



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

JULY 2003
(VOLUME 11, NO. 7)

CCAS Summer Schedule

July

Friday July 25: Observing Session/Meeting
Brandywine Valley Assoc.
begins around sunset
Saturday July 26: cloud date

August

Friday Aug. 22: Observing Session/Meeting
Brandywine Valley Assoc.
begins around sunset
Saturday August 23: cloud date

July Skies

Moon Phases

First Quarter	7/6
Full Moon	7/13 "Full Buck Moon"
Last Quarter	7/21
New Moon	7/29

The Native American name for this month's Full Moon was obtained from the *Farmer's Almanac* Website. The new antlers of buck deer usually push out of their foreheads in July; hence the name. Some tribes also called it the Full Thunder Moon, for it is during this period that thunderstorms are most numerous. Early settlers and farmers also called it the Full Hay Moon.

The Planets

Mercury appears low in the evening sky in the latter half of July, but will be tough to spot.

Venus remains in the morning sky this month, but sinks ever closer to the Sun. By month's end it disappears in the Sun's glare.

Mars is rising as early as 10:00 p.m. by the end of July. It is high in the south at dawn. **In August Mars will be at its closest to us in recorded human history! Only 55,758,006 km, or 34,646,418 miles!** All month Mars is close enough that you should be able to see surface markings in a telescope. Early on the morning of July 17, as dawn begins breaking here, Mars will be very close to the edge of the gibbous Moon. Look around 5:00 a.m. EDT to see this close pairing.

Jupiter is the brightest "star" in our evening skies, blazing away low in the west. It is getting too low for good telescopic observations, and by month's end will disappear behind the Sun.

Saturn is near Venus in the morning sky, less than 1° apart on the morning of July 8. Saturn will get higher in the morning sky each day thereafter.

Uranus is in the morning sky in July, in Capricornus.

Neptune is also in the morning sky this month, in Capricornus.

Pluto is high in the south in the evening, in Ophiuchus. You need good dark skies, at least an 8" telescope, good star charts, and lots of patience to find Pluto.



Calendar Notes

September 9, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
October 14, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
November 11, 2003 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
December 9, 2003 (Tuesday)	CCAS Meeting Location: TBD 7:30 p.m. EST



Newsletter Deadlines

These are the deadlines for submitting material for publication in the newsletter, through the September 2003 issue.

<u>Issue</u>	<u>Deadline</u>
August 2003	07/25/2003
September 2003	08/29/2003



Report on NEAF held on May 17-18 , 2003

By Lisa Compton

[Lisa also took all the photos that accompany this article.]

Some of you may recall that I asked at the May Society meeting if anyone else was planning to attend the Northeast Astronomy Forum (NEAF). Well, no one else appeared to be going. I had a good time at the Forum and the workshops, lectures and presentations were first rate. The exhibition was pretty good. The biggest upset was Meade's no-show. I inquired about Meade's absence with one of the Forum officials but all I was able to learn was that it was a last-minute pullout. I think this was a bad move for Meade. Celestron, TeleVue and others were out in force.

I did bring some materials back if anyone is interested in seeing them. Some of the folks I met were Richard Berry, Ron Dantowitz, John Dobson, and Story Musgrave.

The presentation by Jim Bell (Cornell University) on the two Mars rover missions being launched next month was excellent. I learned a lot about the planned missions and the improved technical capabilities of the new Mars rovers. Jim is the project director for the panoramic camera system on both of the new Mars rovers. Jim's presentation included specifications on the new rovers. The new rovers are awesome and completely surpass the 1997 rover in every way.

The workshops I attended were "How to Get Started in CCD Imaging" facilitated by Richard Berry and "Imaging Mars with Video" facilitated by Ron Dantowitz. Both workshops were very informative and I learned a lot. I was pleased to find a vendor at the Forum that offers 28mm screw-in eyepiece adapters for Nikon's Coolpix line of digital cameras. Nice!

Here are a few of the pictures I took at the forum:



Nifty Great Polaris Vixen Equatorial Mount Supporting a TeleVue telescope with CCD Camera Attached (Nice!)



Richard Berry Delivering His Lecture on CCD Imaging (There is that Great Polaris/TeleVue Setup Again!)



Yours Truly with John Dobson (Can you believe John is 83?)



Ron Dantowitz Answers Questions on Video Astrophotography



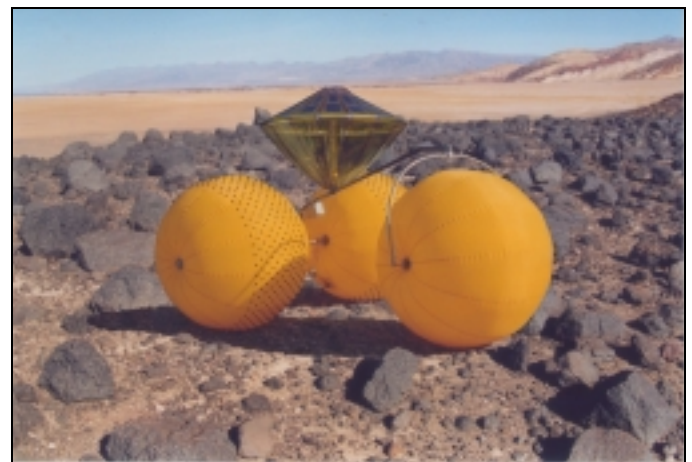
Monster Trucks on Mars

By Patrick L. Barry and Dr. Tony Phillips

We all know what Mars rovers look like now: robotic platforms, bristling with scientific instruments, trundling along on small metallic wheels. Planetary rovers of the future, however, might look a little different—like miniature monster trucks!

Enormous, inflatable tires can easily roll right over the rocks and rugged terrain of alien planets, just as they bound over old cars like as many speed bumps.

That's the idea behind a novel concept for robotic planetary rovers known as the "big wheels inflatable rover." Unlike rovers similar to the Sojourner robot that explored the surface of Mars in 1997 that depend on instructions sent from Earth or complex programmed intelligence to steer through rough terrain, this rover has three beach ball-like tires roughly five feet across that make it a true off-road vehicle.



The "Big Wheels" inflatable rover doesn't mind a few boulder-sized rocks, no matter what planet they're on!

"We sent this rover out to Death Valley, to a place called Mars Hill that has a general geological formation like Mars, and nothing could stop it," says Jack Jones, the mastermind of the inflatable rover concept at JPL. "It just kept going and going and going."

Lots of current research is devoted to developing advanced robotic intelligence that allows rovers to detect rocks in their path and maneuver around them. The alternative to such on-the-spot intelligence is tedium: Ground controllers on Earth working out the maneuvers by hand and waiting an hour or more for the instructions to travel to the distant planet.

A "big wheels" rover would need such computer intelligence to avoid very large boulders, but Jones asks, "Why worry about every little rock, pebble, and crack when you can just roll right over most of them?"



NEAF 2003 Exhibition Floor (Lots of Toys to See!)



NASA's Benefits of Space Exhibition Trailer

(The Benefits of Space Exhibition I saw at Marshall Space Flight Center during my astronaut training was better! However, this one had an awesome 10-minute Manned-Mission-to-Mars presentation!)



Astronaut Dr. Story Musgrave Talks About Hubble
(Story was the point person on the Hubble repair missions in the early '90's.)

Jones imagines a scenario where multiple inflatable-wheel rovers could be sent out to explore the Martian terrain-easily and quickly traversing the rugged terrain. Samples gathered by the rovers could be returned to a central, stationary laboratory module for detailed analysis.

"The Martian surface is really very, very rough with a lot of rocks, and to be banging this laboratory equipment up and down over all of these rocks aboard the rovers doesn't make much sense," Jones says. "I suspect it might be better to leave it in a central location."

At the moment it's all very speculative; NASA currently has no definite plans to send inflatable rovers to Mars. But who knows, one day monster truck-like vehicles could be zipping over Mars' rough, red surface.

Kids can baffle their friends with a robot puzzle (including a "Big Wheels" rover) they make themselves at http://spaceplace.nasa.gov/robots/robot_puzzle.htm. For adults, find out more about NASA's inflatable rover program at http://www.jpl.nasa.gov/adv_tech/rovers/summary.htm.

The preceding 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.



Sad News About FCO

[An e-mail message from CCAS member Deb Goldader, former Director of the University of Pennsylvania's Flower & Cook Observatory in Malvern, where many CCAS educational programs and community star nights were held]

"The University has, as I suspected, arranged to sell the property. I have no information on the timetable, but I do know that there has been one offer. Thank you for all of your support and use of the observatory. It is disappointing to see such a resource now being wasted."

Deb



Web Sites for Astronomy

[Another e-mail]

There are many thousands of astronomy related sites on the web. An amateur astronomer in Virginia has spent several months assembling a free collection of exceptional sites. Whether you are a beginner, or an advanced observer, Clark Thomas' "Astronomy Links" will provide information and inspiration.

You will find sections on "the best of the best," "for beginners and everybody else," "space flight and ETs," "miscellaneous," "organizations and gatherings," "solar system observing," "deep sky observing," "space images," "amateur CCD

astronomy," "product sources and reviews," and even "links with many links."

Clark is constantly upgrading this collection. If you would like to recommend an excellent site, let him know. Meanwhile, enjoy the many links; and tell a friend. Your friend does not need to be experienced, as there are several links to beginner sites.

Here's the web address:

<http://members.cox.net/clarkt7/astronomylinks>

Clear skies,

Clark M. Thomas

clarkt7@cox.net

[I haven't checked this Website yet, so I can't personally vouch for it. If someone does look into it, and would like to give it a brief review for *Observations*, please let me know.

Jim]



Membership Renewals

You can renew your CCAS membership by writing a check payable to "Chester County Astronomical Society" and sending it to our Treasurer:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814



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.

Once you've done that, 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 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. A third 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.



Astronomus

A Journal for Younger Astronomers

By Bob Popovich

“Variation on A Theme”

Throughout their journey about the night sky, our predecessors recorded what they saw. But that was not enough. They were a restless bunch (thanks!). And among them were those with a mechanical bent. Part tinker, part astronomer, they were inspired to create a device whereby they could study the mechanics of what they observed. So enthralled were they by the night sky that they wanted to study it both night *and* day, desiring not only to know what, but to comprehend why and how.

So somewhere in antiquity just such a device was created. One that incorporated ancient knowledge and was yet completely new. A work of art that was a scientific tool useful to both skilled astronomer and novice alike. And long before anyone laid out a grid pattern over a terrestrial map, this tool presented celestial latitude and longitude (altitude and azimuth). What might it have been? Time to test your Greek, for its name is derived from the Greek words for *star* and *to seize* or *determine*. As every English schoolboy knows, this compound word *aster-lambanien* comes down to us as astrolabe.

Fascinated not only with astronomy but also with geometry, the Greeks appear to have developed the astrolabe as a way to observe and compute. Beginning in classical times, and lasting for better than a millennium, knowledge of astronomy was considered an essential part of a person's education. (Ah, for the good old days!)

With knowledge of stereographic projection and a firm conviction that there was an order to both heaven and earth, they developed this tool that was far more than merely a star finder. It was able to compute and solve multiple astronomical problems.

Armed with knowledge of the stars and an instrument that helped bring order to the celestial sphere, astronomers were finding their way in an ever-evolving night sky. The fundamental relationships of earth to sky (astrolabes were custom-made to the observer's location) and of objects within the sky (the sun and stars) were laid out by the astronomers of old using the astrolabe.

This beautiful instrument can compute:

- The current time (Both the modern notion of civil time as well as the ancient notion, used since Biblical times, of the hour of the day)
- The time of sunrise and sunset
- The length of the day
- Sidereal time
- The right ascension and declination of major stars, including our own
- The position of the sun on the ecliptic
- Culmination of major stars

Developed by the Greeks of classical times, the astrolabe moved east throughout the Islamic world where it was greatly valued for being able to determine the time of day for prayers as well as the aspects of the zodiac. Astrology, you see, was deeply imbedded in the science of the times (horrors!).

Adding their own refinements, the astrolabe then moved westward again, reentering Europe via Moorish Spain. Ever wonder why so many stars have Arabic names? Well, perhaps the astrolabe is part of the answer.

My interest in these beautiful devices was aroused by seeing them in art museums. Later surfing the web, I came across astrolabe freeware that I downloaded and studied. But for me, the notion of actually holding an astrolabe in my hands was far more enticing than using the freeware. As it happens, the fellow who developed the freeware also offered custom-made astrolabes. I ordered one along with a guidebook. Still learning, I am utterly fascinated by how elegantly it presents the mechanics of the heavens. I have included two views of my astrolabe with some of its major features (photos are on the next page).

The Rule is the pointer that rotates in the middle of the astrolabe plate. It is used to determine time (both day and night), the position of the sun on the ecliptic as well as its declination. For observational measurement, the instrument is held just above eye level by placing your thumb in the ring at the top (Throne).

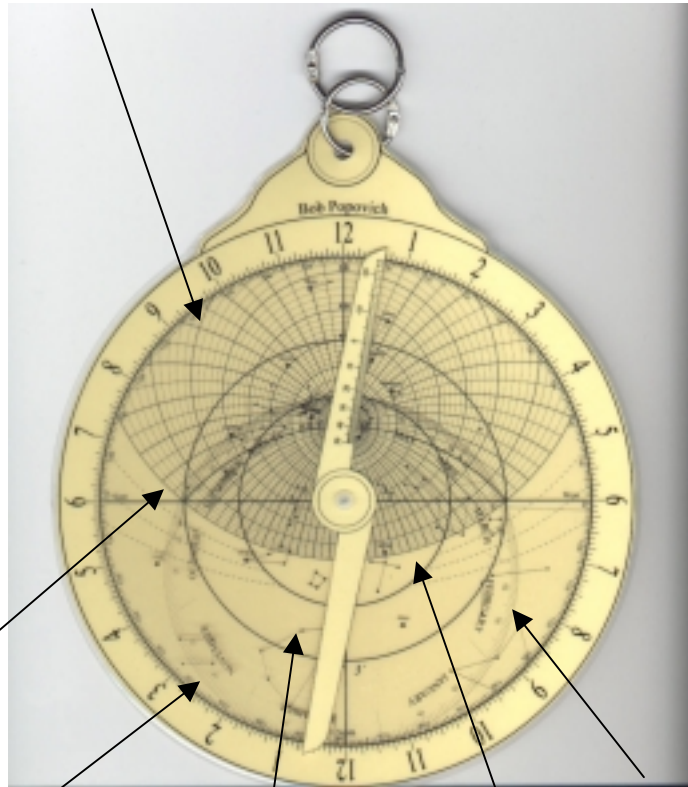
The back of the astrolabe also has a pointer though this one is called the alidade. It is used to measure the altitude of a star or determine the longitude of the sun. The kidney-shaped figure in the center is used to adjust for the difference between civil time and solar time (the equation of time problem). And notice that the calendar is offset—thus illustrating perihelion and aphelion.

Once I become confident enough in the astrolabe's use, I'll bring it to a society meeting so everyone can have an opportunity to enjoy the *classic version* of finding their way in the dark.

The web address is: <http://www.astrolabes.org/>

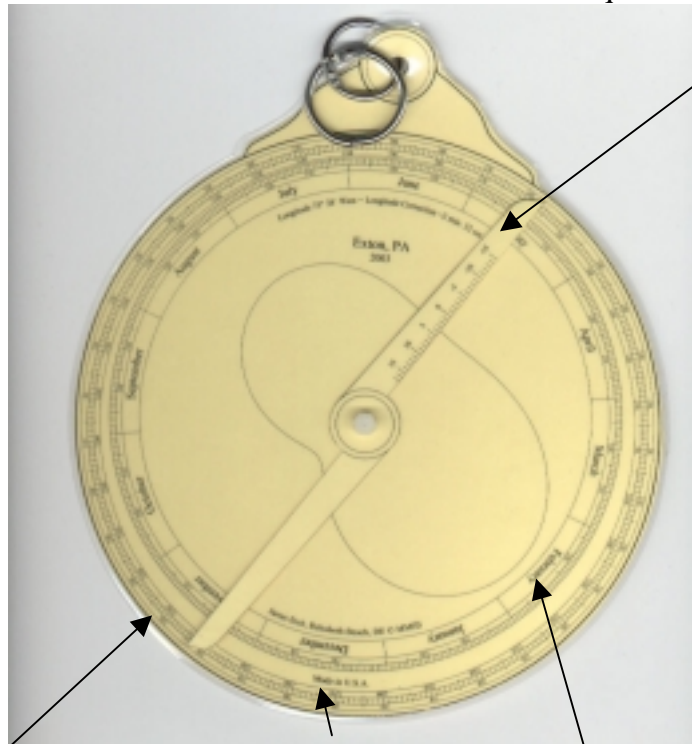
Next Time: The First One on This Side of the Pond

Grid for altitude and azimuth



Horizon Tropic of Capricorn Equator Tropic of Cancer Ecliptic

Alidade (Measures stellar altitude and aids in the calculation of the equation of time)



Altitude Scale Sun's longitudinal scale Calendar



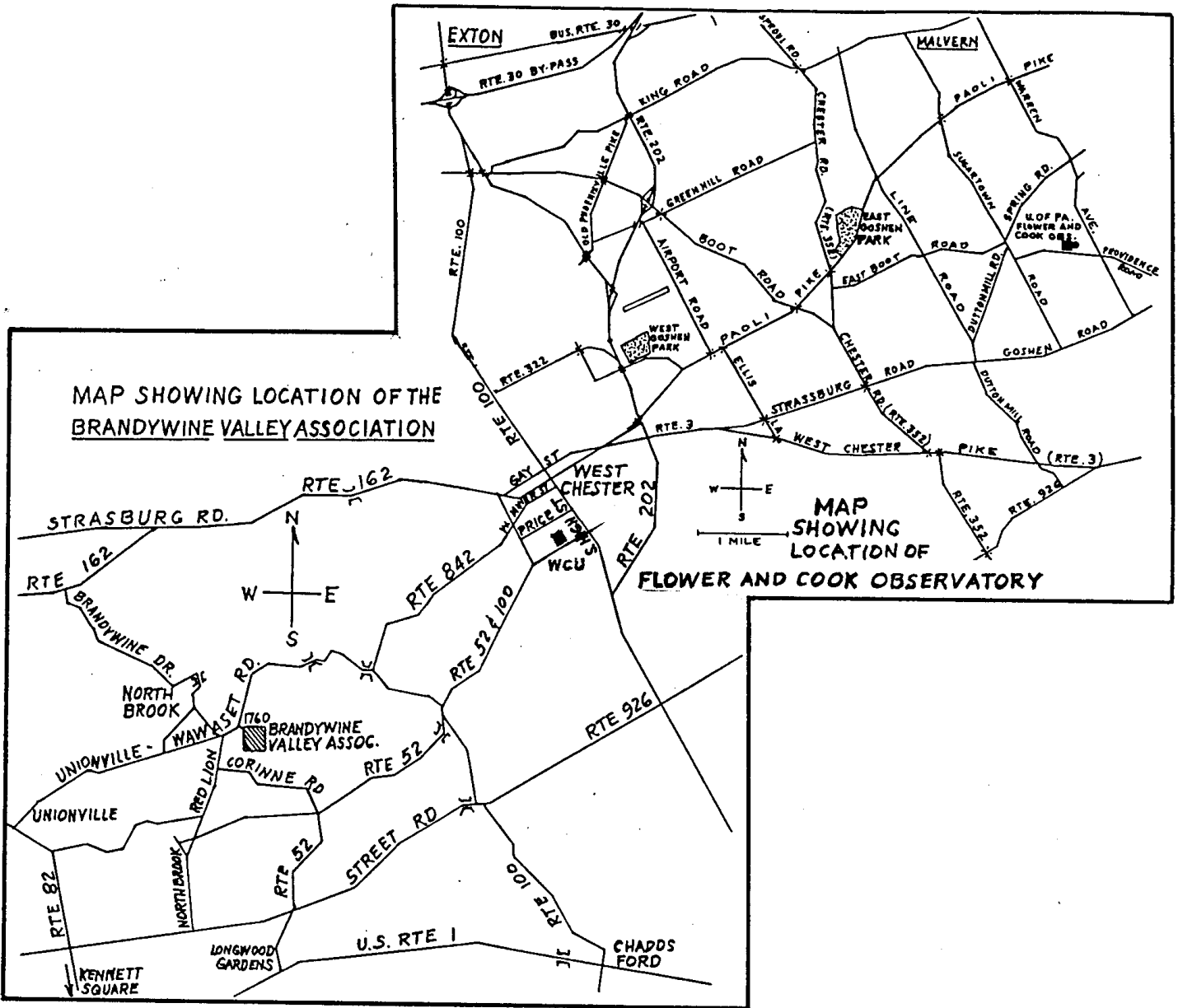
LITTLE KNOWN ASTRONOMY HISTORY



COPERNICUS IN HIS STUDENT DAYS

Cartoon by Nicholas La Para





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).