

The *Prairie Astronomer*

The Official Newsletter Of The Prairie Astronomy Club, Inc.

October 1997

Volume 38 Issue #10

Internet Addresses:

PAC Web Page: <http://www.4w.com/pac/>
PAC E-Mail: pac@infoanalytic.com
NSP Web Page: <http://www.4w.com/nsp/>
NSP E-Mail: nsp@4w.com
Omaha Astronomical Society Web Page:
<http://www.tom.net/cdcheney>
NEKAAL Web Page: <http://world.std.com/~wic/>

**NOMINATION &
ELECTION**
of
PAC OFFICERS for 1998
at the October 28th meeting

LEONID METEOR SHOWER

The Leonid meteor shower will peak on November 17, 1997. In normal years, observers will see approximately 60 meteors per hour. However, due to meteoroids concentrated in a small region of orbit, this rate increases dramatically in certain years. For example, in 1966, approximately 150,000 meteors were seen in a one hour period. The Leonid meteor shower is expected to produce outbursts during the next few years, with strong returns expected for 1997-2001. The peak years will probably be 1998 & 1999. Be sure to get out and observe the Leonids this year. It could possibly be the show of a lifetime.

Also, look for the South Taurid Meteors peaking on November 3rd and the North Taurid meteors peaking on November 13th. Both should produce about 15 meteors per hour.

Reference: RASC Handbook 1997

AUGUST & SEPTEMBER MEETINGS & EVENTS

PAC MEETING

TUESDAY OCTOBER 28, 1997, 7:30 PM
at Hyde Memorial Observatory

NSP-5 PLANNING MEETING

THURSDAY NOVEMBER 13, 1997, 7:30 pm
at Mahoney State Park lodge

PAC MEETING

TUESDAY NOVEMBER 25, 1997, 7:30 PM
at Hyde Memorial Observatory

SHADOW TRANSITS ON JUPITER

There will be three multi-shadow transits on Jupiter in November.

First, there will be a double shadow transit on the evening of November 3rd. Ganymede's shadow will appear at 4:58pm CST and transit until 8:35pm. Io's shadow will appear at 7:38pm and transit until 9:55pm CST. To see both shadows, be observing Jupiter around 7:40 pm.

Then there will be a triple shadow transit on the night of November 10th. Ganymede's shadow will appear at 8:59pm CST and transit until 12:36am. Io's shadow will appear at 9:34pm and transit until 11:51pm CST. Callisto's shadow will appear at 8:10pm and transit until 12:52am. The key time to see all 3 shadows is around 9:30 pm.

Then on November 18th, there will be a double shadow transit. Ganymede's shadow will appear at 1:01am CST and transit until 4:37am. Io's shadow will appear at 11:30pm and transit until 1:47am CST. Best time to be observing this is around 1:00 am.

Reference: RASC Handbook 1997

CONTENTS:

SIGHTING THE SPACE SHUTTLE & MIR By Erik Hubl
ASTRO-TRIVIA ANSWERS
MISC. NEWS FROM JPL
SECRETARY'S REPORT
ASTROMAN
PAC CALENDAR

By Liz Bergstrom
By Dave Scherping

PAGE 2
PAGE 2
PAGES 3,4
PAGE 5,8
PAGE 6
PAGE 7

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc. Membership expiration date is listed on the mailing label. Membership dues are: Regular \$20/yr, Family \$22/yr. Address all new memberships, renewals, or questions to: The Prairie Astronomy Club, Inc., PO Box 80553, Lincoln, NE 68501. For other club information, contact one of the following: Doug Bell -President (402) 489-8197, Ron Veys - V.P. (402) 486-1449, John Bruce - Treasurer (402) 483-0389. All newsletter comments and articles should be sent to: Dave Scherping, 640 S. 30th St., Lincoln, NE 68510 (402) 477-2596 or e-mail dscherping@juno.com ten days prior to the club meeting. Club meetings are held the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, NE.

Sighting the Space Shuttle and Mir

by Erik Hubl

I have always been fascinated with the possibility of viewing satellites and knowing which one I was looking at. It adds a bit more excitement to the event and allows some vivid discussion amongst the viewers. I guess the excitement comes with the knowledge of what one is really seeing. Especially since on any given night at least a dozen and probably more satellites can be found but most often no one knows what it is or even which country it belongs to. So I wanted to look for the biggest and the best. The space shuttle and Mir. What I have found is these are very easy to see and I want to share with you my first exciting days of discovery.

A while back I stumbled onto a web page that gave tracking times for the shuttle. A link led me to another page that contained tracking times for Mir. I book marked these and waited for an opportunity when I could view them. The extremely clear skies in early October, 1997 offered the opportunity but that first night I had my hands full...literally. Little Caelum, who is almost 7 months old now, was snuggled in my arms with a bottle in his mouth. The pre-determined time on Oct. 1st was rapidly approaching and there was no way I was going to get to see it. I quickly called Mark Dahmke since I knew he had a good south view over Capitol Beach and he just might be able to see them as they float together, docked in space. I rattled off the numbers to Mark as he had only a few minutes before the time. "Look due south, 10 degrees above the horizon at 8:13 pm and it will track to a point 15 degrees above SSE with a duration of 1 minute" I said. He hung up and less than 2 minutes later was viewing Atlantis and Mir as they sailed gracefully across the south sky with a magnitude of at least 2. Mark called me back right away to give me a report on how easy it was to observe.

Armed with Mark's success, Friday Oct 3rd was our next viewing opportunity, but the shuttle had undocked from Mir that afternoon. My wife Tammy packed Caelum into a backpack baby carrier and we walked a block south of our house to a church parking lot at 51st and Randolph. I felt this would give us an open enough sky to witness the event. This time I had two sets of numbers. Atlantis was due at 7:52 pm appearing 10 degrees above SSW tracking to 17 degrees above E with a maximum elevation of 27 degrees. Mir was due at 7:54 pm appearing 17 degrees above S and tracking to 17 degrees above E with a maximum elevation of 29 degrees. The duration for both would be 4 minutes!

There was still a little sky glow in the west but Jupiter and Venus were brilliant. Right on time the shuttle appeared in the SSW as it made its way toward Jupiter. It's magnitude quickly climbed from 3 to 1 or maybe 0 (at least as bright as Vega). Then about 30 seconds behind it Tammy spotted Mir. Its magnitude climbed to 1 and was as bright as Altair. Interestingly it had a more reddish color whereas the shuttle was bright white. It was so exciting to see these two orbiting space craft flying in tandem, one passing a few degrees above Jupiter and the other a few degrees below. 7 American astronauts, 3 Russian cosmonauts and 1 French astronaut gliding across the Midwest sky while Tammy, Caelum and I watched in envy. As predicted, the two entered into the earth's shadow in the east while the 3 of us walked and talked about what it would be like to fly in space. Caelum said it would be "ahh-goo" which surely must mean good!

I hope this encourages a few of you to get out and try this. It is easy and fun. We even slipped out of the house during the third quarter of Saturday evenings Husker game with K-State to see both space craft at 73 degrees elevation in the north. They were now 7 minutes apart. I wondered if they could see the new lights at Memorial stadium.

If you would like to look up your own times I have included the following web page URL's. Happy hunting!

Mir tracking page:

<http://shuttle-mir.nasa.gov/shuttle-mir/ops/mir/tracking/>

Space shuttle tracking page:

(The STS number changes with every flight)

<http://shuttle.nasa.gov/sts-86/orbit/orbiter/sighting/>



astro trivia....

Answers to last month's trivia questions:

- 1) Near what crater did the Surveyor 7 spacecraft land?
- 2) What is the common name for NGC7317 through 7320?
- 3) Which two constellations have 7 globular cluster Messier objects?
- 4) What double star was the first star to have its distance accurately measured?
- 5) What variable star is also known as the "Garnet Star"?
- 6) What is the highest mountain range on the planet Venus?
- 7) At what distance from the center of a black hole is the escape velocity equal to the speed of light?
- 8) How many Messier Objects are globular clusters?
- 9) What is the name of the 5 point scale used to judge the appearance and brightness of lunar eclipses?
- 10) What is the common name for the open star cluster IC2602 in Carina?

Ans: Tycho

Ans: Stephan's Quintet

Ans: Sagittarius & Ophiuchus

Ans: 61 Cygni

Ans: Mu Cephei

Ans: Maxwell Montes

Ans: Schwarzschild radius or Event Horizon

Ans: 29

Ans: Danjon scale

Ans: Southern Pleiades

GLOBAL SURVEYOR'S ORBIT RAISED WHILE SOLAR PANEL IS ANALYZED

The lowest point of Mars Global Surveyor's aerobraking orbit has been raised temporarily and aerobraking has been suspended while the flight team analyzes data to understand why one of the spacecraft's two solar panels, which did not fully deploy, exhibited unexpected motion during a recent dip through the upper Martian atmosphere.

The spacecraft's current 35-hour orbit around Mars, which was taking it down to 121 kilometers (75 miles) above the Martian surface during each of its closest passes over the planet, has been raised to 170 kilometers (105 miles). The orbit was raised Oct. 12 by the operations team at NASA's Jet Propulsion Laboratory, Pasadena, CA, and Lockheed Martin Astronautics, Denver, CO, by performing a brief, 2.3-meter-per-second (5.15-mile-per-hour) propulsive burn at the farthest point of the spacecraft's orbit around Mars. The panel's performance has had no effect on spacecraft power.

"We're taking a hiatus from aerobraking for the next few weeks while we study data to try to model and understand the apparent deflection of the solar panel that never fully deployed and latched in place after launch," said Glenn E. Cunningham, Mars Global Surveyor project manager at JPL. "This delay in the aerobraking process will probably change the spacecraft's final mapping orbit from the originally planned 2 p.m. passage over the planet's equator in local Mars time to another time, and we are studying several other orbits that will give us nearly the same outstanding science results."

Preliminary data from the panel indicate that it has moved past what would have been its fully deployed and latched position, Cunningham said. In addition, the panel has shown some movement rather than maintaining its rigid position during aerobraking. These changes occurred during the spacecraft's fifteenth closest approach over the Martian surface, on Oct. 6, when the density of the Martian atmosphere doubled unexpectedly.

During the next few weeks, the Mars Global Surveyor flight team will leave the spacecraft's orbit in the current, 35-hour revolution around Mars, which will not take the spacecraft through the upper atmosphere of Mars, while they analyze data and simulate conditions in the Martian atmosphere to understand the behavior of the solar panel. This hiatus also means the spacecraft's solar panels will not be reconfigured for each close pass over Mars, but will remain in the normal cruise position.

"We can't explain yet what has happened," Cunningham said. "We saw the unlatched panel move past the latched-up position, and it remains past that point now. By raising the spacecraft's orbit above the upper atmosphere, the panel should not shift further because it will not be exposed to the aerodynamic forces of the Martian atmosphere."

Several other mapping orbits are available to Mars Global Surveyor to carry out its science objectives. The flight team will explore alternatives in the next few weeks to accomplish the lowest orbit possible and achieve a "sun synchronous" orbit that will allow Global Surveyor to fly over the Martian equator at the same local solar time each orbit. These sun synchronous orbits are designed so that the spacecraft's instruments always see Mars at the same lighting angle on every pass over the surface. "As we step back from aggressive aerobraking temporarily, we will have the opportunity to study the situation until we fully understand it," Cunningham said. "We will take advantage of this opportunity to return some spectacular data from the camera and laser altimeter."

The thermal emission spectrometer and magnetometer/electron reflectometer also will continue to collect data while we remain in this holding pattern."

The Mars Global Surveyor atmospheric advisory group reported that the Martian atmosphere has more than doubled in thickness in the last week. Global Surveyor is designed to withstand more than a 50 percent increase in atmospheric density, but began showing movement in the solar panel last week, during the fifteenth periapsis on Oct. 6.

Additional information about the Mars Global Surveyor mission is available on the World Wide Web by accessing JPL's Mars news site at <http://www.jpl.nasa.gov/marsnews> or the Global Surveyor project home page at <http://mars.jpl.nasa.gov>.

Mars Global Surveyor is part of a sustained program of Mars exploration, known as the Mars Surveyor Program. The mission is managed by the Jet Propulsion Laboratory for NASA's Office of Space Science, Washington, DC. JPL's industrial partner is Lockheed Martin Astronautics, Denver, CO, which developed and operates the spacecraft. JPL is a division of the California Institute of Technology, Pasadena, CA.

MARS PATHFINDER MISSION STATUS

13 October 1997, 1:15 p.m. PDT

Today we attempted to send a set of commands to the spacecraft to turn on its main transmitter. This is a similar set of commands that we have been sending for the past several days. We sent these commands over Deep Space Network station in Madrid. In both cases, we did not receive a transmitter on signal on the ground indicating the command has been received by the spacecraft. We also uplinked sequences that will start tomorrow morning when the spacecraft wakes up and turn on its transmitter near local solar noon. However, since we did not see the transmitter on today, we have no verification that these sequences were received by the spacecraft.

The Pathfinder anomaly team is continuing to investigate the problems we've had over the past several weeks, specifically related to commanding the spacecraft over the last week, and we are continuing to try to understand what configuration the spacecraft is in. We will have meetings tomorrow to discuss what our next step is in our strategy. We do plan to send sequences to the spacecraft that will attempt to move the high gain antenna and give us a downlink session in the middle of the day when we can actually receive telemetry data.

15 October 1997, 3:00 p.m. PDT

Today again we attempted to up link commands to the spacecraft that would turn on the transmitter, however, we were unsuccessful. Tomorrow we will resume our attempts to command the spacecraft. Our team is continuing to investigate the problem in an effort to better understand what is occurring on board the spacecraft.

For further information on the Mars Pathfinder Mission, please call our Mission Status Report line at 1-800-391-6654.

CASSINI MISSION STATUS REPORT

October 16, 1997 11:30 a.m. PDT

Following its spectacular launch into the moonlit sky above Cape Canaveral, FL, at 4:43 a.m. EDT (1:43 a.m. PDT) on Oct. 15, the Cassini spacecraft continues to operate nominally. "The spacecraft is extremely clean and mission operations are proceeding in an excellent manner," said Cassini deputy program manager Ronald Draper.

At one day and nine hours following launch, Cassini is traveling at a velocity of about 4.2 kilometers per second (about 9,223 miles per hour) relative to Earth. Engineers are beginning to look at data from when the Centaur separated from Cassini to correlate after-the-fact information on spacecraft systems with predicted performance. Telemetry recorded on Cassini's solid state recorder will be played back later this week. Extra commands to shut off two commendable heaters (out of 50) for the star camera were added. Radio plasma wave antennas will be deployed in ten days. Updates for engineering software are scheduled for today and tomorrow.

There are no anomalies with the spacecraft, according to Cassini mission director Chris Jones. "I can't recall a launch as perfect as this one," he said, adding that "everything we see is within predictions, with no failures."

PUBLIC INFORMATION OFFICE
JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
PASADENA, CALIF. 91109.
TELEPHONE (818) 354-5011

TELESCOPE FOR THE WEB

Case Western Reserve University is modernizing an 8-ton telescope at the Nassau Astronomical Station in northeastern Ohio by installing a computerized drive and imaging system and research spectroscoppe to make it the world's largest robotic telescope. It will be one of just a few large telescopes that can be accessed over the Internet. Others are at the University of California at Santa Barbara, the University of Iowa, and the University of Bradford (U.K.). (AP 12 Oct 97)

-----Submitted By Bob Leavitt -----

SECRETARY'S REPORT

Minutes From The September PAC Meeting

By Liz Bergstrom

The 30 September meeting of the Prairie Astronomy Club was called to order promptly at 7:30pm by President Doug Bell. Doug brought up a trivia question. Dobsonian telescopes are normally altazimuth. Where on earth will they become equatorially mounted? The answer will be given later in the meeting. Doug then asked if there were any guests in the audience. Our guests were Dominic Di Salvo and his mom, Ellen Di Salvo. The club welcomed our guests.

What's Up:

The full moon of October is known as the "Hunter's Moon". This month there are 2 new moons, one on Oct 1 and the other on Oct 31 which coincides with Halloween. When there are 2 full moons in one month, the 2nd is known as the "Blue" moon. There is no actual name for a 2nd new moon in a month. On 8 October there will be a double transit of moons of Jupiter and later toward the end of the month, there will be a triple transit. On 19 October early in the morning the moon will occult Aldebaran. On 22 October (again best viewing time will be early in the morning around 4am) is the Orionid meteor shower. The meteors are dust from the famous Halley's comet.

Events:

On 4 October the Behlen Observatory will be open to the public. PAC has been invited to help with the event. Those who want to bring their telescopes or binoculars are welcome to do so. On 10 October the last Mahoney Park public star party for this season will be held at the soccer field at the park. On 9-10 October Jim Burr of JMI will be in Omaha with a 3 night lecture series on astronomy and the bible. Each night after the lecture telescopes will be set up for viewing for those attending the lectures. The OAS and PAC have both been invited to bring telescopes to help with the crowd.

News:

Doug brought up the matter of a possible revision of the PAC bylaws regarding NSP. It has been determined that the NSP treasurer can be appointed by the PAC president with no change to the current bylaws. NSP has had a long term relationship between OAS & PAC.

Other News:

Election of officers takes place in October each year. Nominations were opened for candidates for the various officer positions. Those nominated were:

President: Doug Bell & Dave Knisely
Vice President: Doug Bell
2nd VP: Erik Hubl
Treasurer: Larry Hancock
Secretary: Liz Bergstrom

All members are urged to attend the October meeting to cast their votes for the next term officers.

Due to the sale of the Atlas site, a tax return will most likely have to be filed with the IRS. Dave Knisely made a motion that the club consult with an accountant regarding the procedure for this. Motion was seconded by Erik Hubl.

The weather was not clear and it started to rain for the PAC annual picnic which was held 6 September. The picnic was held inside the observatory with 15-20 persons attending. Needless to say there was no observing that night.

Erik Hubl stated that the annual club membership dues of \$50 are now due to the IDA (International Dark Sky Association). The \$50 cost is for clubs of 100 members or less. The IDA proposes ways and means to cut down on light pollution throughout the US. The association sponsors and supports most of the dark sky laws that are passed in the US. A motion was made and passed to continue the club's membership in the IDA.

The club's membership dues to the Astronomical League are now due. Members receive the Reflector newsletter quarterly; can earn certificates for observing from the Messier Club, Binocular Club, Double Star Club, etc. Louis Dorland (a member of OAS & PAC) said that OAS is planning to renew their membership. Lee Thomas moved that PAC renew their membership in the AL with Ron Veys seconding the motion. The motion was passed with one opposed.

John Bruce said that the club membership subscription dues for the Astronomy Magazine are currently \$20. After November 1st the subscription will be \$24. It will pay to renew now during the month of October.

Jack Dunn stated that the Mars Global Surveyor mission reached Mars on 12 September and has already detected magnetic fields on Mars. Also, the Sun is blue in a red sky not as depicted in the color corrected photo in the October issue of S&T of a Martian sunset. There is also a question in scientific circles as to whether or not there should be names on some of the Martian rocks that are observed.

The Cassini mission to Saturn will be launched 13 October. There is controversy among some activists who are very vocal in their opposition to the launch. This is due to the plutonium oxide fuel used for the power plant. These activists want the mission stopped.

New Business:

The subject of ordering through the club the 1998 Guy Ottwell and the 1998 RASC observers handbooks was brought up. A volunteer is needed to spearhead the ordering process. Liz Bergstrom volunteered to take the orders again this year. However Erik Hubl said that he would like to take charge of the observer handbook ordering for the club this year. A list was passed around for those who wished to order and Liz gave this list to Erik. Please give your order requests to Erik Hubl as he is in charge of the ordering.

It was brought up that there is some dark sky areas south and west of Lincoln which should be explored by the observing site committee. The area is bounded on the north by Hwy 6, Crete to the east, Fairbury to the south and Hwy 81 on the west. This will be looked at by the committee.

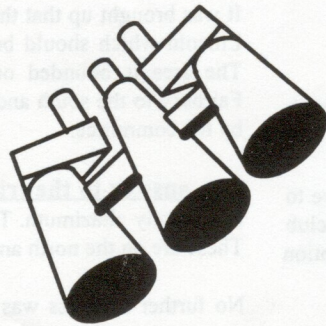
The answer to the trivia question was: A Dobsonian telescope is normally altazimuth. There are 2 places where they are equatorial. These are on the north and south poles.

No further business was brought up for discussion and the meeting was moved and seconded for adjournment.

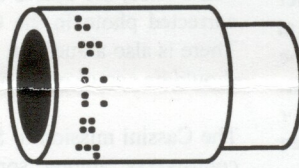
- continued on Page 8 -

A FEW NOT-SO-POPULAR ASTRO-INVENTIONS

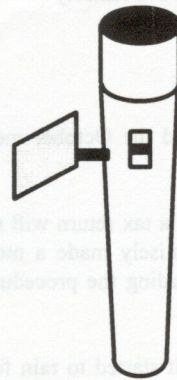
By Dave Scherping



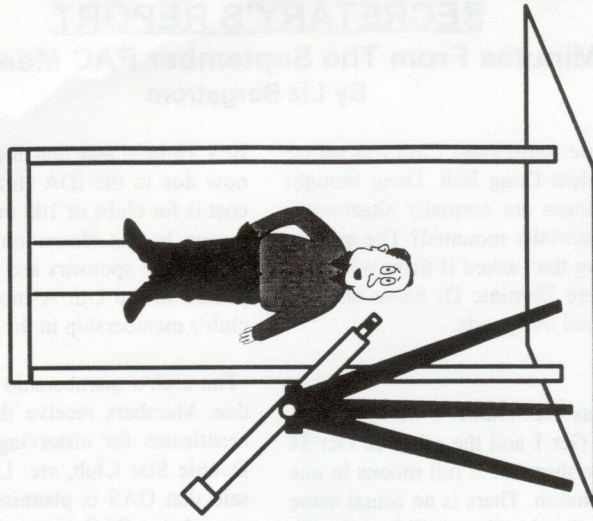
TRINOCULARS



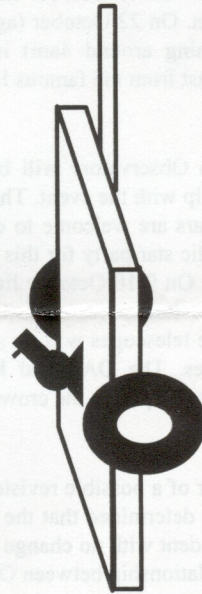
EYEPIECE WITH
BRAILLE DESIGNATION



SOLAR-POWERED
RED FLASHLIGHT








ASTROMAN'S
DELUXE IMAGE INVERTER



ASTROSCAN TRAILER

The PRAIRIE ASTRONOMY CLUB CALENDAR NOVEMBER 1997

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		OCT 28 PAC MEETING 7:30 pm Hyde Observatory !!!	OCT 29	OCT 30	OCT 31 NEW MOON 	1
2	3 S Taurid Meteor Shower Peaks Double shadow transit on Jupiter (7:30 CST)	4	5	6	7 1ST QUARTER MOON 	8
9	10 Triple shadow transit on Jupiter (9:30pm CST)	11 Saturn less than 1° from Moon (7:00 pm CST)	12 N Taurid Meteor Shower Peaks	13 NSP-5 Planning Meeting 7:30 pm at Mahoney State Park Lodge	14 FULL MOON 	15
16	17 Leonid Meteor Shower Peaks	18 Double shadow transit on Jupiter (1:00 am CST)	18	20	21 3RD QUARTER MOON 	22
23	24	25 PAC MEETING 7:30 pm Hyde Observatory !!!	26	27 THANKSGIVING	28	29 NEW MOON 
30						

Secretary's Report (continued from Page 5)

Program:

Louis Dorland presented a program on the history of the Omaha Astronomical Society. Louis moved to Omaha in early 1992 from Rapid City, SD where he was active in an astronomy club. He joined OAS and PAC in the summer of 1992. He said that OAS was formed in the early 1950's and the club first met at Neal Woods Nature Center in Omaha. In the early 1960's the club was incorporated as a nonprofit organization. OAS has an Astro Park near Weeping Water, NE with about 1/2 dozen concrete pads for observing which can be leased by members for a small fee. It is located SE of Weeping Water which is approximately 30 miles east of Lincoln on Hwy 34. Most of OAS scheduled meetings, which are on the first Friday of the month, are before the star Parties at Mahoney State Park. The club's actual permanent home is at Room 169, University of Nebraska Omaha planetarium located at the Duram Science Center. Louis brought some flyers about the club and club newsletters. Thank you Louis for sharing the information about the club and its history. It was very informative.

Liz Bergstrom - Secretary

OFFICERS OF THE PRAIRIE ASTRONOMY CLUB

PRESIDENT:	Doug Bell (402)489-8197 db16696@ltec.net
VICE PRESIDENT:	Ron Veys (402) 486-1449
2nd VICE PRESIDENT (PROGRAM CHAIR):	Larry Hancock (402) 421-2827
SECRETARY:	Liz Bergstrom (402) 464-2038
TREASURER:	John Bruce (402) 483-0389 jbruce@env.licor.com

Please send all submissions for The Prairie Astronomer to:

Dave Scherping
640 S. 30th St., Lincoln, NE 68510
(402) 477-2596
dscherping@juno.com



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

First Class Mail

Next PAC Meeting
October 28, 1997
7:30 PM
Hyde Observatory

10-97