

THE PRAIRIE ASTRONOMER

THE OFFICIAL NEWSLETTER OF THE PRAIRIE ASTRONOMY CLUB, INC.

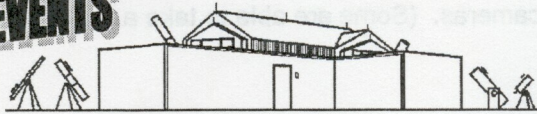
FEBRUARY 2001

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CLUB EVENTS



CLUB STAR PARTY
FRIDAY, FEBRUARY 23, 2001
Wagon Train Lake
(see map on back page)

PAC MEETING
TUESDAY, FEBRUARY 27, 2001, 7:30 PM
at Hyde Memorial Observatory

NSP PLANNING COMMITTEE
THURSDAY, MARCH 8, 2001, 7:00 PM
Mahoney State Park

CLUB STAR PARTY
FRIDAY, MARCH 23, 2001
Wagon Train Lake
(see map on back page)

PAC MEETING
TUESDAY, MARCH 27, 2001 7:30 PM
at Hyde Memorial Observatory

FEBRUARY'S PROGRAM:

This Month's program will be a presentation by OAS's AL DORN. He will be speaking about getting the "Messier Certification", and relating some of his recent experiences.

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. Write "Subscribe PAC-List" in the body of the e-mail.

2001 MAHONEY STAR PARTY DATES: The 2001 Mahoney Star Party dates are:

May 25
June 15
August 17
September 21

The **ASTRONOMICAL LEAGUE'S 2001 CONVENTION** will be held Wednesday, July 25, 2001 to Saturday, July 28, 2001 in Frederick, Maryland. Don't miss the exciting tours, speakers, astronomical vendors, and the League's annual awards banquet! For additional information, visit the ALCon 2001 website at <http://alcon2001.homestead.com/alcon2001.html>.

ASTRONOMY DAY ACROSS THE USA: April 28, 2001, or the week of April 23-29. Local astronomy day may be different that the national dates listed here.

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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, 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: Pamela L. Fiedler

Secretary's Report/ Pamela L. Fiedler

for the Prairie Astronomy Club

President Dave Knisely called the meeting to order. He recognized all visitors present at the January 30th Meeting.

Discussion was held on the solar activity during the January snow storms.

There are several new online sites popping up-- in regard to web cameras. (Some are able to take a photo every 5 minutes).

A new site in Italy recently opened to observe the sun.

Our President reported that:

- Venus is very bright in the southwest during the month of January.
- The Quadrantas (meteor showers) were too cold to watch.
- There is an astroid space craft that is to land on Eros.

The SAC Museum will be holding an exhibit from the Smithsonian on the Hubble Telescope. It will open during the month of February.

Space Week--and it's correct date--has not been set for the 2001 calendar year at this time.

Please send emails to the PAC List if you'd like to observe the stars with a friend.

The Astronomical Calenders were delivered during the January meeting.

A brief summary will be sent out on the Prairie Astronomy/ Hyde Audit.

The next Prairie Astronomy Meeting will be held on February 2nd, at 7:30.

The next Star Party will be held at Wagon Train on Friday, February 3rd.

Adjourn to Program.

HYDE MARCH VOLUNTEER SCHEDULE

Date	Team Leader	Operators
March 3	Bill Wells	Jeff King, AJ Benker
March 10	Lee Taylor	Dave Churilla, Troy Anderson
March 17	Jeff King	Dave Hamilton, AJ Benker
March 24	Brain Sivill	Bill Wells, Bob Leavitt
March 31	Dave Churilla	Joey Churilla, Troy Anderson

The Romantic Astronomer

By: Dave Churilla

There was a time that the thrill of finding objects overshadowed taking the time to really examine them. Being able to brag about finding 12 or 15 new objects during the last night's stargazing was a self-gratifying occasion. I guess it took a couple of seasonal cycles to get the thrill of finding things we hadn't seen before out of our system for Joey and me. But now we've been active in Astronomy for 2½ years and although we've far from seen everything, we've learned it's even more gratifying to spend time on individual objects and really savor their image, what they are and how they fit into the study of our universe. Learning to use higher powers on galaxies and nebulae has been a wonderful treat. Pulling a dark cloak over my head and viewing the object long enough for my eyes to become accustomed to the view in the eyepiece has yielded some spectacular details that I never thought I'd see with our 10" dobsonian.

A few months back I emailed Dave Knisely about a question I had concerning telescopes. Not one to allow his audience to go away with more questions than they started with, he fully explained what I wanted to know (he even was able to use words of less than 4 syllables so I could understand what he was talking about). This led to many more questions and before you knew it we had a running email classroom with me as his only student.

Dave's given me permission to use his answers in my articles. I've only edited for spelling or grammar, or where the names of the innocent needed to be changed....or the guilty.

The section I picked out this month I thought was very appropriate since we are nearing spring and the wonderful galaxy clusters of Virgo. I had asked Dave about f-ratios and observing deep fuzzies. He enlightened me concerning some misconceptions I had, as well as some good rules to follow to apply higher magnification to these dim objects. One Star Party last year Dave was showing a number of us how to pump the magnification up on dim galaxies. I have to confess that it was an eye opener for me. He helped a few of us by suggesting different powers for our various telescopes, but this excerpt helps give a few guidelines to use. I hope it helps some of the other novices, like me, that read this. Enjoy.

* * * * *

Dave C.: Why is f4.5 better than f9 for dim fuzzies, or is it? Does the quicker speed decrease the amount of light lost before it hits your eyes?

Dave K.: On f/ratios, don't be too concerned with exactly what ratio is best. Extremely short f/ratios (under f/5) tend to have some coma at the field edges, but you can buy coma correctors to get rid of this for wide fields if it bothers you (stars at the field edges look like tiny comets). Longer f/ratios have less coma, but longer tubes, so this is one reason large Newtonians often have rather short f/ratios. For planetary viewing, short f/ratios are more difficult to make accurately, are more sensitive to even minor collimation errors, and are harder on the less sophisticated eyepiece designs like Kellners and Ramsdens, especially for wider fields. This is one reason why I like using Barlow lenses to get the longer focal lengths (it improves the eyepiece's performance by making the f/ratio longer).

The old advice on staying with "low power" for deep-sky is a somewhat inaccurate holdover from the small scope days, so I like using the "power per inch" guidelines rather than absolute numbers. For deep-sky, it isn't the f/ratio that is all that important; it is the magnification used. For "finding" things or viewing very large or diffuse deep-sky objects, I like between 4x and 7x per inch of aperture (40x to 70x for a ten inch). For more detailed observing of some Deep-sky objects, I like around 8x to 15x per inch of aperture, and for getting up close and personal with things like globular clusters and planetary nebulae, something in the 20x to 30x per inch range works well. When using nebula filters, I recommend the 4x to 14x per inch range, with slightly better performance in the lower half of this range. In fact, my favorite power tends to be 101x using my big heavy Meade 14mm Ultrawide, as it frequently brings out detail in deep-sky objects which is invisible at lower or higher powers. On M31, for example, the dark lane structure comes out a lot better at 101x than it does at 47x, although I don't see nearly as much of the galaxy as I do at the lower power. If you go too low in power, sometimes sky glow will mask small galaxies, making them nearly invisible or washing out their fine detail. Of course, you don't want to go too terribly

high, as that can also make some faint large objects vanish, but there are times when it is a good idea to kick things up a bit. I sometimes use 200x to 300x on some galaxies to bring out detail (try high power on M82 sometime, and you may be surprised at what you see). When seeing is good, I will often *start* at 141x on galaxies and go up from there (M51 shows its spiral structure pretty well at 220x). I don't know how many times I have used 141x or more on galaxies to pick up things like stellar nuclei or central bars in barred spirals. There is nothing more spectacular than a globular cluster filling the high power field with thousands of faint stars, and that needs a bit of magnification. I have used 353x on M5 (nice tight group of stars at its core), and when looking for the central star in the Ring Nebula, I won't use less than 300x, so if the seeing is good, don't be too afraid to go high.

Since that fateful Star Party last year, I've tried his advice on M82, the Sombrero Galaxy, and M31 as well as other objects, and the views were magnificent. I've also used 114x with my O-III filter on the Ring Nebula, the Dumbbell Nebula and the Orion Nebula and have been able to discern lots of detail and 3 dimensional views. I've learned to take longer looks at old favorites and enjoy more of them than I've ever thought possible. Gee, I really do sound like a novice don't I ... maybe, or maybe not. The excitement of discovery is a feeling that is unequalled.

So as spring nears and you hear the call of the Virgo Galaxy Cluster beckoning you to your favorite dark site, try pumping some iron ... er, I mean some magnification. You'll be rewarded with things you never thought possible.

METEOR OBSERVING CALENDAR

No Major Activity for March



Minor Activity

Radiant	Duration	Maximum
<u>Eta Draconids</u>	March 22-April 8	Mar. 29-31
<u>Beta Leonids</u>	February 14-April 25	Mar. 19-21
<u>Rho Leonids</u>	February 13-March 13	Mar. 1-4
<u>Leonids-Ursids</u>	March 18-April 7	Mar. 10/11
<u>Delta Mensids</u>	March 14-21	Mar. 18/19
<u>Gamma Normids (GNO)</u>	March 11-21	Mar. 16/17
<u>Eta Virginids</u>	February 24-March 27	Mar. 18/19
<u>Pi Virginids</u>	February 13-April 8	Mar. 3-9
<u>Theta Virginids</u>	March 10-April 21	Mar. 20/21

Orion is the master of the winter skies. He lords over the heavens from late fall to early spring, with his hunting dog Sirius trailing at his feet.

The mythic tales of Orion go as far back as the Hittites, who flourished from the Second Millennium BC to around 1200 BC.

One story from this culture gives an interesting account of Orion's death. Here he is called Aqhat, and was a handsome and famous hunter. The Battle-Goddess Anat fell in love with Aqhat, but when he refused to lend her his bow, she sent another man to steal it. This chap bungled the job, and wound up killing Aqhat and dropping the bow into the sea. This is said to explain the astronomical fact that Orion and the Bow (an older version of the constellation) drops below the horizon for two months every spring.

Like all myths borrowed from several sources over a great length of time, the Greek stories offer many variations. Generally speaking,

Orion was known as the "dweller of the mountain", and was famous for his prowess both as a hunter and as a lover. But when he boasted that he would eventually rid the earth of all the wild animals, his doom may have been sealed.

It might have been the Earth Goddess herself who sent the deadly scorpion to Orion. Or possibly Apollo, concerned that Orion had designs on his sister, Artemis. Thus Apollo may have told the Earth Goddess of Orion's boast. In any case, it seems clear that it was the Earth Goddess who sent the scorpion on its mission.

Some stories have the scorpion killing Orion with its sting. However the general consensus is that he engaged the scorpion in battle but quickly realised its armour was impervious to any mortal's attack. Orion then jumped into the sea and swam toward Delos. But Apollo had witnessed Orion's struggle with the scorpion and would not let him escape so easily. He challenged his sister Artemis, who was an excellent shot, if she could hit that small black object far away in the sea, the head -- he told her -- of an infamous and treacherous villain. Artemis struck the object with her first shot. She then swam out to retrieve her victim's corpse, and discovered she had killed Orion. Artemis implored the gods to restore his life, but Zeus objected. So she put Orion's image in the heavens.

In his eternal hunting, Orion is careful to keep well ahead of the scorpion. In fact Orion has disappeared over the horizon by the time Scorpio rises in the east, as it becomes his turn to rule the evening sky.

Finding Orion should be no problem. Its stars are some of the most familiar in all the heavens. Question: can you name the three stars that make up Orion's Belt. (Answer below.)

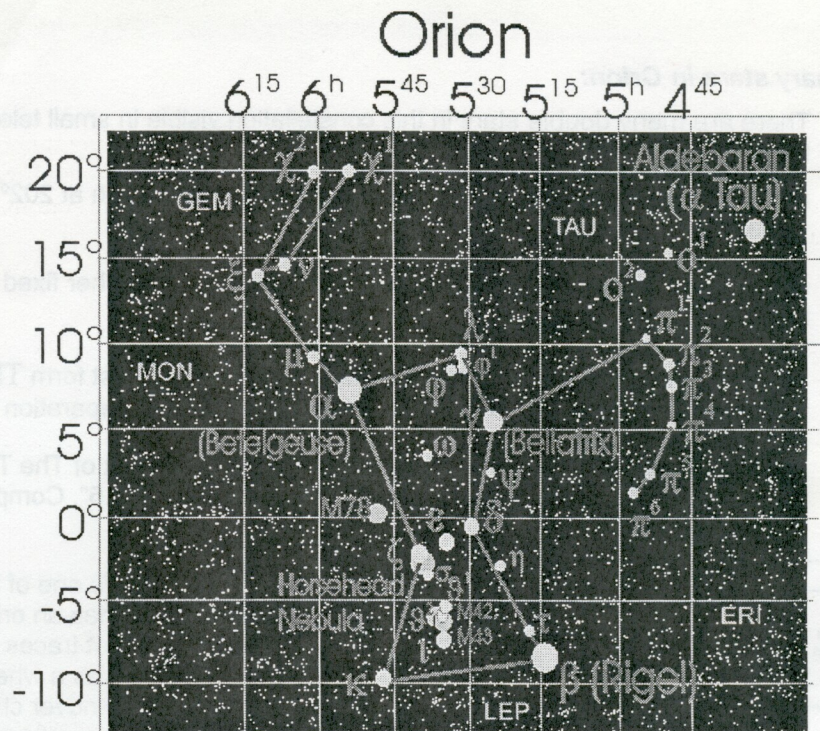
Above the belt, slightly to the left, is *Betelgeuse*, *alpha Orionis*.

Betelgeuse, the right arm of Orion (or "armpit" as the name suggests), glows with a dull red. Although labelled *alpha Orionis*, it is less bright than *beta Orionis* (Rigel), in the opposite corner of the constellation, to the southwest. Yet if slightly less bright, it is much larger, estimated at around 250 Suns. If one were to replace our Sun with Betelgeuse, its size would completely engulf the Earth and extend as far as Mars.

As the brightest star in Orion, *Rigel* ranks as the seventh brightest star in all the heavens, just behind Capella. It is a visual binary; its companion is much fainter, but quite visible if you are persistent enough (PA 202°, 9.4").

The other corners of the constellation are formed by *Bellatrix* (*gamma Orionis*) and *Saiph* (*kappa Orionis*). It was once thought that all women born under the sign of Bellatrix would be fortunate and have the gift of speech. The star's name is often translated as Female Warrior or Amazon, and another name sometimes seen is "Amazon Star". The constellation's main feature is of course the three stars which form the "belt" across the middle of Orion: from west to east *Mintaka*, *Alnilam*, and *Alnitak*. Even the Bible makes reference to this famous group. God, while pointing out how all-powerful he was, is purported to have asked Job if he (Job) was able to "loose the bands of Orion" (*Job* 38.31).

The last of these stars is also known as *zeta Orionis*, and is a well known triple star system. The primary is a blue-white star, and its companion (165°, 2.3") is a dull red. Close by, just to the south, is the renowned Horsehead Nebula, a so-called dark nebula that is not visible in scopes but quite spectacular in long-exposure photographs.



Binary stars in Orion:

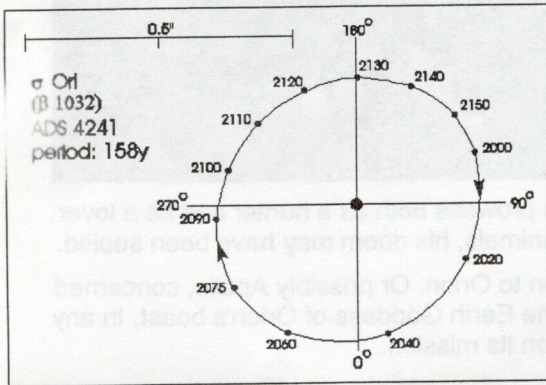
There are many double stars in this constellation visible in small telescopes. Below are several selected from a wide list.

Beta Orionis (Rigel) has a 10.4 visual magnitude companion at 202° and a wide 9.5" separation. This is a fixed system.

Lambda Orionis (between Betelgeuse and Bellatrix) is another fixed binary, with a 5.5 companion at PA 43° and 4.4" away.

Theta¹ is a complex system of fixed stars. The four brightest form The Trapezium, an outstanding multiple system for small telescopes. AB is at a position angle of 32° and separation 8.8", AC: PA 132° , 12.7", and AD: PA 96° , 21.5".

Theta² is also a fine binary, a triple system to the southeast of The Trapezium. Component B is a binocular object: 6.4 magnitude at a position angle of 92° and separation 52.5". Component C (8.5) is even wider: PA 98° and separation 128.72".



Sigma Orionis is one of the few orbiting binaries found in Orion.

Component B has an orbit of 158 years and is one of the few components that traces a not-quite-perfect circle. That's to say, we see it nearly face on, as a wheel spinning around its hub.

The separation never changes much from its current distance of only 0.2". Its 2000.0 position angle is 132° .

Much easier to resolve is component E, with a visual magnitude of 6.7, this is a binocular object at a position angle of 61° and separation of 42".

Zeta Orionis (1.9, 4.0) has a very slow orbit of 1509 years, and is currently at 165° and 2.3" separation.

Variable stars in Orion:

A dozen stars in this constellation are visible in small scopes, but most of them are of the EA type of eclipsing binaries, which change very little. These include two stars of the Trapezium (theta 1A and 1B).

EA variables are old stars, nearing the end of their evolutionary process. The companion has grown to the size of a subgiant, perhaps equal in size to its primary. But their luminosities are quite different; thus, as the dimmer companion revolves around its primary, variations in the total brightness occur.

The maximum brightness occurs of course when the two are not eclipsed, with each one adding its luminosity to the total output. Two minima also occur: the principal minimum is when the companion blocks out the primary; while a secondary minimum occurs when the companion is eclipsed by the primary.

The only interesting Mira-type regular variable is *U Orionis*, which usually has a brightness of 4.8 but every 368.3 days it drops down to 13. In 2000 the minimum is scheduled to occur on 5 December.

Deep Sky Objects in Orion:

M42, The Orion Nebula is perhaps the most photographed deep sky object in the heavens, a vast nebula of gas and dust exquisitely lit by surrounding stars.

This is a celestial nursery; soon (that's to say, in several hundred million years) young stars will appear from this wealth of cosmic matter.

Inside the nebula is the fascinating four-star system known as **The Trapezium**: theta 1A, 1B, 1C, and 1D - four stars held together by common gravity (actually at least two other stars are part of this complex system.) They are visible in medium sized telescopes and, with the nebula, form one of the most beautiful binary systems in the heavens.





M43 (NGC 1982) is a detached part of the Orion Nebula, with a ninth magnitude central star. A dark lane of gas separates M43 from M42, although the two are actually part of the same vast cloud.

M78 (NGC 2068) is a faint reflection nebula NE of Alnitak (zeta Ori), that looks best in long-exposure photographs.

The Horsehead Nebula is an intriguing and devilishly difficult dark nebula found just between zeta Orionis and sigma Orionis, visible in medium to large telescopes given the right sky conditions. An H-Beta filter is also helpful.

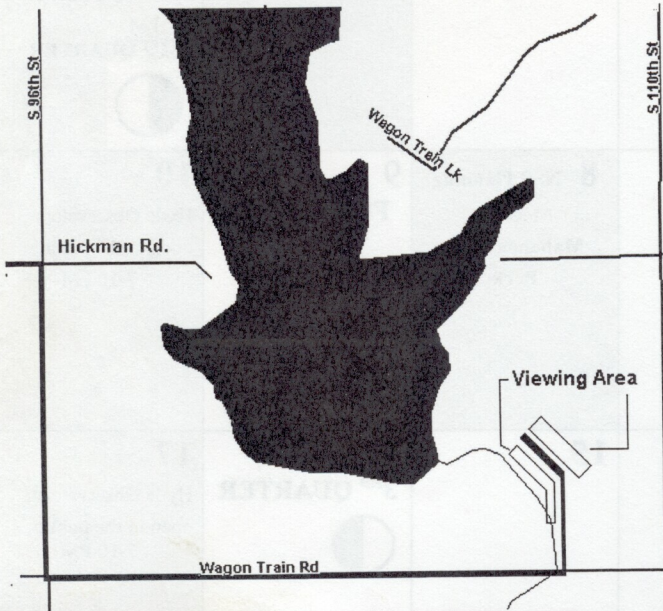
THE PRAIRIE ASTRONOMY CLUB CALENDAR

For March 2001

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
				1	2	3 Hyde Observatory open to the public 7-10 PM 1 ST QUARTER 
4	5	6	7	8 NSP Planning Meeting Mahoney State Park	9 FULL MOON 	10 Hyde Observatory open to the public 7-10 PM
11	12	13	14	15	16 3 RD QUARTER 	17 Hyde Observatory open to the public 7-10 PM
18	19	20	21	22	23 Club Star Party	24 Hyde Observatory open to the public 7-10 PM
25 NEW MOON 	26	27 PAC Meeting 7:30 PM Hyde Observatory	28	29	30	31

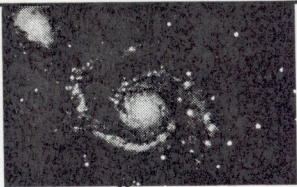
**Directions to Wagon Train Lake
Observing Site**

From Hickman, NE, turn East on Hickman Road. Go until you reach 96th Street, then turn RIGHT. Drive until you reach Wagon Train Road, then turn LEFT. Area 6 is about 3/4 of a mile East. Turn LEFT into Area 6.



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

EARL MOSER 9/2001
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