Observations

2006 Winner of the Astronomical League's
Mabel Sterns Best Newsletter Award

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

FEBRUARY 2007
(VOLUME 15, NO. 2)
Visit our website at www.ccas.us

In This Issue

Important February 2007 Dates

2 Full Moon—the Snow Moon. Also, Saturn is just above the Moon after dusk.

6 **Introductory Astronomy class** meets at West Chester University. Class starts at 7:00 p.m. EST. Topic: *Spaceship Earth*.

See page 4 for details.

7 Mercury is at greatest elongation. This is a good evening to look for Mercury 45 minutes after sunset.

10 Last Quarter Moon. Also, Saturn is at opposition, which means Earth is as close to Saturn as it will get this year. Therefore, this is a good month to see Saturn.

13 **CCAS Meeting 7:30 p.m.** EST
Location: West Chester University
Constellation of the Month: Corona Borealis

Topic: Member's Night. See page for details.

16/17 **CCAS Observing Session**
Location: Brandywine Valley Association

Time: sunset, or earlier (see page 4)

17 New Moon.

19 Venus shines below the crescent Moon—this should be a wonderful sight! No telescope required.

20 **Introductory Astronomy class** meets at West Chester University. Class starts at 7:00 p.m. EST. Topic: *The Moon*.

See page 3 for details.

24 First Quarter Moon is at 2:56 a.m. EST. Possible Lunar X opportunity on evening of 23rd.

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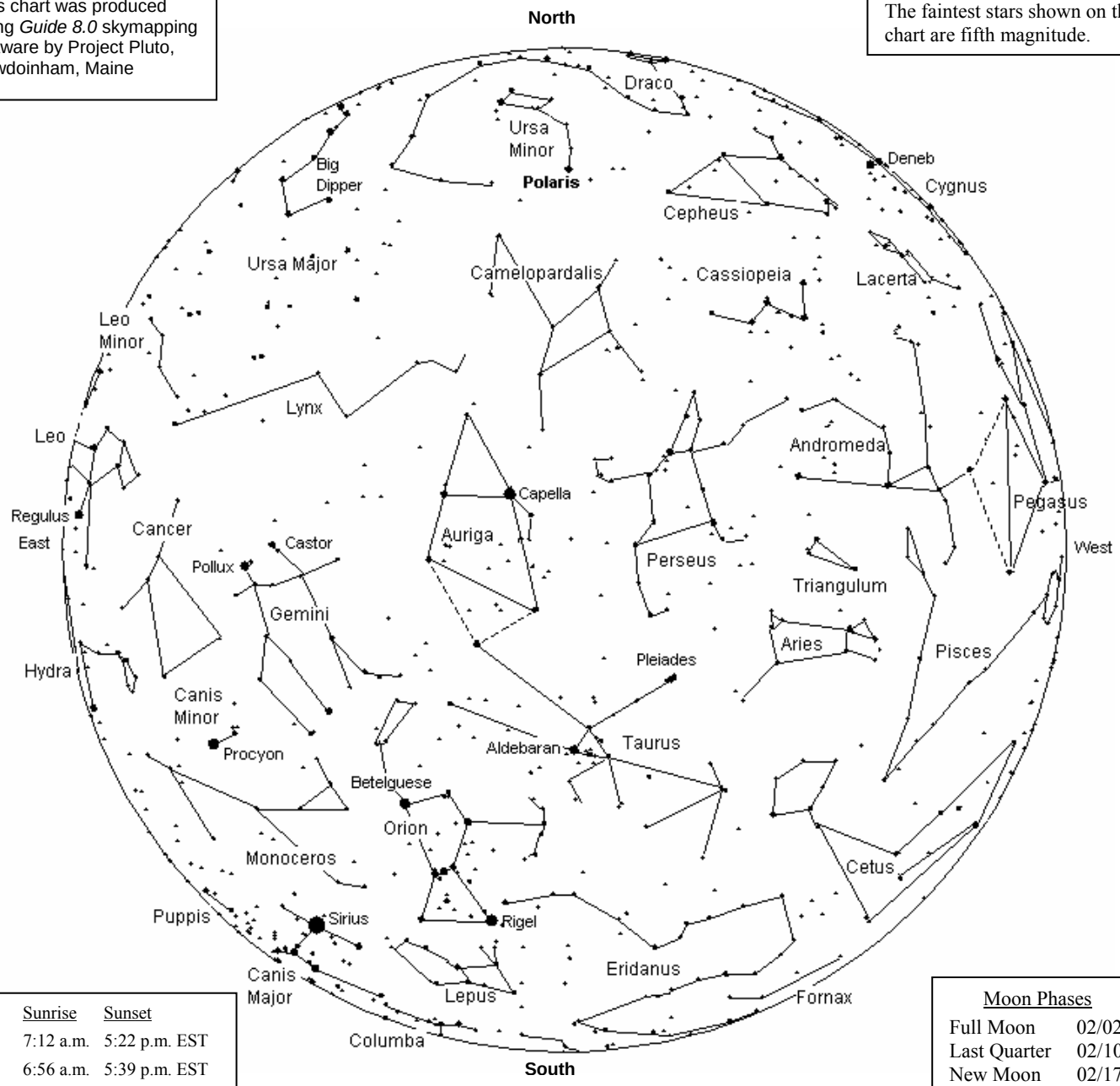
This chart was produced using *Guide 8.0* skymapping software by Project Pluto, Bowdoinham, Maine

The faintest stars shown on this chart are fifth magnitude.



Date	Sunrise	Sunset
2/1	7:12 a.m.	5:22 p.m. EST
2/15	6:56 a.m.	5:39 p.m. EST
2/28	6:38 a.m.	5:54 p.m. EST

Moon Phases	
Full Moon	02/02
Last Quarter	02/10
New Moon	02/17
First Quarter	02/24

The sky over Chester County
February 15, 2007 at 7:00 p.m. EST

The Planets, by Don Knabb

Mercury: If you have not seen Mercury for a while there is a great opportunity during February. On February 7th Mercury reaches greatest elongation east, shining below and to the right of Venus in the evening twilight. Look in the west-southwest about 45 minutes after sunset. By mid-month Mercury fades from view.

Venus: The "evening star" sets about a half hour after astronomical twilight ends, so it will be easy to find as the glow of the Sun fades.

Mars: Mars rises before the Sun, so get up early if you want to see the Red Planet. Mars is much dimmer and lower in the sky than brilliant Jupiter.

Jupiter: Jupiter is quite a bright beacon in the east as I pick up the morning paper at 6:00 a.m.

Saturn: This is a great time to see Saturn! On February 10th it is at opposition when it rises near sunset, transits near midnight and sets near sunrise. The ringed beauty looks fantastic in clear winter skies and is shining a bit brighter than it will for many years to come! Share the view with some friends! Oohhhs and aaahhs are guaranteed.

Uranus: Uranus can be found near Venus on February 6th and 7th

Neptune: Neptune is in conjunction with the Sun on February 8th and cannot be seen during the month.

Pluto: Pluto is higher than Jupiter before dawn, but is a tough target for Chester County skies.

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 online.

February Observing Highlights

by Don Knabb, CCAS Observing Chair

Planets: Saturn gets top billing during February. The ringed beauty is bright in the evening sky and the rings are at a good angle for viewing. Venus is also a bright point of light as the sun sets. Too bad there isn't still a comet in the sunset skies!

Constellations: Orion rules the southern winter sky. Follow the line of his three belt stars up and to the right to find Taurus the Bull. Go to the left you will find Sirius, in Canis Major, the brightest star in the night sky

Deep sky: There are many wonderful deep sky sights in the cold winter skies. The star clusters in Auriga are almost directly overhead, well positioned for viewing through the minimum amount of atmosphere. M41, a cluster of stars, is just below Sirius. Find somewhere dry and put down a blanket, dress REAL warmly, grab your binoculars and just stare at the beautiful Pleiades. Then look to the east and find the Beehive in Cancer before you freeze!

Meteor shower: There are no meteor showers during February.

Feb. 2	Full Moon, 12:45 a.m., the Snow Moon.
Feb. 2	Saturn is just above the Moon after dusk.
Feb. 7	Mercury at greatest elongation.
Feb. 10	Last quarter Moon, 4:51 a.m.
Feb. 10	Saturn is at opposition.
Feb. 12	Jupiter shines above the Moon before dawn. Antares is to their right.
Feb. 17	New Moon, 11:12 a.m.
Feb. 19	Venus shines below the crescent Moon – this should be a wonderful sight!
Feb. 23	Grab your binoculars and catch the Pleiades next to the First Quarter Moon.
Feb. 23/24	First quarter Moon, 2:56 a.m. – Lunar X opportunity around 9:00 p.m. to midnight on February 23?

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Through the Eyepiece: NGC 457 the ET Cluster

by Don Knabb, CCAS Observing Chair

One of the most fun objects in the night sky for me is NGC 457; also known as the Owl Cluster, the Dragonfly Cluster, the Phi CAS Cluster or the ET Cluster.

NGC 457 is an open star cluster in the rich star fields of the Milky Way in the constellation Cassiopeia. It appears as a scattered group of stars consisting of about 100 stars brighter than 13th magnitude. NGC 457 is approximately 9000 light years from the Sun. The website astropix.com lists NGC 457 as one of the top 10 open star clusters.

What makes this NGC 457 fun is that it is such a unique shape. Just like lying on your back and finding shapes in the clouds, NGC 457 just begs us to identify it with something that we recognize in our earthly world. So I can see why it is called the Owl or Dragonfly cluster, but for me it is most certainly the ET Cluster, named for that goofy extraterrestrial star of the movie many years ago.

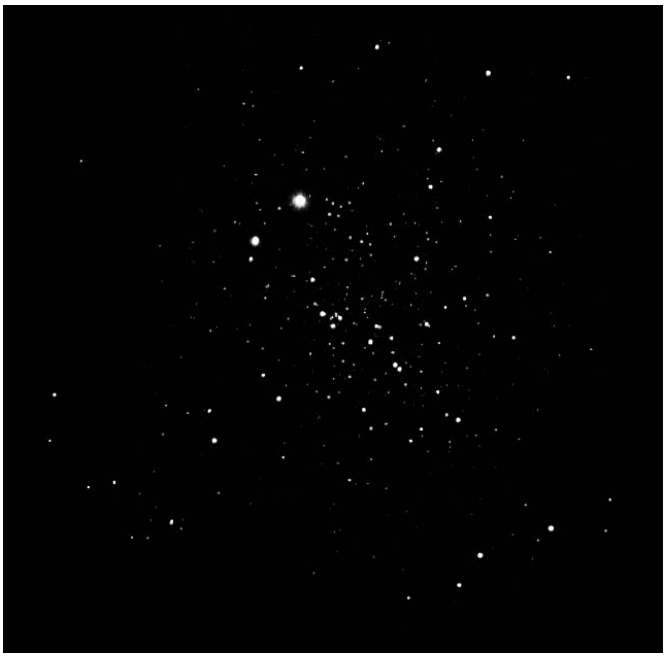

Image: Starry Night software

The two bright stars form ET's eyes, scattered rows of faint stars make up arms and the rest of the cluster forms a body. With good skies you can pick out the stars that form ET's feet.

Locating this fine open cluster that was discovered by William Herschel in 1787 is very easy. From delta Cassiopeia go 2 degrees south-southwest. There you will find NGC 457.

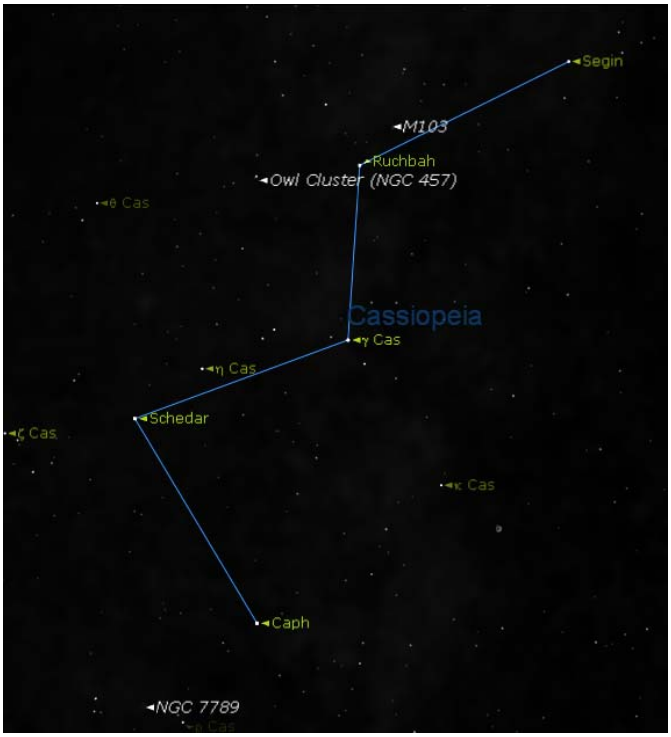

Image: Starry Night software

NGC 457 is one of the brightest non-Messier open clusters. The star phi (φ)Cas is considered a part of this cluster. This star is one of the most luminous known, with at least 200,000 times the light of the sun.

When you scan Cassiopeia and its neighboring constellations with binoculars, the star fields in Cassiopeia seem to be much richer than in Perseus and Cepheus. This is because in the Perseus and Cepheus Milky Way, large nearby dust clouds of our own spiral arm (the Orion arm) block the view. But, in the Cassiopeia Milky Way there are no dust clouds to block the view, so you actually look through a "window", across an inter-arm gap towards the Perseus arm, the next spiral arm toward the exterior of our galaxy.

In Cassiopeia you can find a large variety of open clusters. Because you can look over great distances through the Cassiopeia window, you see clusters lying at very different distances from us. Some clusters are "foreground" clusters that lie relatively nearby (Stock 2, NGC 225), some lie scattered across the inter-arm gap between our own Orion arm and the Perseus arm (M52, NGC 7789), while others actually lie in the Perseus arm. NGC 457 is on of them. In an 8-inch telescope NGC 457 is a wonderful sight. It is far superior to the Messier clusters of Cassiopeia, M 52 and M 103.

Cassiopeia is easily viewed in the clear winter sky. Dress warmly, find NGC 457 and ask ET to phone home some night soon!

Information sources:

http://www.astronomical.org (Peoria Astronomical Society)
http://www.nightskyinfo.com
http://www.dibonsmith.com
http://www.backyard-astro.com
http://www.astropix.com

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CCAS February Meeting

DATE: **Tuesday February 13, 2007**
TIME: **7:30 p.m. EST**
PLACE: Room 113 – Boucher Building
West Chester University
LOCATION: South Church Street
West Chester, PA

A map of the campus showing the location is on page 15.

This month's Constellation of the Month (COM) will be Corona Borealis, presented by Don Knabb.

This month's meeting will be members' night. Bring your questions on astronomy, and we'll try to answer them. If you have a "mini-talk," something about astronomy or space exploration, that would only require 5-15 minutes to cover, come prepared to talk about it, and let Kathy Buszynski or Jim Anderson know you have a mini-talk. Thanks!

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CCAS Observing Session
February 16/17, 2007

CCAS Observing Sessions will be at the Brandywine Valley Association's Myrick Conservancy Center (see map on page 14) on Fridays starting at sunset; or earlier, if you can get there earlier. If it's too cloudy on Friday, then the Observing Session will be on the next day, Saturday. At the observing sessions, there will be help available to set up and use your telescopes. If you're having trouble using your telescope, or finding your way around the sky, come on out and get some assistance. All members are invited whether they have a telescope or not. Telescope owners are always glad to share the view through their telescope. CCAS Observing Sessions are free of charge and open to the public.

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CCAS Introductory Astronomy Class

The Education Committee of the CCAS is offering a class intended to introduce people to basic astronomy. This series of eight classes will be held on the first and third Tuesdays of each month, starting at 7:00 p.m. and ending at 8:00 p.m. These are the dates on which classes will be held:

February 6	Spaceship Earth
February 20	The Moon
March 6	The Other Kids on the Block
March 20	Planispheres/Star Charts
April 3	Stars by Design: Constellations
April 17	The Secret Life of Stars
May 1	Planetarium show (WCU planetarium)
May 15	Beyond Naked Eye

The classes will be held in Room 113 in the Boucher Building at West Chester University. This is the room where we hold our monthly meetings. See the map on page 15.

The cost for non-members is $20.00 per person, and $30.00 per family (with the same address). **For current CCAS members, the classes are free!** Space is limited to just 40 people, however, so call Kathy Buczynski to reserve your space **now** (610-436-0821). Also, please call Kathy if you'd like to help at the classes.

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Welcome!

We welcome our newest members to the Society: Bill Marella of Malvern, Jean Rodriguez & family of Spring City, John Von Wagener of Pottstown, Devon Sewart of Philadelphia, Thomas McDevitt of West Chester, and Chris Dautrich of Chesterbrook. We're glad you decided to join us! Clear skies to all!

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Treasurer's Report by Bob Popovich

November 2006 Financial Summary

Beginning Balance	$1,663
Deposits	146
Disbursements	66
Ending Balance	$1,743

Membership Renewals Due

02/2007	Farrelly
	Fellwock
	La Para
	Leiden
	Reimer
03/2007	Dascaloff
	LaFrance
	Morgan
04/2007	Corrum
	Heck
	Imburgia
	Popovich
	Reynolds
	Richter

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 in this newsletter.

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New Benefit for CCAS Members!

by Bob Popovich & John Hepler

We are offering a new benefit for members of the Chester County Astronomical Society: a special group-discount subscription rate for ***Astronomy* magazine**! This excellent full-color monthly magazine is issued by Kalmbach Publishing Company, who makes this special rate available. We thank Bob and John for getting us the needed information for this offer! And, of course, a special thanks to Kalmbach Publishing for making this generous offer to astronomy clubs.

They offer one and two year discounted rates for CCAS members. The one year rate is $34.00; two years is $60.00. The normal subscription rate is $42.95 per year, or $79.95 for two years. At the group rate, you save an additional 21% on a one-year subscription, and 25% on a two-year subscription!

The only condition needed to qualify for the discounted Group Subscription rate is a minimum of five subscription orders (new and/or renewal) from our Society.

If you want to participate in this special discount program, contact **Bob Popovich at 610-363-8242** or by e-mail at

B2N2@verizon.net.

As soon as Bob hears from at least five members who want to participate, he'll distribute the subscription forms.

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CCAS Trip to U.S. Naval Observatory

The CCAS is making plans for a trip to Washington D.C. in December to visit the U.S. Naval Observatory and the National Air and Space Museum.

The Naval Observatory is open for tours on Monday evenings (except national holidays) 8:30 to 10:00 p.m. We will tour the Observatory and be able to observe (weather permitting). We can reserve a date for up to twenty people. We're considering **April 16, 2007**. We must reserve 4-6 weeks in advance (which means **Linda must know who is going by March 8, 2007**) and the USNO will confirm via e-mail or phone, no later than the Friday prior to the requested date.

We have to send the USNO a list of the names and birthdates of those attending. Upon arrival (gates open at 8 p.m.) we must each show a valid photo ID and go through a security procedure. The security is required because the home of the Vice President of the United States is also located on the USNO grounds.

We will travel to Washington on Monday evening, arriving in time for the tour at the USNO. After that, we will stay overnight and visit the National Air and Space Museum on Tuesday before traveling home on Tuesday evening. If you are interested in going, please **contact Linda Lurcott-Fragale at 610 269-1737**. Please be ready to give Linda the full names of all attendees, exactly as their name appears on the photo ID they will use at the USNO for check-in (this could be a valid driver's license, student ID card, passport, etc.) as well as each person's date of birth. This information will **only** be used to register you at the USNO for this trip.

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Error in January 2007 Observations

by Jim Anderson

On page 4 of the January 2007 issue of *Observations* there is an article entitled "Report on Griffith Observatory," I erroroneously attributed that article to member Robert Fellwock. The article was written by member Robert Richter.

I am sorry for this clumsy mistake, and apologize to Robert Richter for the error. The mistake was entirely mine.

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More About the Franklin Institute's Refractor

By Bob Richter

In last month's newsletter, I reported on my visit to the Griffith Park Observatory in Los Angeles, which houses a 12-inch Zeiss refractor that predates World War II. A telescope demonstrator for the observatory said there are only two such Zeiss refractors left in the world—the other being at the Franklin Institute in Philadelphia. I also reported that the Franklin Institute's web site did not have information on its telescope. Subsequently, Derrick Pitts, Chief Astronomer, provided some additional information.

He said "there are very few of these refractors left. Except for one in China somewhere, my understanding is that the others are in private hands." He said he has "a newspaper photo from 1931 showing our two telescopes under construction in the erecting shops at Zeiss Jena [East] Germany. And ours is only 10-inch but almost exactly the same design [as the one at Griffith Park Observatory]. These two are probably the smallest of this type made. Most of their other observatory-grade instruments were much larger."

He said the Franklin Institute's observatory "was renovated this past year" and is "open for solar observing every day the sky is clear and on the 3rd Wednesday night each month

(from 5 to 9 p.m.) for night observing (such as it can be in center city)."
He said he plans to add information about the telescope to the Institute's web site (**www.fi.edu**) in the near future.

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Minutes from CCAS January Meeting

by Vic Long, CCAS Secretary

For the meeting held on Tuesday January 9, 2007.

Constellation of the Month:
Kathy Buczynski prepared a handout and presentation on Taurus, but unfortunately she was unable to attend the meeting. Jim Anderson presented the COM for her.

Main Presentation:
Nicholas LaPara demonstrated an innovative software application "Where is M13?" that helps you visualize the locations and physical properties of deep sky objects in and around the Galaxy. Using paired face-on and edge-on views, it shows you where a cluster, star, or nebula is actually located relative to the center and plane of the Galaxy, providing a unique 3-D perspective.

Education:
The Introductory Astronomy class will commence on February 6th and be held the first and third Tuesday for 8 weeks. The limit of 40 students was questioned as the lecture room where the classes are to be held at WCU can accommodate more.

Observing (Don Knabb):
The next observing session is scheduled for 19th January. Observing comet McNaught was discussed. It may be observed low in the west shortly after sunset. More information is available at **www.spaceweather.com**

Website (John Hepler):
John continues to try to get the "members" e-mail list resolved. The issue is only with Comcast subscribers—mail from our hosting company looks like spam to Comcast, which blocks it. John is exploring the use of other hosting companies for which this interface problem with Comsat would not exist. John will also look at ways for members to post photos to file.

Public Relations (Deb Goldader):
Course flyer was sent to e-mail addresses (families, newspapers, names from Sally Ride, Astronomy Day). The poster will be sent to Astronomical League, for possible posting on their website. Several members at the meeting volunteered to place posters advertising the course on local area bulletin boards, e.g., supermarkets, libraries, etc.

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Calendar Notes

March 6, 2007 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EST
March 11, 2007 (Sunday)	**Daylight Savings Time begins!**
March 13, 2007 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
March 16/17, 2007 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
March 20, 2007 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EDT
April 3, 2007 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EDT.
April 10, 2007 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
April 17, 2007 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EDT
April 20/21, 2007 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
April 21, 2007 Saturday	**International Astronomy Day**
May 1, 2007 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EDT.
May 8, 2007 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
May 15, 2007 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EDT.
May 18/19, 2007 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset

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Canis Major

By Robert Frost

The great Overdog,
That heavenly beast
With a star in one eye,
Gives a leap in the east.

He dances upright
All the way to the west
And never once drops
On his forefeet to rest.

I'm a poor underdog,
But tonight I will bark
With the great Overdog
That romps through the dark.

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Astronomus

"A Tale Swiftly Told"

By Bob Popovich

At some point in 1667 Jonathan Swift made his first public statement. As he was but a baby, it was doubtless a cry. And though it may have pleased Mr. & Mrs. Swift, it left no permanent mark on the greater world. Yet one day, the Reverend Jonathan Swift would leave a literary mark on the world and, more to the matter at hand, quite a mark on the history of astronomy. Yes, you read correctly—astronomy. "And just what would that mark be?" I'm glad you asked. The clever satirist, whom Ireland and England both claim as a native son, left us with a written work into which are woven intriguing proclamations of astronomical fact. The rub is that they weren't facts when Swift penned them. I suppose you could call them guesses and we *can say* with certainty that science formally frowns upon guessing. Yet, what we *can't say* with certainty is how Swift came to these revelations. It's been a source of fascination for well over a century. And that's simply because it's too spooky to be ignored. And it goes something like this…

In part three of his 1726 fantasy novel *Travels Into Several Remote Nations of the World in Four Parts,* Swift, writing under the pseudonym of Lemuel Gulliver, describes the knowledge of the astronomers of Laputia:

"…They have made a catalogue of ten thousand fixed stars, whereas the largest of ours do not contain above one-third part of that number." [that's not the spooky point]

Continuing: "They have likewise discovered two lesser stars, or satellites, which revolve around Mars, whereof the innermost is distant from the center of the primary planet exactly three of its diameters, and the outermost five: the former revolves in the space of ten hours and the latter in twenty-one and a half; so that the squares of their periodical times are very near the same proportion with the cubes of their distance from the center of Mars, which evidently shows them to be governed by the same law of gravitation that influences the other heavenly bodies…" [That's the spooky point]

Swift points to two things that are of interest to astronomers. First, that there are a whole lot more stars in the universe than in contemporary star catalogues. This is as true today as it was then. This one's more an axiom than a spooky guess. What is spooky pertains to Mars' two moons—Deimos and Phobos.

"So what's all the hubbub, Bob?" you ask. "We all know that the solar system's fourth planet does have two small natural satellites in its gravitational grasp." True enough. As I inferred earlier, the only wee problem is that what Swift described in 1726 was unknown to astronomers until 1877. Lucky guess, right? Maybe. If it wasn't a lucky guess, perhaps then Swift was using the same sort of logic that Voltaire applied some 25 years later—the two inner planets had no moons, Earth had one and the two outer planets had several. So, is it not reasonable to conclude that Mars, lying between the planet with one moon and the planets with several, must have at least two? A tidy sort of reasoning that has more holes than Swiss cheese.[1]

Could he have observed them? Not likely because, aside from the fact that instruments of his time did not possess the power of resolution necessary to detect objects as small as Deimos and Phobos (diameters of 22 Km and 12.5 Km respectively), we have no information that Swift was an amateur astronomer.

If not logic, guessing or observing, what then? Gulliver tells us that Laputian astronomers ascertained that the inner satellite (Phobos) was "…distant from the center of the primary planet exactly three of its diameters…" Mars is 6,800 Km in diameter, and so we're told that Phobos was 20,400 Km distant. [6,800 x 3 = 20,400]. The actual mean distance is 9,400. Gulliver further relates that the revolutionary period is 10 hours; the actual is 8 hours.

For Deimos, "…distant from the center of the primary planet … the outermost five: revolves in twenty-one and a half…" Five times Mars' diameter would put Deimos 30,600 Km from the red planet. The actual mean distance is 23,500 Km. Swift's orbital period for Deimos is 21.5 hours; in actuality, it is 30 hours.

All things considered, a pretty darn close guess/deduction/measurement.

Curiously enough, when Mars was favorably positioned for observing in 1862, astronomers turned a keen eye on the red planet in search of Swift's two moons but found nothing. When Asaph Hall actually discovered Deimos and Phobos in 1877 using the Naval Observatory's 26 inch refractor, people starting scrambling to (1) explain Swift's reference of 150 years earlier and (2) figure out why the moons were not seen in 1862. A byproduct of this scrambling were some creative explanations for Mars' inclusion in *Gulliver's Travels* in addition to those previously noted. Here they are in order of amusement:

- Swift was communicating with Michel de Nostradame (Nostradamus)
- Swift was a Martian (the mother ship allowed him to spill the beans)
- The moons are artificial satellites launched by the Martians AFTER 1862.

- The moons were discovered by Galileo, a fact that Galileo transmitted via a cryptic anagram to friends who agreed with his views on the solar system. The anagram was:

  smaismrmilmepoetaleumibunenugttauiras

  Which Kepler subsequently misinterpreted as:

  Salue umbistineum geminatum Martia proles (Hail, twin companionship, children of Mars).

  If Galileo's anagram is an astronomical message, the solution generally given is:

  Altissimum planetam tergeminum observavi (I have observed the most distant planet [Saturn] to have a triple form) It is believed that Galileo detected the rings but his modest telescope could not resolve the two "lumps" on either side of Saturn.

Looks like this will always be one of those unsolved mysteries—intriguing to ponder, fun to debate and utterly without resolution. For those of you who hate unsolved mysteries, you can rest easy in knowing that this is the only occurrence of an author correctly presaging a planetary fact involving an until then-unknown moon.

Oh, no. Wait. In Arthur Clarke's novel *Rendezvous With Rama*, a solitary moon of Pluto is described. No, wait again. Pluto is no longer a planet. Phew! We're safe. For now…

Next Time: A Ride on The Main Line

(1) Remember that at this time the solar system consisted of the classical planets: Mercury, Venus, Earth, Mars, Jupiter and Saturn. The appeal of this logic at that time was a commonly held belief that there was a harmonious order to the universe. As a result, orderly things had an appealing correctness to people living then.

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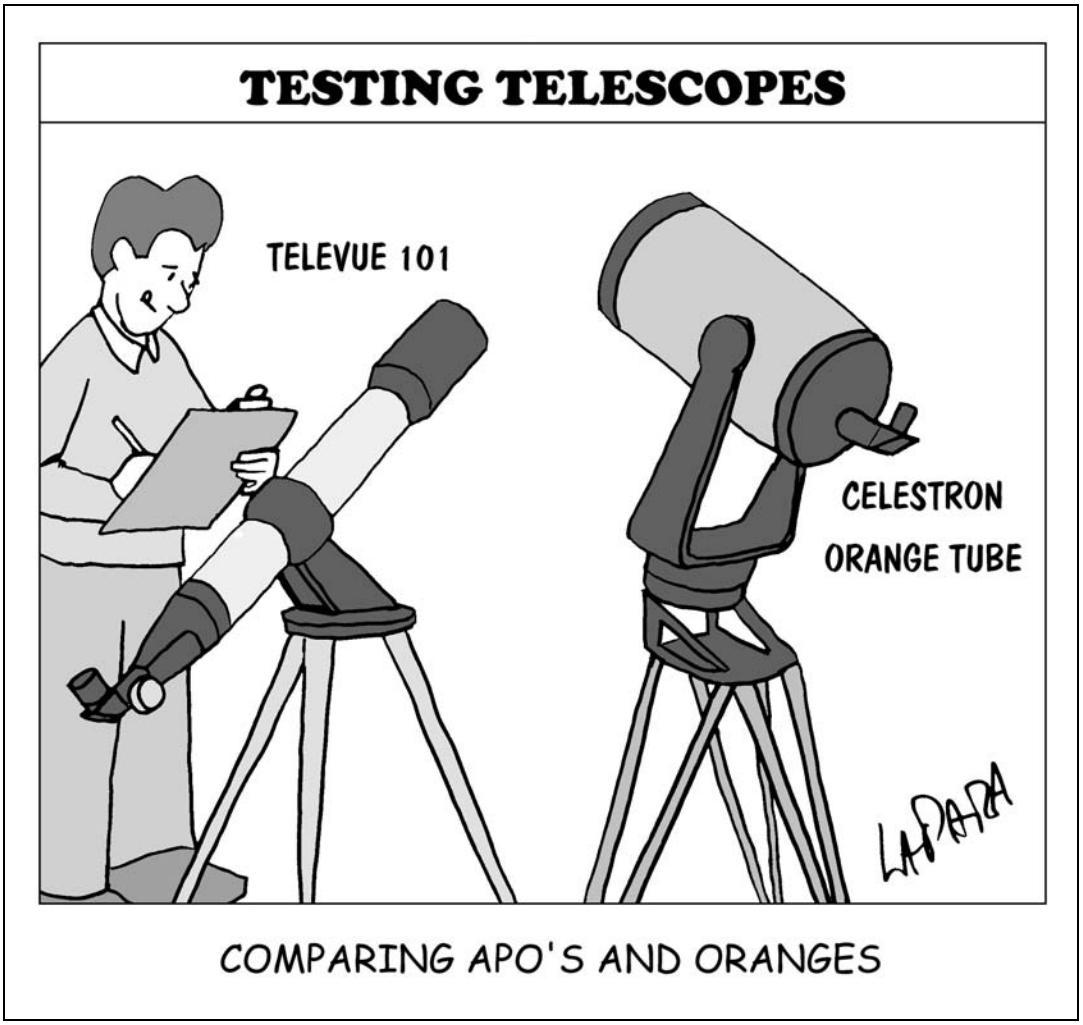


Cartoon by Nicholas La Para

A Great Big Wreck

By Dr. Tony Phillips

People worry about asteroids. Being hit by a space rock can really ruin your day. But that's nothing. How would you like to be hit by a whole galaxy?

It could happen. Astronomers have long known that the Andromeda Galaxy is on a collision course with the Milky Way. In about 3 billion years, the two great star systems will crash together. Earth will be in the middle of the biggest wreck in our part of the Universe.

Astronomer John Hibbard isn't worried. "Galaxy collisions aren't so bad," he says. A typical spiral galaxy contains a hundred billion stars, yet when two such behemoths run into each other "very few stars collide. The stars are like pinpricks with lots of space between them. The chance of a direct hit, star vs. star, is very low."

Hibbard knows because he studies colliding galaxies, particularly a nearby pair called the Antennae. "The two galaxies of the Antennae system are about the same size and type as Andromeda and the Milky Way." He believes that the Antennae are giving us a preview of what's going to happen to our own galaxy.

The Antennae get their name from two vast streamers of stars that resemble the feelers on top of an insect's head. These streamers, called "tidal tails," are created by gravitational forces—one galaxy pulling stars from the other. The tails appear to be scenes of incredible violence.

But looks can be deceiving: "Actually, the tails are quiet places," says Hibbard. "They're the peaceful suburbs of the Antennae." He came to this conclusion using data from GALEX, an ultraviolet space telescope launched by NASA in 2003.

This GALEX UV image of the colliding Antennae Galaxies shows areas of active star formation, which is not in the tidal tails as one might expect.

The true violence in colliding galaxies is areas of star formation. While individual stars rarely collide, vast interstellar clouds of gas *do* smash together. These clouds collapse. Gravity pulls the infalling gas into denser knots until, finally, new stars are born. Young stars are difficult to be around. They emit intensely unpleasant radiation and tend to "go supernova."

GALEX can pinpoint hot young stars by the UV radiation they emit and, in combination with other data, measure the rate of star birth. "Surprisingly," Hibbard says, "star formation rates are low in the tidal tails, several times lower than what we experience here in the Milky Way." The merging cores of the Antennae, on the other hand, are sizzling with new stars, ready to explode.

So what should you do when *your* galaxy collides with another galaxy? A tip from GALEX: head for the tails.

To see more GALEX images, visit

www.galex.caltech.edu

Kids can read about galaxies and how a telescope can be a time machine at

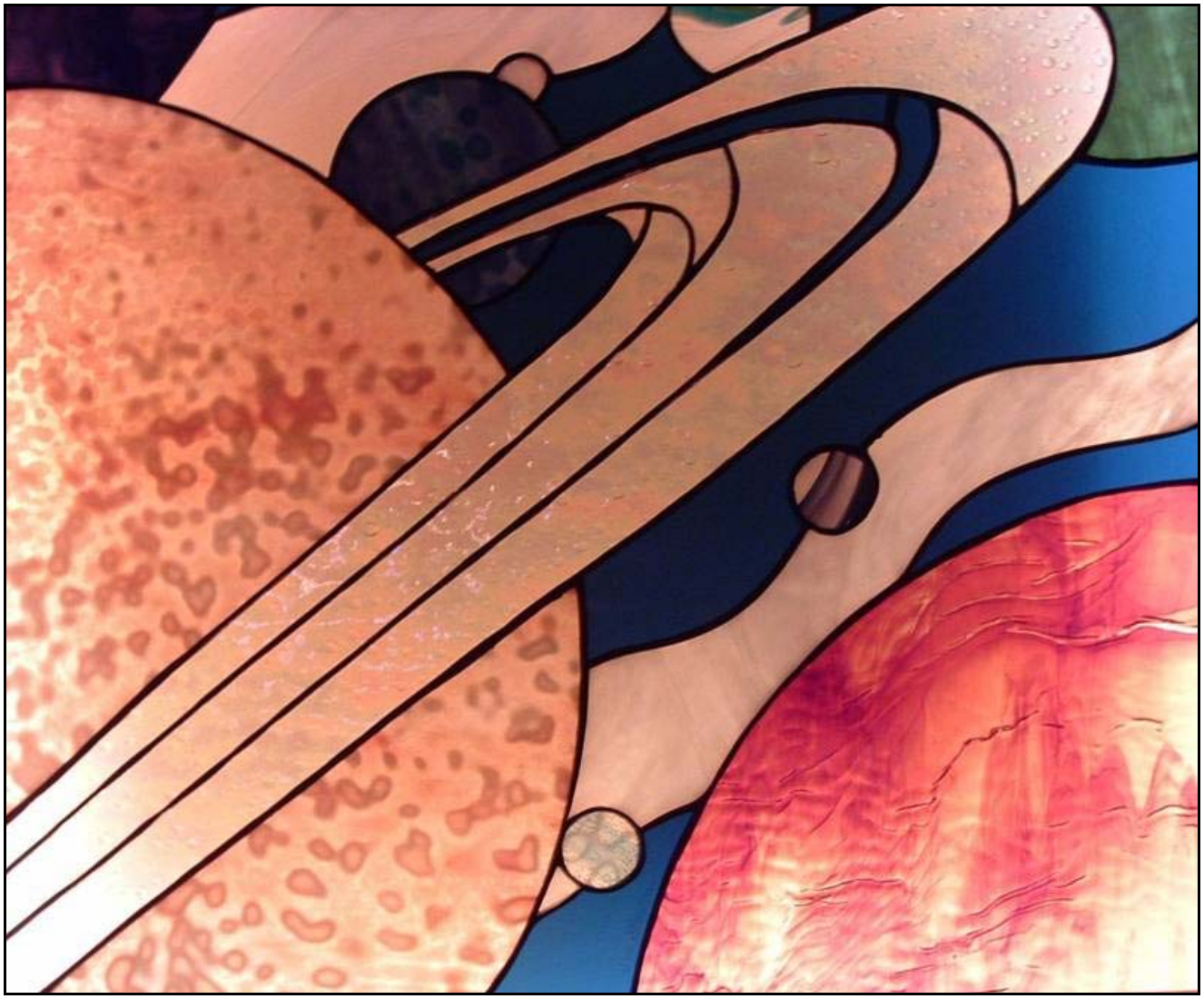
spaceplace.nasa.gov/en/educators/galex_puzzles.pdf

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

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Mystery Image

by Don Knabb



This is an original artwork owned by Don Knabb. Question: what is the media? First person to call or email Don with the correct answer wins the book *Binocular Stargazing* by Mike Reynolds. Prize will be presented at the February meeting.

Phone: 610-436-5702 email: dknabb00@comcast.net

Introductory Astronomy Class

February 6
through
May 15, 2007

8 one-hour classes
First & Third Tuesdays
7:00 p.m. to 8:00 p.m.

Sponsored by the
Chester County
Astronomical Society

All classes are taught by
members of the CCAS,
a club of amateur astronomers

Cost

$20.00 per person
or
$30.00 per family
(with same address)

For ages 9 - 90

Price Includes

- Parking
- Handouts
- 4-month CCAS membership
- CCAS Monthly newsletter
- Observing sessions
- Star locator (planisphere)
- Drawing for excellent beginners' guide book *Nightwatch*

Location:

West Chester University

Rm. 113 Boucher Building

South Church Street

West Chester, PA

Learn:

- What's in the sky this month
- How to find stars and constellations in the sky
- How to find planets
- How to observe eclipses
- How to use binoculars
- How to use telescopes
- How to use star charts
- What's on the Moon
- The differences between stars
- The life cycle of stars
- About types of telescopes
- Why we have seasons
- How the Earth moves in space
- About the Solar System
- About light pollution
- Astronomy on the Web

Enrollment limited to 40.
Call and reserve
your space now!

Kathy Buczynski
610-436-0821

Note: Content of class sessions subject to change without notice

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:

http://home.epix.net/~ghonis/index.htm

★ ★ ★ ★ ★ ★ ★ ★

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/

CCAS Members Benefit from High Point Scientific

The owners of High Point Scientific, an astronomy equipment store in Montague, NJ, have extended a special free benefit to members of the CCAS. All members get a *High Point Advantage Card*, which entitles the member to special discounts on almost all purchases. It also includes access to exclusive deals only available to *High Point Advantage Card* holders. Other benefits of the program are detailed in the letter and booklet given to each CCAS member.

High Point Scientific
442 Route 206
Montague, NJ 07827
Phone: 1-800-266-9590

www.highpointscientific.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:	Vic Long 610-399-0149
Newsletter:	Jim Anderson 610-857-4751
Librarian:	Linda Lurcott Fragale
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

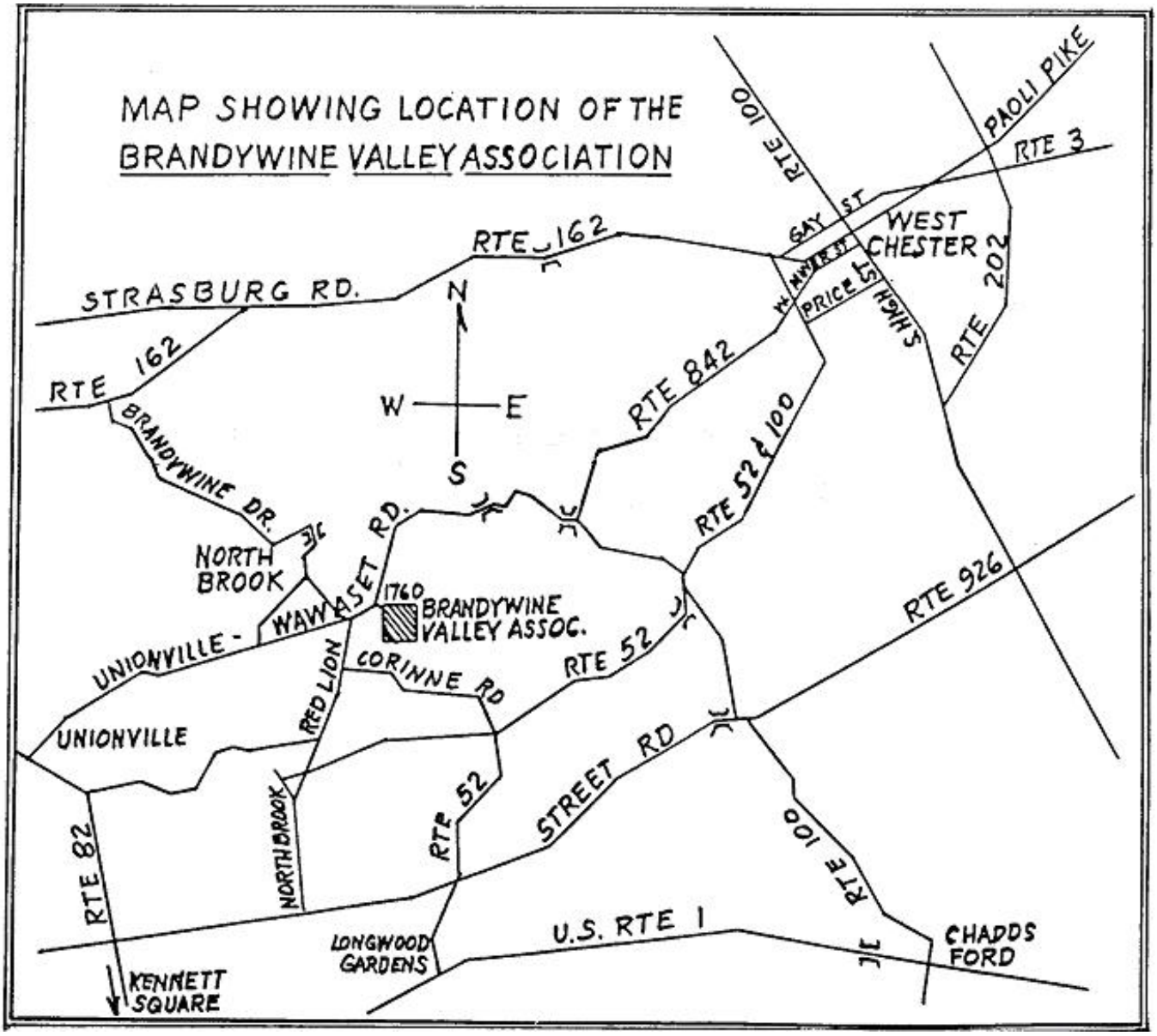
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95** which is much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society** (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

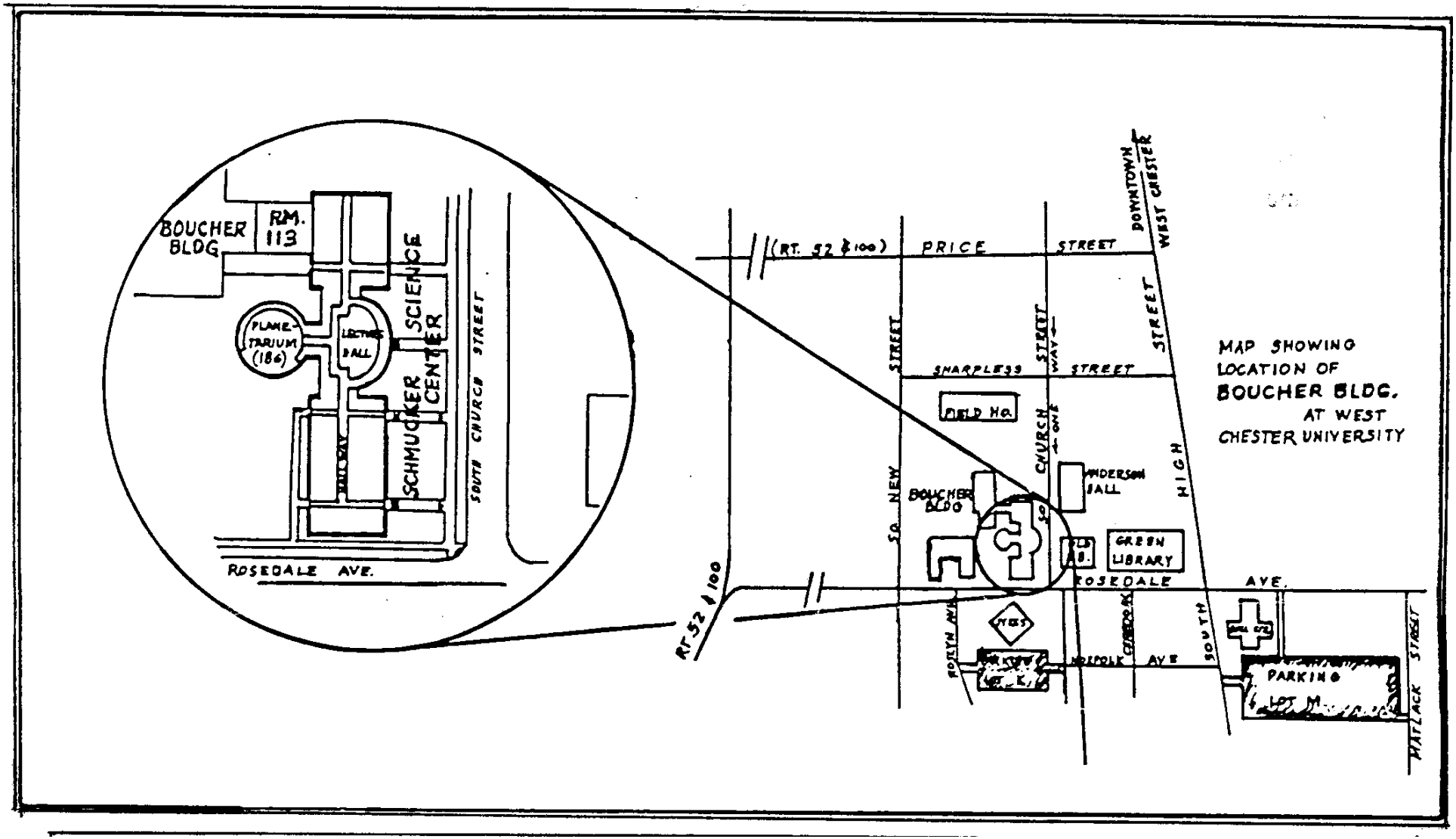
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$34.00** which is much less than the individual subscription price of $42.95 (or $60.00 for two years). If you want to participate in this special Scoiety discount offer, **contact our Treasurer Bob Popovich.**

Phone: 610-363-8242

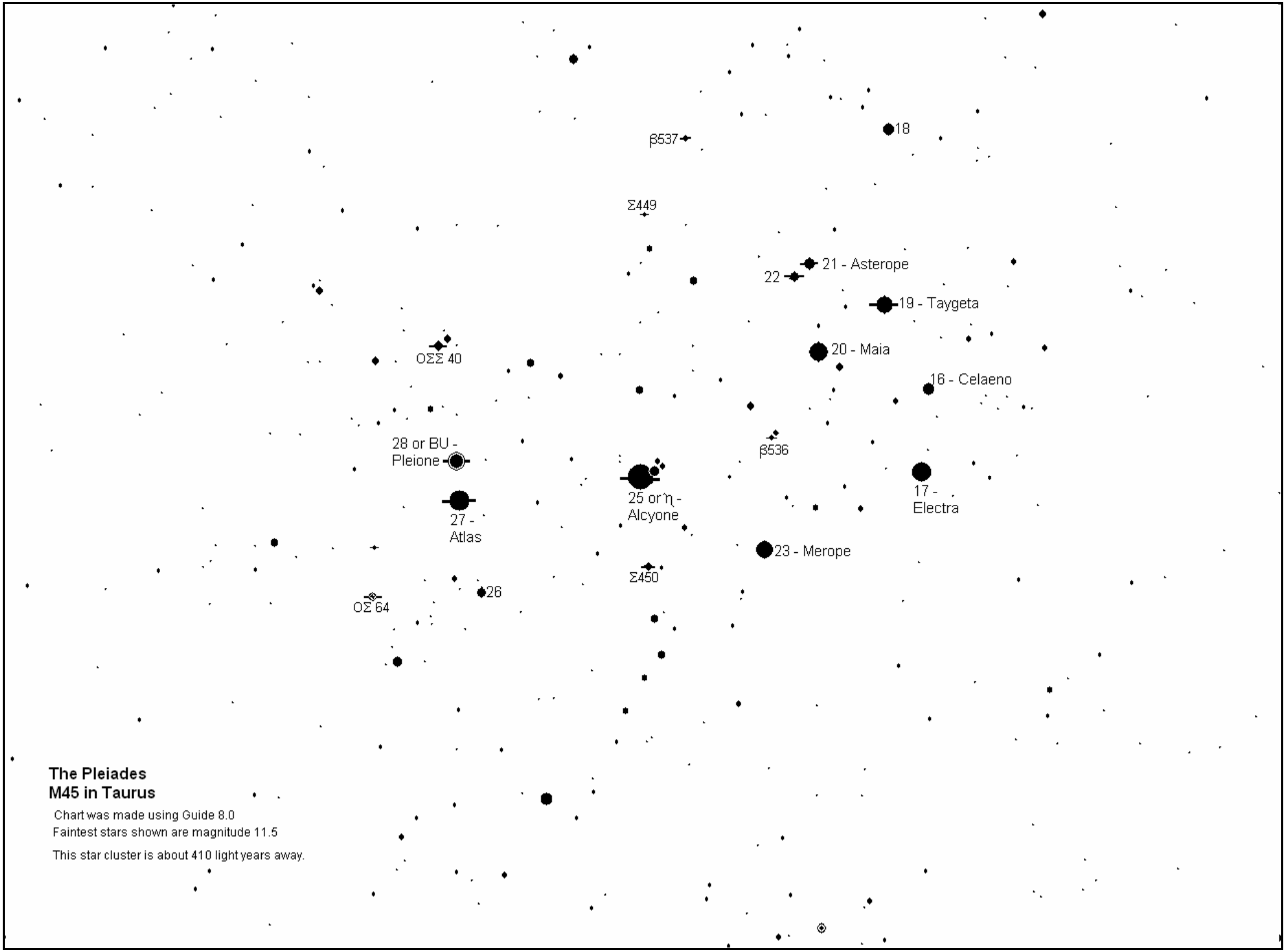
e-mail: B2N2@verizon.net



To get to the Myrick Conservation Center of the Brandywine Valley Association 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 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 up the farm lane to the left; it's about 800 feet or so to the top of the hill. 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).



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.


β537
18
Σ449
21 - Asterope
22
19 - Taygeta
ΟΣΣ 40
20 - Maia
16 - Celaeno
28 or BU -
Pleione
β536
25 or η -
Alcyone
17 -
Electra
27 -
Atlas
23 - Merope
Σ450
26
ΟΣ 64
The Pleiades
M45 in Taurus
Chart was made using Guide 8.0
Faintest stars shown are magnitude 11.5
This star cluster is about 410 light years away.