

CCAS Schedule of Events

January 3/4, 2003 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
January 14, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
Jan. 31/Feb. 1, 2003 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
February 4, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EST
February 11, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
February 18, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EST
Feb. 28/Mar. 1, 2003 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
March 4, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EST
March 11, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
March 18, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EST
March 28/29, 2003 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
April 1, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EST (no fooling!)
April 6, 2003 (Sunday)	Start of Daylight Savings Time 2:00 a.m. local time Turn clocks ahead one hour
April 8, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
April 15, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EDT
April 25/26, 2003 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
May 6, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EDT

May 10, 2003 (Saturday)	National Astronomy Day
May 13, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
May 20, 2003 (Tuesday)	Beginning Astronomy Class Location: Flower & Cook Observatory 7:00 p.m. EDT
May 23/24, 2003 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset



December Skies

Winter Solstice: December 21 at 8:14 p.m. EST

The Sun reaches its southernmost point in its annual apparent path in our sky, and “stands still” (the meaning of the word solstice) before moving northward again. For us in the Northern Hemisphere of Earth, that marks the first day of winter. It’s the first day of summer in the Southern Hemisphere.

Moon Phases

New Moon	12/4
First Quarter	12/11
Full Moon	12/19
Last Quarter	12/26

The Planets

Mercury appears in our evening sky during the second half of the month, with the best opportunity to see it (greatest elongation from the Sun = highest above the horizon at sundown) on the evening of December 25.

Venus is blazing away in the morning sky this month. You’ll have no trouble finding it as much as three hours before sunrise. On the morning of December 1, Venus forms a tight group with Mars and the Moon! This tight threesome of Venus, Mars, and the Moon repeats on the morning of December 30. On December 6, Venus and Mars are only 1.6° apart: with some really wide-angle eyepieces you might be able to see both planets at once in a telescope!

Mars is also in the morning sky, staying fairly close to Venus all month. It is so far away now that it is a tiny featureless dot in a telescope.

Jupiter is now rising during the evening hours. It is best placed for telescopic observations in the early morning hours.

Saturn reaches opposition this month on the 16th. It is well placed for telescopic observations by late evening. Furthermore, Saturn is at perihelion in July 2003, meaning that it is the closest it has been to the Sun (and therefore us) in 29 years. Plus, its rings are tilted at their greatest angle in the last 15 years. So 2002 and 2003 are great “Saturn years”!

Uranus is in Capricornus this month, and thus visible in the evening sky, but it isn’t above the horizon for long after sunset.

Neptune is also in Capricornus in December, and visible in the evening sky, but not for long.

Pluto is behind the Sun this month. You'll have to wait until next summer to look for Pluto.

Meteor Shower: December 13-14

The annual Geminid shower is expected to peak on Friday night, December 13-14. Because the radiant point for this shower is in Gemini, which is rising in the east at sunset, a satisfying meteor watch can begin as early as 10:00 p.m. local time. It won't match the Leonid shower we saw last month, but this shower has been known to produce as many as 75 meteors per hour. Geminid meteors usually are bright, slower moving than those of other showers, and are often yellow in color. Typically, the rates increase steadily for several days before the peak (Dec. 11 to Dec. 14) and then drop off rather quickly after the peak.



Members report on Leonid Meteor Shower

From Bob Popovich:

I counted 15 Leonids from 5:15 to 5:40 a.m. on the 19th. I was really disappointed.

From Jim Anderson:

I didn't go outside; I was lazy and just looked out the windows for about ten to fifteen minutes, at about 5:20 a.m. on the 19th. Last year I saw several meteors this way, even though it is definitely not the best way to observe a meteor shower. This year I did not see any at all. I did see a lot of high-level cirrus clouds, lit up by the Moon, which made it hard to see any stars dimmer than about second magnitude (I couldn't see Polaris, which I can usually see easily from inside on a clear night). Based on that brief evaluation, it didn't seem worth it to get dressed and go outside, so I went back to bed.

From Jeff Goldader:

From my home in Paoli, I observed 15 meteors between 9:15 and 10:00 UT, and 100 between 10:00 and 10:50 UT. Sky conditions were fair to poor, with ~30-75% coverage by variable cirrus lit by the bright moon. However, the clouds cleared and the moon was very low by about 10:30 UT, allowing a good view of the peak. The rise was rapid, and the peak seemed to me to be asymmetric, with more meteors visible after the predicted peak than preceding it. The peak observed rate, averaged over perhaps 15 minutes, was probably in the range of a few hundred per hour.

Though not good for meteors, the cirrus provided a beautiful display of the 22-degree lunar halo, and I also noticed for the first time the upper tangent arc.

There is also a preliminary report from Mt. Lemmon available at www.amsmeteors.org; it seems that in fact the peak was several minutes later than predicted, which is in line with my observations. The observed hourly rate at Mt. Lemmon peaked at just after 11:00 UT, the ZHR peaked at around 10:45-10:50 UT. As I recall, the predicted peak for us was 10:36 UT.



Need for Members and Telescopes: Dec. 27

Ed Lurcott has been contacted by a teacher at Owen J. Roberts Middle School about a star night for students at Warwick County Park. This event is tentatively scheduled for Friday December 27, with a cloud date of Sunday December 29. It was still tentative at press time because the school needed to make arrangements to have one of the county's park rangers at the park that night. The teacher said we could anticipate about 50 people. Please contact Ed (610-436-0387) if you can help out with this event. Thanks.



Membership Fee Increase

There were enough Society members present at the October meeting to make a quorum of the total membership, which meant we were able to take a vote on the proposed dues increase (first proposed and discussed at the May 2002 meeting). The proposal was to raise Regular and Family memberships by \$5.00 each, while keeping Junior, Student, and Senior membership fees the same as they are now. The proposal passed by a solid majority. Regular (or "individual adult") memberships are now \$25.00 per year, and Family memberships are \$35.00 per year. The change is effective in November 2002.



Enlightened by the Darkness

By Diane K. Fisher

On the clearest of nights, I may see a dozen stars from my suburban backyard near Los Angeles. Unfortunately, my studies of space and astronomy have been confined to books and the pictures taken by others. Seldom have I experienced for myself a truly dark, clear, moonless sky.

One of those rare times was a summer camping trip in Bryce Canyon, Utah. I lay on my sleeping bag in an open area away from trees. I saw millions of stars (so it seemed) and the cloud of the Milky Way streaking across the sky. Nothing of planet Earth was in my view. It was then I glimpsed my true situation in the universe, a speck of dust clinging to a tiny stone hurtling through the darkness of a cold, infinite universe. I was awestruck by the beauty of the stars and the darkness—and terrified!

In the light of day and a more "down-to-Earth" state of mind, I wondered: With around 100 billion galaxies out there, why is it still so dark out there?

Until the 20th century, astronomers thought the universe was infinite. They were perplexed though, because in an infinite universe, no matter where you look in the night sky, you should see a star. Stars should overlap each other and the sky

should be blazing with light and hot as the sun. This problem became known as "Olber's Paradox."

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although a finite universe is enough to explain the darkness, the expansion of the universe also contributes. As light travels from a distant galaxy to us, the space through which the light is traveling is expanding. Therefore, the amount of energy reaching us dwindles all the time, thus causing the color of the radiation to be "redshifted." (The wavelength is stretched out due to cosmic expansion.) The more distant the galaxy, the more redshifted the light. The largest redshift astronomers have measured comes from radiation that was emitted when the Universe was only 300,000 years old. This radiation has taken over 12 billion years to reach us and although it began as infrared radiation, it is now seen as the microwave background radiation.

GALEX (Galaxy Evolution Explorer) is a NASA space telescope that will survey the universe, including galaxies with redshifts that indicate their light has been traveling for up to 10 billion years (or 80% of the history of the universe). Read about GALEX at www.galex.caltech.edu/ . For budding astronomers, print out The Space Place New Millennium Program calendar at spaceplace.nasa.gov/calendar.htm to identify great sky watching opportunities.



The GALEX (Galaxy Evolution Explorer) mission will do a broad survey of galaxies in various stages of evolution and identify interesting objects for further study by the Hubble Space Telescope.

Diane K. Fisher is the developer and writer for The Space Place web site.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

The *Space Place* now offers a three-minute answer to a space-related question on a toll-free phone line. Dr. Marc Rayman, Deep Space 1 Manager (and an amateur astronomer himself), answers a question about space or space exploration. Call (866) 575-6178 to hear the monthly message.



Web Sites and More for Astronomy Education

In October, Dr. Harry J. Augensen spoke to us about astronomy education. These are some useful web sites I jotted down in my notes during his presentation. I'm listing them here in case they may be of interest to other members who were not present at the October meeting.

Dr. Augensen's web site:

<http://www.science.widener.edu/~augensen> Harry's e-mail address is listed there, and he said he will correspond about astronomy education if people wish to contact him.

Some good freeware, "Home Planet" by John Walker, available for download at:

<http://www.fourmilab.ch/>

The CLEA project has a whole series of very good computer programs for astronomy education at:

<http://www.gettysburg.edu/>

Another site mentioned, good for astronomy history:

<http://www.astrohistory.com/>

A good book for Native American star lore (constellations and myths) is *Keepers of the Night*, by Caduto.



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
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
Public Relations:	Vic Carlucci	(610) 458-7457

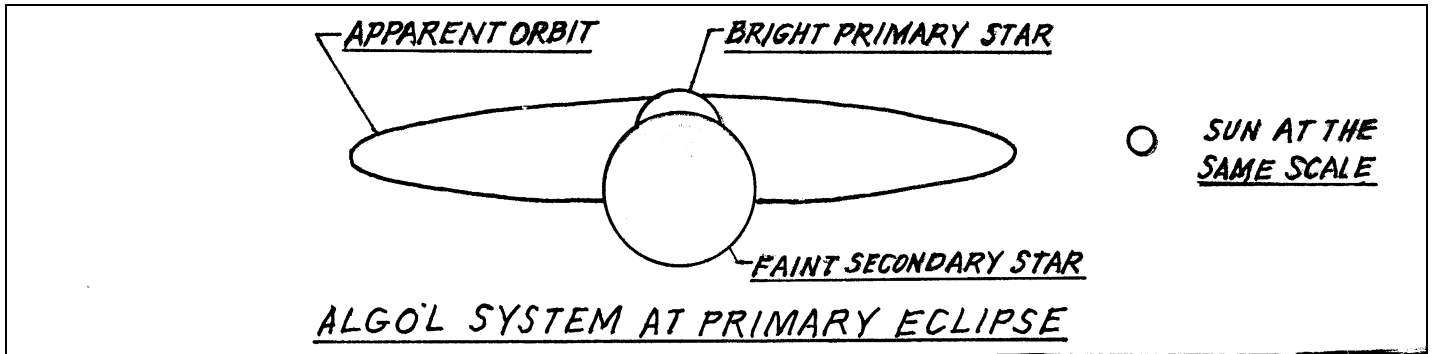


December Observing Opportunities

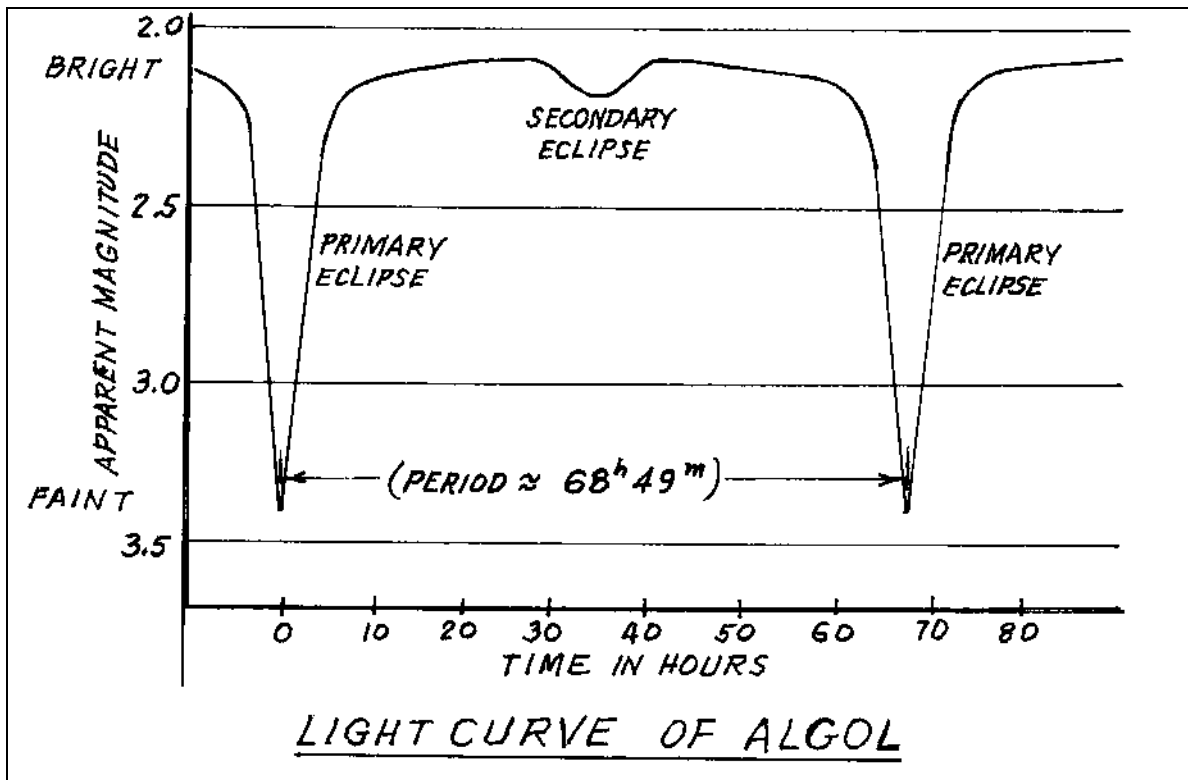
By Ed Lurcott, Observing Chair

"The Demon Star," Beta (β) Persei, was probably known to the ancient Greeks and Egyptians by its strange variability. In modern times astronomers had recognized its variability for over a hundred years, but it was John Goodricke in 1782 who first determined its periodicity of 2.87 days. Goodricke also correctly assumed that a fainter star was in orbit around the brighter primary star, and that the fainter secondary star was eclipsing the brighter primary star, causing the dimming of the combined light from the pair.

As you can see by the scale drawing below, both stars are many times larger than our sun, and their centers are only about six or seven million miles apart (by comparison, the Earth's center is about 93 million miles from our sun's center.) At a distance of 93 light years, Algol is one of the closest of all the eclipsing binary stars.



From recent studies it has been determined that about 80% of the bright star is covered by the fainter one, causing the brightness to drop from magnitude 2.1 to 3.4 at maximum eclipse. This can easily be noticed with the naked eye by comparing Algol's brightness to the brightness of Gamma (γ) Andromedae (magnitude 2.1) which is about eleven degrees to the west of Algol, and to Epsilon (ϵ) Persei (magnitude 2.9) some nine degrees east of Algol. Most of the time (when not in eclipse) Algol will appear slightly brighter than Gamma Andromedae. At minimum light (fully eclipsed) Algol will be fainter than Epsilon Persei. The eclipse does not occur suddenly, but takes about five hours to fade to minimum, and another five hours to return to full brightness for a total duration of ten hours. There is also a secondary eclipse when the primary star covers part of the fainter star, but this dimming is very slight and cannot be detected without instruments. Below is a complete light curve for Algol showing the primary and secondary eclipses.



The predicted times of primary eclipse (minimum light) for Algol are published in *Sky & Telescope* magazine each month. Listed below are the times of minimum light for December and January.

December 2002		January 2003	
Date	E.S.T.	Date	E.S.T.
3	6:02 a.m.	3 *	7:03 p.m.
6	2:51 a.m.	6	3:52 p.m.
8 *	11:40 p.m.	9	12:41 p.m.
11 *	8:29 p.m.	12	9:30 a.m.
14	5:18 p.m.	15	6:20 a.m.
17	2:08 p.m.	18	3:09 a.m.
20	10:57 a.m.	20 *	11:58 p.m.
23	7:46 a.m.	23 *	8:47 p.m.
26	4:35 a.m.	26	5:37 p.m.
29	1:24 a.m.	29	2:26 p.m.
31 *	10:13 p.m.		

* = dates on which eclipse occurs at a convenient evening hour.

See if you can detect the changes in brightness of Algol!

[Editor: A star chart of Perseus that Ed supplied to accompany this article is on page 8.]

References:

Burnham's Celestial Handbook, Vol. 3, Dover Publications, 1978.

Sky & Telescope magazine, December 2002 and January 2003, Sky Publishing Company.



Cartoon by Nicholas La Para

Astronomus: 20

A Journal for Younger Astronomers

By Bob Popovich

“All I Want For Christmas”

I suppose we need to get “it” out of the way before we go any further. So, here “it” is: “All I want for Christmas is my two front teeth.” There. Done. Now let’s move on...

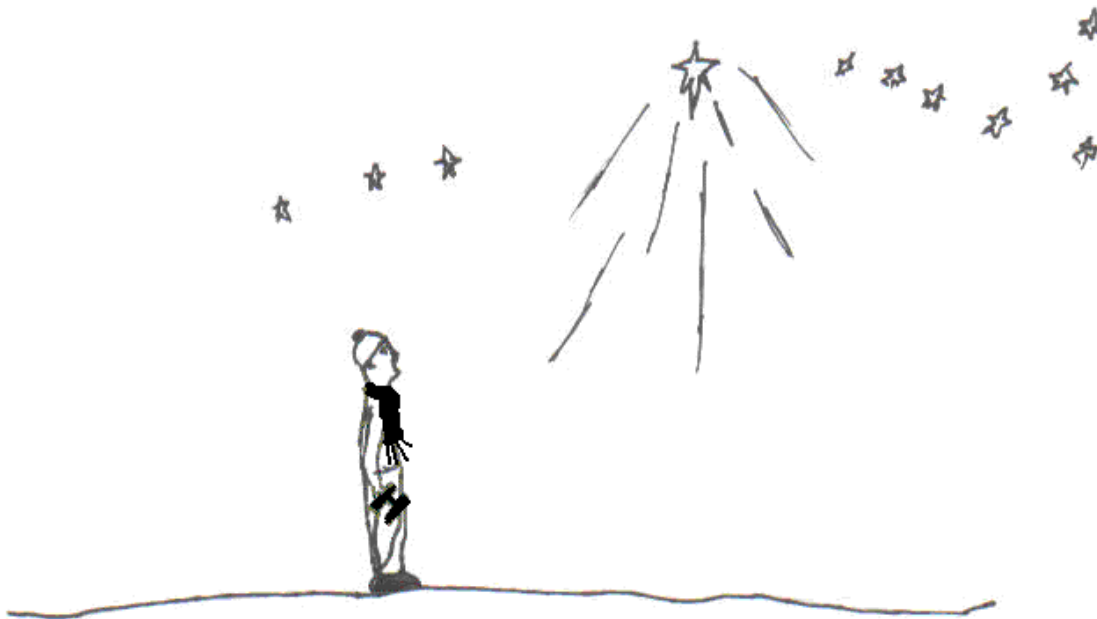
There isn’t really anything that I *want* for Christmas. Well, that’s not entirely accurate. I do want a pair of light pollution filters for my binoculars. (Anyone know where these might be had?) But other than these, nothing. No, wait. One more thing. How about a way to inspire two boys (genetically linked to yours truly) to take an interest in astronomy? But other than this, nothing. This time for sure.

Though I want for nothing more, I do *desire* some things. Now when you look at the force powering the word “want”, it seems weaker and perhaps even petty when compared to that which powers the word “desire.” This month’s article will center on desires. I would like to tell you about three of mine. Maybe you share one of them. And while we observe stars, wishing upon them won’t make these desires come to pass. It will require a community effort. And however you may define “community” is fine.

One—Being outside with clear, dark skies and ambient weather is a delight we all know and share. But more common than this are commercial jets passing overhead. Ignoring them while observing was once easy. But now, they give me pause. “Is everything up there OK?” I think. “Are all the passengers safe?” I desire a return of sanity and respect for human life.

Two—Why do so many people fear embracing the night? Why not enjoy the night as it was created to be—a time when the moon, stars and Milky Way (remember?) held center stage. But don’t we find many of our neighbors installing monstrous multi-light lampposts and motion sensitive floodlights? And these are on all night, to boot. An obscene effort to chase away the night while they’re inside in the partially conscious state called sleep (this being how some “watch TV”). So I also desire us to return the precious darkness to the night. And not just because it’s good for looking at the stars, but also because it’s the right thing to do.

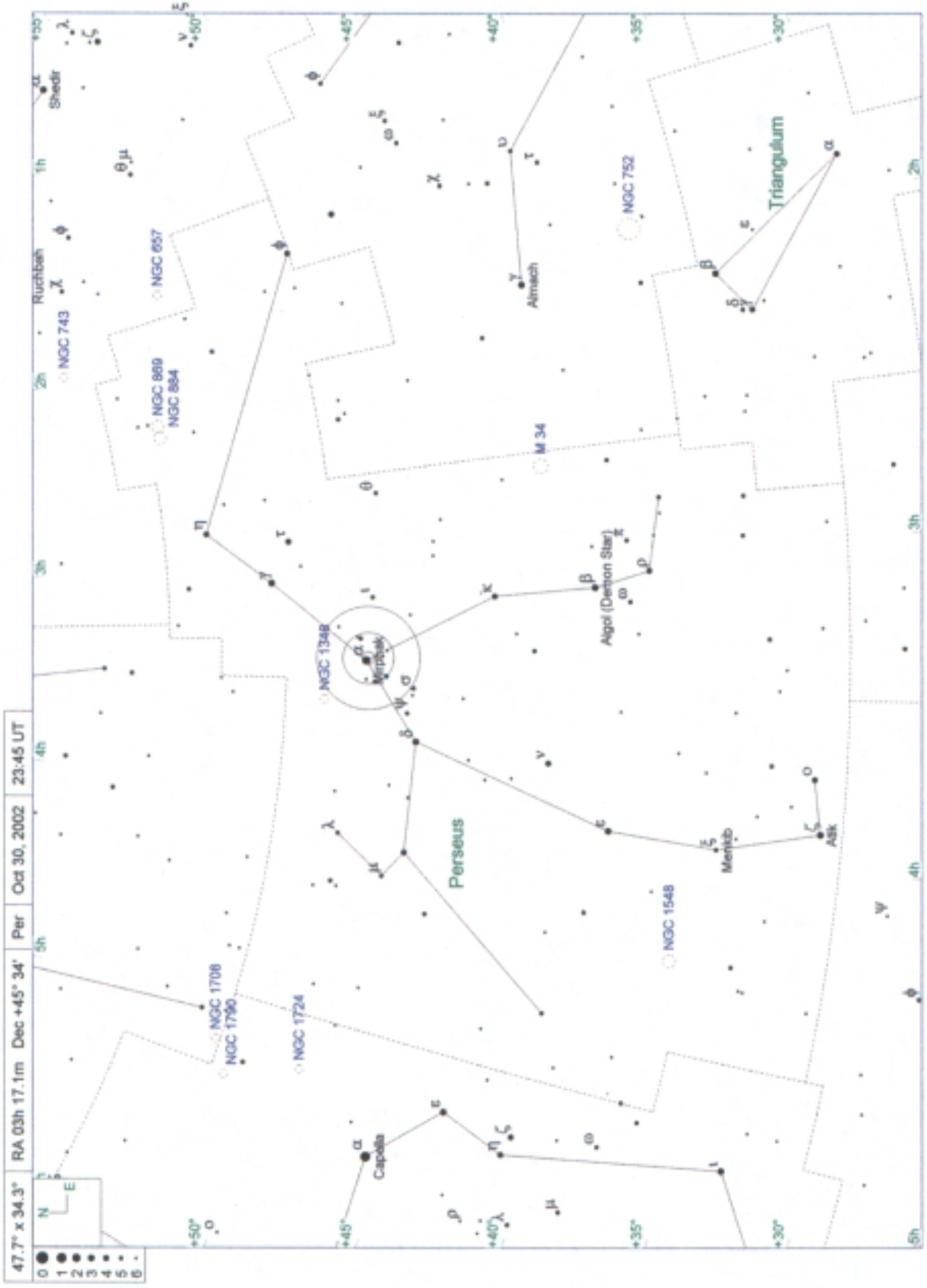
Three—Think for a moment how you feel after a satisfying evening of stargazing. Can you imagine the impact on people all over the planet if we all went outside to stargaze and ponder the universe even one night a year? Could it not generate a sense of how precious our common life on Earth truly is? Now this may sound too hopeful, but if nothing else, amateur astronomers are a hopeful bunch. And herein lies my third desire—that we diligently stoke the flame of our hope so that our families, present and future—will be able to enjoy the contentment and peace that the night sky brings.



A Merry Christmas and A Healthy, Peaceful New Year to You All.

Next Time: The Mouse With The Broken Tail





PERSEUS
Telrad circles centered on Alpha Persei