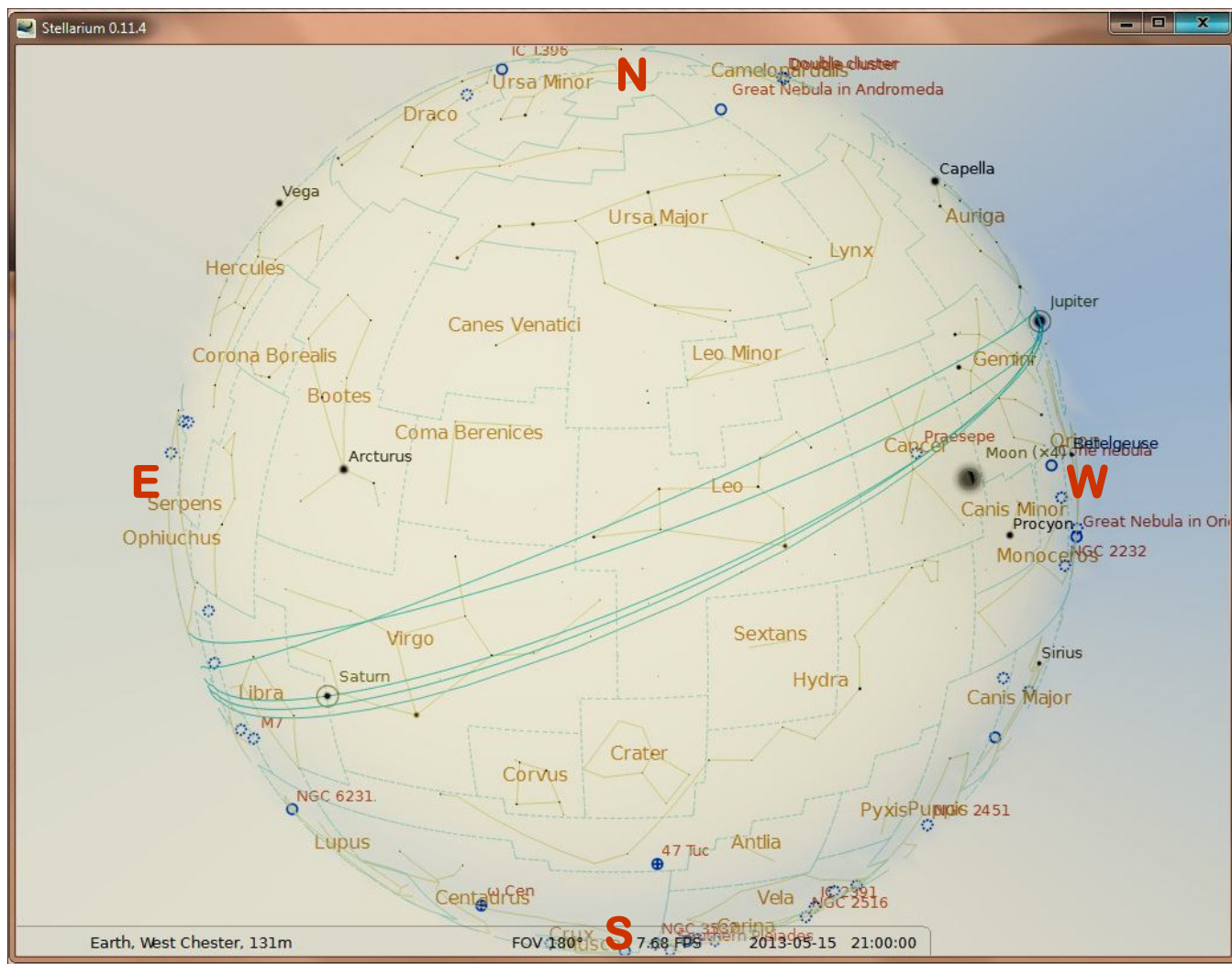
eruption, which is classified as a gamma-ray burst (GRB) and designated GRB 130427A, produced the highest-energy light ever detected from such an event. "We have waited a long time for a gamma-ray burst this shockingly, eye-wateringly bright," said Julie McEnery from NASA's Goddard Space Flight Center in Greenbelt, Maryland. "The GRB lasted so long that a record number of telescopes on the ground were able to catch it while space-based observations were still ongoing." See [full article](#) for details.



# The Sky Over Chester County

May 15, 2013 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](http://www.stellarium.org).



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
5/01/2013	5:31 a.m. EDT	6:01 a.m. EDT	7:55 p.m. EDT	8:25 p.m. EDT	13h 54m 57s
5/15/2013	5:15 a.m. EDT	5:45 a.m. EDT	8:09 p.m. EDT	8:40 p.m. EDT	14h 23m 52s
5/31/2013	5:02 a.m. EDT	5:34 a.m. EDT	8:23 p.m. EDT	8:55 p.m. EDT	14h 48m 21s

Moon Phases					
Last Quarter	5/31/2013	2:59 p.m. EDT	First Quarter	5/18/2013	12:35 a.m. EDT
New Moon	5/09/2013	8:29 p.m. EDT	Full Moon	5/25/2013	12:25 a.m. EDT

## May 2013 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

May 2	Last Quarter Moon
May 5/6	The Eta Aquarid meteor shower peaks
May 9	New Moon
May 11	A thin crescent Moon is between the Hyades and Jupiter
May 12	The Moon and Jupiter are close in the sky
May 17	Regulus shines above the Moon
May 18	First-quarter Moon
May 22	The Moon and Spica are very close in the sky
May 24	Mercury is close to Venus shortly after sunset
May 24	The Moon occults Beta Scorpii – this will be quite a show!
May 25	Full Moon
May 28	Venus is close to Jupiter in the early evening sky
May 31	Last Quarter Moon

**The best sights this month:** The season of star gazing without shivering has begun! I look forward to seeing Saturn in the eyepiece for the next several months. And the beautiful “evening star” Venus returns to the sky. Jupiter, Venus and Mercury form a nice trio in the dusk sky late in the month. Look for “shooting stars” on the night of May 5th and on May 24 we have a rare event when the Moon occults Beta Scorpii in the constellation Scorpius.

**Mercury:** Mercury is not visible for the first half of May but later in the month it appears in the evening dusk. It joins Jupiter and Venus for several days before and after May 24th, when they are closest in the sky.

**Venus:** The “evening star” will be rising higher into the sky every evening just after sunset. On May

10th to the 12th Venus, Jupiter and the crescent Moon make a nice grouping in the sky.

**Mars:** The red planet passed through conjunction with the Sun on April 18th and cannot be observed during May. Although Mars will appear in the early morning hours later this year it will not be an evening object until 2014.

**Jupiter:** As Venus rises in the evening sky Jupiter is sinking toward the setting Sun. On May 31st it will set less than an hour after the Sun.

**Saturn:** Saturn can be observed all night during May. Wait until it is high in the sky to see the planet at its best through the least amount of atmosphere.

**Uranus and Neptune:** These distant gas giants can be seen just before dawn. I think I’ll wait until they are visible at a more civilized hour later this year.

**The Moon:** The Moon is full on May 25th. 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.

On May 9th the Moon passes in front of the Sun in such a way that a “ring of fire” appears. This is known as an annular eclipse. Too bad we cut the rocket plane from the club budget or we could fly to northwestern Australia to see this rare event.

**Constellations:** This is a great time of year to look high overhead at the Big Dipper and find all of Ursa Major, the Big Bear. Leo the Lion is still high in the sky as darkness falls, but he seems to be running away from Hercules as he is rising in the east. And bright Arcturus in Bootes shines like a beacon in the southeast. Bootes and Hercules are well placed for viewing by the time it is really dark and an hour or two later the summer triangle is rising in the east. And if we have a good dark sky the Milky Way can be seen in Cygnus. Aim your telescope there and

*(Continued on page 13)*

## Le Quattro Stelle—An Update

by Frank Angelini

There have been a few interesting updates to the observatory since my presentation last fall. For those who missed my talk, I built a roll-off roof observatory last year. After years of loading and unloading heavy equipment I decided now or never. So when my daughter moved to a new home with a large open lot, the wheels started turning.

What you see below is the basic setup. The design is based on plans I purchased on the internet. The concept was conceived by two young Canadian amateur astronomers. Their goal was to offer a simple design using readily obtainable materials. The roll-off roof uses standard garage door track and rollers. The very first design included a very simple 10 ft. square observing area. This was thought to be large enough for one medium sized scope and perhaps 2 people.

The plans are arranged in modular form using standard dimen-

sional lumber. So, it is a simple matter to increase or decrease the space. My observing area is roughly 12 feet long and 10 feet but I added a 4 x 10 ft. warm room. My original equipment setup included a 180mm, TMB designed, German built refractor on a Parralax goto German Equatorial Mounting. The electronics which drive the mount are from Astrophysics. I decided to spend the first year with visual observations and tweaking the pier alignment. Future plans were to add a second scope, an 11-inch SCT and a trial at imaging with a DSLR.

Late last year I found that manual opening and closing of the roof was beginning to cause chronic shoulder pain and an improvement, incorporating an electrical motor mechanism was designed. Using parts from an old motorized winch and a linear gear (rack) I now have a pain free way to open and close the roof.

Plans could now proceed to design and build a dual-scope mounting to accommodate both the refractor and new 11-inch SCT. Due to the complex geometry I realized that a dual scope mount was going to be a challenge. The goal here was to have a perfect balance between the center of gravity of both scopes and the main axes of the mount. Otherwise there could be certain positions where large torque loads could overwhelm the servos and cause a stall.

When balancing an equatorial mount the aim is to place the centre of gravity of the scopes, accessories and weights at the intersection of the RA and Declination axes. If you achieve this then the setup will be balanced in any orientation.

Generally there are only two axes that require balancing for a single scope (or a 'piggyback' setup). However, if you use a side-by-side arrangement then

*(Continued on page 7)*



*Sky Shed - Roof Closed*



*Sky Shed - Roof Open*



## Dual-Scope Mounting (Cont'd)

(Continued from page 6)

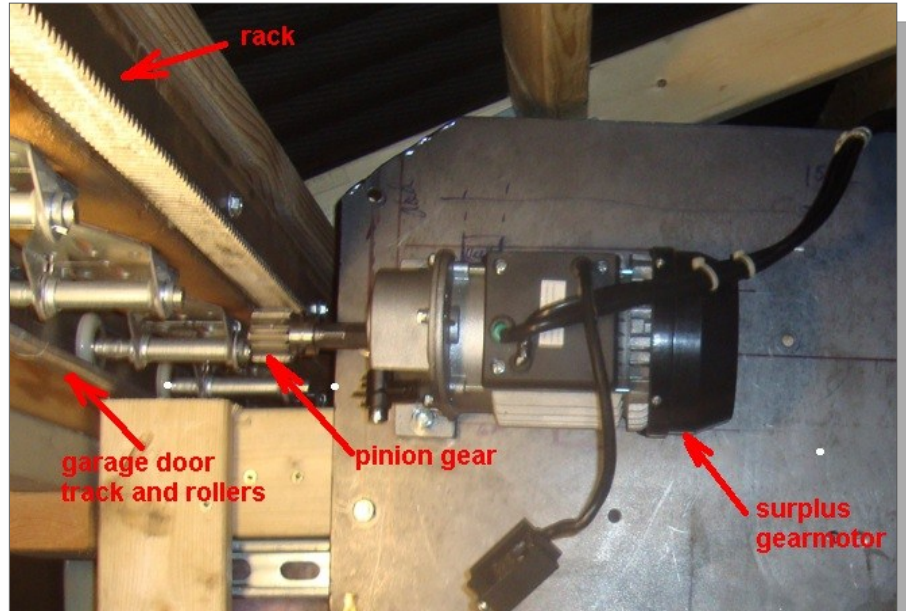
there are three axes that require balancing. There is one 'gotcha' though, the order that you balance these axes does matter, if you balance in the wrong order then even a single scope may not be correctly balanced at the end.

(Credit for the following guidelines goes to Mark Crossley of Wilmslow, UK, a friend and avid amateur astronomer.)

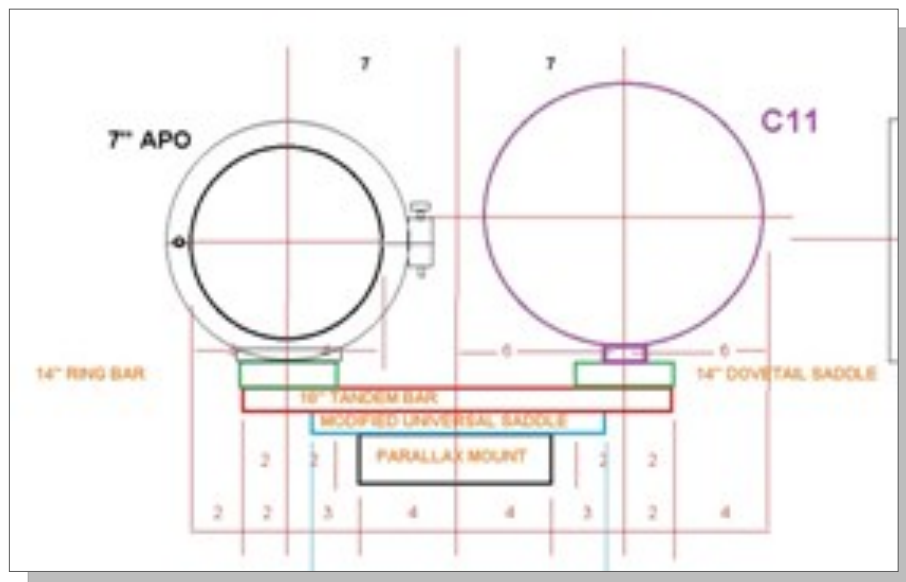
When balancing an equatorial mount the aim is to place the centre of gravity of the scopes, accessories and weights at the intersection of the RA and Declination axes. If you achieve this then the setup will be balanced in any orientation.

Generally there are only two axes that require balancing for a single scope (or a 'piggyback' setup). However, if you use a side-by-side arrangement then there are three axes that require balancing. There is one 'gotcha' though, the order that you balance these axes does matter, if you balance in the wrong order then even a single scope may not be correctly balanced at the end.

If you have any cameras, guiders, dew heaters etc attached to your scopes (I left them off in the pictures for clarity) then the cables should always be routed back the mount. Dangling cables will upset the balance.



*New Motorized Roof Mechanism*



*Conceptual drawing showing desired placement of refractor and SCT*

Don't forget to add your finders/diagonals/eyepieces/dew heaters etc before balancing.

After I've balanced my usual setup, I mark the dovetails with a bit of masking tape on the sides so that next I assemble every-

thing I can put it back in almost the right place.

Also remember that the G11 works best for imaging with a slight RA weight offset to the East. This keeps the worm driv-

*(Continued on page 8)*

## Dual-Scope Mounting (Cont'd)



### Step 1.

Place the counterweight shaft horizontal and *roughly* adjust the counterweights to balance your scopes. This balance is not critical at this stage so do not waste too much time getting it perfect. Tighten your R.A. axis clutch so it won't move.



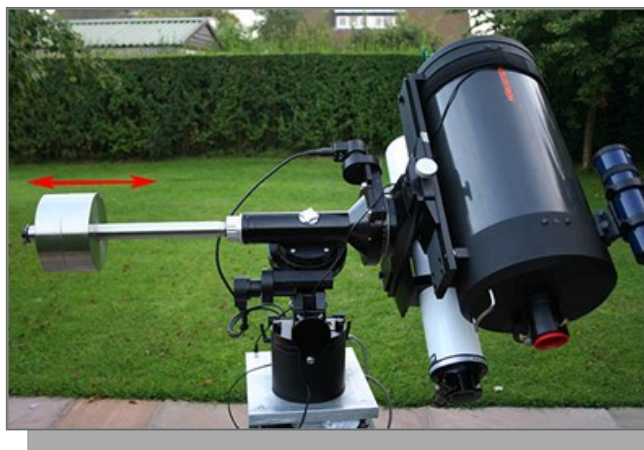
### Step 2. (only applies to side-by-side setups)

With the mount in the same position, loosen the Dec. clutch and point the scopes vertically upwards. Now adjust the side by side plate on the mount so that the two scopes balance each other.



### Step 3.

Now point the scope(s) horizontally, and slide the scope (s) backwards and forwards until they balance (*care - tighten the clutch before each adjustment*). The centre of gravity is now aligned with the Dec. axis. The scope(s) will now be balanced at every point of rotation of the Dec. axis - try it give them a spin (cables allowing!) Tighten up the Dec. clutch again.



### Step 4.

Now slacken the RA clutch and adjust your counter weights to perfectly balance the scope. You have now moved the centre of gravity along the Dec. axis until it intersects the R.A. axis resulting in a perfect balance. Try it, loosen the clutches and move the mount around, you should find it now balances in every orientation.

(Continued from page 7)

ing against a load and you will find it much smoother. Add the weight offset after you have found the correct balance. Caution: After following these instructions, I was able to mount and balance both scopes. However, it is not as easy as it sounds. The combined weight of my setup, including counter weights, scopes and accessories is well over 100 lbs. A small mistake in balance can send your precious scopes into a sudden crash. This happened to me resulting in a bruised shoulder and scratches in the C-11 tube. Fortunately, there was no serious damage that would affect performance. **Warning:** I did all of this alone and I would never try that again.



## Photos from Anson Nixon Star Party

by Don Knabb

Many thanks to the members who came out the night of April 20, 2013, to Anson Nixon Park for the star party. Although it was a bit chilly, the wind dropped off as the evening set in so it was not terribly cold. As you can see from the pictures below we had a great line up of equipment. We had everything from Ed's Father's hand ground reflector through refractors, large binoculars and it was first light for Roger's new 14 inch go to truss Dob! Although the crowd was lighter then we have experienced at this site for other star parties the folks who came out stayed for nearly the entire star party and were very interested to see everything they could in the sky.



*Ann & Carmen*



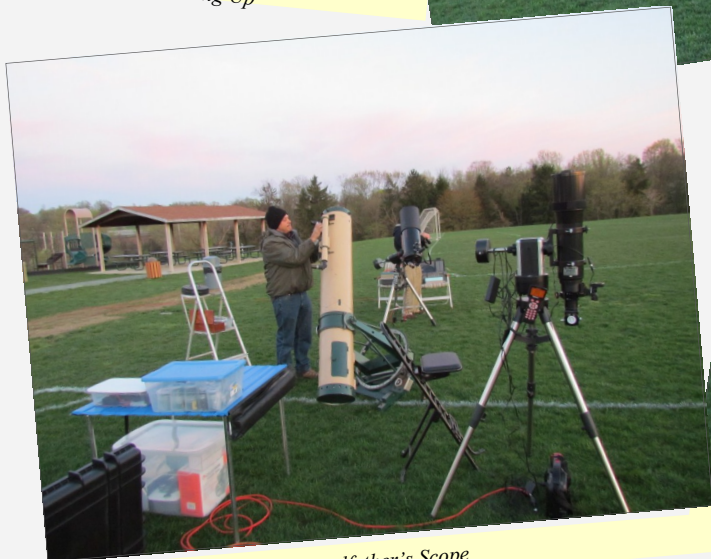
*Roger & His New Toy*



*Dave Setting Up*



*Viewing the moon*



*Grandfather's Scope*



*Rafael & His Equipment*

## Triple Threat

by Dr. Ethan Siegel

The solar system is a busy place, with five wandering planets visible to the naked eye alone. When any two pass close by each other from our point of view, we see an astronomical *conjunction*, but on very rare occasions, three planets will find themselves grouped together: a *triple conjunction*. Towards the end of May, Mercury, Venus and Jupiter will treat us to the best triple conjunction in years.

On May 25th, Mercury will pass within  $1.4^\circ$  of Venus, then two days later Mercury comes within  $2.4^\circ$  of Jupiter, and finally on the 28th, Jupiter and Venus approach within  $1^\circ$  of one another. If it weren't for the slight orbital



tilt of our solar system's planetary orbits, these conjunctions would all be *occultations* instead. During the nights of May 26th-27th, all three planets are visible immediately after sunset within the same  $3^\circ$  field of view, with the triple conjunction peaking in a triangular shape on the 26th. (For scale, the full Moon subtends about  $1/2^\circ$ .) The three planets appear close together for

a few days more, making a line in the sky on the 30th/31st.

How does this happen? Mercury and Venus race around the Sun far faster than Earth, with Mercury completing more than four revolutions around the Sun for each one that Earth makes. At the same time, Jupiter is far slower, taking 12 years to orbit just once around the Sun. Jupiter's been high in the sky during the early parts of the night, but steadily lowers throughout May as Earth continues to move away from it, approaching its maximum distance from Earth. Mercury and Venus, meanwhile, begin to move out from behind

(Continued on page 11)



The image shows the configuration of Mercury, Venus, and Jupiter in the western sky just after sunset on May 26, 2013. Insets show the relative size appearance of the planets on that date.



## Space Place (cont'd)

(Continued from page 10)

the Sun during May: Venus at the beginning of the month and Mercury in the middle.

Thus, during this triple conjunction, *all three* planets will be on the far side of the Sun, something that happens just 25% of the time in triple conjunctions involving Mercury and Venus! If you telescopically resolve these planets into disks, you'll see our inner worlds in a nearly-full gibbous phase. Jupiter will appear largest in terms of angular diameter, followed by Venus and lastly by Mercury. Just a year ago, during its now-famous transit, Venus took up more than a full arc-minute in the sky; during this conjunction, it will just *one-sixth*

that angular size and less than a third the apparent diameter of Jupiter. Nevertheless, Venus will still be more than **six times** as bright as Jupiter during this time, outshining all night-sky objects other than the Moon. Closer conjunctions of two naked-eye planets are frequent, but getting three or more like this happens just once or twice per decade, so don't miss your chance to see it.

And speaking of occultations, The Space Place has a great kid-friendly explanation of the Venus transit and solar eclipses of 2012 at [spaceplace.nasa.gov/venus-transit](http://spaceplace.nasa.gov/venus-transit).

*Dr. Ethan Siegel, a theoretical astrophysicist, is a professor at the University of Portland (OR) and Lewis & Clark College.*

## Skylab (Cont'd)

(Continued from page 3)

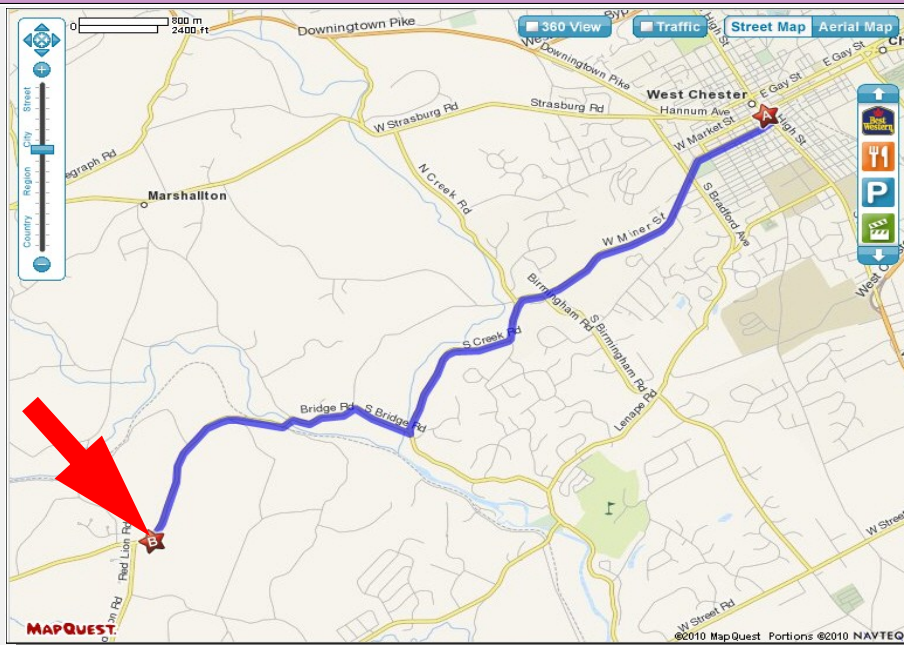
pellant tanks for maneuvering jets, and a heat radiator.

Numerous scientific experiments were conducted aboard Skylab during its operational life, and crews were able to confirm the existence of coronal holes in the Sun. The Earth Resources Experiment Package (EREP), was used to view the Earth with sensors that recorded data in the visible, infrared, and microwave spectral regions. Thousands of photographs of Earth were taken, and records for human time spent in orbit were extended.

Plans were made to refurbish

(Continued on page 14)

## CCAS Directions



### Brandywine Valley Association

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

<http://brandywinewatershed.org/>

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

### Brandywine Valley Association

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

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

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

## Through the Eyepiece: Melotte 111, the Coma Cluster of Stars

by Don Knabb, CCAS Treasurer & Observing Chair

As we sit under dark skies during May we often search the sky for galaxies around the constellations Leo, Virgo and Coma Berenices. The Leo Cluster is a galaxy cluster in the constellation Leo. Along with the Coma Cluster, it is one of the two major clusters comprising the Coma Supercluster.

The Virgo Cluster is a cluster of galaxies whose center is in the constellation Virgo. If you have very dark skies and a large telescope you can see these faint fuzz balls of deep space. This region of the sky holds the north galactic pole. Here we have a window into the depths of the universe, unobscured by the Milky Way.

But this article is about another Coma Cluster. This is the Coma Cluster of stars. It is much easier to see and is a naked eye object in a dark sky location and is a nice sight in binoculars in Chester County skies. Around 9 or 10 at night during May one need only lean back in your lounge chair and look due south and about half way from the horizon to the zenith. If you see a fuzzy spot a bit behind and above Leo's tail, you have found the Coma Cluster of stars.

The Coma Cluster of stars is also known as Melotte 111 after its entry in the catalogue of deep sky objects by the astronomer P. J. Melotte. This cluster is in the constellation Coma Berenices.

The Coma Cluster is a small but nearby star cluster in our galaxy with a common proper motion, making it a true physical cluster, not just a visual alignment of widely distant stars. At one time it was considered to represent Leo's tail. The open cluster is 288 light-years away, roughly twice as distant as the Hyades, and covers an area of more than 5 degrees on the sky. That's the size of 10 full Moons! The cluster is approximately 450 million years old.

Photos don't do the Coma Cluster justice, but below is one of the better photos I found. Melotte 111 is too large for a telescope. It is a wonderful naked eye object or use low powered binoculars to see this large cluster.

Some of its stars are visible to the naked eye but it needs binoculars to reveal its true potential. There is also some background nebulosity and larger telescopes will also show that

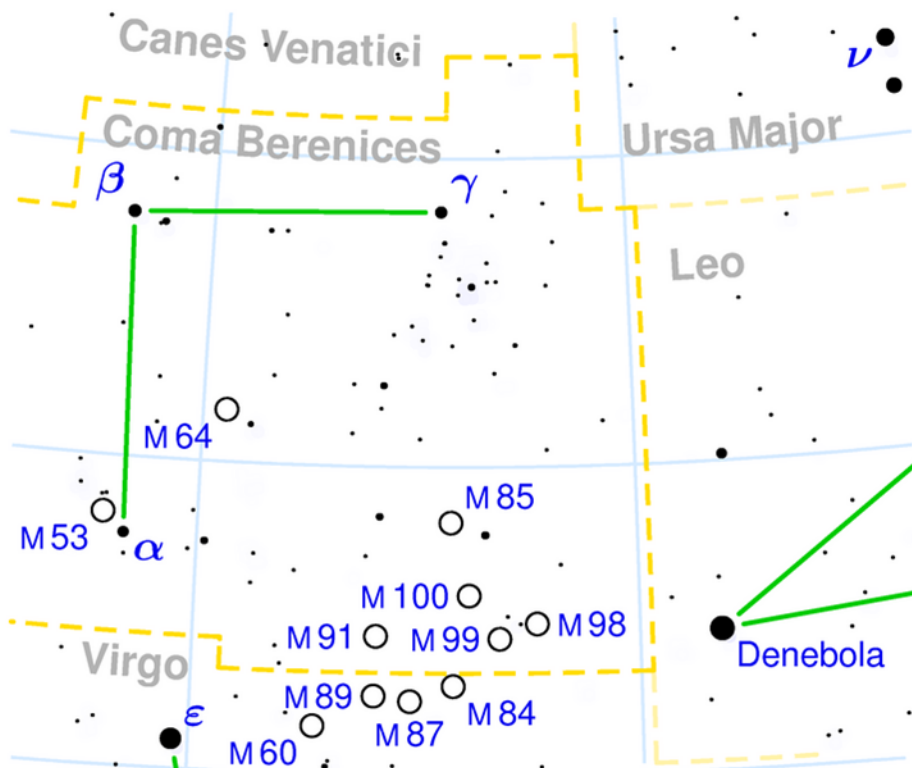
Continued on page 13)



Image credit: Coma Cluster image from 20 x 2 minute frames; Canon XSi (modified); Canon 85mm lens; AstroTrac mount. <http://www.geoandpat.com/Georgesastro.html>



## Eyepiece (Cont'd)



Sky map credit: [http://en.wikipedia.org/wiki/Image:Coma\\_Berenices\\_constellation\\_map.png](http://en.wikipedia.org/wiki/Image:Coma_Berenices_constellation_map.png)

(Continued from page 12)

many of the “stars” visible to binoculars as small fuzzy patches are really galaxies.

This is a star cluster similar in nature to the Pleiades and Hyades but is further away and slightly fainter. The Coma star cluster is currently neither approaching nor receding from us. This makes it one of the nearest open star clusters, only the Ursa Major Cluster and the Hyades are closer.

The cluster was never cataloged as a Messier or NGC object, even though it’s very visible. At least 37 stars have been identified as members of this cluster. Its brightest stars are 50 times brighter than our sun and its

faintest are 1/3rd the sun’s brightness.

The diagram below will help you find the Coma Cluster. If you can’t see it naked eye from your observing location, use binoculars and scan east from Leo’s tail.

Information credits:

[http://en.wikipedia.org/wiki/Coma\\_Berenices](http://en.wikipedia.org/wiki/Coma_Berenices)

<http://www.seds.org/messier/xtra/ngc/mel111.html>

[http://en.wikipedia.org/wiki/Mel\\_111](http://en.wikipedia.org/wiki/Mel_111)

## Observing (Cont'd)

(Continued from page 5)

feast on the eyepiece full of stars!

**Messier/deep sky:** It is globular cluster time once again! M3 is high overhead in the constellation Canes Venatici 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!

May is also an excellent month to look for galaxies, especially in the area of the constellations Virgo and Coma Berenices. This region of the sky holds the north galactic pole. Here we have a window into the depths of the universe, unobscured by the Milky Way.

**Comets:** Comet PanSTARRS continues to be visible but you’ll need a dark site and a good sized telescope. There is a sky chart in the May issue of Astronomy magazine that plots the nightly position of the comet among the background stars.

**Meteor showers:** The Eta Aquarid meteor shower peaks on the night of May 5/6. This is not expected to be a good show for Northern Hemisphere observers, but unexpected outbursts can happen with any meteor shower, so why not take a look? These meteors are dust left behind by Halley’s Comet!

## 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).



### Skylab (Cont'd)

*(Continued from page 11)*

and reuse Skylab, using the Space Shuttle to boost its orbit and repair it. However, development of the Shuttle was delayed, and Skylab reentered Earth's atmosphere and disintegrated in 1979, with debris striking portions of Western Australia.

Each Skylab mission set a record for the amount of time astronauts spent in space. The station offered what a later study called "a highly satisfactory living and working environment for crews", with even enough room for personal privacy.

### CCAS Membership Information and Society Financials

#### Treasurer's Report by Don Knabb

##### April 2013 Financial Summary

Beginning Balance	\$1,768
Deposits	\$45
Disbursements	<u>\$411</u>
Ending Balance	\$1,402

#### New Member Welcome!

Welcome new CCAS members Louis Caccamo and his family of West Chester, PA.

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

#### Membership Renewals

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

**Don Knabb**  
**988 Meadowview Lane**  
**West Chester PA 19382**

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



## Join the Fight for Dark Skies!

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

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

Phone: 520-293-3198  
Fax: 520-293-3192  
E-mail: [ida@darksky.org](mailto:ida@darksky.org)

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

<http://www.darksky.org>

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

## Dark-Sky Website for PA

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

<http://www.POLCouncil.org>

## Find out about Lyme Disease!

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

<http://www.LymePA.org>

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

## CCAS Event Information

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

## Good Outdoor Lighting Websites

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



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

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

<http://www.starrynightlights.com>



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

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

Phone: 512-944-7354

<http://www.greeneearthlighting.com>

## Local Astronomy-Related Stores

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



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

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

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

<http://www.skiesunlimited.net>



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

4403 Main Street  
Philadelphia, PA 19127

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

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

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

## CCAS Information Directory

### CCAS Lending Telescopes

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

### CCAS Lending Library

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

### Contributing to *Observations*

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

### CCAS Website

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

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

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



### CCAS Membership Information

The present membership rates are as follows:

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

### Membership Renewals

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

**Don Knabb**  
988 Meadowview Lane  
West Chester PA 19382-2178  
Phone: 610-436-5702  
e-mail: [treasurer@ccas.us](mailto:treasurer@ccas.us)

### Sky & Telescope Magazine Group Rates

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

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

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders. If you have **any** questions call Don first at 610-436-5702.

### Astronomy Magazine Group Rates

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