

THE PRAIRIE ASTRONOMER

The Official Newsletter Of The Prairie Astronomy Club, Inc.

June 2005

Volume 46 Issue #6

Internet Addresses

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 NSP E-Mail: info@nebraskastarparty.org
 OAS Web Page: www.OmahaAstro.com
 Hyde Observatory www.hydeobservatory.info
 NEB-STAR www.neb-star.org

Club Events

PAC Meeting 7:30pm

Program: Hyde's New Nexstar Telescope

Tuesday, June 28, 2005

Club Star Party

Friday, July 08, 2005

Mahoney Star Party

Friday, July 08, 2005

PAC Meeting 7:30pm

Program: NASA Hubble Videos

Tuesday, July 26, 2005

Club Star Party

Friday, August 05, 2005

Mahoney Star Party

Friday, August 12, 2005

Nebraska Star Party

Valentine, NE

July 31 – August 5, 2005

Program

Hyde's New Nexstar Telescope

Hyde Observatory recently installed a new Nexstar Schmidt Cassegrain telescope. Dave Knisely, Brian Sivill and Lee Taylor will talk about the capabilities of the telescope, how and why Hyde bought it, and how it was installed. The new scope will add many capabilities to Hyde, including better wheelchair accessibility and the potential for video astronomy. If weather permits, the telescope will be demonstrated at the end of the meeting.

PAC-LIST: You may subscribe to the PAC listserv by sending an e-mail message to: imailsrv@prairieastronomyclub.org. In the body of the message, write "Subscribe PAC-List your-email-address@your-domain.com"

For example:
 Subscribe pac-list stargazer@myISP.com

To post messages to the list, send to the address pac-list@prairieastronomyclub.org

Contents:

Secretary's Report 2
 Hyde Observatory Volunteer Schedule 3
 Club Telescopes – Checkout Policy Changed 3
 NASA Announces Spectacular Day of the Comet 3
 Scientists Discover Possible Titan Volcano 4
 July Star Chart 6
 Events Calendar 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 \$30/yr, Family \$35/yr.** Address all new memberships and renewals to: **The Prairie Astronomy Club, Inc., PO Box 5585, Lincoln, NE 68505-0585.** For other club information, please contact one of the club officers listed on the last page of this newsletter. Newsletter comments and articles should be submitted to: **Mark Dahmke, PO Box 80266, Lincoln, NE 68501 or mdahmke@4w.com, no less than ten days prior to the club meeting.** The Prairie Astronomy Club meets the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, NE.

Secretary's Report

President Ron Veys called the meeting to order. There were no visitors. Ron discussed upcoming club events:

- The next club star party will be June 3rd at Olive Creek.
- The next club meeting will be June 28th.
- Dates for upcoming Mahoney Star Parties are June 10, July 8, August 12, and September 9.

The Omaha Astronomical Society has decided to go ahead with the handicapped star party. The date will be June 10. OAS reports that they are expecting a large crowd and they could really use some help from PAC. Contact Bob Leavitt if you would like to participate.

NSP news: The deadline for early registration is June 1. After June 1 the price goes up \$10. The dates for this year's NSP are July 31st – August 5th. NSP takes place at Merritt reservoir in the Nebraska Sandhills, about 27 miles southwest of Valentine.

Treasurer's report: Lee Thomas reported that there is \$395.50 in the main club account and \$206.74 in the Hyde account. Total assets, including savings and CD's, is \$33,482.81. The audit committee will schedule another meeting in June to complete the audit.

The club voted to spend \$100 to renew its membership in the International Dark Sky Association. The club also voted to renew its membership in the Astronomical League. The cost is \$5.00 per member, or approximately \$235. Side note: the Astronomical League's national convention (ALCon 2005) is in Kansas City this year. The dates are August 12-13.

Website: Mark Dahmke reported that he is close to completing the new design for the member database and web interface.

Mark Dahmke has digitized the video of Rick's program on the history of PAC from the February PAC meeting, and produced a two-DVD set that includes Rick's talk plus Earl Moser's video clips. The DVDs are available through the club library, and if you want your own copies they're available for \$5 from Mark.

Hyde Observatory is now on its summer hours – sundown to 11:00 pm. If you'd like to help at Hyde, contact volunteer coordinator, Dave Churilla.

Astronomy class: The Beginning Astronomy Class is scheduled to take place on June 8, 15, and 22 from 8:00 – 10:30 p.m. at Hyde. Preparations for the class are complete and the class is full (20 students).

Ron reviewed a summary of observing highlights for what's up in the sky in June.

The meeting was adjourned to the program. Erik Hubl and Larry Hancock presented "Meteorites and Tektites", a program on their meteorite collections. Dave Brokofsky also brought his meteorite collection to the meeting.

Submitted by,
Bob Leavitt

Hyde Observatory Volunteer Schedule

Date	Team Leader	Operators		Supervisor	Events
June					
6/25/05	Bob Leavitt	Bob Kacvinsky	Cece Hedrick	Martin Gaskell	
July					
7/2/05	Brian Sivill	Joey Churilla	Dave Brokofsky	Dave Churilla	
7/9/05	Bill Wells	Josh Machacek	Jim Kvasnicka	Jack Dunn	
7/16/05	Dave Hamilton	Bob Kacvinsky	Steve Lloyd		
7/23/05	Bob Leavitt	AJ Benker	Erica Block	Martin Gaskell	
7/30/05	Dan Delzell	Jared Delzell	Cece Hedrick	Martin Gaskell	
August					
8/6/05	Jeff King	Joey Churilla	Erica Block	Dave Churilla	
8/13/05	Bob Leavitt	Jim Kvasnicka	Dave Brokofsky	Martin Gaskell	
8/20/05	Dan Delzell	Jared Delzell	Josh Machacek		
8/27/05	Bill Wells	Bob Kacvinsky	Cece hedrick	Dave Hamilton	
Summer Hours: April through September (Sundown to 11:00 PM)					
Winter Hours: October through March (7:00 PM to 10:00 PM)					

Club Telescopes – Checkout Policy

Starting in June, when club members check out a club telescope, they will need to contact Mark Dahmke (475-3150) or mdahmke@4w.com once a week, to verify the location of the telescope and how long they plan to use it. The checkout time limit will be two weeks, but can be extended if no one else has requested use of a club scope.

NASA Announces Spectacular Day of the Comet

After a voyage of 173 days and 431 million kilometers (268 million miles), NASA's Deep Impact spacecraft will get up-close and personal with comet Tempel 1 on July 4 .

The first of its kind, hyper-speed impact between space-borne iceberg and copper-fortified probe is scheduled for approximately 12:52 a.m. CDT on Independence Day. The potentially spectacular collision will be observed by the Deep Impact spacecraft, and ground and space-based observatories.

"We are really threading the needle with this one," said Rick Grammier, Deep Impact project manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "In our quest of a great scientific payoff, we are attempting something never done before at speeds and distances that are truly out of this world."

During the early morning hours of July 3 (EDT), the Deep Impact spacecraft will deploy a 1-meter-wide (39-inch-wide) impactor into the path of the comet, which is about half the size of Manhattan Island, N.Y. Over the next 22 hours, Deep Impact navigators and mission members located more than 133 million kilometers (83 million miles) away at JPL, will steer both spacecraft and impactor toward the comet. The impactor will head into the comet and the flyby craft will pass approximately 500 kilometers (310 miles) below.

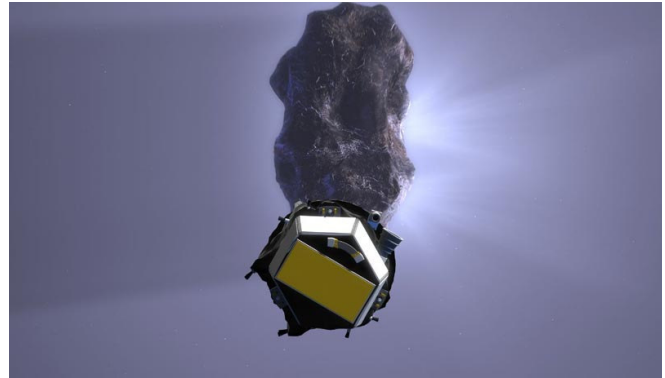
Tempel 1 is hurtling through space at approximately 37,100 kilometers per hour (23,000 miles per hour or 6.3 miles per second). At that speed you could travel from New York to Los Angeles in less than 6.5 minutes. Two hours before impact, when mission events will be happening so fast and so far away, the impactor will kick into

autonomous navigation mode. It must perform its own navigational solutions and thruster firings to make contact with the comet.

"The autonav is like having a little astronaut on board," Grammier said. "It has to navigate and fire thrusters three times to steer the wine cask-sized impactor into the mountain-sized comet nucleus closing at 23,000 miles per hour."

The crater produced by the impact could range in size from a large house up to a football stadium, and from two to 14 stories deep. Ice and dust debris will be ejected from the crater, revealing the material beneath. The flyby spacecraft has approximately 13 minutes to take images and spectra of the collision and its result before it must endure a potential blizzard of particles from the nucleus of the comet.

"The last 24 hours of the impactor's life should provide the most spectacular data in the history of cometary science," said Deep Impact Principal Investigator Dr. Michael A'Hearn of the University of Maryland, College Park. "With the information we receive after the impact, it will be a whole new ballgame. We know so little about the structure of cometary nuclei that almost every moment we expect to learn something new."



The Deep Impact spacecraft has four data collectors to observe the effects of the collision. A camera and infrared spectrometer, which comprise the High Resolution Instrument, are carried on the flyby spacecraft, along with a Medium Resolution Instrument. A duplicate of the Medium Resolution Instrument on the impactor will record the vehicle's final moments before it is run over by Tempel 1.

"In the world of science, this is the astronomical equivalent of a 767 airliner running into a mosquito," said Dr. Don Yeomans, a Deep Impact mission scientist at JPL. "The impact simply will not appreciably modify the comet's orbital path. Comet Tempel 1 poses no threat to the Earth now or in the foreseeable future."

Deep Impact will provide a glimpse beneath the surface of a comet, where material from the solar system's formation remains relatively unchanged. Mission scientists expect the project will answer basic questions about the formation of the solar system, by offering a better look at the nature and composition of the frozen celestial travelers we call comets.

The University of Maryland is responsible for overall Deep Impact mission management, and project management is handled by JPL. The spacecraft was built for NASA by Ball Aerospace & Technologies Corporation, Boulder, Colo.

For more information about Deep Impact on the Internet, visit: <http://www.nasa.gov/deepimpact>. For information about NASA and agency programs on the Internet, visit: <http://www.nasa.gov/home/index.html>.

Scientists Discover Possible Titan Volcano

A recent flyby of Saturn's hazy moon Titan by the Cassini spacecraft has revealed evidence of a possible volcano, which could be a source of methane in Titan's atmosphere.

Images taken in infrared light show a circular feature roughly 30 kilometers (19 miles) in diameter that does not resemble any features seen on Saturn's other icy moons. Scientists interpret the feature as an "ice volcano," a dome formed by upwelling icy plumes that release methane into Titan's atmosphere. The findings appear in the June 9 issue of Nature.

"Before Cassini-Huygens, the most widely accepted explanation for the presence of methane in Titan's atmosphere was the presence of a methane-rich hydrocarbon ocean," said Dr. Christophe Sotin, distinguished visiting scientist at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

"The suite of instruments onboard Cassini and the observations at the Huygens landing site reveal that a global ocean is not present," said Sotin, a team member of the Cassini visual and infrared mapping spectrometer instrument and professor at the Université de Nantes, France.

"Interpreting this feature as a cryovolcano provides an alternative explanation for the presence of methane in Titan's atmosphere. Such an interpretation is supported by models of Titan's evolution," Sotin said.

Titan, Saturn's largest moon, is the only known moon to have a significant atmosphere, composed primarily of nitrogen, with 2 to 3 percent methane. One goal of the Cassini mission is to find an explanation for what is replenishing and maintaining this atmosphere. This dense atmosphere makes the surface very difficult to study with visible-light cameras, but infrared instruments like the visual and infrared mapping spectrometer can peer through the haze. Infrared images provide information about both the composition and the shape of the area studied.

The highest resolution image obtained by the visual and infrared mapping spectrometer instrument covers an area 150 kilometers square (90 miles) that includes a bright circular feature about 30 kilometers (19 miles) in diameter, with two elongated wings extending westward. This structure resembles volcanoes on Earth and Venus, with overlapping layers of material from a series of flows.

"We all thought volcanoes had to exist on Titan, and now we've found the most convincing evidence to date. This is exactly what we've been looking for," said Dr. Bonnie Buratti, team member of the Cassini visual and infrared mapping spectrometer at JPL.

In the center of the area, scientists clearly see a dark feature that resembles a caldera, a bowl-shaped structure formed above chambers of molten material. The material erupting from the volcano might be a methane-water ice mixture combined with other ices and hydrocarbons. Energy from an internal heat source may cause these materials to upwell and vaporize as they reach the surface. Future Titan flybys will help determine whether tidal forces can generate enough heat to drive the volcano, or whether some other energy source must be present. Black channels seen by the European Space Agency's Huygens probe, which piggybacked on Cassini and landed on Titan's surface in January 2005, could have been formed by erosion from liquid methane rains following the eruptions.

Scientists have considered other explanations. They say the feature cannot be a cloud because it does not appear to move and it is the wrong composition. Another alternative is that an accumulation of solid particles was transported by gas or liquid, similar to sand dunes on Earth. But the shape and wind patterns don't match those normally seen in sand dunes.

The data for these findings are from Cassini's first targeted flyby of Titan on Oct. 26, 2004, at a distance of 1,200 kilometers (750 miles) from the moon's surface.

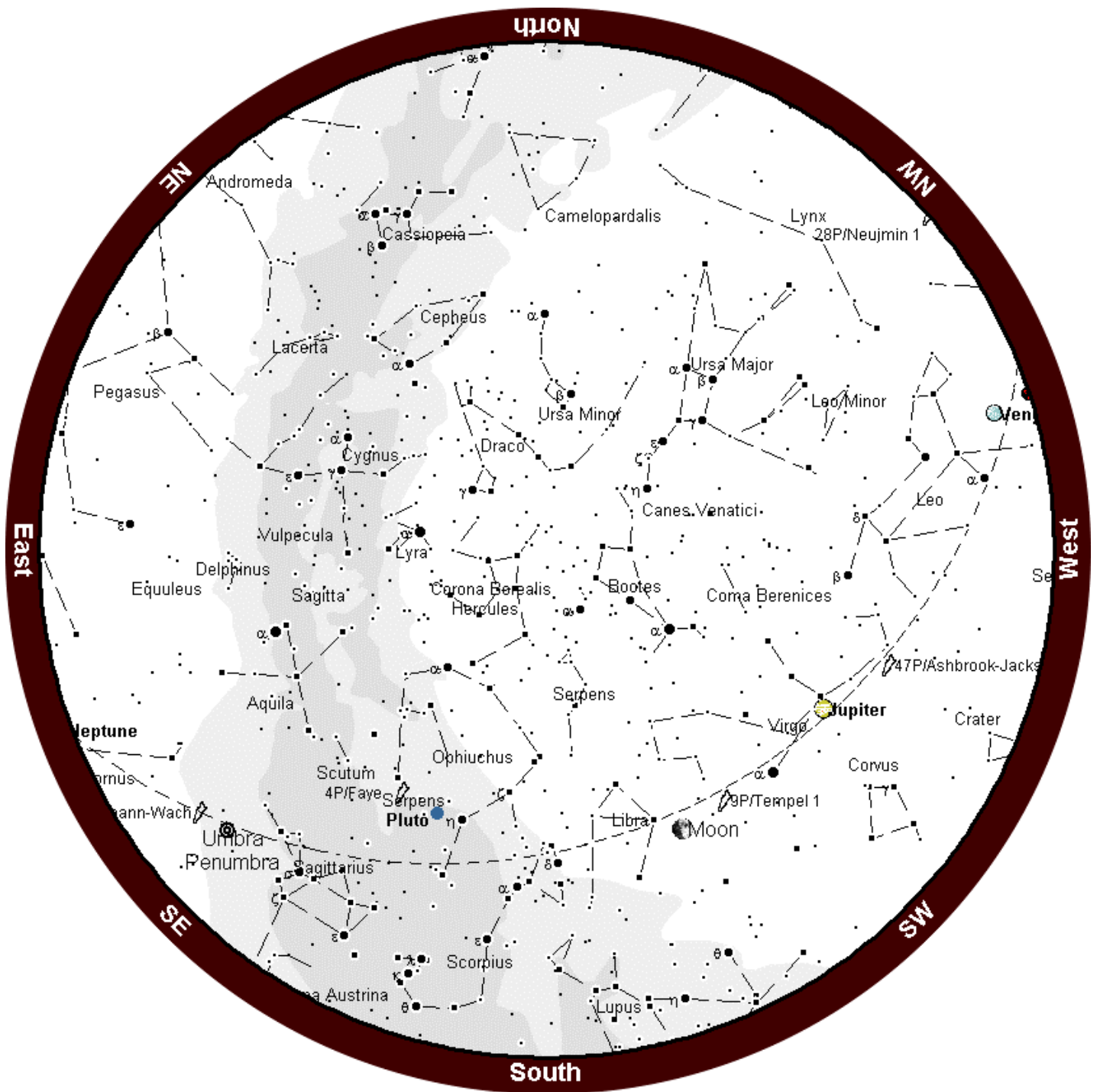
The visual and infrared mapping spectrometer instrument can detect 352 wavelengths of light from 0.35 to 5.1 micrometers. It measures the intensities of individual wavelengths and uses the data to infer the composition and other properties of the object that emitted the light; each chemical has a unique spectral signature that can be identified.

Forty-five flybys of Titan are planned during Cassini's four-year prime mission. The next one is Aug. 22, 2005. Radar data of the same sites observed by the visual and infrared mapping spectrometer may provide additional information.

For more information about the Cassini-Huygens mission visit <http://saturn.jpl.nasa.gov> and www.nasa.gov/cassini . The visual and infrared mapping spectrometer page is at <http://wwwvims.lpl.arizona.edu> .

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter was designed, developed and assembled at JPL. The visual and infrared mapping spectrometer team is based at the University of Arizona.

July Star Chart



Events Calendar

July 2005						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1  Sun: 17:59 - 09:01	2  Sun: 17:59 - 09:01 Hyde Observatory open to the public
3  Sun: 18:00 - 09:01	4  Sun: 18:00 - 09:01	5  Sun: 18:01 - 09:01	6  Sun: 18:02 - 09:00	7  Sun: 18:02 - 09:00	8  Sun: 18:03 - 09:00 Mahoney Star Party; Mercury - elongation; Club Star Party	9  Sun: 18:04 - 08:59 Hyde Observatory open to the public
10  Sun: 18:04 - 08:59	11  Sun: 18:05 - 08:58	12  Sun: 18:06 - 08:58	13  Sun: 18:07 - 08:57	14  Sun: 18:07 - 08:57	15  Sun: 18:08 - 08:56	16  Sun: 18:09 - 08:56 Hyde Observatory open to the public
17  Sun: 18:10 - 08:55	18  Sun: 18:11 - 08:54	19  Sun: 18:11 - 08:54	20  Sun: 18:12 - 08:53	21  Sun: 18:13 - 08:52	22  Sun: 18:14 - 08:51 Venus close to Regulus	23  Sun: 18:15 - 08:51 Hyde Observatory open to the public
24  Sun: 18:16 - 08:50	25  Sun: 18:17 - 08:49	26  Sun: 18:18 - 08:48 PAC Meeting 7:30pm	27  Sun: 18:19 - 08:47	28  Sun: 18:19 - 08:46	29  Sun: 18:20 - 08:45	30  Sun: 18:21 - 08:44 Hyde Observatory open to the public

Moon phase images by: António Cidadão

**Directions to Olive Creek
Observing Site**

Shorter:

Take Hwy 77 South out of Lincoln until you get to the Crete corner (junction Hwy 77 and Hwy 33). Go West on Hwy 33 (toward Crete) until you get to SW 72 St. Turn Left (South) on SW 72 St. and go about 5 miles until you get to SW Panama Rd. Turn right (West) until you get to SW 100 St. (SW 100 St does NOT go through to Hwy 33). Turn Left (South) on SW 100 St and go about 1 to 1 1/2 miles until you see the sign and entrance to Olive Creek (this is the West side of the Park). It's on your left (East) side of the road.

More Black Top:

Take Hwy 77 South out of Lincoln until you get to the Crete corner (junction Hwy 77 and Hwy 33). Go West on Hwy 33 (toward Crete) until you get to about SW 114 St. - the first intersection after SW 100 St. (forgot to look at this street sign, sorry - you'll see a sign for Olive Creek though at this road- but don't count on anymore signs after that, I didn't see any). Turn Left (South) on SW 114 St and go about 5 miles or so until you get to SW Panama Rd (you'll see a church and small school on your right). Turn Left (East) and go about a mile to SW 100 St, then turn Right (South) and go 1 to 1 1/2 miles until you see the Olive Creek entrance and sign (on your left hand side of the road).

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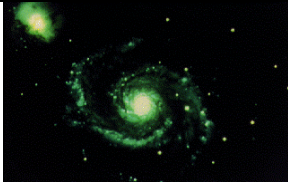
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c/o The Prairie Astronomy Club, Inc.
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First Class Mail

**Next PAC Meeting
June 28, 2005
7:30 PM
Hyde Observatory**

«Title» «FIRSTNAME» «MIDDLENAME» «LASTNAME» «RENEWALDATE»
«CAREOF»
«ADDRESS1»
«ADDRESS2»
«City», «State»
«Zip»