Observations
A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

**SEPTEMBER 2006**
**(VOLUME 14, NO. 9)**
**Visit our website at www.ccas.us**

**The supermarket tabloids report the latest astronomy news…**

# PLUTO DEMOTED

## Other planets outraged

## Mars explodes: "This means war!"

### Gas Giants add their considerable mass to the anti-Earth coalition

### Mercury engages in a flurry of rapid diplomacy to defuse crisis

### In a prepared statement, Coalition spokesplanet Saturn said: "It is time to end the capricious tyranny of the Terrans!"

### Earth's Moon refuses to comment

### Ceres and Xena also tearful

**On August 24, 2006, the International Astronomical Union approved a definition for planet that means there are only eight planets in our solar system. Pluto lost its "planet status" under the new definition.**

Of course, the last two sentences are the only correct statements. But then again, I haven't seen any tabloids since August 24th, so maybe that **is** how they're reporting it…

*Jim Anderson*

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**SEPTEMBER 2006**
**(VOLUME 14, NO. 9)**
**Editor: James J. Anderson**
**stargazer1956@comcast.net**

## In This Issue



This issue is dedicated to

## Clyde W. Tombaugh (1906-1997)

Discoverer of Pluto

Mr. Tombaugh in 1930

Mr. Tombaugh speaking at the A.L. meeting in 1988

## Important September 2006 Dates

**4** Uranus at opposition.

**5** Hercules Observing Cluster meets.
Call Kathy Buczynski at 610-436-0821 for details.

**7** Full Moon—the Fruit Moon.

**8** Free Planetarium Show at West Chester University.
See page 5 for more information.

**9** Look for the Pleiades next to the Moon.

**12** **CCAS Meeting 7:00 p.m.** EDT (see page 5)
Location: West Chester University
COM: Sagitta
Presentation: Super Star Clusters in Our Own Backyard

Also: Hercules Observing Cluster meets.
Call Kathy Buczynski at 610-436-0821 for details.

**14** Last Quarter Moon.

**19** Hercules Observing Cluster meets.
Call Kathy Buczynski at 610-436-0821 for details.

**22** New Moon.

**22/23** **CCAS Observing Session**
Location: Brandywine Valley Association
Time: sunset, or earlier (see page 5)

**23** **September Equinox at 12:03 a.m. EDT**

First day of Autumn in Chester County

**26** Hercules Observing Cluster meets.
Call Kathy Buczynski at 610-436-0821 for details.

**27** Star Party—see page 5 for details.

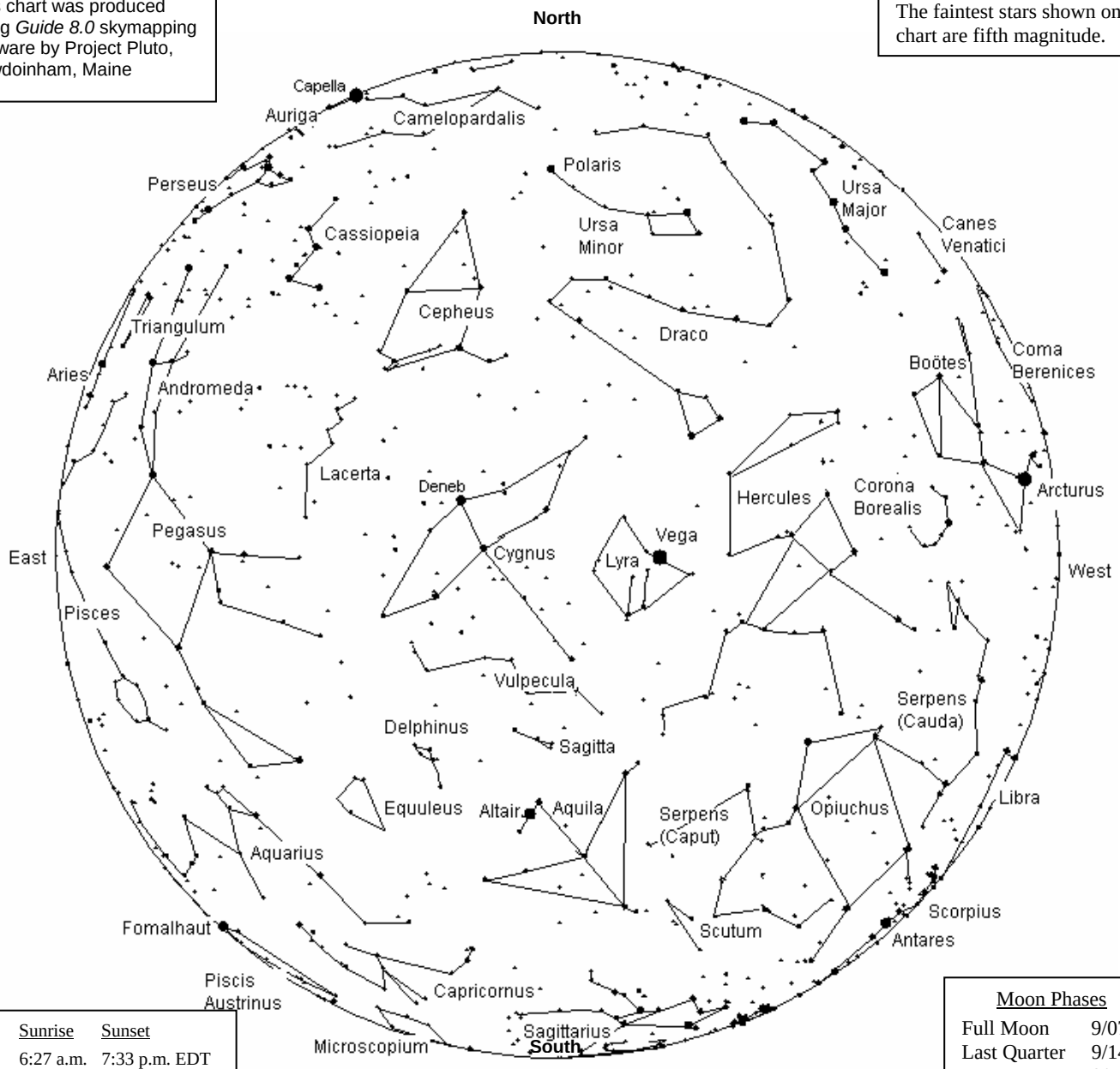
Also: Antares is within one degree of the crescent Moon in the evening sky, with Jupiter to the Moon's right.

**30** First Quarter Moon.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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 |
|---|---|---|
| 9/1 | 6:27 a.m. | 7:33 p.m. EDT |
| 9/15 | 6:40 a.m. | 7:10 p.m. EDT |
| 9/30 | 6:55 a.m. | 6:45 p.m. EDT |

| Moon Phases | |
|---|---|
| Full Moon | 9/07 |
| Last Quarter | 9/14 |
| New Moon | 9/22 |
| First Quarter | 9/30 |

## The sky over Chester County

September 15, 2006 at 9:00 p.m. EDT

### The Planets, by Don Knabb

**Mercury**: Mercury cannot be easily observed during September.

**Venus:** Venus continues to be a bright beacon in the dawn sky but it rises only about a half hour before the sun during September. If you have a clear view of the eastern horizon, on September 21 keen eyes will see an extremely slender crescent Moon just a degree or so to the upper right of Venus. By month's end Venus is lost in the Sun's glare.

**Mars:** Mars is lost in the glare of the sun and will not be easily viewed until December.

**Jupiter:** In September the king of the planets is still the first point of light to catch your eye as twilight deepens, but it gets lower and lower during the month until it is only 10 degrees high by month's end at mid-twilight. Although the moons and the planet disk are still a beautiful sight in a telescope, details of the planet will be difficult to see due to the atmospheric turbulence.

**Saturn:** The ringed planet rises about 2 hours before the Sun at the start of the month and almost 4 hours before the sun at month's end. If you get up for the Venus/Moon grouping on September 21, just look up and slightly to the right and you'll see the bright star Regulus in the constellation Leo, then Saturn.

**Uranus & Neptune:** Both gas giants are in reasonably good position for viewing around midnight. The May issue of Sky and Telescope magazine has charts to help you find the blue and green planets. If you don't have that issue send me an e-mail (observing@ccas.us) and I can scan it and send you a copy, or we can try to find them during our star party at Brandywine Valley Association on September 22.

**Pluto:** Pluto is highest in the south during the evening, but to find this 14th magnitude speck you'll need at least a 10 inch telescope and good charts, not to mention clear skies!

## August Observing Highlights

by Don Knabb, CCAS Observing Chair

**Planets:** The evening sky in September has only Jupiter for our viewing pleasure, and the king of planets is fading rapidly as it sinks into the sunset by month's end. With a little effort around midnight you can find Uranus and Neptune. At a dark sky site Uranus can be found naked eye, but in Chester County binoculars or a telescope will be needed. If you get up before dawn you can find Saturn and Venus.

**Constellations:** The September sky is dominated by the constellations of the Summer Triangle, Lyra, Cygnus and Aquila. But stay out a little later and the Great Square of Pegasus is rising and you can find our neighbor galaxy Andromeda with binoculars. A bit later yet and you will get a preview of the fall and winter constellations with the beautiful Pleiades leading the charge.

**Deep sky:** September is your last chance of 2006 to catch the Messier objects in the southern constellations of Sagittarius and Scorpius. If you can find a clear view of the southern horizon you can find M4, M6, M7, M17, M8 and M22. On the other side of the sky, if you stay out late, you can catch the star clusters in Auriga rising: M36, M37 and M38.

**Meteor shower:** There are no meteor showers during September.

| | |
|---|---|
| **Sept. 4** | Uranus is at opposition |
| **Sept. 7** | Full Moon 2:42 p.m., called the Fruit Moon. |
| **Sept. 9** | Look for the Pleiades next to the bright Moon. |
| **Sept. 14** | Last Quarter Moon, 7:15 a.m. |
| **Sept. 22** | New Moon, 7:45 a.m. |
| **Sept. 23** | Autumnal Equinox occurs at 12:03 a.m. and Autumn begins in Chester County. |
| **Sept. 27** | Antares, in Scorpius, is within 1 degree of the waxing crescent Moon low in the southwest at dusk. Bright Jupiter is further to the Moon's right. |
| **Sept. 30** | First Quarter Moon, 7:04 a.m. |

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## Through the Eyepiece: The Andromeda Galaxy: Fuzzy Spot Supreme!

by Don Knabb, CCAS Observing Chair

If you stay up a bit late during September you can find the Great Square of Pegasus rising in the northeast. If you look from there toward the North Star, you will run into the constellation Cassiopeia. When I see those two constellations in the sky I always want to grab my binoculars or telescope and look about half way between the northeast corner of the square and Cassiopeia. Just a bit to the left of that line I scan for what I believe is the grandest fuzzy spot of all: The Andromeda Galaxy.

Don't we wish the view in our eyepiece was like this?

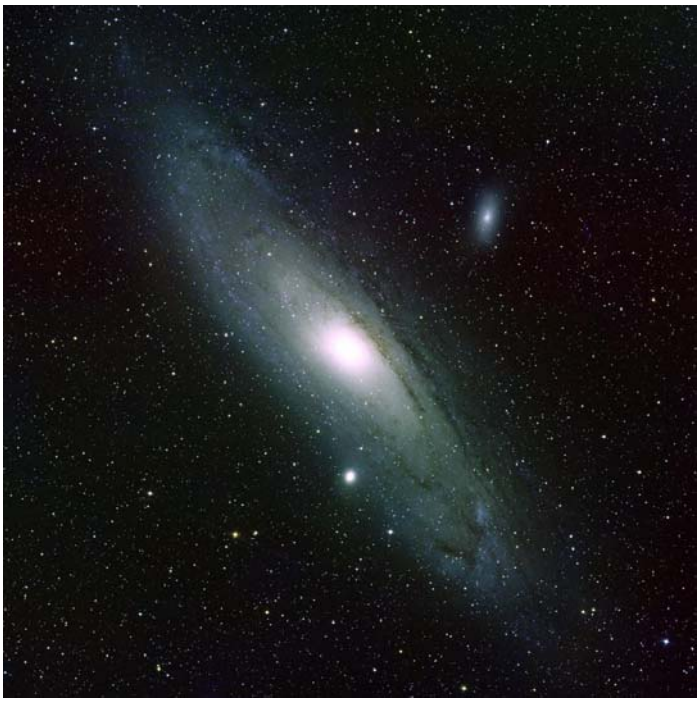

Image source: National Optical Astronomy Observatory/Association of Universities for Research in Astronomy/National Science Foundation

Unfortunately, our views are not that clear. But with this image in mind, a cool clear September night, and a bit of time at the eyepiece you will get a familiarity with our neighbor galaxy that goes beyond just a large white center surrounded by fainter haze.

If you'd like a bit more help finding M31, as the Andromeda Galaxy is also known, here is a sky map of Andromeda the constellation:

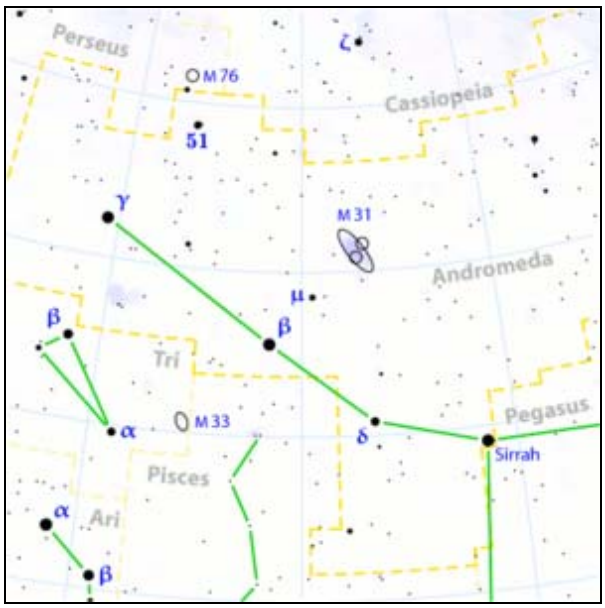


Image source: http://en.wikipedia.org/wiki/Andromeda

The Andromeda Galaxy is a barred spiral galaxy, much like our own Milky Way Galaxy. When you look at the Andromeda Galaxy you are looking at a glow of light that is made up of

one trillion stars according to recent observations by the Spitzer Space Telescope. Although it is reported that the Andromeda Galaxy is easily visible to the naked eye in dark skies, I have not had the thrill of seeing it without the help of binoculars. Even at a true dark sky location one only sees the central part of the galaxy, but the full angular diameter of the galaxy is seven times that of the full Moon! Wouldn't that be a sight to see!

Measurements suggest that the Andromeda Galaxy and the Milky Way are heading toward each other at 75 miles per second. Although it is not clear if there will actually be a collision, you should not lose sleep over this possibility since it will not occur for about 3 billion years.

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## Star Party Request: September 27, 2006

by Don Knabb, CCAS Observing Chair

On Wednesday September 27 we will be hosting a star party for the Spring-Ford Area School District Evening School Program. We'll need lots of help from members, with and without telescopes! It will be held at the headquarters of the Schuylkill Canal Association. There will be more details in the September newsletter, but please mark your calendars now and let me know if you can help out. Thanks.

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## CCAS September Meeting

| | |
|---|---|
| DATE: | **Tuesday September 12, 2006** |
| TIME: | **7:00 p.m. EDT** |
| PLACE: | Room 113 – Boucher Building<br>West Chester University |
| LOCATION: | South Church Street<br>West Chester, PA |

**Please note that the September meeting will start at 7:00,** rather than the usual 7:30 starting time. We are starting at 7:00 so that Dr. Gagné's astronomy class can also attend his talk.

A map of the campus showing the location is on page 16.

This month's Constellation of the Month (COM) will be Sagitta, presented by Jim Anderson.

The title for the main presentation is "Super Star Clusters in Our Own Backyard," presented by Dr. Marc Gagné, professor of astronomy in the Department of Geology and Astronomy at West Chester University.

The study of star formation in the Milky Way has focused mostly on nearby stars we can study at optical wavelengths. The advent of satellite-based infrared and X-ray astronomy has allowed us to look deeply into the dusty plane of the galaxy to look for sites of recent star formation. Interspersed among the countless older stars in the disk are star-forming clouds and young clusters, including a few super star clusters. Two of these, Cygnus OB2 and Westerlund 1, have even been classified as proto-globular clusters. The surprising fact is that Cygnus OB2 may be only 1 kpc (about 3,300 light years) from the Sun. Dr. Gagné will discuss what these clusters can teach us about star and planet formation.

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## CCAS Upcoming Program Notes

| | |
|---|---|
| October 10, 2006 | The Astrolabe<br>by Bob Popovich |
| November 14, 2006 | The Specialness of Water:<br>Water and Life<br>by Nicholas La Para |
| December 12, 2006 | TBA (Holiday Party?) |

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## CCAS Observing Session

### September 22/23, 2006

CCAS Observing Sessions are held 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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## Monthly Planetarium Show at WCU

The West Chester University Department of Geology & Astronomy is now hosting a free show open to the general public on the second Friday of each month. The WCU Planetarium is located in the Schmucker Science Center on Church St.

The shows start promptly at 7:00 P.M. ET and run approximately one hour in length. Late arrivals will not be permitted to enter the planetarium. Each show will include an overview of what is visible in the current night sky and a special focus on some aspect of astronomy.

Reservations are required because the planetarium has limited seating. Please contact Dr. Vanlandingham, Planetarium Director, at (610) 436-2788 or via e-mail at kvanlandingham@wcupa.edu to reserve your seat(s). For more information visit the planetarium's webpage **http://astro.wcupa.edu/planetarium/index.htm.**

**Program Topics**

September 8: Our Milky Way Galaxy

October 13: Nine Planets and One to Grow On

November 10: A Universe of Galaxies

December 8: Show: A Star is Born

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## Calendar Notes

| | |
|---|---|
| September 5, 2006 (Tuesday) | Hercules Observing Cluster meets<br>Call Kathy Buczynski for details |
| September 8, 2006 (Friday) | WCU Planetarium Show<br>Location: West Chester University<br>7:00 p.m. EDT |
| September 12, 2006 (Tuesday) | CCAS Meeting<br>Location: West Chester University<br>**7:00 p.m. EDT** |
| September 19, 2006 (Tuesday) | Hercules Observing Cluster meets<br>Call Kathy Buczynski for details |
| September 22/23, 2006 (Friday/Saturday) | CCAS Observing Session<br>Location: BVA<br>sunset |
| September 26, 2006 (Tuesday) | Hercules Observing Cluster meets<br>Call Kathy Buczynski for details |
| October 10, 2006 (Tuesday) | CCAS Meeting<br>Location: West Chester University<br>7:30 p.m. EDT |
| October 13, 2006 (Friday) | WCU Planetarium Show<br>Location: West Chester University<br>7:00 p.m. EDT |
| October 20/21, 2006 (Friday/Saturday) | CCAS Observing Session<br>Location: BVA<br>sunset |
| November 10, 2006 (Friday) | WCU Planetarium Show<br>Location: West Chester University<br>7:00 p.m. EST |
| November 14, 2006 (Tuesday) | CCAS Meeting<br>Location: West Chester University<br>7:30 p.m. EDT |
| November 24/25, 2006 (Friday/Saturday) | CCAS Observing Session<br>Location: BVA<br>sunset |
| December 8, 2006 (Friday) | WCU Planetarium Show<br>Location: West Chester University<br>7:00 p.m. EST |
| December 12, 2006 (Tuesday) | CCAS Meeting<br>Location: TBA |
| December 22/23, 2006 (Friday/Saturday) | CCAS Observing Session<br>Location: BVA<br>sunset |

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## Treasurer's Report by Bob Popovich

**July 2006 Financial Summary**

| | |
|---|---|
| Beginning Balance | $1,356 |
| Deposits | 0 |
| Disbursements | 0 |
| Ending Balance | $1,356 |

**Membership Renewals Due**

| | |
|---|---|
| 09/2006 | Bogucki |
| | Holenstein |
| 10/2006 | Anderson |
| | Angelini |
| | Charitnonchick |
| | End |
| | Hillenbrand |
| | Massarella |
| | Padgett |
| | Vely |
| 11/2006 | Athens |
| | Bower |
| | Buczynski |
| | Cook |
| | Hepler |
| | Malloy |
| | Murray |

## 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 14 in this newsletter.

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## Pluto—Mickey's Dog???

by Kathy Buczynski, CCAS President

On August 24, 2006, the International Astronomical Union's Planetary Definition Committee demoted the Planet Pluto. The popular planet among school students is no longer considered the ninth planet in the solar system and will henceforth be known as a dwarf planet. Did Neil deGrasse Tyson, director of the Hayden Planetarium, have the foresight to omit it from the displays or did he have the influence to demote Pluto so that the displays did not have to be re-done? HHHMMMM! Something to think about.

Pluto's popularity did not win; physics took over. The new definition is:

"A planet is a celestial body that (a) is in orbit around the Sun and (b) has sufficient mass for its self-gravity to overcome rigid-body forces so that it assumes a hydrostatic equilibrium (nearly round) shape." But unlike the original proposal the resolution adds another criterion, stating that "(c) a planet has cleared the neighborhood around its orbit." Significantly, the IAU did not extend the definition of a planet beyond the solar system, limiting it to objects orbiting the Sun.

Poor Pluto. But how will future students learn the order of the planets? Many children (and adults) learned the planets with the following mnemonic:

My Very Educated Mother Just Served Us Nine Pizzas.

I propose the following which I learned as a child. Admittedly, Pluto sounds like an add-on in this mnemonic but can easily be dropped:

Mary Visits Every Monday And (Asteroid Belt) Just Stays Until Noon, Period.

So dwarf-planet Pluto and its siblings Charon (its own moon), Ceres (in the asteroid belt) and 2003 UB313 (larger than Pluto and within the Kuiper Belt) have lost their status as planets; Mickey Mouse's dog happily remains a dog.

To read more about Pluto, the Planetary Definition Committee and the IAU, I suggest you visit the Planetary Society's website at www.planetary.org. There you can hear an interview with Committee member Dava Sobel, author of the books *Longitude*, *Galileo's Daughter* and *The Planets*. You can also read comments from some other notables like Neil deGrasse Tyson, and Louis Friedman, Executive Director of the Planetary Society.

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## Equipment for Sale

by Pete LaFrance

One eight-inch (8") Celestron SCT fork mounted telescope. This is an early 1980s model with Celestron's Starbright coatings. This scope has some cosmetic defects, but the optics are superb. It comes complete with tripod and HD wedge and a new quartz tracking corrector for accurate tracking at lunar, solar and sidereal rates. It also includes a 1¼" diagonal and a 26mm eyepiece. This outfit is capable of doing limited astrophotography. I can supply pictures of the telescope upon request.

I am asking $350.00 for the package.

Pete LaFrance

610-268-2616

plafrance@verizon.net

★ ★ ★ ★ ★

## A Dark Sky Vacation

by Don Knabb, CCAS Observing Chair

Although Barb and I love living in beautiful Chester County, the fact is that local light pollution impacts our ability to observe the fainter stars and deep sky objects in the sky. Of course, there is plenty to see from good old West Chester, but this summer we decided to vacation at a location with a darker sky. We didn't want to travel too far away so we rented a vacation home in the southern Pocono Mountains, a mere 2 hour drive.

So in early August I loaded up the telescope, tripod, eyepieces, accessories, binoculars, observing chair and folding lounge chairs into the car. That filled the trunk, so our luggage went into the back seat.

Our rental house had a large elevated deck, so several nights we just set the scope up on it despite the fact that we knew there would be a lot of vibration. We did not have a wide view of the sky, but what we did have was a clear view of the summer triangle, so we decided to go deep and see what we could find in that relatively small section of the sky. That was actually a lot of fun and we saw many objects that we had not seen before. And yes, we had a stunning view of the Milky Way!

There are several state parks in the Poconos and we went hiking at three of them. At one that was only a 15 minute drive from our vacation house we asked the park rangers where we could set up at night for a good dark sky view. The one area they suggested had recently been visited by bears, so we decided to skip that! Instead we rented a campsite for a night just to get a place to park the car near a good size field surrounded by other campers who would hopefully keep the bears away.

Here are a few pictures from that evening:

As you can see, we had a few bathroom lights and a first-quarter Moon to deal with, but we saw a long list of stars and deep sky objects during a 3 hour observing session. The Wild Duck Cluster, M11, was beautiful. We also saw M81, M82, the Double Cluster, NGC 4457 the "ET Cluster," M13, M22, M31, M15, M27, M2, M5, M57 and M52. This was the first time we saw M57, the Ring Nebula, and that was a wonderful sight. Perhaps the highlight of the night was around midnight when Uranus rose over the trees. This was the first time we saw the blue-green planet as a distinct disk in the eyepiece. We also found Neptune, but it was just a dot. And truth be told, yes we used the "go to" scope to see these objects.

Part of the fun at this campsite was sharing the sky with campers. A group of students and a teacher spent quite a bit of time with us, resulting in lots of "oohhs" and "aaahhhhs."

Just for fun I aimed our simple digital camera into the eyepiece and got a reasonably good picture of the Moon:

So if you have ever thought about a dark sky vacation, you don't need to go to New Mexico, Arizona or even northern Pennsylvania. The Poconos offer good skies a reasonable drive away!

### Oct. 20-22, 2006: Stella Della Valley Starfest

This 20th annual star party will be held at Camp Onas, Ottsville, PA, and is sponsored by the Buck-Mont Astronomical Association. Vendors, swap meet, pizza party, door prizes, raffles, and even some stargazing. For more information, visit the website:

**http://www.bma2.org**

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### September 16-18, 2006: ASP Annual Meeting

The Astronomical Society of the Pacific is an organization dedicated to astronomical education. This year they are holding their annual meeting in **Baltimore, Maryland.** The **Space Telescope Science Institute**, from which the Hubble Space Telescope is controlled, is co-sponsoring the meeting. This is a great opportunity to learn from the best about astronomy and space science education and outreach. More information about the ASP, their educational resources, and their annual meeting, can be found at their web site:

**http://www.astrosociety.org/**

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### October 18-22, 2006: Mason-Dixon Star Party

This annual star party in York County PA has been moved to October (it was previously held in late May or early June). See the website for more info:

**www.ycas.org**

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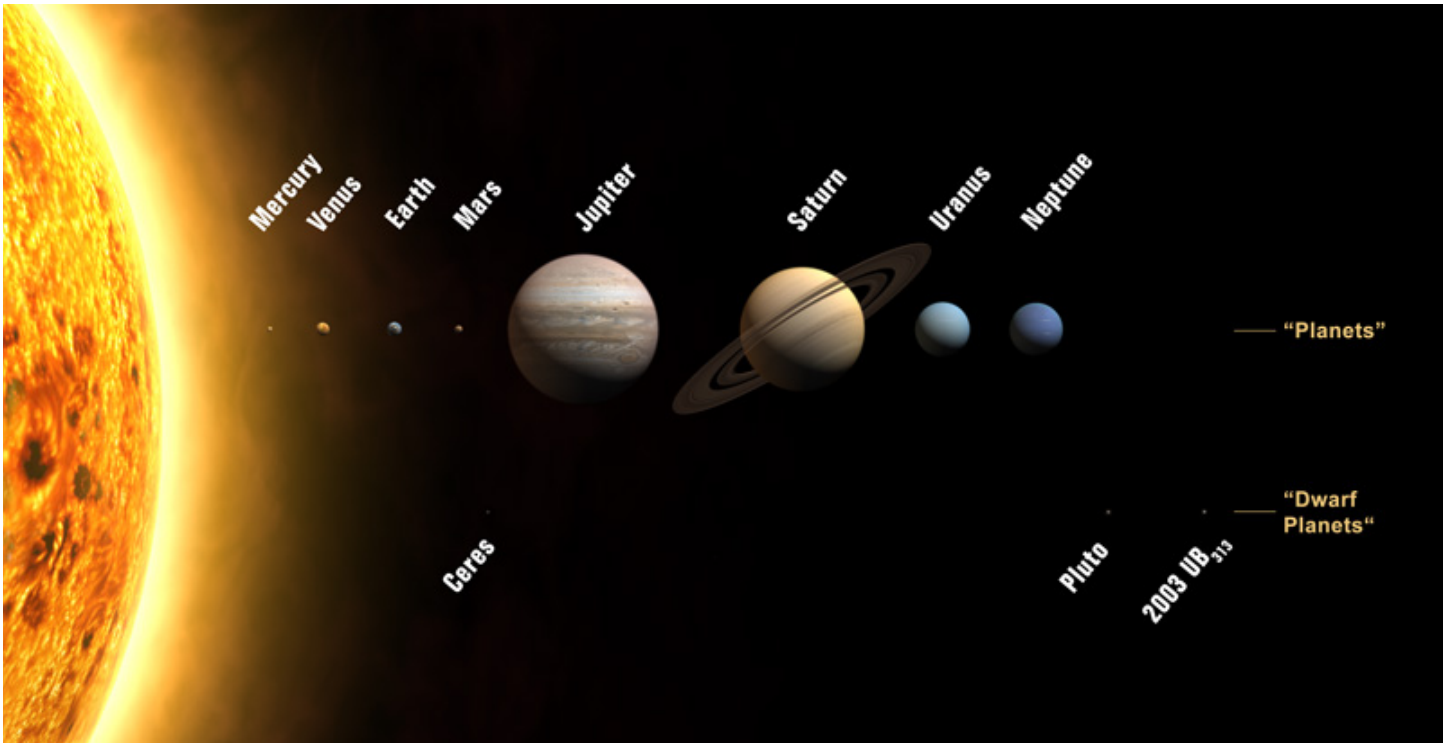
## And then there were eight…




Picture credit: International Astronomical Union, via Astronomy Picture of the Day
**http://antwrp.gsfc.nasa.gov/apod/astropix.html**

## Astroimages

by Pete LaFrance

This image of NGC6992 was acquired with a new telescope (an Orion 120mm F5), using a SBIG ST-8XME CCD camera. The exposure time was about an hour and a half, using RGB and HA filters. The raw images were processed into this final image using Maxim/DL and Astronomy Action tools.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## Astronomus

"Paradoxically"

By Bob Popovich

Relegated to

While on recent *holiday* (as the English would have it), I found myself pondering the notion of paradox. After reading this piece, you may wish to ponder on your own. Or, you may conclude that my membership in the lunatic fringe is secure.

But I digress. Paradox. Paradox and astronomy, to be precise. No doubt that almost any discipline you can name has its share of paradoxes. But astronomy's paradoxes are infused with dimensions of vastness. Of timelessness. They take us down a path that leads to philosophizing—oftentimes on a spiritual basis. Paradoxes of astronomy bring to light fog-shrouded particles of our human essence. This fog calls out for understanding. This understanding is not only a revelation onto itself, but a tantalizing invitation to seek out other such particles and tackle them as well.

Picture this, if you will. You walk out on a perfect night to stargaze. Your observing targets are few in number and include some of your favorites. The conditions are ideal—transparent sky, still air, ambient temperature and an unobstructed view in all directions. Settling in to your observing chair you raise your 1x stereoscopic viewers skyward. A leisurely altitude & azimuth scan of the sky allows you to absorb the beauty of the firmament. What do you see? Stars (duh!). About 3,000 from this hemisphere of our home planet. And we know there are a like number visible to our counterparts on the southern regions of this pale blue dot. So that's 6,000 in total. $6x10^3$, scientifically noted. But…But…But we know that current estimates on the stars in the universe reside at something in the neighborhood of $10^{24}$. Boy that's a BIG neighborhood.

OK, OK. The mind begins to race in a furious effort to reconcile this gaping disparity. “Aha! We can only detect stars down to about 6th magnitude! So 1024 is going to come down—way down.” Fine, let’s assume that most of the stars in the universe are too faint for us to see discreetly. But they ARE OUT THERE aren’t they? Emitting energy, visible & invisible. And what would be the collective impact of 1,000,000,000,000,000,000,000,000 stars distributed more or less equally throughout the sky? One would suppose that there should, at the very least, be an aggregate glow that would be *exponentially* brighter than the Milky Way (let’s not even talk about radiation energy). Accepting the current figure of 125,000,000,000 galaxies housing the universe’s stars, what do you suppose the night sky should look like with a background glow of 125 billion Milky Ways? Even if these other Milky Ways are no more than tiny, fuzzy points of light.

Needless to say, we’d all be astro-deer in the headlights (and radiationally, astro-toast). The light should be beyond our ability to cope. Certainly life on Earth would be far different. But this is not the case, we can all agree. And we thus arrive at Oblers’ paradox. I invite you to read up on this 18th century question in astronomical texts. Or, if you are a more literary type, borrow a copy of Edgar Allen Poe’s 19th century prose poem “Eureka” wherein he explains a solution to Oblers' paradox—well before trained astronomers had one! *Poe really was spooky.*

Now, how about space & time? The French mathematician and philosopher La Place once declared, paradoxically, that *the universe is a sphere of which the center is everywhere, the circumference nowhere.* A paradox of formless shape. Of finite infinity. Consider La Place’s invitation to think, to dissect and to understand. This must have seemed very odd to his 18th century age-of-reason counterparts. He wasn’t a contemporary of Poe’s, but it makes one wonder…

Notice—is not our current understanding of the universe remarkably in tune with La Place’s? As both La Place and modern astronomers agree, space is curved and omni-directional. Yet, as every English schoolboy knows, time is quite linear. Linear and, so far as we can tell, unidirectional. It goes forward. Or we go forward and it stands still. Or we both move forward. Whatever the case, the net effect is that we observe time moving forward. What a sad paradox that time is experienced moving forward and understood looking backward!

Is it a paradox that these two disparate features are intricately joined in our understanding of the mechanics of the universe? Or is it simply a mirage caused by our own limitations?

Investigating this paradox is more a career than an avocation, but it’s right up there with the top questions before theoretical astrophysicists and cosmologists today. Speaking of theoretical, isn’t it interesting that modern astronomy, so rooted in accepted scientific methods, benefits more from *theoreticians* than it does from rote testing and experimentation? Think about it—Kepler, Newton, Einstein, Hubble and Hawking—they all took a leap beyond the edge to propose something that more methodical scientists could not envision. Could we not say they *guessed*? An intelligent and educated guess, to be sure. An unscientific leap forward followed by a pause to let the methodical types fill in the gap with good, old-fashioned scientific methods. What a paradox that is!

All things considered, sometimes it just pays to sit, look at the night sky and ponder…

Next Time: Don’t Leave Home Without It.

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NASA Space Place

## Deadly Planets

By Patrick L. Barry and Dr. Tony Phillips

About 900 light years from here, there's a rocky planet not much bigger than Earth. It goes around its star once every hundred days, a trifle fast, but not too different from a standard Earth-year. At least two and possibly three other planets circle the same star, forming a complete solar system.

Interested? Don't be. Going there would be the last thing you ever do. The planet’s star is a pulsar, PSR 1257+12, the seething-hot core of a supernova that exploded millions of years ago. Its planets are bathed not in gentle, life-giving sunshine but instead in a blistering torrent of X-rays and high-energy particles.

"It would be like trying to live next to Chernobyl," says Charles Beichman, a scientist at JPL and director of the Michelson Science Center at Caltech.

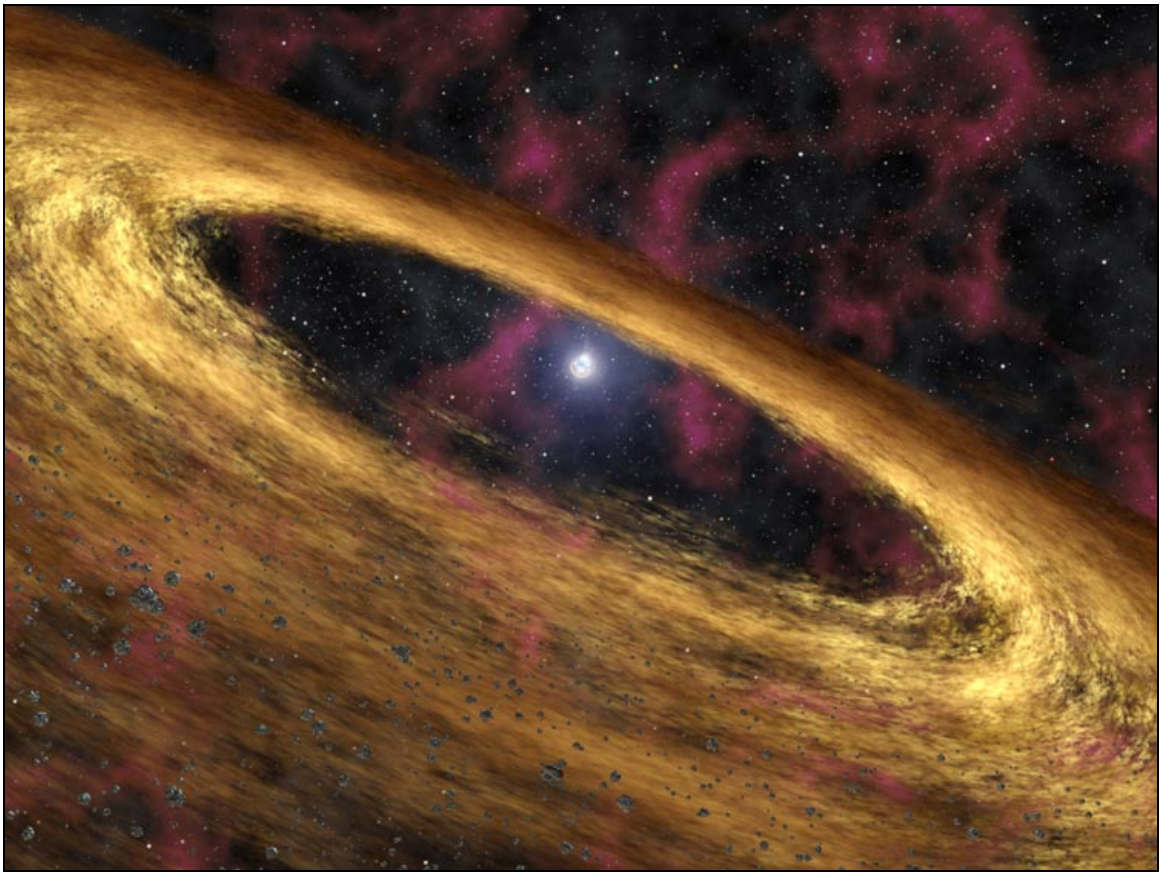
Our own sun emits small amounts of pulsar-like X-rays and high energy particles, but the amount of such radiation coming from a pulsar is "orders of magnitude more," he says. Even for a planet orbiting as far out as the Earth, this radiation could blow away the planet's atmosphere, and even vaporize sand right off the planet's surface.

Astronomer Alex Wolszczan discovered planets around PSR 1257+12 in the 1990s using Puerto Rico's giant Arecibo radio telescope. At first, no one believed worlds could form around pulsars—it was too bizarre. Supernovas were supposed to destroy planets, not create them. Where did these worlds come from?

NASA's Spitzer Space Telescope may have found the solution. Last year, a group of astronomers led by Deepto Chakrabarty of MIT pointed the infrared telescope toward pulsar 4U 0142+61. Data revealed a disk of gas and dust surrounding the central star, probably wreckage from the supernova. It was just the sort of disk that could coalesce to form planets!

As deadly as pulsar planets are, they might also be hauntingly beautiful. The vaporized matter rising from the planets' surfaces could be ionized by the incoming radiation, creating colorful auroras across the sky. And though the pulsar would only appear as a tiny dot in the sky (the pulsar itself is only 20-40 km across), it would be enshrouded in a hazy glow of light emitted by radiation particles as they curve in the pulsar's strong magnetic field.

Wasted beauty? Maybe. Beichman points out the positive: "It's an awful place to try and form planets, but if you can do it there, you can do it anywhere."



Artist's concept of a pulsar and surrounding disk of rubble called a "fallback" disk, out of which new planets could form.

More news and images from Spitzer can be found at http://www.spitzer.caltech.edu/ .

In addition, The Space Place Web site features a cartoon talk show episode starring Michelle Thaller, a scientist working with the Spitzer Space Telescope. Go to http://spaceplace.nasa.gov/en/kids/live/ for a great place to introduce kids to infrared light and the joys of astronomy.

*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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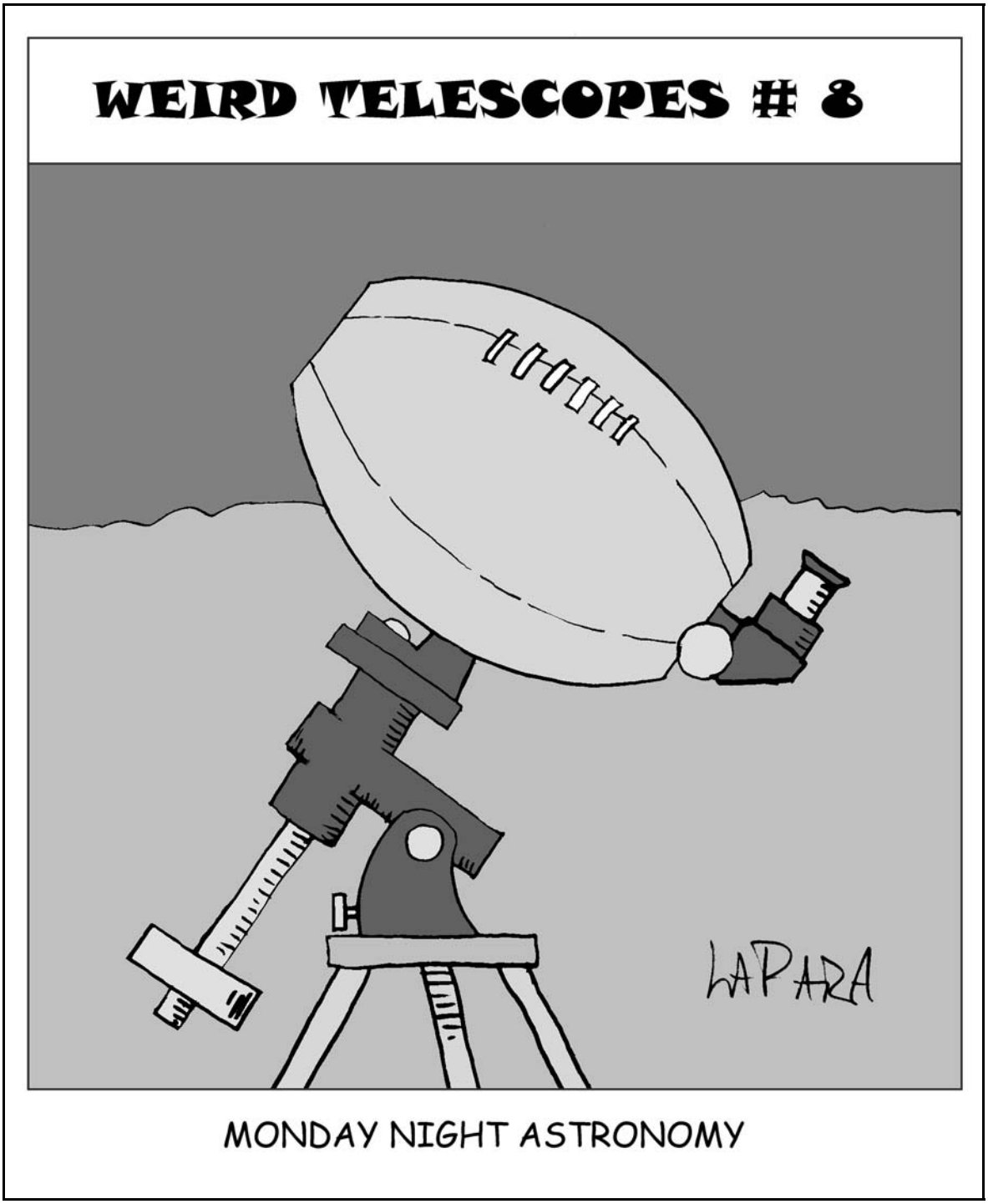


Cartoon by Nicholas La Para

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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:

**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/**

### Our Local Astronomy Store: *Skies Unlimited*

In case you didn't know it, there is an astronomy equipment store called ***Skies Unlimited*** in our area, in Pottstown to be specific. **The store has moved from its former location to:**

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

**Phone numbers:**
610-327-3500
888-947-2673

**Fax:**
610-327-3553

**http://www.skiesunlimited.net/**

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### 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. Hopefully you will not also need to know how to recognize its symptoms, but you can learn all 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!"

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**www.ccas.us**

# *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 A.L. Award Coordinators

These are the members to contact when you have completed your observing log for the Messier, Binocular Messier, Lunar, or Double Star Awards:

Messier (both): Jim Anderson
(610-857-4751)

Lunar: Ed Lurcott
(610-436-0387)

Double Star: Jim Anderson
(610-857-4751)

Constellation Hunters: Jim Anderson
(610-857-4751)

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

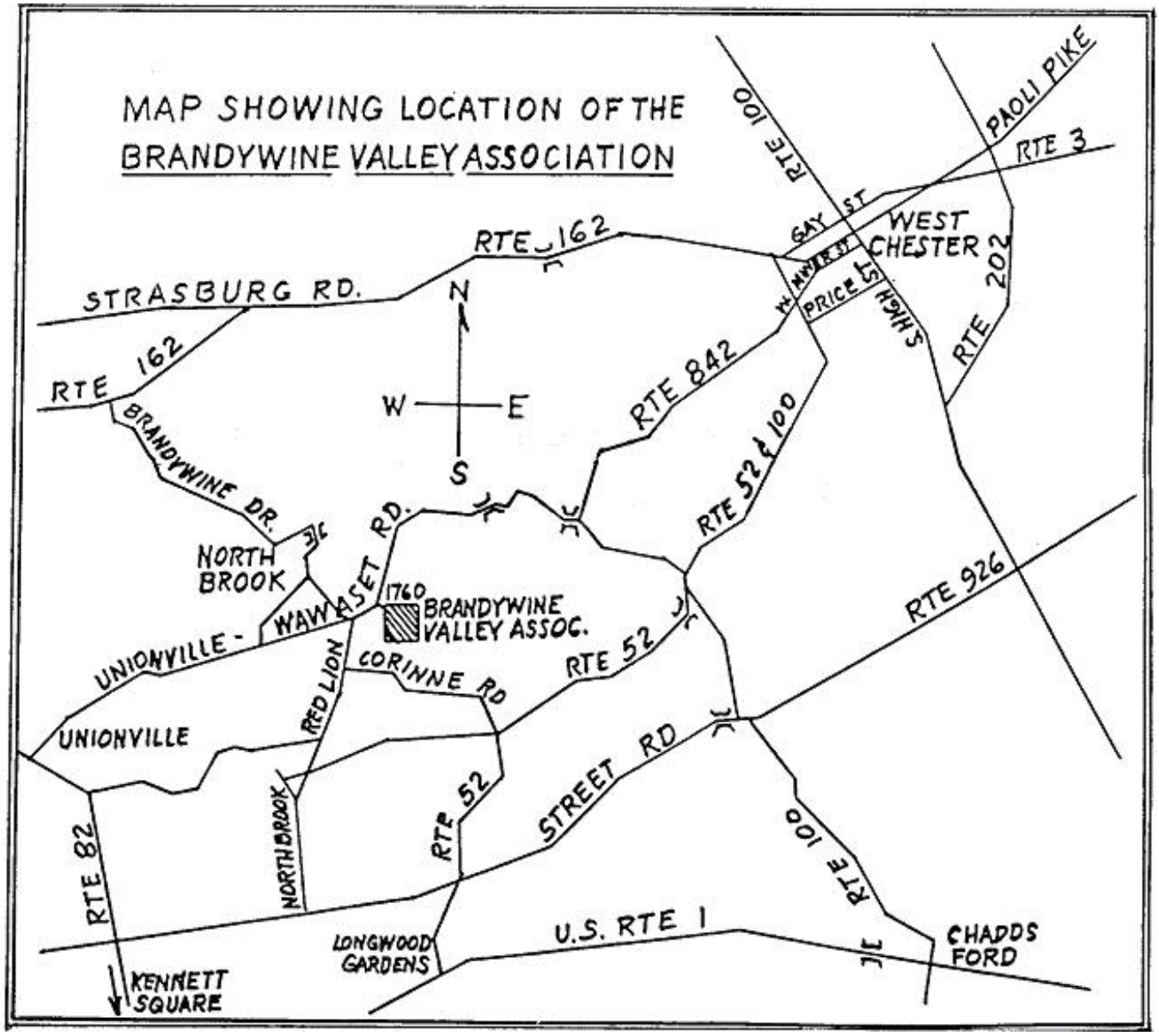
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95** which is much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society** (do **not** make the check out to Sky Publishing, this messes things all 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.

### CCAS Website

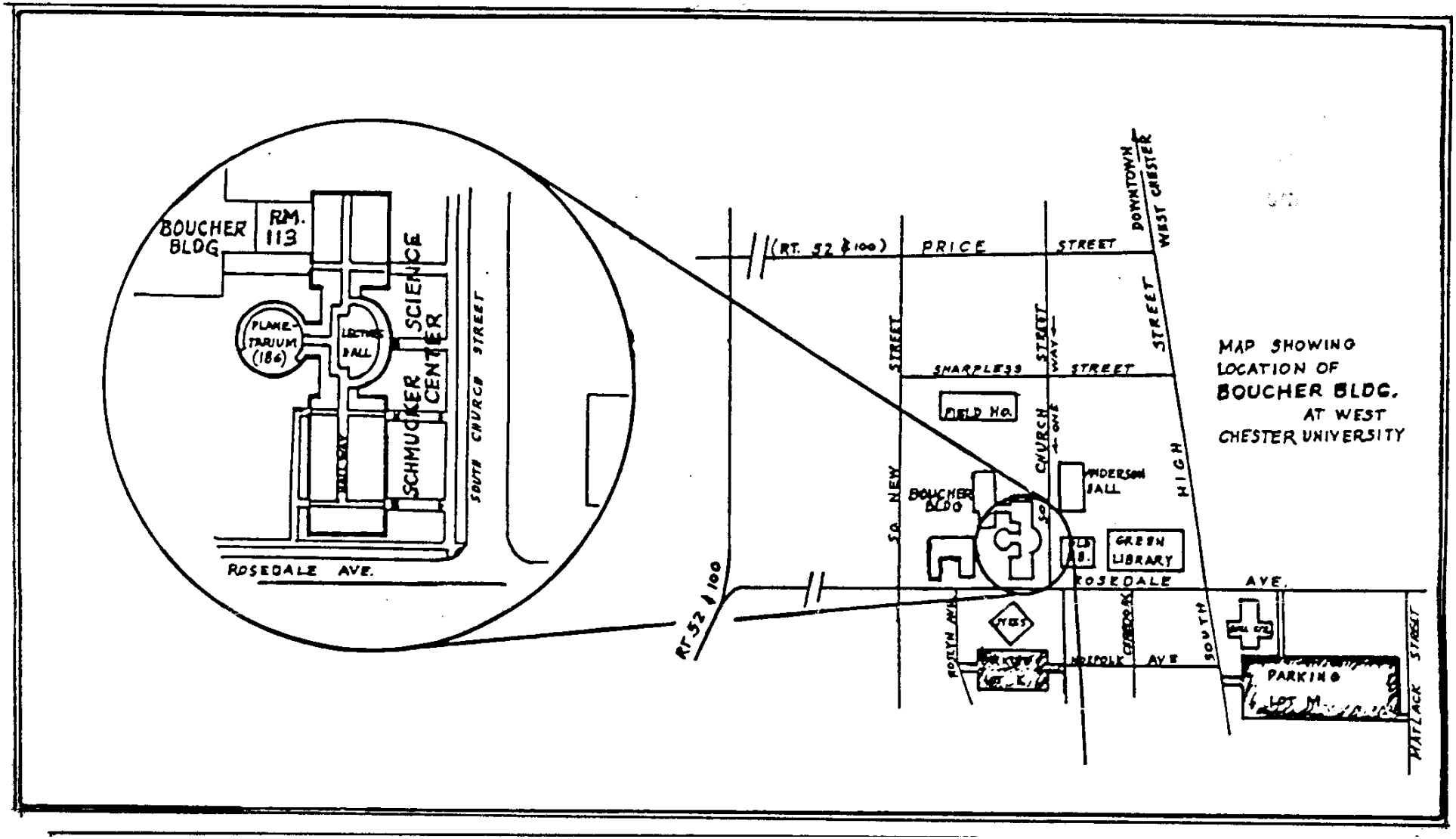
John Hepler is the Society's Webmaster. You can check our Website at:

**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**




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.