OBSERVATIONS

A MONTHLY PUBLICATION OF THE
CHESTER COUNTY ASTRONOMICAL SOCIETY

★President: Mike Turco ★Vice President: Kathy Buczynski
★Treasurer: Pete LaFrance ★Secretary: Frank Angelini

JULY 1998
(VOLUME 6, NO. 7)

CCAS June Meeting

DATE: **Friday July 24, 1998**
RAIN DATE: Saturday July 25, 1998 (regardless of weather)
TIME: 8:15 p.m. EDST
PLACE: **Brandywine Valley Association** (BVA)
LOCATION: 1760 Unionville-Wawaset Rd. (PA Route 842) West Chester, PA (map is included)

Special Note: During the summer months of June, July, and August, the monthly meeting will be combined with the Observing Session out at the BVA. There will not be any meetings at West Chester University in July and August. That means that if the Friday Observing Session evening is clouded out, we will hold the meeting on Saturday evening, even if that night is also clouded out. Summer meetings start at about 8:15 p.m.

To get to the observing site at the BVA, from the main parking lot by the office, go up the farm lane to the left, 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. At the observing sessions, there will be help available to set up and use your telescopes. 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 free of charge. Children are always welcome as long as an adult accompanies them.

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Upcoming Events

Next CCAS combined Observing Session and Meeting:
August 28 (29)

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Request for Astronomical Pictures

Pete LaFrance is working on a Web page for the Society. He would like to include some pictures taken by CCAS members. The pictures (or CCD images, on a diskette) can be of any astronomy subject or object, or related to space exploration. The only requirement is that it is your own photo/image; no copying copyrighted images!! Give your contributions to Pete LaFrance (268-2616).

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July's Skies

Moon Phases

First Quarter	07/01
Full Moon	07/09
Last Quarter	07/16
New Moon	07/23
First Quarter	07/31

The Planets

Mercury is visible in the evening sky during the first 2 weeks of July. It will be visible in the west-northwest about an hour after sundown. Careful; you could confuse it with Regulus, in Leo, which will be above Mercury and to the left.

Venus is low in the east before sunrise in July.

Mars is rising in the morning sky, later than Venus, so it is not well placed for telescopic observations yet.

Jupiter is rising in the east around midnight in early July; by month's end it is rising around 10:00 p.m. EDT.

Saturn is to the east of Jupiter, rising about 3 hours later. For the next couple of months, our viewing angle of Saturn is such that in a telescope you will be able to see part of the shadow that the planet casts on its rings.

Uranus and Neptune are in Capricornus, and getting rather high in the southeast by midnight.

Pluto is in Ophiuchus, just north of the head of Scorpius. It is getting fairly high in the southern sky as twilight fades. It requires at least an 8" - 10" telescope, dark skies, and lots of patience to bag Pluto.

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July 2, 1998

To all members of the Chester County Astronomical Society:

My first official action as President of our Society is to acknowledge the efforts of Ed Lurcott. He has led the Society through its formative years and laid the groundwork for its future. I want to personally thank Ed for his time and work. It is great to be associated with someone with Ed's character and experience, and his willingness to share his experience and knowledge with us. We are all the richer for it. I'm sure you all read his letter in last month's newsletter. I dare say that the membership would be happy if you serve as Observing Chair for the Society, Ed. We hope you stick around for a long, long time.

As a Society we are moving forward. The officers held an informal executive committee meeting in May and began to formulate plans. Briefly, we are thinking of action on the following issues.

- Education. Establishing relationships directly with schools; possibly developing a basic astronomy course. Kathy Buczynski is spearheading work on this issue.

- Astronomy Day 1999. Mall exhibit again. Possibly hold a symposium. Suggested places are WCU, Exton Library or the Flower & Cook Observatory. Extra effort will be needed to improve the event each year. Advertising, admission charge and pre-printed programs have been suggested as considerations. This subject will continue to be discussed over the next few months.

- Member Interests. To help determine our abilities to accomplish any endeavor, whether it be to erect a small observatory, build a telescope, or assist in the teaching of a symposium, a Member Interests form has been distributed. Please complete these so that we may determine our true capabilities and to help steer the Society in the direction of member interest.

- Observatory Committee. Working to the mutual benefit of the Society and the Flower & Cook Observatory. Discussions continue on designing, erecting and operating a Dobsonian reflector using a mirror furnished by the Observatory, for the benefit of the Society members and the public.
  Also, the viability of a scope located on BVA property has been put forth for discussion. I believe at least one of these projects can be carried out. This will mean the coordinated efforts of many in the Society, but I think we have the right stuff to make it happen.

- Publicity. Getting meeting notices in newspapers, advertising the observing sessions, etc. This could lead to increasing membership and a greater public awareness of who and what we are.

- Non-profit Organization. We may need to become one to take on some of the projects described above.

- Trips/Dark-Sky Excursions. Several members have expressed interest in overnight excursions or a trip out west to do some real dark-sky observing and have some other fun at the same time.

- Internet Web Site. Establishing a web site for the Society is in the works. Pete LaFrance is heading this effort.

- Constitutional Issues. Items on the table include formalizing the composition of an executive committee, membership requirements, and specifying vice-presidential duties.

The Chester County Astronomical Society has been and will be a reflection of the make-up, interests and efforts of its membership. Its emphasis on observing the sky is one that I value highly and want to retain. There is obviously a lot we can do and yet remain an amateur astronomy society that emphasizes what I feel is the aspect that makes it a club of choice.

To that end I propose the Society's motto should be: *"Promoting astronomical observation and knowledge to members and the community."* I hope you all feel the same. I look forward to functioning as President for the betterment of the Society and its members. I hope I can do as well as my predecessor.

Yours truly,
Mike Turco
President CCAS

Heavenly Hero by Jim Anderson

Riding high in our July evening sky, almost straight overhead, is the constellation Hercules. The constellation is composed of fainter stars, the brightest being a third magnitude variable star. However, convenient guideposts are nearby. First magnitude Arcturus is nearby to the west, and brilliant Vega is nearby to east. The outline of this constellation does look somewhat like a man, if you remember that Hercules is upside-down as we see him in the sky: his head is to the south, and his feet are to the north. Looking at the outline on the all-sky chart in the July 1998 issue of *Sky & Telescope*, his head is at Alpha (α) Herculis. From there his strong, broad shoulders bulge out at the stars Beta (β) and Delta (δ) Herculis, where his arms are attached. One arm is upraised holding a club. From there his muscular torso slims down to his smaller waist and belt at the stars Epsilon (ε) and Zeta (ζ) Herculis, the "bottom", or southernmost, stars of the keystone asterism of Hercules. The keystone itself represents the lower part of Hercules' tunic, which hangs below his belt. From the northern end of the keystone extend Hercules' legs. Note that he is kneeling.

Hercules is of course one of the most famous heroes of the classical world. We all know, from watching his many movies and TV shows, that he was extremely strong. What may not be as obvious from those sources is that Hercules was revered throughout the ancient classical world surrounding the Mediterranean Sea. The ancient myths tell us that Hercules was the half-mortal son of Zeus (Jupiter in the Roman pantheon of gods). Hercules performed many noble tasks during his earthly life, the most famous of which are known as the Twelve Labors of Hercules. As a reward for his bravery, Zeus made Hercules one of the gods after he died, placing him amongst the stars for all eternity.

Older myths from the area surrounding the Euphrates River seem to associate the stars of Hercules with the sun god Izhdubar (a.k.a. Nimrod or Gilgamesh), and the constellation Draco with the great dragon Tiamat. The Chaldean myths from this area said Izhdubar killed Tiamat, and so he is shown in the sky with a foot on the head of Tiamat (Draco). Many students of mythology believe that this older Chaldean myth is the source of the later myths of Hercules and Hydra. In the later myths, the Twelve Labors are said to represent the passage of the Sun through the twelve constellations of the zodiac. This may represent another link back to the earlier myths, when this figure was seen as a sun god.

So first he was a sun god, then he was half-god and half-mortal. Then he became a god again. However you choose to look at Hercules, we astronomers know that Hercules is great. When Hercules rides high in the summer sky, we always take time to gaze at the deep-sky wonders therein. Modern day hero-worship? Nah.

Couldn't be.

Or could it???

Have Fun, and Clear Skies!

References:

Star Names: Their Lore and Meaning, R.H. Allen, 1899

Skywatching, David H. Levy, 1994

Stars and Planets (Peterson's Field Guides), Donald H. Menzel and Jay M. Pasachoff, 1983

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Moonshots, Part 1 by Frank Angelini

If you'd like to take pictures through your telescope, shooting the Moon is a good place to start. If you're starting out in astrophotography the Moon is the best target. Compared with most other celestial objects, the Moon has a decided advantage: it's bright! This makes it easy to find, easy to focus on, and allows exposures to be short. It also means you can photograph the Moon from a city: there's no need to worry about light pollution on an object as bright as the Moon.

For lunar photography, as with most astronomical photography, the best camera to use is a 35mm single-lens reflex, or SLR. There are hundreds of models available on the market today, each loaded with features. But for taking shots through your telescope, the most important feature is a removable lens. The second requirement is that the camera must allow you to change shutter speeds with a manual control. Ideally, the camera also should have mirror lock-up and a self-timer. These reduce camera shake by locking the mirror up out of the way before the shutter is released, and by allowing you to keep your hands away from the camera at the moment the shutter opens and closes. Another nice feature is a mechanical shutter, one that operates without battery power. It's a feature you'll appreciate on chilly nights.

THREE STAGES

There are basically three ways to photograph the Moon. The first doesn't even require a telescope. Simply mount a telephoto lens (135mm or longer) on your 35mm camera, attach the camera to a tripod, and shoot. This method is good for shots of the crescent Moon setting in a twilight sky, the Full Moon rising, or other pictorial compositions.

The advantage of this technique is that it couldn't be simpler: literally point and shoot. The limitation is that even with relatively long telephoto lenses (500mm or so),

the image of the Moon will be small. **To determine the size in millimeters of the lunar image on your frame, divide the focal length of your lens or telescope by 110. A 500mm telephoto will produce a Moon about 4.5 mm across, still a small disk compared with the 24mm height of the frame.** To reveal individual craters on the Moon, you need to use a focal length longer than 500mm. This is where your telescope comes in. Even a modest 60mm-aperture refractor usually has a focal length of 700mm or more. Telescopic photography will be covered in later parts of this article.

WHEN TO LAUNCH

Because the Moon moves around Earth, it is not always in the same place in our sky. The phase of the Moon for any given date can be found in your local newspaper, or in *Astronomy, Sky & Telescope,* or *Observations* each month. As a general rule, the waxing crescent, First Quarter, and waxing gibbous phases are visible in the evening sky. The Full Moon is directly opposite the Sun and, therefore, visible all night. To catch the waning gibbous, Last Quarter, or waning crescent you have to go out late at night or very early in the morning. While the Full Moon tends to attract the most attention, it is not the best phase to photograph. The side we see at Full Moon is illuminated by direct sunlight, eliminating shadows. The Full Moon looks flat, with no contrast. The best time to photograph the Moon is during the crescent, Quarter, and early gibbous phases. During these times, long shadows from mountain ranges, crater ridges, and other lunar features create striking contrasts along the terminator, the day/night line on the Moon. For the sharpest shots always try to photograph the Moon when it is as far above the horizon as possible. The higher in the sky, the less atmosphere there is to look through, which means the image is affected less by turbulence. For thin crescent phases there is not much you can do because the crescent Moon is always low in the sky when the Sun is below the horizon.

FUELING YOUR CAMERA

If you are using a clock drive, you're best off using a slow, fine-grained film. With a clock drive the longer exposures demanded by slow films are no problem. If you are not using a clock drive then your choice of film depends on the lunar phase. When full, the Moon is extremely bright and even slower films offer short exposures. During crescent phases the Moon is dimmer and faster films are better since they allow shorter exposures.

For color print work try the Ektar series of films, either ISO 25 or 100. If you prefer color slides, use Kodachrome 25 or 64 or Fuji Velvia; Ektachrome 100X or 100HC are also worth trying, as are comparable speed films from Fuji. For black and white photography, try Ilford's FP4 Plus, Kodak's T-Max 100, or Technical Pan 2415. If you need a faster film (such as for eyepiece projection shots), try Kodachrome 200, Ektachrome 400X, Fujichrome 400, or any of the ISO 400 color print films or black and white films.

AVOIDING OVEREXPOSURE

When determining exposures, don't use your camera's internal light meter if your telescope or lens has less than 2,000mm of focal length. Most camera light meters will be fooled by the large area of blackness surrounding the Moon, resulting in an overexposed Moon. If your telescope's focal length is 2,000mm or more, the Moon almost fills a 35mm frame and your camera's internal light meter will provide a more accurate metering.

For recommended exposures, see the table at the end of the article. However, whether you determine your exposure from a light meter or from a table, keep in mind that lots of variables other than phase can affect the brightness of the Moon. These include the Moon's altitude and the transparency of Earth's atmosphere. To ensure you get good photos at each shooting session, bracket your exposures: make some longer and some shorter than the recommended time. So, if 1/30 of a second is the recommended exposure, take shots at 1/8, 1/15, 1/30, 1/60, and 1/125 second.

HELPFUL HINTS

To reduce vibration use a cable release when tripping the shutter. Better yet, use the self-timer on your camera. Center the Moon and focus as usual. Once you are ready, cock the shutter, set the timer and release it, then stand back. The few seconds of waiting before the shutter fires will allow vibrations to die down. Always keep accurate records for each roll of film. Record the date, telescope, exposures, eyepiece, f/ratio, film, and some comments on the seeing conditions. Those notes are your best teaching tool. A final tip: start with tripod shots of the Moon. These simple methods will get you good results in your first rolls of film that will inspire you to try more advanced techniques with a telescope. Before long, you'll be a master at staging Moon shots.

MOON SHOT EXPOSURES

Try the following exposures when photographing different lunar phases with ISO 200 film at various f/ratios. These are based on the easy to remember sequence that as the Moon waxes in phase, it doubles in brightness at each successive phase. For example, a wide crescent Moon is twice as bright as a thin crescent Moon, and requires half the exposure time.

F/ratio	**Thin Crescent**	**Wide Crescent**	**Quarter**	**Gibbous**	**Full**
5.6	1/60	1/125	1/250	1/500	1/1000
8	1/30	1/60	1/125	1/250	1/500
11	1/15	1/30	1/60	1/125	1/250
16	1/8	1/15	1/30	1/60	1/125
22	1/4	1/8	1/15	1/30	1/60
32	1/2	1/4	1/8	1/15	1/30
44	1	1/2	1/4	1/8	1/15
64	2	1	1/2	1/4	1/8
88	4	2	1	1/2	1/4
100	6	3	1.5	1	1/2

For films other than ISO 200:

- For ISO 100 films, double the exposure times (for example, ¼ second becomes ½)
- For ISO 50 films, multiply exposures by 4 (¼ second becomes 1 second)
- For ISO 400 films, exposures are one-half those recommended above.

[*Editor's note: I rearranged Frank's article to fit it into the size available in the newsletter. Any lack of clarity in this article is therefore probably my fault, not Frank's. Complete copies of the original (unedited) article as Frank wrote it are available upon request.*]

CCAS Lending Library

Our Librarian, Bill O'Hara, has the books in our library all ready for members to borrow. You can drop by Bill's place (call first, of course) to borrow a book. Or you can call Bill before a meeting and ask him to bring a book to the meeting for you. The complete list of books is too big to include in the newsletter; there will be copies available at CCAS meetings. Bill's phone number is 696-1422.

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AL Observing Programs

One of the benefits of joining the CCAS is that you also become a member of the Astronomical League, a national federation of astronomy clubs. The AL has a series of Observing Awards, and 4 observing clubs based on these awards have been started in the CCAS. These are the Messier Club, the Binocular Messier Club, the Lunar Club, and the Double Star Club. Working on these awards also gives you a plan of observing: "What will I look at tonight?" becomes "Which Messier objects are visible tonight that I haven't seen yet?" Each club has a volunteer coordinator:

Messier Clubs (both): Bob Hartje (610-325-7285)
Lunar Club: Ed Lurcott (610-436-0387)
Double Star Club: Jim Anderson (610-380-4512)

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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 the editor at **SNY114@aol.com**
Or mail the contribution, typed or handwritten, to:

Jim Anderson
19 Bluff Road
Thorndale, PA 19372-1104

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CCAS Lending Telescope

You can make arrangements to borrow the telescope for a month by contacting Steve Leiden (296-3793). The 6" f/8 reflector can be borrowed by club members for a month at a time.

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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

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Sky & Telescope Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price, which is about half the newsstand price, and also cheaper than individual subscriptions! 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.

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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

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

President:	Mike Turco	(610) 399-3423
Vice Pres:	Kathy Buczynski	(610) 436-0821
Treasurer:	Pete LaFrance	(610) 268-2616
Secretary:	Frank Angelini	(610) 873-7929
ALCor and Newsletter:	Jim Anderson	(610) 380-4512
Librarian:	William O'Hara	(610) 696-1422
Observing:	Ed Lurcott	(610) 436-0387

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