



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

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Have We Been Invaded by Mars?



Nah! Just some of Ann Miller's creativity on display at our annual CCAS Summer Picnic held July 14, 2012 at Don and Barb Knabb's home.

Important August 2012 Dates

- 8th** • Last Quarter Moon, 9:16 a.m.
- 15th** • New Moon, 10:11 p.m.
- 22nd** • First Quarter Moon, 3:41 p.m.
- 22nd** • Autumn Equinox at 10:49 a.m.
- 29th** • Full Moon, 11:19 p.m.



CCAS Upcoming Nights Out

CCAS has several "nights out" scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

- ✦ **Friday, September 14th** at Longwood Gardens. As part of the Family Light Night series, from 5 to 9 p.m., we'll do some solar observing early in the program.
- ✦ **Saturday, October 20th** is Fall Astronomy Day. The theme of Astronomy Day 2012 is "Bringing Astronomy to the People." CCAS Monthly Observing Session, Hoopes Park, West Chester. The observing session starts at sunset.

Membership Renewals Due

09/2012	Baudat & Family Catalano-Johnson & Family Lurcott, E.
10/2012	Hicks Sterrett
11/2012	Buczynski Hepler Holenstein O'Hara Taylor Zibinski

Summer/Fall 2012 Society Events

September 2012

5th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

7th • West Chester University Planetarium Show: "The Galactic Center," in the Schmucker Science Building. The show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, visit the planetarium's [webpage](#).

11th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after. Guest Speaker: Derrick Pitts, Chief Astronomer at the Franklin Institute.

13th • The von Kármán Lecture Series: [The Challenge of Mars Exploration](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

14th • CCAS Monthly Observing Session, Special event "Display of Lights" at Longwood Gardens. Event held from 5:00 p.m. to 9:00 p.m., with sunset at 6:30. Longwood staff expect up to 1000 people to attend, so we'll need as many members with their equipment as possible.

20th • Open call for articles and photographs for the October 2012 edition of *Observations*.

26th • Deadline for newsletter submissions for the October 2012 edition of [Observations](#).

October 2012

3rd • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the [PA Outdoor Lighting Council](#) website.

7th • West Chester University Planetarium Show: "Killer Rocks from Outer Space," in the Schmucker Science Building. The show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, visit the planetarium's [webpage](#).

9th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after. Guest Speaker: TBA.

13th • The von Kármán Lecture Series: [Herschel Opens Up the Cool Universe](#), Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • [Fall Astronomy Day](#). The theme of Astronomy Day 2012 is "Bringing Astronomy to the People." CCAS Monthly Observing Session, Hoopes Park, West Chester. The observing session starts at sunset.

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First Man on the Moon Dies at 82

by John John Noble Wilford, *NYTimes.com*

Neil Armstrong, who made the "giant leap for mankind" as the first human to set foot on the moon, died on Saturday. He was 82.

His family said in a statement that the cause was "complications resulting from cardiovascular procedures." He had undergone heart bypass surgery this month in Cincinnati, near where he lived. His recovery had been going well, according to those who spoke with him after the surgery, and his death came as a surprise to many close to him, including his fellow Apollo astronauts. The family did not say where he died.

A quiet, private man, at heart an engineer and crack test pilot, Mr. Armstrong made history on July 20, 1969, as the commander of the Apollo 11 spacecraft on the mission that culminated the Soviet-American space race in the 1960s. President John F. Kennedy had committed the nation "to achieving the goal, before the decade is out, of landing a man on the Moon and returning him safely to Earth." It was done with more than five months to spare.

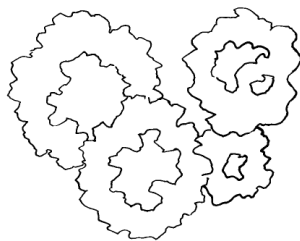
On that day, Mr. Armstrong and his co-pilot, Col. Edwin E. Aldrin Jr., known as Buzz, steered their lunar landing craft,

(Continued on page 14)

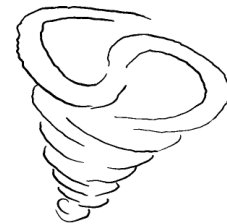
Nicholas's Humor Corner

by Nicholas La Para

THE NEW MESSIER LIST



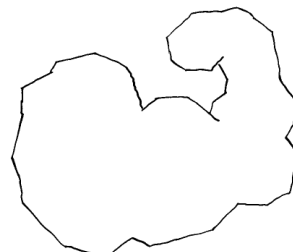
ONION RINGS NEBULA



BATHTUB DRAIN GALAXY



CASPER THE GHOST NEBULA



STEROID ASTEROID

LaPara

September 2012 Guest Speaker

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on September 11, 2012, starting at 7:30 p.m. The meeting will be held in Room 113, Merion Science Center (former Boucher Building), West Chester University. Our guest speaker will be Derrick Pitts, PhD, chief astronomer at the Franklin Institute. This renowned astronomy evangelist will give a talk about the future exploration of Space in "Mars and Beyond". Brought to you in close cooperation with [Department of Geology and Astronomy](#) at West Chester University.

Derrick Pitts has been associated with the Franklin Institute Science Museum since 1978, designing and presenting many of the museum's public programs and exhibits. Pitts was the original director of the Tuttleman OMNIMAX Theater, museum vice-president and many other valued positions. He has been Chief Astronomer and Director of the Fels Planetarium since 1990, having written and produced more than two-dozen planetarium programs. He served as the US National Spokesperson for the IAU 'International Year of Astronomy 2009' and currently is a NASA Solar System Ambassador.

He has written numerous astronomy columns for newspapers and national magazines. He appears regularly on all the major television networks as a science content expert and, for nearly



CCAS Guest Speaker Derrick Pitts

two decades, has hosted award-winning astronomy radio programs for Philadelphia's WHYY 91 FM and for WXPB's 'Kids' Corner' radio program. Pitts is an 'on-air' content contributor for Current TV's *Countdown with Keith Olberman*, for CNN International and for MSNBC. He recently had stunning appearances on the Comedy Channel's "Colbert Report" and "The Late, Late Show with Craig Ferguson" on CBS. Pitts recently met President Barack Obama and his family when he was invited to the White House to participate in the first ever White House Star Party.

Pitts is nationally known as an excellent 'teacher'. His presentations are stimulating, humorous, intellectually challenging, compelling and at the same time accessible to the broadest audiences. He puts his emphasis on making sure that everyone can come to appreciate the universe as he sees it – not a watered-down sketch of the universe, but

a rich, deep, complex version with human connections that everyone can understand at some level.

Among his many awards are the Mayor's Liberty Bell, the St. Lawrence University Distinguished Alumni Award, the G. W. Carver Medal, Please Touch Museum's "Great Friend To Kids" Award, induction into the Germantown Historical Society Hall of Fame, selection as one of the "50 Most Important Blacks in Research Science" by Science Spectrum Magazine in 2004, the 2010 inaugural recipient of the David Rittenhouse Award, and in 2011, an honorary Doctor of Science degree from LaSalle University.

Pitts currently serves as the Academic Affairs committee chair on the Board of Trustees for his alma mater St. Lawrence University, is a member of the Board of Trustees at Widener University and is currently president of the Greater Philadelphia Chapter of Tuskegee Airmen Inc. He and his wife Linda reside in the Wynnefield Heights section of Philadelphia.

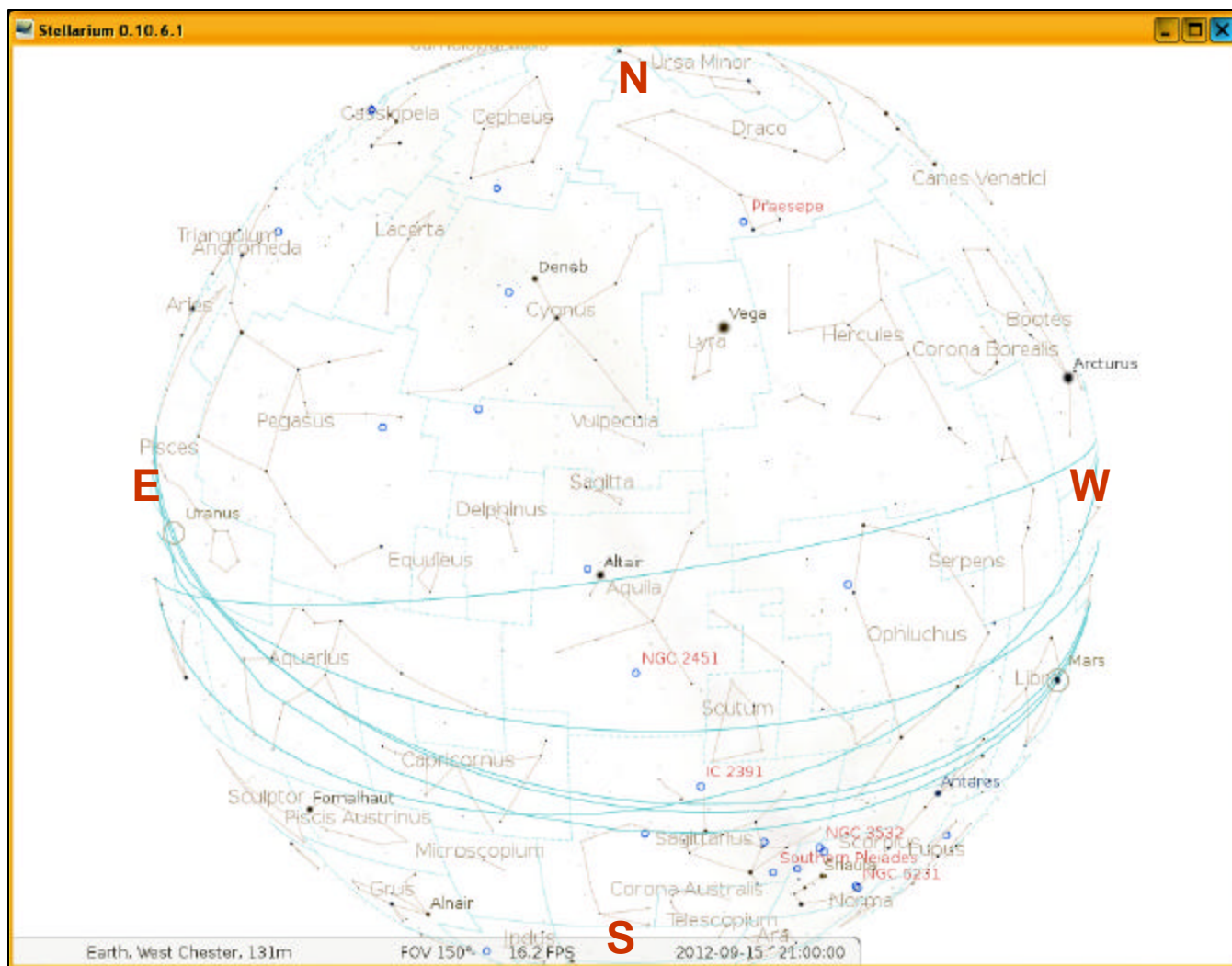
Please note that inclement weather or changes in speakers' schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

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The Sky Over Chester County

September 15, 2012 at 9:00 p.m. ET

Note: This screen capture is taken from Stellarium, the free planetarium software available for download at www.stellarium.org.



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
09/01/2012	6:01 a.m. EDT	6:29 a.m. EDT	7:31 p.m. EDT	7:59 p.m. EDT	13h 02m 03s
09/15/2012	6:15 a.m. EDT	6:42 a.m. EDT	7:09 p.m. EDT	7:36 p.m. EDT	12h 26m 29s
09/30/2012	6:29 a.m. EDT	6:56 a.m. EDT	6:44 p.m. EDT	7:11 p.m. EDT	11h 47m 25s

Moon Phases					
Last Quarter	09/08/2012	9:16 a.m. EDT	First Quarter	09/22/2012	3:41 p.m. EDT
New Moon	09/15/2012	10:11 p.m. EDT	Full Moon	09/29/2012	11:19 p.m. EDT

September 2012 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

8	Last Quarter Moon, 9:16 a.m.
15	New Moon, 10:11 p.m.
18-19	The waxing crescent Moon is near Saturn and Mars, low in the southwest
22	Autumn begins at 10:49 a.m.
22	First-quarter Moon, 3:41 p.m. The Lunar X will be visible!
29	Full Moon, 11:19 p.m.
26	Uranus is at opposition and shines its brightest for 2012

The best sights this month: The gas giant Uranus is in excellent viewing position during September, so if you have not seen this green disk in the eyepiece of a telescope, come to our star party at Anson Nixon Park in Kennett Square on Saturday, September 22nd. It will also be visible at our star party on Friday September 14th at Longwood Gardens, but unless you are helping with the star party you'll need to pay to have access to the gardens.

The Lunar X will also be visible during the star party at Anson Nixon Park. This interesting feature results from the Sun shining on high ridges at the Moon's terminator.

Mercury: Mercury is too close to the Sun to see during September.

Venus: Venus shines high in the pre-dawn sky all month like a beacon in the sky. If you are up before sunrise it will be impossible to miss this bright planet in the eastern sky.

Mars: The red planet hangs low in the southwest through September, setting about two hours after the Sun. After the close encounter between Mars and Saturn in August, Mars draws away from the ringed planet as we progress through September.

Jupiter: Jupiter is slowly moving into a viewing

position that does not require losing sleep! It is rising around 10:00 p.m. by the end of the month and it crosses the meridian (the line in the sky that divides North from South) around dawn.

Saturn: Take a look at the ringed beauty in early September because it is rapidly falling behind us and it will disappear below the horizon in October.

Uranus and Neptune: Uranus is at opposition on September 28th so it is high in the sky around midnight. At a dark sky location you should be able to find Uranus with the naked eye. Neptune was at opposition last month, and Barb and I had a nice view of this distant pale blue dot. Sky maps to locate these gas giants can be found at skypub.com, the website of Sky and Telescope magazine.

The Moon: Full Moon occurs on September 29th. This full Moon is called the Full Corn Moon by Native Americans. This full Moon gets that name because it marked when corn was supposed to be harvested. A special event occurs on Saturday September 22nd while we host a star party at Anson Nixon Park in Kennett Square. The Lunar X will be visible! This is a fun feature to observe, and the window for seeing it is only about 6 hours long, and the timing must be right for it to be visible. Come to the star party and share in the fun!

Constellations: Hercules and the Summer Triangle shine near the zenith throughout September with "the backbone of the night", the Milky Way, arching across the sky. Stay up a bit later and the autumn constellations will rise in the east, so look for the Great Square of Pegasus, Cassiopeia and Perseus.

Messier/deep sky: We lose the southern Messier objects as September moves on but the Andromeda galaxy makes up for that loss. What a sight that is! The Double Cluster in Perseus is a worthwhile target and late at night the clusters in Auriga rise out of the eastern horizon.

(Continued on page 16)

Face Off: TeleVue NP 127is vs. Questar 7 Classic

by Dave Hockenberry

In astronomical circles, the refractor vs. reflector debate has been going on since Issac Newton invented the reflector in 1668. By this time refractors as astronomical instruments had been around for more than 50 years, thanks to Galileo. Newton had a particular fascination with light, lenses and prisms, and was disappointed with the state of the art refractors of the day. They suffered considerable chromatic aberrations, and demanded very long optical tubes to generate appreciable aperture or magnification. Newton rightly figured he could get around these problems by using a series of reflecting mirrors. He was correct (of course!), but the mirrors of the day he was forced to use – tin/copper alloys without silvering – left much to be desired. Newton found himself distracted with other projects, and it fell to later generations of designers to make suitable mirrors commensurate with Newton's design.

Fast forward to the 1960's. Now the situation is reversed. The largest and most powerful telescopes on the planet are overwhelmingly reflectors, and two primary designs – the Ritchey/Cretien and the Maksutov/Cassegrain – hold the top spot in the biggest professional observatories. But the reflector/refractor debate still rages in amateur circles, because at the aperture size amateur astronomers find practical the refractor holds many advantages. Refrac-

tor optics have significantly improved, and are still much easier and cheaper to manufacture than the Schmidt/Cassegrains of the day. Even a decked out Unitron is still more affordable than a comparable Celestron or Questar in the 60's.

Fast forward again to the 1980's. The debate is far from settled. Refractors have gotten even better with the introduction of apochromatic designs, and Schmidt/Cassegrain manufacturers have become much slicker in their manufacturing techniques. Between these two designs the playing field has become even more level, adding fuel to the flames of the debate. This trend continues into the next decades, right up to the present day.

So today's amateur, on walking into his local telescope shop, is presented with a bewildering number of telescope designs and features. Where price used to settle the issue, the modern consumer finds either refractors or reflectors at extremes of the price scale. Low-end Newtonians and very affordable refractors both work well. At the high end of the market, one has to place an order and spend many thousands of dollars for either a high end refractor like an Astro-Physics or a reflector from RC Optics. So which is better?

Two recent purchases by Club members provided me with a unique chance to put both sides of this debate to the test. I had

recently purchased a barely used Questar 7 Titanium Classic which became available, at a considerable discount on consignment, at our local shop Skies Unlimited.

Questar is an older and venerated manufacturer of Maksutov/Cassegrain catadioptric reflectors, and since the 1960's had a reputation for fanatical precision in their optics. They are located locally here in New Hope, PA. They have only ever really made three designs, almost completely unchanged since the 1960's – a 3.5 inch, a 7 inch, and a 12 inch "Mak/Cass."

At the same time, our Observing Chair ordered a TeleVue NP 127is Refractor. TeleVue is the brainchild of Al Nagler, designer of some of the best eyepieces in the world. They have also been offering a truly premium apochromatic refractor for many years now – the Nagler-Petzval. Astronomical telescopes from TeleVue have also come in a few choices, the 127is (at 5 inches aperture) being their largest "Flagship" model. TeleVue also has a reputation for top quality optical precision, as well as extremely rugged design and construction. These are some of the toughest field telescopes ever built, and are still assembled by hand just outside of New York.

So the stage was set for a perfect showdown between these two

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Face Off (cont'd)

(Continued from page 6)

designs. We gathered at our Observing Chair and Librarian's dark sky site in the Poconos, Starry Nights. We were also fortunate to have two wonderfully clear almost moonless nights for our comparison. As we set up our respective rigs, I enjoyed examining each of these instruments in detail. They look—and feel—different. The TeleVue, despite the extremely rugged construction, was still much lighter to lift and carry. This is largely due to the Questar 7 having a large and heavy glass corrector plate at the front of the barrel, along with the larger aperture and corresponding mirror at the back.

Another advantage for the TeleVue was also immediately apparent – the focusing mechanism. TeleVue comes with a

very well designed dual-speed Crayford type focuser. The Questar has only a small knob that moves the primary mirror, and they do not offer any other focuser with their classic “control box.” The Questar focuser does not have a “fine focus” option so getting exact focus takes a lot more effort. With dew shields extended and taking into account the Questar “control box” housing the finder mechanism, barlow, and rotating prism, both telescopes were about the same length when fully deployed on their respective mounts. Lifting the TeleVue and subsequent balancing on a German Equatorial mount was also much easier that with the bulky, heavier Questar OTA.

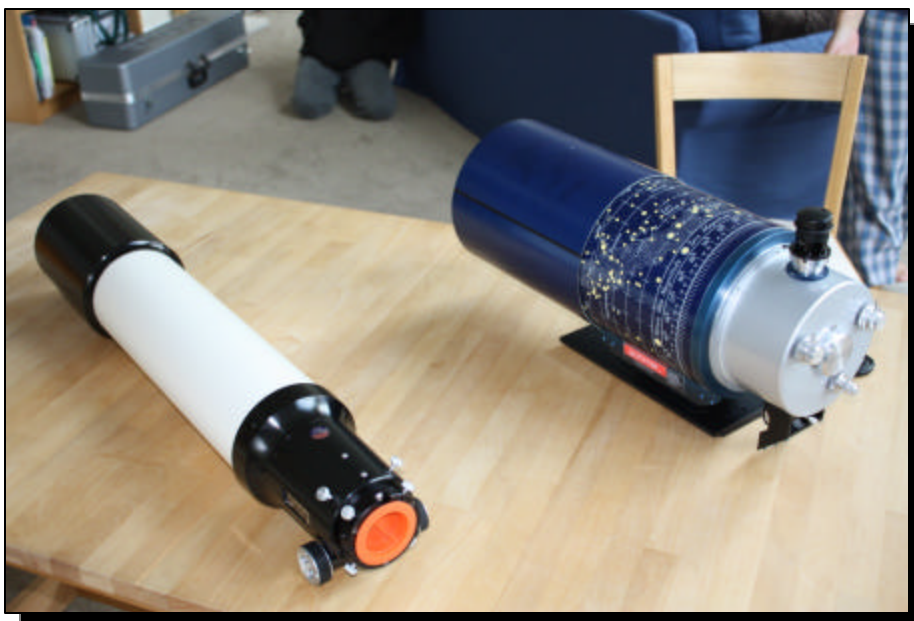
This particular Questar sports a silk-screened star map on the OTA barrel, and a basic moon

map on the dew shield. Not essential equipment, but we discovered that the star map – screened in white and yellow – reflected our red headlamp lights beautifully, making it easy to read while sparing our night vision. Probably unnecessary “fluff” to our Observing Chair, but for those of us who need a quick sky map to reference (especially me) this is a nice add on.

So we waited for the skies to darken enough for Polaris to show and to test the optics. At first blush, the reader may think that comparing two vastly different focal length telescopes is unfair. The TeleVue focal length of 660 mm (focal ratio 5.2) is very different and much shorter than the Questar 7, which starts at 2,426 mm (focal ratio 13.6). Isn't this comparing apples and oranges? As it turns out, not entirely. For Don's rig was also optionally outfitted with a Denkmeier BinoViewer with the Power Switch. This allowed us to jack up the magnifying power of the TeleVue to near it's limit of 300X, so that views of deep sky objects appeared close in size between either 'scope. And without the Bino viewers, we had between the two of us plenty of different eyepieces (from Panoptics through Naglers and Delos and even Ethos types) to allow as careful comparison as possible.

As it happened, we both found

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TeleVue NP 127is Refractor (left) and Questar 7 Titanium Classic

Face Off (cont'd)

(Continued from page 7)

that viewing through both telescopes was best at between 75 and 200X for the seeing available to us on those particular nights. One might also point out the difference in aperture as being somewhat unfair in favor of the Questar. 7 inches is decidedly more than 5. Yet when we started viewing deep space objects, we found that the differences although present were not as striking as one might think.

Our first test subject was a globular cluster in Sagittarius. Both TeleVue and Questar are reputed to be excellent for splitting doubles and pinpoint stars, so this was an excellent start. The view through the TeleVue was wonderful, with pinpoint stars and excellent definition. The view through the Questar had a much darker background, giving the impression of greater contrast (especially through the manufacturer supplied Brandon eyepieces). This wasn't entirely surprising, as the much wider native FOV for the TeleVue tends to leave background sky brighter. But this distinction in the Questar was marked. We suspect that the large corrector glass in the front of the Questar might mitigate the amount of light getting into the OTA. That being said, the detail in the center of the cluster was better defined and many more individual stars through the Questar. We then looked at the Double Double. Splitting double and multiple stars are strengths of BOTH



telescopes, and neither disappointed. Again, the stars were more pinpoint through the TeleVue, while the contrast was better through the Questar. We then turned to Albireo, one of the prettiest double stars in the sky. This time we were comparing color definition. And again, neither telescope disappointed. I thought that the reflector would have a natural advantage here, but the TeleVue did amazingly well. Albireo's blue companion looked just about the same hue of blue in both telescopes. We later had a chance to test this again with the planet Neptune. I perhaps noticed a slight increase in the bluish color through the Questar, but I wouldn't bet the farm on it.

Next we observed some open clusters. No contest here, as the TeleVue's wide field of view easily accommodated the entire cluster. With the Questar one

had to do considerable moving of the telescope with the mount hand paddle to get around the whole object. Advantage TeleVue.

We then turned to nebulas. Our first test subject was the Swan. Here, the Questar had a distinct advantage with greater aperture. This is not to say that the view through the TeleVue was unsatisfying. We both got great definition with both telescopes. But with the Questar the Swan glowed brighter and more of the details through the "body" of the Swan were easier to distinguish.

We then went to the Trifid nebula. Again, Questar had a slight advantage, but this object was getting closer to the horizon at this point and the view through both telescopes wasn't great. It has been said that when dealing with nebulas "aperture wins"

(Continued on page 9)

Face Off (cont'd)

(Continued from page 8)

and so it was in this case. It would be interesting to be able to compare these designs at the same effective aperture to see if this would change our minds, but for the gear we were looking through the edge went to Questar.

It would have been helpful to have brighter planets and perhaps a crescent moon to continue the test. Alas, Saturn and Mars dipped below our effective horizon before we could get started, and Jupiter and Venus wouldn't be visible until shortly before dawn. These comparisons will have to be made at a later date, and the author will update *Observations* if the opportunity presents itself. Another comparison to make is with planetary and Lunar photography. By all that we saw, the Questar with its long native focal length and excellent contrast should excel here. But for large deep space objects, the TeleVue has the clear advantage due to its fast focal ratio and its much wider field of view.

The night we were observing was during the peak of the Perseid meteor shower, which was also a treat. We actually saw meteors streak across the eyepieces of both telescopes, which was a delight. An added bonus for our testing nights! Indeed, our CCAS Secretary and Librarian seemed much more content to lie facing up on a lawn chair and bask in meteor

shower glow that get involved in the refractor/reflector debate!

So after two nights of head to head competition which telescope came out on top? In this author's mind it really depends on what the observer wants to view. For nebulas and Lunar/planetary observing, I strongly suspect the Questar 7 has the edge. Indeed, these objects are where a Mak/Cass design is best suited. But for overall use by an amateur astronomer, I believe the TeleVue is a better telescope.

First, it can simply do more. It can do wide-field views that the Questar cannot, making it much more versatile for both visual observing AND photography. It can split double stars and match the Questar for color definition. With a powerful Barlow or, better yet, a good Bino viewer, it can give excellent high-power views that rival the Questar. It is tough, yet lighter weight and easier to handle and mount than the fussier and more delicate Q7.

It never needs collimation, which my Questar did (necessitating a trip to New Hope – it must be adjusted at the factory and cannot be adjusted by the owner). TeleVue comes stock with a much more desirable focuser. And it does so for nearly half the price of the Questar 7. Current list price for the TeleVue NP 127 is around \$3,780, and for the Q7 Titanium Classic is \$7,890. This makes the Q7 a pricey telescope for specialty applications.

But does this end the refractor vs. reflector debate? Given that there are many other types of reasonably priced reflectors on the market such as Newtonian, Dobsonian, Dall-Kirkham, and even reasonably priced Ritchey Cretien models this debate won't end anytime soon.

It is really a privilege in this day and age of so many good consumer grade telescopes to have the luxury of such a comparison as we had at Starry Nights. I must encourage everyone in the market for a telescope, who finds themselves on the front line of the great debate, to attend and many star parties and observing sessions as they possibly can before spending hard-earned cash.

More information on the TeleVue refractors at <http://www.televue.com> and at Skies Unlimited in Pottstown. Information and specifications on the Questar line of telescopes at <http://www.QuestarCorporation.com>.

Observing (Cont'd)

(Continued from page 3)

We are looking for presenters for our meetings in October and November of this year. If you are interested in presenting at either of these meetings, or during one of the Spring 2013 monthly sessions, please contact me at programs@ccas.us.

A Brand New Age: Queue Observing at Mt. Paranal

by Dr. Marc J. Kuchner

First a caravan of white observatory cars arrives, winding up the narrow road to the 2600-m (~8500-foot-) high summit. Then the shutters around the domes open, and rays from the setting sun alight on colossal mirrors and metal struts. It's the beginning of another busy night at Mt. Paranal, Chile, where I am learning about new, more efficient ways of managing a modern observatory.

I stepped into the observatory's control room to soak up some of the new, unfamiliar culture. Here, under florescent lights and drop ceilings are banks of computer screens, one bank to control each of the four big telescopes on the mountaintop and a few others too. At each bank sits two people, a telescope operator and an astronomer.

The layout of this workspace was not unfamiliar to me. But the way these Mt. Paranal astronomers work certainly was. When I was cutting my teeth at Mt. Palomar observatory in California, I would only go to the telescope to take my own data. In stark contrast, everyone observing at Mt Paranal tonight is taking data for someone else.

The Mt. Paranal astronomers each spend 105 nights a year here on the mountain performing various duties, including taking data for other astronomers. The latter, they call "executing the queue." Headquarters in Germany decides what parts of the



sky will have priority on any given night (the queue). Then the Mt. Paranal astronomers march up the mountain and carry out this program, choosing calibrators, filling the log books, and adapting to changing conditions. They send the data back to headquarters, and from there it makes its way out to the wider astronomical community for study.

This new way of working allows the Mt. Paranal astronomers to specialize in just one or two telescope instruments each. Surely this plan is more efficient than the old-fashioned way, where each of us had to learn every in-

strument we used from scratch—sifting through manuals at 3:00 AM when the filter wheel got stuck or the cryogen ran out, watching precious observing time tick away. Here at Mt. Paranal, much of the work is done in a big room full of people, not off by yourself, reducing some dangers of the process. Also, queue observing cuts down on plane travel, an important step for cutting carbon emissions.

It's a brand new age, I thought as I watched the giant domes spin in the silent, cold Chilean

(Continued on page 15)



European Southern Observatory at Mt. Paranal, Chile.

CCAS Star Party at the Delaware Museum of Natural History

by Don Knabb & Dave Hockenberry



On Friday August 24th we hosted a star party at the Delaware Museum of Natural History. We had a great turnout of CCAS members, at least a dozen of us were there. We had two large binoculars set up on tripods and 4 telescopes. In addition, Greg Weaver, observatory manager at Mt. Cuba Observatory, gave a lecture and brought his 11 inch telescope. About 30 people attended the event. The crowd included everyone from young children to active seniors. Everyone had a great time! We could have used better skies, but we did see the Moon and several double stars. An added treat was seeing the International Space Station fly over! Many thanks to all the members who came to help, we could not do public outreach like this without the assistance of you!

Through the Eyepiece: The Eastern Veil Nebula, NGC 6992 in Cygnus

by Don Knabb, CCAS Treasurer & Observing Chair

Cygnus is high in the sky during September, so now is the time to seek out the faint fuzzy objects in this part of the sky. The Veil Nebula is one of these objects. This wispy cloud is a popular target for astrophotographers and Dave Hockenberry's picture shows all the wispy detail of this faint object. This is a difficult object for telescopic observing, but I intend to give it a try on a clear dark night without any Moon to interfere.

Approximately ten thousand years ago, before the dawn of recorded human history, a bright "star" must suddenly have appeared in the night sky and faded after a few weeks. Today we know this light was an exploding star and the colorful expanding cloud that remains is most often called the Veil Nebula. The expanding debris cloud gains its colors by sweeping up and exciting existing nearby gas. The supernova remnant lies about 1400 light-years away towards the constellation of Cygnus. The bright star 52 Cygni is visible with the unaided eye from a dark location but is unrelated to the ancient supernova.

The Veil Nebula has several other names such as the Cygnus Loop, Cirrus Nebula, Bridal Veil Nebula and Filamentary Nebula. All refer to the nebula's wispy streaks and elegant lace-like filamentary structures.

The structure is so large that several NGC numbers were as-

signed to various arcs of the nebula. There are three main visual components: The Western Veil (also known as Caldwell 34), consisting of NGC 6960, the Witch's Broom, near the foreground star 52 Cygni; The Eastern Veil (also known as Caldwell 33), whose brightest area is NGC 6992, and Pickering's Triangle (or Pickering's Triangular Wisp), brightest at the north central edge of the loop, but visible in photographs continuing toward the central area of the loop.

Pickering's Triangle is much fainter, and has no NGC number. It was discovered photogaphi-

cally in 1904 by Williamina Fleming (after the New General Catalogue was published), but credit went to Edward Charles Pickering, the director of her observatory, as was the custom of the day.

The entire Veil Nebula spans 3 x 3 degrees of sky, equal to over five times the size of the full Moon

There are few directly visible supernova remnants, but the Veil is one of the finest. The Witch's Broom is sometimes called the Network Nebula. When finely

(Continued on page 13)

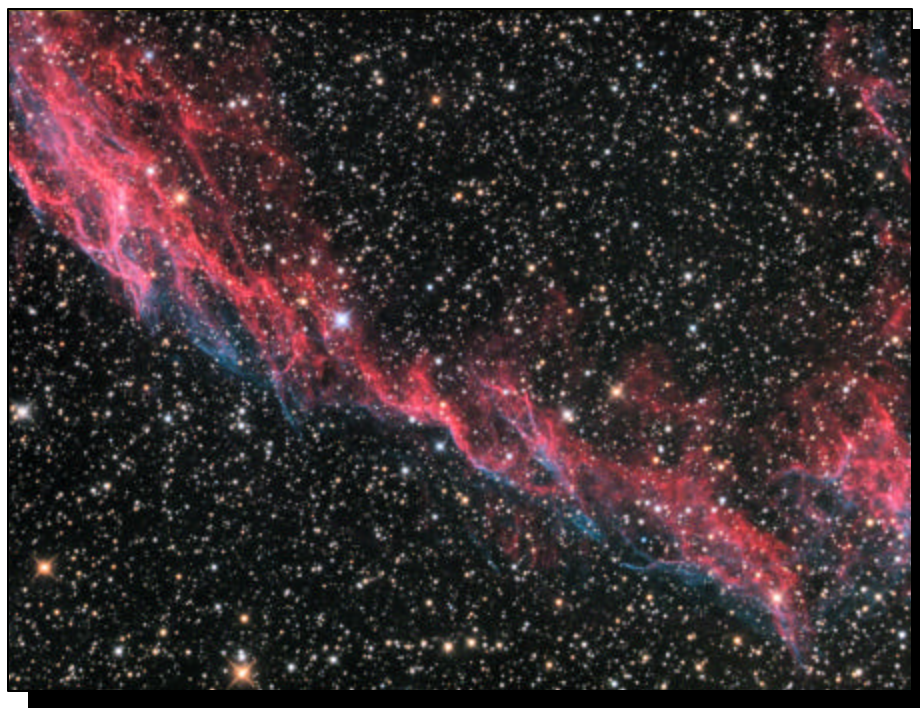


Image credit: Dave Hockenberry, CCAS Program Chair Shot 8/18/2012 with QSI 583 wsg camera through AstroTech AT8RC telescope on an AP 1200 GEM mount, autoguided with SX Lodestar camera off-axis and SX AO adaptive optics unit. 90 minutes Lum (10 minute exposures X 9), 35 minutes each RGB (5 minute exposures X 7) through AstroDon filters. Image capture with MaxIm DL5. Image calibration, hot pixel removal, stacking, deconvolution, and RGB color creation in CCDStack. Lum-RGB merge and other adjustments in Photoshop CS5. Sky noise adjustment with Noise Ninja. FITS Liberator courtesy of ESA. "Guest" astronomer during image capture Peter Zimmer.

Eyepiece (cont'd)

(Continued from page 12)

resolved, some parts of the image appear to be rope-like filaments. The standard explanation is that the shock waves are so thin that the shell is visible only when viewed exactly edge-on, giving the shell the appearance of a filament. Undulations in the surface of the shell lead to multiple filamentary images, which appear to be intertwined.

The nebula was discovered in 1784 by William Herschel. He described the western end of the nebula as "Extended; passes thro' 52 Cygni... near 2 degree in

length", and described the eastern end as "Branching nebulosity... The following part divides into several streams uniting again towards the south."

Wisps like this are all that remain visible of a Milky Way star. At the time of the supernova, the expanding cloud was likely as bright as a crescent Moon, remaining visible for weeks to people living at the dawn of recorded history. Even though the nebula has a relatively bright integrated magnitude of 7, it is spread over so large an area that the surface

brightness is quite low, so the nebula is notorious among astronomers as being difficult to see. However, an observer can see the nebula clearly in a telescope using an OIII filter (a filter isolating the wavelength of light from doubly ionized oxygen), as almost all light from this nebula is emitted at this wavelength. An 8-inch telescope equipped with an OIII filter shows the delicate lacework apparent in photographs, and with an OIII filter almost any telescope could conceivably see this nebula. Some argue that it can be seen without any optical aid except an OIII filter held up to the eye.

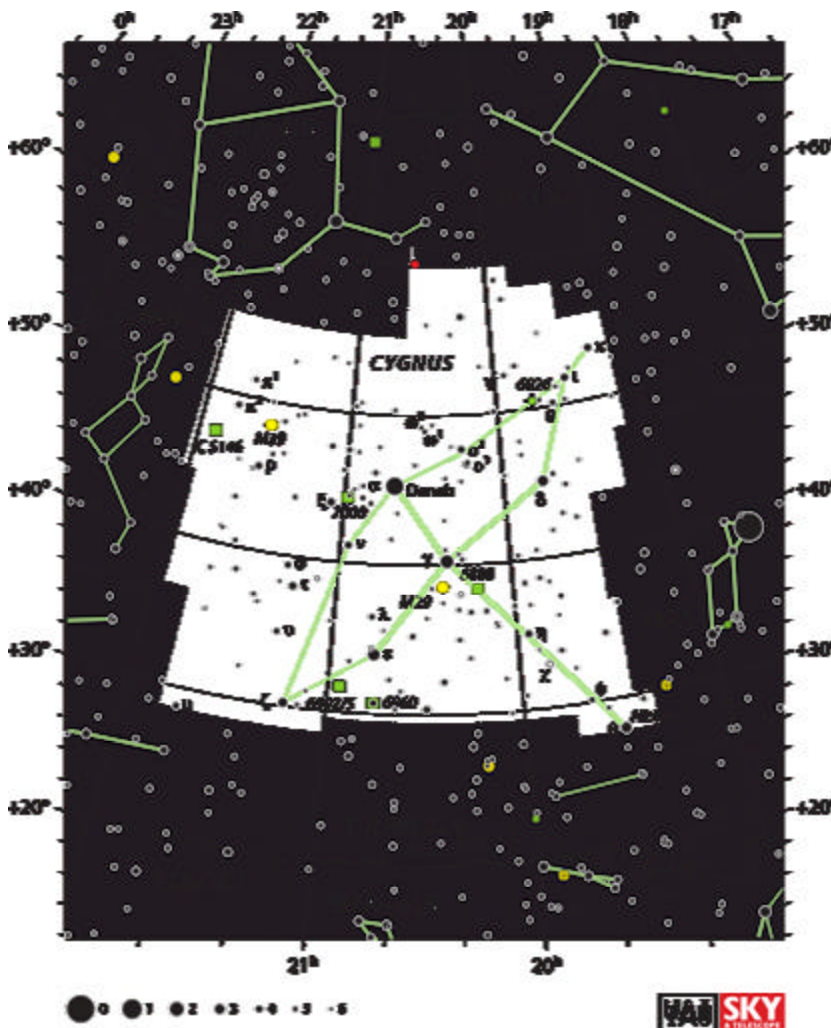
The Veil Nebula and the Witch's Broom are well positioned during September for telescopic observation. You will find it several degrees south of epsilon Cygni, the third brightest star in Cygnus, shining at magnitude 2.5. This star is named *Gienah*, which is the Arabic word for wing. Note that this is not the star you see in Dave's photo, that is the much fainter 52 Cygni.

Image credit:

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

Information credits:

iPad application Sky Safari Pro
http://en.wikipedia.org/wiki/NGC_6992



First Man on the Moon Dies (cont'd)

(Continued from page 2)

Eagle, to a level, rock-strewn plain near the southwestern shore of the Sea of Tranquillity. It was touch and go the last minute or two, with computer alarms sounding and fuel running low. But they made it.

“Houston, Tranquillity Base here,” Mr. Armstrong radioed to mission control. “The Eagle has landed.”

“Roger, Tranquillity,” mission control replied. “We copy you on the ground. You’ve got a bunch of guys about to turn blue. We’re breathing again. Thanks a lot.”

The same could have been said for hundreds of millions of people around the world watching on television.

A few hours later, there was Mr. Armstrong bundled in a white spacesuit and helmet on the ladder of the landing craft. Planting his feet on the lunar surface, he said, “That’s one small step for man, one giant leap for mankind.” (His words would become the subject of a minor historical debate, as to whether he said “man” or an indistinct “a man.”)

Soon Colonel Aldrin joined Mr. Armstrong, bounding like kangaroos in the low lunar gravity, one sixth that of Earth’s, while the command ship pilot, Michael Collins, remained in orbit about 60 miles overhead, waiting their return. In all, 12 American astronauts walked on the moon be-



*Mr. Armstrong, photographed inside the lander after the moonwalk on July 20, 1969.
Photo courtesy of NASA.*

tween then and the Apollo 17 mission in 1972.

The moonwalk lasted 2 hours and 19 minutes, long enough to let the astronauts test their footing in the fine and powdery surface — Mr. Armstrong noted that his boot print was less than an inch deep — and set up a television camera and scientific instruments and collect rock samples.

Charles F. Bolden Jr., the current [NASA](http://www.nasa.gov) administrator, said, “As long as there are history books, Neil Armstrong will be included in them, remembered for taking humankind’s first small step on a world beyond our own.”

Mr. Bolden also noted that in the years after the moonwalk, Mr. Armstrong “carried himself with a grace and humility that was an example to us all.” The historian Douglas Brinkley, who interviewed Mr. Armstrong for a

NASA oral history, described him as “our nation’s most bashful Galahad.” His family called him “a reluctant hero who always believed he was just doing his job.”

Indeed, some space officials have cited these characteristics, as well as his engineering skills and experience piloting X-15 rocket planes, as reasons that Mr. Armstrong stood out in the astronaut corps. After the post-flight parades and a world tour for the three Apollo 11 astronauts, Mr. Armstrong gradually withdrew from the public eye. He was not reclusive, but as much as possible he sought to lead a private life, first as an associate administrator in the space program, then as a university professor and director of a number of corporations.

Mr. Armstrong re-entered the

(Continued on page 15)

First Man on the Moon Dies (cont'd)

(Continued from page 14)

public spotlight a couple of years ago to voice sharp disagreement with President Obama for canceling NASA's program to send astronauts back to the Moon. Later, he testified to a Senate committee, expressing skepticism that the approach of relying on commercial companies would succeed.

Last September, Mr. Armstrong testified to a House committee that NASA "must find ways of restoring hope and confidence to a confused and disconsolate work force."

Almost as soon as the news of his death was announced, there was an outpouring of well

wishes and fond memorials on Web sites and social media, a reflection of the extraordinary public acclaim that came to a very private man.

"As much as Neil cherished his privacy, he always appreciated the expressions of good will from people around the world and from all walks of life," his family said. "While we mourn the loss of a very good man, we also celebrate his remarkable life and hope that it serves as an example to young people around the world to work hard to make their dreams come true, to be willing to explore and push the limits, and to selflessly serve a cause greater than themselves."

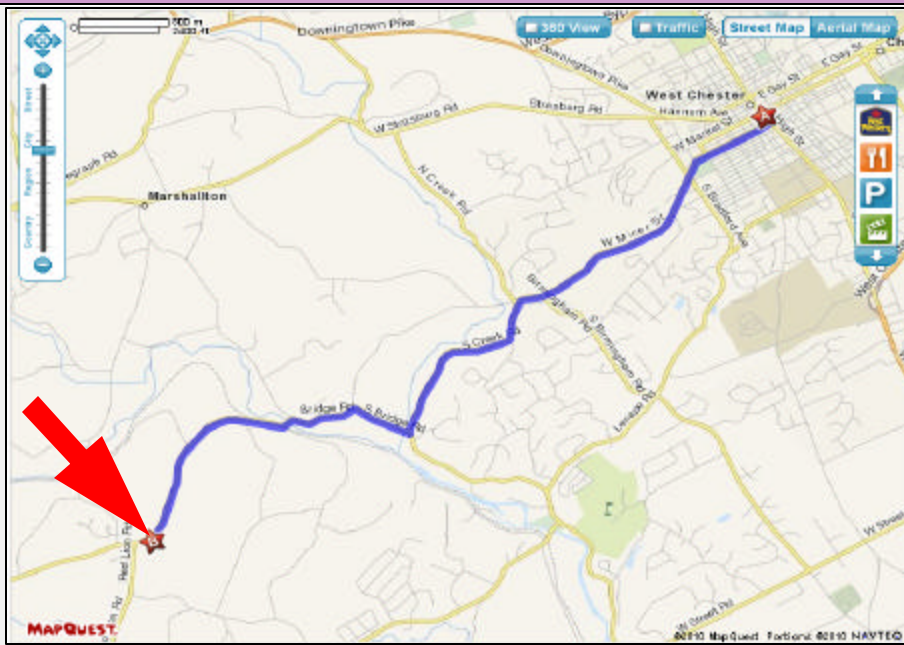
Space Place (Cont'd)

(Continued from page 10)

night. And maybe with queue observing, some of the romance is gone. Still, my colleagues and I couldn't help saying as we stared out across the moonlit mountains: I can't believe how lucky we are to be here.

Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at <http://www.science.nasa.gov/astrophysics/>. Kids can explore these topics at <http://spaceplace.nasa.gov/space>.

CCAS Directions



Brandywine Valley Association

1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090

<http://brandywinewatershed.org/>

BVA was founded in 1945 and is committed to promoting and protecting the natural resources of the Brandywine Valley through educational programs and demonstrations for all ages.

Brandywine Valley Association

The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Valley Association.

To get to the Myrick Conservation Center 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 left 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 left through the gate and drive up the farm lane about 800 feet to the top of the hill. The observing area is on the right.

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).

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 113 in Merion Science Center (formerly the Boucher Building), attached to the Schmucker Science Center. The Schmucker Science Center is located at the corner of S. Church St & W. Rosedale Ave. Parking is generally available across Rosedale in the Sykes Student Union parking lot (Lot K).



Observing (Cont'd)

(Continued from page 5)

Comets: There are no comets brighter than 10th or 11th magnitude in the sky during September.

Meteor showers: There are no significant meteor showers during September. I can't complain, even a night after the peak of the Perseid meteor shower last month we saw at least three dozen meteors in an hour or two, several leaving long trails as would come from Mickey the Mouse's magic wand!

CCAS Membership Information and Society Financials

Treasurer's Report

by Don Knabb

Aug 2012 Financial Summary

Beginning Balance	\$1,488
Deposits	\$284
Disbursements	\$264
Ending Balance	\$1,508

New Member Welcome!

Welcome new CCAS members John Harp of Parkesburg, PA, and Dr. Peter Zimmer of West Chester University.

We're glad you decided to join us under the stars! Clear skies to you!

Membership Renewals

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

Don Knabb
988 Meadowview Lane
West Chester PA 19382

The current dues amounts are listed in the *CCAS Information Directory*. Consult the table of contents for the directory's page number in this month's edition of the newsletter.

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

Phone: 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:

<http://www.darksky.org>

Note that our CCAS Webmaster John Hepler has a link to the IDA home page set up on our Society's home page at <http://www.ccas.us>.

Dark-Sky Website for PA

The Pennsylvania Outdoor Lighting Council has lots of good information on safe, efficient outdoor security lights at their web site:

<http://www.POLCouncil.org>

Find out about Lyme Disease!

Anyone who spends much time outdoors, whether you're stargazing, or gardening, or whatever, needs to know about Lyme Disease and how to prevent it. You can learn about it at:

<http://www.LymePA.org>

Take the time to learn about this health threat and how to protect yourself and your family. It is truly "time well spent"!

CCAS Event Information

We've set up a special phone number you can dial to find out if our monthly observing session and other scheduled events will be held or postponed. Call **610-436-0829** after 5 PM ET to hear a recording to find out the latest news.

Good Outdoor Lighting Websites

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? Check out these sites and pass this information on to others. Help reclaim the stars! And save energy at the same time!



Light pollution from poor quality outdoor lighting wastes billions of dollars and vast quantities of valuable natural resources annually. It also robs us of our heritage of star-filled skies. Starry Night Lights is committed to fighting light pollution. The company offers the widest selection of ordinance compliant, night sky friendly and neighbor friendly outdoor lighting for your home or business. Starry Night Lights is located in Park City, Utah.

Phone: 877-604-7377
Fax: 877-313-2889

<http://www.starrynightlights.com>



Green Earth Lighting is a dedicated lifetime corporate member of the International Dark-Sky Association. GEL's products are designed to reduce or eliminate the negative effects outdoor lighting can have while still providing the light you need at night.

Green Earth Lighting LLC
620 Onion Creek Ranch Rd
Driftwood, Texas 78619

Phone: 512-944-7354

<http://www.greeneearthlighting.com>

Local Astronomy-Related Stores

Listing retail sites in this newsletter does not imply endorsement of any kind by our organization. This information is provided as a service to our members and the public only.



Skies Unlimited is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, Stellarvue, Takahashi, Vixen, Losmandy and more.

Skies Unlimited
Suburbia Shopping Center
52 Glocker Way
Pottstown, PA 19465

Phone: 610-327-3500 or 888-947-2673
Fax: 610-327-3553

<http://www.skiesunlimited.net>



Located in Manayunk, Spectrum Scientifics educates and entertains customers with an array of telescopes, microscopes, binoculars, science toys, magnets, labware, scales, science instruments, chemistry sets, and much more.

4403 Main Street
Philadelphia, PA 19127

Phone: 215-667-8309
Fax: 215-965-1524

Hours:

Tuesday thru Saturday: 10AM to 6PM
Sunday and Monday: 11AM to 5PM

<http://www.spectrum-scientifics.com>

CCAS Information Directory

CCAS Lending Telescopes

Contact Don Knabb 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. Don's phone number is 610-436-5702.

CCAS Lending Library

Contact our Librarian, Barb Knabb, 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. Barb's phone number is 610-436-5702.

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: newsletter@ccas.us

Or mail the contribution, typed or handwritten, to:

John Hepler
2115 Lazor St.
Apt. 227
Indiana, PA 15701

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 John Hepler, the newsletter editor, at: newsletter@ccas.us.

CCAS Website

John Hepler is the Society's Webmaster. You can check out 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 copyrighted material! Give your contributions to John Hepler at (724) 801-8789 or e-mail to webmaster@ccas.us

CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "nights out" for school, scout, and other civic groups.

CCAS Executive Committee

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

President:	Roger Taylor 610-430-7768
Vice President:	Liz Smith 610-842-1719
ALCor, Observing, and Treasurer:	Don Knabb 610-436-5702
Secretary:	Ann Miller 610-558-4248
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 724-349-5981
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 Membership Renewals on the front of each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178

Phone: **610-436-5702**
e-mail: treasurer@ccas.us

Sky & Telescope Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$32.95**, much less than the newsstand price of \$66.00, and also cheaper than individual subscriptions (\$42.95)! Buying a subscription this way also gets you a 10% discount on other Sky Publishing merchandise.

To **start** a **new** subscription, make **sure** you make out the check to the **Chester County Astronomical Society**, note that it's for *Sky & Telescope*, and mail it to Don Knabb.

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders. If you have **any** questions call Don first at 610-436-5702.

Astronomy Magazine Group Rates

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