



# The Prairie Astronomer

The Official Newsletter Of The Prairie Astronomy Club, Inc.

November 2001

Volume 42 Issue #11

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 NEB-STAR: [www.neb-star.org/](http://www.neb-star.org/)

## NOVEMBER'S PROGRAM:

Check the PAC website for an update.

**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](mailto:list@4w.com). Write "Subscribe PAC-List" in the body of the e-mail.

**ELECTION OF PAC OFFICERS:** The following club members were elected as officers of the Prairie Astronomy Club during the October meeting:

President: Dave Knisely

Vice-President: Dave Brokofsky

2<sup>nd</sup> Vice-President/Program Chair: Brian Sivill

Secretary: Lee Taylor

Treasurer: Liz Bergstrom

**DECEMBER'S PAC MEETING TIME CHANGE:** Due to Christmas falling on our normal PAC meeting date, our December monthly meeting has changed to Wednesday, December 26<sup>th</sup>.

**NEWSLETTER CLARIFICATION:** The November newsletter will be mailed to everyone. After November, unless you specifically tell Jeff King or Mark Dahmke that you do not want to receive the newsletter in the mail, you'll get it in the mail. Read inside the newsletter for more details.

**MARK DAHMKE TAKES OVER AS NEWSLETTER EDITOR:** Please read page 4 for more details.

## CLUB EVENTS

### PAC MEETING

**TUESDAY, NOVEMBER 27, 2001, 7:30 PM**  
at Hyde Memorial Observatory

**UNL STUDENT OBSERVATORY PUBLIC NIGHT**  
**FRIDAY, DECEMBER 7, 2001**  
UNL Student Observatory

**SOLAR OBSERVING AT THE UNL STUDENT OBSERVATORY**  
**FRIDAY AFTERNOON, DECEMBER 14, 2001**  
UNL Student Observatory

**SOLAR OBSERVING AT HYDE OBSERVATORY**  
**FRIDAY AFTERNOON, DECEMBER 14, 2001**  
at Hyde Memorial Observatory

**CLUB STAR PARTY**  
**FRIDAY, DECEMBER 14, 2001**  
Olive Creek S.R.A.

### PAC MEETING

**WEDNESDAY, DECEMBER 26, 2001, 7:30 PM**  
at Hyde Memorial Observatory

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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: **Jeff King, 4018 South 83rd Street, Lincoln, NE 68506-5973 or [jeffrey892@aol.com](mailto:jeffrey892@aol.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

By: Lee Taylor

Prairie Astronomy Club Meeting Minutes for 10/30/01

Dave Knisely opened the meeting with introductions of our two guests, Derik McGaw and Rebecca Harbeson, two of Dr. Gaskell's students.

Mars is still hanging on in the southwest, getting steadily smaller. On the bright side, it has a new visitor, Mars Odyssey 2001 just entered orbit. We look forward to the new information it will provide in the coming years.

Jupiter and Saturn a nice morning objects for the next couple of months.

The PAC meeting for December will be held Wednesday December 26, 2001 due to the Christmas Holiday on Tuesday December 25.

Everyone's invited out to Olive Creek Saturday Nov. 17th for the anticipated Leonid Meteor Storm. We've got a great chance this year. The peak occurs with the radiant well up in our sky this time, according to predictions.

Dave Churilla mentioned that he wanted to have Hyde open for the Dec. 14th partial eclipse visible, weather permitting.

REGARING THE NEWSLETTER: There still seems to be some confusion as to how we are doing the PAC Newsletter. Right now, all newsletters since August(?) are on the PAC website on a password protected page. For the password, get in touch with Jeff King. THE NOVEMBER NEWSLETTER WILL BE MAILED TO EVERYONE! AFTER NOVEMBER, UNLESS YOU SPECIFICALLY TELL JEFF KING THAT YOU DO NOT WANT TO RECEIVE THE NEWSLETTER IN THE MAIL, YOU'LL GET IT IN THE MAIL!

The dates for the club star parties are Nov. 9th and 16th at Olive Creek.

Election of Officers: Elections for club officers were held with the following results:

President: Dave Knisely, Vice President: Dave Brokofsky, 2nd Vice President (Program Chair): Brian Sivill  
Secretary: Lee Taylor, Treasurer: Liz Bergstrom

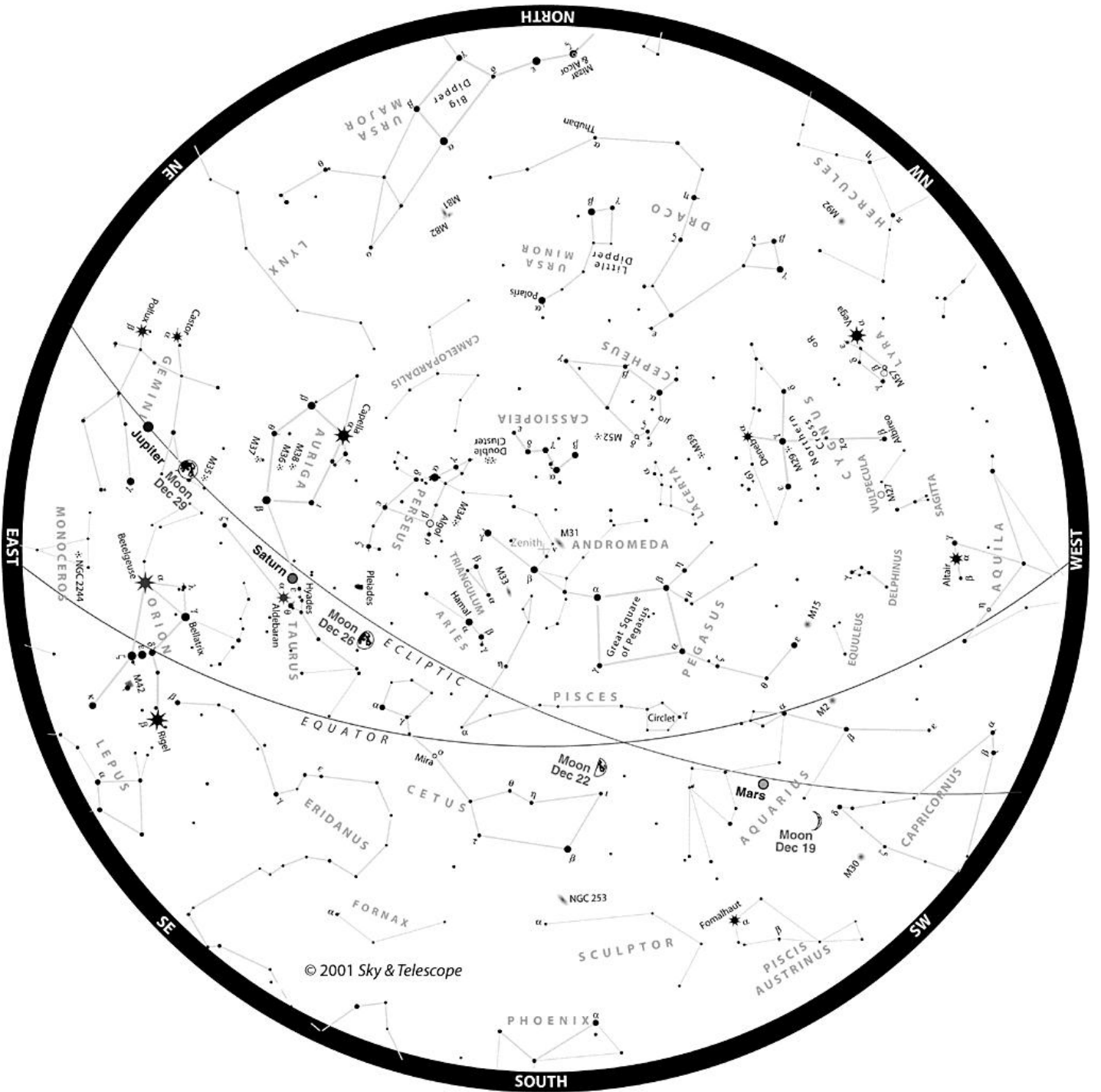
Newly re-elected Program chair Brian Sivill is looking for any club member interested in providing a program for the coming year. Any observing project you've done, equipment you've built, etc. would be welcome. We'd love to hear about it!

Adjourn to Brian Sivill's program on recent Mars developments.

## Hyde December Schedule

<u>December</u>	<u>Team Leader</u>	<u>Telescope Operators</u>	<u>Supervisor</u>
12/01/01	Brian Sivill	AJ Benker, Justin DeVries	
12/08/01	Dave Hamilton	Jared Delzell, Dan Delzell	Dave Churilla
12/15/01	Dave Churilla	Joey Churilla, Steve Lloyd	Dave Scherping
12/22/01	Jeff King	Bob Leavitt, Jeff Campbell	
12/29/01	Bill Wells	Justin Devries, Dave Brokofsky	Rick Johnson

## December sky map



© 2001 Sky & Telescope

## Transit Times of Jupiter's Great Red Spot

**December 1**, 9:33, 19:28; **2**, 5:24, 15:19; **3**, 1:15, 11:11, 21:06; **4**, 7:02, 16:57; **5**, 2:53, 12:48, 22:44; **6**, 8:40, 18:35; **7**, 4:31, 14:26; **8**, 0:22, 10:18, 20:13; **9**, 6:09, 16:04; **10**, 2:00, 11:55, 21:51; **11**, 7:47, 17:42; **12**, 3:38, 13:33, 23:29; **13**, 9:24, 19:20; **14**, 5:16, 15:11; **15**, 1:07, 11:02, 20:58; **16**, 6:54, 16:49; **17**, 2:45, 12:40, 22:36; **18**, 8:31, 18:27; **19**, 4:23, 14:18; **20**, 0:14, 10:09, 20:05; **21**, 6:00, 15:56; **22**, 1:52, 11:47, 21:43; **23**, 7:38, 17:34; **24**, 3:29, 13:25, 23:21; **25**, 9:16, 19:12; **26**, 5:07, 15:03; **27**, 0:59, 10:54, 20:50; **28**, 6:45, 16:41; **29**, 2:36, 12:32, 22:28; **30**, 8:23, 18:19; **31**, 4:14, 14:10.

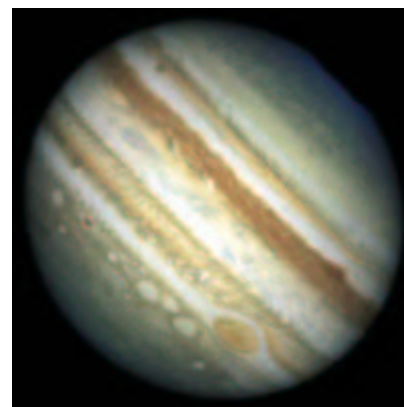


Photo from the Hubble Space Telescope

\*All times are UT; please subtract 6 hours for our CDT.

## A Pair of December Eclipses



An annular solar eclipse on **December 14th** and a penumbral lunar eclipse on **December 30th** bring **2001** to a close. The path of the annular eclipse falls almost entirely in the Pacific Ocean, touching land at 22:32 Universal Time only in Costa Rica and Nicaragua. However, the partial phases are visible from southern Canada, the United States, Central America, and the northwest corner of South America.

The year ends with a deep penumbral eclipse visible throughout North America. Observers should be able to detect subtle shading across the southern portion of the Moon around the time of mid-eclipse (10:29 UT).



### ATTENTION: NEWSLETTER UPDATE



The newsletter for the month of November will be delivered via USPS mail to every club member. Those that wish to help with publishing costs by receiving only the on-line version of the newsletter should contact the newsletter editor and request a sign-on and password for access. You may receive both the mailed version and the on-line version if you wish. Those members that would like to continue to receive the mailed version need to do nothing. Those that wish to access the on-line version need to contact the editor.

We are starting over, so if you have already contacted the newsletter editor requesting only the on-line version, you must do so again.

## New Newsletter Editor

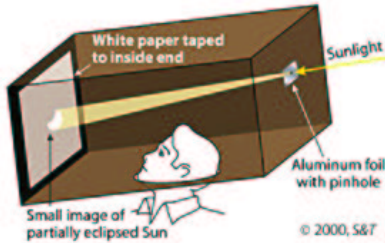
The November issue of The Prairie Astronomer will be my last as editor of the club newsletter. Mark Dahmke has graciously volunteered to become the next PAC newsletter editor. Please congratulate him and **support** him in his effort. With the club's goals aimed toward an on-line version as well as the mailed version, Mark will need everyone's help to make it work.

I would also like to thank those members who have supplied articles or information in the past. Especially, Dave Churilla for all of his Romantic Astronomer stories and Dave Knisely for his observing reports and product reviews. Also, Martin Gaskell for the telescope making marathon articles and the student observatory updates. Dave Hamilton was also helpful in supplying variable star updates. Thanks to these individuals and those that I've failed to list, we have, and will continue to have, a great newsletter.

# How to Watch an Eclipse

Looking at the sun is harmful to your eyes at any time, partial eclipse or no. The danger that a partial solar eclipse poses is simply that it may prompt people to gaze at the Sun, something they wouldn't normally do. The result can be "eclipse blindness," a serious eye injury that can cause temporary or permanent blurred vision or blind spots at the center of your view. Fortunately, there are many easy ways to watch the show safely.

**Pinhole projection.** The simplest safe way to view the Christmas eclipse is to watch the Sun's image projected onto a piece of paper. Poke a small hole in an index card with a pencil point, hold it face-on toward the Sun, and hold a second card three or four feet behind and below it. The hole will project a small, inverted image of the Sun's disk onto the lower card. This image will go through all the phases of the eclipse just as the real Sun does. Experiment with different size holes. A large hole makes the image bright but fuzzy; a small hole makes it dim but sharp.



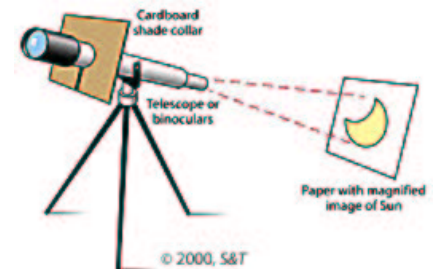
For a better view, you can enclose the viewing card in a long box, as shown at left, to reduce the amount of daylight shining on the card. This lets you use a small pinhole giving a sharp image.

A much better way to do pinhole projection can be arranged at a window indoors. Because this eclipse comes only four days after the winter solstice, the Sun will remain fairly low in the sky all day -- excellent for casting an image sideways into a room. Find a room with a Sun-facing window, turn out any lights, and pull the shades.

Arrange for sunlight to enter through a small hole punched in a card near the top of the window. A paper punch from a stationery store works great. Set up a white piece of paper as far as possible across the room to catch the Sun's image. Again, experiment with different size holes to get the best, sharpest view. (Of course, don't look through the hole directly at the Sun! Look only at the spot of light that falls on the opposite projection surface.)

Even at its best, pinhole projection gives only a small image. The throw distance in feet, divided by 9, gives the image diameter in inches. Pretty small!

**Projection with binoculars or a telescope.** A much sharper and bigger Sun image can be formed by projection through a small telescope or binoculars, as shown at right. This should be done outdoors to avoid the distorting effect of a windowpane. To aim the instrument safely, look at its shadow on a white card as you swing the tube around. When this shadow nears its minimum size, a brilliant beam of sunlight will burst out of the eyepiece and fall onto the card. Turn the focus knob and experiment with the card's distance behind the eyepiece until the Sun's disk is sharp and as big as you want. Look for sunspots!



**Direct viewing.** If you prefer to look directly at the Sun, you can use a square or rectangular arc-welder's glass of shade 13 or 14, available for a few dollars from local welding-supply stores. (Don't get a lower-numbered shade; the Sun will be too bright to look at safely.) Alternatively, special, cheap "eclipse glasses" (see astrophotographer Johnny Horne's photo at left) are widely made from safe solar filter materials. A solar filter designed to be used with a telescope is also safe for viewing with the otherwise unaided eye.

Filters that are not necessarily safe, though sometimes recommended in the past, include stacked sunglasses, crossed polarizing shades, smoked glass, photographic neutral-density filters, or a filter intended to block visible light for infrared photography. While any of these may drastically dim the Sun's glare, thus appearing to do the job, invisible ultraviolet or infrared radiation may be getting through to damage your eyes.

**Telescopic viewing.** The clearest and best views of the Sun are had through a properly filtered telescope. (*Sky & Telescope* reviewed commercial solar filters designed for telescopes in the July 1999 issue, page 63, and September 2000, page 63.) The filter must be secured over the telescope's front to keep most of the Sun's light and heat out of the instrument, as shown in Rick Fienberg's photo at right. Never use a Sun filter at the eye end, where it could crack or melt in the concentrated heat.

Direct viewing with a telescope and proper solar filter gives the best views of sunspots and the complex details within them, as well as the progress of the Moon's jagged, mountainous edge making its way across the solar disk.





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# Astronomy For Kids

The sun is the star at the center of the solar system. It formed about 5 billion years ago from a huge cloud of gas and dust.

The sun is an averaged-sized, yellow star. It is also middle-aged.

About 109 Earths would fit across the face of the sun! One large sunspot could hold several Earths. The sun's diameter is 864 thousand miles.

Most of the mass in the solar system is in the sun (99%).

The sun's outer atmosphere is called the corona. Its inner atmosphere is called the chromosphere. The photosphere marks the sun's surface. Below the photosphere are the convective zone, the radiative zone, and the core.

The sun's core converts 700 million tons of hydrogen gas into 695 million tons of helium gas every second. The remaining 5 million tons of matter is converted to pure energy. That 5 million tons is about 600 times the amount of water flowing over Niagara Falls in one second.

The temperature at the sun's core is 15 million degrees (K).

The photosphere is churning and boiling like a thick pot of chili or oatmeal. Heat, deep inside the sun, rises from the radiative zone through the convective zone until it bubbles at the surface, the photosphere. At the photosphere, things cool a bit and the gas begins to sink back down through the convective zone. When the gases reach the radiative zone, things heat up and the whole process starts all over again.

The photosphere is the layer that holds sunspots. Although sunspots are very hot, they are slightly cooler than the rest of the photosphere so they look darker. Sunspots have a dark center called the Umbra and a lighter ring around the outside called the Penumbra.

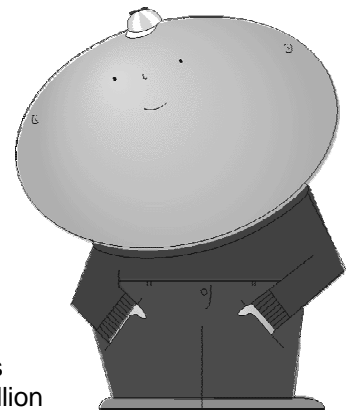
It takes 50 million years for the energy formed deep inside the sun to reach Earth.

Earth only gets one-billionth of the total energy produced by the sun.

Light, traveling at 186 thousand miles per second, takes just over 8 minutes to reach Earth from the sun

One million Earths could fit inside the sun.

Apollo was both the Greek and Roman god of the sun. He brought life-giving heat and light to Earth and was the patron god of musicians and poets.







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# THE PRAIRIE ASTRONOMY CLUB CALENDAR

## For December 2001

*Sun                      Mon                      Tue                      Wed                      Thu                      Fri                      Sat*

<h1 style="margin: 0;">Geminids Meteor Shower</h1> <p style="margin: 5px 0;"><b>Best Night:</b> December 13 to 14, with about 80 meteors per hour  <b>Total Duration of Activity:</b> December 9 to 19</p>							<p><b>1</b> Hyde Observatory open to the public 7-10 p.m.</p>
<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b> <b>3<sup>RD</sup> QUARTER</b> 	<b>7</b> <b>Student Observatory Open House</b>	<b>8</b> Hyde Observatory open to the public 7-10 p.m.	
<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b> <b>NEW MOON</b>  <b>Solar Eclipse Club Star Party</b>	<b>15</b> Hyde Observatory open to the public 7-10 p.m.	
Geminids Meteor Shower							
<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b> <b>1<sup>ST</sup> QUARTER</b> 	<b>21</b>	<b>22</b> Hyde Observatory open to the public 7-10 p.m.	
<b>23</b>	<b>24</b>	<b>25</b> <b>PAC Meeting</b> 7:30 p.m. Hyde Observatory	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b> Hyde Observatory open to the public 7-10 p.m.	
<b>30</b> <b>FULL MOON</b> 	<b>31</b>	The newsletter for the month of November will be delivered via USPS mail to every club member. Those that wish to help with publishing costs by receiving only the on-line version of the newsletter should contact the newsletter editor and request a sign-on and password for access. You may receive both the mailed version and the on-line version if you wish. Those members that would like to continue to receive the mailed version need to do nothing. Those that wish to access the on-line version need to contact the editor. We are starting over, so if you have already contacted the newsletter editor requesting only the on-line version, you must do so again.					

**Directions to Olive Creek  
Observing Site**

Take US 77 south to Hallam Road, and go west on Hallam Road through Hallam and on to SW100th St. Then turn north (right) on the gravel and go about 2.4 miles to the Olive Creek entrance on the west side of the lake.

**OFFICERS  
OF THE PRAIRIE ASTRONOMY CLUB**

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**VICE PRESIDENT:** Dave Brokofsky  
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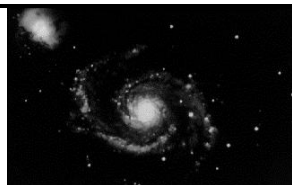
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477-1346

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First Class Mail

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Next PAC Meeting  
November 27, 2001  
7:30 PM  
Hyde Observatory