OBSERVATIONS

A MONTHLY PUBLICATION OF THE
CHESTER COUNTY ASTRONOMICAL SOCIETY

★President: Edwin Lurcott

JULY 1996

★Vice President: Emil Volcheck

★Treasurer: Pete LaFrance

(VOLUME 4, NO. 7)

★Secretary: William O'Hara

CCAS July Observing Session

DATE: **Friday July 12, 1996**
RAIN DATE: Saturday July 13, 1996
(regardless of weather)
TIME: 8:15 PM EDT
PLACE: Brandywine Valley Association (BVA)
LOCATION: Brandywine Valley Association
1760 Unionville-Wawaset Rd
(PA Rte. 842)
West Chester, PA (see map)

Important Note: In July and August the monthly Society meeting is combined with the monthly observing session. Both are held at the BVA. If skies are bad on Friday, there is no meeting or observing. If skies are bad on Saturday, then the Society meeting will be held at the BVA, but there will be no observing session for that month.

At our July meeting, Ed Lurcott will have a presentation on the constellation Hercules. There will also be some time for questions from the floor. The BVA property is approximately six miles west of West Chester on Route 842. As usual, 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. A map is enclosed.

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CCAS August Observing Session

The August Observing Session and Meeting is scheduled for Friday August 16, with a rain date of Saturday August 17. Mark your calendars now so you don't miss it! August will be a big month for big planets: Jupiter, Uranus, and Neptune.

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CCAS June Observing Session

Friday night was cloudy, so only the Society meeting was held on Friday by the members and visitors in attendance. Vice-President Jim Sylvester presided, and announced the Society election results. Ed Lurcott was elected President, Emil Volcheck is Vice-President, Pete LaFrance is Treasurer, and William O'Hara is Secretary. Our thanks to all these members who have volunteered to keep our Society running for another year.

Kathy Buczynski then gave an excellent presentation on the constellation Bootes. This presentation was the first of what is intended to be an ongoing series. Each month we would like a Society member to give a brief presentation on a constellation, preferably one that is visible that month. Kathy has volunteered (Thanks, Kathy!) to coordinate this series. Contact Kathy if you'd like to volunteer to do a presentation.

On Saturday night we had clear skies for observing. As darkness fell, we had fun finding the first star to appear (Arcturus), and then picking out other bright stars and constellations as the sky got darker. Some hunted double stars in Bootes (from a list Kathy gave us the night before), some scanned the sky with binoculars, and some hunted down star clusters and galaxies. All present had a good time.

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CCAS at Mason-Dixon Star Party

Four members of CCAS and their family members attended the Mason-Dixon Star Party put on by the York County Parks Astronomical Society on June 14-16, 1996. Over 200 people were there from Delaware, Maryland, and Pennsylvania. Skies were heavy on Friday night but were excellent on Saturday night. Many observers stayed up all night.

Swap tables, vendors, and talk sessions were all available during the daytime.

Those attending from the CCAS were: Raefael Gonzales and his wife, Pete LaFrance and his son James, Ed Lurcott, and Chuck Shorten and his family.

It would be nice to have more CCAS members enjoy this event next June.

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July's Skies

Moon Phases

Full Moon	7/01
Last Quarter	7/07
New Moon	7/15
First Quarter	7/23
Full Moon	7/30

Blue Moon !! Again !!

If you use Universal Time for marking the Full Moon (see the June 1996 *Observations*), then there is a Full Moon on July 1, with another Full Moon on July 30. When there are two Full Moons in one calendar month, the second one is called a Blue Moon.

The Planets

Mercury will be lost in the Sun's glare during the first part of July, but emerges in the evening sky during the last week in July. Look for it in the west-northwest skies about 30-40 minutes after sunset. Binoculars may make it easier to find. On July 31, Regulus (α Leonis) will be only 1° away from Mercury.

Venus moves upward in the morning sky this month, and will be at its brightest for this morning-cycle on July 15. For most of the month (indeed, until September) it will be following Mars through the constellations. The big show, though, is on July 12. If you get up early enough, you will see a very brilliant Venus very, very close to a thin crescent Moon. In fact, early risers in Europe on that morning can watch the Moon occult Venus (meaning the Moon passes in front of Venus, hiding it from our sight.) The occultation will not have been over for long when the pair rises in our sky that morning.

Mars rises higher into the morning sky in July also. As noted above, it will not be too far away from Venus (about 10° away.) While Venus is at its brightest this month, Mars will be at its dimmest. It is still too far away for good telescopic viewing. But you can follow its track across the constellations with the naked eye during the coming months. That can be a good naked eye observing project. First draw the constellations it moves through (Taurus and Gemini), and then plot the position of Mars

and note the date. You could trace the constellation outlines from a book. As the months go by you will see the motion of the planet against the stars. That's how astronomy got started long, long ago. People noticed that certain stars moved around, and started keeping records of their motions. In fact, our word planet comes from a Greek word meaning "wanderer".

Jupiter will be rising at sunset at the beginning of July, and is at opposition on July 4. Being at opposition means that a planet is directly opposite the Sun in our sky. So on July 4, Jupiter rises as the Sun sets, crosses the meridian at midnight, and sets in the west as the Sun rises in the east on the following morning. After that, Jupiter will be appearing higher in the southeastern skies each night as the skies darken, and will be favorite target at star parties for the next 3 or 4 months. With binoculars or a small telescope you can follow the dance of the Galilean Moons. These are the four brightest moons of Jupiter, discovered by Galileo with his first telescope. You can easily see and sketch their positions from night to night. The monthly astronomy magazines publish position charts to help you identify these four moons.

Saturn is rising in the east at around 1 PM on July 1, and rises around 11 PM by the end of July. The ring system will be at its greatest angle of tilt for the year during July, a little over 6°. Interesting factoid for cocktail parties: Saturn is actually not in any of the 12 zodiacal constellations this month! It is in a corner of Cetus, the Whale, near Pisces. Constellation boundaries were re-drawn in 1930, and now a planet occasionally ends up outside the zodiac.

Uranus reaches opposition on July 25, and is in Capricornus, shining at about magnitude 5.7. With dark enough skies, and a good star chart, you could possibly find it with the naked eye. Yet it was never discovered until long after the telescope was invented! William Herschel discovered it in 1781.

Neptune is about one binocular field east of brighter Uranus. Neptune shines at about magnitude 7.8 in the constellation Sagittarius. It reaches opposition on July 18.

Pluto is in the constellation Ophiuchus, well placed for observing. You'll need good seeing and at least an 8" scope to see it. Both of the major astro magazines had good finder charts for Pluto in the last couple of months.

Coming in August: The Perseid Meteor Shower

The Perseid Shower usually lasts about 4 nights, August 11 through 14. The peak activity this year is forecast to be on August 12. Since New Moon is on the 14th, it won't "drown out" the fainter Perseids. So this year should be a really good show! Optical aid is **not** required for meteor showers. Plan ahead!

Space Exploration Notes

Historical Notes for July

In 1961, the Mercury spacecraft *Liberty Bell 7* makes a successful flight, but then sinks in the Atlantic after splashdown.

In 1962, Telstar 1 is launched, allowing the first trans-Atlantic TV transmissions.

In 1964, the Ranger 7 spacecraft is launched to the Moon, to take close-up pictures that were used in selecting sites for the Apollo landings. The Ranger series of spacecraft flew right into the Moon, taking pictures and transmitting them back to Earth, right up until they crashed into the lunar surface.

In 1965, Mariner 4 makes the first successful flyby of Mars. There were several failed flights, both American and Soviet, before Mariner 4.

In 1969, Apollo 11 astronauts Neil Armstrong and Buzz Aldrin make the first moonwalk in history. "We came in peace for all mankind." (from the plaque on the Lunar Module's leg, still on the Moon) What a night that was!

In 1971, the Apollo 15 astronauts (Scott and Irwin) are the first to drive on the Moon, as the Lunar Rover is used for the first time.

In 1973, the second Skylab mission starts. It lasted 56 days.

In 1975, the Apollo and Soyuz spacecraft dock in Earth orbit, and Soviet cosmonauts and American astronauts sail the heavens together for the first time. Sadly, this mission, Apollo 18, was the last Apollo mission flown.

In 1976, Viking 1 lands on Mars.

In 1979, Voyager 2 flies past Jupiter. Also in 1979, Skylab falls back to Earth, with pieces landing in the Indian Ocean and the Australian outback.

In 1980, India launches its first satellite.

In 1985, the European Space Agency launches its Giotto probe to intercept Halley's Comet.

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Comet Hale-Bopp by Jim Anderson

Latest reports indicate that Comet Hale-Bopp is now at about magnitude 6.0, which means that if you have really sharp eyesight and a **dark** observing sight, you could possibly see it with the unaided eye. The rest of us will need binoculars for a while yet. For most of July the comet is in the constellation Scutum, the Shield, just south of Aquila, the Eagle. In August it will move across Serpens Cauda, the

Serpent's Tail, and on into Ophiuchus, the Serpent Bearer. Coordinates are listed below for July and August. Right now the comet is about 3 AU (Astronomical Unit = average Sun to Earth distance=93 million miles), or about 279 million miles, away from Earth (and about 4 AU from the Sun).

An interesting and easy experiment you can do with Comet Hale-Bopp is to record for how long you are able to track the comet with the unaided eye. Simply record the first night that you can find it without binoculars. Then later, probably in May of 1997, record the last night that you can spot it with your eyes alone. In 1985-86, Halley's Comet could be followed for 7 months. The record holder is the Great Comet of 1811, which was visible to the naked eye for 9 months. Many people believe that the old record is about to fall!

Astrophotographers have a good photo op on July 15, when it will be within 1° of open cluster NGC 6649. Yet another good photo op is on August 5, when the comet passes right between two globular clusters that are only 2° apart: NGC 6517 and NGC 6539. (Yes, Pete, that's a challenge!)

July-August Coords for Comet Hale-Bopp

Date	R.A.	Dec.	Constell.
7/1	18h 54.7m	-11° 53'	Scutum
7/6	18h 47.7m	-11° 23'	Scutum
7/11	18h 40.5m	-10° 54'	Scutum
7/15	18h 34.7m	-10° 29'	Scutum
7/21	18h 26.0m	-09° 55'	Scutum
7/26	18h 18.9m	-09° 26'	Serpens Cauda
8/1	18h 10.7m	-08° 52'	Serpens Cauda
8/5	18h 05.5m	-08° 32'	Serpens Cauda
8/10	17h 59.4m	-08° 07'	Ophiuchus
8/15	17h 53.7m	-07° 42'	Ophiuchus

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Jupiter by Jim Anderson

Beginning this month and continuing through the summer, a favorite object for viewing will be the planet Jupiter. I thought I'd put together a few facts on Jupiter for you.

Jupiter is the biggest planet in the Solar System by far. If you combined all the other planets in the Solar System into one, Jupiter would still be 2 and a half times larger! Jupiter's diameter is a little over 11 times that of Earth. Jupiter has 318 times the mass of the Earth. Jupiter's biggest moon, Ganymede, is bigger than the planet Mercury. Jupiter takes about 12 years to orbit the Sun at an average distance of 5.2 AU, or 483,000,000 miles. Since the Earth is 1 AU from the Sun, between Jupiter and the Sun, that means Jupiter is about 4.2 AU from Earth, or 390,600,000 miles.

Jupiter is what we call a gas giant. It is basically a big ball of various gases, like hydrogen, helium, methane, and ammonia. We see only the tops of these gases which circle the planet like clouds. Because all we see are the gas clouds, astronomers are still not certain if there is a rocky core in the center. Most believe that there is such a core. Jupiter spins fast on its axis: once every 10 hours. That means that a day on Jupiter is only 10 hours long. It also means that the gases move around at incredible speeds. From Earth, we see the clouds as bands around the planet. These are the most noticeable features that you will see.

Jupiter was the first planet Galileo looked at with his telescope. With his tiny telescope, he could see the four biggest moons of Jupiter, now named Io, Ganymede, Europa, and Callisto. With bigger telescopes, and visits from four spacecraft, we have now identified a total of 16 moons, and a very thin ring. Most of these moons (and the ring) are too small for us to see with our amateur telescopes. But with a decent set of binoculars or a small telescope, you can see the four Galilean Moons, and draw their changing positions from night to night. It's a fun and easy project. Too simple, you say? Recall that Galileo revolutionized our understanding of the Solar System with such simple observations!

Jupiter is named after the supreme god of the ancient Roman pantheon of gods. The Romans got the idea from the Greeks, whose name for Jupiter was Zeus. The names of the moons of Jupiter are taken from the ancient legends about Jupiter: all the moons are named after his lovers.

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First Light by Jim Anderson

To learn stellar coordinates, we'll start off this month with some easy ones. The easiest one is the zenith, or the highest point in the sky (when you consider the sky to be like the inside of an inverted bowl.) Just go outside, crane your neck back, and look straight up. That's the zenith. Easy, wasn't it?

The next trick is to locate the four compass points of direction, north, south, east and west. In previous issues of *Observations*, I've described how to find north using the Big Dipper and Polaris, the Pole Star. Polaris just happens to be located right above the Earth's North Pole. The point in the sky marked by Polaris is also known as the North Celestial Pole.

If you face north, draw an imaginary line through the zenith and Polaris, and then extend it right on down to the horizon, you have half of the celestial meridian line. If you extend that line straight on to the southern horizon point (you'll have to turn around, of course), you'll have the full celestial meridian line. The celestial meridian is one of the most important of the basic coordinates in astronomy. When the Sun is on the meridian, it is half way across the sky for that day. This is the definition of "local noon", despite what the clocks may say (due to Daylight Savings Time and Standard Time Zones.) In the night sky, astronomers prefer to look at a star or other object when it is close to the celestial meridian. That's because the object will be at the highest point in its path across the sky. The higher (and closer to straight up) an object is, the less air you have to look through to see it. The Earth's atmosphere is always in motion, even when you can't see or feel it moving, so the less turbulence you look through the better.

The other basic coordinate we will cover this month is the celestial equator. You may be able to guess that since the celestial North Pole is the point right above the Earth's North Pole, that the celestial equator is the line in the sky right over the Earth's equator. You would be right, too. Now you may think that you can't see the celestial equator from the Philadelphia area. On that point you would be wrong. Why, when you can't see the Earth's equator from here? Recall that you can see high objects from further away. You can see the skyscrapers in downtown Philadelphia from several miles away.

You can see the Rocky Mountains from dozens of miles away. So now imagine that you draw a line marking the Earth's equator, and move it higher than any mountain, out into space, an infinite distance. You can see it from every place on Earth, save two: the North Pole, and the South Pole, because there the celestial equator is forever below the horizon (actually, it is the horizon!) So if we can see it, where is it? Draw a line across the sky from east to west, but not through the zenith. Because around here we live at about 40° north latitude, which is roughly halfway between the North Pole and the equator, the celestial equator crosses our celestial meridian about halfway up the meridian from the south. So the celestial equator line starts and ends on true east and west, but crosses the sky at about a 45° angle (roughly). So face south, point your hands straight out to your sides to find east and west, and look halfway up the sky from the horizon to the zenith: that's where the celestial equator crosses the celestial meridian. Got it? If not, come to an observing session and have some one point it out to you. There's really no substitute for getting out there and seeing it yourself.

Next month: Those nasty stellar coordinates, like the ones up above for Comet Hale-Bopp.

Also Available

A free brief overview called *Getting Started In Astronomy* is available from the CCAS. It can be picked up at a CCAS function, or you can call the newsletter editor to get a copy mailed to you. Suggestions for improving this introduction to our hobby are always welcome. Articles for the *First Light* column, intended for beginners, are also needed.

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Contributing to the Newsletter

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 **skywalkr56@aol.com**. Or mail to:

Jim Anderson
1086 King Road IVY-312
Malvern, PA 19355

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"Put three grains of sand inside a vast cathedral, and the cathedral will be more closely packed with sand than space is with stars."

Sir James Jeans (1877-1946)
English Astronomer

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Membership Renewals

Check the date printed on the address label of this issue of *Observations*. 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

Sky & Telescope Magazine Group Rates!

Subscriptions to this excellent periodical are available through the CCAS at $27 per year, 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.

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CCAS Membership Information

The present membership rates are as follows:

REGULAR MEMBER
(18 years or older) $20/year
SENIOR MEMBER
(65 years or older) $10/year
STUDENT MEMBER
(full-time college student) .... $ 5/year
JUNIOR MEMBER
(under 18 years old) .....$ 5/year
FAMILY MEMBER
(husband, wife & children) ....$ 30/year

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

President:	Edwin Lurcott	(610) 436-0387
Vice Pres:	Emil Volcheck	(610) 388-1581
Treasurer:	Pete LaFrance	(610) 268-2616
Secretary:	William O'Hara	(610) 696-1422
Public Rel:	Kathy Cseke	(610) 644-9543
Obs Chm:	Mike Tucker	(610) 584-8236
Newsletter:	Jim Anderson	(610) 993-0261

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"The stars I know and recognize and even call by name. They are my names, of course. I don't know what others call the stars."

An old woman quoted by Robert Coles in *The Old Ones of New Mexico*

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