Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

AUGUST 2005
(VOLUME 13, NO. 8)
Visit our website at www.ccas.us

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Important August 2005 Dates

2 Hercules Observing Cluster meets.

4 New Moon

6 **Starfest at Warwick County Park** (see page 14). CCAS members invited to bring telescopes.

7 Neptune reaches opposition tonight.

9 Hercules Observing Cluster meets.

12/13 **Perseid Meteor Shower** peaks in the early morning hours of August 12.

Also: CCAS Observing session & meeting at Myrick Conservation Center (BVA) starts at sunset. Map with directions is on page 17.

Also: First Quarter Moon on August 12

16 Hercules Observing Cluster meets.

19 Full Moon

23 Hercules Observing Cluster meets.

24 Mercury reaches greatest elongation from the Sun in our morning sky, rising about 90 minutes before the Sun (Mercury rises at about 4:50 a.m. EDT)

26 Last Quarter Moon.

30 Hercules Observing Cluster meets.

31 On the morning of the 31st, Saturn rises 3 hours before the Sun. On that morning with binoculars or a finderscope, you will be able to see M44, the Beehive Cluster, about 2° below and to the left of Saturn.

Also: Uranus reaches opposition tonight.

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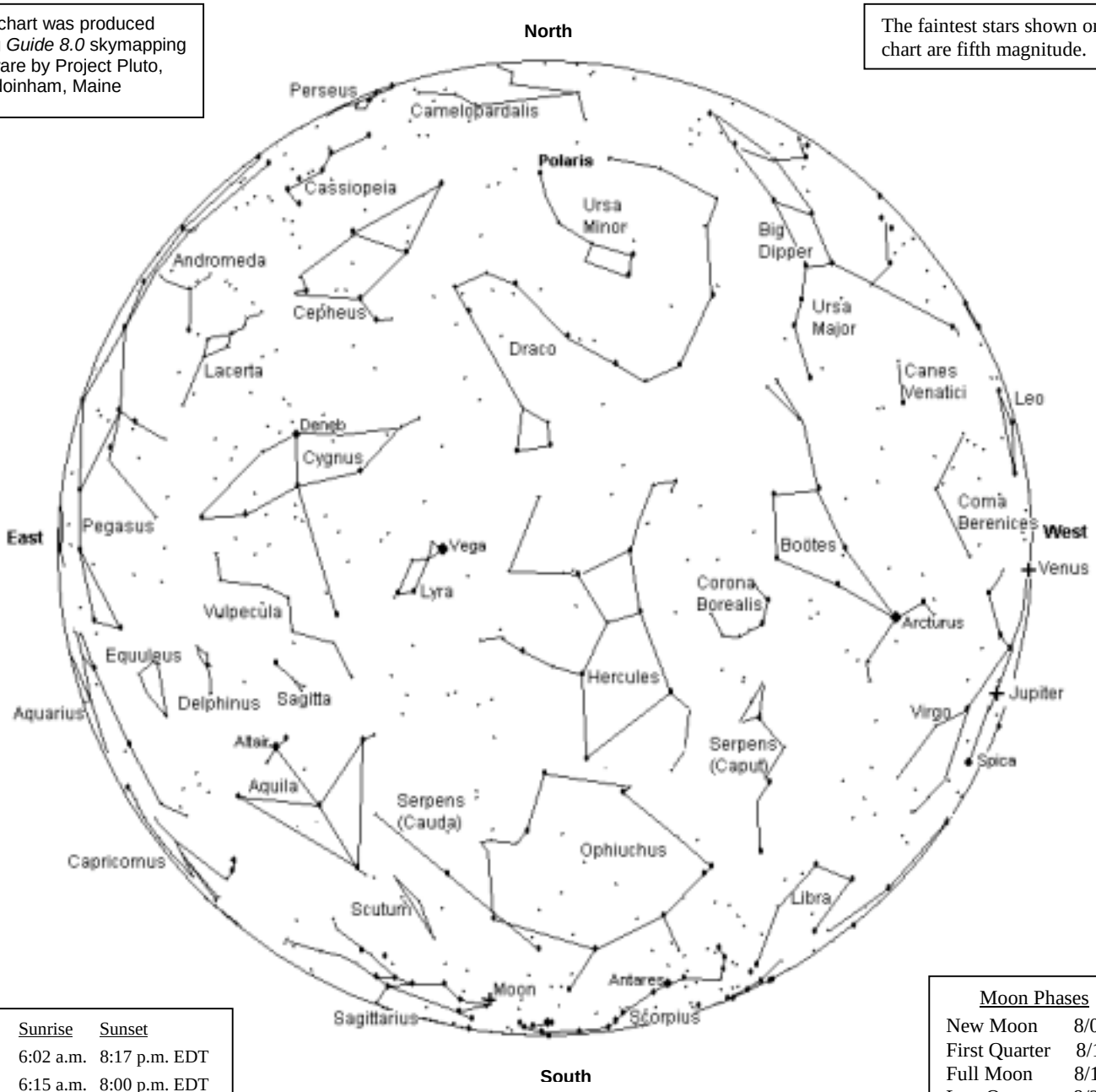
This chart was produced using *Guide 8.0* skymapping software by Project Pluto, Bowdoinham, Maine

The faintest stars shown on this chart are fifth magnitude.



Date	Sunrise	Sunset
8/1	6:02 a.m.	8:17 p.m. EDT
8/15	6:15 a.m.	8:00 p.m. EDT
8/30	6:29 a.m.	7:38 p.m. EDT

Moon Phases	
New Moon	8/04
First Quarter	8/12
Full Moon	8/19
Last Quarter	8/26

The sky over Chester County
August 15, 2005 at 9:00 p.m. EDT

The Planets

Mercury is in the morning sky in the second half of August.

Venus is in the evening sky all month, setting about 90 minutes after the Sun. How soon after sunset can you pick out Venus?

Mars is in the morning sky, high in the south at sunrise. It's getting noticeably brighter now as it moves closer to Earth.

Jupiter is in the evening sky this month, moving closer to Venus as the month progresses. By August 31, the two brightest planets will be only about 1.5° apart!

Saturn is in the morning sky in August.

Uranus is visible all night, and is best placed for observation about 1:00 a.m. EDT.

Neptune is visible all night, and is best placed for observation about 1:00 a.m. EDT.

Pluto is in our evening sky if you want to find it. It takes at least an 8" to 10" telescope to find Pluto, dark skies, good charts, and lots of patience to find Pluto.

Perseid Meteor Shower: peaks in the early morning hours of August 12, with many meteors visible on the two evenings both before and after August 12.

Large Complex sunspot group on Sun: **for week of Aug. 1-7**, good chance of flares and CMEs, and resulting **auroral storms**!

CCAS August Observing Session & Meeting

The next CCAS Observing Session will be at the Brandywine Valley Association's Myrick Conservancy Center (see map on page 10) on Friday August 12, 2005 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 August 13, 2005. 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.

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Treasurer's Report by Bob Popovich

June 2005 Financial Summary

Beginning Balance	$1,604
Deposits	83
Disbursements	318
Ending Balance	$1,369

Membership Renewals Due

08/2005	Knabb
	Fragale
09/2005	Bogucki
	Furman
	Lurcott
10/2005	Anderson
	Freeburg
	Fusco
	Hillenbrand
	Hogate
	Jain
	Padgett
	Smith
	Stoltzfus

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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 a later page in this newsletter.

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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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Help Wanted (and Needed)

Your Executive Committee is looking for help in promoting the Society to the community. In the past, opportunities have just slipped by because we didn't have a person handling the situation. It will probably require about 10 hours/month, but you will set the limit. This position includes such tasks as making phone calls, writing and distributing (email, snail mail and faxing) flyers for special events, contacting newspapers, and maintaining contact lists for such flyers.

The Executive Committee has several ideas to get you started; you will decide which ones you feel best promote the CCAS.

This position, which we are calling the PR Chair, will be a part of the Executive Committee. If you feel that you'd like to help promote astronomy to the community through the CCAS, we'd like to hear from you. Contact Kathy at president@ccas.us or 610-436-0821.

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CCAS Trip to U.S. Naval Observatory

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

The Naval Observatory is open for tours on Monday evenings (except national holidays) 8:30 to 10pm. We will tour the Observatory and be able to observe (weather permitting). We can reserve a date for up to twenty people. We're considering December 5th and/or 12th. We must reserve 4-6 weeks in advance (around 10/1) and they will confirm via e-mail or phone, no later than the Friday prior to requested date. If we find that more than twenty members can commit to the trip, we could request both 12/5 and 12/12. We will have to send them a list of 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 grounds.

We would go to the National Air and Space Museum on Sunday, possibly staying overnight and spending all day Monday in Washington as well. If you are interested in going, please contact Linda Fragale at 610 269-1737 so we can determine if we need to reserve one date or two dates. 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). Thanks.

About the Naval Observatory:

The U.S. Naval Observatory is one of the oldest scientific agencies in the country. Established in 1830 as the Depot of Charts and Instruments, its primary mission was to care for the U.S. Navy's chronometers, charts and other navigational equipment. Today, the U.S.N.O. is the preeminent authority in the areas of Precise Time and Astrometry, and distributes Earth Orientation parameters and other Astronomical Data required for accurate navigation and fundamental astronomy.

The U.S.N.O. performs an essential scientific role for the United States, the Navy, and the Department of Defense. Its mission includes determining the positions and motions of the Earth, Sun, Moon, planets, stars and other celestial objects; providing astronomical data; determining precise time; measuring the Earth's rotation; and maintaining the Master Clock for the United States. Observatory astronomers formulate the theories and conduct the relevant research necessary to improve these mission goals. This astronomical and timing data, essential for

accurate navigation and the support of communications on Earth and in Space, is vital to the Navy and Department of Defense. It is also used extensively by other agencies of the government and the public at large.

The U.S.N.O. 26-inch refracting telescope is located on the grounds of the Observatory and is included as part of the Monday night tour when skies are cloudy.

This telescope has a rich history. Completed in 1873 at a cost of $50,000, it was the largest refracting telescope in the world for a decade. The lens and mounting were made by the renowned firm of Alvan Clark & Sons of Cambridgeport, MA, and the great telescope was erected on the grounds of the old Naval Observatory site in the Foggy Bottom section of Washington.

It was from this site, in August of 1877, that astronomer Asaph Hall discovered the two moons of Mars, Phobos and Deimos, with the "Great Equatorial Telescope," bringing the attention of the world to the U.S.N.O.

The move to the Observatory's present site in 1893 allowed the 26-inch lens to be re-mounted in a new dome with a new mounting designed by the Warner & Swasey Company of Cleveland, OH. This design incorporated a rising floor to facilitate access to the eyepiece. This floor is still the largest elevator in the city!

Today, the telescope is used on every clear night to measure the parameters of double stars. Over the years, visual observations by astronomers using micrometers have been replaced by electronic imaging techniques. By taking very short exposures with a Charge-Coupled Device (CCD) camera, astronomers can actually use the blurring effect of Earth's atmosphere to their advantage to measure the separations and position angles of double star components. The technique, known as "speckle interferometry," is ideally suited to the 125 year-old optics of the great telescope, and relatively unaffected by the urban location of the Observatory. Several thousand stars are measured annually, and the database of such observations, added to the visual observations dating back over a century, provide for one of the most concise double star catalogs in the world.

The telescope is also used to measure the positions of the moons of the outer planets to help refine their orbital parameters. These data are vital in planning missions to such distant worlds.

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New Planet in our Solar System!

A team of astronomers announced on July 29 their discovery of a large body of rock and ice, estimated to be bigger than Pluto. The new planet orbits our Sun in 560 years, and is currently nine billion miles from the Sun, about three times Pluto's current distance from the Sun. Its temporary name is 2003 UB313. The new planet's elliptical orbit brings it as close as 3.3 billion miles to the Sun (Pluto's orbit ranges from 2.7 billion miles to 4.6 billion miles out). The orbital plane of the new planet is inclined by 44° to the plane of the ecliptic, which may help explain why it wasn't found before.

The body was first discovered on January 8, 2005 at Palomar Observatory in California. Checking images they had taken earlier, the team found they had imaged the body several times back as far as 2003 using the Observatory's 48-inch telescope.

The team members are: Michael E. Brown (California Institute of Technology), Chadwick A. Trujillo (Gemini Observatory in Hawaii), David L. Rabinowitz (Yale University). This is the same team that last year discovered Sedna, another large Kuiper Belt object beyond Pluto that is smaller than Pluto. That discovery raised the question of "what is the proper definition of a planet?", but that debate faded away because Sedna was smaller than Pluto. Now the debate may be rekindled by 2003 UB313.

The team has recommended a name for the body to the International Astronomical Union, the official arbiter of astronomical names. Until the IAU announces its decision on a name, the team will not disclose their recommendation.

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Mars in August???

An email message has been bouncing around the Internet during the last several months. It says that Mars will be the closest to Earth that it has ever been in all of recorded human history in August.

The data listed in the message is correct for August **2003**, but the message does not list the year anywhere in the text! This has led many people to ask me if it's true, thinking that the message means August 2005. How this message got started around the Internet I don't know, but if you receive it don't pass it on. If anyone asks you, tell them that it is an old message from August 2003. Tell them that Mars will be very close again this year in October and November, but not quite as close as it was in 2003. This year's apparition will be the best time to look at Mars between now and 2018. The other apparitions between then and now will occur with Mars farther away from Earth than it will be this year.

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Area Near Copernicus Crater on the Moon

by Victor Long

Taken last month from West Chester using my 5-inch Orion Mak and Creative webcam. I used Registax to register and process nine frames with a little touch-up in Photoshop.

Pete LaFrance's Backyard Observatory

(Part 3 of a series)

By Jim Anderson

Part 1 of this series appeared in the October 2000 issue of Observations; it covered the construction of the dome. Part 2 was in the March 2001 Observations; it described the weathertight covering of the dome and the sliding door that covers the observing slot in the dome.

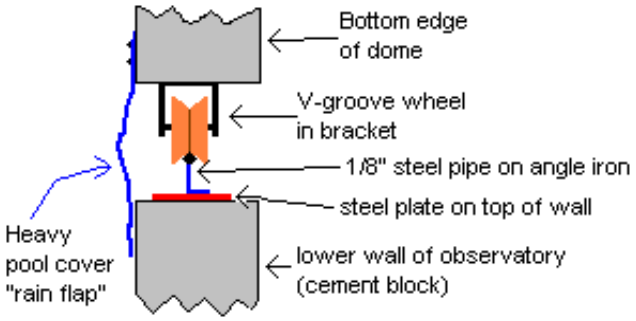
Recently I visited the home of CCAS member Pete LaFrance to see his backyard observatory, now that it is finished. Pete designed the observatory himself, and developed the methods of construction (sometimes through repeated trial and error). Pete is very pleased with the finished observatory (the family calls it "Dad's King Dome," as in it's his "kingdom" where you don't disturb him when he's observing).

Pete's observatory.

The base the observatory sits on is poured concrete, deep enough to resist frost heaving. Pete traded work with some friends of his who do concrete work so that the foundation would be done correctly. The electrical, phone, and computer network lines are all buried underground. In the photo above, you can make out the conduit and junction box low on the right side of the base wall where the wiring enters the observatory.

The base wall is cement block construction; it is ten feet in diameter and five feet high. The outside of the wall is covered with white vinyl siding, which makes the wall more watertight. It also reduces heat buildup by reflecting a large part of the Sun's energy.

The dome rides atop the wall on six V-groove wheels, each of which can carry 500 pounds of weight. These wheels are attached to the bottom of the dome, but are attached slightly loose so they can "float" a bit on the track to allow for minor deviations from a true circle in the track. They ride atop a track made of one-eighth inch diameter black water pipe tack-welded to angle iron, which in turn is tack-welded to a steel plate that runs around the top of the wall. Pete used a heavy-duty swimming pool cover, cut into wide strips, to make a flexible "rain flap" that he attached to the bottom of the dome. It hangs down over the gap between the dome and the wall to keep the weather out.



Cross-section schematic drawing of wall and dome with bearing wheel (drawing is not to scale)

Pete folding up the rain flap so we can see one of the six bearing wheels.

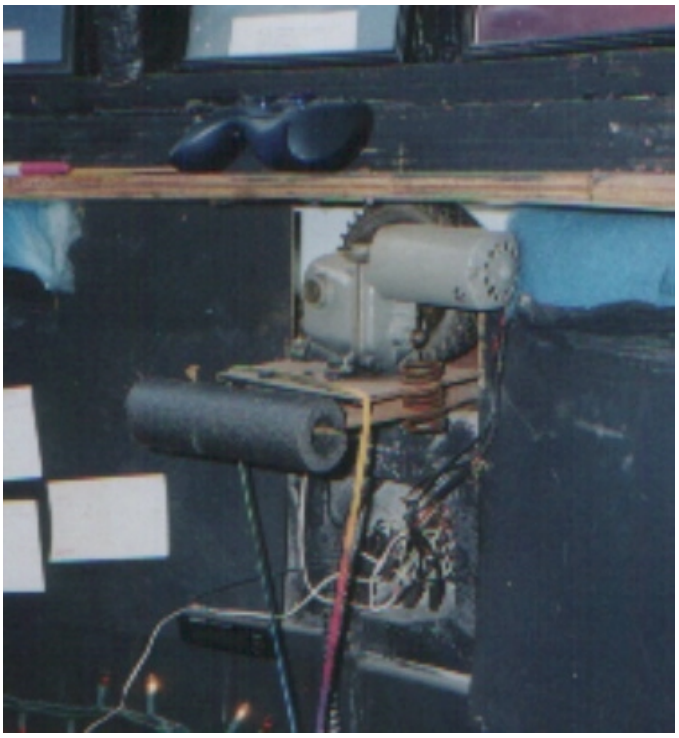
Pete also used some of the swimming pool cover to add a flexible weather strip along the outside of the door guide rails for the dome's observing slot cover door.

The observing slit in the dome (note the angle bracket at the bottom of the slit that serves as a doorstop for the cover).

Here you can see the end of the cover for the observing slit hanging down on the other side of the dome, opposite the observing slot. You can also see the light rope used to pull the cover into the "open" position. There is another cord on the other end to pull it closed; the slot cover is not motorized.

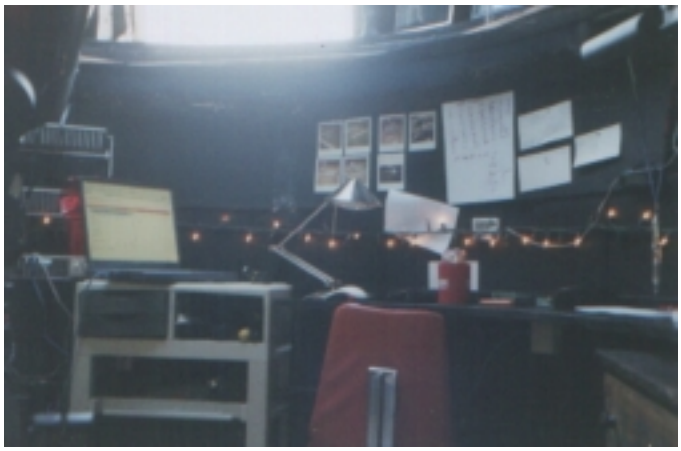
Behind Pete and his beloved Celestron CGE-11, inside the observatory, you can see the R4 insulation (as used on air-conditioning ducts) that Pete used to keep the dome from sweating on the inside. The inside walls were painted flat black to minimize stray light reflections.

The final tough problem was devising a means to rotate the dome. It is too heavy to move manually. Pete devised a mechanism using a cast-off electric motor that drives a rubber wheel from a lawn mower. There is a galvanized steel strip on the bottom of the dome. The rubber wheel presses up against this smooth hard surface. The motor and wheel assembly is attached to a multi-part mount that incorporates several heavy springs, and is attached to the lower wall of the observatory. The ingenious combination of springs and other parts allows the motor assembly to "float" so it does not bind or make the dome move up or down. As Pete notes, and as you can see from the photo below, it may look like a "Rube Goldberg" invention, but it works very well!



Inside the observatory, to mount the telescope, a concrete pier goes three feet down into the ground to form a very solid anchor. This pier is separated from the floor slab, and the separation is filled with blue foam board: this prevents vibrations from people walking on the floor being transmitted to the telescope. Such vibrations can ruin CCD images being taken with the telescope. The pier that rises from the floor is made of four-inch diameter steel pipe, attached to the concrete pier with a simple pipe flange bolted to the concrete. Then the pipe was filled with concrete to increase mass and stability. A malleable pipe coupling is attached to the top of the steel pipe, and the equatorial drive head of the CGE-11 fits snugly onto this coupling.

Then Pete strung two strings of miniature Christmas lights around the inside of the lower wall: one string has all white bulbs, and the other string has all red bulbs. A "desk" shelf runs along part of the inside wall, and there are shelves for equipment and the small PC used to operate the drive and CCD camera. A computer network line runs to a bigger PC with image processing software in the house, so that "raw" images can be copied from the observatory PC to the inside PC for later image processing (in greater comfort).



Shelves for equipment, a desk shelf, miniature light strings, and a chair complete the outfitting of the observatory interior.

Now that the observatory is all done, what would Pete do differently if he did it over again? When he started the observatory, he designed it to hold his venerable Celestron C-8. The observatory was too far along in construction to change when Pete got the bigger CGE-11. The bigger telescope made the inside more cramped than anticipated. When pointing to the northern skies, for example, the operator can get pinned against the desk if he's not careful. This could be fixed by making the observatory twelve feet in diameter rather than ten feet, or by offsetting the location of the pier from the center of the building. Pete would have also made the observing slot wider, if he had known he would be getting the bigger telescope. Pete notes that for the dome he would have used chicken wire covered with fiberglass, rather than sheet metal covered with fiberglass: that would have made for easier construction. One other correction Pete would make is a lower bottom wall, so the telescope could point closer to the horizon: presently he can't image M6 or M7 in Scorpius because the wall is too high.

Even with those minor problems, Pete is as happy as can be with his observatory. He never has to worry about the optics dewing over. He can continue imaging even if it's windy, because the dome protects the telescope from the wind. The dome also blocks lights from the neighbors' properties. Pete can now regularly image galaxies he never thought he would be able to see from around here. All this in relatively comfortable surroundings, music playing, drinks handy. Pete concludes, "This is astronomy as I always dreamed it could be, right at home. I may never travel to dark-sky sites again!"

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Calendar Notes

August 2, 2005 (Tuesday)	Hercules Observing Cluster meets
August 9, 2005 (Tuesday)	Hercules Observing Cluster meets
August 12/13, 2005 (Friday/Saturday)	CCAS Observing Session & Meeting Location: BVA sunset
August 12-13, 2005	AlconExpo 2005 A.L. National Convention Location: Kansas City, MO Website: www.astroleague.org
August 16, 2005 (Tuesday)	Hercules Observing Cluster meets
August 23, 2005 (Tuesday)	Hercules Observing Cluster meets
August 30, 2005 (Tuesday)	Hercules Observing Cluster meets
Sept. 9-11, 2005	Black Forest Star Party Location: Cherry Springs State Park in Potter County, PA
Sept. 29 – Oct. 2, 2005	Delmarva No-Frills Star Party Location: Tuckahoe State Park, MD website: www.delmarvastargazers.org/archives/nofrills2005/index.html
September 6, 2005 (Tuesday)	Hercules Observing Cluster meets
September 13, 2005 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
September 13, 2005 (Tuesday)	Hercules Observing Cluster meets
September 20, 2005 (Tuesday)	Hercules Observing Cluster meets
September 23/24, 2005 (Friday/Saturday)	CCAS Observing Session & Meeting Location: BVA sunset
September 27, 2005 (Tuesday)	Hercules Observing Cluster meets
October 4, 2005 (Tuesday)	Hercules Observing Cluster meets
October 11, 2005 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
October 11, 2005 (Tuesday)	Hercules Observing Cluster meets
October 18, 2005 (Tuesday)	Hercules Observing Cluster meets
October 21/22, 2005 (Friday/Saturday)	CCAS Observing Session & Meeting Location: BVA sunset
October 25, 2005 (Tuesday)	Hercules Observing Cluster meets
November 8, 2005 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
November 25/26, 2005 (Friday/Saturday)	CCAS Observing Session & Meeting Location: BVA sunset
December 9/10, 2005 (Friday/Saturday)	CCAS Observing Session & Meeting Location: BVA sunset (moongazing night)
December 13, 2005 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST

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Newest Weather Sentry Takes Up Watch

By Patrick L. Barry

Today, we've become accustomed to seeing images of the Earth's swirling atmosphere from space every night on the evening news.

Before 1960, no one had ever seen such images.

The first-ever weather satellite was launched that year, kicking off a long line of weather satellites that have kept a continuous watch on our planet's fickle atmosphere—45 years and counting! The high-quality, extended weather forecasts that these satellites make possible have become an indispensable part of our modern society, helping commercial aircraft, recreational boaters, and even military operations avoid unnecessary risk from hazardous weather.

But satellites don't last forever. Parts wear out, radiation takes its toll, and atmospheric drag slowly pulls the satellite out of orbit. Many weather satellites have a design life of only 2 years, though often they can last 5 or 10 years, or more. A steady schedule of new satellite launches is needed to keep the weather report on the news each night.

In May 2005, NASA successfully launched the latest in this long line of weather satellites. Dubbed NOAA-N at launch and renamed NOAA-18 once it reached orbit, this satellite will take over for the older satellite NOAA-16, which was launched in September 2000.

[Editor's Note: NOAA stands for National Oceanic and Atmospheric Administration, the Federal agency that is the parent of the National Weather Service.]

NOAA-18, the newest in a long line of weather and environmental satellites, launched May 20, 2005.

"NOAA always keeps at least two satellites in low-Earth orbit, circling the poles 14 times each day," explains Wilfred E. Mazur, Polar Satellite Acquisition Manager, NOAA/NESDIS. "As Earth rotates, these satellites end up covering Earth's entire surface each day. In fact, with two satellites in orbit, NOAA covers each spot on the Earth four times each day, twice during the day and twice at night," Mazur says.

By orbiting close to Earth (NOAA-18 is only 870 km above the ground), these "low-Earth orbit" satellites provide a detailed view of the weather. The other type of weather satellite, "geosynchronous," orbits much farther out at 35,786 km. At that altitude, geosynchronous satellites can keep a constant watch on whole continents, but without the kind of detail that NOAA-18 can provide.

In particular, low-Earth orbiting satellites have the ability to use microwave radiometers to measure temperature and moisture in the atmosphere—two key measurements used for weather prediction that, for technical reasons, cannot be sensed by distant geosynchronous satellites.

With NOAA-18 successfully placed in orbit, the 45-year legacy of high-tech weather forecasts that we're accustomed to will go on.

Find out more about NOAA-18 and the history of polar-orbiting weather satellites at

http://goespoes.gsfc.nasa.gov/poes.

For kids and anyone else curious about the concept, the difference between polar and geosynchronous orbits is explained at

http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.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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Black Forest Star Party: September 9-11, 2005

The Annual Black Forest Star Party, hosted by the Central Pennsylvania Observers, is being held at Cherry Springs State Park in Potter County in northern Pennsylvania on the weekend of September 9 through 11, 2005. Cherry Springs is Pennsylvania's first official Dark-Sky Park. Seeing at this site is, to put it mildly, superb: probably the best astronomical seeing anywhere in the northeastern United States. Previous BFSP attendees from the CCAS have included Pete LaFrance, Ed Lurcott, and Steve Limeburner. More details, including registration information, can be found at the website www.bfsp.org . As of May 30, there were 234 slots still open for this star party. All registrations must be made in advance for the BFSP; they will not accept any "on-site" registrations. Steve Limeburner can provide information about motels in the area if you don't want to camp on-site.

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What's in a name? Beginners Enjoy the Advanced Observer Program at Kitt Peak

by Deborah Goldader

Telescopes and eyepieces in our household have given way to cribs and highchairs in recent years. When was the last time I read an issue of *Sky & Telescope* cover to cover? I can't remember, but I can sure fill you in on the latest tips about "What makes a toddler tick" according to *Parenting*. Yet for a fleeting moment last month, I indulged in an astronomical paradise.

As a high school physics teacher, I covertly sneak astronomy into my lessons now and then. A few week's discussion of gravity, for example, can pretty easily meander into the development of Kepler's Third law and orbits ("hey, kids, ever seen Jupiter's moons through a telescope?"). Projectile motion and escape velocity calculations inevitably lead to discussions of black holes ("let's take a look at a few double star systems—sometimes the companions are unseen!"). This summer, though, I had the opportunity to present—wholesale and unashamed—astronomy in its most basic form to eight high school students through a summer program. We started with a week in Pennsylvania, meeting for classes in the afternoon, observing on a few evenings (sometime I'll write a piece for you describing our experience at a local dark site, Camp Onas). This astro boot camp was all for the purpose of preparing them to observe from Arizona.

We touched down in scorching Phoenix on Monday, July 27 and drove straight to Tucson. Our first night of observing wasn't all that it could have been. Though I had sent our telescope power supply ahead by UPS ground, our Tucson contact was, well, out of contact. That was ok—we just plugged the scope into one of the rented mini-vans (although the prospect of sucking the car battery dry in the middle of the desert did rattle me). My students didn't quite understand the concept that they should rest in the afternoon for an all night observing jaunt, either. Instead, they walked about 3 miles in the heat of the day in search of a Radio Shack to buy an adapter to plug their DVD player into the room TV! Our dinner that night ran late, so by the time we were exiting yummy Guillermo's, sunset's splendor was already being upstaged by the spectacular sight of Mercury and Venus in conjunction with Saturn nearby. We all passed the binoculars around the parking lot to see it and then piled into the vans for a half hour jaunt southeast of Tucson to our chosen site—a site used by the Tucson astronomy club off of Sahuarita Road.

The site is up a short dirt "road" (hardly recognizable as a road in the dark) which rises steeply. As I crested the top of the hill, I swear I felt I was driving off the edge of the Earth into a bath of stars—it was that dark out there. My students were so busy looking up as they got out of the vans that one stepped into a giant hill of fire ants—this made for difficult equipment setup and a rather jumpy evening under the stars ("hey—HEY—something's crawling on my neck—aaaaaacckk! Oh—it's just the binocular strap…"). The sky was crystal clear and the seeing was stable—barely a breeze and the temperature had cooled off pleasantly. Tucson was visible to the northwest, and some faint sky glow from Phoenix could be seen in the distance. Since Tucson has a strict light pollution ordinance, this wasn't too bad. Even in the early evening, Andromeda and other things just rising to the north were very easy to see naked eye. Naked eye targets were popping out all over—the Coma cluster and the Virgo Cluster were easy "averted vision" eyecatchers. Binocular views were spectacular. The Milky Way and galactic center to the southeast were delectable—Lagoon Nebula, M6, M7—wowee!! We set up our Meade ETX, but couldn't get it polar aligned and pointing properly. After fighting with it for hours, we finally gave up, concluding that it probably just wasn't level. So, we "surfed" the sky for a while and lingered on some familiar targets like M57 (it sure looks different out there!) and Albirieo.

On our second night, I split the group in two: half would remain in Tucson (returning to Sahuarita Road) and the other half would travel to the summit of Kitt Peak for the night to participate in the Advanced Observer Program. Through this program, anyone can buy time on either the 20-inch or 16-inch telescopes (or both, as we did), equipped with a variety of instruments and eyepieces. As I drove to the summit I had butterflies in my stomach. Previous trips to Kitt Peak had been work—either my observing runs or someone else's. But this time, I was going for fun and I would actually be able to use an eyepiece to look through a telescope. Night fell, and the experience did not disappoint!

To kick things off, we snatched looks at Saturn, Venus and Mercury (still close together) at sunset. Our host, Adam Block, reviewed our target list with us during dusk as the regular visitor's program used the telescopes (a terrific option for those who either don't want to spend the entire night at the summit or who do not want to run the telescope themselves). Once we were given the green light, we set up the 20-inch telescope with its SBIG CCD to image one of the several interacting systems I'm interested in. Since we were doing long exposures (six of them, 10 minutes each), we were able to leave the telescope doing its thing while we walked over to the 16-inch scope. This one wasn't quite so easy to set up. Somehow, it had gotten out of collimation. Once we got that right, we couldn't get it pointing or tracking well enough to do imaging. After about an hour had passed, one of my students pointed out that this telescope happened to be another Meade (!). Upon this realization, and on the recommendation of Adam, we decided to abandon imaging on this scope, and just take a look around. This was a fabulous decision! The telescope also had a 3.5-inch Televue piggybacked to it (used as a finder) so we were able to look at wide-field targets as well as highly-magnified, hard to resolve objects. The AOP spared no expense acquiring eyepieces; the 9-mm Nagler on the 16-inch was amazing! Even though we were fighting a gusty wind, our seeing was just about 1.2 arcseconds that night. I can't remember everything we looked at, but I'll try to give you some highlights. Most striking were the nebulous objects, especially the Lagoon. I had never seen that through a telescope before. It reminded me of the way that M42 looked through the FCO 28.5-inch on some clear winter nights—practically three-dimensional. We looked at several globular clusters—some of the familiar ones (M13, M15) but others I can't remember in the southern sky. They were so highly resolved—even at high airmasses! Open clusters like M6 and M7 were fantastic through the Televue. By the time the night was over, we had looked through a telescope at every planet with the exception of Pluto (ok…and Earth!). Meanwhile, we could control most of what the 20-

inch was doing from the 16-inch dome (although we did walk back now and then). At times, Adam took us outside and used his laser pointer to show everyone binocular targets. A highlight for the kids was watching for an Iridium flare near dawn. The great part of using both telescopes simultaneously is that we have the benefit of take-home, printable CCD "souvenirs" plus the memories of an unparalleled evening under the stars.

Adam was patient with both groups of my students, showing them how to reduce the images once acquired (using a combination of Maxim DL, Mira and Photoshop) and even his N-body code for cluster simulations. I got the sense he was having a good time, too; if he wasn't, then it was a convincing act! He even ordered clear weather for us both nights. That kind of skill must come in handy. Unfortunately, I got an altitude migraine around 10:30 on the night my second group came to the summit, so I couldn't enjoy sky-surfing with them. Adam got to have all the fun. When I heard the kids enter the dorm laughing at dawn—only to grab their cameras and run out the door again for another hour—I knew that they just had the same kind of addicting, magical experience I had the night before.

Postcards from Tucson

M17
Omega or Swan Nebula
(NGC 6618)
Emission nebula and
star cluster (a stellar nursery)
located in Sagittarius
about 6800 light years away

NGC 6365
Two interacting spiral galaxies
located in Draco
about 360 million light years away
(Principal Galaxy Catalog, PGC)

NGC 6621/6622
Two interacting galaxies
located in Draco
about 280 million light years away
(Principal Galaxy Catalog, PGC)

NGC 7253
Two interacting spiral galaxies
located in Pegasus
about 200 million light years away
(Principal Galaxy Catalog, PGC)

Arp 314
Peculiar galaxy(ies)
located in Aquarius
(could locate any distance data)

For more information about the Kitt Peak Advanced Observing Program, go to http://www.noao.edu/outreach/aop/

If you are a high school student interested in participating in the Summer Science Institute in Observational Astronomy at Friends' Central School in 2006, please contact Deborah Goldader, 610-645-5107.

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Astronomus

"**Prettier** Than a Picture"

By Bob Popovich

Toting around telescopes, tripods and the like (in the dark, no less) is an activity that surely causes some outside our club to pause and think "Why?" Yet aside from us amateur astronomer types there are others for whom the heavens are full of beauty and promise. Nowhere was this more evident than at the recently concluded INSAP (Inspirations of Astronomical Phenomena) Conference held at Chicago's Adler Planetarium and Astronomy Museum.

Sitting at the end of a jetty into Lake Michigan, Copernicus keeps watch over Adler's main entrance. Downtown Chicago is seen in the background.

As part of the celebration marking its 75th year (the Western hemisphere's first planetarium), the INSAP Conference brought together astronomers, academicians, artists and the general public for a weeklong program of lectures, film screenings, special exhibitions of astronomical antiquities and works of art commissioned specifically for INSAP. So much was brought together that events were staged at all hours and even at sites apart from Adler itself. Diversity and detail—all beautifully presented—made it an astro-event *par excellence*.

In this, the first of a two-part story, I would like to focus on our inaugural event wherein Betsy and I were pleased to meet and chat with Anna Herlihy, a doctoral candidate, author, and Assistant Curator of Adler's unmatched collection of astronomical antiquities.

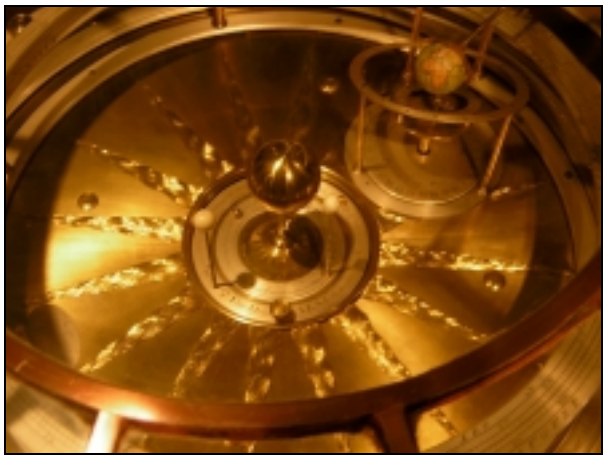
An art historian, Ana is a graduate of the Art Institute of Chicago. You may well ask, "How did an art major end up at a science museum?" Well, it started out innocently enough as Anna took an internship at Adler while still an undergraduate. Combining her art training with knowledge of several foreign languages, she found herself delving deeper and deeper into astronomy, eventually becoming an Assistant Curator. As she spoke to us, her enthusiasm revealed an understanding that astronomy has always presented an exceptional union of art and science.

Looking about at all the wonderful exhibits at Adler, this union was evident. So I was curious as to how she actually went about designing the various displays—was it an artistic expression of science or a scientific expression of art? Just so you understand how much I know, I was wrong on both parts of my question. She replied that modern museum exhibits needed to be "slick" and eye catching but within the level of understanding of most of the museums' visitors. Whatever tools were needed to achieve that goal, so be it. Now succeeding on this account must be somewhat of a challenge at Adler, for Anna informed us that half of Adler's visitors have graduate degrees. (So, are smart people interested in astronomy or does interest in astronomy make us smart? You decide…)

Continuing in this vein, she explained that this ancient union of art and astronomy came to a parting of the ways in the 19th century when astronomers began to insist on more technical, detailed and utilitarian tools, leaving artists to express their celestial thoughts for the public at large. Both Betsy and I bemoan this divorce because we still see astronomy and art as intertwined expressions of our common humanity.

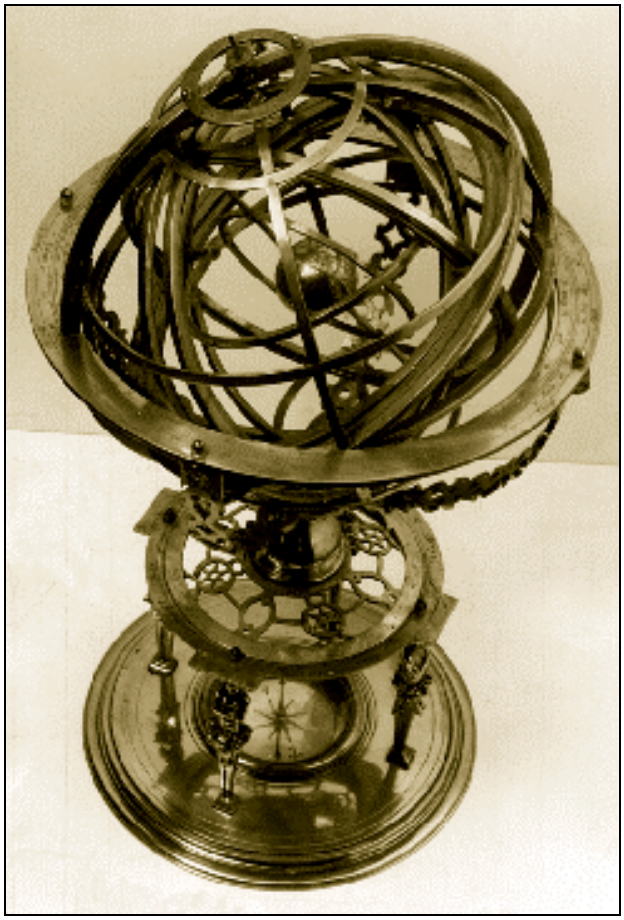
We could not resist ending our conversation with Anna without asking for her museum favorites. Walking through the exhibit halls of Adler, there was no hesitation in her replies. I'm sure that more than one of you will nod in agreement at these choices.

Favorite mechanical devices:



Heath orrery

View from above the orrery. Built in 1740, the 12-sided table base displays reliefs of the zodiac constellations. Notice that the Earth is not a brass sphere but actually a miniature globe!



Clockwork driven armillary

Fully engraved with the calendar and zodiac, this armillary is both a beautiful piece of craftsmanship and an instructive device

Most useful device:

Pocket globe

Measuring only about 3 inches across, this terrestrial globe was encased in a celestial sphere. It was primarily a teaching tool. The detail is astounding

Printed objects:

"Hands down", she exclaimed, Johan Hevelius' *Uranographia*[1]. Bringing a smile to my face, she immediately added John Flamsteed's *Atlas Coelestia* as well. We were also informed that we owe a debt of gratitude to both Mrs. Hevelius and Mrs. Flamsteed for, having lost their respective husbands before they had the opportunity to publish their monumental tomes, they saw to it that their atlases were published. Both of these works occupy places of distinct honor in the history of astronomy.

A front page of Hevelius' *Uranographia* showing Hevelius bowing before the great astronomers of history and before the muse Urania.

Before concluded our visit with Anna, we asked if there was anything new on Adler's horizon. She told us that Jim Lovell's (local boy who made good) personal collection of memorabilia was being presented to the museum on a long-term loan basis.

I can hardly wait for my next visit…

Next Time: Part Two of INSAP- From Persia to Malta

Footnotes:

1. Urania is the mythological muse of astronomy

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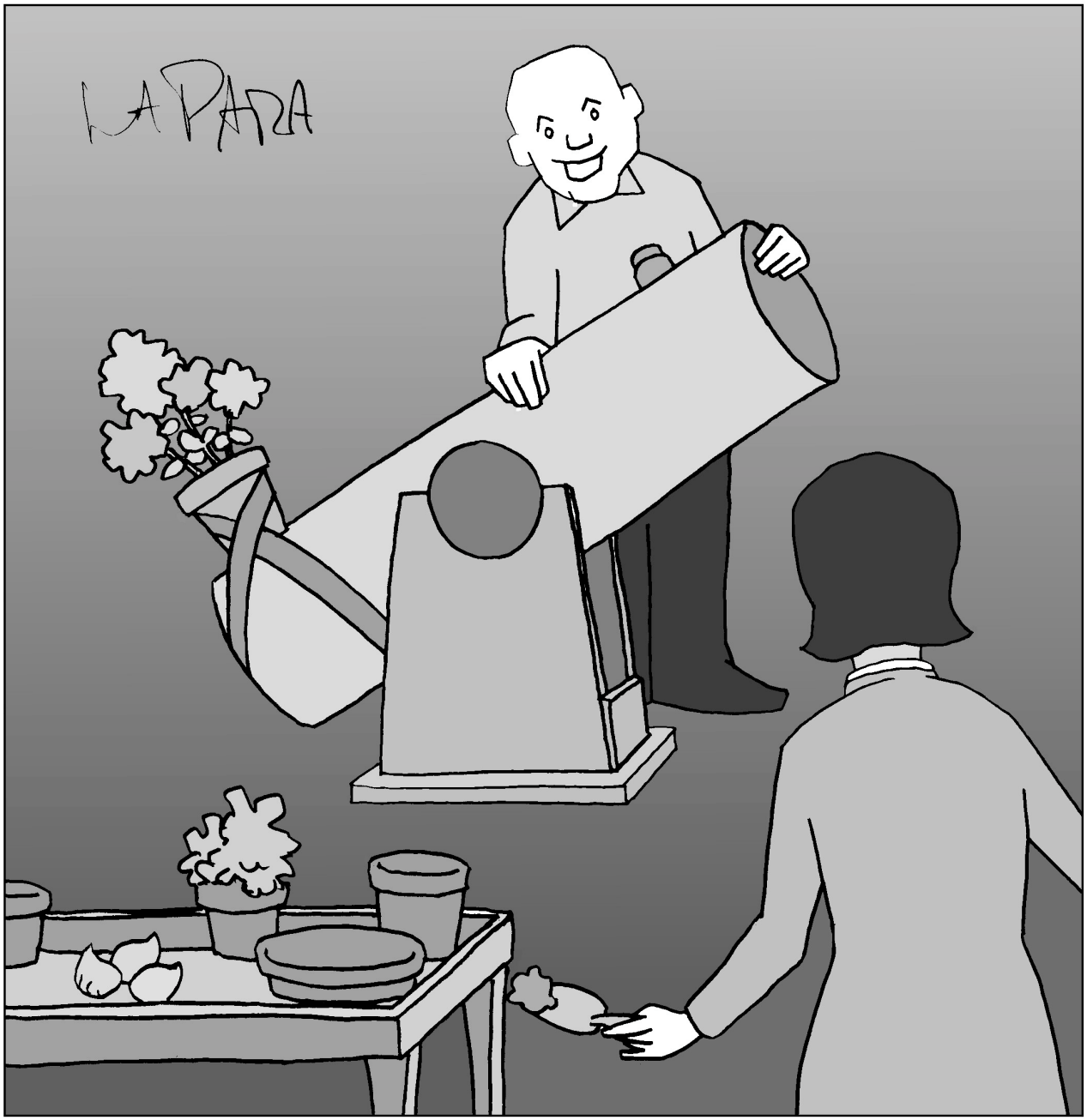
Seventh Annual Starfest at Warwick County Park: 4:00 p.m. to midnight on Saturday August 6, 2005

ChesMont Astronomical Society will host their seventh annual public stargazing party at Warwick County Park, located just off PA Route 23 in Knauertown. The event starts at 4:00 with solar telescope viewing. There will be presentations and events, including some for children. After dark there will be stargazing. There will also be drawings for several door prizes. There is no fee for any of the astronomy programs, but Warwick Park will charge a parking fee (I think it's $5.00 or less, but the newspaper article I have doesn't list the actual amount). Chester County's Warwick Park is located on County Park Road, just off PA Route 23, 3.5 miles west of Pa Route 100. For directions, call the park office at 610-469-1916. Cloud date is Sunday August 7, 2005.



"THAT NEW PLANT YOU GOT FROM THE GARDEN CLUB BALANCES MY BIG EYEPIECES PERFECTLY!"

Cartoon by Nicholas La Para

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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
(610) 269-1737

Observing: Ed Lurcott
(610) 436-0387

Education: Kathy Buczynski
(610) 436-0821

Webmaster: John Hepler
(610) 363-0811

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

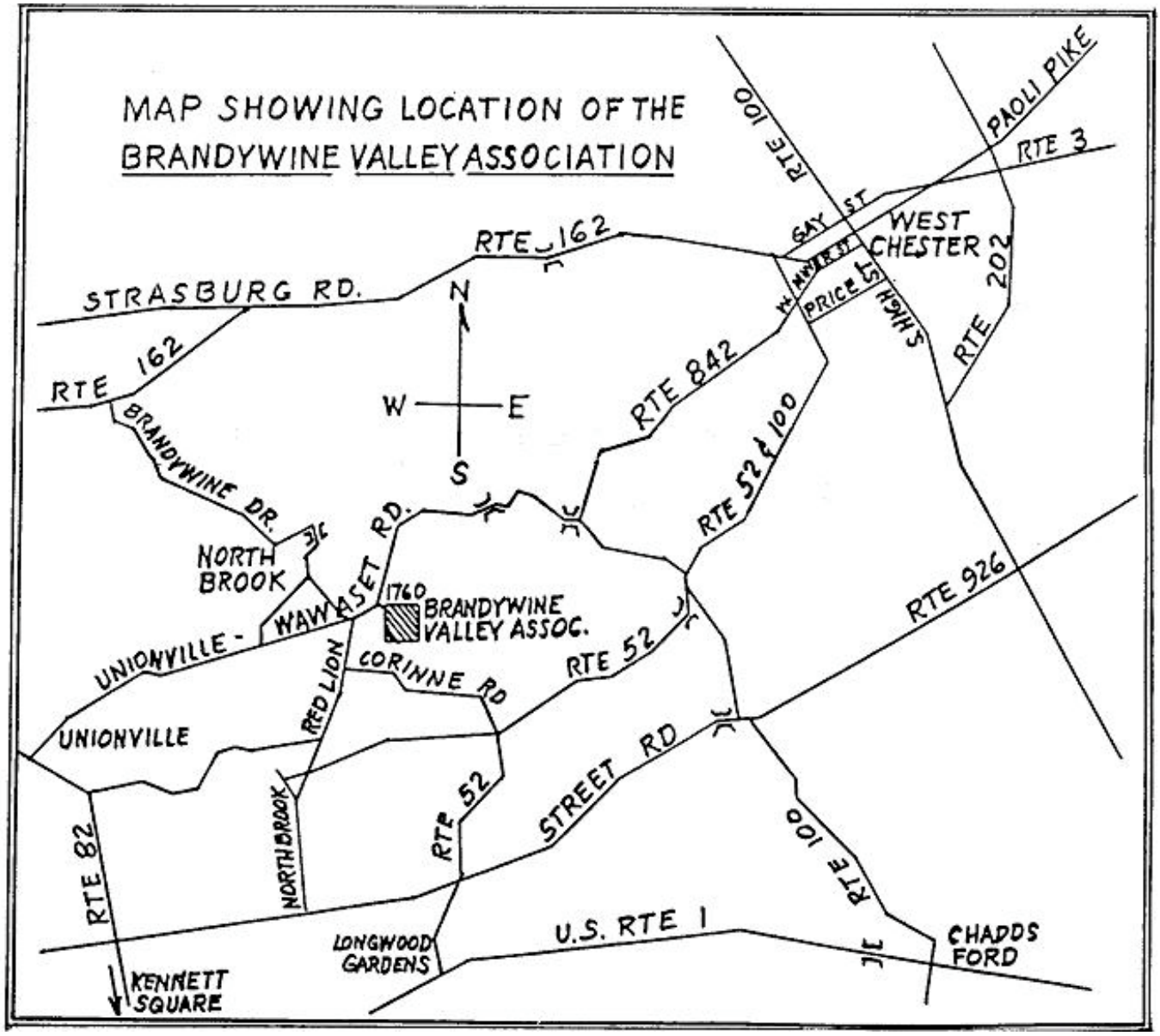
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95** which is much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society**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

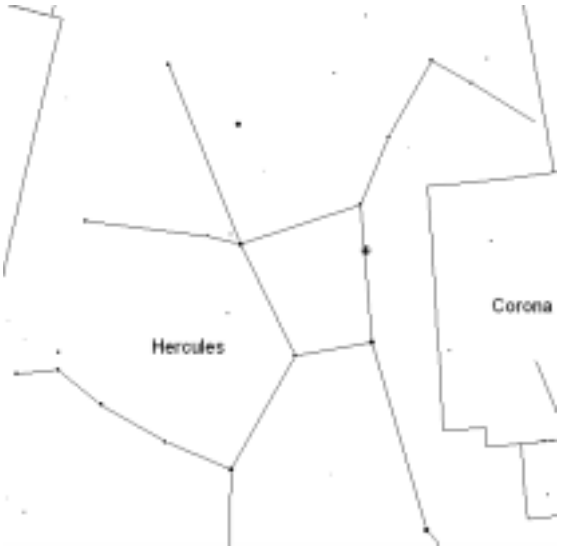
http://www.ccas.us/

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 **JohnHepler@comcast.net**



To get to the Myrick Conservation Center of the Brandywine Valley Association from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BVA property, turn off Route 842 into the parking lot by the office: look for the signs to the office along Route 842. From that parking lot, go up the farm lane to the left; it's about 800 feet or so to the top of the hill. If you arrive after dark, please turn off your headlights and just use parking lights as you come up the hill (so you don't ruin other observers' night vision).

CHESTER COUNTY ASTRONOMICAL SOCIETY



Is forming "observing clusters" around the county

Starting at dusk on Tuesday, May 31, 2005 and every Tuesday thereafter, The *Hercules Cluster* will meet in **West Goshen Township**.

For more information on location, call Kathy Buczynski at 610-436-0821

Additional Information

- ✓ **Serious observers are encouraged to attend**
- ✓ **Astronomical League Awards lists will be available, bring pencil and paper**
- ✓ **Telescope owners are always willing to share their view, but if you have a telescope or binoculars please bring them (if you are working on the Constellation Hunter's Award, only naked-eye observing is required)**
- ✓ **Bathroom available only a block away**

Observing Hints

- ✓ **Please bring star charts; a list of the objects you want to observe will be helpful**
- ✓ **Bring red flashlight for reading charts**
- ✓ **Dress appropriately; consider bug spray, but use it before you get there**

Check out our newsletter **"Observations"** and our website **www.ccas.us** for more clusters forming

If you are interested in helping others with their observations or need help with your observations, consider attending a cluster near you