



The *Prairie Astronomer*

The Official Newsletter Of The Prairie Astronomy Club, Inc.
February 2000

Volume 41 Issue #2

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 Astronomy in NE: www.blackstarpress.com/arini/
 Hyde Observatory: www.blackstarpress.com/arini/hyde/

FEBRUARY'S PROGRAM:

Bill Wells

The Art of Home Brew: Inexpensive Astronomy Projects

Bill Wells (PAC Member & Hyde Volunteer) will give a presentation about astronomy projects that can be built using common materials and tools.

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.

GETTING TO KNOW OUR CLUB OFFICERS: This issue includes an article on our club Secretary, Willa Penney.

PVAO: Astronomy is live and well in central Nebraska with the birth of the Platte Valley Astronomical Observers. Meetings at Crane Meadows Nature Center on the third Thursdays of the month with a star party on the Friday nearest the new moon. Be sure to visit the ARiN notes page at <http://www.blackstarpress.com/arini/pvao/> for more information.

NSP 7 SPEAKERS NEEDED: Dave Hamilton is still looking for speakers for NSP7. Speakers get their registration paid, \$75 and a NSP7 T-shirt.

MONTHLY STAR PARTY: Bill Wells, our new Club Observing Chairman, has invited everyone out to the OAS observing site on March 3rd for our star party. He has extended an observing challenge for those that show up. Objects M105 and NGC3384 are close objects in Leo. See if you can pick them out along with M65, M66, M95 and M96. Also, NGC 1977 and NGC 1981 in Orion along with the "other" Orion nebula. Check out "Objects in Leo" beginning on page 3.



MEETINGS & EVENTS

PAC MEETING

TUESDAY, FEBRUARY 29, 2000, 7:30 PM
at Hyde Memorial Observatory

CLUB STAR PARTY
FRIDAY, MARCH 3, 2000
OAS Observing Site
(see map on back page)

COMMITTEE PLANNING MEETING FOR 2000 NSP
THURSDAY, MARCH 9, 2000, 7:30 P.M.
Mahoney State Park Lodge

UNL STUDENT OBSERVATORY OPEN HOUSE
NO PUBLIC NIGHT IN MARCH (SPRING BREAK)

HYDE VOLUNTEER MEETING
SUNDAY, MARCH 12, 2000, 7:00 - 10:00 P.M.
At Hyde Memorial Observatory

PAC YOUTH GROUP MEETING
SUNDAY, MARCH 12, 2000, 7:00 - 8:30 P.M.
At Hyde Memorial Observatory

PAC MEETING
TUESDAY, MARCH 28, 2000, 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,** 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: *Willa Penney*

Prairie Astronomy Club Meeting
January 25, 2000

President Dave Knisely called the meeting to order. We had one guest. Dave reported that there was a weak aurora this past week that was visible over the northern half of the U.S. He expects more in the weeks to come. The lunar eclipse brought out about 500-600 people to Hyde; Martin Gaskell reported that there were about 300 at the UNL observatory.

Erik Hubl thanked everyone for their support in writing/calling their City Council representatives; the council passed an amended billboard ordinance. He said that Lancaster County also passed a similar resolution, so the entire county will also have billboard restrictions, which include down lighting.

The next Nebraska Star Party planning meeting will be February 10 at Mahoney State Park Lodge. Dave Hamilton reported that two of the speakers will be coming from the University of Colorado, but that two more speakers are needed. John Lawler said that there are still 4 medium cabins available (with 2 double beds). Cabin reservations will be turned in to Merritt as of February 1.

The next Club Star Party will be February 4 at the OAS site. The UNL observatory will be open February 11, from 7:00 – 10:00.

Mark Fairchild, Hyde Volunteer Coordinator, noted that the next Hyde Youth and Hyde Volunteer meeting is Sunday, February 13. Volunteers will meet from 7:00 – 10:00 p.m.; the Youth group will meet from 7:00 – 8:30.

Larry Loomis told us about the Science Olympiad for high school students. There are 30 different events, one of which is astronomy. Students are divided into two groups – 7th to 9th graders, and 10th – 12th graders. He asked if our club would be willing to act as sponsors for the astronomy event; this would involve writing an activity to test the students' knowledge of the heavens. There will be an invitational meeting at Lincoln Southeast High School on Saturday, February 12, with the students' test from 3:00 – 4:00 p.m. and discussion from 4:00 – 4:45. Student teams would then compete at the state event, April 15 at UNL. Ron Veys, Erik Hubl and Rick Johnson volunteered to help. Science teachers from across the state will be at LSE on Friday, February 11, to train to be coaches. The National Director of Reach for the Stars will be attending.

Dave asked for a volunteer to be club observing chairman who would schedule star party dates and contribute observing articles in the newsletter. Bill Wells volunteered.

Dave also asked for a volunteer to be the Chairperson for Astronomy Day. Lee Taylor volunteered and will arrange for the displays at the Mueller Planetarium (May 13, 10:00 – 4:00).

Liz Bergstrom, Treasurer, reported that we have about \$200 in the club treasury.

Erik has one copy of the Ottewell Astronomical Calendar available for sale at \$13.50.

Please turn in the survey that has been in the past newsletters. Only 7 have been turned in so far; as soon as a few more are in, there will be a drawing for a door prize. Mark needs these to plan programs that will meet everyone's interests!

Meeting was adjourned to our program: Dr. Gregory Snow from the UNL Physics Department gave a presentation on C.R.O.P. (Cosmic Ray Observatory Project)

Objects in Leo

Leo is a fairly compact constellation and, unlike so many other constellations, it is readily recognisable. *Alpha Leonis* is named "Regulus" because it was seen as the Heaven's Guardian, one who regulated all things in the heavens. While the name Regulus was given us by Copernicus, the star was better known in antiquity as *Cor Leonis*, the Lion's Heart.

Regulus is a multiple binary, discussed below. Also, because Regulus lies so close to the ecliptic, the moon often passes close by, and even occults the star on very rare occasions.

Like other ancient constellations, many of the stars in Leo are named.

Beta Leonis is called "Denebola": the Lion's Tail.

Gamma Leonis is "Algeiba", Arabic for forehead, but more correctly named *Juba*, meaning mane.

Zeta Leonis is "Aldhafera", the meaning is uncertain;

Epsilon Leonis and *mu Leonis* go under the name of "Al Ashfar", the eyebrows.

Delta Leonis is "Zosma", a Greek word meaning girdle.

Lambda Leonis is Alterf, apparently meaning "extremity". It's located right at the tip of the lion's mouth.

Double stars in Leo:

Alpha Leonis (Regulus) is a multiple system. Component B is very wide: (8.1m, PA 307 degrees, 177"), and this star has its own companion ("C"), a very faint 13m dwarf, with a period of about 2000 years, now approximately 2.6" and a PA of about 86 degrees.

A fourth companion, D, is only optical. That is, there is no gravitational bond with the others, but before that was established, it too became a part of the group. It is found at 274 degrees, and 217".

Gamma Leonis is a notable binary with a slow orbit. While Burnham lists three possible periods (407y, 701.4, and 618.6)

we have settled on the latter as the most probable, and based its orbit on this period.

Presently the companion is very gradually drawing away from the primary. The current values are: PA 124 degrees and separation 4.4".

Iota Leonis is a more rapid binary, with a period of 192 years. Its orbit shows that the 6.7m companion is slowly increasing its distance (now at PA 122 degrees and separation 1.62").

Variable stars in Leo:

R Leonis is the only variable of note in Leo. This isn't your typical Mira-type long-period variable. First of all, it's usually a very faint 11.3m star, which grows to an extremely bright 4.4m every 309.95 days. In 2000 the maximum should arrive in the last week of February.

Secondly, its colour is an unusually deep red, approaching purple. Surrounded by a number of white stars (18, 19, 21 Leo.) its own colour is even more pronounced. Thus *R Leonis* has become a favourite subject for many variable star observers.

Deep Sky Objects in Leo:

Leo has five Messier objects: *M65*, *M66*, *M95*, *M96*, and *M105*.

M65 (NGC 3623) and *M66* (NGC 3627) make a splendid pair of spiral galaxies in the same field, between theta Leonis and iota Leonis.

This is a fine binocular duo, or use a small telescope. *M66* is the one to the east. Both galaxies are elongated north-south; *M65* has a tighter spiral and is perhaps the more noticeable.

About a degree north, hovering just between *M65* and *M66*, is NGC 3628, a galaxy seen edge-on. Actually this is larger than either Messier object, but much dimmer because it is seen edge-on.

M95 (NGC 3351) and *M96* (NGC 3368) form another nice pair, although farther apart. The two are found in a group of galaxies midway

between alpha Leonis and theta Leonis, and just slightly to the south.

Of the two, M95 is to the west. This is a curious round object, with a very faint circular bar. M96 is a tight spiral galaxy, much brighter than its neighbour. Both this pair and M65/M66 are considered to be about 30 million light years away.

M105 (NGC 3379) is a much dimmer galaxy to the north-north-east of M96. Along with NGC 3384 and NGC 3389, which lie just to the east, this object forms a small triangle of galaxies.

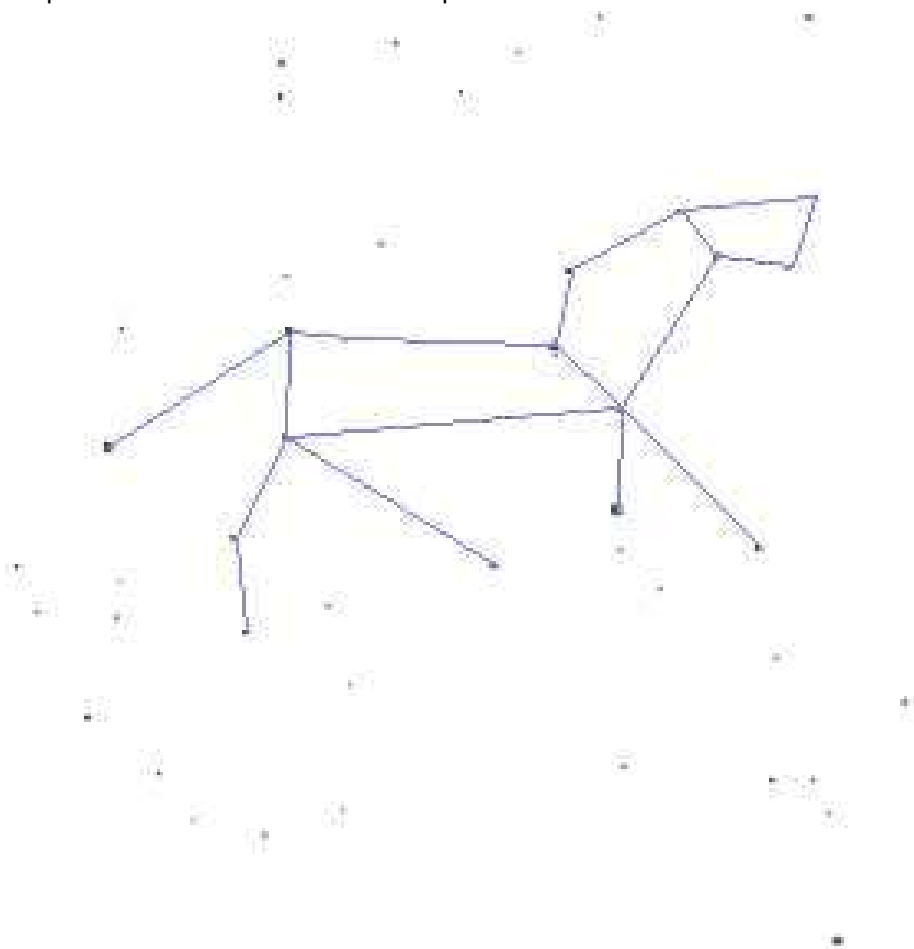
Then there is *NGC 2903*, which somehow escaped Messier's telescope. This deep sky object is judged to be a visual magnitude of 8.9, which makes it brighter than any of the above Messier objects, and covering a larger area as well. It is an elongated multiple-armed spiral located directly south of lambda Leonis, one and a half degrees.

Indeed, there are many more galaxies in Leo to explore. Most of them lie between alpha

and beta Leonis, with a smaller group scattered around gamma Leonis. Most of them are 10-12m, so the larger the telescope the more favourable the viewing.

If you wish a real deep sky challenge, try *Wolf 359*. This is an extremely faint red dwarf, and the third closest star, at 7.65 light years. It has a visual magnitude of only 13.53, which renders it all but lost among the millions of other stars. Only as large as Jupiter, it has a luminosity about 1/65,000 of the Sun's; its absolute magnitude is calculated at 16.7m.

Its Epoch 2000 values are: right ascension 10h 56m, declination 07 degrees, one second. If using Tirion's *SkyAtlas 2000.0*, while this chart doesn't show the star, you can easily find the region. Locate 56 Leo (west of sigma Leonis) then place a mark on the ecliptic just above this star. (The ecliptic is the dotted line running north of this star). This is where you'll find *Wolf 359*. Now you'll need Burnham's finder (on his page 1072), a nice dark sky, and plenty of patience.

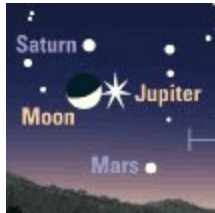


Winter closes with a stunning conjunction, and spring returns with warmer nights.

by Martin Ratcliffe and Alister Ling

The best evening conjunction of the year occurs in March as three planets quickly close in on each other. Mars, Jupiter, and Saturn begin the month spread out in the eastern sky, stretching over 28°. The slender crescent moon stands nearby Mars on March 8 and Jupiter on March 9, adding to the splendor of the planetary conjunction. By March 31, these planets are separated by just 9°. Jupiter, the brightest, stands in the middle of the trio. Shining at magnitude 1.4, Mars appears dimmest of the three because it is lowest in the sky in bright twilight. Saturn, a full magnitude brighter than Mars, lies highest above the horizon.

Jupiter makes an especially attractive target in the twilight of early evening. Just after sunset when the planet becomes visible, small telescopes will show the four major moons and the fine, delicate detail of the clouds and zones in the turbulent atmosphere. Note especially the South Equatorial Belt, which telescopic observers see as the upper dark belt of the two that are easiest to view in the inverted image of Jupiter. Remarkable activity takes place in and around this region of the planet, partly due to the presence of the famous Great Red Spot. Jupiter has dimmed a whole magnitude since its close opposition last year and shines at magnitude 2.0 by the end of March. Its disk has shrunk noticeably also, to 34". Both Jupiter and Saturn lie in the constellation Aries the Ram.



Saturn's disk spans only half the size of Jupiter's, and because the two planets are close in physical size, the apparent size indicates that Saturn is almost twice as far away as Jupiter. Saturn's rings outstrip Jupiter's girth, however, and their long axis extends a full 38". The sun follows a path around the sky called the ecliptic, and this month the ecliptic is well defined by the line of planets in the western sky. Higher in the sky lies the Pleiades, or Seven Sisters, a fine open cluster of stars in Taurus the Bull. Designated M45, the Pleiades lies a little north of the ecliptic plane. From very dark sites it is possible to see the zodiacal light -- a cone of light extending up past M45 at times. Viewing this elusive glow is made possible by the high inclination of the ecliptic, and March is the best time in the Northern Hemisphere in which to see it.

The sun's motion takes it past the First Point of Aries, an artificial location in the sky defined in our coordinate system as the place where the ecliptic and celestial equator meet. It marks the zero point of the Right Ascension grid -- the celestial equivalent of longitude on Earth. Due to the wobbling motion of Earth known as precession, the First Point of Aries now lies in Pisces. The sun reaches this point at 2:36 a.m. on March 20, marking the beginning of springtime in the Northern Hemisphere and autumn in the Southern Hemisphere.

Ahead of Taurus the Bull and setting with the bright planets in the evening is the constellation Cetus the Whale - dimly visible now as its head leaves the sky scene until later in the year. High in the southwest the winter constellations are gathering, ready for their slide into the twilight zone as the season progresses. Orion and Taurus are well placed for viewing in the early evenings, and passing almost overhead for North American viewers is Gemini the Twins. Lying to the south is the solitary, brilliant star Procyon in Canis Minor the Little Dog. Far to its south reigns the brightest star in the entire heavens, Sirius the Dog Star. Its brightness stems in large part from its closeness to Earth - a mere 8.7 light-years from the sun, making it the sixth closest star to us. The winter stars slide slowly westward each night when viewed at the same time. The stars rise 4 minutes earlier every night, causing an apparent westward shift in the constellations that becomes easily apparent on monthly time scales - amounting to a two-hour difference.

March is guaranteed to come in like a lion this year - at least as far as the constellations are concerned. On March 1, Leo the Lion rises in the east. Taking a springtime star tour in the eastern half of the sky, you'll notice the stars appear decidedly fainter than the setting winter stars. Only three 1st-magnitude jewels appear in the eastern sky during the evening, compared to the eight brilliant gems over in the west. First on the list and high in the southeast, the ruby-red Regulus already stands proud as the heart of the lion (or the period in the backward question mark, if you prefer). The next bright star to show above the east-northeastern horizon is the sparkling citrine of Arcturus lying in Boötes the Herdsman. It rises shortly after 10 p.m. local standard time on March 1 and about two hours earlier by March 31. Roughly 45 minutes later, the icy topaz of Spica in Virgo pops over the

eastern horizon, completing the trio of bright stellar treasures in the sky.

The gems in the springtime sky, however, are subtler.

The region of Leo, Virgo, and Coma Berenices is decked with galaxies. Many are listed in

Messier's catalog of deep-sky objects and can be viewed with a 6-inch scope. Trailing behind Leo later in the evening is a chain of galactic wonders. Your patience in finding them will be rewarded with a bountiful array of distant stellar metropolises.

An interloper in Virgo adds interest to this region of sky. The wanderer is an asteroid - Ceres - the first ever asteroid to be discovered back in 1801 by an Italian astronomer named Giuseppe Piazzi. Many asteroids orbit the sun in the asteroid belt - the region that stretches 2 to 3 AU from the sun between the orbits of Mars and Jupiter. At 580 miles in diameter, Ceres looms larger than all other asteroids and all but the major satellites in the solar system.

Ceres reaches opposition on March 22 at magnitude 6.9, making it an easy binocular object. The difficulty will be identifying which object at 7th-magnitude is the asteroid. Since it moves from night to night, its motion will betray its presence. You can identify Ceres by drawing the stars in the field of view on one night and then again on the following night. Its orbit is inclined 10° to the ecliptic, so its path can wander out of the typical zodiacal constellations, and in mid-month Ceres passes into Coma Berenices. On March 1, Ceres stands 3.5° northwest of Epsilon Virginis, or Vindamatrix, a magnitude 2.8 star marking the eastern tip of the "Y" of Virgo. During the spring equinox on March 20, Ceres passes in front of the 11th-magnitude galaxy NGC 4548, often referred to as the lost "M91" in Messier's catalog. However, with the full moon a few degrees away, the galaxy will not be visible, so this event will remain a curiosity only.

As Virgo rises in the east, far across to the northwest Cassiopeia swings low, followed closely by Perseus. Perseus is home to Algol, the famous variable star that undergoes an occultation by a dimmer secondary star every 2.9 days, causing it to dim by a full magnitude in 10 hours. Look for the star at its dimmest on the evening of March 22. Note how bright Algol appears as soon as it is dark. Compare its brightness to a neighboring star, then repeat the following night. Algol will have returned to its normal magnitude 2.1 by March 23.



You can tell what season it is by stepping outside in the evening and noting how the Big Dipper looks in relation to the horizon. In spring, the Dipper appears to be high in the sky and upside-down. Imagine it pouring water for the springtime flowers. Summer shows the Dipper with its bowl pointed down, poised to take a dip in a cool pond. In autumn the Dipper appears "right-side-up," ready to catch the falling leaves. And in winter the Dipper's handle points downward like an icicle.

This familiar asterism in Ursa Major has not always looked like a Dipper, and its shape will change again in many thousands of years. When looking at the Big Dipper "right-side-up" (or as it appears in autumn), most of the stars are moving together in a direction up and to the left. However, Alkaid, the star at the end of the handle, and Dubhe, the star at the top right corner of the bowl, are moving down and to the right. Future observers will have to rename this asterism when it no longer looks like a dipper.



With the end of winter and the spring equinox, the Big Dipper loops high, reaching almost overhead by midnight. The Dipper carries some fine galaxies along with it, most notably

M81 and M82. You can find them most easily by drawing a line from Gamma through Alpha Ursae Majoris (one of the pointer stars) and extending the line further by 10° - then scan the area for two faint, fuzzy cloud patches - they are quite recognizable in a decent finderscope. M81 is a fine Sb-type spiral galaxy shining at magnitude 8.0. M82 is a galaxy in which a massive amount of star formation is taking place, probably as a result of a gravitational interaction with M81. M82 has a high surface brightness, and its pencil-line smudge on the sky is easy to pick out in most scopes.

During the two hours before dawn we get a sneak preview of the summer sky. The summer triangle sits above the eastern horizon by 5 a.m. local time. The brightest star is Vega, halfway up from the horizon to the overhead point in the sky called the zenith. The Northern Cross, also known as Cygnus the Swan, lies above the northeastern horizon, and if it is very clear, you'll see the Milky Way running through it. Low down in the east is Altair, the brightest star in the constellation Aquila the Eagle. Aquila housed the naked-eye nova last December. Follow the horizon around to the south, and you'll find Antares, the M1-type red supergiant star in Scorpius rising in the southeast.

"Beware the Ides of March." This was the warning Julius Caesar, a chief shaper of our present-day calendar, received before he was assassinated by his former friend Brutus and others. The Ides of March originally referred to the time of full moon in the middle of the first month of the Roman year, but now it denotes March 15. This year on the Ides of March and the following day, the two inner planets, Mercury and Venus, occupy the dawn sky. On March 15 and 16 only 2.1° separates the pair. However, they lie in a bright sky. Venus rises an hour before sunrise and shines at magnitude -3.8, so look for it first, and then try and track down Mercury, which is directly above Venus. Mercury glows at magnitude 0.9 but brightens as the month progresses. Mercury reaches its greatest elongation on March 28, when it stands 28° from the sun and shines at magnitude 0.3, but it remains low in the southeast rising just an hour before the sun.

Through a telescope, Venus exhibits an almost "full" phase - more than 90-percent illuminated - a phase that can only occur with Venus lying on the far side of the sun. Such an observation a thousand years ago was impossible because there were no telescopes. Even so, this simple observation is enough to show that we live in a sun-centered solar system and not an Earth-centered one (as if proof were needed today). In Ptolemy's Earth-centered system it was impossible for Venus to show a full phase, since he had Venus orbiting Earth between us and the sun, displaying only a crescent phase. Mercury, on the other hand, currently displays a crescent phase, presenting an interesting contrast to Venus. Mercury's phase will grow quickly as it approaches greatest elongation, reaching 50-percent illumination by month's end.

Martin Ratcliffe is Director of Theaters at the Exploration Place in Wichita, Kansas. Alister Ling is a meteorologist working for Environment Canada in Alberta.

Willa Penney, Our Club Secretary

Growing up on a farm, I remember how very dark and awesome the skies were to me. My father had a small collapsible scope and I remember watching a comet and seeing an aurora. I wanted to be an astronomer and even went off to college hoping to major in physics. However, my social life took precedence and flunking calculus caused me to change my mind. (I did pass it later!) So astronomy got pushed aside until recently.

I attended UNL and got a degree in psychology. I then spent the next years being a stay-at-home mom with my two sons. We lived in Portland, Maine, Omaha and Kansas City before settling back in Lincoln. After my sons were in junior high, I went back to school and got an M.B.A., working at CityBank and American Charter before moving to UNIPAC 6 years ago.

My interests other than astronomy are gardening, reading, sports, jazz and especially my grandchildren. Besides serving as PAC Secretary, I am currently Treasurer of the Coddington Heights Home Owners Association and the Lincoln Police Citizens Academy Association. I also play in the Bell Choir at my church.

My interest in astronomy was rekindled when I took Mark Fairchild's class in astronomy at Southeast Community College. I recently bought an Astroscan from Edmund Scientific and really love it! It's so easy for me to handle, very portable and there's no setup required. Even though I do not spend very much time outdoors with my scope, I enjoy reading Astronomy magazine and anything else I can about astronomy and science in general. I've enjoyed being in PAC and continue to learn something new every meeting!

Willa has been the club secretary for more than a year now. Be sure to say hi next time you see her at the monthly meeting.

STS-99: EarthKAM

Kids Photograph The Earth

As STS-99 circled Earth, astronauts weren't the only ones peering out the shuttle windows.

Kids were too.

STS-99 had a special camera on board that's operated by kids on the ground. It's called: EarthKAM -- short for Earth Knowledge Acquired by Middle Schools.



Astronauts mount the camera in a shuttle window. Then kids all over the country who are participating in EarthKAM can start their own investigations from space.



It works like this. Kids spend months training before the shuttle takes off. Then, once the shuttle is in orbit, kids get to use the Internet to point the EarthKAM camera at their favorite spots. But that's only the beginning. The shuttle downloads all the pictures so kids can see them on their own computer screens.

Then it's time to investigate the photos they took. They can identify mountains, check out cities, or look for erosion. It's a close-up view of the planet that you can only get from space.

Lots of kids have already taken pictures from the shuttle. EarthKAM has been aboard four shuttle flights. Kids have used the web to set-up and take over 2000 photos of our blue marble.

Sounds like a cool way to zoom-in on Earth as the shuttle zooms through space.

The following Omaha Schools are participating in the project:

Kiewit Middle School
Russell Middle School
Harrison Elementary
Skinner Magnet Center
McMillan Magnet Center

This stamp, showing the Space Shuttle Columbia, is one of a new series of U.S. Postage stamps, The 1980s, unveiled at the KSC Visitors Complex. The collection is the ninth in the Post Office's "Celebrate the Century" commemorative series honoring the last 100 years of history.



Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

THE PRAIRIE ASTRONOMY CLUB CALENDAR

For March 2000

Sun

Mon





Tue

Wed

Thu

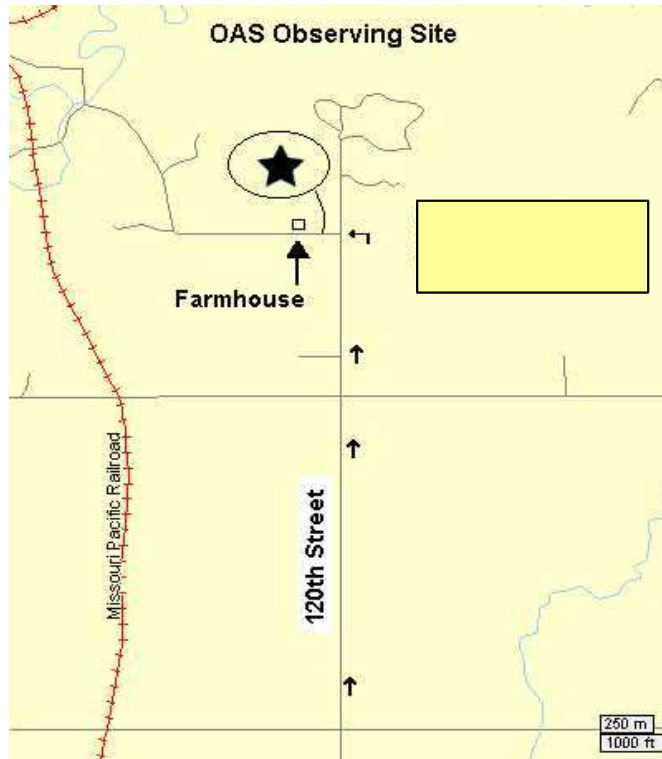
Fri

Sat

Hyde Volunteer Schedule for March 2000		1	2	3	4	
03/04 David Browkowski , Pamela Fielder , <u>Travis Miller</u> , <u>Lee Taylor</u> 03/11 Earl Barnawell , Andrew Connett , Mark Connett , Bryan Schaaf, <u>Bill Wells</u> 03/18 <u>Joe Babcock</u> , Jason Busch , Ron Debus , Dan Schearf 03/25 Angela Gasparetti , <u>Don Gasparetti</u> , Rekha Rajagopal , Bill Wells				3 Club Star Party at the OAS Viewing Site	4 Hyde Observatory o pen to the public 7 PM	
5	6 NEW MOON 	7	8	9 NSP 7 Planning Meeting, 7:30 @ Mahoney State Park	10	11 Hyde Observatory open to the pu 7-10 PM
12 Volunteer Practice Night; 7 p.m. to 10 p.m. @ Hyde <i>PAC Youth Group 7-8:30 p.m. @ Hyde</i>	13 1 ST QUARTER 	14	15	16	17	18 Hyde Observatory open to the pu 7-10 PM
19	20 FULL MOON 	21	22	23	24	25 Hyde Observatory open to the pu 7-10 PM
26	27 3 RD QUARTER 	28 PAC Meeting 7:30 PM Hyde Observatory	29	30	31	

Directions to OAS Observing Site

From Lincoln, take Highway 34 East approximately 29 miles to 120th street. Then go North about 2 1/2 miles.



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Next PAC Meeting
February 29, 2000
7:30 PM
Hyde Observatory

First Class Mail