



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

OCTOBER 2007

(VOLUME 15, NO. 10)

Visit our website at www.ccas.us

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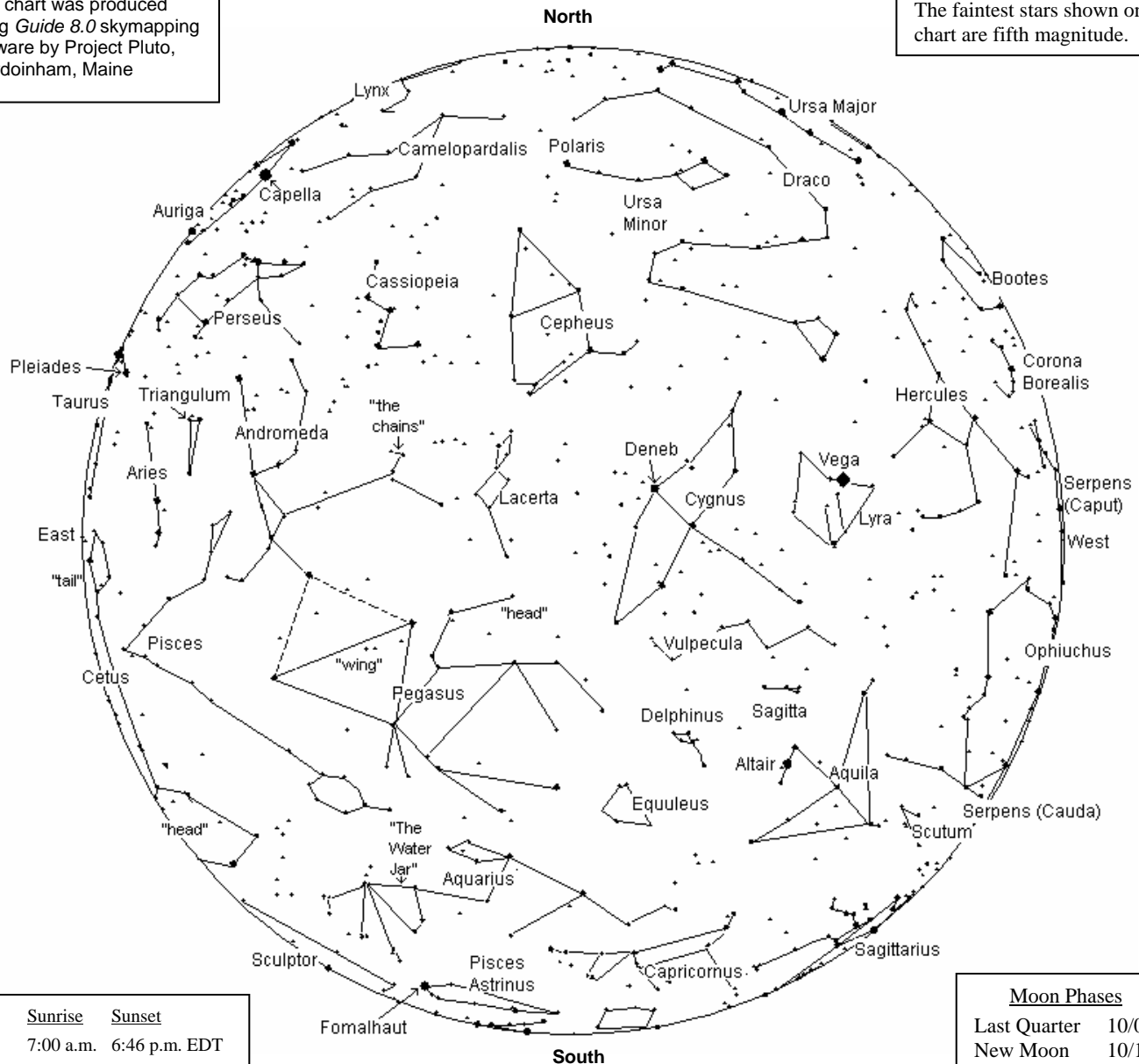
Important October 2007 Dates

- 3** Last Quarter Moon, 6:06 a.m. EDT.
- 9** **CCAS Meeting**
Location: West Chester University
Room 113, Boucher Building
7:00 – "Expansion of the Universe and the Big Bang"
(DVD).
7:30 – Regular Meeting Starts
Constellation of the Month: Vulpecula
Main Presentation: "Classical Novae: Things That
Go Pop in the Night"
See page 4 for more details.
- 11** New Moon, 1:01 a.m. EDT.
- 12** **CCAS Observing Session**
Location: **Hoopes Park in West Chester**
Time: sunset, or earlier (see page 4 for more details.)
- 13** Venus, Saturn, and Regulus are closest in the pre-dawn sky.
- 15** The Moon, Jupiter, and Antares form a compact triangle in the evening sky.
- 19** First Quarter Moon, 4:33 a.m. EDT.
- 21** Orionid meteor shower peaks.
- 26** Full Moon, 12:52 a.m. EDT—the Harvest Moon or Fruit Moon.
- 27** The Moon occults the Pleiades just before midnight.



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
10/1	7:00 a.m.	6:46 p.m. EDT
10/15	7:14 a.m.	6:24 p.m. EDT
10/30	7:31 a.m.	6:04 p.m. EDT

Moon Phases	
Last Quarter	10/03
New Moon	10/11
First Quarter	10/19
Full Moon	10/26

The sky over Chester County
October 15, 2007 at 9:00 p.m. EDT

The Planets, by Don Knabb

Mercury: October is not a good month to see the planet that speeds around the sun. Unless you are taking a trip to the southern hemisphere, that is, in which case Mercury is well placed for viewing.

Venus: Do not miss Venus in the early morning skies! It is incredibly bright in October, although it was at its brightest during September. As you walk the dog or pick up the paper, look for that bright light in the east. It cannot be missed!

Mars: While you are out looking at Venus in the pre-dawn sky, look just about straight up and you can find a fairly bright orange dot. That is Mars. During October, Mars is rising around 11:00 p.m. As the months pass, Mars will take center stage during the holiday season. If you are lucky, someone will get you a new telescope to look at the Red Planet.

Jupiter: The king of the planets is setting earlier as each week passes, so enjoy the sight of this beautiful planet and its four bright moons while you can. Just look southwest as twilight fades into night and Jupiter will be the brightest object you see. Arcturus is also fairly bright but it is far to the right of Jupiter.

Saturn: The ringed beauty is visible in the early morning sky, rising after 2:00 a.m.

Uranus & Neptune: Uranus was a nice sight at our Star Party in Kennett Square on September 15, and it remains in good position for viewing during October. To find Uranus or Neptune, use the finder charts in the July issue of *Sky and Telescope* or go to the Sky and Telescope web site:

<http://www.skyandtelescope.com/>

Pluto: Pluto, the ex-planet, is a challenging 14th magnitude speck in the general area near Jupiter.

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.

October Observing Highlights

by Don Knabb, CCAS Observing Chair

Planets: Early in the evening we can still enjoy the king of the planets, Jupiter. But after that you need to stay up until midnight to get a good look at Mars. Venus and Saturn are best viewed as you pick up the morning paper. Around October 13th, Venus, Saturn and Regulus form an attractive triangle in the pre-dawn sky.

Constellations: How nice, it is finally getting dark early enough that we can do some work-week stargazing before bedtime! How is that for a different perspective.....before I was so interested in stargazing I wished the long days would last longer, but not anymore!

The summer triangle still rules the evening sky during October, but as the night progresses the great square in Pegasus takes over and Andromeda and Perseus are rising with the beautiful Pleiades just to their south. Look for bright Capella in Auriga following Perseus and late in the month Taurus and Orion will be rising around midnight.

Deep sky: We say goodbye to the riches of Sagittarius and Scorpius, but our sister galaxy Andromeda makes up for that loss. And the double cluster in Perseus is reasonably high in the northeastern sky. If you stay up late the three clusters in Auriga, M36, 37 and 38 are excellent telescopic objects.

Comets: There are no bright comets in the sky at this time.

Meteor shower: The Orionid meteor shower peaks on October 21, but we should have reasonable activity for a day or two before and after that date. The radiant is high in the sky at 2:00 a.m., and that is when you will see up to 20 meteors per hour. Hey, it's a Saturday night, why not get up and take a look?

- Oct. 3** Last quarter Moon, 6:06 a.m. EDT
- Oct. 7** A thin crescent Moon is next to Venus, Saturn and Regulus in the pre-dawn sky.
- Oct. 11** New Moon, 1:01 a.m. EDT
- Oct. 13** Venus Saturn and Regulus are closest in the pre-dawn sky.
- Oct. 15** The Moon, Jupiter and Antares form a compact triangle in the evening sky.
- Oct. 19** First quarter Moon, 4:33 a.m.
- Oct. 21** The Orionid meteor shower peaks.
- Oct. 26** Full Moon, 12:52 a.m., the Full Hunter's Moon.
- Oct. 27** The Moon occults the Pleiades just before midnight.

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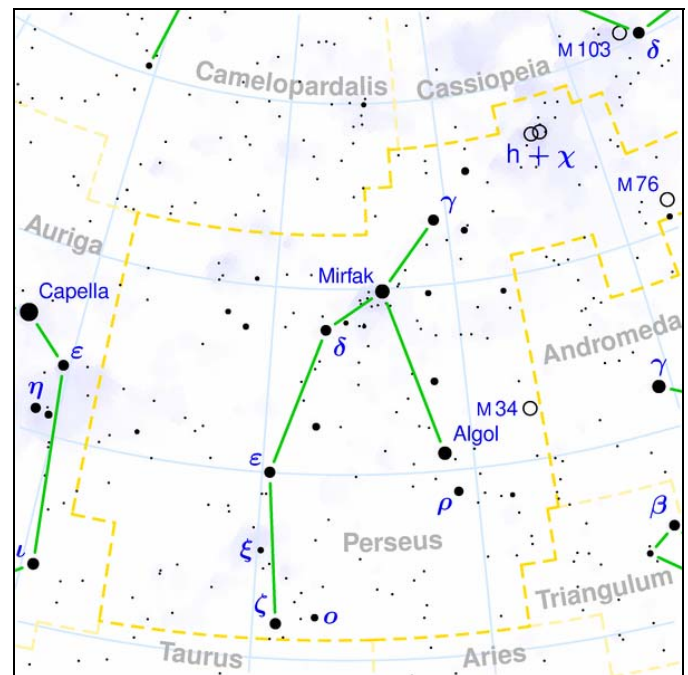
Through the Eyepiece: The Double Cluster in Perseus

by Don Knabb, CCAS Observing Chair

At any CCAS observing session during the fall or winter, one of the first "treats of the night sky" is sure to be the Double Cluster. Take a salt shaker and give a few shakes over a dark table, move a couple of inches and do that again. That will give you a good idea of what the Double Cluster looks like in a pair of binoculars or a telescope with a low power eyepiece.

The Double Cluster is a favorite of amateur astronomers. These bright clusters are often photographed or observed with small telescopes. Easy to find, the clusters are visible in a dark sky with the unaided eye between the constellations of Perseus and Cassiopeia as a brighter patch in the autumn and winter Milky Way. Terence Dickinson calls the Double Cluster "Superb in binocs and small scopes."

In the chart below the Double Cluster is the two rings in the upper right of the chart.



http://en.wikipedia.org/wiki/Image:Perseus_constellation_map.png

The Double Cluster is the common name for the naked-eye open clusters NGC 884 and NGC 869, which are close together in the constellation Perseus. They are close to one another in space as well.

NGC 869 is an open cluster located 6800 light years away in the constellation Perseus. The cluster is most likely around 19 million years old. It is the westernmost of the Double Cluster with NGC 884. Both clusters are located physically close to one another, only a few hundred light years apart. The clusters were first recorded by Hipparchus, but have likely been known since antiquity.

NGC 884 is an open cluster located 7600 light years away in the constellation of Perseus. The cluster is most

likely around 12.5 million years old. It is the easternmost of the Double Cluster with NGC 869.

Open clusters are also known as galactic clusters. Using a small telescope with a wide angle eyepiece to give a 1 degree field of view will show both clusters in one view.



<http://en.wikipedia.org/wiki/Image:NGC869NGC884.jpg> by Andrew Cooper

In small telescopes the cluster appears as a beautiful assemblage of bright stars located in a rich star field. Dominated by bright blue stars the cluster also hosts a few orange stars that add to the visual interest. Both clusters together offer a spectacular low magnification view.

The Double Cluster is in the Milky Way spiral arm beyond our own. Under dark skies the Double Cluster is visible to the naked eye as a brightening in the Milky Way or extended blurs of light. Binoculars just reveal the brighter individual stars of both clusters.

Information sources:

http://en.wikipedia.org/wiki/NGC_869

http://en.wikipedia.org/wiki/NGC_884

<http://www.seds.org/messier/xtra/ngc/n0869.html>

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

Dickinson, Terence 2006. *Nightwatch: a practical guide to viewing the universe*. Buffalo, NY. Firefly Books

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CCAS has an Urgent Need

The Society's 20-inch Dobsonian telescope needs a new home. For many years, CCAS Founder and Past President Ed Lurcott has generously housed the telescopes in his garage. Ed and his wife Evelyn, however, have retired to smaller living quarters. There will no longer be room to store the telescope.

We need to find someplace to keep the Society's telescope. Anyone providing storage for the telescope is of course welcome to use it whenever it is not out on loan. If you can provide storage space, please contact CCAS President Kathy Buczynski ASAP at **610-436-0821**.

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CCAS October Meeting

DATE: **Tuesday October 9, 2007**

PLACE: Room 113 – Boucher Building
West Chester University

LOCATION: South Church Street
West Chester, PA

TIME: **7:00 p.m. EDT for Cosmology Class**
7:30 p.m. EDT for regular meeting

A map of the campus showing the location is on page 19.

Cosmology Class: **Expansion of the Universe and the Big Bang**

This month's Constellation of the Month (COM) will be **Vulpecula**, presented by Kathy Buczynski.

This month's main presentation will be "Classical Novae— Things That Go Pop In the Night" by Dr. Karen Vanlandingham. On any given night, when you look up at the stars, at least half of those you see are most likely binary star systems; two stars orbiting one another. These systems are common occurrences and, for the most part, are not very interesting. However, occasionally we find two stars that are close enough to one another that they interact in exciting ways. A nova is the result of such an interaction. When a nova occurs an explosion takes place on the surface of a star, making the star increase dramatically in brightness and sending stellar material out into space at great velocities. Astronomers are very interested in these systems for a number of reasons. They allow us to study how stars evolve, what the chemical makeup of the stars is, and they may even be used to measure distances to other galaxies. Perhaps most interesting of all, the material that novae eject into space makes up the ingredients for life.

Dr. Vanlandingham is an Assistant Professor in West Chester University's Department of Geology and Astronomy, and the Director of the University's Planetarium.

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Special CCAS Observing Session October 12, 2007

Calling all CCAS members:

The October CCAS Observing Session will be on Friday October 12, 7:30 p.m. at Hoopes Park in West Chester. This will be a Community Star Party sponsored by the Department of Parks and Recreation. Our BVA observing session for October is replaced with this Star Party. This event has been listed in the West Chester Recreation Activity Guide that was mailed to all West Chester residents and was handed out at the popular West Chester Restaurant Festival.

Hoopes Park has power, parking, restrooms and a large open field that is a nice viewing location. Yes, there are some trees but this is a great opportunity to share the night sky with the West Chester community. We had a great time at the recent Kennett Square Star Party, so this should also be a lot of fun. It is a great outreach opportunity. We hope to see you all there!

If you have any questions write to observing@ccas.us or dknabb00@comcast.net, or call Don Knabb at **484 888 1831**. Directions are on page 18.

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Treasurer's Report

by Bob Popovich

August 2007 Financial Summary

Beginning Balance	\$1,516
Deposits	115
Disbursements	<u>0</u>
Ending Balance	\$1,631

Membership Renewals Due

10/2007: Anderson
End
Morgan
11/2007: Athens
Bower
Buczynski
Hepler
Murray
O'Hara

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* on page 12 in this newsletter.

Important Notice Regarding *Sky & Telescope* Subscriptions

For members who have current subscriptions through the Society at the special club discount:

You may now renew directly with the publisher—there is no longer a need to send anything to our Treasurer! You can **renew via mail or telephone** (1-800-253-0245). Sky Publishing will confirm your CCAS membership with Bob.

If you wish to **start** a subscription through the Society, you must still send the check to Bob first. This is only for new subscriptions at the special club rate of \$32.95 per year. As in the past, this initial check should be made out to Chester County Astronomical Society. Bob will then forward the needed information and payment on to Sky Publishing. But once you are started, you too can renew directly with Sky Publishing in subsequent years.

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

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Welcome!

This month we welcome a new family-member to the Society: Fred De Lucia & Family, of Garnet Valley. We're glad you decided to join us under the stars! Clear Skies to all!

Jupiter Redux

by Vic Long



I played around in Photoshop with a webcam shot I took in early June under so-so seeing with my 8 inch reflector. I was trying to try to pull out some more detail; this is the result. This will have to stand as my best Jupiter until it returns higher in the sky next year. I'm now looking forward to Saturn

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The Curse of Perseids

by Nicholas La Para

written on August 13, 2007

I've never seen the Perseids. Nope, never. It's always been cloudy or rainy or something. I really thought that this was the year, terrific clear skies (if turbulent) for two days, humidity and temperature low. No moon. The evening stayed clear and I put two reclining sand chairs on the lawn. Took a nap in the evening. About midnight just took a peek outside and—dang it! Clouds! Waited for awhile and my wife and I checked it out again. Clouds! %\$*&@! So we went off to bed.

At 6 or 6:30 AM I got up, looked out the window, and there is clear sky! What have I done wrong? What am I paying for? Can I get some better karma with a home equity loan?

Perseus was the constellation I used to present for our Observing Course. Didn't I do it well enough? The story of Perseus, Medusa, and Pegasus was one of my childhood favorites in Nathaniel Hawthorne's *Wonder Book*. I'm really a friend, you guys, and I want to see those meteors.

When the dew dries I'll bring the sand chairs in.

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Light Pollution and You, from the September Society Meeting

by Kathy Buczynski, CCAS President

Stan Stubbe, President of the Pennsylvania Outdoor Lighting Council (POLC), addressed our September meeting to discuss light pollution, its effects on the environment and wildlife, its effects on the night sky, and what we can do about it. Stan and the POLC have been very active, especially in southeastern Pennsylvania, in getting local townships to institute lighting ordinances that reduce light pollution including glare, light intrusion and light trespass.

As astronomers we know that controlling light pollution is an ongoing battle, but as Stan pointed out, there are things we can do including educating the public. The POLC has made Power Point presentations available on CD that we can use when addressing groups. The available presentations are:

1. "Light and the Stars"

A presentation to introduce novice stargazers to the relationship between observing and unwanted light. Topics include:

- Light that is needed for observing
- Light that is bad for observing
- Defining sky glow
- Practical steps to control sky glow

Approximate Duration: 45 minutes

2. "Homeowners"

A presentation to introduce homeowners to the subject of light pollution. Topics include:

- The light pollution problem and its extent
- The impact of light pollution on the environment, the economy, astronomy, human health and vision and security.
- Practical steps that can be taken by homeowners to control light pollution

Approximate Duration: 60 minutes

3. "Light Pollution"

A presentation that takes an in-depth look at light pollution, its causes, extent, impacts and solutions from an environmentalist point of view.

- The light pollution problem
- How it impacts the environment
- Solutions

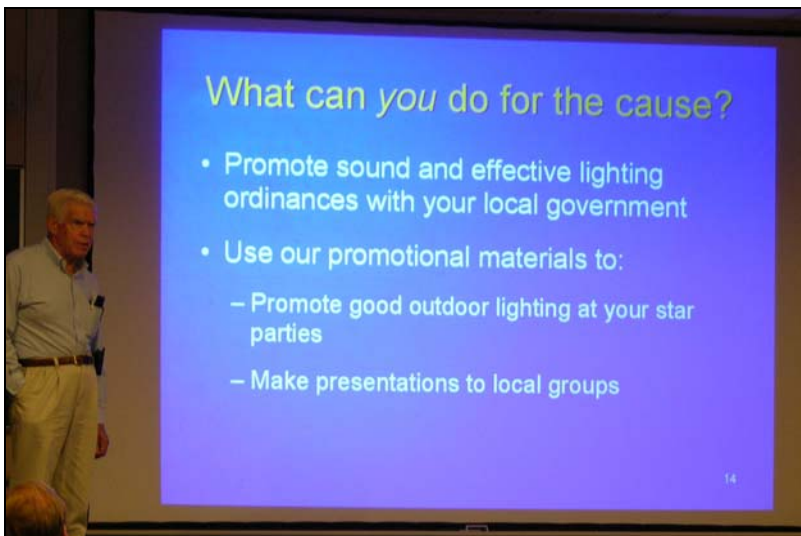
Approximate Duration: 50 minutes

4. "Lighting Ordinances" Presentation

A presentation for municipal officials

- Why a lighting ordinance is important
- The elements of an effective ordinance
- How to get an ordinance started, enacted and enforced

Approximate Duration: 45 minutes



POLC President Stan Stubbe addressing the September meeting of the Chester County Astronomical Society.

Photo By Kathy Buczynski

Stan has also included a list of other resources which can also be found on the website, www.polcouncil.org.

Miscellaneous Resources

1. Model Lighting Ordinances

Ordinance templates based on existing proven lighting ordinance language that can be tailored to a community's needs and adopted. There are three ordinance versions and a write-up on which version to choose.

- Zoning Ordinance version
- Subdivision and Land Development version
- Stand-alone version

2. Reference Lists

Lists of documents and websites where further reading can be found.

- Light at Night and Human Health
- Light at Night and the Environment

The POLC has been doing a wonderful job in educating the public and the townships of most of the surrounding counties. On October 30, 2007, 7:00 PM-8:30 PM at the West Goshen Township Building, the POLC will be holding a Lighting Forum for the municipalities of Chester County. If you, or someone you know is interested in attending, please email jmctish@state.pa.us.



Anson B. Nixon Park Hosts Astronomy Event

by Kathy Buczynski

On Saturday, September 15, 2007, instead of our regularly scheduled observing session, CCAS participated in a "Night Out" under the stars with the residents of Kennett Square at the Anson B. Nixon Park. This was an event that was rescheduled from the spring because the weather would not cooperate. This night, the skies were clear, the moon was a crescent and Jupiter was shining in the south west.

Our host, Pete Kennedy, had advertised for the event and had signs on the road for passers-by. As dusk fell and the skies got darker, people started pulling into the parking lot.



Marty Bower, in background joined by four early arrivals.

They could not believe the sight of Jupiter in the eyepiece.

Before it got too dark, we introduced ourselves to the gathering crowd and briefly described what we were going to see that night. Many people had “wow” moments as they saw the moons of Jupiter in a telescope or the craters on the moon for the first time.



Nicholas La Para sharing his telescope with a dad and his daughter.



Here's Don Knabb aiming his scope at the moon

The horizon at this park was vast and we got a chance to see the Teapot of Sagittarius and almost all of Scorpius.



Kathy Buczynski pointing out the constellations with the green laser pointer while someone sneaks a peek in the eyepiece behind her

The Society's 20-inch telescope also made an appearance. The most spectacular sight for the evening was probably M13, the Hercules Cluster. There were quite a number of stars that were visible in the cluster. It was quite a sight.



Ed Lurcott, face hidden by the 20-inch telescope's focuser, with a crowd waiting for a peek in the eyepiece.

Thank you all CCAS members who attended: Don Knabb, Barb Knabb, Marty Bower, Nicholas La Para, Ed Lurcott, Linda Fragale, Bob Popovich, Deb Goldader and Kathy Buczynski. There was no official count of attendance, but it was estimated that about 65 people had come to the event to get a glimpse through our telescopes. We made some fans that night and Pete Kennedy is planning to have us back in the spring. This observing site has good horizons, little ambient light and enthusiastic participants: an excellent spot to revisit.

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M 16, The Eagle Nebula in Serpens

By Pete LaFrance

Here is an image of M16 taken with three filters: HA(Hydrogen-Alpha), OIII(Oxygen 3), and SII (Sulphur 2).

I used my Celestron CGE-1100 telescope @ f/5 with a ST-10xe CCD camera attached. Exposures were as follows:

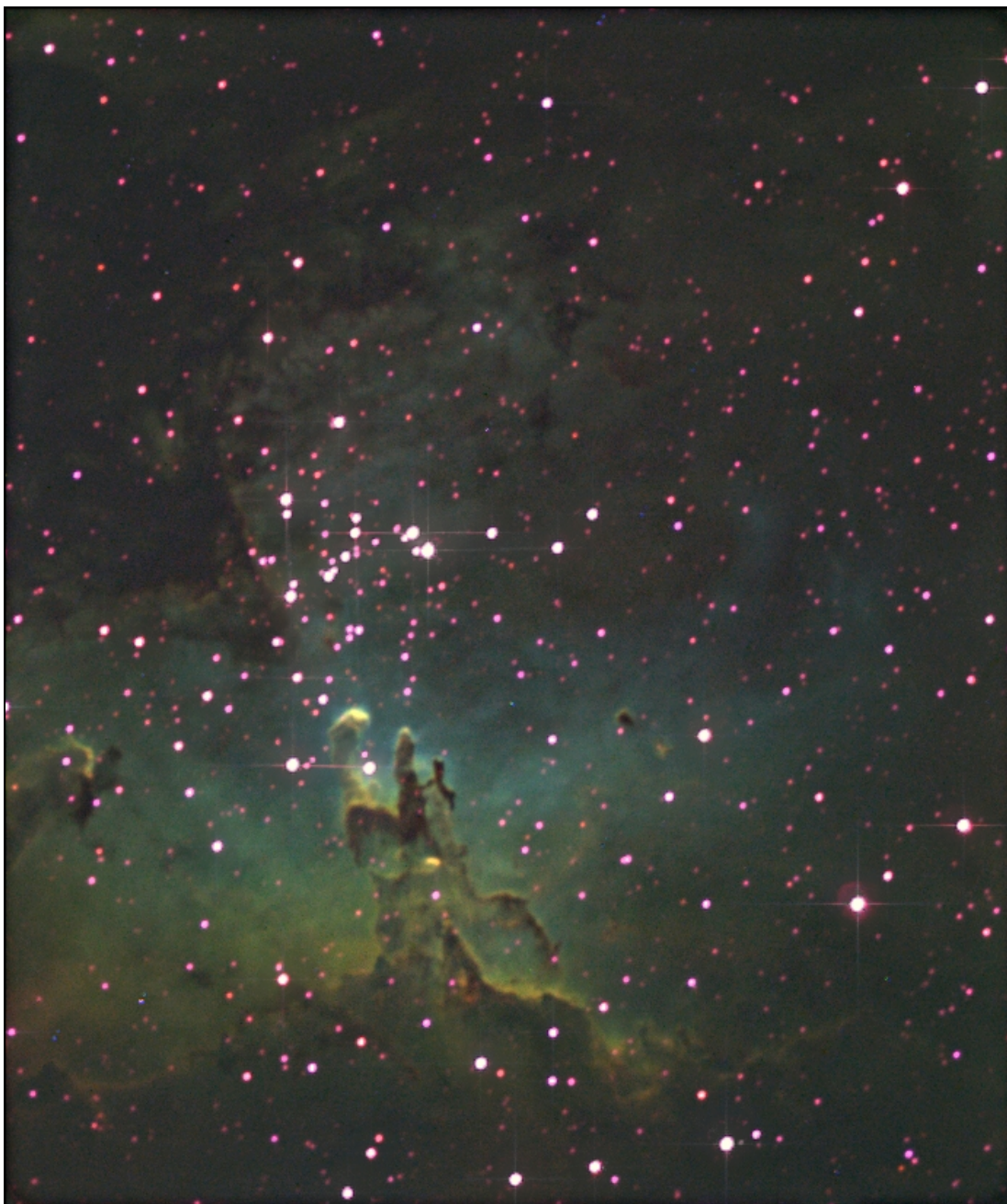
5 images @ 5 min. 1x1 HA

2 img. @ 5 min 1x1 OIII

3 img. @ 5 min. SII

I then calibrated and combined the images with Maxim d/l and Photoshop 7.

As usual, it was not the best night (09/17/2007), but I was quite surprised how well the image turned out. This is probably because I am getting a better grasp on different techniques when processing images. When comparing this image with the Hubble "Pillar of Creation" image, it's kinda neat how well a 11-inch scope operating under less than ideal conditions, stacks up against the Hubble.



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CCAS Lending Telescope: 6 inch Dobsonian reflecting telescope

By Don Knabb

The Chester County Astronomical Society has some equipment that is available for club members to borrow. One of these items is an Orion SkyQuest XT6 Dobsonian reflecting telescope.

This is a nice telescope that is easy to transport, easy to set up and easy to use. The equipment is three pieces: the mount, the telescope itself in a soft carrying case, and the eyepieces and finder scopes in a small case.



This equipment was donated to the CCAS in memory of Sylvia J. Hogate:



It takes only a minute or two to go from the first picture to this one:



The telescope has a “unit power” red dot finder and a small finder scope. Two eyepieces are included. The viewing with this telescope is clear and sharp. It is essentially a brand new telescope.

This telescope is available for club members to borrow for up to a month at a time, or longer if no one else has requested it. If you would like to borrow this equipment, contact Don Knabb at observing@ccas.us.

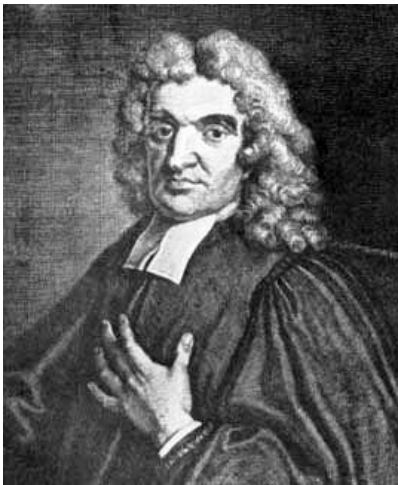


Astronomus

“A Royal Family”

By Bob Popovich

What is it about a family that makes them royal? How did they attain the status of “royal?” I suppose each royal family has its own unique story, but at the very least each royal family has some ancestor who was just a regular person. Regular, maybe. Ordinary, probably not. Whether we ascribe their achievement to good fortune or good sense, the progenitor of each royal family accomplished something so unique that others around them deferred to their mere presence. They were handed authority beyond what they could have acquired on their own. They were declared special. They had become royal.



One such regular fellow was John Flamsteed. He was born in Derbyshire in August of 1646 to parents who were comfortable but by no means wealthy. Though attacked by numerous illnesses not uncommon to the day, John applied his bedridden days to devouring every book upon which he could lay his hands. And from a simple introduction to fractions, he became interested in mathematics as well. But one day—one very special day in his fourteenth year—he observed and drew a solar eclipse. On that one, special day he contracted an incurable condition we call astronomy. Unknown to him at that time, his moment had arrived.

Encouraged by his father, he continued his studies in astronomy by applying his knowledge of math towards understanding the equation of time (the difference between clock time and solar time). He also developed tables of the sun’s altitude for every day of the year, catalogued 70 stars in detail and made the acquaintance of several of the day’s most respected astronomers. Taking full advantage of the time he had recuperating from his various maladies, John was becoming quite the astronomer. And in the midst of all this activity he managed to complete his studies at Jesus College Cambridge and was ordained into the priesthood.

As his reputation grew he was consulted on the construction of an observatory for the Royal Society at Chelsea College. Concurrent with this movement, John extensively studied many of the existing catalogues of stars and planetary motions and concluded [correctly], that there were significant inaccuracies in these works. But they were inaccuracies that could be updated given the techniques of Flamsteed's day. These were the thoughts he communicated to a friend by letter. And in a stroke of good fortune, this very letter found its way to King Charles II.

Bonnie former Prince and now King Charles understood that Britain was a sea-faring nation. A sea-faring nation with great ambitions. And a sea-faring nation with such ambitions needed accurate celestial charts for navigation. While the King acted quickly and decisively you have to admit that Flamsteed combined skill and luck in a unique moment that led to this:

Warrant for the Payment of Mr. Flamsteed's Salary.

Charles Rex.

Whereas, we have appointed our trusty and well-beloved John Flamsteed, Master of Arts, our astronomical observator, forthwith to apply himself with the most exact care and diligence to the rectifying the tables of the motions of the heavens, and the places of the fixed stars, so as to find out the so-much-desired longitude of places for the perfecting the art of navigation, Our will and pleasure is, and we do hereby require and authorize you, for the support and maintenance of the said John Flamsteed, of whose abilities in astronomy we have very good testimony, and are well satisfied, that from time to time you pay, or cause to be paid, unto him, the said John Flamsteed, or his assigns, the yearly salary or allowance of one hundred pounds per annum; the same to be charged and borne upon the quarter-books of the Office of the Ordnance, and paid to him quarterly, by even and equal portions, by the Treasurer of our said office, the first quarter to begin and be accompted from the feast of St. Michael the Archangel last past, and so to continue during our pleasure. And for so doing, this shall be as well unto you, as to the Auditors of the Exchequer, for allowing the same, and all other our officers and ministers whom it may concern, a full and sufficient warrant. Given at our Court at Whitehall, the 4th day of March, 1675

A new royal entered the world stage. John Flamsteed had become the first Astronomer Royal.

On the heels of this warrant came another:

Warrant for Building the Observatory.

Charles Rex.

Whereas, in order to the finding out of the longitude of places for perfecting navigation and astronomy, we have resolved to build a small observatory within our park at Greenwich, upon the highest ground, at or near the place where the Castle stood, with lodging-rooms for our astronomical observator and assistant, Our will and pleasure is, that according to such plot and design as shall be given you by our trusty and well-beloved Sir Christopher Wren, Knight, our surveyor-general of the place and scite of the said observatory, you cause the same to be fenced in, built and finished with all convenient speed, by such artificers and workmen as you shall appoint thereto, and that you give order unto our Treasurer of the Ordnance for the paying of such materials and workmen as shall be used and employed therein, out of such monies as shall come to your hands for old and decayed powder, which hath or shall be sold by our order of the 1st of January last, provided that the whole sum, so to be expended or paid, shall not exceed five hundred pounds; and our pleasure is, that all our officers and servants belonging to our said park be assisting to those that you shall appoint, for the doing thereof, and for so doing, this shall be to you, and to all others whom it may concern, a sufficient warrant. Given at our Court at Whitehall, the 22nd day of June 1675, in the 27th year of our reign.

The Governmental Office of Ordinance provided money for the building and for salaries. The equipment was either donated or bought by Flamsteed himself. Oh, and by the way, notice that it was decided the new observatory should not be built on the grounds of Chelsea College but rather in a place called Greenwich. John Flamsteed maintained his royal position until his death in 1719. Upon his death the mantle was passed to Edmund Halley. Flamsteed and Halley strongly disliked each other. Royals don't seem to get along, do they? Well, at least Halley didn't lead a palace coup...

Astronomer Royal is a senior post in the Royal Household of the Sovereign of the United Kingdom, under the general authority of the Lord Chamberlain. Though largely an honorary post today, it is one of great prestige. The Astronomer Royal receives a stipend of £100 a year and is called upon to advise and educate the Sovereign on matters of astronomy

and science. Can you imagine one of the more interesting of such consultations featuring Astronomer Royal Frank Dyson explaining relativity to George V?

The current member of this royal family, the 15th since 1675, is Martin Rees, Baron of Ludlow. His predecessors have included two clergymen and eight members of the Peerage but [so far as I know] no madmen, imbeciles or megalomaniacs.

And, sorry to say, but Astronomer Royal is, to date, a “good old boys” club.

Next Time: NOvember.



A Missile in Your Eye

By Patrick L. Barry

Satellite technology designed to catch ballistic missile launches may soon help doctors monitor the health of people's eyes.

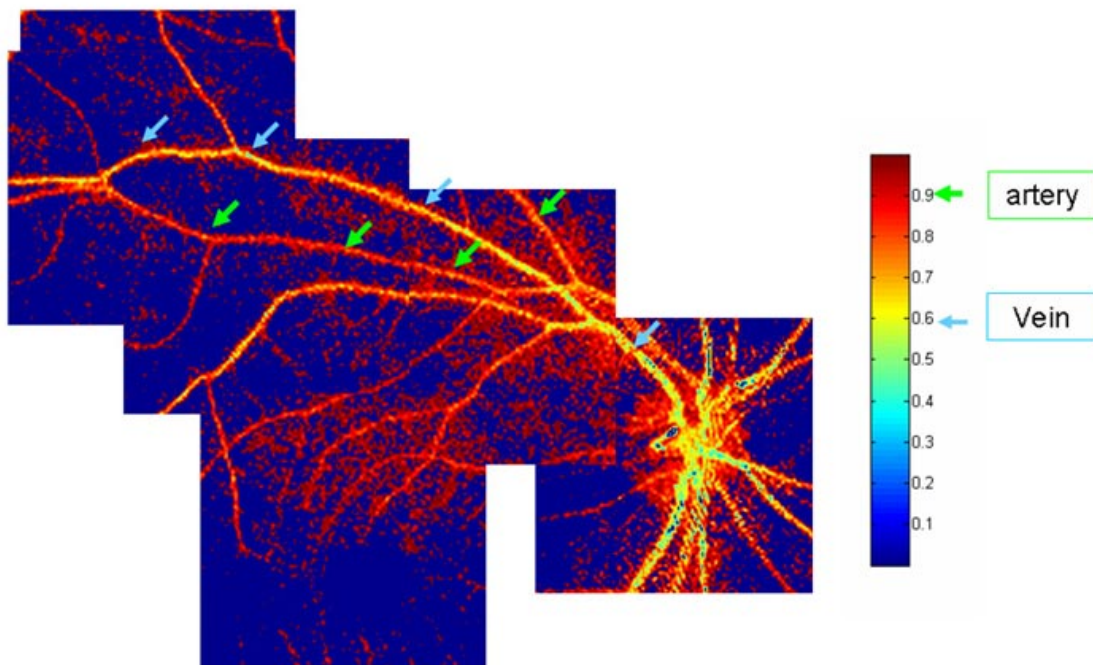
For the last 15 years, Greg Bearman and his colleagues at NASA's Jet Propulsion Laboratory (JPL) have been working on a novel design for a spectrometer, a special kind of camera often used on satellites and spacecraft. Rather than snapping a simple picture, spectrometers measure the spectrum of wavelengths in the light coming from a scene. From that information, scientists can learn things about the physical properties of objects in the photo, be they stars or distant planets or vegetation on Earth's surface.

In this case, however, the challenge was to capture snapshots of short-lived events—like missile launches! The team of JPL scientists designed the new spectrometer, called a computed tomographic imaging spectrometer (CTIS), in collaboration with the Ballistic Missile Defense Organization as a way to detect missiles by the spectral signatures of their exhaust.

But now the scientists are pointing CTIS at another fast-moving scene: the retina of an eye.

Blood flowing through the retina has a different spectral signature when it is rich in oxygen than when it is oxygen deprived. So eye doctors can use a spectrometer to look for low oxygen in the retina—an indicator of disease. However, because the eye is constantly moving, images produced by conventional spectrometers would have motion blurring that is difficult to correct.

The spectrometer that Bearman helped to develop is different: It can capture the whole retina and its spectral information in a single snapshot as quick as 3 milliseconds. "We needed something fast," says Bearman, and this spectrometer is "missile-quick."



This three-color composite image from the computed tomographic imaging spectrometer shows the oxygenation of the blood in the arteries and veins of a human retina. (Arteries appear red, veins appear yellow.)

CTIS is even relatively cheap to build, consisting of standard camera lenses and a custom, etched, transparent sheet called a grating. "With the exception of the grating, we bought everything on Amazon.com," he says.

The grating was custom-designed at JPL. It has a pattern of microscopic steps on its surface that split incoming light into 25 separate images arranged in a 5 by 5 grid. The center image in the grid shows the scene undistorted, but colors in the surrounding images are slightly "smeared" apart, as if the light had passed through a prism. This separation of colors reveals the light's spectrum for each pixel in the image.

"We're conducting clinical trials now," says Bearman. If all goes well, anti-missile technology may soon be catching eye problems before they have a chance to get off the ground.

Information about other NASA-developed technologies with spin-off applications can be found at:

<http://www.sti.nasa.gov/tto>

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

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Cartoon by Nicholas La Para

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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

Telephone: 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:

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 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:

www.POLCouncil.org



Good Outdoor Lighting Website

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? Now there is a web site and business intended to address that very problem. At this site you can find information on all kinds of well-designed (that is, star-friendly) outdoor lighting fixtures. This company, Starry Night Lights, intends to make available all star-friendly fixtures they can find, and information on them, in one place. Check it out, and pass this information on to others. Help reclaim the stars! And save energy at the same time!

<http://www.starrynightlights.com/>



Local Astronomy Store: Skies Unlimited

There is an astronomy equipment store called *Skies Unlimited* in our area, in Pottstown to be specific, at:

Suburbia Shopping Center
52 Glocker Way
Pottstown, PA 19465

Telephone: 610-327-3500 or 888-947-2673

<http://www.skiesunlimited.net/>



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:

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 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 stargazer1956@comcast.net

Or mail the contribution, typed or handwritten, to:

Jim Anderson
1249 West Kings Highway
Coatesville, PA 19320-1133

Get 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 Jim Anderson, the newsletter editor, at:

stargazer1956@comcast.net

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 copying 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:** Kathy Buczynski
610-436-0821
- Vice Pres:** Jim Anderson
610-857-4751
- ALCor and Treasurer:** Bob Popovich
610-363-8242
- Secretary:** Don Knabb
610-436-5702
- Newsletter:** Jim Anderson
610-857-4751
- Librarian:** Linda Lurcott Fragale
610-269-1737
- Observing:** Don Knabb
610-436-5702
- Education:** Kathy Buczynski
610-436-0821
- Webmaster:** 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 your membership. If you are due to renew, you can mail in your renewal check made out to "Chester County Astronomical Society." Mail to:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

Sky & Telescope Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$32.95** which is much less than the newsstand price of \$66.00, and also cheaper than individual subscriptions (\$42.95)! To start a subscription, make **sure** you make out the check to the **Chester County Astronomical Society** (do **not** make the check out to Sky Publishing, this messes things up big time), note that it's for *Sky & Telescope*, and mail to Bob Popovich. Or you can bring it to the next Society meeting and give it to Bob there. **If you have any questions by all means call Bob first (610-363-8242).** Buying a subscription this way also gets you a 10% discount on other Sky Publishing merchandise.

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.**

Phone: 610-363-8242
e-mail: B2N2@verizon.net

Directions to Hoopes Park in West Chester, PA

FROM WEST CHESTER PIKE

- Take West Chester Pike (Rt. 3) Toward West Chester.
- West Chester Pike turns into Gay Street.
- Take Gay Street into town.
- Turn Right onto North High Street (by the Iron Hill Brewery).
- Follow North High Street to Ashbridge Street
- Turn Left onto Ashbridge Street. (at the West Chester Country Club).
- Once you are on Ashbridge Street, the West Chester Country Club is on your right.
- Go through two stop signs, Hoopes park is on the right.

FROM DOWNINGTOWN via BUSINESS 30

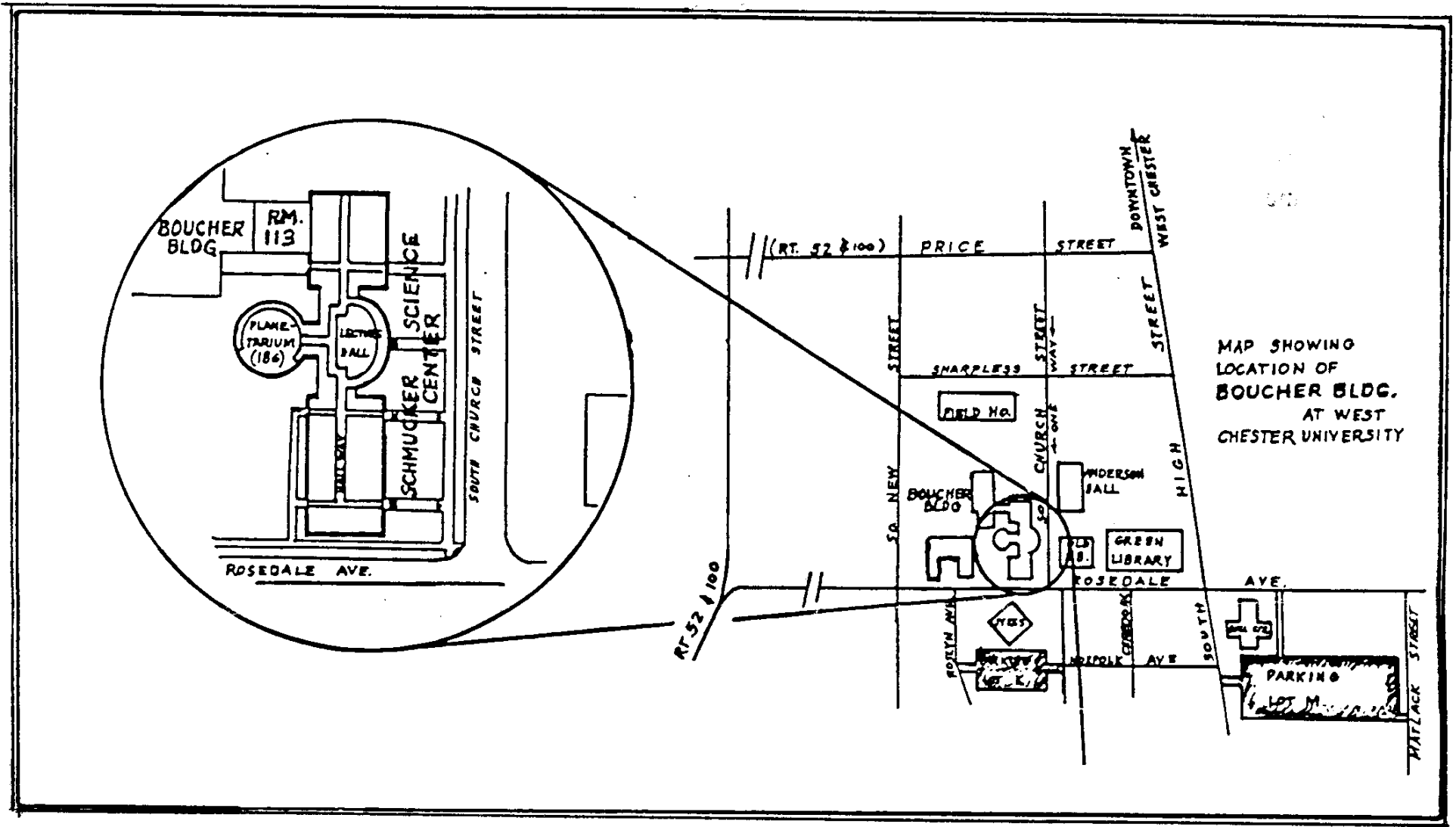
- Take Business Rt. 30 to the heart of Downingtown to Rt.322 South towards West Chester for 7-8 miles.
- Take a Left onto Ashbridge, Hoopes park is on your left.

FROM EXTON

- Take Rt. 100 South toward West Chester.
- Take slight Right onto Rt. 100 (Pottstown Pike Exit) toward West Chester. Stay straight on Pottstown Pike for 4-5 miles. West Chester Country Club will be on your right.
- Turn right onto Ashbridge Street at Country Club. Go through two stop signs. Hoopes Park will be on the right.

FROM SOUTH OF WEST CHESTER:

- Take Rt. 202 North towards West Chester.
- Stay straight into West Chester on High Street.
- Continue North on High Street through town until you reach Ashbridge Street.
- Take Left onto Ashbridge Street.
- Once on Ashbridge, the West Chester Country Club is on your right.
- Go through two stop signs. Hoopes Park is on the right.



Parking is available behind Sykes Student Center on the south side of Rosedale Avenue (Parking Lot K), and behind the Bull Center at the corner of Rosedale Avenue and South High Street (Parking Lot M). If you arrive early enough, you may be able to get an on-street parking space along South Church Street, or along Rosedale Avenue. You can take the Matlack Street exit from Rt. 202 South; Matlack Street is shown on the map at the lower right corner with Rt. 202 off the map. If approaching West Chester from the south, using Rt. 202 North, you would continue straight on South High Street where Rt. 202 branches off to the right. This would bring you onto the map on South High Street near Parking Lot M, also in the lower right corner.