



# Observations

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

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CHESTER COUNTY ASTRONOMICAL SOCIETY

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Visit our website at [www.ccas.us](http://www.ccas.us)

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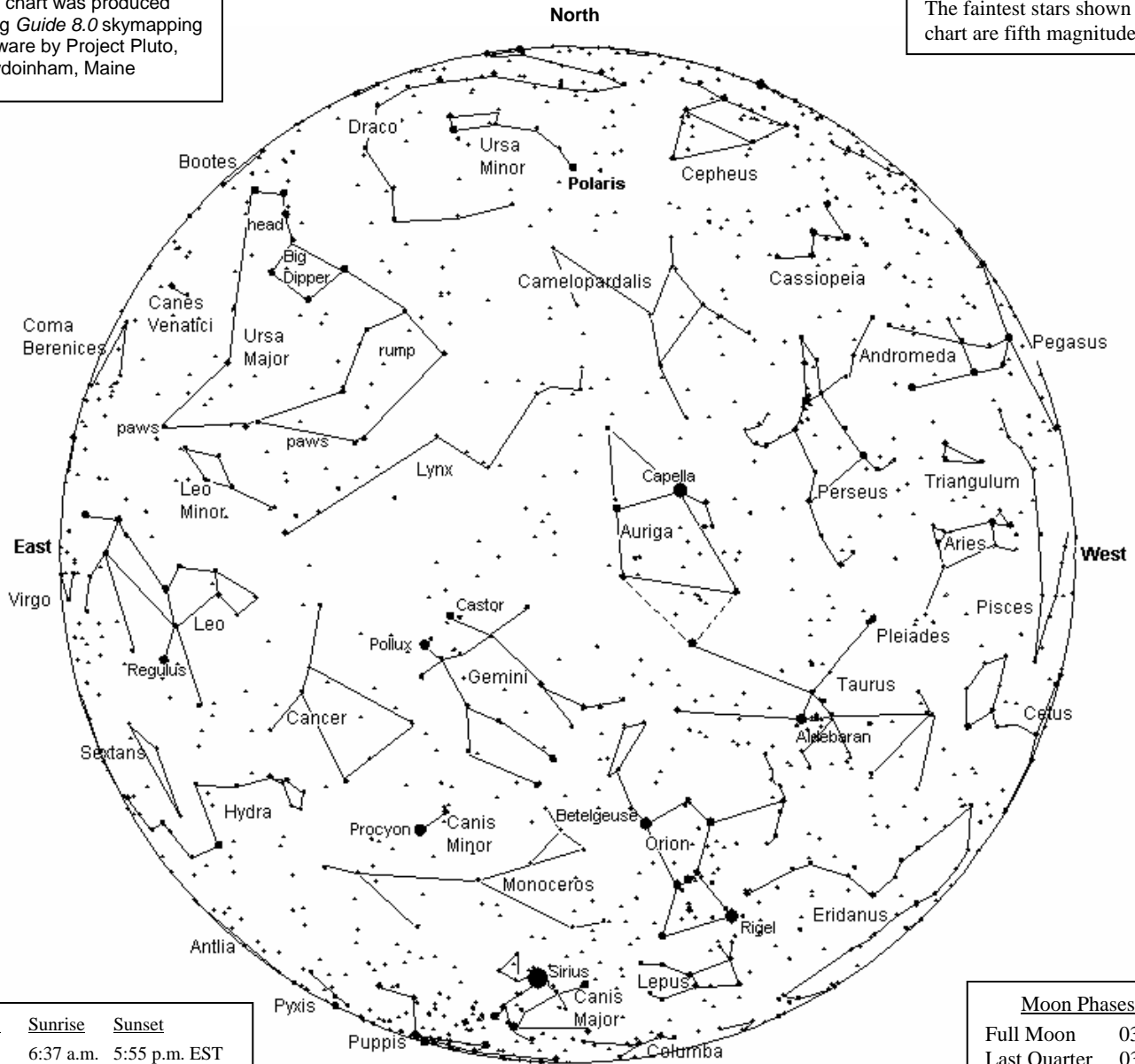
## Important March 2007 Dates

- 3** Full Moon—the Egg Moon.  
**Total Lunar Eclipse!** See party notice on page 4!
- 6** **Introductory Astronomy class** meets at West Chester University. Class starts at 7:00 p.m. EST.  
Topic: *The Other Kids on the Block*.  
See page 4 for details.
- 11** **Daylight Savings Time begins.** Set clocks ahead one hour.
- 11** Last Quarter Moon.
- 13** **CCAS Meeting 7:30 p.m. EDT**  
Location: West Chester University  
Constellation of the Month: Canis Major  
Topic: Member's Night. See page 3 for details.
- 16/** **CCAS Observing Session**
- 17** Location: Brandywine Valley Association  
Time: sunset, or earlier (see page 3)
- 18** New Moon.
- 20** **Vernal Equinox at 8:07 p.m.** Spring begins in Chester County!
- 20** **Introductory Astronomy class** meets at West Chester University. Class starts at 7:00 p.m. EDT.  
Topic: *Planispheres, Star Charts, and Constellations: Oh My!*  
See page 3 for details.
- 25** First Quarter Moon is at 2:16 p.m. EDT.



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
3/1	6:37 a.m.	5:55 p.m. EST
3/15	7:15 a.m.	7:10 p.m. EDT
3/30	6:51 a.m.	7:25 p.m. EDT

Moon Phases	
Full Moon	03/03
Last Quarter	03/11
New Moon	03/18
First Quarter	03/25

**The sky over Chester County**  
 March 15, 2007 at 8:00 p.m. DST

The Planets, by Don Knabb

**Mercury:** If you missed Mercury during February you need to get up before sunrise in March to see it. It will be at its greatest elongation west on March 22.

**Venus:** Venus is an incredibly bright “evening star” as sunlight fades and remains visible for a while after it is fully dark. If you have friends who have not seen Venus this is a great opportunity to share a highlight of the night sky. Venus will continue to climb higher until May.

**Mars:** Mars continues rising in the early morning skies so you will need to make a special effort to see it, or wait until late in 2007 for evening viewing.

**Jupiter:** By mid-month the King of the Planets is rising around 1:00 a.m. It is quite a sight early in the morning before dawn. Look in the southeast where you will see it not far from orange-red Antares in Scorpius.

**Saturn:** This is a great time to see Saturn! It was at opposition in mid-February and looks fantastic in clear winter skies. Saturn is shining a bit brighter than it will for many years to come! In a medium sized telescope you can also see several of Saturn’s moons.

**Uranus:** Uranus is not visible during March, it is behind the Sun.

**Neptune:** Neptune is just coming out from behind the Sun and is not easily viewed during March.

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

## March Observing Highlights

by Don Knabb, CCAS Observing Chair



**The Moon:** A highlight of the month is the **total lunar eclipse** that occurs on **Saturday March 3**. The Moon rises at 5:51 p.m. and the sun sets at 5:56 p.m., so the Moon will be in total eclipse when it rises. And being at the horizon the Moon will appear huge! Don't miss this event! See the notice about a CCAS Lunar Eclipse viewing party on page 4.

**Planets:** Saturn and Venus are both beautiful sights during March. Saturn is in the southeast as night falls and Venus is shining bright in the southwest.

**Constellations:** In mid-March around 9:00 pm the winter constellations are in the western half of the sky heading toward their summer sleep before too many weeks have passed. Catch the Pleiades, Taurus and Orion before we lose them to the spring constellations that are rising in the east. In the spring group Leo the Lion, with beautiful Saturn nearby, is heading toward center stage. The Big Dipper in Ursa Major is high overhead. Follow the arc of the Dipper handle to bright Arcturus in Bootes.

**Deep sky:** There are many wonderful deep sky sights in the cold winter skies. The star clusters in Auriga are heading toward the western horizon but are still well positioned for viewing through the minimum amount of atmosphere early in the evening. Later in the night look overhead to find the galaxies M81 and M82 in Ursa Major. And use your binoculars to look for M35 in Gemini, an open star cluster containing several hundred stars in an area the size of the full Moon.

**Meteor shower:** There are no meteor showers in March.

- Mar. 1** Saturn shines close to the Moon tonight.
- Mar. 3** Full Moon, the Egg Moon, 6:17 p.m.
- Mar. 3** Total eclipse of the Moon as it rises at 5:51 p.m.
- Mar. 11** Last quarter Moon, 11:54 p.m.
- Mar. 12** Jupiter shines to the upper right of the Moon, orange-red Antares is to Jupiter's lower right.
- Mar. 18** New Moon, 10:34 p.m.
- Mar. 20** Venus will be near the crescent Moon at dusk—quite a sight!
- Mar. 20** Vernal Equinox occurs at 8:07 p.m., the start of spring!
- Mar. 25** First quarter Moon, 2:16 p.m.

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## CCAS March Meeting

**DATE:** Tuesday March 13, 2007  
**TIME:** 7:30 p.m. EDT  
**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 16.

This month's Constellation of the Month (COM) will be Canis Major, presented by Vic Long.

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!

You may recall that we were going to hold Member's Night at the February meeting, but we were cancelled due to the snowstorm. West Chester University was closed that night, so we could not meet.

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## CCAS Observing Session March 16/17, 2007

CCAS Observing Sessions will be at the Brandywine Valley Association's Myrick Conservancy Center (see map on page 15) 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 the remaining classes will be held:

- March 6 The Other Kids on the Block
- March 20 Planispheres/Star Charts
- April 3 Astronomy on the Web
- 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 16.

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## Lunar Eclipse Party: Saturday March 3, 2007

Lunar Eclipse Gathering: All lunatics are invited (that would include all club members, families and friends) to view the Moon rising while it is fully eclipsed by the Earth on Saturday March 3rd. The moon will be rising at 5:51 p.m. in total eclipse at sunset, which is at 5:56 p.m. Let's gather around 5:30 p.m. at the South Campus of West Chester University. We will set up at the parking lot that is on the west side of New Street across from the tennis courts. We can set up telescopes and binoculars in the field next to the parking lot. If it is windy we can set up on the east side of New Street at the bottom of the hill near the tennis courts as we did last year for the lunar eclipse.

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### Welcome!

We welcome our newest members to the Society: Charles Cini and Walter & Marsha Mau, all of West Chester; and Lou Ballester of Glenmoore. We're glad you decided to join us! Clear skies to all!

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### 2007 is Election Year in CCAS

The offices of President, Vice President, Treasurer, and Secretary are up for election this year. These officers serve two-year terms. Anyone with a valid CCAS membership is eligible for these offices.

At the March meeting we will ask for three (3) volunteers for the Election Committee. The Election Committee canvases the membership for nominations to form the slate of candidates. In April, they announce the slate, and mail ballots to all CCAS members in good standing. For the election, a Family membership gets one vote. The newsletter editor usually assists the EC with mailing the ballots, because he already has in place the needed computer software to print the envelopes, etc. At the May meeting, the Election Committee collects and counts the ballots. They then announce the new officers. The names of the new officers are published in the newsletter in June, and the new terms of office officially begin in June.

Members of the Election Committee cannot also run for an elected office, because that would be a conflict of interest.

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### Treasurer's Report by Bob Popovich

#### December 2006 Financial Summary

Beginning Balance	\$1,663
Deposits	156
Disbursements	<u>66</u>
Ending Balance	\$1,753

#### Membership Renewals Due

03/2007	Dascaloff LaFrance Morgan
04/2007	Corrum Heck Imburgia Popovich

	Reynolds Richter
05/2007	Henderson Kutta Long Volcheck
06/2007	Churchman Driedyen Hebding Limeburner Mayer-Kielmann Moore Siskind

### 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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### Trip to U.S. Naval Observatory: New Date

The CCAS is making plans for a trip to Washington D.C. in April 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 23, 2007.** We must reserve 4-6 weeks in advance (which means **Linda must know who is going by March 15, 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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**Speaker Needed for School Program**

The parents of students at Tredyffrin-Easttown Middle School run an annual program called *Lives Well Lived* and need a speaker for Tuesday, April 24, 2007. The Speaker Day program's purpose is to inspire students to follow their dreams and is called "Imagine That: Dare to Dream, Live your Dream." Co-Chair Vicki Weiss saw the *Philadelphia Inquirer* article about the CCAS on January 25th and thinks someone from our Society can inspire these young students to pursue their dreams and passions.

The speaker will address 20-25 students for about 30 minutes at a time (20 minute presentation/10 minute Q&A). The speakers program is held from 8:00 a.m. to 2:30 p.m. and you will speak as many times as you like or as long as you are available.

This is an opportunity to inspire students to follow their dreams. The coordinator will send guidelines to help you understand the program and the overall message they are hoping to communicate.

If you are interested in speaking, please let Kathy Buczynski know by March 9 so that they can schedule us into the program. Call Kathy at 610-436-0821.

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**Calendar Notes**

**April BVA observing date change:** Since Astronomy Day is on Saturday April 21<sup>st</sup> we will be moving our BVA observing dates from that weekend to the previous weekend, April 13 or 14.

**May observing session location change:** We have been asked to host an observing session at Anson B. Nixon Park in Kennett Square. The park is a 106 acre public park just north of Kennett Square. There are many events held at the park

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such as concerts, nature programs, etc. They even have restrooms! Check out the web site at: <http://www.ansonbnixonpark.org/>

Since many club members are busy supporting the Astronomy Classes through mid May we have decided to combine our regular monthly observing with the event at Anson B. Nixon Park in order to make fewer demands on club members' time. Therefore, we will not be observing at BVA in May, but will observe at the park on the same date as was scheduled for BVA. Don Knabb will visit the park soon and select an observing location. He will put directions to the park and observing location in the next newsletter.

**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 13/14, 2007** (Friday/Saturday) CCAS Observing Session  
Location: BVA  
sunset

**April 17, 2007** (Tuesday) Introductory Astronomy class  
Location: West Chester University  
7:00 p.m. EDT

**April 21, 2007** Saturday **International Astronomy Day**

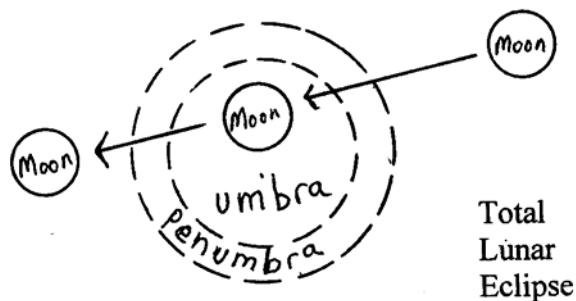
**May 1, 2007** (Tuesday) Introductory Astronomy class  
Location: West Chester University  
7:00 p.m. EDT.

**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: Anson B. Nixon Park  
sunset

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The Moon passes through the Earth's shadow, projected into space opposite the Sun, for a Lunar Eclipse.

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## Through the Eyepiece: M1, the Crab Nebula

by Don Knabb, CCAS Observing Chair

The Crab Nebula, M1, is the object that led Charles Messier to create his now famous catalog of objects that should not be mistaken for a comet. In 1758 while hunting for Comet Halley on its first predicted return he found the Crab Nebula, and noticed that, unlike a comet, it did not move. So he decided to catalog objects in the sky to prevent confusing these objects with comets. The nebulous remnant was first discovered by John Bevis in 1731 and Messier later acknowledged the earlier discovery by Bevis.

One can see why M1 might be mistaken for a comet by looking at this photograph taken by my friend Brent Crabb (really, his name has nothing to do with the Crab Nebula) from Orange County, California. The Crab Nebula looks like a faint comet without a tail.



The Crab Nebula is visible only with a telescope, between the horns of Taurus the Bull in winter skies. The nebula can be easily seen under clear dark skies, but can just as easily get lost in the background sky illumination that we experience in Chester County. Under good conditions M1 is just visible as a dim patch in 7x50 or 10x50 binoculars. With a little more magnification, it is seen as a nebulous oval patch, surrounded by haze as in the photograph above. In telescopes starting with 4-inch aperture, some detail in its shape becomes apparent. Only under excellent conditions and with larger telescopes, starting at about 16 inches aperture, do suggestions of the filaments and fine structure become visible.

M1 is not hard to find using the chart below:

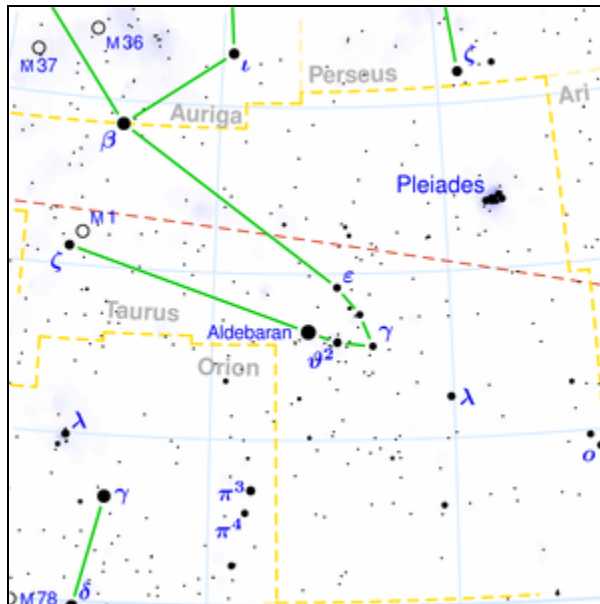


Chart credit: [http://en.wikipedia.org/wiki/Taurus\\_constellation](http://en.wikipedia.org/wiki/Taurus_constellation)

The Crab Nebula is the shattered remains of a star that exploded in 1054 A.D. This supernova explosion was first recorded by Chinese and Japanese observers. For weeks this supernova was the brightest star-like object in the sky. It was about four times brighter than Venus, or about mag -6. It was reported to be visible in daylight for 23 days!

This nebula was christened the "Crab Nebula" because of a drawing made by Lord Rosse about 1844. The nebula consists of the material ejected in the supernova explosion, which has been spread over a volume approximately 10 light years in diameter, and is still expanding at the very high velocity of about 1,800 km/sec.

On November 9, 1968, a pulsating radio source, the Crab Pulsar was discovered in M1 by astronomers of the Arecibo Observatory 300-meter radio telescope in Puerto Rico. It has now been established that this pulsar is a rapidly rotating neutron star. It rotates about 30 times per second! The neutron star is an extremely dense object, denser than an atomic nucleus, concentrating more than one solar mass in a volume 30 kilometers across. This energy source is 100,000 times more energetic than our sun.

Below is an incredible photograph of the Crab Nebula. This composite image was assembled from 24 individual exposures taken with the NASA Hubble Space Telescope's Wide Field and Planetary Camera 2. It is one of the largest images taken by Hubble and is the highest resolution image ever made of the entire Crab Nebula.

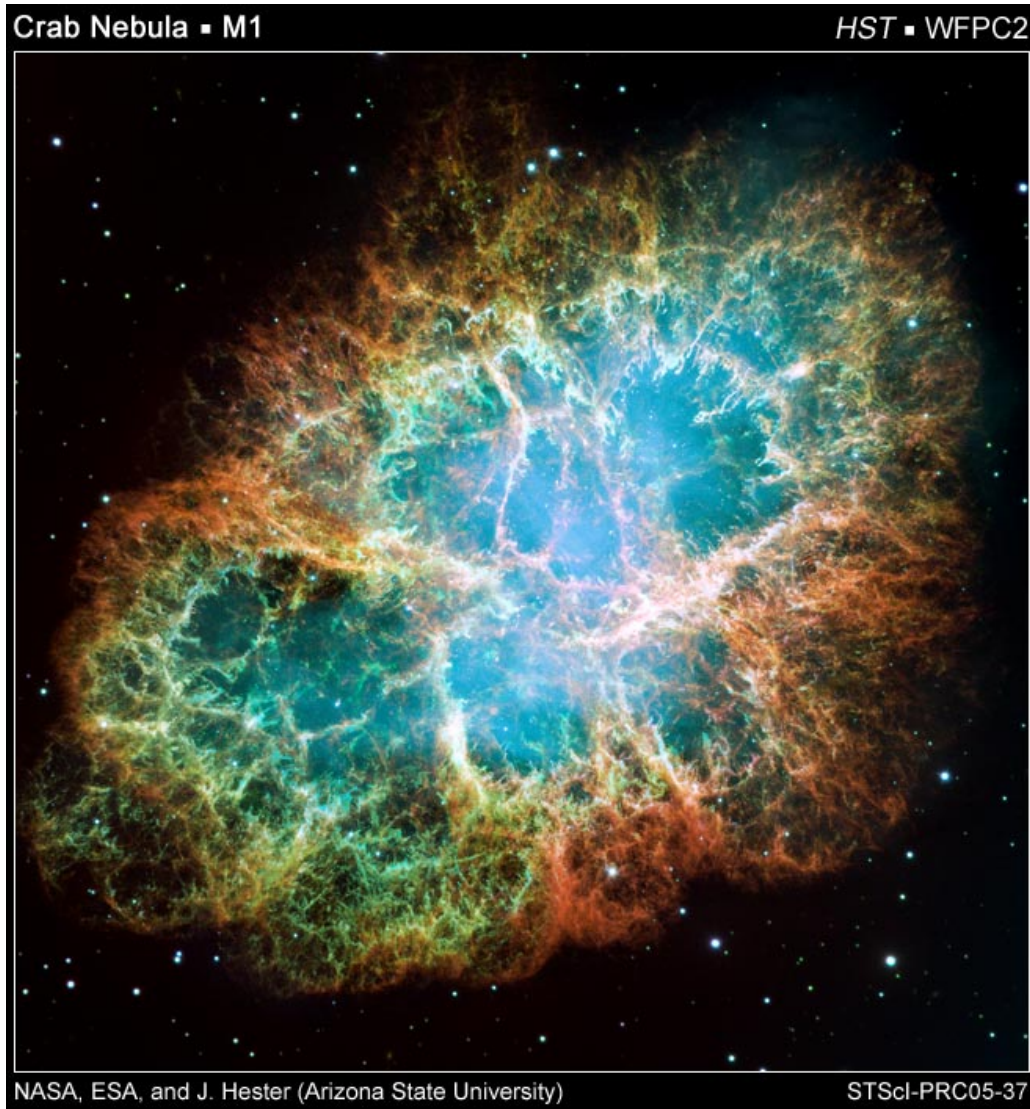


Image credit: [http://hubblesite.org/newscenter/archive/releases/2005/37/image/a/format/web\\_print/](http://hubblesite.org/newscenter/archive/releases/2005/37/image/a/format/web_print/)

Information credits:

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

<http://www.seds.org/messier/m/m001.html>

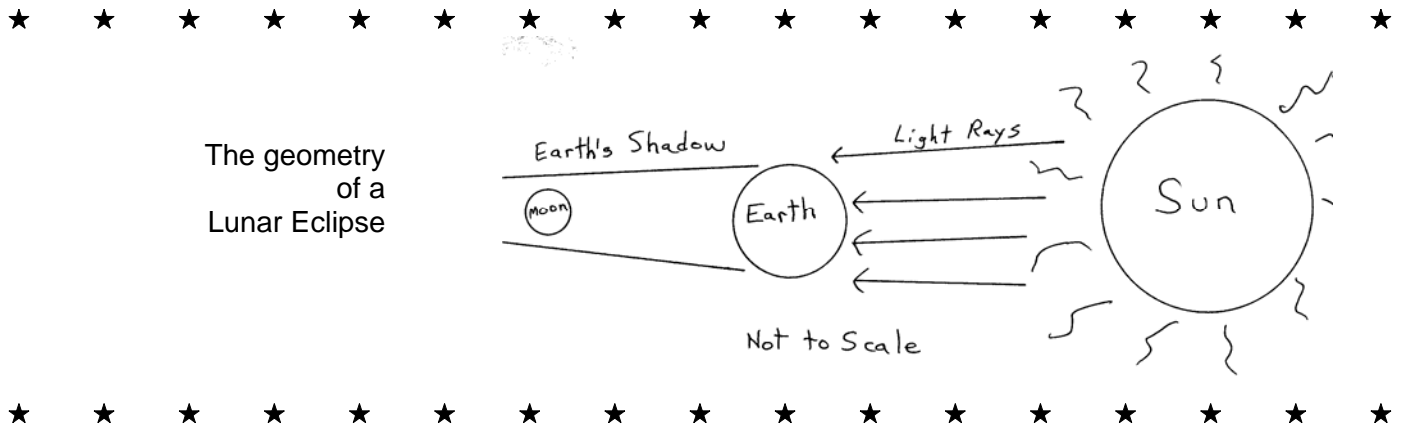
[http://en.wikipedia.org/wiki/Crab\\_Nebula](http://en.wikipedia.org/wiki/Crab_Nebula)

<http://astro.nineplanets.org/twn/n1952x.html>





**IC 1805, The Heart Nebula**, an emission nebula in Cassiopeia.  
The bright white “blob” is the open star cluster Melotte 15 (Mel 15).  
Image was taken with a Hydrogen-Alpha filter to enhance the nebulosity.



### Astronomus

“A Ride on the Main Line”

By Bob Popovich

As you read this month’s contribution, take note of the stations as we ride the Main Line. As is true of both terrestrial and celestial lines, the stations themselves are subordinate to the surrounding area, but do serve as a convenient marker to plot out our journey. I’ll describe all our station stops but only illustrate two of them—it’s up to you to determine where, in heaven’s name, our Main Line is. So if you’re ready, grab your timetable, your lifetime observer’s pass, and let’s begin our ride on the Main Line.

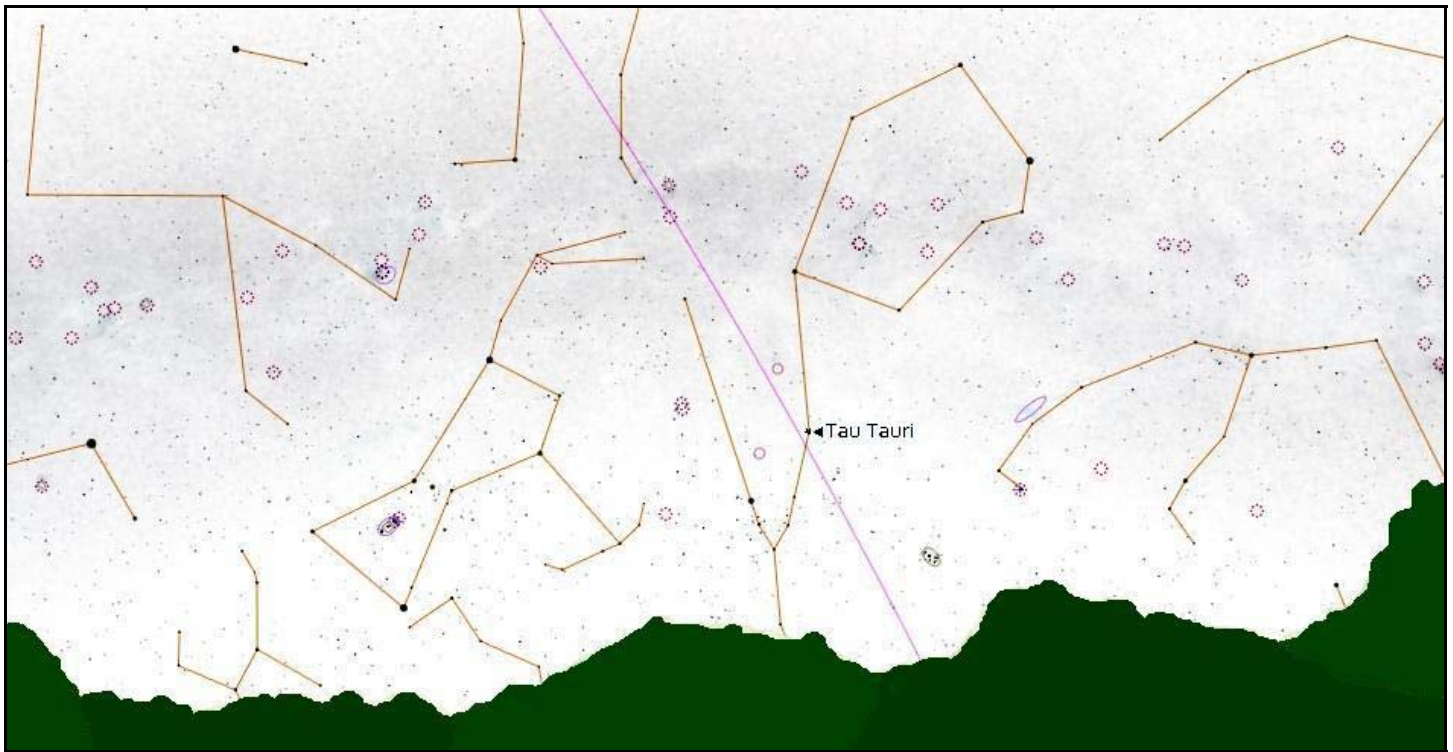


Whether we realize it or not, our eyes and our eyepieces gravitate to the Main Line virtually every time we venture out to travel the night skies. It is, after all, the most prestigious of all the lines. The most stellar, if you will.

Over years of commuting we become intimately familiar with the *skymarks* of the Main Line yet, at the same time, we are ever encountering the new and unexpected. And it is this dichotomy that makes astronomy so satisfying—it's like visiting with an old friend who always seems to have a surprise or two on every visit.

March is an ideal time to ride the heavenly Main Line—it's positioned high in the sky and offers a luxurious ride. Let's start at Paoli, shall we?

Anchoring the western end of the Main Line, our Paoli Station is a bustling area marked by Tau Tauri. Though the visual magnitude is only 4.7, this B7 star has the monstrous luminosity of some 485 of our suns and sits less than one-half of one degree off of the Main Line track. From here it is just a hop, skip and a jump to M45, the Hyades, Aldebaran and M1. These *skymarks* are nearly gone by March so be sure to spend some time in and around Paoli—you'll certainly find plenty to see and do.



As we pull out of this station and make our way east, we chug past NGC 1746—an open cluster about  $0.5^\circ$  from our path. It is just at the edge of the Milky Way's nebulosity but if you're fortunate to have a good night for traveling, it's worth the effort to locate it. A moment later we pull into Daylesford—marked on this ride by NGC 2129. It's a small station that's easily overlooked. Lying directly on the track this little cluster is an introduction to others nearby. In fact, IC 2157, IC 2158 and NGC 2168 (M35) are all within a scant  $2^\circ$  of Daylesford Station.

Proceeding to Berwyn we are treated to a work of art. In this hometown of American impressionist Mary Cassatt, the station is marked by the star Eta Geminorum. Also known as Tejat Prior (or Propus), it sits in the midst of the Milky Way. On a crisp night the massive eclipsing binary star is bathed in the faint glow of our galaxy. A truly splendid sight.

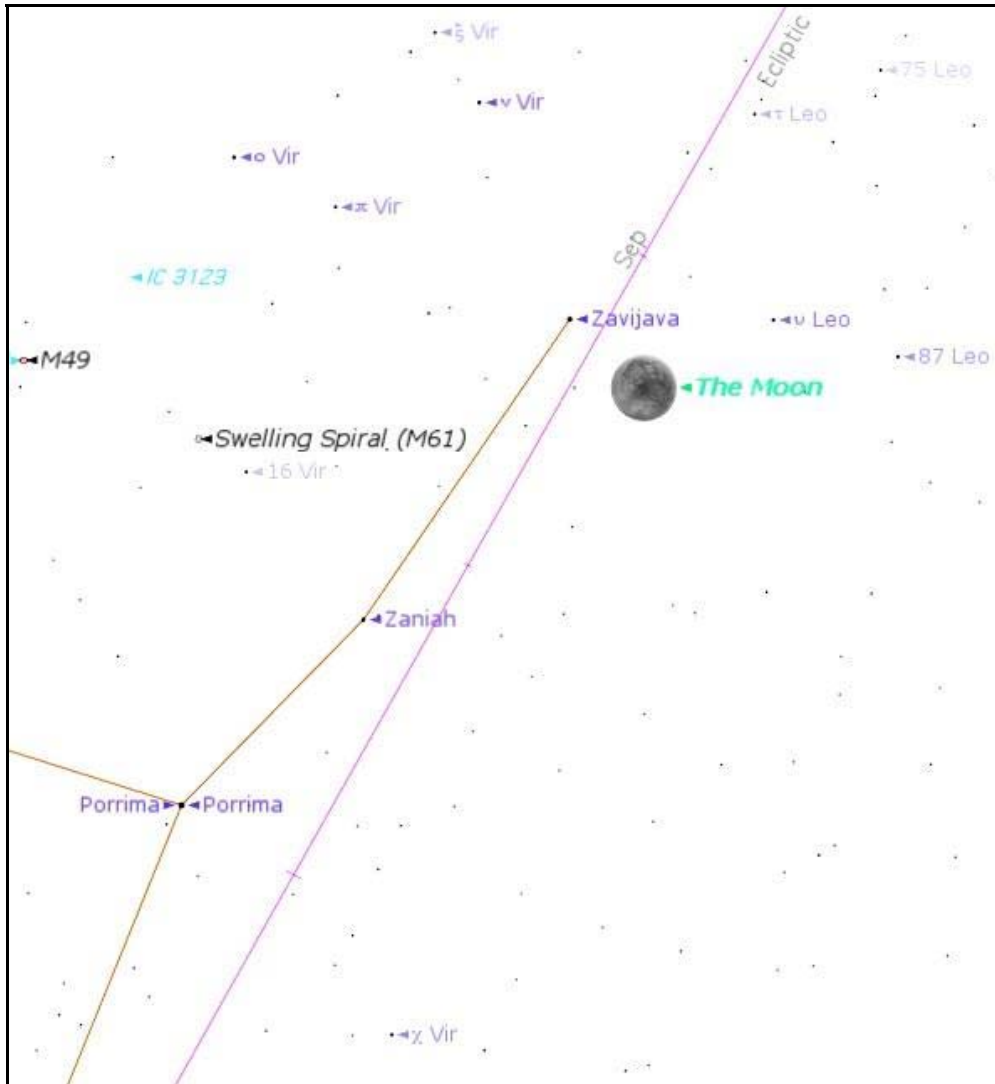
Rounding the gentle curve at the zenith of the Main Line, we glide into Devon—Delta Cancri. Also known as Asellus Australis it, too, lies directly on the track, and just across the street from the horse show grounds. For those of you who have visited the annual spring horse show, you'll recall the sign that proudly proclaims "Where Champions Meet." Well, a bit more than  $1^\circ$  off of the Main Line here at Devon, the beehive cluster (The Praesepe, M44) is nothing if not a true champion. Impressive in appearance, expansive, bright and aptly named, it is well worth an extended stay. How marvelous that our trip thus far has allowed us to enjoy three naked-eye open clusters: the Pleiades, the Hyades and the Praesepe. Is there another line with this sort of scenery?

If you're ready, let's move on to Strafford. This splendid station may be the prettiest of the entire Main Line. So it's appropriate that one of the heavens' most beautiful *skymarks* is there to mark it—the planet Saturn. Little can be said of this gem of the solar system that hasn't already been said. It's spectacular and still positioned well for observing. Truly one of those familiar old friends who never fails to delight. Do stop here for a good, long, satisfying visit.

Next, Wayne—often dubbed the heart of the Main Line. And what could be a more fitting station for Wayne than Cor Leonis—the heart of the lion. The alpha star of Leo that we commonly know as Regulus is a scant  $0.3^\circ$  off of our track and is a sparkling sign that

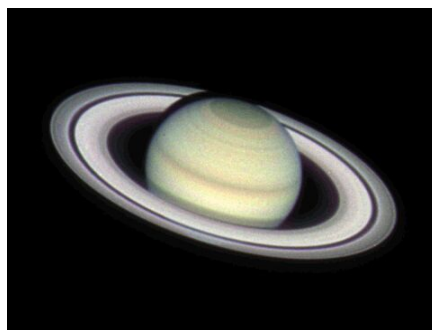
spring can't be far off. As long as we're in the neighborhood, let's make a small side excursion along the backward question mark of Leo to Algeiba (Gamma Leonis) and the nearby 40 Leonis. Together they make a beautiful color combination.

Lastly we come what our celestial timetable refers to as Beta Virginis (Zavijava). On this train ride, its also known as St. David's. Zavijava is an F class star that's part of a multiple star system (unresolvable with amateur telescopes). On the 4th of this month a nearly full moon will be directly across the Main Line from Zavijava. Are you able to see St. David's in the glare of the moon?



Well, we've arrived at the east end of the celestial Main Line—for this time of year at least. The celestial Main Line does, of course, continue on through the spring, summer and autumn until retuning back to our March itinerary. Whether you take an express or a local, you're sure to be treated to a lifetime of observing delights on this flagship line. And as amateur astronomers, we're all honorary Main Liners—so enjoy!

Next Time: THE Astronomer



## Even Solar Sails Need a Mast

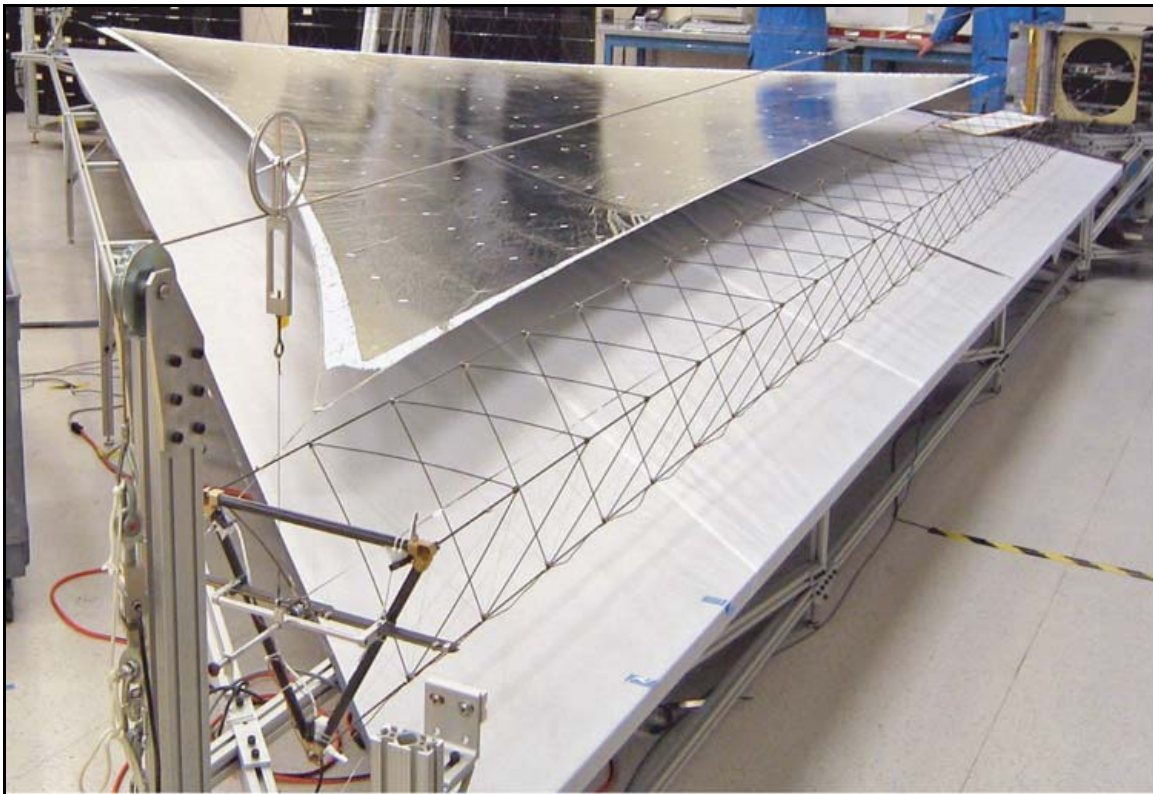
By Patrick L. Barry

Like the explorers of centuries past who set sail for new lands, humans may someday sail across deep space to visit other stars. Only it won't be wind pushing their sails, but the slight pressure of sunlight.

Solar sails, as they're called, hold great promise for providing propulsion in space without the need for heavy propellant. But building a solar sail will be hard; to make the most of sunlight's tiny push, the sail must be as large as several football fields, yet weigh next to nothing. Creating a super-lightweight material for the sail itself is tricky enough, but how do you build a "mast" for that sail that's equally light and strong?

Enter SAILMAST, a program to build and test-fly a mast light enough for future solar sails. With support from NASA's In-Space Propulsion Program to mature the technology and perform ground demonstrator tests, SAILMAST's engineers were ready to produce a truss suitable for validation in space that's 40 meters (about 130 feet) long, yet weighs only 1.4 kilograms (about 3 pounds)!

In spite of its light weight, this truss is surprisingly rigid. "It's a revelation when people come in and actually play with one of the demo versions—it's like, whoa, this is really strong!" says Michael McEachen, principal investigator for SAILMAST at ATK Space Systems in Goleta, California.



SAILMAST is the thin triangular truss in front of the picture. It is attached to a section of a silver foil solar sail section shown here in a laboratory test. The mast in the picture is 2m (6 ft) long. The Space Technology 8 mission will test the full SAILMAST, which is 20 times longer.

SAILMAST will fly aboard NASA's Space Technology 8 (ST8) mission, scheduled to launch in February 2009. The mission is part of NASA's New Millennium Program, which flight-tests cutting-edge technologies so that they can be used reliably for future space exploration. While actually flying to nearby stars is probably decades away, solar sails may come in handy close to home. Engineers are eyeing this technology for "solar sentinels," spacecraft that orbit the Sun to provide early warning of solar flares.

Once in space, ST8 will slowly deploy SAILMAST by uncoiling it. The truss consists of three very thin, 40-meter-long rods connected by short cross-members. The engineers used high-strength graphite for these structural members so that they could make them very thin and light.

The key question is how straight SAILMAST will be after it deploys in space. The smaller the curve of the mast the more load it can support. "That's really why we need to fly it in space, to see how straight it is when it's floating weightlessly," McEachen says.

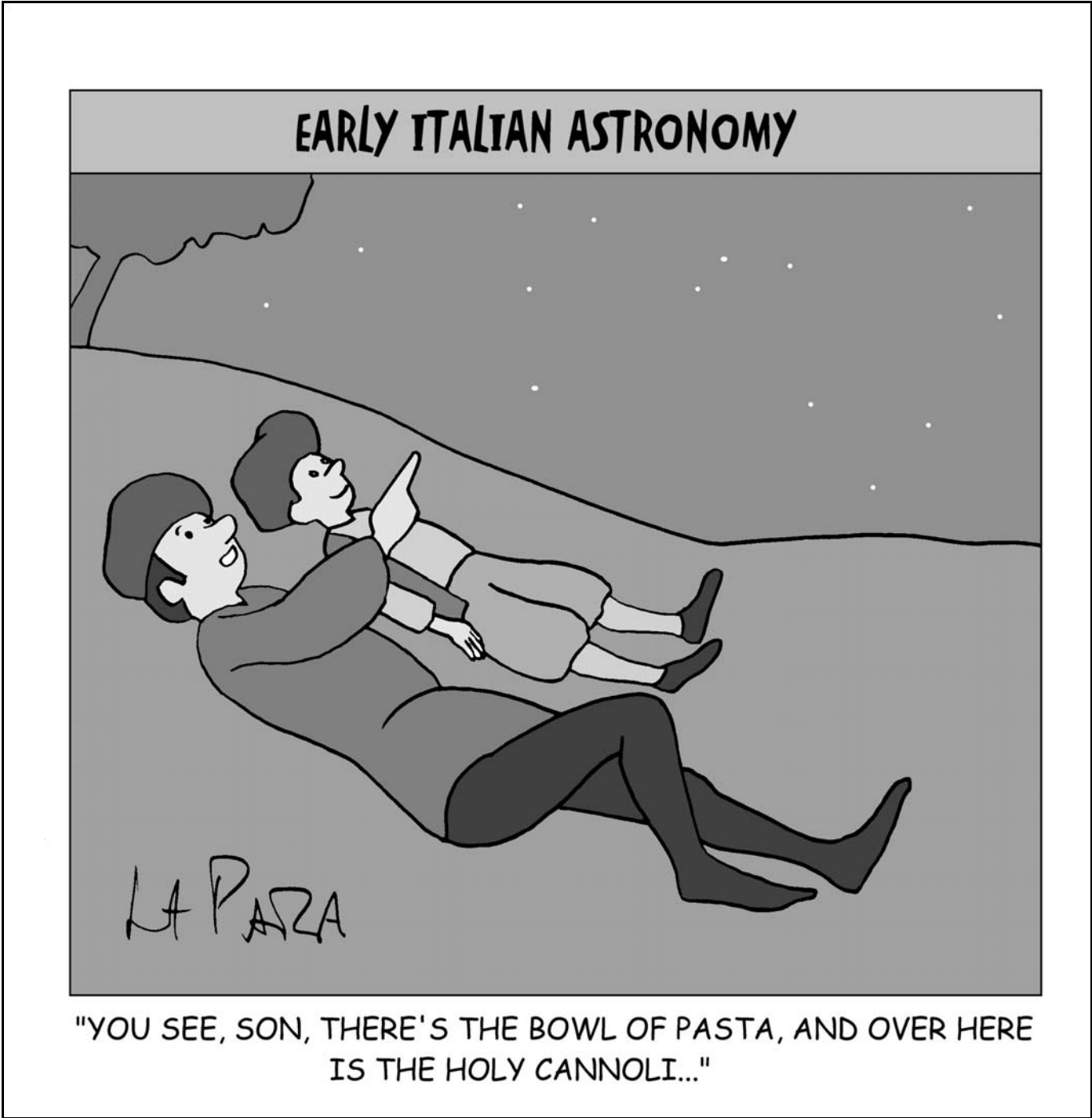
It's an important step toward building a sail for the space-mariners of the future.

Find out more about SAILMAST at:

[nmp.nasa.gov/st8](http://nmp.nasa.gov/st8)

Kids can visit [spaceplace.nasa.gov/en/kids/st8/sailmast](http://spaceplace.nasa.gov/en/kids/st8/sailmast) to see how SAILMAST is like a Slinky® toy in space.

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



Cartoon by Nicholas La Para





## 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](mailto:ida@darksky.org)

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

[www.darksky.org](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 [www.ccas.us](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://home.epix.net/~ghonis/index.htm>

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### 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](http://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](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 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](mailto: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](mailto: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](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 "star nights" for school, scout, and other civic groups.

### CCAS Executive Committee

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

<b>President:</b>	Kathy Buczynski 610-436-0821
<b>Vice Pres:</b>	Jim Anderson 610-857-4751
<b>ALCor and Treasurer:</b>	Bob Popovich 610-363-8242
<b>Secretary:</b>	Vic Long 610-399-0149
<b>Newsletter:</b>	Jim Anderson 610-857-4751
<b>Librarian:</b>	Linda Lurcott Fragale
<b>Observing:</b>	Don Knabb 610-436-5702
<b>Education:</b>	Kathy Buczynski 610-436-0821
<b>Webmaster:</b>	John Hepler 484-266-0699
<b>Public Relations:</b>	Deb Goldader 610-304-5303

### CCAS Membership Information

The present membership rates are as follows:

<b>REGULAR MEMBER</b> .....	\$25/year
<b>SENIOR MEMBER</b> .....	\$10/year
<b>STUDENT MEMBER</b> .....	\$ 5/year
<b>JUNIOR MEMBER</b> .....	\$ 5/year
<b>FAMILY MEMBER</b> .....	\$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

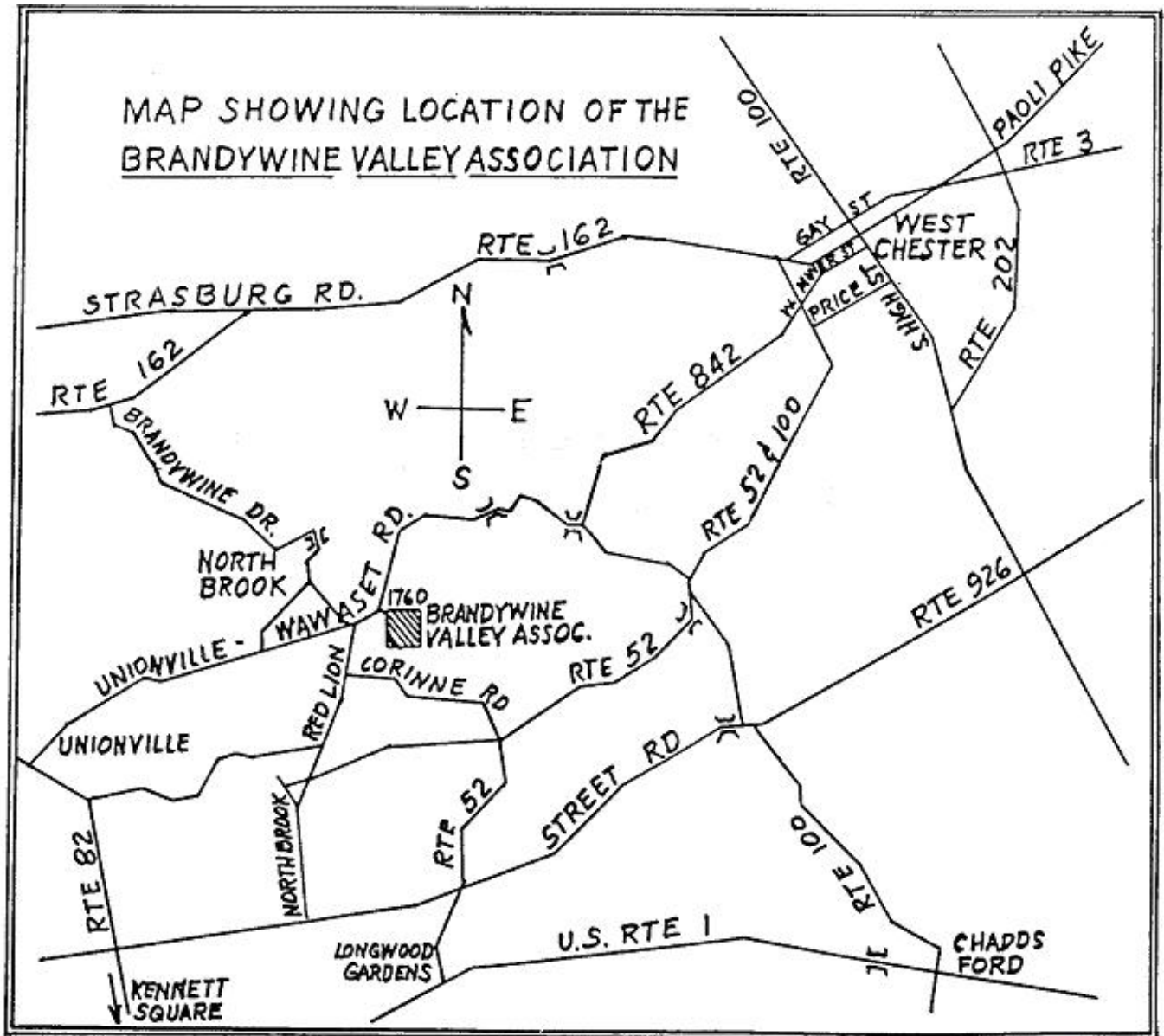
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$32.95** which is much less than the newsstand price of \$66.00, and also cheaper than individual subscriptions (\$42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society**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

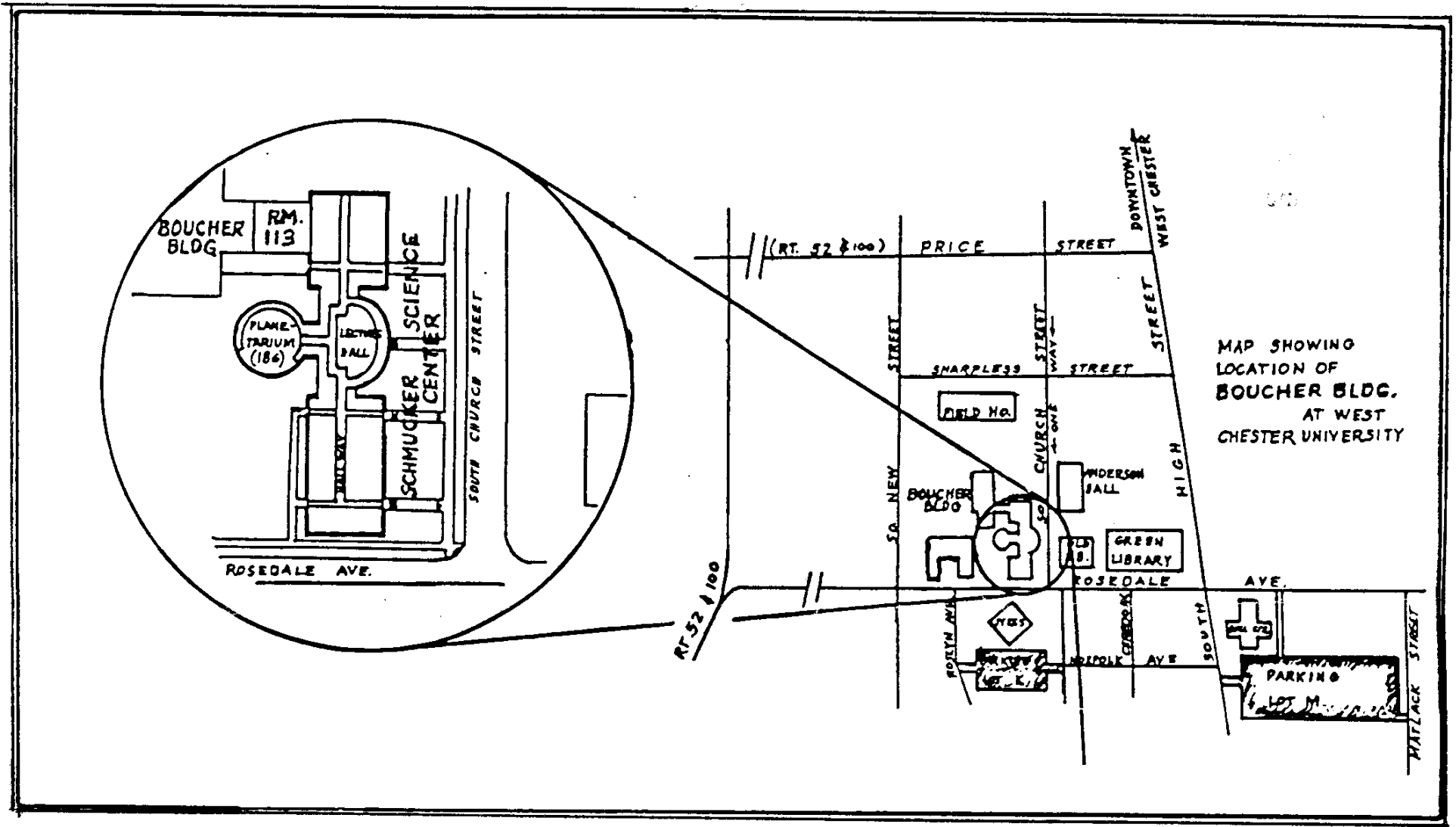
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$34.00** which is much less than the individual subscription price of \$42.95 (or \$60.00 for two years). If you want to participate in this special Society discount offer, **contact our Treasurer Bob Popovich.**

**Phone: 610-363-8242**  
**e-mail: [B2N2@verizon.net](mailto: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.