OBSERVATIONS

A MONTHLY PUBLICATION OF THE

Chester County Astronomical Society

AUGUST 2002

(VOLUME 10, NO. 8)

http://www.ccasastro.org

CCAS Schedule of Events

August 9/10, 2002 (Friday/Saturday)	CCAS Observing Session/Meeting Location: BVA (map on later page) sunset
September 10, 2002 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
September 14/15, 2002 (Friday/Saturday)	CCAS Observing Session Special: Lunar Observing Session Location: BVA sunset
October 4/5, 2002 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
October 8, 2002 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
November 1/2, 2002 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
November 12, 2002 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
December 6/7, 2002 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
December 10, 2002 (Tuesday)	CCAS Meeting Location: **TBA** 7:30 p.m. EST

★ ★ ★ ★ ★

Newsletter Deadlines

These are the deadlines for submitting material for publication in the newsletter, through the June 2002 issue.

Issue	Deadline
September 2002	08/23/2002
October 2002	09/27/2002
November 2002	10/25/2002
December 2002	11/26/2002
January 2003	12/27/2002

★ ★ ★ ★ ★

Steve Limeburner Earns Binocular Messier Award

Photo by Jim Anderson

At the Society's February meeting, Messier Club Coordinator Frank Angelini (at right in photo) had the pleasure of presenting the Astronomical League's Binocular Messier Award to Steve Limeburner. This is the second Binocular Messier Award earned by a CCAS member. Congratulations Steve!

The Binocular Messier Award is given to any AL member who finds and observes at least 50 of the 110 Messier objects using only binoculars. The observing log for this project does not require that you draw the objects, only that you describe them. Frank Angelini is the coordinator in the CCAS for the AL's Messier Awards. When you finish a Messier Award, contact Frank who will review your logbook and then request the award from the Astronomical League. Frank's phone number is 610-873-7929; he lives in Downingtown.

The Astronomical League has a number of observing awards that members can work on. All CCAS members are also members of the AL. Descriptions and rules for the observing awards can be found on the AL's Website at www.astroleague.org. If you don't have a computer, contact Jim Anderson at 610-857-4751 and he'll get you a copy of the award descriptions and rules you want.

★ ★ ★ ★ ★

August Skies

Moon Phases

Last Quarter	8/1
New Moon	8/8
First Quarter	8/15
Full Moon	8/22
Last Quarter	8/30

The Planets

Mercury is in our evening sky in August, but good luck finding it. It will be close to the horizon, setting less than an hour after sunset.

Venus is in the evening sky all month. In August, it will be the only bright planet noticeable in the evening sky.

Mars is behind the Sun this month and therefore invisible.

Jupiter is in the morning sky, and is the brightest object visible in the sky before the Sun rises. But it is still too close to the horizon for good telescopic viewing.

Saturn is in the morning sky in August, standing high in the south at sunrise.

Uranus is in Capricornus this month, reaching opposition on the night of August 19–20. This is a good month to find Uranus using a telescope. It looks like a blue-green disk in a telescope, small and featureless.

Neptune is also in Capricornus, reaching opposition on the night of August 1–2. August is a good time to track down Neptune with a steady telescope using moderate to high magnification. It will appear as a tiny disk, perhaps bluish in color; much smaller than Uranus.

Pluto is in Ophiuchus in August, and well placed for hunting by the time full darkness falls about an hour after sunset. You'll need at least an 8" telescope, dark skies, good finder charts, and lots of patience to find Pluto.

Perseid Meteor Shower: August 12–13 by Ed Lurcott

No telescope needed!

This year the Moon will be conveniently out of the sky during the peak hours of the Perseid meteor shower. For those of us on the east coast of North America, those hours are from late night to dawn on the night of August 12–13. Under dark skies one can expect up to 60 meteors per hour. Lower counts may be seen on the night before (Aug. 11–12) and on the night after (Aug. 13–14).

We will compare our Perseid observations at the next regular monthly meeting on September 10, 2002.

★ ★ ★ ★ ★

Book Review by Nicholas La Para

Measuring the Universe: The Cosmological Distance Ladder, Stephen Webb; Springer-Praxis, 1999. Paperback.

Distance is perhaps the most fundamental astronomical measurement. Does the solar system follow Newton's laws? Planetary distance factors into the answer. What shape is the Milky Way assemblage of stars and objects? You need to map the distances to those objects. Are those faint fuzzies just gas clouds in the Milky Way, or external galaxies? And how big is the observable universe anyway, and is it always that size? And how old is the universe? All questions that need distance measurements to reach answers.

But how do astronomers measure distance anyway? And how reliable are their results? How do we know that the methods work, and what is the margin of error? If you want clear and thorough answers to such questions, this is the book to read. Be aware, though, that there are at least two other books with the title "Measuring the Universe," so pay attention to the author's name.

Stephen Webb is in the Department of Mathematical Sciences, Loughborough University, Leicestershire UK. That's all I know about him, except that he writes well-organized, readable prose. Webb uses a certain amount of fairly basic mathematics to explain various methods, but you can easily skim, or even skip the math, and still follow the story. The book was apparently written in 1998, so it is pretty up-to-date.

"Measuring the Universe" is organized around what Webb calls the ladder of measurement methods; in general (not always), methods to measure the distance to farther objects depend on methods used for lesser distances. This means that the uncertainties in the measurements compound as we go out further. A diagram on page 299 (near the end of the book) very clearly sums up how the specific methods depend on each other. Webb makes clear that the uncertainties in measurements arise from random errors due to imprecision in the method, from systematic errors due to unrecognized phenomena that bias measurement in ways unknown to us, and from differing interpretation of the same data! That last, by the way, gives the greatest uncertainty to the value of the Hubble constant.

The chapters follow the order of the distance ladder, starting with measuring the earth, ending with the size, age, and expansion of the universe. This means that the chapters are roughly the history of measurement too, since that history is largely the story of measuring farther and farther. So the book is not just a survey of measurement methods; it is a history of what we think we know about the universe, and how we came to know it. However, within each chapter, Webb follows the history of each particular method, bringing us up to date on improvements. He is always careful to point out the uncertainties and assumptions in each method.

Webb provides some bonuses too. Along the way, we learn something about the personalities of the astronomers who developed the distance ladder, watching their debates and struggles. And Webb provides some of the nicest brief explanations of a number of astronomical topics such as the Hertzsprung-Russell diagram, the life of a main sequence star, the use of spectroscopy beyond identifying chemical composition, what makes a Cepheid variable pulsate, and much else. There are suggested further readings for each chapter, and miracle of miracles! the entries are annotated, so you know whether you might want to read one.

I got the book through Interlibrary Loan. It's available on Amazon.com for $45. Expensive, but a solid value. I plan to read it a second time.

★ ★ ★ ★ ★

Special Event on September 19, 2002

On September 19, astronomer and physicist Timothy Ferris will speak at the Free Library of Philadelphia about his new book *Seeing in the Dark*. The book is about how backyard stargazers are probing deep space and guarding Earth from interplanetary peril from asteroids and comets. The evening will include a slide show on the wonders of backyard stargazing. Tickets are $12.00. They are available through Upstages starting on September 5th. Upstages' number is 215-569-9700. For additional information contact the Program Director at the Free Library, Andy Kahan at 215-567-4341 or by email at KahanA@excen.library.phila.gov. You can only get tickets, however, via Upstages.

Timothy Ferris is the recipient of the American Institute of Physics Prize and the American Association for the Advancement of Science Prize. His previous books include the bestseller *The Whole Shebang* and *Coming of Age in the Milky Way* (nominated for a Pulitzer Prize).

★ ★ ★ ★ ★

Help Needed With Society's 20" Telescope

The Society's 20" telescope belongs to the whole Society; it is intended to be available for use by members at Observing Sessions, and even for short-term borrowing by Society members. The problem we have with implementing this policy is, simply put, lack of mobility. We need a member with a big enough truck or minivan, and preferably with the storage space at home for the telescope, to volunteer to be the telescope's "custodian" and "chauffeur." The custodian would of course be able to use the telescope whenever it wasn't out on loan. The biggest part of the telescope is the bottom part; it weighs a couple hundred pounds. We have wheels and handles that convert that piece into a large "wheelbarrow" for moving it, though, and ramps so it can be wheeled right into a vehicle. Ed Lurcott is willing to keep storing the telescope in his garage, if someone can volunteer to be the chauffeur, but not the custodian. If you can help, please call Ed Lurcott.

★ ★ ★ ★ ★

CCAS Newsletters Available via E-mail

You can choose to receive the monthly newsletter by e-mail. When the newsletter is finished, I convert it to a special type of file (a .pdf, for Portable Document Format) using a utility called Adobe Acrobat. Then all you need on your PC, besides an Internet connection with e-mail, is the Adobe Acrobat Reader program for your PC or Mac. This program is available free of charge from Adobe. Just connect to their Website at www.adobe.com and follow the links and directions for downloading and installing the correct Reader program for your PC or Mac. On the main screen (home page) of Adobe, at the top look for a "button" labeled "Products" and click it. On the next screen, scroll down to where it says "Adobe Acrobat Reader", and click that. Then click on "Download Now". Make sure the version number of the Reader you get is at least 4.0 because I'm using Adobe Acrobat version 4.0 to make the .pdf files. If you have an earlier version of the Reader, like 3.0, you'll have problems reading the files I make with Acrobat 4.0. The 4.0 Reader can read 3.0 files without a problem, so if you're currently using a 3.0 Reader you will still be able to read older files produced by Acrobat 3.0 if you upgrade your Reader to 4.0.

Once you've done that, then just send me an e-mail to let me know you want to switch to e-mail delivery of the newsletter. The biggest advantage of getting your newsletter this way is you get it two to three days earlier. Another of the advantages of getting the newsletter this way is that the photos and/or drawings that are color in the original will be in color in your copy of the newsletter. When we make the paper copies for mailing, they get copied in black & white, and sometimes the copy quality of pictures is not good. Another advantage is that getting your newsletter by e-mail will save the Society money in copying and mailing expenses. In the past year some issues have cost the Society $75.00 and more in copying and mailing costs. So if you want your newsletter by e-mail, send me an e-mail at jim.anderson@mckesson.com and I'll get you set up on the e-mail distribution list.

★ ★ ★ ★ ★

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 N. First Avenue
Tucson, AZ 85719-2103

★ ★ ★ ★ ★

Globular Cluster M80 by the Hubble Space Telescope

By Bob Popovich

"I Didn't Know That!"

As a youngster I devoured every book, pamphlet or article relating to astronomy and space exploration I could find. Reading something about the moon was no less fascinating in the sixth book than in the first. The subject held boundless interest for me—even if it was often a rerun.

It was the 1960s and the world of amateur astronomy changed slowly from year to year. Back then I recall reading that the sum of scientific knowledge doubled every 20 years. "Imagine that!" I thought. "Scientific knowledge doubling in volume in a mere two decades. There was a time when it would have taken centuries…"

Yet the pace has quickened to an incredible rate. Not long ago I came across a statistic that now estimates the time required to double the body of scientific knowledge as 3–5 years. That is truly astronomical.

Whether it's my failing memory or the overwhelming pace of scientific advancement I do not know. But I can tell you that when I returned to the study astronomy a couple of years ago I was overwhelmed at how many things seemed new to me.

Are you keeping up with all the advancements in astronomy? Well, take this quiz and find out…

1. Absolute zero is approximately:
   - -100° C
   - -500° C
   - -270° K
   - -32° F

2. About 75% of all known large galaxies are what shape?
   - Spiral
   - Elliptical
   - Irregular
   - Swirly

3. The "Grand Canyon" of Mars is called:
   - The Great Rift Valley
   - Canyonus Marinara
   - Valles Marineris

4. Which Apollo XI astronaut remained in the command module during the entire mission?
   - Neil Armstrong
   - Neil Sedaka
   - Edwin Aldrin
   - Michael Collins

5a. Match the spectral class with its approximate surface temperature in degrees Kelvin:

O	3,000
B	6,000
G	20,000
M	30,000
Z	500

5b. Which class might contain a red giant?

5c. Which class might contain a blue giant?

6. Which astronomer had a silver nose?
   - Isaac Newton
   - Caroline Herschel
   - Tycho Brahe
   - Jimmy Durante

7. What star is named the "Rival of Mars"?
   - Antares
   - Uncleares
   - Betelgeuse
   - Garnet Star

8. Collinder 285 is an open cluster whose five brightest stars are part of which constellation?
   - Ursa Minor
   - Ursa Major
   - Orion
   - Draco

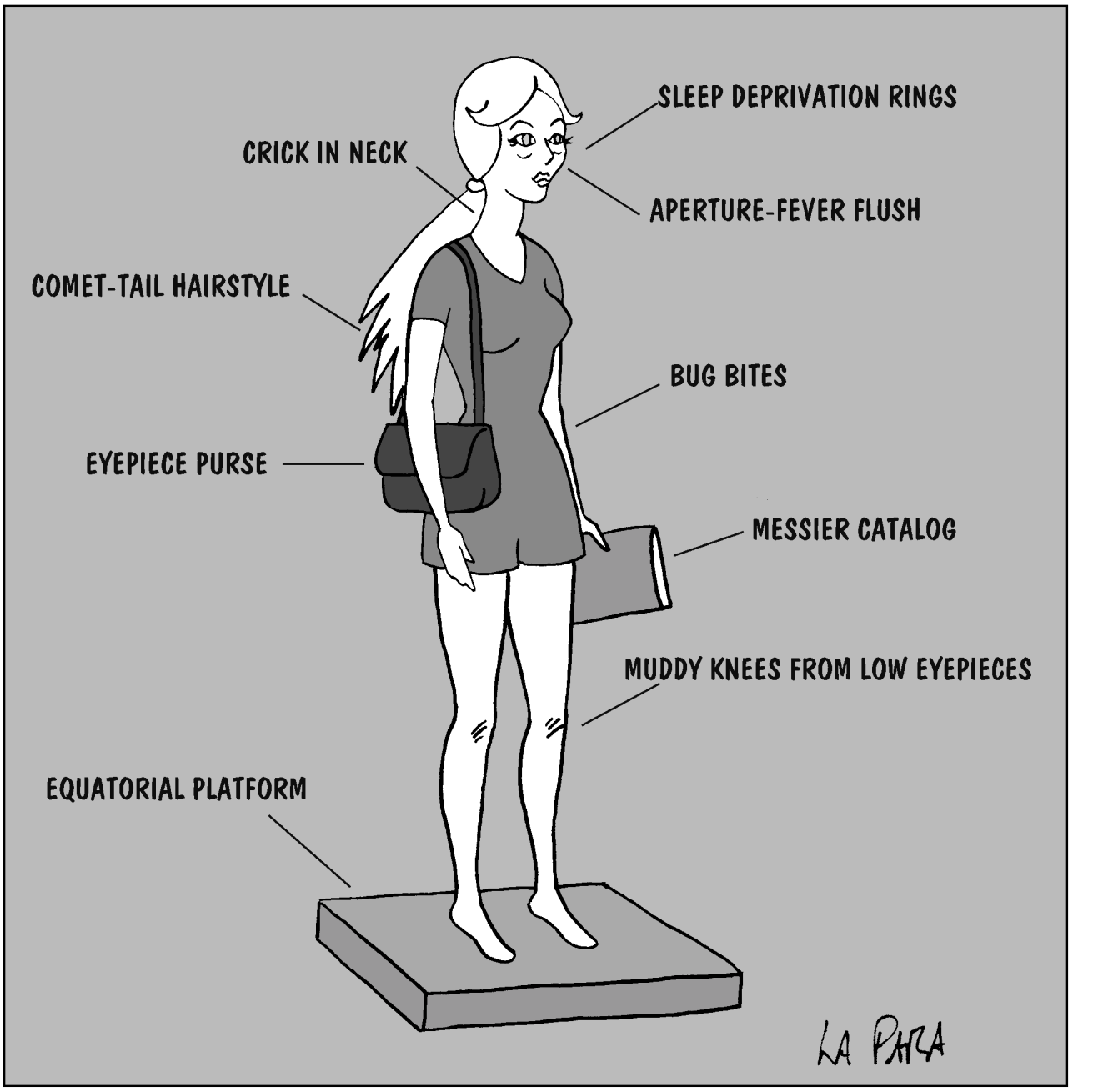
Extra Credit: If someone tells you they have been observing Mare Orientalis in great detail with their new telescope, what would you say?
   - Politely suggest they're mistaken
   - Recommend a good optometrist
   - Tell them to search for the moon buggy
   - Buy them a moon map for their birthday

Next time: "Relatively Speaking"

Answer key is on page 3.

★ ★

The Barbie Astronomy Doll



Cartoon by Nicholas La Para

★ ★

Answer Key to Trivia Quiz

1.-270° Kelvin
2. Spiral
3. Valles Marineris
4. Michael Collins
5a. O 30,000
B 20,000
G 6,000
M 3,000
Z is not a spectral class
5b. Class M
5c. Class B
6. Tycho Brahe
7. Antares
8. Ursa Major
Extra Credit—Anyone able to see details of a feature on the far side of the moon should turn their skills to finding the moon buggy.

Scoring

8 or more	Astronomer Royal
5 – 7	Renaissance Individual
2 – 4	Amateur Astronomer
0 – 1	If we had membership cards, you'd have to turn yours in.

From the Observing Chairman

By Ed Lurcott

After reading the results of the recent member survey, I noted that many members indicated a strong interest in hearing about observing opportunities. As your Observing Chairman I felt responsible to the members to provide observing notes in each newsletter. So here's the first one, for summer observing.

In the summertime there is a virtual parade of globular clusters marching across the sky each evening. Of the 150-plus known globular clusters that surround the center of our Milky Way Galaxy, 29 were noted by Charles Messier in his famous list of 110 objects when he assembled it in the late 1700's. Since he observed from France, he could not see the two brightest globulars, Omega Centauri and 47 Tuscanae which were too far south. These two southern clusters shine at naked-eye magnitudes of 3.9 and 4.0, respectively. Neither is visible from Chester County either.

The constellations of Ophiuchus and Sagittarius, however, which we **can** see, each have seven globular clusters from Messier's list. These range in brightness from magnitude 5.1 to 8.5. This puts them within reach of a good pair of 7x50 or 10x50 binoculars. A pair of 7x35 binoculars may not be able to pick out the fainter ones in our semi-polluted skies, especially considering the southern declination of these globular clusters.

The view in binoculars will be pretty much a matter of seeing a round fuzzy object. Some will be bigger and brighter than others. But if you use a 6-inch (or larger) telescope, then each globular will take on a character of its own. Some can be partly resolved (meaning that you can see individual stars) around the edges; some can be resolved partway across the face of the cluster. Some have bright cores and some have no cores at all.

When viewing these gems through the CCAS's own 20-inch Dobsonian telescope you may be really dazzled by the sight and have to be pried away from the eyepiece. The 20-inch gathers 11 times the amount of light gathered by a 6-inch, and 50 times the amount of light gathered by 7x50 binoculars! So it is well worth a trip to a CCAS Observing Session to view these globular clusters through the 20-inch telescope. At the July Observing Session many of us found several of these clusters. I managed to observe 12 of the 14 with my trusty 6-inch Newtonian telescope.

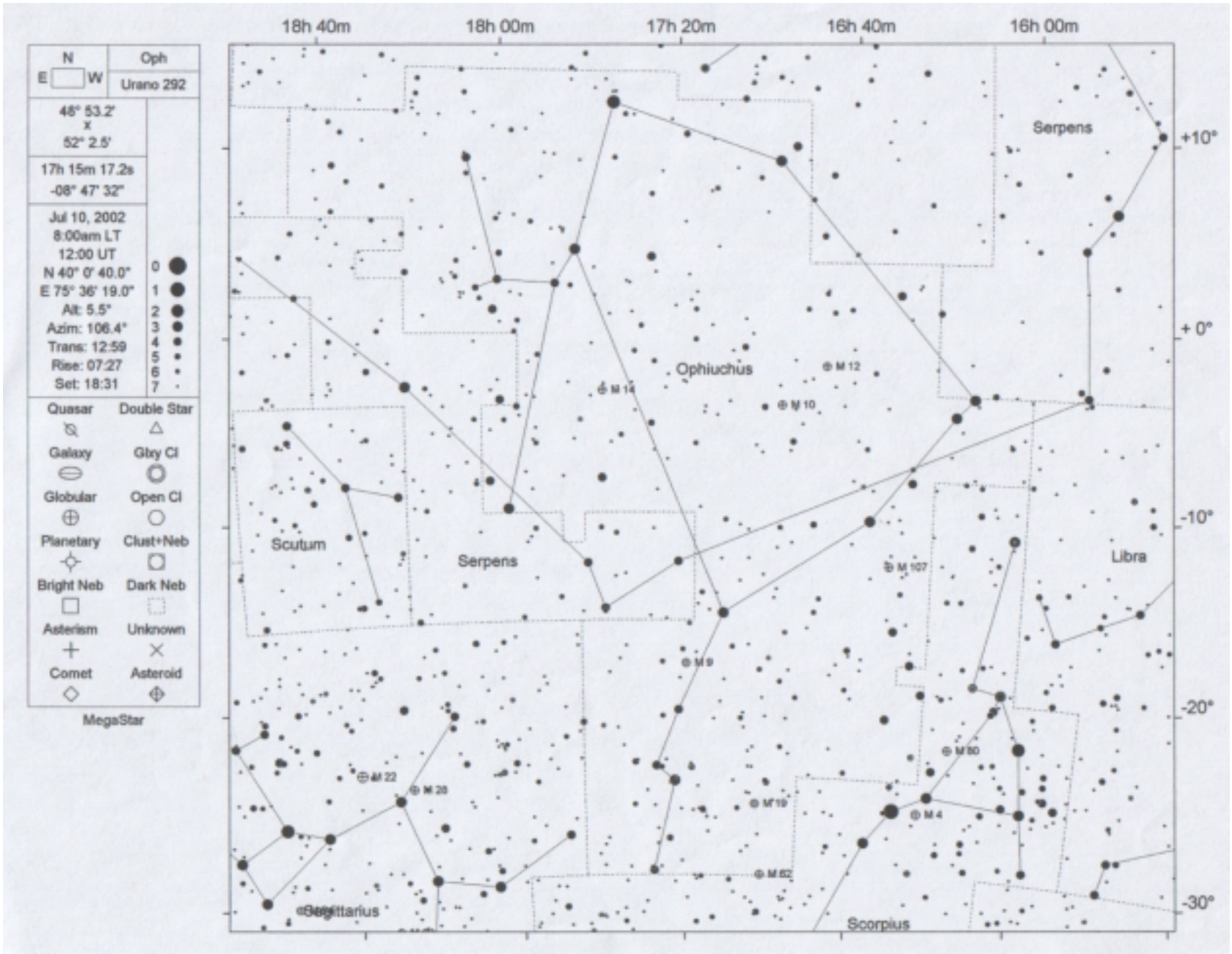
With the aid of the Ophiuchus and Sagittarius charts (included on the next two pages) in which the Messier globular clusters have been plotted, see if you can find and observe each cluster for at least five or ten minutes. It seems that you can see more and more faint detail as your eye becomes more comfortable at the eyepiece. You can then detect the individual characteristics of each cluster. If you observe and record them with your personal notes you are well on your way to observing the Messier list. Note that there are two more globular clusters (M4 and M80) southwest of Ophiuchus in the constellation of Scorpius. That makes a total of sixteen Messier globular clusters shown on the charts.

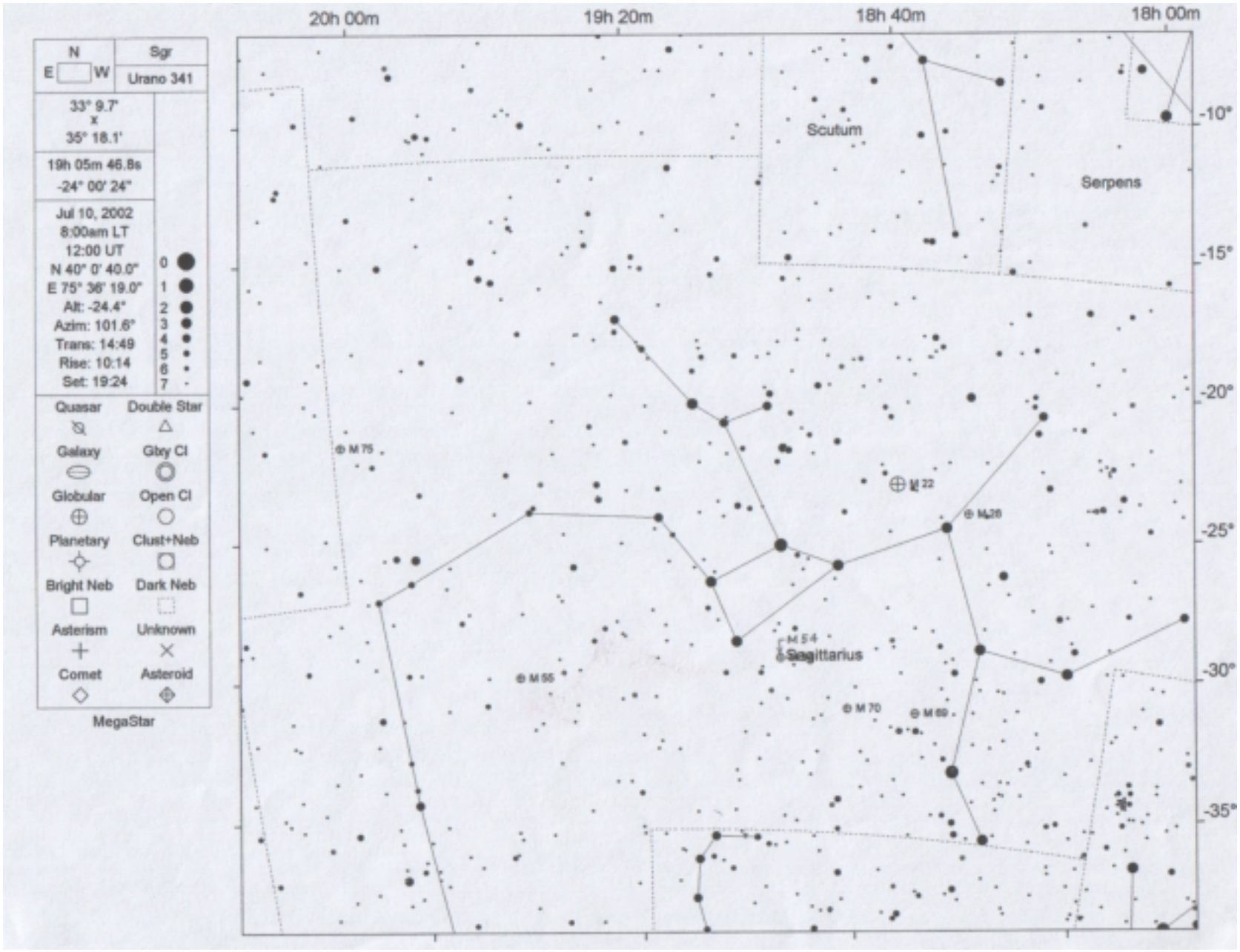
So, clear skies and enjoy the summertime parade.

ID	Constellation	Magnitude	Diameter*	Estimated Distance
M9	Ophiuchus	7.6	9'	27,000 l.y. (light years)
M10	Ophiuchus	6.6	15'	20,000 l.y.
M12	Ophiuchus	6.8	14'	24,000 l.y.
M14	Ophiuchus	7.6	12'	29,000 l.y.
M19	Ophiuchus	6.7	14'	28,000 l.y.
M62	Ophiuchus	6.7	14'	22,000 l.y.
M107	Ophiuchus	8.1	10'	21,000 l.y.
M22	Sagittarius	5.1	24'	10,000 l.y.
M28	Sagittarius	6.8	11'	19,000 l.y.
M54	Sagittarius	7.6	9'	89,000 l.y.
M55	Sagittarius	6.4	19'	20,000 l.y.
M69	Sagittarius	7.6	7'	28,000 l.y.
M70	Sagittarius	8.0	8'	29,000 l.y.
M75	Sagittarius	8.5	6'	61,000 l.y.
M4	Scorpius	5.8	26'	14,000 l.y.
M80	Scorpius	7.3	9'	33,000 l.y.

* For comparison, the Full Moon is about 30' in diameter.

★ ★


N
E W
Oph
Urano 292
48° 53.2'
x
52° 2.5'
17h 15m 17.2s
-08° 47' 32"
Jul 10, 2002
8:00am LT
12:00 UT
N 40° 0' 40.0"
E 75° 36' 19.0"
Alt: 5.5°
Azim: 106.4°
Trans: 12:59
Rise: 07:27
Set: 18:31
0
1
2
3
4
5
6
7
Quasar
Double Star
Galaxy
Glby Cl
Globular
Open Cl
Planetary
Clust+Neb
Bright Neb
Dark Neb
Asterism
Unknown
Comet
Asteroid
MegaStar
18h 40m
18h 00m
17h 20m
16h 40m
16h 00m
+10°
+ 0°
-10°
-20°
-30°
Serpens
Ophiuchus
Scutum
Serpens
Libra
Sagittarius
Scorpius
M 14
M 12
M 10
M 107
M 9
M 22
M 28
M 19
M 4
M 80
M 62


N
E W
Sgr
Urano 341
33° 9.7'
x
35° 18.1'
19h 05m 46.8s
-24° 00' 24"
Jul 10, 2002
8:00am LT
12:00 UT
N 40° 0' 40.0"
E 75° 36' 19.0"
Alt: -24.4°
Azim: 101.6°
Trans: 14:49
Rise: 10:14
Set: 19:24
0
1
2
3
4
5
6
7
Quasar
Double Star
Galaxy
Gbx Cl
Globular
Open Cl
Planetary
Clust+Neb
Bright Neb
Dark Neb
Asterism
Unknown
Comet
Asteroid
MegaStar
20h 00m
19h 20m
18h 40m
18h 00m
-10°
-15°
-20°
-25°
-30°
-35°
Scutum
Serpens
Sagittarius
M 75
M 22
M 28
M 54
M 55
M 70
M 69

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

jim.anderson@mckesson.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:

jim.anderson@mckesson.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
(610-857-4751)

CCAS Purpose

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

CCAS 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) 857-4751

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

Observing: Ed Lurcott
(610) 436-0387

Education: Kathy Buczynski
(610) 436-0821

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

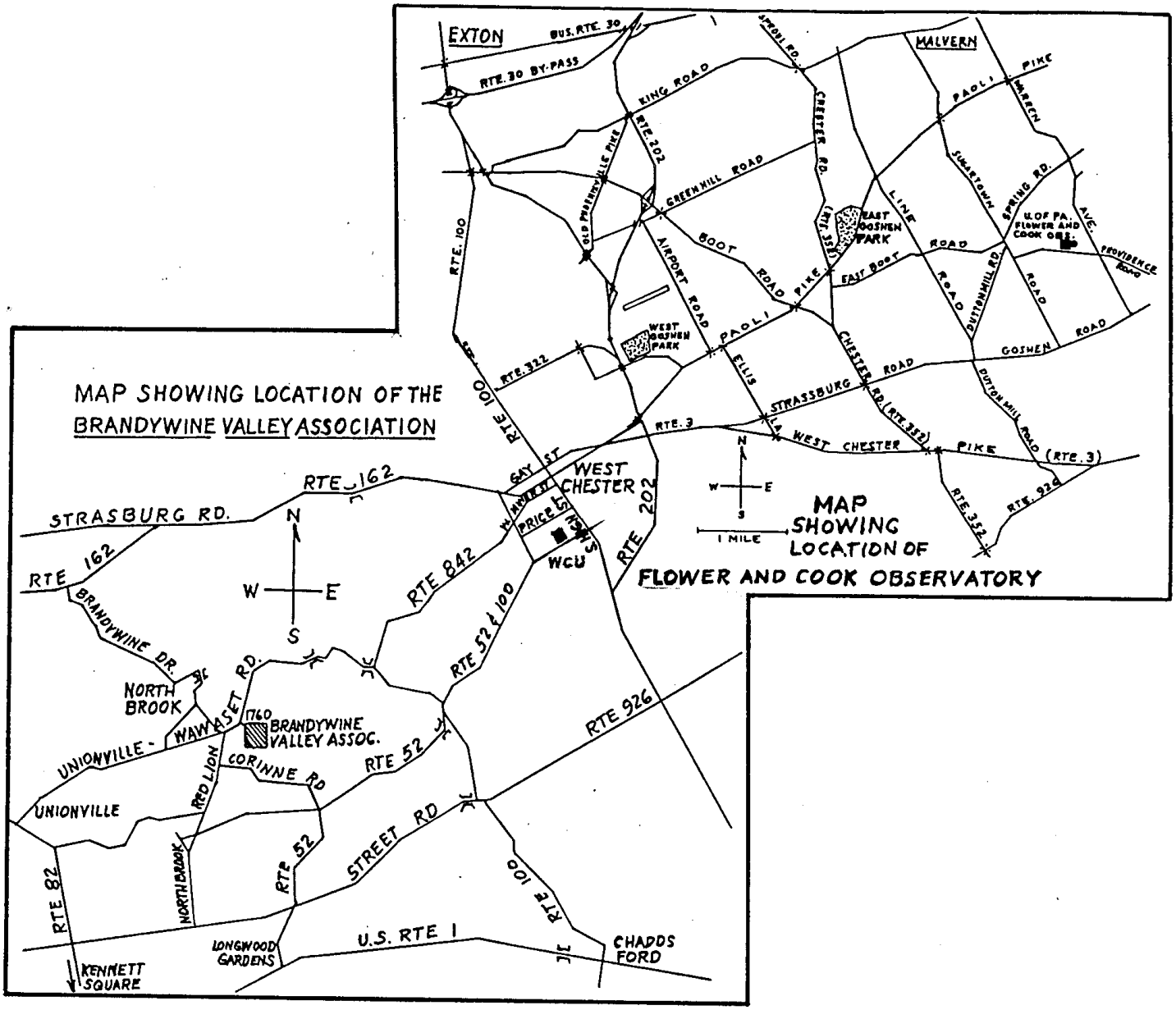
Sky & Telescope Magazine Group Rates

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://www.ccasastro.org

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@kennett.net



To get to the Myrick Conservation Center of the Brandywine Valley Association from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles.

To get to the observing site at the BVA property, turn off Route 842 into the parking lot by the office: look for the signs to the office along Route 842. From that parking lot, go up the farm lane to the left; it's about 800 feet or so to the top of the hill. If you arrive after dark, please turn off your headlights and just use parking lights as you come up the hill (so you don't ruin other observers' night vision).