



# Observations

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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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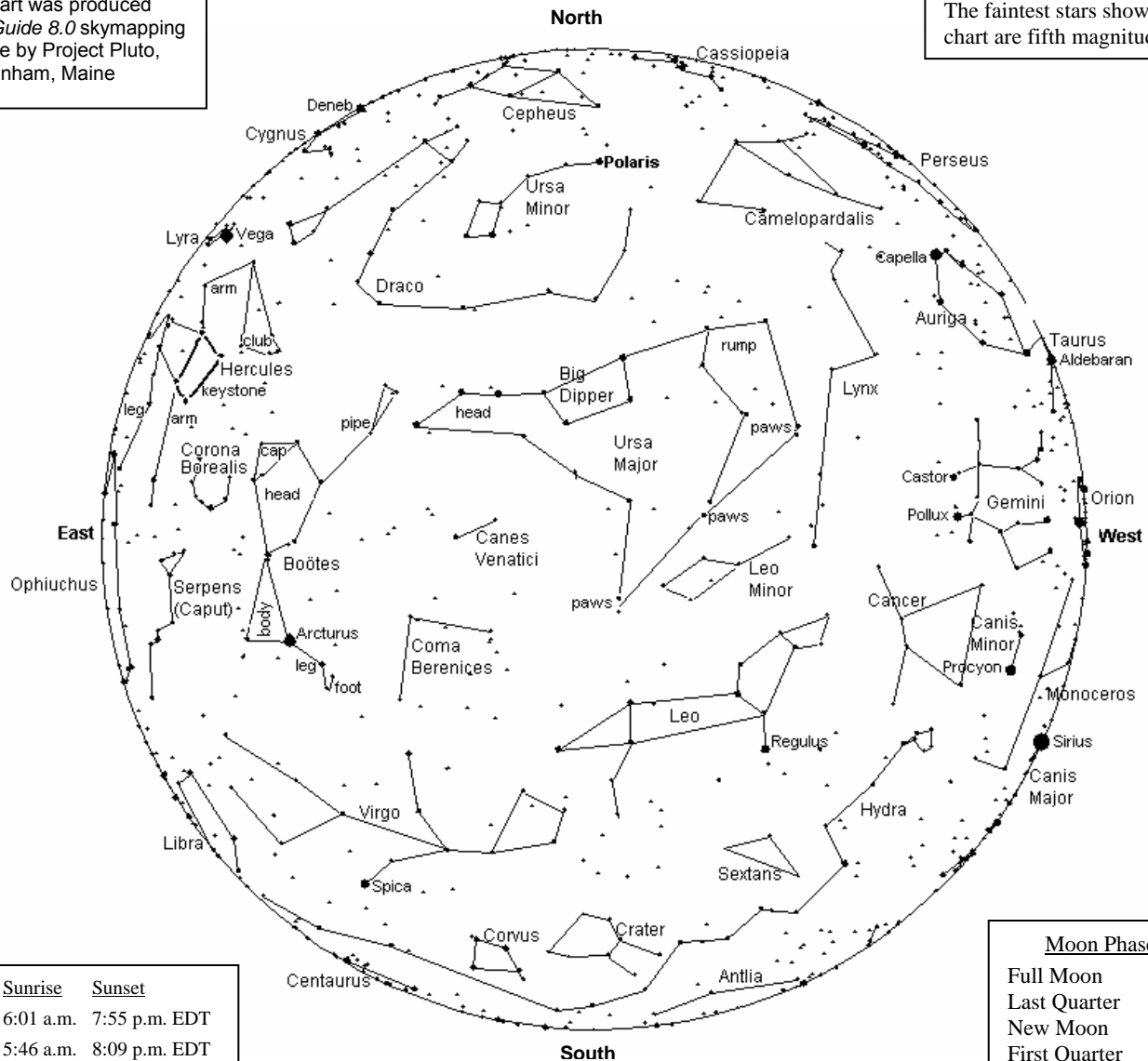
## Important May 2007 Dates

- 1** **Introductory Astronomy class** meets at West Chester University. Class starts at 7:00 p.m. EDT. Topic: **Planetarium Show**.  
See page 5 for details.
- 2** Full Moon—the Full Flower Moon.
- 5** Eta Aquarid Meteor Shower peaks.
- 8** **CCAS Meeting 7:30 p.m. EDT**  
Location: West Chester University  
Constellation of the Month: Canis Major  
Main Presentation: "The Largest Objects in the Universe"  
See page 4 for details.
- 10** Last Quarter Moon
- 15** **Introductory Astronomy class** meets at West Chester University. Class starts at 7:00 p.m. EDT. Topic: *Beyond Naked Eye*.  
See page 5 for details.
- 16** New Moon.
- 18** **Special CCAS Observing Session**  
Location: Anson B. Nixon Park in Kennett Square.  
Time: sunset, or earlier (see page 5)
- 23** First Quarter Moon, 5:03 p.m. EDT.
- 31** Full Moon—A **Blue 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
5/1	6:01 a.m.	7:55 p.m. EDT
5/15	5:46 a.m.	8:09 p.m. EDT
5/30	5:35 a.m.	8:22 p.m. EDT

Moon Phases	
Full Moon	05/02
Last Quarter	05/10
New Moon	05/16
First Quarter	05/23
Full Moon	05/31

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

#### The Planets, by Don Knabb

**Mercury:** The planet closest to the Sun gives us its best show of 2007 in the 2nd half of May. If you look a half hour after sunset you will see Mercury about 10° (the width of your closed fist) above the horizon between Venus and where the Sun just set.

**Venus:** The hottest planet hits its highest point above the horizon during May, standing nearly 40° high at sunset. Venus is so bright that you can find it before the sun even sets. On May 9th it passes less than 2° from M35, a star cluster at the feet of Gemini the Twins. And don't miss the beautiful pairing on May 19th when Venus and the crescent Moon are less than 1° apart in the evening skies!

**Mars:** Mars is a dim speck low in the glow of the sunrise. Wait until later in the summer to enjoy the Red Planet.

**Jupiter:** Early in May Jupiter is rising around 11:00 p.m. As the month progresses the King of the Planets rises earlier until it is clearing the horizon just after sunset by the end of the month. Don't mistake it for a firefly! Although Jupiter stays low in the sky it is nearly as large as it will be all year.

**Saturn:** Ah, the ringed beauty continues its excellent showing. Do not miss this incredible sight in a telescope. Stare for a long time, but take turns at the eyepiece. It's finally warm enough to sit outside for a while without shivering. Saturn is high in the southwest at twilight. Look for the planet's shadow on the rings!

**Uranus:** Uranus is very low and dim in the morning twilight and is therefore not well positioned for viewing during May.

**Neptune:** Neptune, like Uranus, is low and dim in the morning twilight.

**Pluto:** Pluto is not far from Jupiter in the early morning skies, but is a tough target for Chester County skies since it is one three-millionth as bright as Jupiter.

Note: the constellation stick figures used on the chart above were adapted from the book *The Stars: A New Way to See Them*, by H. A. Rey. This excellent guide to learning the constellations can be purchased at many area book stores, or from online booksellers.

## May Observing Highlights

by Don Knabb, CCAS Observing Chair

**Planets:** We welcome tiny Mercury to the evening show in late May. Headliners continue to be brilliant Venus and the ringed beauty Saturn in the evening skies, with mighty Jupiter rising around sunset by the end of the month.

**Asteroids:** I don't often mention asteroids in this article, but Vesta, the brightest asteroid, reaches magnitude 5.4 at the end of the month, shining far brighter than any other main-belt asteroid ever can. The June issue of *Sky and Telescope* will have a finder chart to help locate this unusual target.

**Constellations:** Spring is here, and with it the Big Dipper is high overhead. Follow the arc of the Dipper's handle to bright Arcturus and find Bootes. Just to its left is the Northern Crown, Corona Borealis. Leo is easy to find just after sunset looking due south. And bright Vega in Lyra is rising as the night gets a bit later. Stay out later still and watch Cygnus the Swan fly above the eastern horizon.

**Deep sky:** Would you like to see 500,000 stars at one time? Look nearly overhead during May, to the northwest and not far from Arcturus and find M3, the third object cataloged by Charles Messier. This globular cluster is one of the largest and brightest. Then look about twice as far the other direction from Arcturus and find M5, another fine globular cluster. Under extremely good conditions it is said that both these clusters can be detected with the naked eye. Unfortunately, that will not be possible in Chester County! Sounds like it's time for a field trip!

**Meteor shower:** The Eta Aquarid meteor shower peaks on May 5. This is not expected to be a good show for Northern Hemisphere observers, but unexpected outbursts can happen with any meteor shower, so why not take a look?

- May 2** Full Moon, the Full Flower Moon, 6:09 a.m.
- May 5** The Eta Aquarid meteor shower peaks before dawn.
- May 10** Last quarter Moon, 3:27 p.m.
- May 16** New Moon, 7:36 a.m.
- May 19** Venus passes just south of the Moon's edge at 10:30 p.m.
- May 23** First quarter Moon, 5:03 p.m.
- May 31** Full Moon again at 9:04 p.m.! Being the second full Moon in the month it is called a Blue Moon.



## Through the Eyepiece: Venus, Queen of the Night

by Don Knabb, CCAS Observing Chair

Terence Dickinson, in his book *Nightwatch*, refers to Venus as the Queen of the Night. I had never heard that

before, but I like the expression. And in May Venus is certainly the royalty of the evening and the early part of the night.

May is an excellent time to view Venus by naked eye or with binoculars or a telescope. It is about as high and bright as it ever gets. Since Venus is an inferior planet, that is, it orbits within the orbit of Earth, it shows phases when viewed with a telescope from the perspective of Earth. Galileo's observation of this phenomenon was important evidence in favor of Copernicus's heliocentric theory of the solar system.

I can't see as much detail as in this NASA photograph when I observe Venus in a telescope, but I can certainly see the phases just as we see phases on the Moon. Each month *Sky and Telescope* provides a diagram to show the current phase of Venus.



Photo credit: NASA

Classified as a terrestrial (Earth-like, or rocky) planet, it is sometimes called Earth's "sister planet," for the two are similar in size, gravity, and bulk composition. Venus is covered with an opaque layer of highly reflective clouds of carbon dioxide, preventing its surface from being seen from space in visible light. Terence Dickinson puts it quite correct when he states "The real face of the queen of the night is never unveiled to backyard astronomers."

This NASA diagram shows the relative sizes of Mercury, Venus, Earth and Mars.



Because of the similarities between Venus and Earth, it was thought that below its dense clouds Venus might be very Earth-like and might even have life. But, unfortunately, more detailed study of Venus reveals that in many important ways it is radically different from Earth. It may be the least hospitable place for life in the solar system.

Venus has the densest atmosphere of all the terrestrial planets, consisting mostly of carbon dioxide. The atmospheric pressure at the planet's surface is 90 times that of the Earth. The dense atmosphere produces a run-away greenhouse effect that raises Venus' surface temperature hot enough to melt lead. Venus' surface is actually hotter than Mercury's despite being nearly twice as far from the Sun. Venus is regarded by many scientists to be "an Earth gone wrong." If we unbalance our Earth's atmosphere by burning too many fossil fuels, and therefore releasing too much carbon dioxide, Earth may end up as unlivable as Venus.

Venus is the brightest natural object in the night sky, except for the Moon, reaching an apparent magnitude of -4.6. Jupiter is never more than half as bright as Venus, and Venus is more than 10 times as bright as Sirius, the brightest star in the night sky.

Because Venus is an inferior planet, from Earth it never appears to venture far from the Sun: its elongation reaches a maximum of 47.8°. Venus is bright enough to be seen even in the middle of the day, and the planet can be easy to see when the Sun is low on the horizon.

Venus "overtakes" the Earth every 584 days as it orbits the Sun. As it does so, it goes from being the 'Evening star', visible after sunset, to being the "Morning star," visible before sunrise. While Mercury, the other inferior planet, reaches a maximum elongation of only 28° and is often difficult to discern in twilight, Venus is hard to miss when it is at its brightest as it is now.

As the brightest point-like object in the sky, Venus is a commonly misreported as an "unidentified flying object." In 1969, future U.S. President Jimmy Carter reported having seen a UFO, which later analysis suggested was probably the planet, and countless other people have mistaken Venus for something more exotic. I knew a man who served in World War II and the captain of his bomber dumped their bomb load when he mistook Venus for an enemy plane that he believed was bearing down to attack their plane.

We have a few months to enjoy "The Queen of the Night," but May is the best it will be for a long time, so go out and enjoy this beautiful planet.

Information credits:

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

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

<http://www.nineplanets.org/venus.html>

<http://en.wikipedia.org/wiki/Venus>



## CCAS May Meeting

DATE: **Tuesday May 8, 2007**  
TIME: **7:30 p.m. EDT**  
PLACE: **Room 222 – Boucher Building**  
West Chester University  
LOCATION: South Church Street  
West Chester, PA

A map of the campus showing the location is on page 14.

**NOTE the room change from 113 to 222!** Room 113 will be in use for final exams on May 8, so we will be upstairs in Room 222. Look for yellow directional signs when you enter the Boucher building.

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

This month's presentation will be "The Largest Objects in the Universe," by Dr. Fiona Hoyle. Ever since humans have gazed at the sky, man has asked the question "What is the largest object in the Universe?" In the Universe of the Ancient Greeks the Earth took center stage, whereas the Sun dominated for most of the last millennium. Finally in the last century, mankind realized that the part of the Universe that we call home is just a tiny planet, orbiting a very average star in a typical spiral galaxy and that the Universe contains billions of these galaxies.

Cosmologists call these galaxies the "building blocks of the Universe" as they define the largest structures in the Universe. We now know that there are super-clusters of galaxies that extend over a billion light years and huge regions of the Universe that contain no galaxies at all, known as voids. In this talk Dr. Hoyle will describe how technology has changed our perspective of the Universe.

Fiona Hoyle is Assistant Professor of Physics at Widener University. She earned her Ph.D. in Physics from the University of Durham, in England.



## Welcome!

We welcome our newest member to the Society: Omer Aziz of Exton. We're glad you decided to join us! Clear skies!



## 2007 is Election Year in CCAS

In April, ballots were mailed to all CCAS members in good standing. If you cannot attend the May meeting, please mark your ballot and return it using the enclosed stamped pre-addressed return envelope. You can also return your ballot in person at the May meeting.

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 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.



## CCAS Observing Session May 18, 2007

### Calling all CCAS members:

On Friday May 18 we will be hosting a star party at Anson B. Nixon Park in Kennett Square.

<http://www.ansonbnixonpark.org/index.html>

The gathering will begin around sunset when we can share views of the crescent moon and Venus. As the sky darkens we'll see Saturn and then go deeper into the wonders of the universe. This observing session replaces our normal BVA observing session.

Anson B. Nixon Park hosts many community events for southern Chester County residents. Let's try to get out as many CCAS members as possible for this event. You don't need a telescope or binoculars, but bring them if you have them. Don Knabb will bring star charts to hand out to everyone.

The diagram on page 13 is a bit old, but is a great help to find where we will be observing. If you head west into Kennett Square on State Street ("Old Route 1") you will see North Walnut Street heading to the right just as you enter town. Follow that road to the right, bypassing the main park entrance to what is labeled "future athletic fields" on the map. The fields are no longer "future," they now exist and there is parking space and portable toilets available. Just watch for the "Y" as in YMCA signs on the left as you head north.

Originally we set the next night, Saturday May 19 as a rain date for this event, but Don is unavailable on that date and we have no volunteers to cover the event, so Don decided the best thing would be to reschedule the event for later in the summer if we have bad weather on Friday May 18.

If you have any questions please contact Don Knabb at [observing@ccas.us](mailto:observing@ccas.us) or [dknabb00@comcast.net](mailto:dknabb00@comcast.net).

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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:

May 1 Planetarium show (WCU planetarium)  
May 15 Beyond Naked Eye

The class on May 15 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 14.

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### New Observing Guide Available

The International Occultation Timing Association (IOTA) has just released a new book on Occultations: *Chasing the Shadow: The IOTA Occultation Observer's Manual*. The book is free, online and ready for downloading.

Written by IOTA's most experienced astronomers, this is the only book you'll need for observations of occultations by the

Moon, by asteroids and other solar system bodies. It includes an extensive set of Appendices, and over 120 color figures and diagrams, for a total of 385 pages.

The book is available here:

<http://www.poyntsource.com/IOTAMannual/Previous.htm>

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### Treasurer's Report by Bob Popovich

#### March 2007 Financial Summary

Beginning Balance	\$2,188
Deposits	135
Disbursements	<u>572</u>
Ending Balance	\$1,751

#### Membership Renewals Due

05/2007	Henderson Kutta Long Volcheck
06/2007	Churchman Driedyen Hebding Limeburner Mayer-Kielmann Moore Siskind
07/2007	Scarfo Sleeper Tobey
08/2007	Fragale Knabb

### Membership Renewals

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

**Bob Popovich**  
**416 Fairfax Drive**  
**Exton, PA 19341-1814**

The current dues amounts are listed in the *CCAS Information Directory* on page 12 in this newsletter.

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### Minutes from CCAS April Meeting

by Don Knabb, CCAS Observing Chair

For the meeting held on Tuesday April 10, 2007.

#### Constellation of the Month:

Kathy Buczynski prepared a handout and made a presentation on Cygnus (The Swan). The constellation's mythology, interesting facts, and observing club objects were discussed.

#### Main Presentation:

Steve Siskind gave a presentation on his trip to New Mexico Skies and Skywatcher's Inn in New Mexico to observe and photograph the skies. It was a great presentation.

#### Education (Kathy Buczynski):

The spring classes are proceeding well. The first Tuesday in May is the planetarium session at WCU. All CCAS members are invited to attend the show. The fall classes will be based on backyard observing.

**Observing (Don Knabb):**

The May observing session at BVA has been relocated to Kennett Square at Anson Nixon Park, on the north side of Kennett Square. We were asked to host a star party for the park as part of their community programs. The date is Friday May 18. More details are on page 5.

**Website (John Hepler):**

John has switched us to a new website hosting company. He is still fine tuning a few things with e-mail. If any members are not getting his test messages please send him a note from the website so he can check your e-mail address. Several new features are available with our new host such as podcasts, blogs, etc.

**Treasurer (Bob Popovich):**

We still have polo shirts available for \$30.00 (our cost). Members can still sign up for discounted subscriptions to *Astronomy* magazine in addition to *Sky & Telescope* (see page 12 for more details). We purchased a set of 96 ½ hour lectures on DVD that we can use for classes and meetings.

**Library (Ed Lurcott):**

Ed is updating the list of items in the library.

**Light Pollution (Ed Lurcott):**

Ed attended a meeting of the Pennsylvania Outdoor Lighting Council (POLC). They would like to establish a relationship with CCAS. They have a regular meeting on the first Wednesday of the month in northern Chester County. May 2nd is the next meeting if anyone would like to attend with Ed. This group is active with local governments to work on ordinances to control light pollution.

**Elections (Marty Bower and Ken Reynolds):**

Don Knabb resigned as Chair of the Election Committee so he could run for Secretary. Marty and Ken are working with Jim Anderson to get the ballots mailed so they can be counted at the May meeting.

**Astronomy Day:**

Bob announced that we would have a display in the North Court of the Exton Square Mall from 10 am to 6 pm on Saturday April 21.



**Lecture Series Addition to CCAS Library**

by John Hepler

CCAS has recently purchased a lecture series from the Teaching Company®. Entitled *Understanding the Universe, An Introduction to Astronomy, 2nd Edition*, the series consists of 96 half-hour lectures on DVD by noted Professor Alex Filippenko from the University of California, Berkeley. Dr. Filippenko is a world-renowned expert on exploding stars, black holes, galaxies and cosmology, and has received numerous awards throughout his career in education. Most recently he received the prestigious Richtmyer Memorial Award of the American Association of Physics Teachers (AAPT) at their annual meeting this past January in Seattle. In

November of 2006 he was awarded the Professor of the Year Award, sponsored by The Carnegie Foundation for the Advancement of Teaching and administered by the Council for Advancement and Support of Education (CASE). In 2004, he received the Carl Sagan Prize for Science Popularization. In addition to national awards, he has been voted the best professor at UC Berkeley five times. His lectures are both entertaining and informative and he is noted for “the ability to light the astral fire in undergraduates.”

The sheer number prevents a comprehensive list of all 96 lectures in this article; however, the lectures are grouped as follows:

- I. Observing the Heavens (Lectures 1-24)
  - a. Celestial Sights for Everyone (1-11)
  - b. The Early History of Astronomy (12-16)
  - c. Basic Concepts and Tools (17-24)
- II. Contents of the Universe (Lectures 25-70)
  - a. Our Solar System (25-37)
  - b. Other Planetary Systems (38-42)
  - c. Stars and Their Lives (43-52)
  - d. Stellar Explosions and Black Holes (53-66)
  - e. The Milky Way & Other Galaxies (67-70)
- III. Cosmology: The Universe as a Whole (Lectures 71-96)
  - a. Cosmic Expansion & Distant Galaxies (71-78)
  - b. The Structure & Evolution of the Universe (79-89)
  - c. The Birth of the Cosmos and Other Frontiers (90-96)

The Society is planning on presenting one lecture after each monthly meeting. Everyone attending the meeting is welcome to stay and watch the lecture. The lecture we will be presenting at the May 2007 meeting is “The Rainbow Connection.”

The CCAS website library page will be updated with the complete list of lecture titles in the near future. If you are interested in a particular lecture or series of lectures and don’t want to wait for the presentation at the monthly meeting, contact the society’s webmaster, John Hepler, to make arrangements to borrow the corresponding DVD.



**Calendar Notes**

June 15/16, 2007 (Friday/Saturday)	CCAS Observing Session Location: Brandywine Valley Assoc. sunset
July 13/14, 2007 (Friday/Saturday)	CCAS Observing Session Location: Brandywine Valley Assoc. sunset
August 17/18, 2007 (Friday/Saturday)	CCAS Observing Session Location: Brandywine Valley Assoc. sunset
September 11, 2007 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
September 14/15, 2007 (Friday/Saturday)	CCAS Observing Session Location: Brandywine Valley Assoc. sunset



## Astronomus

“What I Want To Be When I Grow Up”

By Bob Popovich

A silly little childhood statement, isn't it? Well, maybe not...

Is there any among us who, with pride and zeal, hasn't had an answer for this question? But, wait a minute. What might seem like a juvenile assertion actually presupposes that (1) you know when you're grown up; (2) you're able to distinguish between physical maturity and mental maturity and (3) you have fully arrived at the state of being consistent with your chosen calling, i.e.; you really *are* what you want *to be*.

So now that we've moved the question from grade school to grad school, how do we know what we want to be when we grow up? Consider...

Can you tell because you get paid for doing it? Well, that eliminates parenting and married life (For some of us, that may even eliminate our job...)

Can you tell because you're skilled at doing it? Bye-Bye parenting and marriage once again!

Can you tell because it's a calling from which you neither swerve nor demur? Is there anything in life that fits this criterion?

Can it be a decision reached by sound, rational thought? Well, let's not go there.

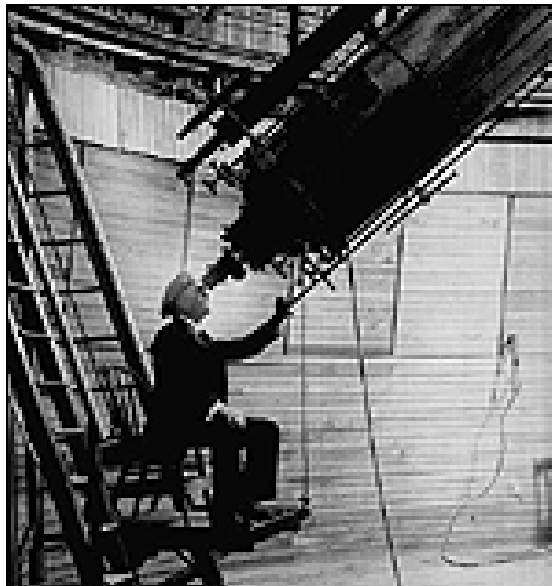
What then? Is it possible- even remotely possible- that it ends up being the fulfillment of that first youthful proclamation: “I want to be an astronomer when I grow up!” Go ahead and admit it. You've probably said it, haven't you? I did—as a 4th grader at the LeMoyne Public School. This school, located just two blocks west of our apartment was a like distance east of Wrigley Field in Chicago. So it was between Lake Michigan and second base that my proclamation found fertile soil. Mind you, this was not an evolutionary thing—it was a revolutionary flash of insight—I WANT TO BE AN ASTRONOMER WHEN I GROW UP. Final. Irrevocable. Immutable. How I eventually succeeded went something like this...

I first attacked the local public library—the Lakeview Branch to be specific. I ingested very book on astronomy that was within the grasp of my reading level. From that point forward, every book report and every extra credit assignment had a preordained topic—astronomy. I gratefully acknowledge the supportive patience of the teachers who indulged my *poor-Johnny-one-note* phase.

I prided myself on knowing the names of the Solar System's moons (there were a lot fewer back then), most of the first magnitude stars and constellations visible from our back porch (boy did I ever butcher some of those names!) and many of the galaxies and clusters in the stunning black and white photographs taken by what I was sure was the largest telescope that would ever be built—the 200" Hale reflector on Mt. Palomar.

Though surrounded by friends who wanted to be ball players, astronauts and doctors, I did not waiver, for my declaration was superior to those other silly things—though I supposed that being an astronaut was OK if you didn't have the *right stuff* to be an astronomer.

Things were proceeding nicely with my chosen calling well into the sixth grade. I was following the path of Tycho, Galileo, Kepler, Herschel and fellow-Illinoisan Clyde Tombaugh. After grade school I would attend Lane Technical High School focusing on math and science and then on to the University of Chicago. Once that was out of the way, I'd be doing this:



Yes, that'll be me at the cutting edge of astronomical research.

Then, one day, while reading a book detailing the profession of astronomy, I came across a four-letter word that so horrified and convulsed me that I was unsure how I could continue. There it was, right on the page, a hideous intrusion between dazzling photos from the Lick Observatory and a table of planetary masses. That four letter word...MATH. Not only this obscenity but, adding insult to injury, the additional blasphemy that astronomers of the day no longer spent much time at the telescope: choosing, rather, theoretical research and analysis of data provided by assistants. How was this to be endured? No telescope time AND math?

English, science, history and French were easy but math—math required me to have a paper towel at hand so that I could quickly wipe away the droplets of blood from the hematidrosis that I suffered each time I had an assignment. Oh, my—what to do?

Fast forward from the late '60s to the present. My present job involves providing healthcare consulting to employers, not aiming the Hubble Space Telescope. Yet I stated that I had achieved success in becoming an astronomer when I grew up. How? Consider...

I don't get paid for my pursuit of astronomy, but my compensation is worth its weight in gold.

I'm not the most skilled observer but my learned friends in CCAS always set me straight when I'm lost.

Over the years I have swerved from the study of the stars but each time have been brought back to the fold by the encouragement of some other astro-nut (thanks, Jim).

As far as sound, rational thought is concerned...well, 3 out of 4 ain't bad.

So, now I'm all grown up and doing what I said would be—what's next? That's easy—time to enjoy it all like a 10-year-old.

Next Time: Dragon Slayer.

P.S: I am much better at math than I was back then. Really. Vote for me!

*Your CCAS Treasurer*

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## Clouds from Top to Bottom

By Patrick L. Barry

During the summer and fall of 2006, U.S. Coast Guard planes flew over the North Pacific in search of illegal, unlicensed, and unregulated fishing boats. It was a tricky operation—in part because low clouds often block the pilots' view of anything floating on the ocean surface below.

To assist in these efforts, they got a little help from the stars.

Actually, it was a satellite—CloudSat, an experimental NASA mission to study Earth's clouds in an entirely new way. While ordinary weather satellites see only the tops of clouds, CloudSat's radar penetrates clouds from top to bottom, measuring their vertical structure and extent. By tapping into CloudSat data processed at the Naval Research Laboratory (NRL) in Monterey, CA, Coast Guard pilots were better able to contend with low-lying clouds that might have otherwise hindered their search for illegal fishing activity.

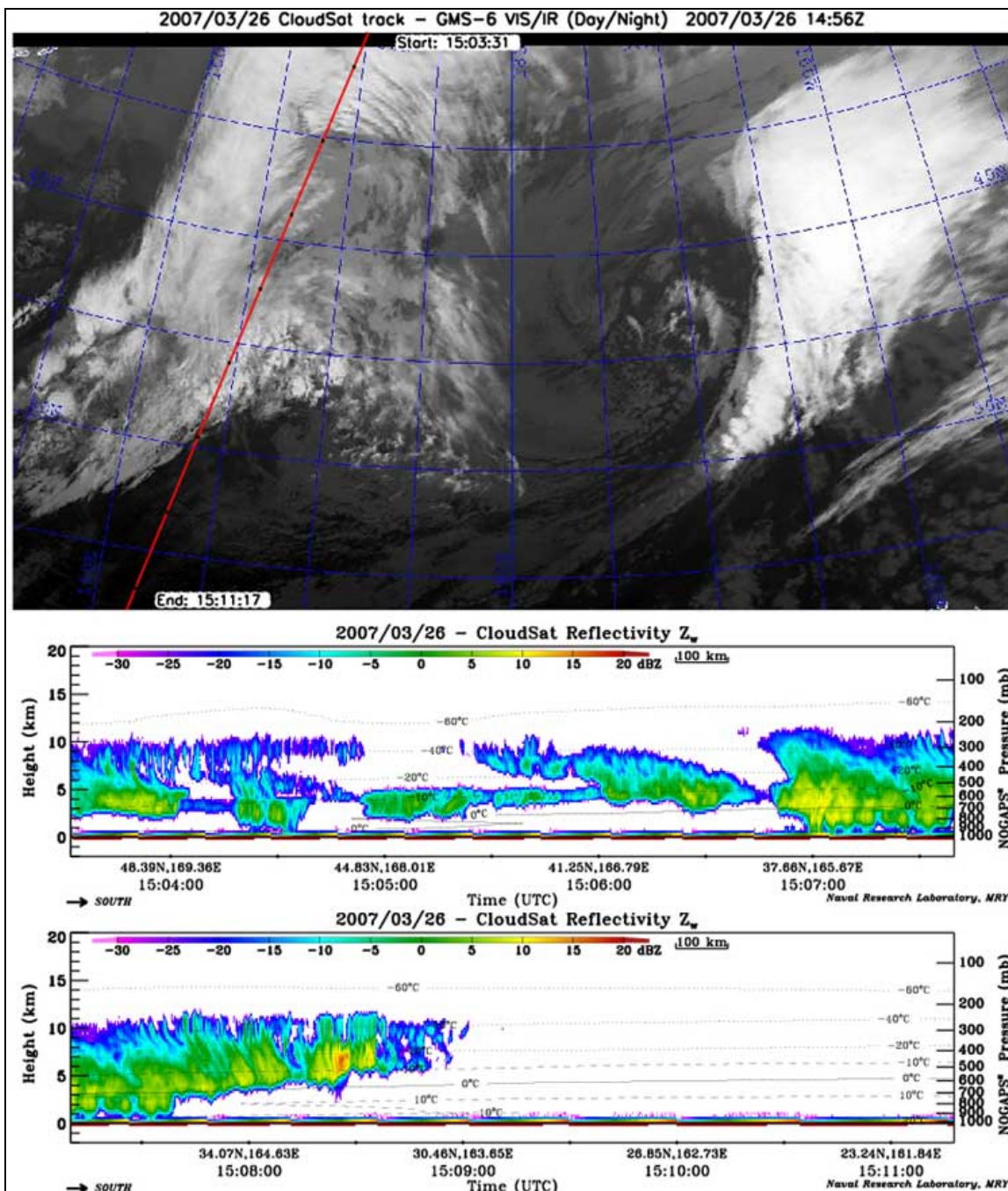
In the past, Coast Guard pilots would fly out over the ocean not knowing what visibility to expect. Now they can find out quickly. Data from research satellites usually takes days to weeks to process into a usable form, but NASA makes CloudSat's data publicly available on its QuickLook website and to users such as NRL in only a matter of hours—making the data useful for practical applications.

"Before CloudSat, there was no way to measure cloud base from space worldwide," says Deborah Vane, project manager for CloudSat at NASA's Jet Propulsion Laboratory.

CloudSat's primary purpose is to better understand the critical role that clouds play in Earth's climate. But knowledge about the structure of clouds is useful not only for scientific research, but also to operational users such as Coast Guard patrol aircraft and Navy and commercial ships at sea.

"Especially when it's dark, there's limited information about storms at sea," says Vane. "With CloudSat, we can sort out towering thunderclouds from blankets of calmer clouds. And we have the ability to distinguish between light rain and rain that is falling from severe storms." CloudSat's radar is much more sensitive to cloud structure than are the radar systems operating at airports, and from its vantage point in space, Cloudsat builds up a view of almost the entire planet, not just one local area. "That gives you weather information that you don't have in any other way."





A CloudSat ground track appears as a red line overlaid upon a GMS-6 (a Japanese weather satellite) infrared image. CloudSat is crossing the north-central Pacific Ocean on a descending orbit (from upper-right to lower-left) near a storm front. The radar data corresponding to this ground track (beginning in the center panel and continuing into the lower panel) shows a vertical cloud profile far more complex than the two-dimensional GMS-6 imagery would suggest. Thicker clouds and larger droplets are shown in yellow/red tones, while thinner clouds are shown in blue.

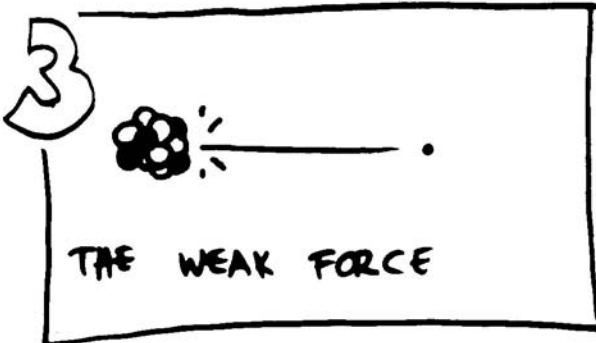
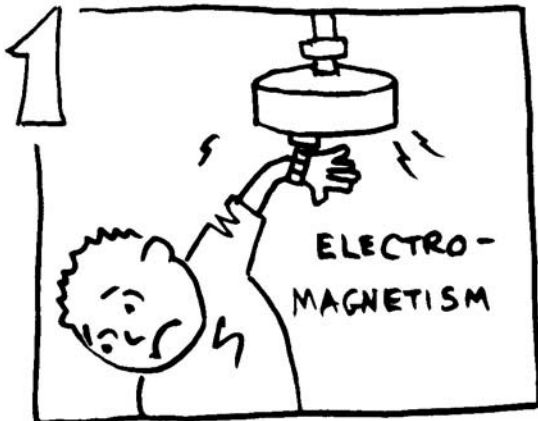
There is an archive of all data collected since the start of the mission in May 2006 on the CloudSat QuickLook website at [cloudsat.atmos.colostate.edu](http://cloudsat.atmos.colostate.edu).

And to introduce kids to the fun of observing the clouds, go to [spaceplace.nasa.gov/en/kids/cloudsat\\_puz.shtml](http://spaceplace.nasa.gov/en/kids/cloudsat_puz.shtml).

*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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# THE FIVE FUNDAMENTAL FORCES OF NATURE



LA PARA

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:

[www.POLCouncil.org](http://www.POLCouncil.org)



### Good Outdoor Lighting Website

One of the biggest problems we face in trying to reduce light pollution from poorly designed light fixtures is easy access to good ones. When you convince someone, a neighbor or even yourself, to replace bad fixtures, where do you go for good lighting fixtures? Now there is a web site and business intended to address that very problem. At this site you can find information on all kinds of well-designed (that is, star-friendly) outdoor lighting fixtures. This company, Starry Night Lights, intends to make available all star-friendly fixtures they can find, and information on them, in one place. Check it out, and pass this information on to others. Help reclaim the stars! And save energy at the same time!

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



### Local Astronomy Store: *Skies Unlimited*

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

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

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

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



### 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)



### 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:

- 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

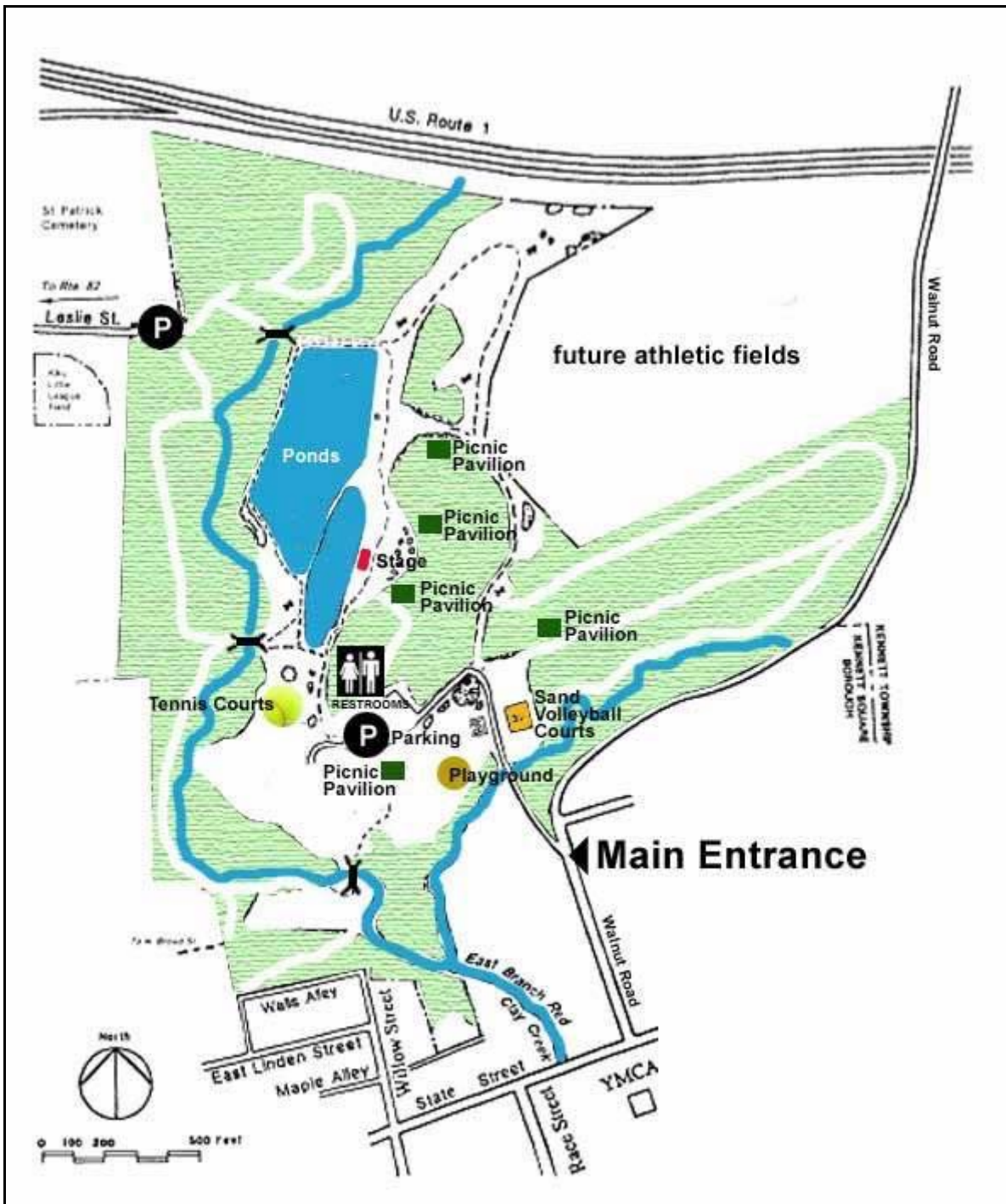
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$32.95** which is much less than the newsstand price of \$66.00, and also cheaper than individual subscriptions (\$42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society**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

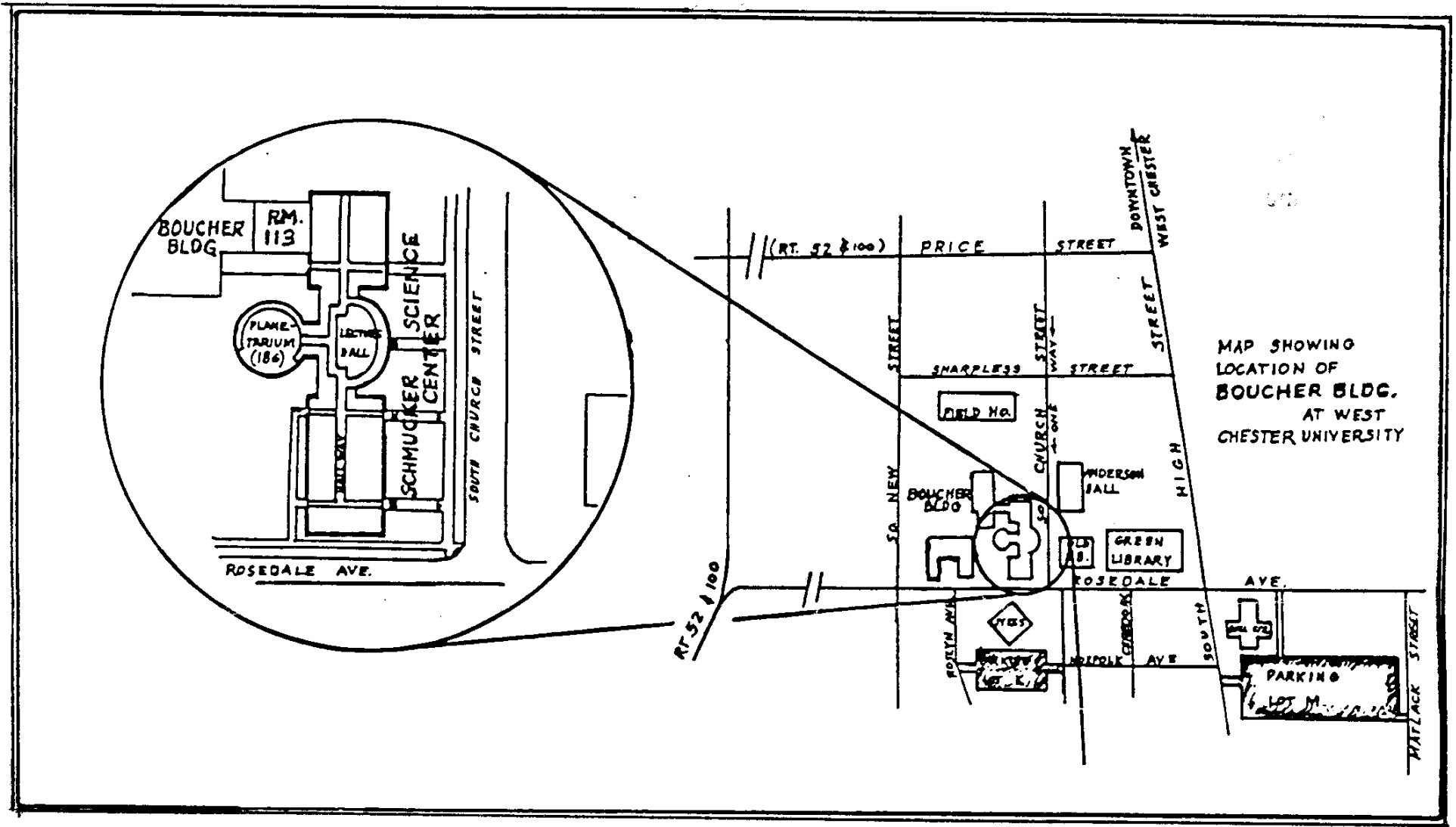
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$34.00** which is much less than the individual subscription price of \$42.95 (or \$60.00 for two years). If you want to participate in this special Society discount offer, **contact our Treasurer Bob Popovich.**

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





Map of Anson B. Nixon Park  
Kennett Square, PA



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.