The Prairie Astronomer

May, 1997 Volume 38 Issue #5

President's Note
by Douglas Bell

To all PAC members,

The Atlas site sale was closed on May 2nd, 1997. Total proceeds to the club were:

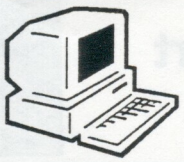
Sale price	$20,000.00
closing costs	- 262.67
net	$19,737.33

We also incurred two consulting fees from the legal firm of Pierson, Fitchett, Blake & Loftis. One has been billed at $35. The second has not yet been billed (as of early May), but should also be in the $35 range.

Editor's Notes
by Bryan Schaaf

The deadline for submissions for the Prairie Astronomer newsletter this month was Saturday, May 17th. Ideally such a deadline wouldn't be necessary, but when I'm put in a bind to get the newsletter processed for prompt mailing I have no choice but to insist on the deadline and proceed with the newsletter. The deadline for next month is June 14th ("ten days prior to the club meeting" as specified on the bottom of page 2) and I urge anyone that has something for the newsletter to get it to me sooner than that Saturday.

I am ready to pass on the editorship of the newsletter to whomever might want to try it. I will continue as editor until the end of the year, if necessary.



If you have access to Internet, see the Prairie Astronomy Club web page:
http://www.4w.com/pac/
E-mail us at: **pac@infoanalytic.com**
Omaha Astronomical Society web page:
http://www.top.net/cdcheney
NEKAAL web page: **http://world.std.com/~wic/**

MAY/JUNE MEETING NOTICES:

PAC MEETING
TUESDAY, MAY 27th, 7:30 p.m.
at Hyde Memorial Observatory

NSP MEETING
THURSDAY, JUNE 12th, 7:30 p.m.
at Mahoney State Park Lodge, Cottonwood Room

MAHONEY STAR PARTY
FRIDAY, JUNE 13th at Mahoney State Park Soccer Field

PAC MEETING
TUESDAY, MAY 24th, 7:30 p.m.
at Hyde Memorial Observatory

At the May meeting, David Scherping will conduct a Name-That-Object contest. There will be a prize, a Valentino's pizza certificate, for the contest winner.

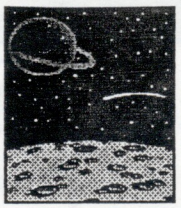
At the June meeting, Earl Moser will show his Comet Hale-Bopp pictures. Anyone that has comet pictures are urged to bring them to the meeting also.

BRIEFS:

About ten people attended the last Atlas Observing Site star party on May 9th. - Larry Hancock

contents:

Observing
Chairman's Report
by Douglas Bell



For June observing
New Moon: June 5th, 1997
Lunar object: Playfair crater
Planet: Uranus
Messier monthly: M 9
Top 40: Scorpius
Deep sky: NGC 4038 & 4039
Challenge: Seeing the tails

Quote of the month: It's not even dark yet!
- 5,000 amateur astronomers and 3,000,000 children

Tip of the month: Use a lotion bug repellant. It has less chance of getting on your optics.

Lunar feature: Playfair Crater
I just couldn't resist. A fairly normal crater in the heavily cratered terrain (lunain?) northeast of Tycho. Named after John Playfair, a Scottish mathematician.

Planet of the month: Uranus
Yes, I pronounce it u-RAN-us. You can use any pronunciation you choose. This slow mover has been in the Summer sky for as long as I've been observing. Hopefully, I'll still be observing after it's moved on.

Messier Monthly: M 9
It's the smallest globular in Ophiuchus. Awww. Still, it distracted Messier and is by no means the least item on the list. The real sign that Summer's here are the return of the globular star clusters.

Top 40: Scorpius
Can a constellation be a top 40 object? Sure! Mainly because it's one of the few that really do look like what they're supposed to, and because it's my list. Also, because I think it's cool. Of course, it's also chock full of deep sky delights.

Deep Sky: NGC 4038 & 4039
These are the antenna galaxies; probably the most scientifically interesting item on this month's list. They're pretty certainly the result of two galaxies trying to be in the same place at the same time. It's almost a dead ringer for computer simulations of interacting galaxies.

Challenge: Seeing the tails
How big of a scope does it take to see the tails (or antennae) of our deep sky friend? You'll need dark skies and a good aperture to resolve these features.

See "Last month's answer" and "Astro Trivia", column 2

DOUBLE STARS TO FOLLOW- PART V:
ORBITS YOU MIGHT LIVE THROUGH
BY MARTIN GASKELL

In the earlier articles in this series I have concentrated on double stars that you can watch "doing something" over a few years even with a small telescope. These were stars that were easy for a 6" Newtonian and should be detectable in a 4" or less. In this article (and maybe in a sequel or two), I want to focus on some stars that are more of a challenge, but some of which have another property: you might live through an entire orbit!

If you are only starting now, how short an orbit has to be for you to live through it depends on how old you are! Actually the number of bright stars that can be resolved in a moderate size amateur telescope and which have short orbits is not very large. One of the laws of orbital motion is that the shorter period orbits are smaller (Kepler's third law), so the shorter the period the harder the stars are going to be to separate. According to a list of bright doubles on "The Constellations Web Page" by Richard Dibon-Smith, the shortest period stars include the following:

NAME	Period (yrs.)	Separation (2000.0)	
Burnham 395	25	0.5"	
85 Pegasi	26.3	0.7"	
Beta Delphini	26.6	0.5"	
Zeta Herculis	34.4	0.7"	
Eta Cor Bor	41.6	0.7"	
Kruger 60	44.6	3.0"	(mags. 9.8 and 11.4)
Xi Scorpii	45.7	0.4	
Sirius	50.1	4.6"	(mags. -1.6 and 8.4)
Zeta AB Cancri	59.7	0.8"	
Xi Ursa Majoris	59.8	1.8"	
Gamma 2-Andromedae	61.1	0.4"	

Of these only Xi Ursa Majoris can be considered easy for a small telescope, and don't count on following it through a whole orbit, unless you're under 20! With two exceptions, all the others have separations of less than an arcsecond most of the time. The exceptions are Sirius, where the companion gets lost in the glare and Kruger 60, a very nearby, wide binary, but one with very faint components. For this month, let's revisit Xi Ursa Majoris and then talk about the two high up in the late spring sky: Eta Coronae Borealis and Zeta Herculis.

(Continued on page 3)

Last month's answer: Surprisingly, the hardest planet to reach is Mercury. Orbital mechanics often appear not intuitive. The fact is that killing Earth's own orbital velocity is quite a trick.

Astro Trivia: Speaking of lenseless telescopes, how many refractive lenses are in an average Dobsonian telescope?

(Double Stars to Follow continued from page 2)

XI URSA MAJORIS REVISITED

Back in the April 1995 issue of The Prairie Astronomer (p. 4), I described Xi UMa as being for those who had larger telescopes (meaning larger than a 6"). When I measured it in 1992, the separation was 0.89". Back then the position angle was changing at over a degree per month. However, the stars were also appearing to fly apart by almost 0.2 arcseconds per year, so, in just a couple of years since 1995, the system has become much more accessible with smaller telescopes. Actually, I was too pessimistic back in 1995; I successfully measured it back then with our 6" (at almost 1.2 arcseconds separation). Between my first measurement of Xi UMa in 1992 and next year I will have seen the pair rotate through almost 90 degrees. Here is an updated ephemeris for the next few years.

Epoch	PA	Separation
1997.42	290.1	1.53" (June 1)
1998.42	282.7	1.66
1999.42	276.2	1.74
2000.42	270.1	1.79
2001.42	264.3	1.80
2002.42	258.5	1.80

ZETA BOOTIS -- YOUR "WARM-UP STAR"

Zeta Boo is not a very short period star (P = 123.4 yrs), and it is not changing much in separation or PA this decade, but it's a good "warm-up" for the next two stars. It's close -- about 0.85" this spring -- but the stars are reasonably bright and almost exactly equal in brightness (magnitude 4.6 each). Try Zeta Boo after Xi UMa to see how much of a challenge these stars are going to be. If you can't resolve Zeta Boo, then the next couple of short period ones won't be possible.

Although not a star of very short period, Zeta Boo is nonetheless quite interesting: the orbit is extremely eccentric (e = 0.957) and in the year 2021 the pair closes to 0.03". At the moment the stars are just past their furthest apart, and moving relatively slowly, but after the turn of the millennium, they will close rapidly. Take a look at Zeta Boo each spring in good seeing to see if you can still resolve it.

1997.42	300.7	0.85"
2000.42	299.6	0.79

ETA CORONAE BOREALIS

Now let's try one of the shorter period ones (P = 41.6 yrs), but one that is a shade harder than the last. The combined magnitude of this pair is only 5.02, so it barely makes naked eye visibility in the city, but it's easy to find in the northern crown. Like all the binaries on my lists that "do something", it's relatively nearby in galactic terms: about 50 light years. At its widest, in 1993, the stars were only 1.0" apart, but with individual magnitudes of 5.7 and 6.0 the stars are very similar and this helps resolve them. In our new 8" (Tel'Poke II) they are easy in good seeing. Timothy, Daniel and I are building a new, ultra-high resolution micrometer, just for measuring these very close pairs, and a recent trial run with a prototype of the new micrometer suggested that Eta CrB was not hard to measure, so long as the seeing was good. I did make some measurements in 1995 of Zeta Bootis, a binary of similar separation, with my old micrometer on Tel'Poke I (6" aperture) and, even though the old micrometer was not designed for really close pairs, I got an answer very close to the predicted position. Here is the ephemeris for the next few years. You can see a drawing of the orbit in Burnhams. Burnham comments that the pair can be followed throughout the entire orbit with a good 6".

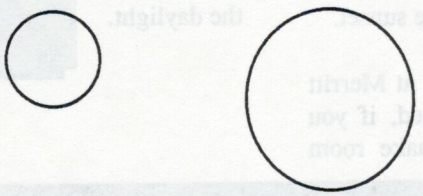
1997.42	51.8	0.85"	(June 1)
1998.42	56.2	0.80	
1999.42	61.3	0.75	
2000.42	67.1	0.69	
2001.42	73.9	0.64	

ZETA HERCULIS

Now we come to another challenge. The problem with Zeta Her (P = 34 yrs) is the big magnitude difference, 3.1 and 5.6. That's a factor of ten in brightness. I first measured Zeta Her back in 1992 using a 10" Newtonian. It was tricky to measure then at about 1.57" because of the magnitude difference. The pair is now starting to sweep round rapidly towards periastron in February 2002. It is sweeping out about a degree per month for the next few years and it is currently closing very rapidly at a rate of about 0.2" per year. In June 2000 the separation will be only 0.63"; in 2002 it will be 0.49". This will be very hard to resolve, given the magnitude difference, but if you're middle-aged and you want to follow a star around its entire orbit, this is one of the ones to try!

Although I measure separations and position angles with my micrometers, you can have the experience of watching Zeta Her and other pairs go round, just by making an accurate drawing in your note book.

1997.42	43.6	1.20"	(June 1)
1998.42	34.4	1.04	
1999.42	21.3	0.84	
2000.42	359.3	0.63	
2001.42	320.2	0.49	
2002.42	275.8	0.56	



The Nebraska Star Party

Newsletter, keeping you up to date on the latest events of NSP

May 1997 **Volume 1, Issue 4**

Take a moment to register for the fourth annual Nebraska Star Party. August 2-9, 1997

NSP Developments

NSP 4 Speakers

Dave Scherping has been in contact with the following people, and they have agreed to give a program at NSP 4:

-Bob Linderholm
-Lorri May
-Vondel Chamberlin
-Brenda Culbertson
-Someone from S&T

NSP will have more speakers in the near future; NSP will keep you informed as further speakers are added. If you would like to suggest or be a speaker yourself, contact Dave at: (402)477-2596 or email:dscherping@juno.com

T-Shirts Jim Rippy has spent many hours designing the official NSP T-shirt, preliminary designs have been fantastic.

The NSP **Ice cream social** is scheduled for Monday August fourth, a few hours before sunset.

All the **cabins** at Merritt Resort are rented, if you still need to make room accommodations, you need to hurry. Some registered guests are saying the hotels in Valentine are filling quickly.

This year's **river trip** registration process has been updated to better serve you. If you wish to attend, you will fill out the proper form and pay for the trip in advance when you arrive at NSP to register. This will eliminate the delays we had in the past of waiting in line to pay once you were in Valentine.

NSP photo day is scheduled for Wednesday August sixth. Set up your equipment a few hours before sunset so people can look at your equipment in the daylight.

One main side attraction to this years NSP is a sailboat racing contest to be held during the first weekend of NSP. NSP is working on many fun and exciting day/night activities for our guests.

If you have any suggestions on things to do, please contact: Jim Rippey at (402) 293-0650 or email: jrippey@radiks.net

NSP will hold **training sessions** in July to prepare individuals who wish to help with the registration check in procedures. If you would like to receive the training, please contact Jason Stahl to sign up.

NSP has received a paid registration from astronomers living in Hawaii. This could be the furthest traveled to date.

A flat rate on shower useage has been agreed upon between NSP and Merritt Resort. NSP will pay a cover charge for your use of the showers. You will still need to pay the coin machine to receive the water. To obtain this privilege, just show the cashier at the Trading Post your nametag, then shower.

NSP CDs are still available for $15 each. the CD contains video clips, articles, photos and other information from past NSPs. Contact Mark Dahmke at (402)475-3150 to order yours.

Just a reminder there is no formal **banquet** for NSP 4. NSP will be having a catered meal in its place. The location has yet to be determined.

Vendors to date:
Starmaster Telescopes KS
MAG 1 Instruments WI

Some of the **Door Prizes**:
-Meade Ultra Wide Angle 14mm
-$275 in gift certificates
-Large assortment of software/books/charts
-Filters, solar/color
-Mirror coatings (two)
-Refractor telescope building kit

NSP Website is located at: http://www.4w.com/nsp/

NSP Hotline: (402)466-4170 (for questions/information)

NSP Meeting Dates:
June 12 Cottonwood Rm
July 17 Prairie Agate Rm
(all times are for 7:30pm on Thursdays. Meetings are held at Mahoney State Park Lodge. Exit 426 on I-80)

Questions/Comments?
Contact: Jason B. Stahl, NSP Chairman, (402)423-4936
email: bgstahl@juno.com

NSP mailing address:
The Nebraska Star Party
c/o Tom Miller
3400 North 102nd Street
Lincoln, NE 68527

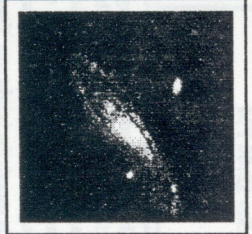
Make checks payable to : **The Prairie Astronomy Club Inc.-NSP**

The Prairie Astronomy Club

June 1996

S	*M*	*T*	*W*	*T*	*F*	*S*
1	**2**	**3**	**4**	**5** NEW MOON 2:03 AM	**6**	**7**
8	**9**	**10** In the news, 1976: The Viking 1 orbit insertion will be delayed 15 hours than scheduled due to a leaking helium tank	**11**	**12** NSP MEETING AT MAHONEY STATE PARK LODGE, 7:30 PM Moon at apogee, 251,149 miles 12:06 AM	**13** MAHONEY STATE PARK STAR PARTY FIRST QUARTER MOON 11:51 PM	**14**
15	**16** In the news, 1976: Viking 1 is racing at more than 6000 miles per hour through space toward a July 4th landing on Mars	**17** In the news, 1976: A total of 628 commands were sent to help put Viking 1 in Mars orbit were sent to the spacecraft's computer yesterday	**18** In the news, 1976: Viking 1 en route to Mars discovers a "bright haze" thought to be a thin cloud layer that obscures surface details	**19** In the news, 1976: A 15 mile high volcano and 2500 mile long canyon were photographed by Viking 1 yesterday	**20** FULL MOON 2:09 PM	**21** SUMMER SOLSTICE AT 4:20 AM; FIRST DAY OF SUMMER
22 In the news, 1976: Viking 1 sensors detect water vapor in low areas; more than previously thought	**23** In the news, 1976: The launch of Salyut 5 space station by Soviet Union was announced yesterday. It is expected to be manned "soon"	**24** PAC MEETING AT 7:30 PM AT HYDE MEMORIAL OBS. Moon at perigee, 227,729 miles 12:00 PM	**25**	**26**	**27** LAST QUARTER MOON 7:42 AM	**28**
29	**30** In the news, 1976: Viking 1 reveals a pattern of fracture-like features at the landing site on the plains of Chryse on the Mars surface					

Although **Venus** is bright (magnitude -3.9), it is only about 12 degrees above the horizon at sunset and sets within the hour. **Mars** (magnitude +0.4 at mid-month) is high in the south-southwest sky after sunset. Mars and forms a triangle in the southwest evening sky with Arcturus and Spica. **Jupiter** (magnitude -2.6) rises after midnight on June 1st. On June 10th Jupiter is stationary in Capricorn and begins retrograde motion thereafter. The giant planet is nearing Earth for it's closest approach in August. Check it out telescopically for it's large apparent size from now through the summer. **Saturn** (magnitude +0.7) is in Pisces and rises in the east at about 3:30 am on June 1st and 1:30 am by the end of the month.
This month the bright star Vega or Alpha Lyrae is high over head at around midnight, particularly at the end of the month. That same hour the "backwards question-mark" or "sickle" of Leo hangs over the west horizon. Aquila, the Eagle with it's bright star Altair has risen in the east. If you have a pair of binoculars and a fairly dark-sky view of Scorpius, the Scorpion in the south-southeast, then aim your binoculars at Antares, the bright red star, scan the area of the scorpion tail and east to Sagittarius. This region is rich with many globular and open star clusters. *Clear Skies!*



The Prairie Astronomer
c/o The Prairie Astronomy Club, Inc.
P.O. Box 80553
Lincoln, NE 68501

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Next PAC Meeting
May 27th, 1997

5-97

Mr. Earl Moser
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