



The Prairie Astronomer

The Official Newsletter Of The Prairie Astronomy Club, Inc.

November 2002

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NOVEMBER PROGRAM

November program: To be announced.

PAC-LIST: 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.

CLUB EVENTS

UNL Student Observatory Open House
Friday, November 22, 2002

PAC Meeting 7:30pm Hyde Observatory
Tuesday, November 26, 2002

Club Star Party
Friday, November 29, 2002

PAC Meeting 7:30pm
Monday, December 30, 2002 Hyde Observatory



READ THIS NEWSLETTER ONLINE

Those who wish to help with publishing and postage costs by receiving only the on-line version of the newsletter should contact Liz Bergstrom at 464-2038. Mark Dahmke or Liz can give you the logon account and password for access. You may receive both the mailed version and the on-line version if you wish. A printable PDF version of this newsletter is also available through the website.



About 200 guests came to the Hyde Anniversary celebration on Sunday. See Dave Churilla's article on page 3 for details.

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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 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 — Lee Taylor

PAC Minutes for the Meeting of October 29, 2002

Dave Knisely called the meeting to order. No new visitors. Karla Bachmann reported a good star party last month, but only a few people. The next star party will be November 1st. at Olive Creek. There will also be one on Friday Nov. 29.

Anyone who plans to go out observing put a note out on the pac-list and you just might get some company.

Solar activity appears to be decreasing, but we still have a good chance for some flares. Saturn is a good object late in the evenings, with Jupiter getting better.

We had 50-60 people at the PAC-OAS banquet on Oct. 11th. Thanks to Larry Hancock for arranging such a good time. The next PAC-OAS banquet will be Friday Oct. 10, 2003.

The last good chance to see a good leonid meteor storm is the 19th of November. We're hindered by a full moon, but we'll see.

Steve Lloyd and yours truly, Lee Taylor are planning to put together an effort to complete our Messier observing certificates during the coming year at PAC Star parties. If you need some encouragement in completing such a project, join us and we'll help you overcome your procrastination.

The next UNL student observatory open house will be Friday Nov. 22. The next PAC meeting will be at Hyde Observatory on Nov 26. THE DECEMBER MEETING WILL BE ON MONDAY DEC. 30, to avoid the Christmas Eve rush.

If you have completed any of the Astronomical League's observing programs, get your observations to our observing chair, Jeff King, so you can receive your recognition.

At the fall banquet, the PAC officers held an executive meeting and approved spending \$1000.00 for the purchase of a 3-4" refractor and accessories. These will be available to check out by members just as the 13" is now. Incidentally, the 13" is available for checkout. Contact Dave Brokovsky to check out the 13".

Hyde Observatory's 25th anniversary celebration is Sunday November 10th from 7-10 PM at Hyde. Also, from 1-4PM at the UNL city campus union we will have more of the celebration with Kevin Houser from the International Dark-Sky Association with a presentation on light pollution, Larry Stepp, former PAC president on building large telescopes and Astronaut Clayton Anderson on our future in space.

Information on the 25th anniversary will be broadcast on City Channel 5.

From 7-10 PM on the 10th, Hyde will be open to the public and we will have the speakers and the Mayor as guests. All Hyde volunteers and PAC members are encouraged to attend with 'scopes to show the public. If you'd like to help that night, members are requested to park in the lot on the south end of the road running past Hyde. Transportation to and from the parking lot will be courtesy Erik Hubl's van. For further information on helping out at Hyde, see Dave Churilla.

To receive the PAC newsletter online, contact Liz Bergstrom. RASC Observers Handbooks and Ottwell astronomical calendars are being ordered. Contact Liz Bergstrom to order.

PAC elections were held, with the following results:

PRESIDENT: Dave Knisely
VICE PRESIDENT: Dave Brokovsky
2nd VICE PRESIDENT (program chair): Brian Sivill
SECRETARY: Lee Taylor
TREASURER: Liz Bergstrom

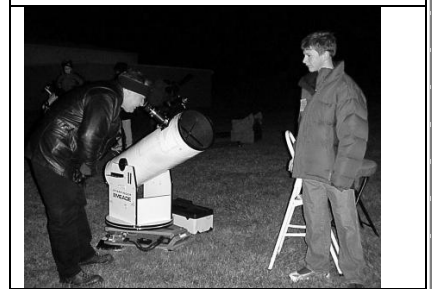
Now re-elected for another term, Brian Sivill STILL needs ideas for programs. If you have any, be sure to get in touch with him. Adjourn to Jack Dunn's program on good lighting, bad lighting, and what we can do to improve the situation.

Respectfully submitted by,

Lee Taylor

Hyde Observatory Volunteer Schedule

Date	Team Leader	Operators		Supervisor
Winter Hours (7:00 PM to 10:00 PM)				
November				
11/16	Dave Hamilton	Dan Delzell	Jared Delzell	Brian S
11/23	Bill Wells	Bob Leavitt	Steve Lloyd	Rick J
11/30	Dave Churilla	Jeff Campbell	Joey Churilla	Dave H
December				
12/7	Jeff King	Lynda Beck	Karla Bachman	Jack D
12/14	Dave Churilla	Joey Churilla	AJ Benker	Brian S
12/21	Bill Wells	Dan Delzell	Jared Delzell	Rick J
12/28	Brian Sivill	Jeff Campbell	Bob Leavitt	Dave H
January (Tentative)				
1/4	Bill Wells	Josh Macechek	Lee Taylor	Dave C
1/11	Dave Churilla	Joey Churilla	Steve Lloyd	
1/18	Jeff King	Justin DeVries	AJ Benker	Brian S
1/25	Dave Hamilton	Jeff Campbell	Bob Leavitt	Rick J



Hyde Observatory's 25th Anniversary Celebration— Dave Churilla

I've only been associated with Hyde for about 4 years, so my perspective on it's history and the events of this past weekend are likely different than those who have literally been a part of Hyde's entire history. And yet it's difficult to not become enamored with what Hyde stands for as well with the people that are its lifeblood. The Observatory and the Prairie Astronomy Club have become a second home for me, and for my son Joey. We care very much about the people there, the views we are treated to, and what we've learned over the past 5 years. For this reason the Celebration on November 10, 2002 commemorating Hyde Observatory's 25th Anniversary meant a great deal to me.

The planning and work took literally months spearheaded by the Anniversary Committee (Ron Veys, Jack Dunn and yours truly) with guidance and help from Erik Hubl. By the time the Big Day arrived nerves were frayed and the butterflies resounded in all our stomachs. Would it come off even half as well as planned?

Luckily the answer was a resounding YES.

The day's activities began at the downtown UNL Student Union with 3 special guest speakers. As the audience arrived they were greeted by a new Hyde Banner, which went through an evolution that rivals that of mankind. Approximately 75 people came to listen to the 3 speakers and many had very positive comments about the content and professional way the afternoon was handled.



The first speaker, Dr. Kevin Houser, addressed issues pertaining to lighting and light pollution. Dr. Kevin W. Houser received his B.A.E. and Ph.D. degrees in Architectural Engineering from the Pennsylvania State University. His principle research interest focuses on the relationship between the spectral composition of light and human vision. I was very glad to see Dr. Houser hit the areas of education, not only from a public standpoint, but in the political arena as well.

The next speaker, Larry Stepp, was the President of the Prairie Astronomy Club during the construction of Hyde Observatory and is the Project Manager for the New Initiatives Office of the Gemini Telescope Project. Larry discussed some of his memories of Hyde and the people involved with its conception and funding, as well as his work on the Gemini Telescopes and the WIYN Telescope. During Larry's talk about Gemini, Joey leaned over to me and said "Now THAT'S what I call aperture!" Hope he doesn't get any ideas....my wife already wonder's what else she find in our spare bedroom where we store our Astronomy Equipment, now known for all time as the "Scope Room".

The final speaker was Astronaut Clayton Anderson who hales from Ashland, Nebraska. A mission specialist hoping for his first assignment aboard the Space Shuttle, Clay talked about EVA missions and the training he is undergoing in that

area. I figured nothing in Joey's mind could top the "Aperture Fever" of the previous speaker, but I think dreams of space had him glued to every word Clay uttered.

With the conclusion of the afternoon activities, it was time for Joey and I to grab a bite to eat and head to Hyde to finish setting up things for that night's Open House. At this point, let me briefly thank all the Volunteers who helped in this event. Volunteers met Joey and me Sunday morning to set up and decorate, they met me 1 ½ hours early that evening to finish up and prepare Hyde for that evening. I want to thank Joey, who was with me all day helping out, Karla Bachman, Lynda Beck, Lee Taylor, Jeff King, Brian Sivill, Josh Machecek, AJ Benker, Bob Leavitt, Dave Brokofsky, Jeff Campbell, Dave Hamilton, and Doc Manthey. A big thanks go out to Holly Johnson who organized and set up all the refreshments and my wife Julie who worked the refreshment table and procured 100 mini Runzas from Runza.

The night went as well as we'd hoped. Although skies didn't cooperate, we did have some early holes for the public to view through. We had about 5 telescopes set up out front for viewing, as well as the Deck. The observatory had been decorated with streamers and balloons; tables had blue and gold table clothes and star confetti on them. For refreshments there were mini Runzas and Holly's famous cookies, punch, hot cider and coffee. In front of the mural was a table for Clay Anderson...who could hardly be seen because of the steady stream of kids (young and old alike) in line for a free autographed picture of Clay. I think he was pretty worn out by the end of the night.

At 7:30 PM we held a small ceremony. Erik Hubl presided and spoke on some of the accomplishments of Hyde. Yours truly tried in his meager way to acknowledge the great work the volunteers do at the Observatory and presented a plaque of appreciation to the Prairie Astronomy Club for all the efforts of its volunteers, without whose work Hyde could not flourish. Dave Knisely accepted the award.

Terry Gendrich spoke on behalf of the Parks and Rec Dept and introduced Mayor Wesley. The Mayor read a Proclamation naming the day Hyde Observatory Day and presented each of our speakers with keys to the City of Lincoln.

To me, one of the highlights of the evening was when Erik handed out surprise awards to the 5 members of the Board of Supervisors who have been here since Hyde's inception: Robert Manthey (retired board member, but still a very active volunteer), Rick Johnson, Ron Veys, Lee Thomas and Jack Dunn. These gentlemen have served Hyde for 25 years (luckily the building seems to be in better shape) and I have great respect for each of them.

During the course of the night about 200 patrons came to Hyde, some enjoying the reunion with old friends, some there to enjoy the telescopes. But all were there to celebrate a great facility that professes a lofty goal, to educate the public about space exploration and astronomy. An also to celebrate the people who give up their evenings to staff Hyde, insuring that those patrons who visit enjoy an experience like no other...a look through the "window to the universe".

Life, Evolution and the Universe (Part 2 of 3)— Mark Dahmke

Life on Mars?

In 1996 NASA announced that a meteorite found in Antarctica came from Mars, and that it might hold fossil evidence of life. After the initial findings, additional research cast doubt on many of these claims. By 1999 most scientists had backed away from any claims that the meteorites showed any definitive evidence for life on Mars.

The arguments in favor of life include several findings, first, that within carbonate globules, researchers found crystals of magnetite measuring about 50 nanometers across. These crystals are very similar to those found in bacteria, where they serve as tiny magnetic compasses. Also, researchers found organic carbon compounds in association with the globules. Called polycyclic aromatic hydrocarbons, they are often associated with the decay products of microbes. Third, they claim that the rocks show evidence of the fossilized remains of microbes. In 1998, John Bradley studied the structure of the crystals and claimed they were not the product of life because the axes of some of the crystals are actually aligned with the carbonate crystals they are touching, indicating formation by natural processes. Others have pointed out that the so-called fossils are more than a factor of ten smaller than any known organism found on earth, and were probably formed during the process of preparing the samples for the electron microscope.

In a recent paper published in the scientific journal *Precambrian Research* two additional Martian meteorites were examined that are 1.3 billion and about 170 million years old, respectively. According to the authors, both younger meteorites showed the same evidence of microfossils and other remnants of early life as the first 4.5 billion year old meteorite. Everett Gibson, a geochemist at NASA says that "if the features observed in the two younger Martian meteorites are confirmed to have a biogenic origin, life may have existed on Mars from 3.9 billion years ago to as recently as 165 to 175 million years ago."

Clusters of very small spheres found in the two younger meteorites are very similar to those seen in bacteria-containing samples from deep beneath the Earth's surface in the Columbia River Basalts in eastern Washington. Whether or not these sphere-like structures are true biomarkers has yet to be determined, but the fact that they are embedded in or coated by clays that are clearly of Martian origin suggests that they too were formed on Mars.

According to the NASA press release, studies using a transmission electron microscope have provided further evidence of fossils in the original Martian meteorite, ALH84001. This evidence is in the form of tiny magnetite crystals, identical to those used as compasses by aqueous bacteria on Earth, to find food and energy. Magnetite (Fe₃O₄) is produced inorganically on Earth, but the magnetite crystals produced by magnetotactic bacteria are different – they are chemically pure and defect-free, with a distinct size and shape. Magnetotactic bacteria arrange these magnetite crystals in chains within their cells.

Dr. Friedmann at Nasa Ames states that “The chains we discovered are of biological origin. Such a chain of magnets outside an organism would immediately collapse into a clump due to magnetic forces.” These results are not conclusive though— not enough work has been done to show that these chains of magnetites can only be formed inside living organisms.

Additional studies showed that a substantial portion of the hydrocarbons found in the meteorites were in them when they left Mars and are not the result of terrestrial contamination. There is also strong evidence that most of the carbonates in all three meteorites were formed at a time when Mars was warmer and wetter – an environment much more conducive to life than the current surface of Mars.

If life did exist, or possibly still exists on Mars, it'll probably be found deep under the surface. Recent studies have shown that most of Earth's biomass could also reside below the surface in the form of rock eating anaerobic bacteria. In fact, there is evidence to support the idea that our branch of the tree of life evolved from extremophiles – bacteria that thrive in high temperature environments.

The Mars Viking landers initially sent back results that indicated that something in the Martian soil was highly reactive and imitated some of the chemical reactions we associate with life. But subsequent research has shown that the surface is at chemical equilibrium, and that the reactions were due to the fact that the surface is bombarded by ultraviolet light, most likely causing an accumulation of peroxides

Life in Deep Space?

What are the prospects for finding the precursors to life in deep space? In a simulated deep-space environment, researchers have created small structures that look like cell walls in living organisms and show early signs of the ability to convert sunlight into chemical energy.

According to a report published online at space.com, scientists at NASA's Ames Research Center and UC Santa Cruz duplicated the conditions of interstellar clouds of gas and dust, which are the birthplaces of stars. They combined ordinary chemicals common on Earth and in space -- including water, ammonia, carbon monoxide and methanol -- and chilled the mixture to near absolute zero. They then flooded the mix with ultraviolet light, simulating the light from a nearby star. This caused the ice crystals to be transformed into more complex chemical compounds, as expected. But to everyone's surprise, when dipped in water, these compounds assembled themselves into membranes similar to those that protect living cells. While these structures are not alive, they show that chemical reactions in space are more complex than originally thought.

It is understood that the formation of simple membranes is not a precursor to complex structures like DNA, but the fact that so many organic compounds are readily formed in deep space is interesting. Similar organic molecules, such as amino acids have been found in comet dust. Micron sized grains of dust from comets can enter the earth's atmosphere without burning up, so the odds of organic molecules reaching the surface intact are fairly good.

A team of Spanish astronomers has made the first detection of interstellar rings of carbon, the type of molecules on which earthly life is based. Using the European Space Agency's Infrared Space Observatory (ISO) they found benzene. They hypothesize that stars produce benzene at a specific stage of their evolution, and that it is an essential chemical step towards the synthesis of more complex organic molecules.

Another essential ingredient to life as we know it is water, and more specifically, water within a certain range of temperatures. A long list of attributes make the chemical properties of water unique, and ideally suited for use by terrestrial life forms. This is not to say that other environments might not also support life, for example, liquid ammonia, but until we learn more about how life originated on Earth we can't even begin to speculate on how it might form using a chemistry based on something like ammonia.

In the past decade we've discovered that Earth might not be the only planet in the solar system that contains large bodies of liquid water. Jupiter's moon Europa almost certainly has a large ocean, possibly a hundred kilometers deep, below a thick layer of protective ice. Although too far from the sun to rely on solar energy as a source of heat, the tidal forces caused by Jupiter provide sufficient energy to keep an ocean warm enough for life to be present. Like earthly extremophiles, European life would have to depend on sources of chemical energy rather than sunlight to make a living.

Recent photos taken by the space craft Galileo show that Ganymede, another of Jupiter's moons might also contain some liquid water. Researchers say they can see features that look like liquid water eruptions, similar to volcanic eruptions on earth.

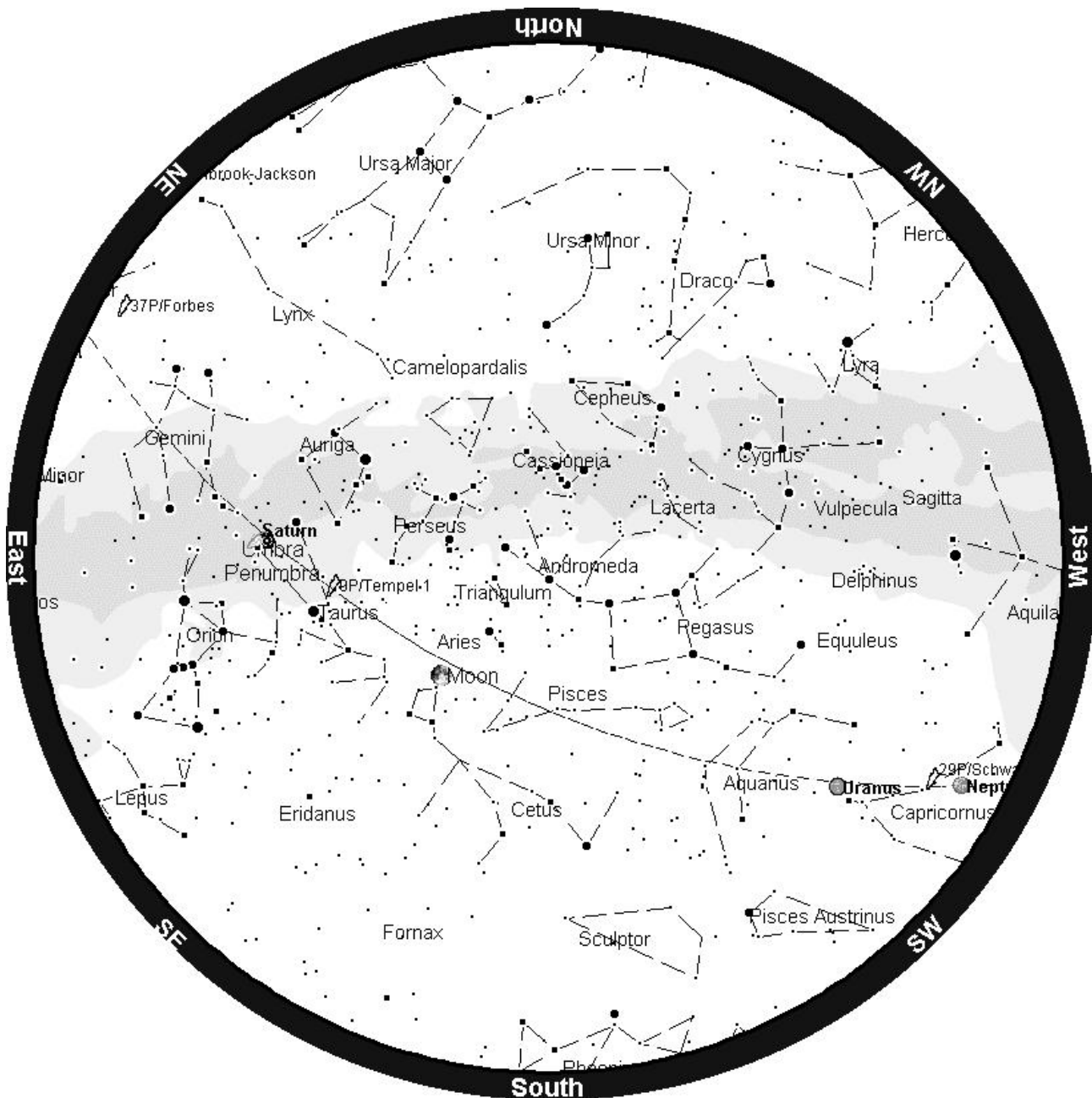
Next generation space-based telescopes are being designed that will, by about the year 2020, allow us to look into other solar systems and detect earth-sized planets. The challenge is comparable to trying to see a firefly that is a few inches

away from a 1000 watt light source – but from a distance of a few thousand miles. How will scientists detect life on distant planets? Assuming that there are no intelligent aliens trying to send us messages, the best technique is to look for high concentrations of atmospheric oxygen. As is the case with Mars, free oxygen will quickly react with chemicals on the surface. Signs of an atmosphere that is not at equilibrium would be a strong indicator that life is present.






Based on recent findings, many scientists now believe that microbial life is probably quite common in the universe. There is even speculation that terrestrial life might not have originated here, but might have been deposited on earth about 4.5 billion years ago. Finding a world rich in basic raw materials such as carbon, water and sunlight, it began to evolve into all the forms of life we see today. This theory is called panspermia. It has even been suggested that life could have originated on a warmer, wetter Mars and then migrated to Earth on dust and meteorites ejected by meteor impacts. Until we find fossil evidence or strands of DNA on Mars, this is just speculation.

In part 3, next month: Superstring theory and quantum evolution.

December Star Chart



Events Calendar

December 2002						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 	2 	3 	4 	5 	6 	7 
Sun: 07:31 - 16:59	Sun: 07:32 - 16:59	Sun: 07:33 - 16:59	Sun: 07:34 - 16:59	Sun: 07:35 - 16:58	Sun: 07:36 - 16:58	Sun: 07:37 - 16:58 Hyde Observatory open to the public
8 	9 	10 	11 	12 	13 	14 
Sun: 07:38 - 16:58	Sun: 07:38 - 16:58	Sun: 07:39 - 16:58	Sun: 07:40 - 16:58	Sun: 07:41 - 16:59	Sun: 07:42 - 16:59	Sun: 07:42 - 16:59 Hyde Observatory open to the public
15 	16 	17 	18 	19 	20 	21 
Sun: 07:43 - 16:59	Sun: 07:44 - 17:00	Sun: 07:44 - 17:00	Sun: 07:45 - 17:00	Sun: 07:46 - 17:01	Sun: 07:46 - 17:01	Sun: 07:47 - 17:02 Hyde Observatory open to the public
22 	23 	24 	25 	26 	27 	28 
Sun: 07:47 - 17:02	Sun: 07:48 - 17:03	Sun: 07:48 - 17:03	Sun: 07:49 - 17:04	Sun: 07:49 - 17:05	Sun: 07:49 - 17:05	Sun: 07:50 - 17:06 Hyde Observatory open to the public
29 	30 	31 				
Sun: 07:50 - 17:07	Sun: 07:50 - 17:07 PAC Meeting 7:30pm	Sun: 07:50 - 17:08				

**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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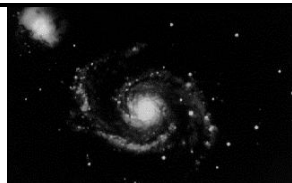
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**The Prairie Astronomer
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First Class Mail

**Next PAC Meeting
November 26, 2002
7:30 PM
Hyde Observatory**