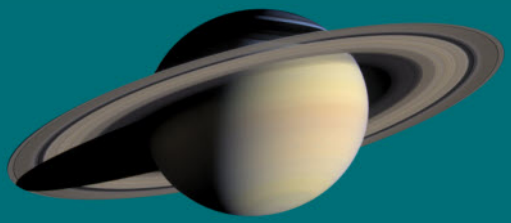


The Prairie Astronomer

June, 2009 Volume 50, Issue #6

The Official Newsletter of the Prairie Astronomy Club

PAC Program

Tentative: review and video of the LRO/LCROSS mission.

In This Issue

Featured Photo

Arp 213 by Rick Johnson. “Arp 213 is classed by Arp as; "Galaxies (not classifiable as S(piral) or E(lliptical: Irregularities, absorption and resolution. Often I don't know what he is referring to but in this case it is obviously the odd dark band that forms a radial spoke. "Faint straight absorption lanes lead toward nucleus, become triple" (Arp). Near the core it splits in three parts, one goes to the east of the core, one to the center and another to the west side of the core. Is this a feature of the galaxy or a dust lane in our own galaxy? I couldn't find a definite answer to this. Red shift data puts it at about 40 million light years. The spiral galaxy below it and a bit left is UGC 2955 and it too is about 40 million light years away. They likely are part of the same group but I see no sign of interaction between them. So if the dark radial lane is due to interaction with another galaxy, where is it?”

Please send your astrophotos to Mark Dahmke to be added to the PAC website and the newsletter.

Saturn image courtesy NASA.

Club Business --Meeting Minutes

President Brian Sivill called the meeting to order 22 members, no guests

Announcements:
The next Prairie Astronomy Club meeting will be Tuesday June 30 at Hyde Observatory
The next PAC star parties will be June 12 and 19 at the farm. Club Observing Chair, Jim Kvasnicka will be hosting a Lunar Party at his home on May 29.
The next Mahoney Star Party will be Friday, June 12 at Mahoney State Park.

The 16th Annual Nebraska Star Party will be held Sunday July 19, 2009 through Friday July 24, 2009 at Merritt Reservoir, near Valentine Nebraska.

The Iowa Star Party will be held from August 20 – 23, 2009 at the Whiterock Resort in Coon Rapids Iowa.

Observing Report
Jim reviewed the last few star parties. We haven't had much luck lately, our weather just isn't cooperating. Jim also previewed the upcoming Lunar Party, intended to provide the students from the beginning astronomy class a chance to observe, since the class had cloudy skies.

Club Business:
In 2009, the terms of two members of the Astronomical League's executive board conclude. They are: Treasurer, Mary Sutter, and Secretary, John Gross. There is one candidate for Treasurer, Joanne Hailey. There are two candidates for Secretary: Bill Bogardus and Robert A. Burgess. Profiles of these candidates appear in the June 2009 issue of The Reflector and on the AL website. PAC's ballot is due on June 30th. Our vote(s) will be determined soon.

Adjourn to program on The Nature of Science, a full dome show produced by college students

Respectfully submitted by,
Lee Taylor

Club Events

PAC Club Meeting
Tuesday, June 30, 2009 7:30pm @ Hyde Obsv.

PAC Club Meeting
Tuesday, July 28, 2009 7:30pm @ Hyde Obsv.

Next newsletter submission deadline: July 18.

2009 Star Party Dates
July 17th and **July 24th**
August 14th and **August 21st**
September 18th and September 25th
October 16th and October 23rd
November 13th and November 20th
December 11th and **December 18th**
The date that is **bold and underlined** is the date closest to the New Moon.

Nebraska Star Party: July 19-24, Merritt Reservoir, Valentine, NE.
Iowa Star Party: August 20-23, 2009, Coon Rapids, Iowa.

Mahoney Star Party dates: July 10th, August 14th, September 11th

SETI@Home's 10th Anniversary

SETI@home, the world's largest and longest-running volunteer computing project, celebrates its tenth anniversary this month with 140,000 participants and 235,000 computers powering the search for intelligent signals from space. No extraterrestrials have been found yet. But the project has continued to inspire and excite the public, and has spurred the development of dozens of similar volunteer computing projects.
Mark Dahmke established a PAC group on SETI@Home in 1999. The group currently has six members, two of which are active. To date the PAC group has 1,699,165 credits with Rick Johnson the leader at 796,978 credits., or work units delivered. To join SETI@Home, go to http://setiathome.berkeley.edu/.

Club Telescopes - Checkout Policy

To check out one of the club telescopes, contact Cassie Etmund at ccggymnast1@aol.com. If you keep a scope for more than a week, please check in with Cassie once a week, to verify the location of the telescope and how long you plan to use it. The checkout time limit will be two weeks, but can be extended if no one else has requested use of a club scope.

ON THE NET

PAC:
www.prairieastronomyclub.org

PAC E-Mail:
info@prairieastronomyclub.org

NSP:
www.nebraskastarparty.org

NSP E-Mail:
info@nebraskastarparty.org

OAS
www.OmahaAstro.com

Hyde Observatory
www.hydeobservatory.info

Panhandle Astronomy Club
Panhandleastronomyclub.com

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

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

To post messages to the list, send to the address

pac-list@prairieastronomyclub.org

PAC can also be found on Twitter and Facebook.

Buy club apparel through the club website. Shirts, hats, mugs, mouse pads and more.

Financial Report--Dan Delzell

It has been a while since I updated the membership on the club's finances.

As of 5/31/09, our account balances were:

Checking Account	$ 3161.01
Savings Account	$ 9355.22
CD-1	$18,297.24
CD-2	$ 4050.09
CD-3	$ 5555.00
Total	$40,418.56

CD-1 and CD-2 were both rolled over to 11 Month CDs in February. An 11 month CD carried a better rate of return than then a 12 Month CD. .It is hoped that the interest rate situation will improve before they come up for renewal. CD-3 matures the end of June.

New Members

Welcome our new members since January 1:

Linda and Hugh Clarke
Dale Bazan & Family
Jason Noelle
Ben Rush
Jay Bouers
Brett Boller
David Wilson
Nathan Barry & Erika Boren
Larry & Mallory Paul
Jason Sweazy
Daniel & Bryan Dulaney & Family

Total Club Membership is 52

Cash Flow - YTD
1/1/2009 through 5/31/2009

INFLOWS	
Education - Class Registration	182.00
Gift Received	30.00
Interest Income	15.97
Member Dues	731.00
Ottwell & RASC Handbooks	
RASC Handbooks	32.45
Other Ottwell & RASC Handbooks	95.85
TOTAL Ottwell & RASC Handbooks	128.30
TOTAL INFLOWS	**1,087.27**
OUTFLOWS	
Astronomical League	240.00
Dues and Subscriptions	100.00
Education	72.34
Government Fees	30.00
Meals & Entertainment	37.46
Member Dues	5.00
Newsletter	75.64
Office Supplies	21.38
Ottwell & RASC Handbook	
Ottwell Calendars	30.95
RASC Handbooks	97.35
TOTAL Ottwell & RASC Handbook	128.30
Printing and Reproduction	40.66
US Postmaster	16.20
TOTAL OUTFLOWS	**766.98**
OVERALL TOTAL	**320.29**

Respectfully submitted by Dan Delzell
Club Treasurer

Letter to PAC from Karla Bachman

Dear Prairie Astronomy Club:

As many of you know, as often as I can I try to fit my passion for astronomy and space travel into the things I do in my classroom. The kids love it! They moan when I say we need to get back to the "topic at hand."

This past winter a student in my math class commented that they wished I'd teach an after-school class on astronomy. I passed it off explaining to them that the after school clubs were PTO not school classes. The next day the student came to math informing me they'd called the PTO person to ask about how they could have the class. She was told they needed a teacher and a minimum of 6 students signed up. She already had signatures of 21 who said they'd come… "would I please say yes."

Thus began our exciting semester! "PAK" (Pyrtle Astronomy Kids) met weekly on a wide range of topics. It was such a delight to work with kids who were eager and wanted to learn. Their high energy levels left me tired every session – but at the same time energized about doing the next one.

I received a small stipend for doing the classes. I want to split it with PAC because many pieces I used in the class came directly or indirectly from PAC contacts. (Things like the Mars globe, several videos and activity ideas). Thank you for sharing.

I can't tell you how many ripples have come from our class. The Boy Scout group traveled to the Kansas Cosmosphere, a couple students now have telescopes in their families, a mother told me her daughter had something to look forward to talking to her grandpa about when he visits now, many students attended events when Clay Anderson visited and on Astronomy Day at Morrill Hall or SASM… and of course, because kids were involved, adults were too.

I had so many ideas about ways I wanted to improve it another time! Unfortunately Pyrtle School is undergoing major construction changes next year so there won't be any after-school activities. But that won't keep me from collecting new ideas and activities to use in my class or hopefully when construction is done. So anytime you come across "kid friendly" ideas or events, continue to let me know. You're very much appreciated.

Karla Bachman

ANNUAL MEMBERSHIP DUES

REGULAR MEMBER - $30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - $35.00 per year. Same as regular member except gets 2 votes at club meetings.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

From the Newsletter Archive

Commandments for Stargazers, from the July 1981 Prairie Astronomer.

1. Thou shalt not shatter the darkness at the observing site. All man-made lights shalt thou eschew, save faint red ones.
2. Thou shalt not illuminate thy car headlights, nor open thy car door without disconnecting thy dome light. Even a struck match is mightily unpleasing in the dark-adapted eyes of the Lord.
3. Thou shalt walk carefully over the site, taking pains not to stumble over power lines, tripod legs, rattlesnakes, nor sleeping babes. The Lord has given thee free will to break thine own neck, but thou must never jostle thy neighbor's equipment.
4. Thou shalt not raise a dust cloud with thy clumsy clodhoppers. Neither shall thou "burn rubber" with thy hot rod, even though thy best girl be watching thee.
5. Toot not thy horn, race not thy motor, expose not with loud talk thine tonsils to the night air. Even as the condemned man sayeth: "No noose is good noose," so the observer sayeth: "Noise annoys."
6. Long shalt thou ponder before thou seeketh to borrow thy neighbor's equipment. A screwdriver is perhaps reasonable—a telescope preposterous. Wouldst thouh ask to borrow a corpse at a wake?
7. Thou shalt praise thy fellow observer's equipment. Even when thou findest naught of merit, thou canst at least laud the colour of the paint, and the darkness will absolve thee from lying. But keep a straight face, for verily, a straight face is the shortest distance between two deceptions.
8. Thou shalt not disturb anyone who hath his eye glueth to a telescope. His mind may be light years away, exploring cosmic mysteries, unscrewing the inscrutable. He may be "tracking" a photograph—and though it may turn out badly, permit the "unguided" ones to spoil their own pictures.
9. Squabble not with thine wife. If she sighteth a flying saucer, belittle not her wisdom, yea, help her count the little green men, lest she seek a more agreeable companion. The plural of mouse is mice, and plural of louse, lice—but, nay, the plural of spouse is not spice: it's bigamy.
10. Thou shalt clean up the observing site before thou leavest, and close all gates safely behind thee. These duties well behoove the amateur astronomers, whose motto might well be said: "We try harder, ours is only the second oldest profession."

From a fragment of parchment found under a boulder in Boulder, Colorado, with thanks to the Bowie and Salt Lake Astronomical Societies.

July Observing: What to View--Jim Kvasnicka

This is a partial list of objects visible for the upcoming month.

Planets

Venus/Mars: Venus rises 3 hours before the sun at magnitude -4.1. Mars is at magnitude 1.1 and starts the month at 4° to the upper right of Venus. They will get farther apart as the month proceeds.
Jupiter and Neptune: Both are highest in the south during early morning hours. Jupiter at magnitude -2.8 and Neptune much fainter at 7.8. Neptune will be 34' NNW of Jupiter on July 13th.
Uranus: It is near the Circlet of Pisces at magnitude 5.8.
Mercury: Very dim and low at dawn, difficult to see to the lower left of Venus.
Saturn: Low in the west. By the end of July it will be only 10° above the horizon an hour after sunset.

July Messier List

M3: Bright globular cluster in Canes Venatici.
M4: Globular cluster in Scorpius near Antares.
M5: Globular cluster in Serpens Caput.
M53: Globular cluster in Coma Berenices.
M68: Faint globular cluster in Hydra.
M80: Small, faint globular cluster in Scorpius.
M83: Face on spiral galaxy in Hydra.
Last Month: M58, M59, M60, M84, M86, M88, M89, M90, M91, M98, M99, M100
Next Month: M6, M7, M8, M9, M10, M12, M19, M20, M21, M23, M62, M107

NGC and Other Deep Sky Objects

NGC 6207: Galaxy in Hercules.
NGC 6445: Planetary nebula in Sagittarius.
NGC 6642: Globular cluster in Sagittarius.
NGC 6645: Open cluster in Sagittarius.
B92/B93: Dark nebulae in Sagittarius.

Double Star Club List

Nu Draconis: Equal pair of white stars.
Psi Draconis: Light yellow pair.
40/41 Draconis: Equal pair of light yellow stars.
Xi Scorpii: Yellow primary with a light blue secondary.
Struve 1999: Pair of yellow-orange stars.
Beta Scorpii: Blue-white primary with a light blue secondary.
Nu Scorpii: Yellow and light blue stars.
Delta Serpentis: Pair of pale yellow stars.
Theta Serpentis: Blue-white pair.

Challenge Object

B72: Barnard's dark S-Nebula or "The Snake". Located 1.5° NNE of Theta Ophiuchi, an area rich in dark nebulae.

Focus On Observing Clubs--Jim Kvasnicka

Focus on Constellations - Ophiuchus

By Jim Kvasnicka

Ophiuchus

Ophiuchus, The Serpent Bearer, is a large constellation; its 948 square degrees make it the eleventh largest constellation. Most of it lies just NW of the southern part of the summer Milky Way. The SE wing of the constellation extends into the Milky Way almost to the direction toward the Galactic Center. Because most of our Galaxy's globular clusters are distributed around the direction toward the Galactic Center, Ophiuchus is rich in globular clusters, which make up most of its showpiece objects. Ophiuchus is a summer constellation best seen in July.

Mythology

Ophiuchus represented the god of medicine Aesculapius, son of Apollo. Aesculapius/Ophiuchus was taught the art of healing by Chiron, the centaur in the constellation Centaurus. According to one story, when Aesculapius once killed a snake another came along with a medicinal herb in its mouth that revived the first snake. Aesculapius took some of the herb and gained the power to restore life. Hence the symbol of Aesculapius, and medicine in general, is the staff or two intertwined serpents. Aesculapius was so successful that the kingdom of Pluto, god of the Nether World, was threatened. Pluto appealed to Zeus, who killed Aesculapius with a thunderbolt. Apollo interceded on his dead son's behalf with Zeus, who relented and immortalized Aesculapius in the heavens as the constellation Ophiuchus.

Objects in Ophiuchus Magnitude 12.0 and Brighter

Galaxies:	NGC6384
Open Clusters:	IC4665, NGC6633, Cr350, Tr26
Globular Clusters:	M9, M10, M12, M14, M19, M62, M107, NGC6284, NGC6287, NGC6293, NGC6304, NGC6316, NGC6342, NGC6355, NGC6356, NGC6366, NGC6426
Planetary Nebulae:	IC4634, NGC6309, NGC6369, NGC6572, PK3+2.1, PK357+7.1, PK8+5.1, PK8+6.1
Bright Nebulae:	
Dark Nebulae:	B244, B256, B259, B46, B57, B60246, B61, B62, B63, B64, B67a, B68, B69, B70, B72, B74, B77269, B78, B79276
Named Stars:	Rasalhague (Alpha), Cebalrai (Beta), Yed Prior (Delta), Yed Posterior (Epsilon), Sabik (Eta), Marfic (Lambda)

Number of Ophiuchus Objects in Various Observing Clubs

Messier Club:	7 objects
Double Star Club:	3 objects
Herschel 400 Club:	15 objects
Globular Cluster Club:	Ophiuchus contains 17 globular clusters, all can apply towards the 50 required by the Globular Cluster Club.
Open Cluster Club:	3 objects
Planetary Nebula Club:	5 objects
Urban Club:	5 objects

Lunar Party--Jim Kvasnicka

To deal with the frustration on not being able to hold our regular scheduled star parties due to the weather I hosted a Lunar Party on Friday, May 29th at my house. We had a good turnout with 12 people including members Dave Churilla, Bob Kacvinsky, Dan Delzell, Bob Leavitt, Lee Taylor, Jason Noelle and Brett Boller. We also had a few guest including Dan Dulaney and his son Bryan who were looking for assistance in setting up their 6" Celestron telescope. A big thank you goes to Dave Churilla who took some time to help them out. Things must have gone well because Dan and Bryan both joined the club. Along those lines I would like to say thank you to Dan Delzell who has done a fantastic job this year in getting new members to join our club.

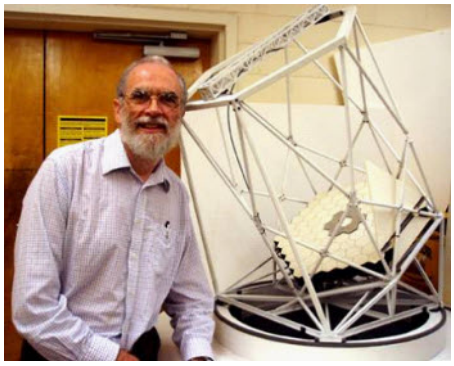
We had a total of eight telescopes and a pair of 20x80 binoculars set up on my yard. I live on an acreage with 3.8 acres so I have plenty of room for people to set up their telescopes and spread out. Dave Churilla had put together a large laminated map of the moon for all of us to share along with smaller individual copies. Another thank you goes to Dave for doing this.

Most of the people spent time observing the moon before it was dark. Once it started to get darker we observed other objects as well including Saturn, some double stars and globular clusters. I had some neighbors out walking and they stopped to take a look through the telescopes. I was great to be able to show them the moon and Saturn.

There were some clouds moving in from the northwest and we could see lightning and hear thunder. People started packing things up around 10:15 and by 10:45 we started to have rain. This was a very fun and enjoyable night. It was too bad the weather again forced us to stop early. Having another Lunar Party is something we will definitely plan for in the near future.

Black Holier than Thou? – Double the Fun with Supermassive Black Holes! (Part I) --Martin Gaskell

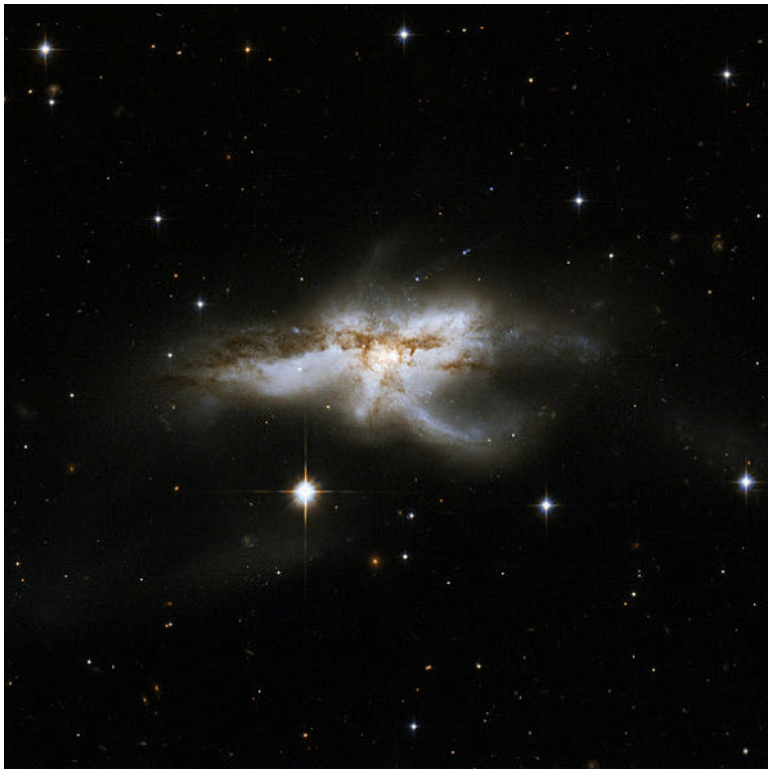
When I gave a talk at a PAC meeting last summer, I talked about how we now know that every large galaxy has a giant black hole in the center, and about the progress we have made in understanding how the tremendous energy in active galactic nuclei (AGNs) is released. Another topic I have worked on over the years is the question of whether we an AGN sometimes has not one, but *two* black holes. This has become an increasingly hot topic recently, so I thought I'd tell you some of the story about this.



Martin Gaskell in front of a scale model of the 9.2-meter effective aperture Hobby-Eberly Telescope

Normally the dense, rapidly-moving gas (what we call the "broad-line region") in an AGN has the same redshift as the host galaxy. This is because the gas is associated with a supermassive black hole (masses of about a million to a billion times the mass of the sun), and the black hole is sitting smack in the center of a large galaxy. Back in the early 1980s, however, I noticed that there were quite a lot of AGNs where this gas was systematically moving at quite high velocities relative to the galaxy in which the black hole was located. It would be moving at a thousand kilometers per second or so towards us (a blueshift) or away from us (a redshift), or sometimes there would be gas doing both things (i.e., a blueshift and a redshift in the same object). The prototype of these objects was a 15th magnitude AGN called 3C 390.3 whose unusual redshifted and blueshifted emission lines were first noticed by Alan Sandage in 1966. I proposed in 1982 at the Texas Symposium on Relativistic Astrophysics that this phenomenon arose because the black holes the gas was associated were not at rest at the center of the host galaxy but were moving at a high speed. The most likely way this could happen would be if the black hole were orbiting another black hole. I published a short paper on this the following year. Although this was new idea for AGN people, a couple of years earlier, in 1980, three theoretical astrophysicists, Mitch Begelman, Roger Blandford, and Martin Rees had pointed out

in an important paper in *Nature* that since galaxies must collide and merge, their central supermassive black holes would end up orbiting each other.



Hubble Space Telescope image of NGC 6240, a 14th magnitude pair of colliding galaxies located about 330 million light years away in the constellation of Ophiuchus.

My idea that we were seeing two separated regions of dense gas around two separate black holes generated what with hindsight can best be called "polite interest." One problem was that at that stage (the mid-1980s) we didn't understand what the gas was doing around AGNs with only one black hole! In 1977 my University of Texas colleague Greg Shields had proposed that the emission lines in AGNs could arise from flattened rotating discs. A decade later, in 1987, Caltech astronomer Beverley Oke specifically proposed, based on his observations with the Palomar 200-inch, that the double-peaked (blueshifted and redshifted) emission lines in the prototypical 3C 390.3 were the result of emission from a rotating disc. I argued in a paper the following year that a disc origin was unlikely because the line profiles were changing in a manner inconsistent with central illumination of a disc. I pointed out that the two sides of the line profile should vary up and down together if they arise in a disc, but instead the ratio of the red and blue sides was definitely changing with time. This was a problem for the disc model, but consistent with the binary black hole model where the two sides should vary independently because the emission from around each black hole would be independent.

So far things were looking good for my binary broad-line region model. The model made a definite prediction: that the double peaks should change their positions with time as the black holes slowly orbited. This is just what happens in a spectroscopic binary star. In 1996 I reported just such a change in 3C 390.3, thus demonstrating that the gas was being accelerated. This was presumably because it was orbiting a supermassive black hole. However, the following year (1997), a group of researchers at Berkeley led by Mike Eracleous reported that the orbital motion shown in my 1996 paper had not continued. The simple binary black hole model was thus not working. Meanwhile a large number of collaborators and I had been using many telescopes in space and on the earth (including Behlen Observatory) to follow changes in 3C 390.3. Our papers (Dietrich et al. 1998 and O'Brien et al. 1998) showed clearly that, on *short* timescales (the length of time it would take light to cross the system), the red and the blue sides of the line profile in 3C 390.3 were varying simultaneously. Our discovery strongly ruled out the binary black hole model, but was completely consistent with the disc model instead.

I saw that the mistake I had made in my 1996 paper was in interpreting the orbital motion as being due to the orbital motion of black holes. Yes, it was orbital motion, but it orbital motion of asymmetries ("blobs") the gaseous disc. At this point I immediately abandoned the binary black hole model as an explanation of the double-peaked emission line profiles, and recognized that they were due to asymmetric discs orbiting single black holes.

Although binary black holes were no longer tenable as the explanation of double-peak emission line objects, there was never any doubt that supermassive binaries must exist, and indeed that they must be a rather common phenomenon, because the original premise that supermassive binary black holes form in mergers has to be correct.

Continued next month, or read the rest online on the PAC website.

THE *Prairie Astronomy Club*

Amateur Astronomy --
A Hobby as Big as the Universe

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc. Membership expiration date is listed on the mailing label. Membership dues are: **Regular $30/yr, Family $35/yr**. Address all new memberships and renewals to: **The Prairie Astronomy Club, Inc., PO Box 5585, Lincoln, NE 68505-0585**. For other club information, please contact one of the club officers listed to the right. Newsletter comments and articles should be submitted to: **Mark Dahmke, PO Box 80266, Lincoln, NE 68501 or mark@dahmke.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.

The Prairie Astronomer
c/o The Prairie Astronomy Club, Inc.
P.O. Box 5585
Lincoln, NE 68505-0585

FIRST CLASS MAIL

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{MM:RENEWALDATE}

Next PAC Meeting
TUESDAY
June 30, 2009
7:30 PM
Hyde Observatory