Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

MAY 2006
(VOLUME 14, NO. 5)
Visit our website at www.ccas.us

In This Issue

Important May 2006 Dates

2 **Introductory Astronomy class** meets at West Goshen Township Building. Class starts at 7:00 p.m. EDT. Topic: *Beyond Naked Eye*

Hercules Observing Cluster meets **at the West Goshen Township building**.

5 First Quarter Moon.

6 **International Astronomy Day**

CCAS will have a display at the Exton Square Mall from 10:00 a.m. to 6:00 p.m. More details on page 3.

9 **CCAS Meeting** 7:30 p.m. EDT

Location: Room 113, Boucher Building, WCU
COM: Canes Venatici
Presentation: *Observation and Analysis of Suspected Variable Stars,* by Dr. Harry Augensen.

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

13 Full Moon—the Flower Moon.

16 **Introductory Astronomy class** meets at **West Chester University.** Class starts at 7:00 p.m. EDT. **Class meets in the Planetarium tonight!**

All CCAS members are welcome to attend!
See page 3 for more details.

Also: Hercules Observing Cluster is **cancelled.**

19/20 **CCAS Observing Session**
Location: Brandywine Valley Association
Time: sunset, or earlier (see page 3)

20 Last Quarter Moon.

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

27 New Moon

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

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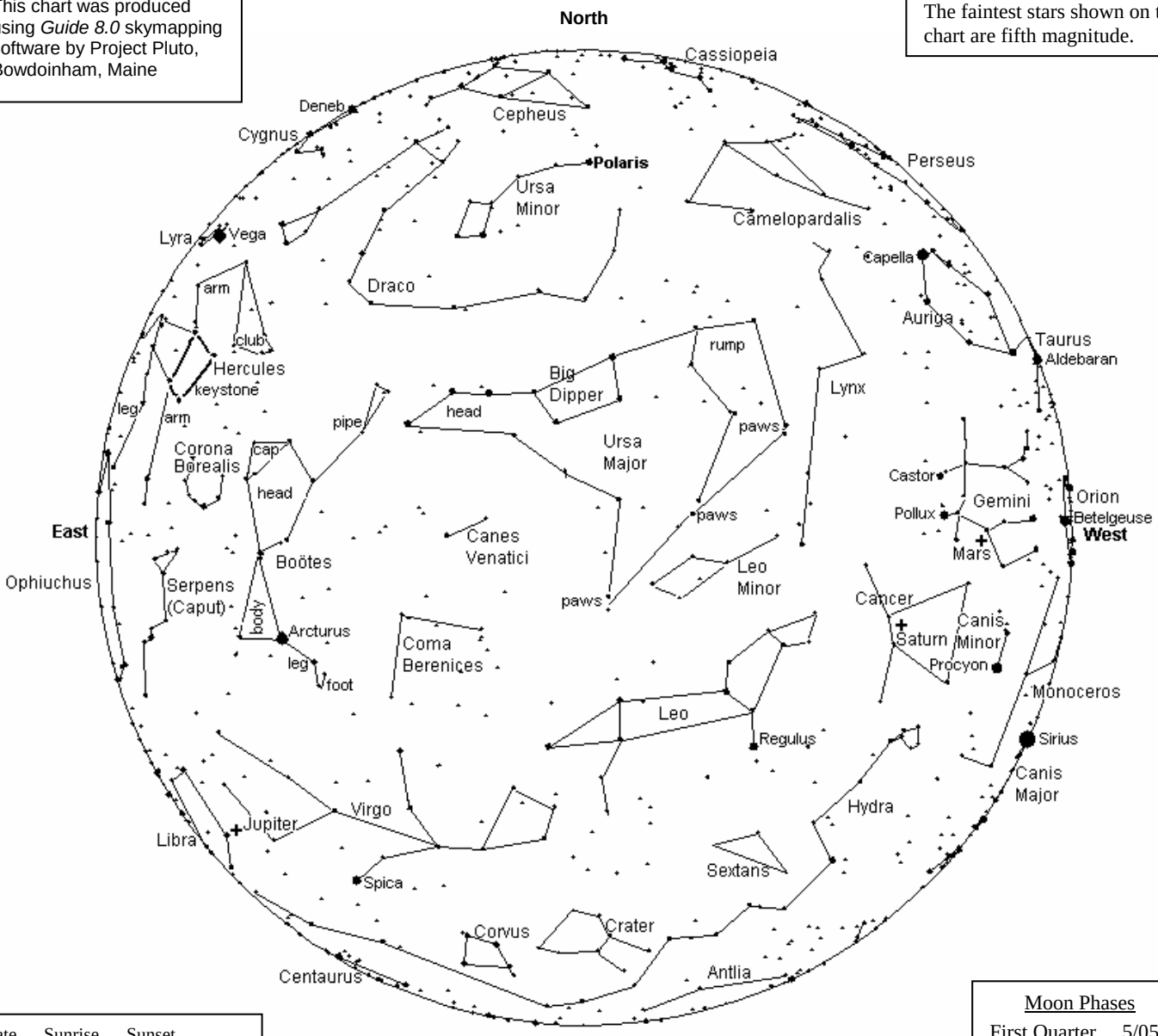
This chart was produced using *Guide 8.0* skymapping software by Project Pluto, Bowdoinham, Maine

The faintest stars shown on this chart are fifth magnitude.



Date	Sunrise	Sunset
5/1	6:03 a.m.	7:58 p.m. EDT
5/15	5:48 a.m.	8:12 p.m. EDT
5/30	5:37 a.m.	8:24 p.m. EDT

Moon Phases	
First Quarter	5/05
Full Moon	5/13
Last Quarter	5/20
New Moon	5/27

The sky over Chester County

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

The Planets, by Don Knabb

Mercury: Mercury can be observed in the evening during the last days of the month. It will be very low in the west as twilight fades.

Venus: In May Venus rises less than 2 hours before the Sun and is only visible during the morning twilight low in the east. Look for the bright "morning star" if you go out for the morning paper!

Mars: During May Mars moves from Gemini to Cancer at the end of the month and begins to get close to Saturn. It is about 20° high in the west-northwest at the end of evening twilight and sets around 11:30 pm.

Jupiter: Jupiter, currently in Libra, will be at opposition on May 4 and is visible all night. The king of the planets is a sight not to be missed. Even with small binoculars you can see the four Galilean satellites that dance around the planet. With a 4-inch or larger telescope you should be able to see dark bands on the planet.

Saturn: Along with Mars Saturn is in Cancer and sets less than 4 hours after the sun. Although Saturn's visibility is now fading it is still a wonderful sight in even the most modest telescope. Saturn continues to dance through the sky with the Beehive Cluster, M44, practically touching it at the end of the month.

Uranus & Neptune: Both gas giants are low in the southeast before dawn in May. *Sky and Telescope* magazine has charts to help you find the blue and green planets.

Pluto: Pluto is at magnitude 14 in Serpens Cauda. You'll need at least a 10-inch telescope and good charts to find it in the south after midnight.

May Observing Highlights

by Don Knabb, CCAS Observing Chair

Constellations: If you are out late enough in May the summer constellations will be rising. Boötes and Hercules are well placed for viewing by the time it is really dark, and an hour or two later the summer triangle is rising in the east. And if we have a good dark sky the Milky Way can be seen in Cygnus. Aim your telescope there and feast on the eyepiece full of stars!

May 5	First Quarter Moon.
May 6	Eta Aquarid meteor shower. This shower is mostly for Southern Hemisphere observers but we might get lucky and see some action.
May 11	Spica is 0.3° south of the Moon. Also, Jupiter crosses the night sky with the Moon as a companion.
May 13	Full Moon—the Flower Moon.
	The main fragment of periodic comet Schwassmann-Wachmann 3 is closest to Earth (0.7 a.u.)
May 14	Antares is 0.1° north of the Moon.
May 20	Last Quarter Moon.
May 21	Uranus is 1.0° north of the Moon
May 27	New Moon.
May 30	The Moon, Mars, Saturn, Castor and Pollux make a nice grouping in evening twilight.

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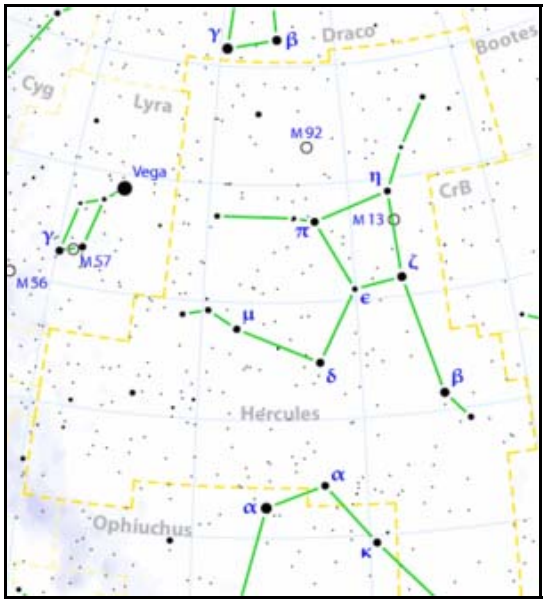
Through the Eyepiece: M13, the Great Globular Cluster in Hercules

by Don Knabb, CCAS Observing Chair

As we go from spring toward summer, we see the constellation Hercules rising in the east as late spring evenings darken. Hercules contains one of the most looked at and beautiful objects visible from the Northern Hemisphere, M13, the Great Globular Cluster. To find M13, first find “the Keystone,” an asterism in Hercules. M13 is along one side of the keystone of Hercules.



Even modest telescopes show M13 as a blazing ball of stars. With a medium sized telescope the outer edges can be resolved into its member stars.

The Great Globular Cluster was discovered by Edmond Halley in 1714. Messier, when he cataloged this object as M13 in 1764, described it as a "nebula containing no stars." It is difficult to determine the exact number of stars, especially in the central core where they are most numerous, but 30,000 stars have actually been counted and estimates are that the cluster contains something like one million stars. The total luminosity of M13 is over 300,000 times that of the Sun and the total mass is equal to perhaps half a million Suns. The brightest members of the cluster are red giants, each as bright as 2,000 Suns.

A globular cluster is a spherical collection of stars that orbits a galaxy as a satellite. They can contain anywhere from ten thousand to a million stars. These stars orbit the collective center of mass of the cluster in a veritable bee hive of motion, and the cluster itself orbits the Milky Way as a distinct object, occasionally plunging right through the main disk and out the other side. Although the cluster appears extremely dense, the distance between individual stars is actually quite large. As a result, stars within them rarely collide, and globular clusters survive relatively unscathed by their passage through the galaxy's disk.

It is interesting to contemplate what the night sky might look like if we lived on a planet revolving around a star in M13. Contrary to what seems obvious, one would not be dazzled by a sky swarming with stars. There might be a dozen or so stars much brighter than any we see and perhaps a hundred as bright as our brightest but it would still get dark out. However, as it would be lighter than our darkest skies, we just might not have a clue of the dim galaxies and nebulae that lie outside our cluster. The Milky Way would probably be about as exciting as it is from the middle of a football stadium at night here on Earth.

Globular cluster M13 was selected in 1974 as target for one of the first radio messages addressed to possible extra-terrestrial intelligent races. The message was sent by the big radio telescope of the Arecibo Observatory in Puerto Rico.

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CCAS May Meeting

DATE: **Tuesday May 9, 2006**
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 17.

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

The feature presentation will be *Observation and Analysis of Suspected Variable Stars Listed in the NSV Catalogues*, delivered by our guest Dr. Harry Augensen of Widener University. Dr. Augensen's abstract of the presentation is in the following paragraph.

Results will be reported from an extensive program of photometric monitoring, in collaboration with Dr. W.D. Heintz of Swarthmore College, of northern and near-southern declination objects taken from the *New Catalogue of Stars Suspected of Variability of Light* (Kukarkin et al. 1982) and also from the recent *New Catalogue of Stars Suspected of Variability of Light, Supplement Version 1.0* (Kazarovets et al. 1998). Most of the observations have been made through R and/or V filters using an Apogee AP-6 CCD camera mounted on the 24-inch refractor at the Sproul Observatory. Additional observations have been obtained using the 31-inch reflector of the Lowell Observatory in Flagstaff, Arizona, and, most recently, using a SBIG STL-6303 research camera mounted on the Meade 16 inch LX200GPS Cassegrain telescope at the Widener University Observatory. Over 4000 individual frames of nearly 300 stars have been taken since the program began in 1998. We find that approximately one-fifth of the stars in our program exhibit distinct variability with amplitudes greater than about 0.2 magnitude. About 40% show no variations at all. Most of the remaining stars have too few observations to make a definitive categorization at this time. The majority of the confirmed variables exhibit slow, large-amplitude variations, but a few objects apparently vary more rapidly, on a time scale of a few days. Results for several of the more interesting, well-observed objects will be discussed in some detail. In addition, a general overview of the various mechanisms for light variations in stars will be presented, and a preview of the Sun's variability in the distant future will be shown.

Variable star monitoring is one of the areas of astronomy where amateurs can also contribute observations to the scientific record, via the American Association of Variable Star Observers (website: www.aavso.org). This is an opportunity to hear the scientific interpretations of the many observations and measurements made by dedicated variable star observers, whether those observations are made by professionals like Dr. Augensen or by amateurs like us. Plus, Dr. Augensen's discussion of what makes variable stars variable, and his projections for the Sun's future, will be very interesting. Don't miss it!

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CCAS May Observing Session

The next CCAS Observing Session will be at the Brandywine Valley Association's Myrick Conservancy Center (see map on page 16) on Friday May 19, 2006 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 Saturday May 20, 2006. 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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National Astronomy Day is May 6, 2006

We have completed arrangements to have a display at the Exton Square Mall on that Saturday. We will be in the hallway in front of The Camera Shop, near the North Court. The North Court, where we usually set up, was already reserved by another group for that day. We also have permission to set up for solar observing outside the North entrance to the Mall. The Mall asks that we be in position and set up by 10:00 that morning, before the Mall officially opens. You'll have no trouble getting in the North entrance (midway between Sears and the Food Court) before 10:00. Once inside, turn right and our display area will be just a short distance down the hallway. We will not have electricity available at this location, so keep that in mind when deciding what to bring for the display. If you can't stay all day, that's OK, come for the morning or afternoon. If you can come for an hour or so around lunchtime, that's a big help: then people who are there longer can take a break to eat lunch. Another way to help is to make some extra copies of this May newsletter if you can: 5, 10, however many you can make, please do that and bring them along. We pass out copies of the current newsletter and we always run out. If you have purchased a CCAS polo shirt, this is an excellent activity for "showing the colors."

Please consider helping out with this important outreach program. If you can attend, please contact Kathy Buczynski at 610-436-0821 so we know how many members will be showing up, and at about what times. Thanks!

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Welcome!

We welcome our newest members to the Society: Robert Henderson and Family of Coatesville. We're glad you decided to join us under the stars! Clear skies to all!

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CCAS Polo Shirts Available

You can purchase a classy polo shirt with the CCAS logo embroidered on the left breast. Price is $30.00 per shirt. Adult sizes S, M, L, XL only. Contact our Treasurer Bob Popovich to purchase yours!

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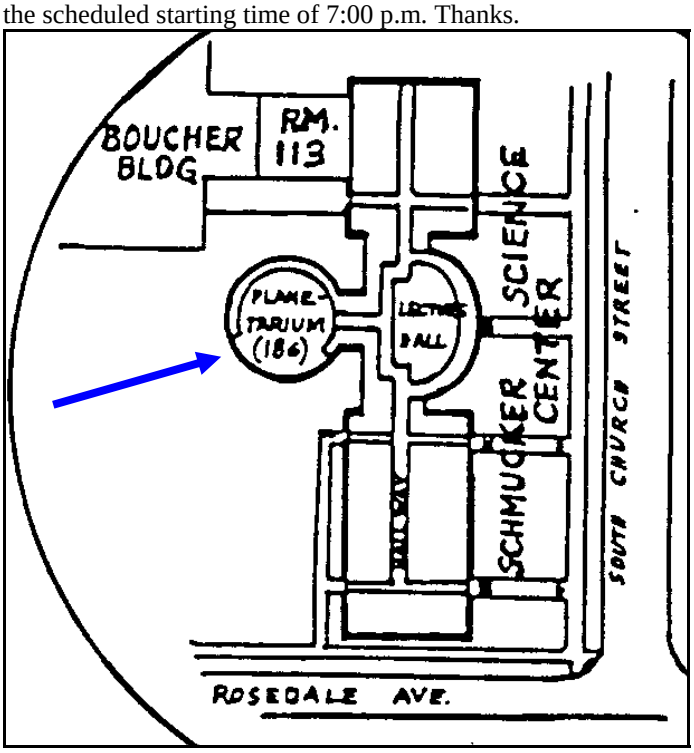
CCAS Introductory Astronomy Class

The May 16 class will meet in the Planetarium at West Chester University. The planetarium show will be given by Dr. Karen VanLandingham, professor of astronomy at WCU. The Planetarium is in the Schmucker Science Center, which is next to the Boucher Building where the other classes have been held. The excerpt below (from the overall map of West Chester University on page 17) shows the planetarium's location. Once you enter via the front door on South Church Street, look for directional signs inside the building to guide you to the planetarium. **All CCAS members are welcome to attend (free).** Please make every effort to arrive at the planetarium by the scheduled starting time of 7:00 p.m. Thanks.



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Request for a Daytime Presentation

from Kathy Buczynski

I received a call from a school that would like a presentation during the day. The Willistown Country Day School on Paoli Pike in West Chester requested a planet presentation on a Tuesday or Friday morning in late May or early June. I'm glad she requested this early because it is a daytime event.

I am looking for volunteers to attend this event. They are looking for a 45-minute presentation on the planets, and have a stage available for use. They also have a long driveway if we want to go outside. Please let me know of your availability.

Additional information:
Willistown Country Day School
365 Paoli Pike
West Chester

10:30 AM on a Tuesday or Friday

Late May or Early June

If you can help, call Kathy at 610-436-0821. Thanks.

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Treasurer's Report by Bob Popovich

March 2006 Financial Summary

Beginning Balance	$1,396
Deposits	150
Disbursements	0
Ending Balance	$1,546

Membership Renewals Due

04/2006:	Goldader
	Kerson
05/2006	Brownback
	Grillo
	Long
06/2006	Taylor

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 15 in this newsletter.

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President announces Founder's Award

by Kathy Buczynski

At the April meeting of the CCAS, President Kathy Buczynski announced the creation of the *Edwin T. Lurcott Founder's Award* for exemplary service to the Chester County Astronomical Society. This award is given in recognition of extraordinary contribution by a member through educational efforts, participation in society business, and outreach to the community or any promotion of the Society that goes over and above what would typically be expected from an individual member.

Kathy Buczynski presents Ed Lurcott with certificate.

First, at the April meeting, the award's namesake was presented with a special certificate of acknowledgement honoring his truly exceptional service to the Society and to

astronomy education. Ed's dedication and knowledge of astronomy has been instrumental in forming the society and continuing its mission of education, discussion and observation.

Second, the initial *Edwin T. Lurcott Founder's Award* was presented to Jim Anderson. Jim's exceptional service to the society consists of his duties as newsletter editor, Vice President, Program Chair, and Education Committee member. Jim is always willing to volunteer and aid the society in any way he can.

Jim Anderson receives first *Founder's Award.*

The *Founder's Award* will be presented at the discretion of the President to an individual whose service to the society is exemplary and who carries on the mission of the Society. The nominating committee will consist of Ed Lurcott and the current President. Any nominations for this award can be submitted to these individuals.

Congratulations and thank you, Ed and Jim!

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New Addition to CCAS Family

Email from Deb Goldader

My baby boy was born Easter Sunday! Lyle David Goldader was 6 pounds 11 ounces, delivered only 2 hours after hospital arrival, so he made quite a dramatic entrance into the world.

Deb and Jeff's other children are Neil and Adele.

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Moon Madness Party at Ridley Creek Park

Email from Robert Fellwock

Ridley Creek State Park in Delaware County has invited our club (in addition to other local astronomy clubs like the DVAA) to supply telescopes for a public star party on **Saturday, May 13th, 2006**. The hours would be from 7:30 p.m. to midnight. A covered pavilion and lavatory facilities are available. Ample parking too. No electrical hookups are available.

The site within the park is a large open area with horizons about 20-35 degrees above the "true" horizon. With moonrise at 9:03 p.m. that night, some time will be available to observe other objects until the Moon clears the tree line.

Since this date is a Full Moon, the emphasis will be for that object (in the event stars are not too visible).

A Full Moon cloud/rain date has been set for June 10, 2006.

Please contact me if you think you could help out and for further information. Thank you,

Robert Fellwock

610-356-1697 (evenings)

roalfe@comcast.net

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CCAS Trip to U.S. Naval Observatory

The CCAS is again making plans for a trip to Washington D.C. 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 must reserve in advance and they will confirm via e-mail or phone, no later than the Friday prior to requested date.

We will have to send them 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 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 Tuesday evening. The price depends on how many of us go (you will not have to commit to the trip until we can give you a final cost). **If you are interested in going, please contact Linda Lurcott Fragale at 610 269-1737.**

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Report on WCASD Star Party

Text by Don Knabb
Photos by Kathy Buczynski

On Thursday March 30 the Chester County Astronomical Society hosted a "star party" for approximately 20 students from Kathy Massey's eighth grade class, from the West Chester Area School District. Astronomy is part of the eighth grade course of studies and Kathy likes to mix practical observing with classroom study, so she asked the CCAS to set up some telescopes at East Goshen Community Park.

The field of visions in the night.

There was a great showing by club members and we had five or six telescopes to share with the students and their parents. In addition the sky was often crisscrossed by green laser

pointers as club members star hopped around the sky to point out the numerous constellations visible that night.

There were "oohhs and aahhhs" to be heard over the field whenever someone saw Saturn for the first time. And the bright stars Betelgeuse and Sirius got a lot of attention, as did the Great Orion Nebula. We also zoomed into the nice open clusters in Auriga. Later in the evening we were just able to pick out M81 and M82 in Ursa Major.

WCASD students Ruth Forese and Jenn Golda pose with the Society's six-inch lending telescope.

It was a fun night that was appreciated by Kathy Massey and all the students and parents in attendance!

Kathy Massey (left) stops by to thank CCAS members Don Knabb and Ed Lurcott for their help with the star party.

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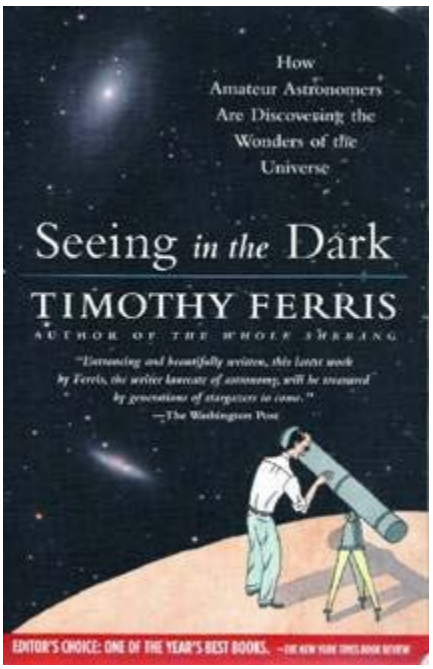
Book Review: *Seeing in the Dark*

by Timothy Ferris 2002, New York, N.Y.: Simon & Schuster

Review by Don Knabb

I recently finished reading this book and thoroughly recommend it to anyone interested in astronomy. It might not show in the scan I made of the cover, but the words in the top right of the cover are "How Amateur Astronomers Are Discovering the Wonders of the Universe." That sums up one aspect of the book that I enjoyed, which is that Tim Ferris relates numerous times where amateurs are contributing to the advancement of astronomy. But that's just one aspect of the book. It's a nice blend of history, personal reflections and hard science.



I like to read books, but the reality is that I don't often take the time to sit down for an hour or two for several days and finish a book in a reasonable time frame. I tend to read more in half hour increments in the evening, and I carry a book with me if I know I'll have some idle time waiting for an appointment. This book is ideal if you are this kind of reader. The chapters are relatively short, and each can be read as a stand alone essay about a specific topic, such as the Moon, Vermin of the Skies (asteroids and comets) or Galaxies. About 300 pages of the book are the text and the appendices include some reference tables and an extensive glossary.

There were many points in the book where I was hit with that wonderful moment of insight—the light bulb was at least briefly lit—as Tim Ferris put some concept into a new light of understanding for me. Here's one of my favorite of those moments, from the Galaxies chapter where Tim Ferris uses the size of galaxies to provide a sense of scale for the Universe: "Needless to say, they're really big. Were the Sun a grain of sand, Earth's orbit would be an inch in radius, the solar system the size of a beach ball, and the nearest star another sand grain four miles away. Yet even on that absurdly compressed scale, the Milky Way galaxy would be a hundred thousand miles wide. Galaxies are so big that once you get up to their scale, the universe starts to take on an almost country-cottage intimacy. The larger galaxies in clusters like the Local Group, to which Andromeda and the Milky Way belong, typically lie only a couple of dozen galactic diameters apart from one another—comparable to dinner plates at the ends of a twenty-foot-long dining table. Add in the galaxies' halos of stars, globular clusters, associated hydrogen clouds, and dark outer disks, and they almost impinge on each other. On the same scale, the Virgo supercluster, of which the Local Group

is an outlying member, comprises ten thousand plates scattered across an area not much larger than a football stadium, and the entire observable universe has a radius of only about twenty miles. From a galaxy's point of view, the universe isn't all that large."

So if you are looking for some fun summer reading I think you will enjoy this book. Now just picture yourself reading this book at the beach, the sun warming you as the waves ripple onto the sand…

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Calendar Notes

May 2, 2006 (Tuesday)	Introductory Astronomy class Location: West Goshen Twp. Building 7:00 p.m. EDT
May 6, 2006 (Saturday)	**International Astronomy Day CCAS at Exton Square Mall**
May 9, 2006 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
May 13, 2006 (Saturday)	Moon Madness Party Location: Ridley Creek State Park 7:30 p.m. to midnight EDT
May 16, 2006 (Tuesday)	Introductory Astronomy class Location: West Chester University 7:00 p.m. EDT
May 19/20, 2006 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset

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June 22-26, 2006: Cherry Springs Star Party

The annual Cherry Springs Star Party, at Cherry Springs State Park, in Potter County, PA, will be held on June 22-26, 2006. Cherry Springs State Park is Pennsylvania's premier dark site for astronomical viewing, and is the state's first official Dark-Sky State Park (meaning that strict controls are enforced on light pollution). Several members of the CCAS (Ed and Linda Lurcott, Steve Limeburner, and Pete LaFrance are four) have been to star parties at Cherry Springs and can attest to the superior observing conditions there.

If you would like to go, you can get more information at the website, and even register online:

http://www.cherrysprings.org/

You can also contact Robert Werkman, a member of the organizing committee, who lives in Hershey:

Robert F. Werkman, MD

telephone: 717-533-2224

email: rwerkman@giacp.com

The Cherry Springs Star Party is organized through the Astronomical Society of Harrisburg via a long term agreement with the Department for Conservation of Natural Resources (DCNR) of the Commonwealth of Pennsylvania.

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June 21 - 24: Green Bank Star Quest III

Combining Optical and Radio Astronomy at One Event!

This event is held June 21st-24th, 2006 under the dark skies of West Virginia for the 3rd annual Green Bank Star Quest at the National Radio Astronomy Observatory in Green Bank, WV. By day, check out all the NRAO has to offer, like the new multi-million dollar Visitors Center, and free tours of the facilities, including the 100 meter GBT which is the world's largest fully steerable radio telescope. Star Quest will have 4 days of lectures, imaging classes, vendors, raffles, kids activities, keynote talk by Seth Shostak of the SETI Institute, and nighttime optical observing on over six acres of camp sites at the low price of $ 75.00 for a party of two or $ 100.00 for a family.

For more information contact Joe Gonzalez at (304) 626-5012 or visit our web site at:

http://www.greenbankstarquest.org

Register before 5/31/2006 to receive a 10% discount off your total registration fees: just write Web Deal on the registration form!

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August 25-27, 2006: Black Forest Star Party

This annual star party is also held at Cherry Springs State Park in Potter County PA. You can read about Cherry Springs State Park in the note above. You can find out more about the details, as well as register online, for the Black Forest Star Party at the website:

http://www.bfsp.org/starparty/index.cfm

The Black Forest Star Party is organized through the Central Pennsylvania Observers, Inc. (a group of amateur astronomy clubs) via a long term agreement with the DCNR of the Commonwealth of Pennsylvania.

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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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"On Assignment"

By Bob Popovich

Not that's it ever come up in the course of an Astronomy Day conversation, but both Betsy and I are of Serbian ancestry. In fact, Betsy lived the first 5 years of her life in Belgrade. And it was to that city that we, teenage sons in tow, ventured last month. While Betsy spent time lining up relatives to see and childhood haunts to revisit, my assignment (assigned by me) was to search for any available astro-tourist sights.

My first lead was generated by placing a call to a dear friend of ours in Chicago whose nephew, Dr. Milan (pronounced Mee-lon) Chirkovich, just happens to be a Professor of Astronomy in Serbia. He's also a member of the staff of the Belgrade Astronomical Observatory! In late March I sent him an email requesting an interview and tour. There was no response. Did the email go through? Was he away? Or was he just an absent-minded professor? I'd have to seek him out personally. We departed for Belgrade on Wednesday April 5.

Arriving in Belgrade at noon the next day, we were whisked away by an entourage of relatives all of whom wanted to do two things: (1) to talk to us and (2) to serve us prodigious quantities of food and drink. The conversation was wonderful and, not wanting to refuse our gracious kin, we accepted the local fare including (but not limited to) multi-course meals for lunch and brandy at 10 AM. Oh, and coffee. Strong Turkish coffee. Lots and lots of it. We couldn't be rude to our hosts, could we?

In between feedings, we did manage to get in some sightseeing, including a splendid walk through Kalemegdan Fortress—an imposing structure perched on high ground at the confluence of the Sava and Danube Rivers. Beneath the ramparts were to be found millennia of history: Neolithic, Celtic and Roman ruins. And above, open skies in all directions. Approaching the northeast tower of the fortress, I saw a sign designating it as a public viewing sight of the Belgrade Astronomical Observatory!

The observing tower of the Kalemegdan Fortress

Wending our way up the narrow spiral staircase we came upon a small office where, in the doorway, stood Dr. Chirkovich! I had planned on calling him while in Belgrade, but this good fortune? Some things are just destined to be…

"Milan!" Betsy exclaimed. We exchanged greetings with Milan who then proceeded to explain to us that this site not only contained an observing deck on top of the tower, but a small planetarium in the basement as well. Apparently, public outreach was a major thrust of the observatory's mission. Hmm, what a coincidence…

Two days later Betsy and I made our way to the outskirts of town, ascending Observatory Hill (!) to #7 Volga Street. We were greeted there by Milan who introduced us to the observatory's director who, we were told, is one of the few living people with an asteroid named in his honor. I told him about CCAS and that our members would be interested in reading about the history and work of the Belgrade Observatory (at least I hope you are…)

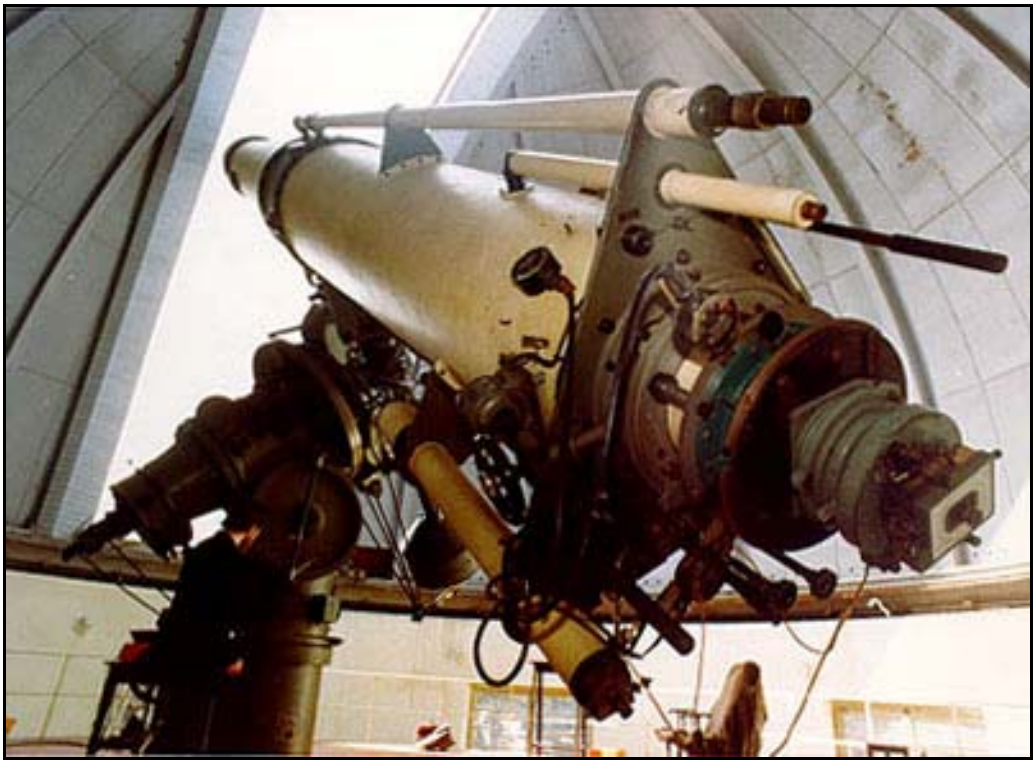
Our tour began in the library, an inviting room containing journals from all over the world (did you know that Kazakhstan publishes an astronomical bulletin?) as well as a number of historical volumes.

The Observatory Library
The desk in the foreground was stacked with journals from the world over

Sitting pretty much in the center of the Balkan Peninsula, the Belgrade Astronomical Observatory was founded in 1887 and is the largest observatory in southeastern Europe, having as its centerpiece a 650 mm (25.6") refractor built by the venerable manufactory of Carl Zeiss. You no doubt find the name Zeiss familiar to this day as a producer of high quality optical equipment including planetarium projectors. The large refractor, coupled with a movable floor, reminded me very much of Yerkes.

Milan explained to us that during the years of communist rule the observatory received literally no funding for the astronomers were not enthusiastic party members. So the staff kept the place together as best they could. With the regime change, funds have started to flow and the staff is now enthusiastically in the midst of working on upgrades to equipment and a general face-lift. You could sense the positive outlook that they shared about the facility's future. Much the same as many old observatories near urban areas, they now focus their efforts on studying double stars, asteroids and comets, the planets and theoretical work.

The art-deco entrance to the main dome.



The big Zeiss refractor inside the dome.

The drizzly day didn't impede our tour of the peaceful grounds that included separate buildings for a smaller refractor, a reflector, a spectrograph, an astrograph and a transit instrument.

My assignment concluded over a leisurely cup of Turkish coffee and a discussion, in Serbian, about aspects of the Grand Unifying Theory (Theory of Everything). I thanked him for his hospitality and he encouraged me to send him a story about CCAS for inclusion in the magazine *Astronomiya* of which he is an editor. So, it looks like we now have a pen pal in the Balkans.

My assignment complete, I realized it was probably time to eat and drink again. So off we went. It wasn't high tech or cutting edge, but it was inspirational to see people engaged in the wholehearted pursuit of astronomy. I hope to return here again soon.

Next Time: Seeing Red.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

NASA Space Place

Who Wants to be a Daredevil?

By Patrick L. Berry and Dr. Tony Phillips

When exploring space, NASA naturally wants to use all the newest and coolest technologies—artificial intelligence, solar sails, onboard supercomputers, exotic materials.

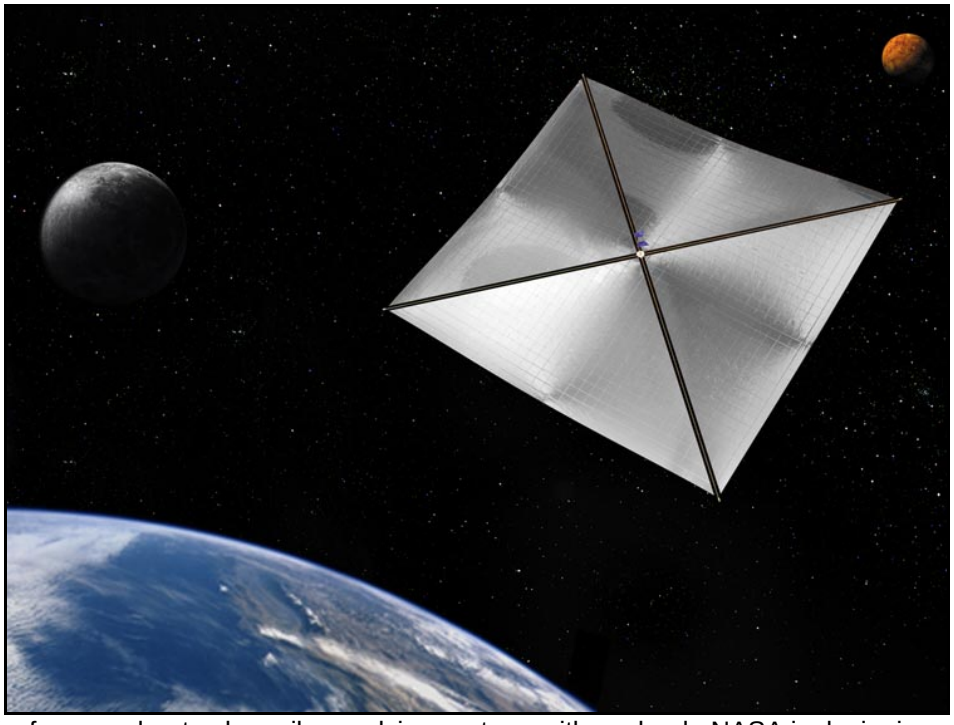
But "new" also means unproven and risky, and that could be a problem. Remember HAL in the movie *2001: A Space Odyssey*? The rebellious computer clearly needed some pre-flight testing.

Testing advanced technologies in space is the mission of the New Millennium Program (NMP), created by NASA's Science Mission Directorate in 1995 and run by JPL. Like the daredevil test pilots of the 1950s who would fly the latest jet technology, NMP flies new technologies in space to see if they're ready for prime time. That way, future missions can use the technologies with much less risk.

Example: In 1999, the program's *Deep Space 1* probe tested a system called "AutoNav," short for Autonomous Navigation. AutoNav used artificial intelligence to steer the spacecraft without human intervention. It worked so well that elements of AutoNav were installed on a real mission, *Deep Impact*, which famously blasted a crater in Comet Tempel 1 on July 4, 2005. Without AutoNav, the projectile would have completely missed the comet.

Some NMP technologies "allow us to do things that we literally could not do before," says Jack Stocky, Chief Technologist for NMP. Dozens of innovative technologies tested by NMP will lead to satellites and space probes that are smaller, lighter, more capable and even cheaper than those of today.

Another example: An NMP test mission called Space Technology 9, which is still in the planning phase, may test-fly a solar sail. Solar sails use the slight pressure of sunlight itself, instead of heavy fuels, to propel a spacecraft. Two proposed NASA missions would be possible only with dependable solar sails—L1 Diamond and Solar Polar Imager—both of which would use solar sails to fly spacecraft that would study the Sun.



Artist's rendering of a four-quadrant solar sail propulsion system, with payload. NASA is designing and developing such concepts, a sub-scale model of which may be tested on a future NMP mission.

"The technologies that we validate have future missions that need them," Stocky says. "We try to target [missions] that are about 15 to 20 years out."

A menagerie of other cool NMP technologies include ion thrusters, hyperspectral imagers, and miniaturized electronics for spacecraft navigation and control. NMP focuses on technologies that have been proven in the laboratory but must be tested in the extreme cold, vacuum, and high radiation environment of space, which can't be fully recreated in the lab.

New NMP missions fly every one and one-half to two years, taking tomorrow's space technology for a daredevil test drive.

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

★ ★ ★ ★ ★ ★ ★ ★

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 Glenmoore to be specific. Their phone number is (610) 321-9881, and their Website URL is www.skiesunlimited.net.

Directions: Go north on PA-100, four miles past the Downingtown interchange of the PA Turnpike; then turn left onto PA-401, then immediately turn left again into Ludwig's Village. The new store is next to Ludwig's Village Market.

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. 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!"

★ ★ ★ ★ ★ ★ ★ ★

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 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 610-363-0811
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

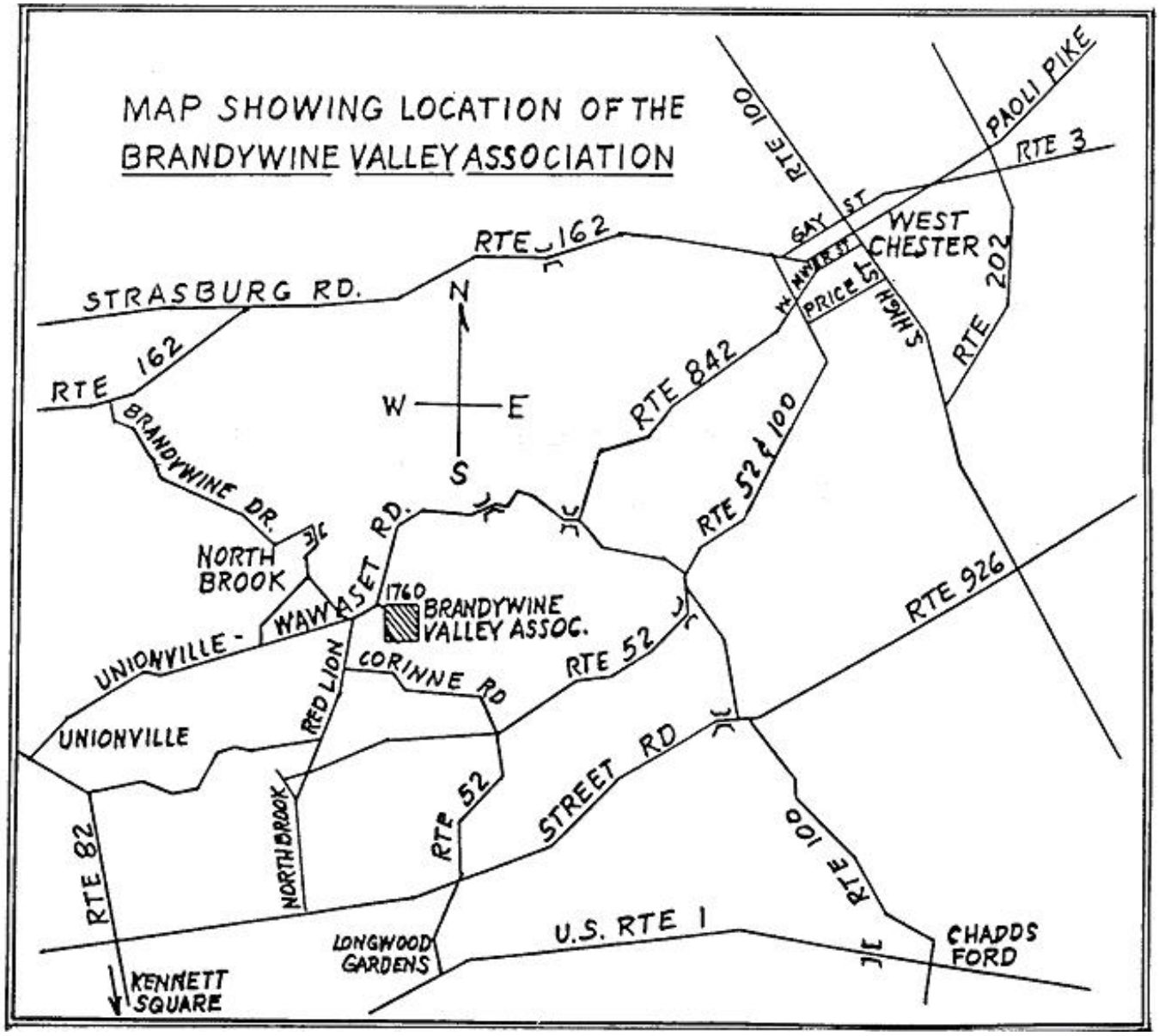
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95** which is much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society**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

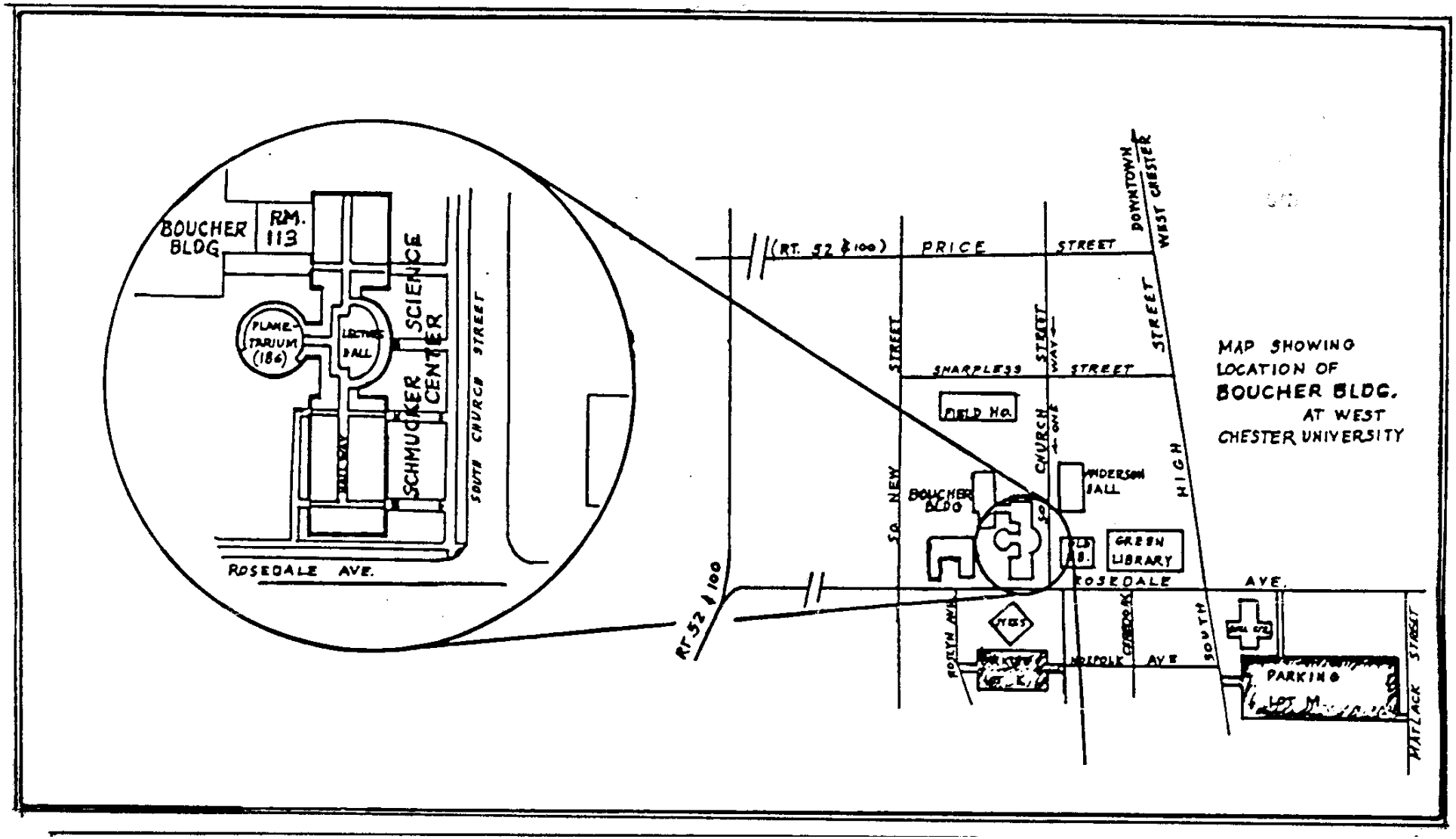
John Hepler is the Society's Webmaster. You can check our Website at:

http://www.ccas.us/

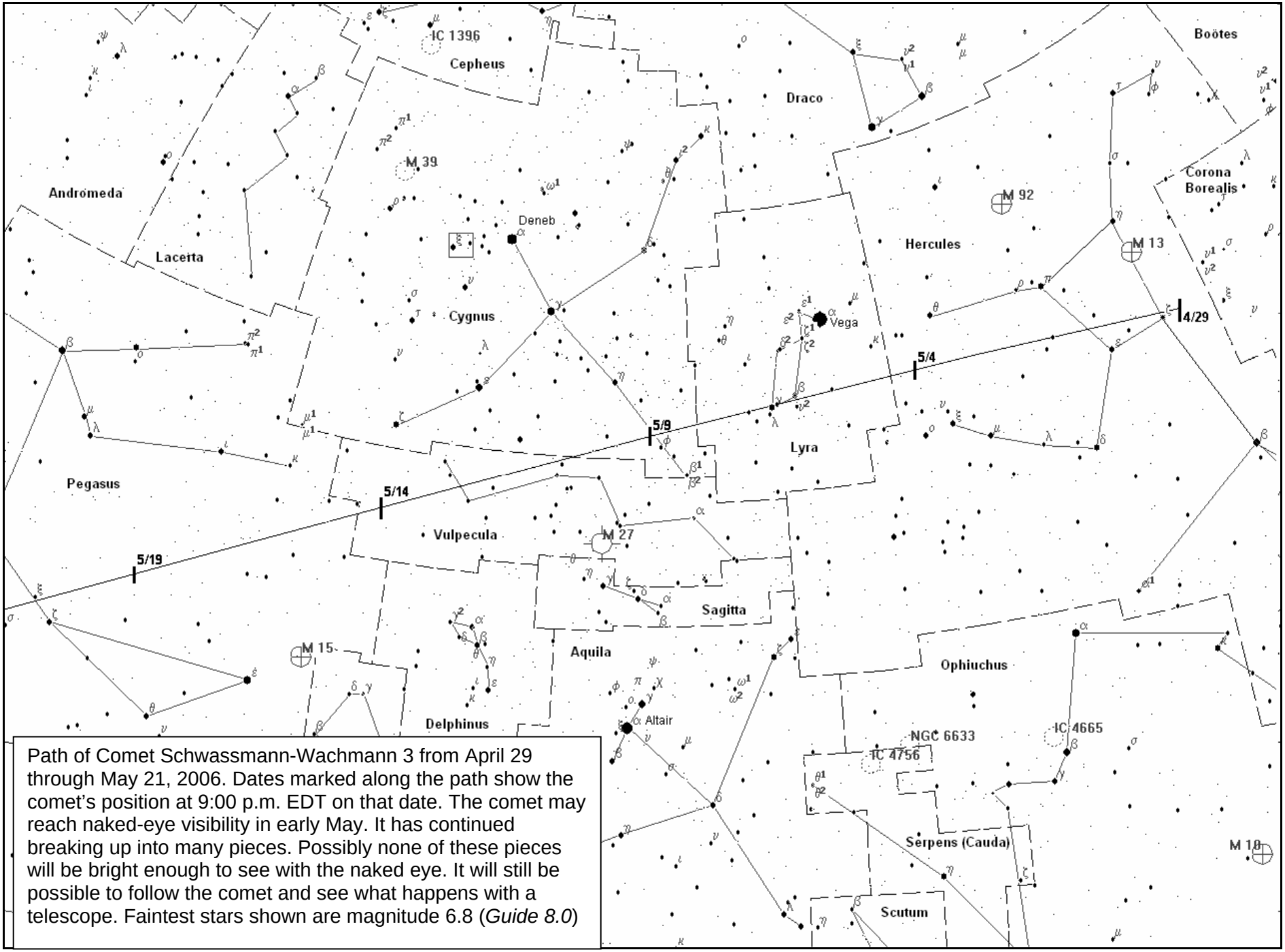
John welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work; no copying copyrighted material! Give your contributions to John Hepler (610-363-0811) or 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.



Path of Comet Schwassmann-Wachmann 3 from April 29 through May 21, 2006. Dates marked along the path show the comet's position at 9:00 p.m. EDT on that date. The comet may reach naked-eye visibility in early May. It has continued breaking up into many pieces. Possibly none of these pieces will be bright enough to see with the naked eye. It will still be possible to follow the comet and see what happens with a telescope. Faintest stars shown are magnitude 6.8 (*Guide 8.0*)