

The *Prairie Astronomer*

The Official Newsletter Of The Prairie Astronomy Club, Inc.

September 1999

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MEETINGS & EVENTS

PAC MEETING

TUESDAY, SEPTEMBER 28, 1999, 7:30 PM
at Hyde Memorial Observatory

MAHONEY STAR PARTY
FRIDAY, OCTOBER 8, 1999
Mahoney State Park

CLUB STAR PARTY
FRIDAY, OCTOBER 8, 1999
OAS Observing Site

PAC AND OAS BANQUET
FRIDAY, OCTOBER 8, 1999, 7:30 P.M.
Mahoney State Park River View Lodge

HYDE VOLUNTEER MEETING
SUNDAY, OCTOBER 10, 1999, 7:30 P.M.
At Hyde Memorial Observatory

NSP 7 PLANNING MEETING
THURSDAY, OCTOBER 14, 1999
Mahoney State Park

BEHLEN OBSERVATORY OPEN HOUSE
FRIDAY, OCTOBER 15, 1999, 7:00 P.M.-10:00 P.M.
Meade, NE

PAC MEETING
TUESDAY, OCTOBER 26, 1999, 7:30 PM
at Hyde Memorial Observatory

SEPTEMBER'S PROGRAM:

David Hamilton and Variable Stars

This month David Hamilton, a member of the American Association of Variable Star Observers (AAVSO), will give a presentation on observing variable stars. Observing variable stars is one of the most enjoyable and rewarding projects that amateur astronomers can engage in; and it does not even require a telescope. Join us for a look at this fascinating activity.

NOMINATION OF PAC OFFICERS

Will take place at the September 28th meeting. Elections will be held at the October meeting. If you wish to make a nomination, please be sure to attend the next meeting.

PAC-LIST: Mark Dahmke maintains an e-mail list server for PAC. If you have an e-mail address and are not on the PAC List, you may subscribe by submitting an e-mail to list@4w.com. Write "Subscribe PAC-List" in the body of the e-mail.

HYDE OBSERVATORY HOURS: Hyde
Observatory hours will change in October from sunset-11 P.M. to 7:00 P.M. - 10:00 P.M.

THE HUBL METEORITE: Time: Approximately Noon, Friday, August 13th, 1999. Was it a hotshot fighter pilot trying to get back to the base bar a little quicker, a piece of space junk that didn't burn up as fast as predicted, or was it an incoming space rock on its final plunge toward the blue planet? Be sure to read all about it in Erik Hubl's report on the PAC website at:
www.4w.com/pac/meteor/

UNL STUDENT OBSERVATORY: There will be no October Public Night at the UNL student observatory, but one is planned for November. Watch the October newsletter for date and time.

CONTENTS:

Secretary's Report - By Willa Penney	Page	2
Behlen Observatory Open House	Page	3
Product Review - By David Knisely	Page	4/5
Leonid Shower Update	Page	5
The Furnas-Norton meteorite - By Donald Wright	Page	6/7
July Telescope Making Marathon, Part 1 - By Martin Gaskell	Page	8
Meteor Map	Page	9
Program Interests Survey	Page	10
PAC Calendar	Page	11
OAS Viewing Site Directions and List of Officers	Page	12

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Secretary's Report

By: Willa Penney

President Dave Knisely opened the meeting. We had one guest, Robert Loda (sp?), who came because of a renewed interest in astronomy.

Dave reported that there was a major solar flare within the past few days. Comet Lee is visible in the morning sky in Auriga. Jupiter and Saturn are highly detailed and worth viewing.

Erik Hubl has been researching the "sonic boom" heard recently; he had responses from about 43 people who heard it, but no sightings. It broke windows in Valpariso. His charting of responses went from South Dakota to Falls City. According to his calculations, the sound trail was traveling 857 miles per hour. He plans to write up his findings and put on the PAC web page.

Jack Dunn reported that a teleconference may be set up with the man who discovered water in a meteorite.

Doug Bell has been named as Chairman for the 2000 Nebraska Star Party. He asked for volunteers to help plan next year's event. This year's NSP drew about 330 people.

Two star parties are scheduled for September 10: the Mahoney Star Party at Mahoney State Park, and the PAC party at the OAS site near Weeping Water. Martin Gaskell reported that the Behlen observatory will be open on Friday, October 15, from 7-10:00 p.m.

The PAC/OAS Fall Banquet, arranged by Larry Hancock, will be Friday, October 8, at the Helen Sapp Riverview Lodge at Mahoney State Park (the large lodge overlooking the river, north of the main lodge). Dinner will begin at 7:30, with Martin Gaskell's program at 8:30. Door prizes will follow. Cost is \$7.00.

Dave said that the Homestead National Monument in Beatrice would like to hold an Astronomy Night on Saturday, September 18. It would be held in the Freeman School, located 4 miles west of Beatrice.

Nominations will be accepted next month for PAC officers for 2000 with the election at the October meeting.

Mark Dahmke reported that over 2,000 hours have been logged so far for SETI. You may sign up on links from the PAC web page.

Liz Bergstrom, Treasurer, reported that \$50 will be available for the club banner that Bob Leavitt is having made, leaving about \$85 in our treasury. Bob asked for suggestions for a club logo to put on the banner.

Hyde has installed a new video projector; the screen will be installed soon. Mark Fairchild reported that the Hyde volunteer list is on the calendar in the newsletter. The website will report items that are actually observed. Volunteers meet the 2nd Sunday of the month, beginning at sunset. New volunteers are always welcome.

A new astronomy club is being formed in Nebraska; meetings will be at the McDonald planetarium in Hastings.

Erik Hubl raised the suggestion that the club enter a float in the Star City Parade. It was decided that we would not have enough time to prepare for this December, but should look into it for the December 2000 parade.

Dave Scherping said that the club was in need of a new Telrad; John Lawler offered to donate one to the club.

Our program, presented by Mark Dahmke, was video and slides taken at NSP.



Mark Dahmke

Photo courtesy: Mark Fairchild

Behlen Observatory Public Night

The Behlen Observatory Public Night for the Fall 1999 will be held on Friday, October 15. It will run from 7 p.m. to 10 p.m. Directions to Behlen Observatory in Mead, Nebraska are given below.

Slide Show Talks

The following speakers are tentatively scheduled to give talks (in the North Concourse):

- Dr. Todd Young WSC "Current NASA Programs" 7:15 p.m.
- Dr. Stephan Ducharme "Lasers and Your Life" 8:00 p.m.
- Dr. Peter Dowben "The New (or Fake) Physics in Science Fiction Movies" 8:45 p.m.

At least one slide show talk will be given by the astronomy faculty regardless of whether the weather allows telescopic viewing.



Demonstrations

The following demonstrations are tentatively scheduled to be set up (in the South East Lecture Hall):

- Dr. Bob Hilborn "Laser Demos"

Directions to Behlen Observatory

From LINCOLN: Take highway 77 north to about 1/2 mile past Swedeburg where you turn east on highway 63. Follow highway 63 for about 7 miles until you reach 10th street (same as spur 78F) where you will see a sign to Mead. Turn left and go one mile north to avenue "H". Turn right on Avenue "H" and continue east about 2 miles until you reach "8th" Street. Turn left on "8th" street and follow it north about 0.7 miles to the observatory, which will be seen off to the left.

From OMAHA: Take highway 92 west until you reach Mead. At Mead turn south on to spur 78F and follow it about 5 miles until you reach Avenue "H". Turn left on Avenue "H" and continue east about 2 miles until you reach "8th" Street. Turn left on "8th" street and follow it north about 0.7 miles to the observatory, which will be seen off to the left.

About Behlen Observatory

Behlen Observatory is a research facility operated by the University of Nebraska-Lincoln Department of Physics and Astronomy. It is located in Mead, Nebraska approximately 38 miles northeast of Lincoln. It houses a 30-inch Cassegrain Reflector which is primarily used for variable star research.

Two public nights are held each year (one in the fall and one in the spring) where the 30-inch telescope is available for public viewing. The exact dates of these nights will be advertised on these pages well in advance. Typically slide show talks, physics demonstrations, and the opportunity to look through smaller telescopes is offered as well. School groups may also arrange special tours schedules permitting.

People with questions concerning the observatory may contact the Behlen Observatory Director Dr. Edward Schmidt by E-mail at eschmidt@unlinfo.unl.edu or the Behlen Observatory Coordinator Dr. Kevin Lee by E-Mail at kml@unlinfo.unl.edu or by phone (with voice mail) at 402-472-3686

PRODUCT REVIEW

By:

David Knisely

Tele Vue POWERMATE 2.5X Barlow-like "Image Amplifier"

List price \$220,
(often available for under
\$170)



There was a time when the negative lens system know as the Barlow lens was looked down upon by many amateur astronomers. Although they have been improved a great deal since the time of the old tiny Edmund Barlows, the Barlow still has a bit of a stigma attached to it. With newer and more sophisticated designs of eyepieces, barlows sometimes seemed a bit redundant.

However, the short focal length eyepieces used to get high power with the newer short f /ratio instruments still lacked a little eye relief, with some still seeming to give the "looking through a pinhole" effect. Hence, a good Barlow on a longer-focal length eyepiece seemed to give better eye relief and good overall performance, while extending the power range of the amateur's eyepiece collection. Now, optical wizard Al Nagler has turned the Barlow concept inside out, and has once again worked his magic to produce a true innovation in telescope optics; the Tele Vue POWERMATE 2.5X "Image Amplifier".

To be upfront, calling the Powermate a Barlow would be insulting to the Powermate! Most Barlows consist of an achromatic or apochromatic negative lens set which magnifies the light cone from the telescope to give a longer effective focal length, and thus a higher magnification with a given eyepiece. Barlows will often introduce their own set of optical problems into the telescope/eyepiece mix, often resulting in something of a compromise in performance. Since the negative lens of Barlows diverges the light, they also change the light angles of the light cone, resulting in only a rough simulation of a longer f /ratio system. By contrast, the Powermate isn't really a Barlow at all. It is a set of 4 lenses which, in effect, faithfully re-creates the characteristics of the light cone from a telescope with 2.5 times its original focal length. While this might not seem to be much of a conceptual difference, in performance, this idea results in a significant improvement in the view over regular Barlow lens systems.

The Powermate is similar in size to a regular 2x barlow, being 4 1/8" long and 1 5/8" wide at the top end with the top end flared slightly to accomodate

1.25" eyepieces without vignetting. Everything about the Powermate is machined to Tele Vue's usual high standard of quality. The upper half has a smooth black finish, while the lower half is bright chrome, with a wide machined groove in the 1.25" lower section above the lens section to help hold the set screw of the focuser. While some might be annoyed at this wide groove, those who use big heavy eyepieces on large scopes with tubes which allow the eyepiece to point downward slightly will know that this slot prevents some big heavy optics from ending up on the ground! Similarly, the set screw of the Powermate itself is captive, so it can't fall out.

The lens at the bottom of the Powermate is only 7/8ths of an inch wide, but up inside, the top lens set looks to be close to 1.2 inches in width, again showing that this optical invention is not a Barlow! The Powermate is used pretty much like you would a Barlow with the eyepiece in its usual spot. My smaller 1.25" eyepieces initially were slightly troublesome to insert into the upper end of the Powermate due to a slightly wider machined lip which holds the set screw. However, once I got the hang of the little "wiggle" I had to do, they went in without much trouble. This lip did not seem to bother my 14mm Meade Ultrawide eyepiece, so those of you who like the big "glass hand grenades" shouldn't have much trouble getting your eyepieces into the Powermate.

I tested the Powermate on my ten inch $f/5.6$ Newtonian with a variety of eyepieces. I had one of those "nights in a hundred", where the seeing is rock steady, so I could push the power on the ten as high as I wanted to go. At the telescope, the difference in performance between the Powermate and my older 3-element air-spaced Meade Model 140 "Tele-negative Amplifier", was nothing short of

Product Review Continued

remarkable. The contrast in the Powermate was
Continued on page 5

noticeably higher, with no evidence of scattered light, edge-of-field aberrations, or lateral color. With my 10mm Ultrascope on Jupiter, the disk showed both better contrast and a bit more detail (352x) than with the Meade Barlow. With Saturn, I sometimes had trouble with the fainter moons using the old Barlow, but they popped out nicely with the Powermate. The detail on both planets was amazing that night, so I did the usual silly thing of pushing into the realm of "empty magnification", using my 6.4mm "Super Plossel" and the Powermate. When I had tried this trick with the Meade Barlow (440x), the image was stable, but slightly dim and not absolutely sharp, with some weak color excess. It was almost like what you get when you are viewing a planet with a regular Achromatic objective and seeing a little hint of violet or bluish tint in the overall image. By contrast, using the Powermate, there was no hint of this color, and the image was a bit sharper at 550x than it was at 440x with the Meade 2x Barlow. The Encke gap was visible most of the way around the outer portion of the A-ring, although it was not all that easy. The detail in the B-ring was easy, with a "stair-step" brightness change being noticeable. The C-ring was not visible at 440x using the Meade Barlow, but was easily seen at both 352x and 550x using the Powermate. The Meade Barlow was simply being blown out of the water by the Powermate! On Gamma Andromedae, I had not seen the tiny close (0.46 arc sec.) companion to Gamma-B in at least 5 years, but tonight, the Powermate and the 6.4mm showed its tiny Airy disk touching Gamma-B, with

The Next 3 Leonid Showers Should Be Great

clear notching. Indeed, a small reddish star next to Jupiter showed its wonderful tiny and perfect diffraction pattern next to the comparatively-huge disks of the Galilean satellites. On wider field eyepieces, the Powermate gave me wonderfully sharp views of the moon, giving me much more of a feel of flying over the surface. It helped the slight lateral color of my Meade 14mm Ultrawide only slightly, but it did preserve that "space-walk" feel. My 24mm Koenig was also noticeably better in the Powermate than it was in the old Meade Barlow.

As a final test, a friend of mine had suggested that I try the Powermate as a focal extender for my Daystar T-scanner H-alpha solar filter. I had been using a barlow at the front of the T-scanner to get the required f/32 light cone, but this meant that only a portion of the solar disk was within the passband. My friend had indicated that the Powermate might be November's Leonid meteor shower will produce good displays this year and next, and strong storms of meteors in 2001 and 2002, according to new research by David Asher, of Armagh Observatory, and Rob McNaught of the Australian National University.

Writing in the Monthly Notices of the Royal Astronomical Society (21 August 1999 issue), they show how the times when Earth passes through the dense streams of matter in space that produce meteor showers can now be predicted with remarkable accuracy.

In the early hours of November 17, 1998, meteor watchers awaiting the Leonid shower were taken by surprise when a spectacular display of bright meteors occurred 16 hours before the predicted time for the maximum of the shower. The explanation for this phenomenon was discovered by Asher and his colleagues Professor Mark Bailey of Armagh Observatory, and Professor Vacheslav Emel'yanenko of South Ural University, Chelyabinsk, Russia. They showed that the bright meteors were seen when Earth passed through a dense arc-shaped cloud of particles shed from Comet Tempel-Tuttle in the year 1333 and they proved for the first time that meteoroid streams can have complex braid-like structures within them. This work pointed the way to more precise predictions of the timing and intensity of meteor showers, such as those Asher and McNaught are now making for the Leonids.

The latest analysis, covering Leonid meteor storms over the past 200 years, shows that the peak times of the strongest storms and sharpest outbursts are predictable to within about five minutes. The technique involves mapping the fine "braided" structure of the dense dust trails within the Leonid meteoroid stream. Although comet Tempel-Tuttle, the "parent" of the Leonid stream, passed close to the Earth in 1998, Asher and McNaught predict strong meteor storms in both 2001 and 2002. 1999 and 2000 will be less spectacular, but good. In 1999, observers at European longitudes are favored, and may see up to 20 meteors a minute (in ideal conditions under a clear, dark sky) at around 2 a.m. on the morning of November 18th.

"telecentric", which meant that might establish the field angles of an intrinsic long f/ratio system. Sure enough, when I used the Powermate, the *entire* solar disk was now showing chromospheric detail, so the barlow will soon be replaced by the Powermate!

In summary, the Tele Vue POWERMATE 2.5X Image Amplifier is an outstanding new optical invention which may eventually replace the standard Barlow in the arsenal of the amateur astronomer. If you have been considering a new Barlow, DON'T!! Get a POWERMATE instead!

The Furnas-Norton Meteorite

By Donald Wright, Lincoln
PAC Member

Those who were fortunate enough to attend the Nebraska Star Party in August were treated to velvet dark skies, brilliant space objects and a fine showing of meteors.

Thursday night was cloudy and my viewing buddy, Bob Jones of Iowa, and I turned in early. Something awoke me about 1:30 a.m., however. I have the distinct impression I was dreaming about people walking by our cabin and remarking on how bright the stars were!

Had to see, so I popped my head out and...pow...a meteor streaked down the length of the Milky Way! Failing to rouse Mr. Jones, I bundled up in the 44 degree temperatures and took my little 4.5 reflector out in the trees and away from the Merrit Resort's danged farm lights.

I easily popped Andromeda, Saturn, Jupiter and some fuzzy things down in Saggiarius. It really was too cold and windy to bring out star charts and red flashlights. I just decided to scope around. It was great. Clusters. Fuzzy things. Pow...another Geminid.

I went back in and put on more clothes and a jacket, wishing now I had thought to throw in gloves. Gloves? In August? In Nebraska?

Putting the little scope away, I took a yard chair and a cup of microwaved leftover coffee to a dark spot on the reservoir's beautiful white sand beach and just watched for meteors.

I wasn't disappointed. This was supposed to be the peak of the Persids and it certainly appeared so. I counted 31 in a half hour and there were bright flashes just on the edge of my vision that told me many more were dropping to the south if I was looking to the north, and vice versa. The cold finally won, however, and I returned to bed and a fitful sleep.



Friday night was another clear one, but this time I had the honor of escorting a writer from AAA's Home and Away Magazine who was doing a story on the Nebraska Star Party. This was one of her first experiences with looking at sky objects and she feasted on a 26" image from a friend from Kansas, as well as oohing and aahing in my little 4.5" peashooters aimed at the thin crescent moon. She really wowed, however, when she saw her first shooting star in those dark, Nebraska skies.

Heck, I even heard the assembled astronomers cheer when a sizzler came overhead. Astronomers, it seems, are easily amused.

The big news, however, came when I showed her where "the facilities" are located. She met some women she knew from the Valpariso area. It seems a meteorite, a bollide or a jet plane had created a huge "bang" in the area. My wife reported she could hear it inside our house in Lincoln, some 35 miles away!

If it WAS of extraterrestrial origin, and it had popped the sound barrier on entry, was it the only one to hit our fair state? I then remembered a news article from the Cambridge Clarion of Jan 1, 1998. Joyce Newport wrote about the world's second largest achondrite meteorite which smashed into the farm of Miss Helen Whitney south of Hendley, near the Nebraska-Kansas border on Feb. 18, 1948, about 4 p.m.

Cambridge resident Charles Mousel, then the chief engineer on the city's sewer system, saw the meteor fall at about a 45 degree angle.

"When I heard a roaring noise, I looked up and there it was. Even in daylight you could see it glowing and sparkling." The Beaver City Times-Tribune reported a "brilliant explosion high in the air..." Calculations based on observation from numerous men with aviation training provided a "strewn-field" location for the meteorite. The field had an elliptical shape about eight miles long and four miles wide centered on a spot 25 degrees west of true north, about four miles south of the Kansas-Nebraska border and almost exactly on the 100th meridian, and extended to a point about four miles north into Nebraska.

Field survey teams were sent from the University of New Mexico and the University of Nebraska, but they were hampered by the blizzards of 1947 and 1948, some of the worst on record. Several small stones were recovered in March by the search team and local citizens. On May 1, a deeply buried achondrite weighing 131.5 pounds was discovered in Norton County (Kansas). It wasn't until July 3 when the main body of the beast was discovered by...litterly... accident.

O. E. Will of Wilsonville and Arthur Hahn of Norton, KS., were harvesting winter wheat on Miss Whitney's farm near Hendley when the tracks of their caterpillar almost capsized into a hole seven feet across and about 10 feet deep.

At the bottom was a huge intact rock...the Furnas-Norton meteorite!

Besides being the second largest of its kind, the makeup of the meteorite also is unusual. Most are composed of solid things such as nickel-iron, magnesium-iron silicates, stone or a combination. The Furnas-Norton meteorite is composed of enstatite, a member of the pyroxene mineral family and rare on earth. It also contained many unusual sulfide minerals, also rare on earth.

So little was known about meteorites at the time, that the U.S. Army posted a guard at the dig site. Actually, a little late, since vandals had already crawled in the hole and stolen a chunk of the space visitor.

Teams encased it in plaster, pulled it out and weighed it in at 2,359 pounds (1070 kg), 20 times larger than any previous achondrite in the British Museum Catalog of Meteorites (1977 ed.). It then was hauled by truck to the Institute of Meteorite at the University of New Mexico. There, when the plaster was removed, the meteorite grew a "beard" of white fibers made up of magnesium, water and carbon dioxide. The beard covered 2,000 square centimeters, with some of the fibers reaching a length of 5 centimeters.

According to her article, more than 30 meteorites have been recorded as interrupting Nebraskan's Good Life.

The Cosmosphere now has a webcam on their site so you can watch the restoration of Liberty Bell 7.

Go to: <http://www.cosmo.org/libertybell7.htm> and then click on the webcam for the latest picture.



The July Telescope Making Marathon – Part I.

Martin Gaskell

During the course of Saturday July 24th a large number of people came by our house to take part wittingly or unwittingly in helping make a 6-inch Newtonian for Kelly Crowley. This is the first of a series of newsletter articles chronicling this enterprise. I'm intending, if time and space permit, to have one article on this per month over the next few months since there is a *lot* to describe and between us we took over 150 photographs of the telescope making (I'll spare you every single photo!). In this first article I'll give some of the background of the project; next month we'll start a blow-by-blow look at what we all did.

I believe that every household in the world ought to have a telescope! Through my experiences of sharing astronomy with several thousand people I've found that most people would *love* to have a telescope. The main obstacle is price. If telescopes were free, then I suspect that almost every household already *would* have one! Most people I talk to (mostly students) are not rich; almost all the equipment advertised in *Sky & Telescope* is well beyond their reach.

As many of you know, I've been a life-long amateur telescope maker ("ATM"). Like many young amateur astronomers I began that way because I *had* to – it was the only way to get a decent-sized telescope in those days – and despite becoming a professional astronomer, I've remained fascinated with telescope making. I want others to be able to have their own telescopes to explore the universe so I always tell my students about telescope making. Despite this I find that three prejudices remain which stop all but a few of my students from building or even contemplating building a telescope. They are as follows:

- (i) building your own telescope is *expensive*.
- (ii) it is *difficult*.
- (iii) even if you know what you are doing *it takes a long time*.

The first prejudice is the easiest to overcome. I can point to a home-made telescope and tell people what each component cost. The second prejudice is a little harder to overcome, but it is here that my children help me. I can show pictures of my children helping to make telescopes when they were pre-schoolers (I had an article in the newsletter a few years ago on how to get your children involved in telescope making and this was the theme of my July club program). My point is then:

"hey! – if pre-school children can do it, almost *anyone* can do it!"

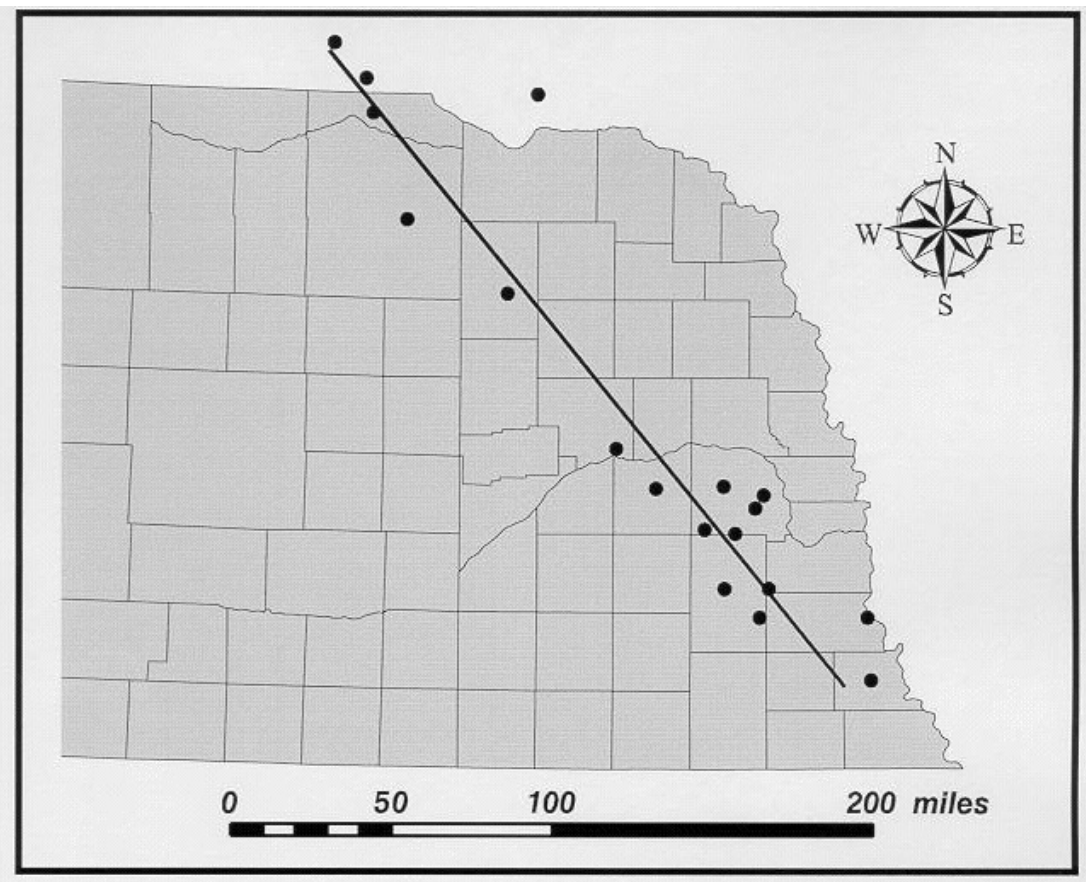
The July telescope-making marathon was aimed at addressing the third objection: that telescope making takes a long time. I knew from the theory, and extrapolating from my own experience, that it *should* be possible to build an entire telescope, including the mirror, from scratch, *in one day*. In response to the question, "doesn't it take a long time?" I had often pointed this out. I knew it ought to be possible, but I wanted to *actually* do it. Then I could say to people, "we made a complete telescope from scratch in one day". I had heard of another club making a 12-inch mirror from scratch in 42 hours (as a project for Astronomy Day), but I wanted to be much more ambitious than this: I wanted to start at 9:00 a.m. on a Saturday morning and have people *use* the completed telescope that night!!

At church a few years ago we met Kelly. She was a freshman or sophomore in high school at the time. One evening we had Kelly, her younger sister and her mother round at our house looking through "Tel'Poke" our home-made six-inch equatorial Newtonian. Kelly decided that she wanted to make one. She and I discussed the details. The main obstacle was just the cost of the primary mirror. Even buying a kit to make a 6-inch mirror was a lot for someone like Kelly. So I told her that if I got a spare mirror blank I'd let her have it to make a telescope mirror from.

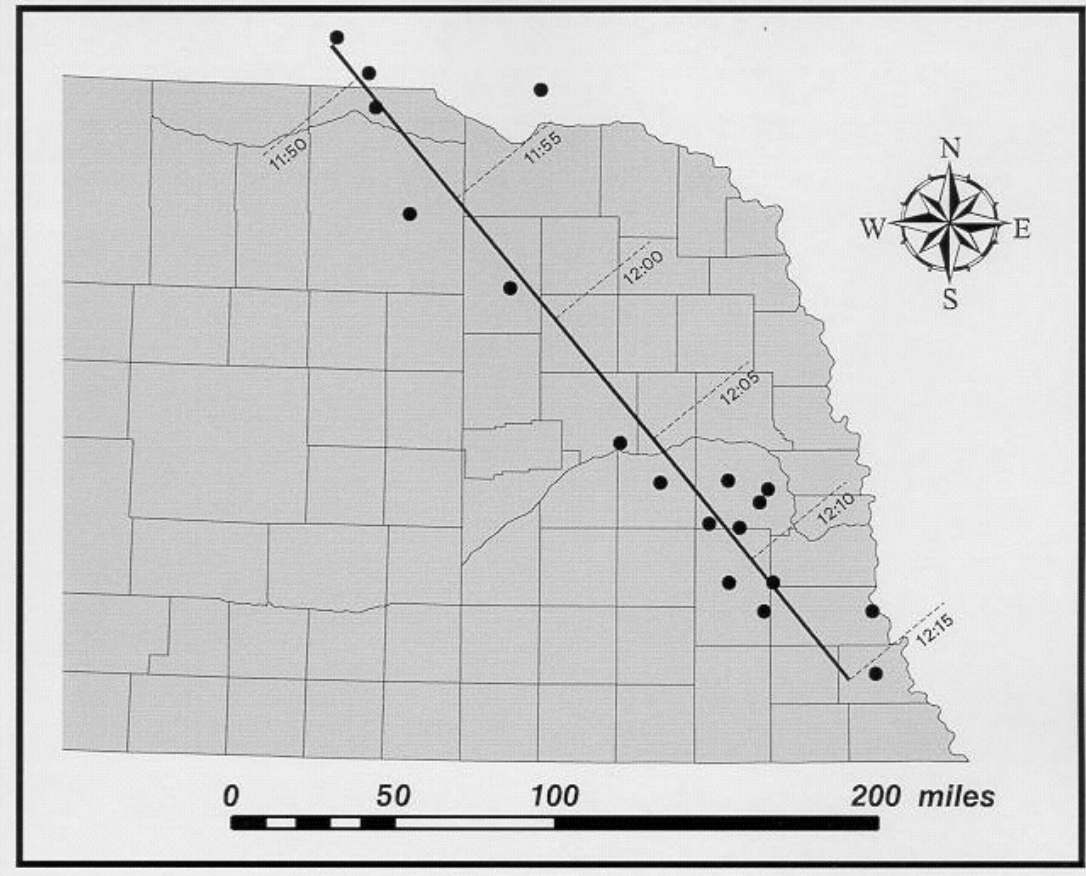
In the spring of last year, as I was browsing the Newport Glass Works web page, I noticed a place to register to win a free 6-inch mirror kit. I filled in the on-line form and submitted it. Of course I didn't need a 6-inch mirror kit, but I thought to myself, "if I win it, Kelly can make a telescope". Well, as many of you know, I did win it, and now Kelly has made her telescope! Thanks to being able to aluminize the mirror at UNL, we were able to not only make the mirror, but have it aluminized to look through the same evening. I'm unaware of any group of amateurs achieving such a feat before.

Next month I going to start off the saga by describing the rough grinding (we'll have lots of photos of everyone at it). To wrap things up for this month, let me correct one wrong impression that might have arisen as a result of the marathon. We had a total of 30 people (including children) around at our house during the course of the telescope making marathon. However, you *don't* need *that* many people to make a telescope! Three people would probably have been adequate to get the job done in a day. In fact, most of the time we only had a few people present. You could do everything we did on your own, and many people do, but almost certainly not in one day. My own physical stamina would not have been up to it.

THE SONGBIRD METEORITE SPAS



Trajectory based on known reports.



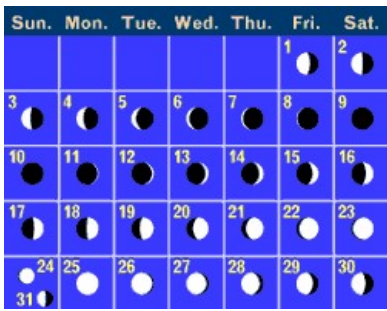
Estimated time intervals of the path of the songbird meteorite. Beginning from the top, time intervals are 5 min.

Program Interests Survey

One of the major parts of the club meetings is the program. Hence it would be helpful to know what the audience is interested in. Please take a moment to convey your interests by filling out the form below. Return it to the program chair at any club meeting.

Objects of Interest	I would like to:			Elaborate (If you wish)
	Hear a talk	Give a talk	Do a project	
Astrophotography	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Instrumentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Amateur Telescope Making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Telescope use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Binoculars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Developing a personal observing program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
History of astronomy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Local astronomy activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Deep Sky Observing (General)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Double Stars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Planetary Nebulae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Open Clusters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Globular Clusters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Novae	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Galaxies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Solar System Observing (General)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Sun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Planet: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Moon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Asteroids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Comets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Aurora	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
• Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
_____				_____
_____				_____
_____				_____

Please add any additional notes that you might have for the Program Chair below:



THE PRAIRIE ASTRONOMY CLUB CALENDAR

For October 1999

Celestial objects for Hyde Public Nights in October are: Gamma Andromeda, M-15, M-31, M-39, NGC-7009 (the "Saturn Nebula.")

Sun *Mon* *Tue* *Wed* *Thu* *Fri* *Sat*

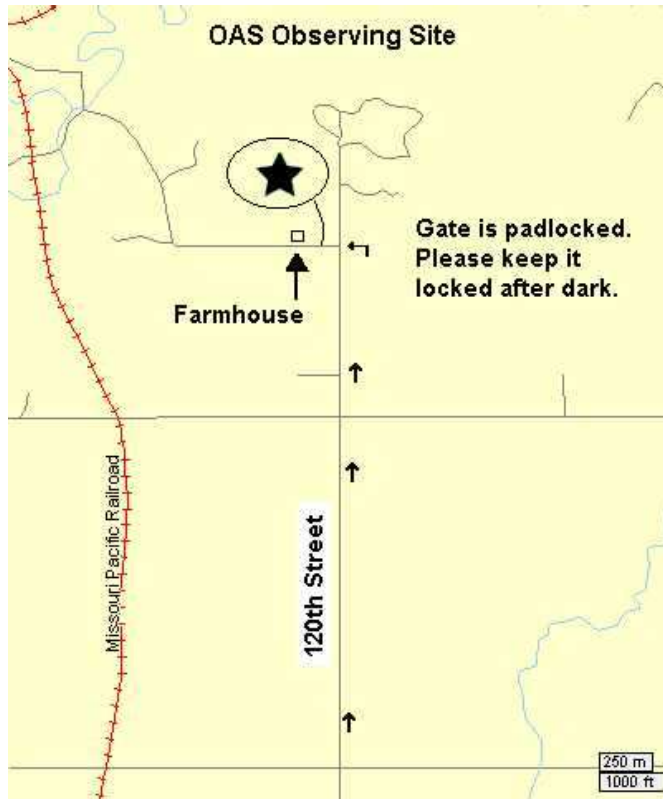
October Volunteer Schedule for Hyde Observatory: 10/02: Liz Bergstrom, Cedric Gibb, Jeff King, Matthew Lefeber 10/09: Mark & Margaret Fairchild, Mark Fairchild & Cassie Flyod, Sally Sterling 10/16: Dave & Joey Churilla, Bob Leavitt, Deepali Gangahar, Marki Fairchild 10/23: Travis Miller, Mel Thorton, Rosemary Thorton, Mark Fairchild 10/30: Don Gasparetti, Ben Rush, Mark & Michael Fairchild, Harve Deogun 10/10: Volunteer Practice Night; sundown to 10 p.m. All volunteers (and people who want to know more about volunteering) are invited.						1 3RD QUARTER 	2 Hyde Observatory open to the public 7-10 PM
3	4	5	6	7	8 Club Star Party/ Mahoney Star Party/ PAC-OAS Banquet	9 Hyde Observatory open to the public 7-10 PM NEW MOON 	
10 Volunteer Practice Night; sundown to 10 p.m.	11	12	13	14	15	16 Hyde Observatory open to the public 7-10 PM	
17 1ST QUARTER 	18	19	20	21	22	23 Hyde Observatory open to the public 7-10 PM	
24 FULL MOON 31 3RD QUARTER 	25	26 PAC Meeting 7:30 PM Hyde Observatory	27	28	29	30 Hyde Observatory open to the public 7-10 PM	

Great Plains Star Party
October 7-10

Scopeville, south of Osawatomie, Kansas. Contact Walt Robinson, 515 West Kump, Bonner Springs, KS 66012 (913) 422-1262

Directions to OAS Observing Site

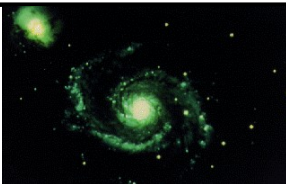
From Lincoln, take Highway 34 East approximately 29 miles to 120th street. Then go North about 2 ½ miles.



OFFICERS OF THE PRAIRIE ASTRONOMY CLUB

PRESIDENT:	Dave Knisely (402) 223-3968 dk84538@ltec.net
VICE PRESIDENT:	Larry Hancock (402) 421-2827 hancock@unlnotes.unl.edu
2nd VICE PRESIDENT (PROGRAM CHAIR):	Mark Fairchild (402) 488-8681 mark@blackstarpress.com
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Please send all submissions for The Prairie Astronomer to:
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jeffrey892@aol.com



The Prairie Astronomer
c/o The Prairie Astronomy Club, Inc.
P.O. Box 5585
Lincoln, NE 68505-0585

First Class Mail

Next PAC Meeting
September 28, 1999
7:30 PM
Hyde Observatory