



OBSERVATIONS



A MONTHLY PUBLICATION OF THE
Chester County Astronomical Society

★ *President:* Mike Turco
★ *Treasurer:* Pete LaFrance

JUNE 2001
(VOLUME 9, NO. 6)

★ *Vice President:* Steve Limeburner
★ *Secretary:* Doug Liberati

http://members.tripod.com/~ccas_2/ccas.html

CCAS June Meeting & Observing Session

DATE: Friday/Saturday June 15/16, 2001
TIME: sunset
PLACE: Brandywine Valley Association
LOCATION: PA Route 842
West of West Chester, PA (see map)

During the summer months of June, July and August we combine the Observing Sessions with the meetings. The June Observing Session will be on Friday June 15, 2001 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 June 16, 2001. 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 `scope. CCAS Observing Sessions are always free of charge. Children are always welcome as long as an adult accompanies them.



CCAS Officer Elections

At the May meeting, the election of officers was completed. The term of office for these positions is June 2001 through May 2003. The winners were:

President: Mike Turco
Vice President: Steve Limeburner
Secretary: Doug Liberati
Treasurer: Pete LaFrance



Public Open House: F & C Observatory

There will be a **FREE** public open house program at the University of Pennsylvania's Flower & Cook Observatory in Malvern, PA on Friday June 29, 2001 at 8:30 p.m. EDT. There will not be a formal program, just observing with the Observatory's telescopes. The Observatory is located on Providence Road, just west of the intersection with Warren Avenue. A map is included on a later page.



Calendar Notes

June 15/16, 2001 (Friday/Saturday)	CCAS Meeting & Observing Session Location: BVA sunset
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June 21, 2001 3:38 a.m.	Summer Solstice Northern Hemisphere
June 22-24, 2001	Mason-Dixon Star Party Location: Spring Valley Park in York County PA
July 20/21, 2001 (Friday/Saturday)	CCAS Meeting & Observing Session Location: BVA sunset
July 25-28, 2001	ALCON 2001 Astronomical League National Meeting Location: Frederick, Maryland
August 11/12, 2001	Perseid Meteor Shower Location: everywhere early morning hours
August 17/18, 2001 (Friday/Saturday)	CCAS Meeting & Observing Session Location: BVA sunset

Observations Editorial Staff

Editor in Chief: James J. Anderson

Note: This month's newsletter is somewhat abbreviated because I am moving on June 1. My new address is listed in the CCAS Information Directory.

Newsletter Deadlines

These are the deadlines for submitting material for publication in the newsletter, through the August 2001 issue.

<u>Issue</u>	<u>Deadline</u>
July 2001	06/26/2001
August 2001	07/27/2001



CCAS Beginning Astronomy Class

This series of eight classes has been completed. Congratulations to all who finished the course! We hope you have learned a lot and will enjoy astronomy even more in the coming months.

Kaitlyn Rocklage was the lucky winner of the 4.5" Newtonian telescope donated by John Black.

In the autumn, we will have an Intermediate Astronomy class.



Telescopes and Members Needed: FCO

On Friday June 22, 2001, there will be a gathering of UPenn students in the Veterans' Upward Bound Program at the Flower & Cook Observatory. About 50 people are expected, so FCO Director Deb Goldader would really appreciate some help from CCAS members. If you can bring a telescope, that would be even better. For more information, contact Deb Goldader at 610-407-9213.



President's Message June 2001

Camelot Lost

Those of us who attended the May meeting were treated to a great video episode from the *From the Earth to the Moon* series. It explained how the Apollo 15 crew members were educated to observe rock and mineral formations, so that they could identify and retrieve the most useful specimens from the moon. We also had commentary and Q&A with Dr. Allen Johnson of the Geology & Astronomy Dept. of West Chester University, which really made it a good and informative evening. Kudos to Steve Limeburner for arranging the session.

However, in typical Gemini fashion, I found the show both enjoyable and frustrating. At the same time I was absorbed in the story, I was reminded why the Apollo program died and that we've never gone back to the moon.

At one point in the show, the crews are told that two Apollo missions were scrubbed due to cost cutting. This was in 1970. No mention was made of why this happened. Those of us who were around then, however, should remember. There was this undeclared "conflict" going on that was not only laying waste to a country and its people, but it was ripping apart the American social fabric and, if that wasn't bad enough, was an economic disaster. The Vietnam War cost the U.S. a billion dollars a month. A *billion a month!* Not even our economy could withstand that. 58,000 U.S. soldiers and countless Vietnamese killed, a divided nation, an economy that took years to recover, all for what? To save political face? History has shown it sure wasn't the Domino Theory we needed to worry about. No wonder the Apollo program was cut. We couldn't afford to explore the craters of the moon while cratering Southeast Asia with bombs.

In another segment, a geology professor expresses his opinion that robots could go to the moon and do the same job cheaper and safer. That belief carries on today. To that I say what Hawkeye Pierce in M.A.S.H. said to B.J. Hunnicutt when B.J.

was going to write home to his wife and tell her he strayed: *NO, NO, NO, NO, NO!!!* There is no way a robot can do

what humans can in a situation like space exploration, which calls for reason, judgment, quick thinking and the ability to react and adjust to change. In the video this was shown to be true in the Apollo astronauts' success in retrieving the specimens that answered the most pressing geological questions about the moon's origin. More recently, we've seen the limitations of the robotic devices tried on Mars. Yes, they obtained information and some terrific photos, but what we've gotten can't begin to compare to what we would have if astronauts had made the journey. Let's spend a month's war cost for that.

Unfortunately, it's not just a matter of money. As the episode ended, I realized it has been almost 30 years since man walked on the moon. Thirty years, and absolutely no indication that we will do so again in my lifetime. Is that progress? Would we not have a moon base now if Apollo and successive programs been allowed to continue, even in a limited sense? Would we not likely have already been to Mars?

What is even more frustrating is what Gordon Cooper, one of the original Mercury astronauts, reported in his book *Leap of Faith*. Cooper said that when the Apollo program was cancelled, government cost cutting didn't stop at mothballing the hardware. Senator William Proxmire, a member of the Budget and Space committees, made sure to prevent future spending by seeing that the entire Saturn V production and assembly line was shut down, and the machinery and tooling necessary to build the rocket was destroyed. We have no heavy launch capability left. We couldn't send a man to the moon now if we wanted to without starting over again in this regard, and that would be very costly to do. The plan to avoid future spending on manned space exploration succeeded all too well. And that is a damn shame.

So with a limited budget to work with, NASA continues to peck away at exploring our extraterrestrial neighbors. A faulty rover prematurely ends a Martian voyage to find evidence of life. Another try ends with a lost probe that couldn't survive the landing. Then they lose contact with the orbiter that launched the probe. Around the moon, an orbiter shows evidence of water ice at the lunar south pole. Other remote sensors render this evidence inconclusive. One thing you can be sure of: had a human been there, we'd know a hell of a lot more about Mars and the Moon. We wouldn't be relying on inadequate wheeled robots, faulty orbiters and crashed probes. And had Gordon Cooper been tooling around Moon Base Alpha, we'd know for sure if any ice existed there, and a hell of a lot more.

So while the video was enjoyable and the meeting quite informative, I was left feeling cheated. The Apollo program was Camelot, and we didn't even know it.

Bartender, make mine a double.

Mike Turco



Astronomus: 2

A Journal for Young Astronomers

By Bob Popovich

“Hey, It’s #@&* $\$^+$ Out Here!”

Have you ever met someone who wanted to stargaze but was afraid of the dark? Getting my 10 year-old friend out under the stars took some doing, but it was worth it.

We were all set to go out with the Big Dipper, Polaris and Lyra on our observing list. No sooner had we left the house than was the silence broken by the nervous words “Hey, it’s dark out here!”

Having heard that, step one had to be to reassure my friend that darkness was good for stargazing. Then I handed him my flashlight to help illuminate the way. By the way, paint the lens of the flashlight with red nail polish because red light is much easier on the eyes than bright, white light.

My *braver* young friend lead the way down a slight hill to a field that had an unobstructed view in all directions. I followed as he decided upon the spot where we’d set up. But it didn’t take long for him to realize that two things weren’t right: the air was getting cool and damp, and we were being assaulted by bugs. As it happens, both problems are related to the fact that we had picked a low-lying place for observing. The heavier, damp air settles in the low spots first; and brings the bugs with it.

My friend, however, was firmly fixed on doing some observing, and nothing was going to stop him. So back up the hill we went. We shared the hilltop view with some trees, but we were much more comfortable.

We opened up our beach chairs (great for observing and easy to carry!) and settled down to business.

Finding Ursa Major (the Big Dipper) was easy enough, but Polaris was a challenge. “Stretch out your arm and hold your hand so it covers the bowl of the Dipper. Extend your index, middle and ring fingers. See how the fingers cover the space between the two stars at the end of the bowl? Those two stars point the way to Polaris and the 3 fingers (equal to 5°) are your ruler.”

“Now what?” Was the excited question.

Following the pointer stars, I explained that by measuring **X** 3-finger distances out from the bowl, he would find Polaris. *If you know how many 3-finger distances it is from the pointer stars to Polaris, e-mail me at b2n2@aol.com and we’ll proudly publish your name in the next issue.*

“There it is!” He shouted.

I asked him to look away for a moment and then try to find the North Star again. Up went the arm, the distance was measured and he acquired the target in no time (that’s astronomy talk for finding what you’re looking for).

“Do you see that star in the Dipper’s handle with another star really, really close to it?” He asked. Very good, I thought, he spotted the pair of stars named Mizar and Alcor on his own.

Then, my courageous friend explained to me, since the Big Dipper always points the way to Polaris, there’s no reason to

be scared or confused in the dark because you can always get your directions (as long as it’s not overcast).

A call to return to the house pulled us back to Earth. “But mom, it’s so cool out here! Can I stay out a little while longer?”

We know the feeling...

We never did get to Lyra, did we? So next time, *The Music of The Night*.



“Well, not exactly...” and a Challenge

By Ed Lurcott

In the CCAS Beginning Astronomy class, we taught that the Earth orbits the Sun in 365.25 days, the Moon orbits the Earth in 27.32 days, and that we see the same side of the Moon all the time. Well, as with any subject, the deeper we dig into it the more complex things become. So here are a few complications concerning the Earth-Moon system.

We said above that the Moon orbits the Earth. But as in the Hertz Rent-a-Car ad we must also say “Well, not exactly...”. The Moon and the Earth actually orbit their common center of gravity. Where is that? It is about 3000 miles toward the Moon from the **center** of the Earth. Since Earth’s radius is almost 4000 miles that puts the center of gravity of the Earth-Moon system 1000 miles **below** the surface of our Earth. So, what effect does this have?

One effect is that the Earth does not orbit the Sun in a nice curving line but in a curved wavy line. When the Moon is New (between the Earth and the Sun), Earth is 3000 miles further from the Sun than average. And when the Moon is Full (opposite the Sun), the Earth is 3000 miles closer to the Sun than average. But 3000 miles is only 0.003% of the distance to the Sun, and far too small to make any noticeable difference.

Another effect is that the Earth will speed up in its orbit when the Moon is New, and slow down when the Moon is Full. These effects are also very small indeed when compared to the Earth’s average orbital velocity of 66,629 miles per hour. So once again we have to say “Well, not exactly...”

We also stated above that we see the same side of the Moon all the time. Actually, we are able to see about 59% of the Moon’s surface from Earth. Of course, we can only see 50% at any one given time. There are two major and two minor causes which contribute to the increase.

The first major cause is known as *longitudinal libration*. The Moon rotates (yes, it rotates on its axis once per orbit) very steadily. Because it orbits in an ellipse, though, the Moon speeds up in its orbit near perigee (the point nearest to Earth) and slows down near apogee (the point furthest from Earth). We therefore are favored to see almost 8° in longitude around the right-hand side of the Moon after perigee, and favored to see almost 8° around the left-hand side after apogee.

The second major cause is known as *latitudinal libration*. The Moon’s equator is tilted 6 2/3° to the Moon’s orbital plane. This allows us to see 6 2/3° beyond the Moon’s north pole

when that pole is tilted toward Earth, and $6\frac{2}{3}^\circ$ beyond the Moon's south pole when that pole is tilted toward Earth.

The effect of these two major causes can be observed by the careful observer by noting the proximity of certain craters and Maria to the lunar limbs at various times during the lunar month.

Two minor effects (not noticeable to the visual observer) also contribute to seeing more of the lunar surface. One is the small angle produced by considering different observing locations on opposite sides of the Earth. This angle adds about 1° to the other major librations and is known as *diurnal libration*. The last effect is known as *physical libration* and is very small, only 0.1° , and is caused by gravitational irregularities in the rotation rate of the Moon.

The areas of the Moon which can be seen during these various librations are called *libration zones*, and are included in more advanced maps of the lunar surface.

In spite of all these libration effects, there is still 41% of the Moon's surface that is **always** visible from the Earth.

Now back to our original question: do we always see the same side of the Moon all the time? Well, not exactly...

Our challenge, then, is to observe the effects of longitudinal libration and latitudinal libration over the course of a lunar month or two. Sketches or photos will show the effects nicely.

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Telescope for Sale

For Sale: Early vintage Meade 2045 LX-3, Schmidt-Cassegrain telescope, in excellent condition. This is a 102mm (4 inch) aperture f/10 scope. These earlier design Meades, which were manufactured in Japan, are known for their superior optics. Scope includes Quartz R.A. drive, adjustable reticle output, plug for external drive corrector, map light and DEC drive output. All aluminum construction (no plastic). I consider this a "poor man's" Questar. Included in this package is a JMI DEC motor and the original Meade hard shell case and table-top tripod legs. The scope also has provisions for mounting on an equatorial wedge. This scope is a perfect starter scope, or 2nd travel scope. The tube can be easily removed from the fork mount and used in piggy back mode, or as a guiding scope for a larger telescope. \$550.

Call Frank Angelini at 610-873-7929.

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CCAS Information Directory

CCAS Lending Telescope

Contact Kathy Buczynski to make arrangements to borrow the Society's lending telescope. CCAS members can borrow the 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, Bill O'Hara, to make arrangements to borrow one of the books in the CCAS lending library. Copies of the catalog are available at CCAS meetings. Bill's phone number is 610-696-1422.

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 email message and send it to

jimanderson1956@aol.com

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 by 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:

jimanderson1956@aol.com

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): Frank Angelini
(610-873-7929)

Lunar: Ed Lurcott
(610-436-0387)

Double Star: Jim Anderson
(610-857-4571)

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 Officers

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

President: Mike Turco
(610) 399-3423

Vice Pres: Steve Limeburner
(610) 353-3986

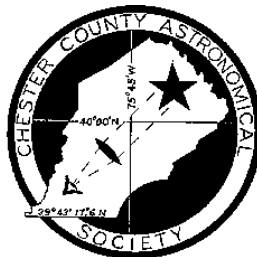
Treasurer: Pete LaFrance
(610) 268-2616

Secretary: Doug Liberati
(610) 827-2149

**ALCor and
Newsletter:** Jim Anderson
(610) 857-4571

Librarian: William O'Hara
(610) 696-1422

Observing: Ed Lurcott
(610) 436-0387



CCAS Membership Information

The present membership rates are as follows:

REGULAR MEMBER.....\$20/year
SENIOR MEMBER.....\$10/year
STUDENT MEMBER.....\$ 5/year
JUNIOR MEMBER.....\$ 5/year
FAMILY MEMBER.....\$ 30/year

Membership Renewals

Check the date printed on the address label of this issue of *Observations*; "exp." appears in front of it, just after your name. If you are due to renew, you may send your renewal check made out to our Treasurer, Pete LaFrance. Mail to:

Pete LaFrance
413 Church Rd.
Avondale, PA 19311-9785

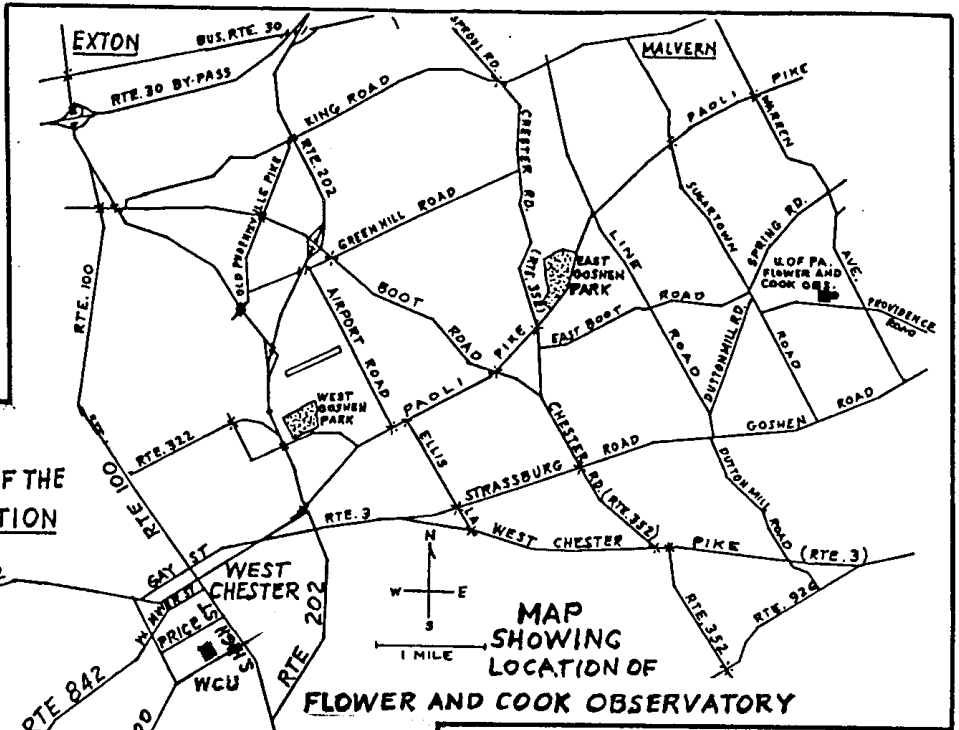
Sky & Telescope Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **\$29.95** which is much less than the newsstand price of \$54.00, and also cheaper than individual subscriptions (\$39.95)! Make out a check to the Chester County Astronomical Society, note that it's for *Sky & Telescope*, and mail to Pete LaFrance. Or you can bring it to the next Society meeting and give it to Pete there. Buying a subscription this way also gets you a 10% discount on other Sky Publishing merchandise.

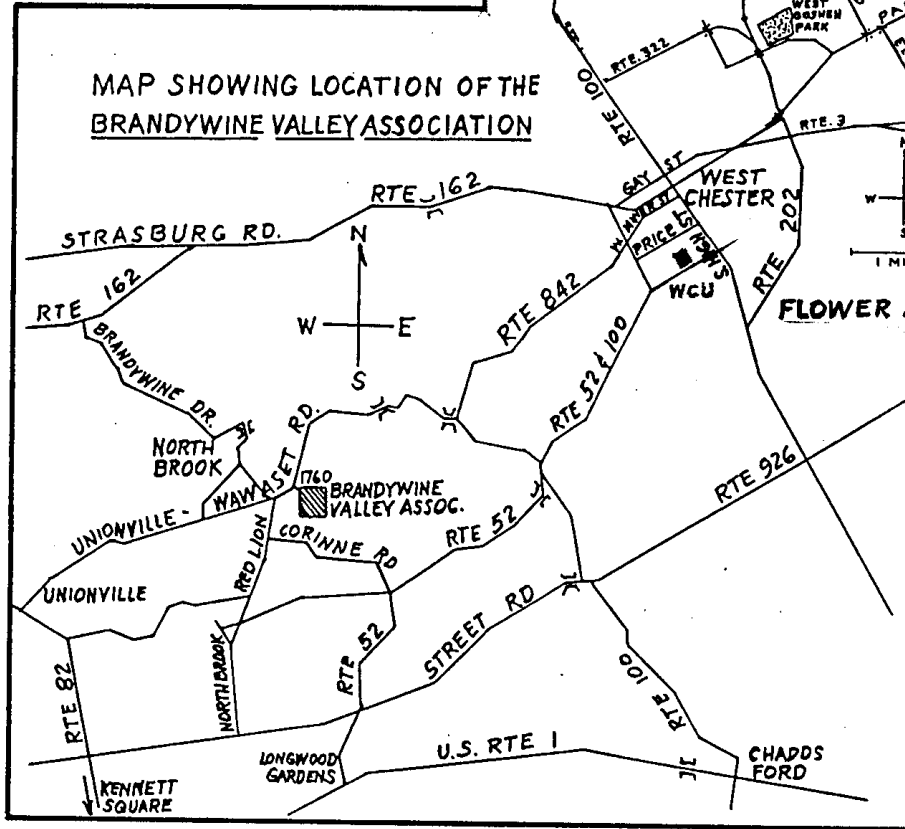
CCAS Website

Pete LaFrance is the Society's Webmaster. You can check our Website at:
http://members.tripod.com/~ccas_2/ccas.html

Pete 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 Pete LaFrance (610-268-2616) or e-mail to lafrance@chesco.com



MAP SHOWING LOCATION OF THE
BRANDYWINE VALLEY ASSOCIATION



MAP
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FLOWER AND COOK OBSERVATORY