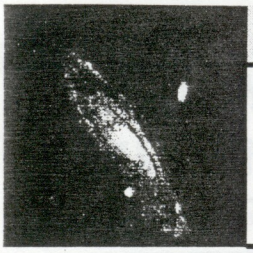
The Prairie Astronomer

September, 1996 Volume 37 Issue #9



President's Report

by Dave Scherping

PAC PICNIC...
The annual PAC picnic was held on Saturday, September 14th. There was a fairly good turnout, with about 35 PAC members and their families enjoying good food and socializing. The evening was cool, which seemed strange for a PAC picnic, and the clouds prevented us from doing any observing. Still, it was a good time for all.

MAHONEY STAR PARTY...
The last Mahoney Star Party of the year was held September 20th. Since this article was written before then, I can't comment on its outcome. I can only hope that we had better weather than the earlier dates this year.

ELECTION TIME...
It's time to nominate PAC Officers for the upcoming year. Nominations will be made at this month's PAC meeting and elections will be held at the October 29th meeting. If you'd like to run or nominate someone to run for an office, now's the time.

ATLAS SITE...
Only two PAC members (Bryan Schaaf & Doug Bell) expressed an interest in helping out at the Atlas Site work bee on September 7th. Once again, there was not enough support to have a successful work bee.

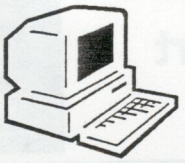
The following day, Alan and Ryan Peters, Bob Opp and I made a trip to the site to haul a truckload of trash to the dump. We were able to get rid of a lot of junk, but unable to get it all. This brings up another point. I am insisting that nobody leave anything at the site without prior approval from the club officers. All of the stuff we hauled to the dump was brought to the site by our members, thinking we might have a use for it which we obviously didn't. This excludes items such as the wheelbarrow, ladder, grill, and charcoal, which are obviously useful and appreciated.

On Thursday September 12th, Bryan Schaaf and I did some weed whacking in preparation for the September 14th PAC picnic and star party. The weeds were up to 5 feet high.

There's still a lot of work that needs to be done. Here's a partial list: The shed needs cleaning, there is scrap wood, brush, and trash that needs to be burned, there is more trash to haul to the dump (perhaps those who brought it could come and get it), the outhouse needs to be set in place and bolted down (it's not over the hole and someone's been using it), there is more mowing & weed-whacking to be done, and we need to install additional fence since people are driving around the old one.

Thanks Alan, Ryan, Bob, Doug & Bryan for your help.

Sorry for the inconvenience of the small print. I had quite a few late arriving news items to add the last minute and all were equally important, so I had to reduce the type size to fit all of it on eight pages.
Also, my apologies to those people that arrived an hour "late" to the club picnic on September 14th, due to my error in last month's *Prairie Astronomer* newsletter. - The Editor



If you have access to Internet, see the Prairie Astronomy Club web page:
http://infoanalytic.com/pac/
E-mail us at: **pac@infoanalytic.com**
Omaha Astronomical Society web page:
http://www.top.net/cdcheney
NEKAAL web page: **http://world.std.com/~wic/**

SEPTEMBER/OCTOBER MEETING NOTICES:

MAHONEY PUBLIC STAR PARTY
FRIDAY, SEPTEMBER 20th
at Mahoney State Park
on the Soccer Field

GENERAL MEETING
TUESDAY, SEPTEMBER 24th, 7:30 p.m.
at Hyde Memorial Observatory

BEHLEN OBSERVATORY OPEN NIGHT
FRIDAY, OCTOBER 11th, begins at 8:00 PM
at Behlen Observatory

STAR PARTY
SATURDAY, OCTOBER 12th
at the Atlas Site

BRIEFS:

A reminder: The October *Prairie Astronomer* issue will have the updated club membership list in it. If you have any additions (new member?), changes (moved?, email address?) or corrections, please **LET ME KNOW SOON !!!**, if you haven't already. Thank you.
And... Nominations for 1997 club officers will be open at the September 24th PAC meeting. The officers positions are: President, Vice President, 2nd Vice President (Program Chairman), Treasurer and Secretary.
- Bryan Schaaf

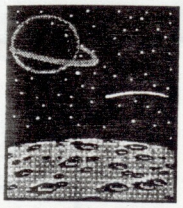
In the article "*More Evidence for Binary Black Holes*" on page 15 in the *Sky & Telescope* October issue, there is mention of some quasar research findings by Martin Gaskell. Check it out! - Dave Scherping

A BIG THANK YOU

goes out to Alan & Ryan Peters, Bob Opp and Dave Scherping for their concerted efforts to haul away most of the junk pile from the Atlas Observing Site and to Alan for the use of his truck on the morning of September 8th. Good deeds sometimes go unnoticed, but not this one! They didn't do this for themselves. They did this for the club.

contents:

Observing
Chairman's Report
by Douglas Bell



For October 1996 Observing:

New Moon: October 12, 1996
Lunar object: Hesiodus A
Planet: The seven comets
Top 40: The Helix
Deep sky: NGC 7662
Challenge: The gegenshein
Messier Monthly: M72, the Saturn Nebula

Tip of the month: Align the cross-hairs on your finder with the major axes of your mount. That makes it easier to align the objects.

Quote: Light Pollution....when there are more stars on the flag than there are in the sky.

Lunar feature: Hesiodus A
The official crater of the Astro-Prairie Dog Hunters Club. Hesiodus A is a perfect bull's-eye of concentric craters a little north and west of Tycho. Its a big target, but you might have some trouble finding a big enough gun. Look for it a day or two after first quarter.

Planet of the month: The seven comets
Well it's quite a parade. The comet page lists seven long period comets now in view. Four of which are bright enough and in place for a North American amateur. Is it just that Hale-Bopp and Hyakutake have made everyone take notice, or are there a lot of comets these days?

Messier Monthly: M 72, The Saturn Nebula
I guess they don't call them planetaries for nothing. This one has extensions which (in photos or a really big scope) look slightly like Saturn's rings. How much can you see in your scope?

Top 40: The Helix
The biggest and best planetary (?). A whopper planetary in Aquarius. Use binoculars or as low a power as you can get. Very low surface brightness makes it hard to see.

Deep Sky: NGC 7662
A bright planetary in Andromeda. The RASC handbook says it's blue(?!). Hmmmm.....

Challenge: The gegenshein
Ever seen inter-planetary dust? Of course you have. Other than meteors, the zodiacal light and the gegenshein both shine faintly due to sunlight reflecting off of the very sparse band of dust left by passing comets etcetera. The gegenshein is the faintest. You'll need an extremely dark site.

Astro trivia: If you'd told an 17th century astronomer that you had a one meter scope, he'd have wondered why it was so small. What has changed in the way telescopes are measured?

Last month's answer: The Mayas worshipped Venus and knew as much about it as a non-telescopic society can. This included the fact that Venus was both the morning and evening star; a fact which somehow eluded the Greek philosophers.

YOU KNOW YOU'RE AN ASTRONOMER IF ....
Submitted By Dave Scherping

- The mirror in your bathroom is made of Pyrex,
- You've purchased heat-rope,
- You've committed the Orion catalog to memory,
- 10% of your paycheck goes toward buying AA batteries,
- Your wife refers to your scope as "The Other Woman",
- Your scope IS the other woman,
- You use averted vision for every-day activities,
- You consider optical glass a turn-on,
- You thought the movie "Beetle Juice" was supposed to be an astronomy documentary
- You refer to your age as "main sequence",
- You paid $35 for a personalized license plate that only 2% of the population can understand,
- You get violent whenever someone refers to you as an "astrologer", uses "light-years" as a measure of time, or suggests that aliens live on Jupiter,
- You've been asked at least once, "When does the Age of Aquarius begin?"
- You can locate over 300 deep-sky objects by memory, but you get lost going to the grocery store,
- You get confused when looking at terrestrial maps because you forget that east is to the right and not to the left,
- You see potential telescope parts whenever you go to the junk yard or to the dump,
- You've actually estimated the apparent magnitude of a firefly,
- Your first word was "Zubenelgenubi",
- As a child, your favorite bedtime story was "Snow & the Seven White Dwarfs",
- Until you moved to Nebraska, you thought "Big Red" was Betelgeuse,
- You've always thought that "Red Light District" referred to the observing field at a major star party,
- Your eyeglasses are fully multi-coated with flip-down O-III filters,
- You get strange looks from people on the street when they see you holding out your arm with your fingers spread (they don't know you're trying to locate Venus in the daytime),
- You'd gladly pass up a good night's sleep to stand alone at the top of a ladder, in the dead of winter, and stare intensely at a faint gray oval-shaped thing you've seen 100 times before,
- You spent 10 hours and $5600 to take a picture you could have bought for $9.95,
- You would gladly spend $2500 and travel 3000 miles to witness a 3 minute solar eclipse,
- You would prefer a clear -20°F night over a partly cloudy 60°F night,
- You have your phone programmed to speed dial "Star Date" and/or S&T's "Sky Line",
- Your goal in life is to be the main poster on sci.astro.amateur,
- All of the lights in your house are red,
- Your house has a roll-off roof,
- Your car won't fit in the garage, because that's where you store your scope, and your scope's worth more than your car,
- The main criteria for the size of your new vehicle was the size of your scope,
- Some unknown vandal keeps shooting out the streetlight in front of your house,
- There is a picture of Edwin Hubble hanging on your wall,
- You know who Edwin Hubble was,
- You receive a Christmas card from Al Nagler each year,
- Your stress level correlates with the lunar cycle,
- You've always thought camera flashes and Mag-Lites were toys for cloudy nights,
- You've always thought that Vitamin "C" stood for "Caffeine" and "B" stood for "Bilberry",
- You drive a Saturn, your TV is a Quasar, you wear a Pulsar watch, and your favorite baseball team is the Houston Astros.

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 Members...$15/yr.; Family Memberships...$17/yr. Address all new memberships, renewals, or questions to THE PRAIRIE ASTRONOMY CLUB, INC., P.O. BOX 80553, LINCOLN, NE 68501. For other club information contact one of the following: President Dave Scherping (Lincoln) 477-2596, Treasurer John Bruce (Lincoln) 483-0389, Secretary Bryan Schaaf (Lincoln) 438-4285. All newsletter comments and articles should be sent to: Bryan Schaaf, 1309 W. PLUM, LINCOLN, NE 68522 (or E-mail to schaafb@aol.com) ten days prior to the club meeting. Club meetings are held the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, Nebraska.

MEETING ADJOURNED...

Secretary's Report by Bryan Schaaf

The August 27th PAC meeting at Hyde Memorial Observatory began at 7:40 P.M. There were three visitors and many club members present.

President Dave Scherping described "what's up". "This month is one of those rare months when it's possible to view all nine planets in one night - if you're ambitious. And Earth is pretty easy to see, of course". Mercury, Venus and Mars are all in the early morning sky in the east. Jupiter, Saturn, Uranus, Neptune and Pluto are all in the evening sky. The comets Hale-Bopp and Kopff are in constellations Ophiuchus and Sagittarius, respectively.

Saturn will be just two degrees from the Moon on September 26-27. What's so special about that? The Moon will be totally eclipsed that evening!

The first item of business was a review of the Nebraska Star Party last month. Dave Scherping asked that if anyone has any comments or ideas about NSP that would be interesting to others or could help enhance NSP '97, then please let him know about them.

Erik Hubl described the clarity of the sky during the week of NSP. "The views of Jupiter were astonishing... A highlight of NSP was the sight of the aurora pillar that appeared by the big dipper (Thursday morning)... Oh, the -4 magnitude meteor (Thursday morning at about 2:00 A.M.) was incredible, too."

There was discussion about the annual PAC picnic scheduled for September 14th behind Hyde Memorial Observatory.

The last Mahoney Star Party for the year will be (was) on September 20th. Did you bring yourself? Did you bring a telescope? Was the weather decent? I hope so. I hope so. I hope so.

In site news the Atlas Observing Site land is "optioned to sell" to 20th Century Castles in accordance with the "option to buy" agreement signed just before the July PAC meeting. Twelve months... eleven... ten... After a year the option expires and then...

We're presumably faced with maintaining the site on a regular basis as responsible owners do. Ron Veys stopped by the site recently while homeward-bound from a business trip. He said the site "looks good. The trash pile is still there. The house is the same - unfinished - and there's a barn put up behind the house - half done". Earl Moser checked with the realty company to find out that the asking price for the house is 200,000 dollars once it's completed. It doesn't appear that people will be residing there anytime soon.

The Treasurer's report *wasn't* as the Treasurer wasn't present at the meeting, but the NSP account is sufficient "enough to pay for travel expenses for speakers or whatever else next year at NSP4", Dave Scherping said.

"The club (13 inch Dobsonian) telescope was checked out during the early summer, but it is available to check out now", V.P. Dave Hamilton said. If you're interested, contact him at his office at Soap Notes Inc., 3140 O Street, 434-2900, hamilton@soapnotes.com . Besides standing for Vice President, V.P. also stands for "very polite". Dave *wants* to check the telescope out to you. Just call him! It's there for the borrowing.

There was extensive discussion about the *other* club telescope that is currently and temporarily kept in Tom Miller's barn until we decide what to do with it. Dave Scherping said he "has a vision of mounting it permanently somewhere, so that club members can use it for astrophotography". How about at the Atlas Site? Hmmm... How about converting it to a truss tube telescope? Hmmm... There were some ideas kicked around awhile, and then Dave Scherping proposed that we come up with a lot of ideas and viable options of what to do with the scope; a building for it?; project proposals; project costs, etc. There needs to be a committee to gather and decide these club telescope issues. The committee volunteers at the time of the meeting were: Dave Scherping, Ron Veys, Larry Hancock, Erik Hubl and (maybe) Liz Bergstrom. Are there any others? If so, contact Dave (477-2596) or Ron (486-1449).

Jack Dunn showed and described his 4.5 inch EXT telescope that he recently purchased and took along to NSP. It comes with a 26 mm plossl eyepiece (1 1/4 inch standard size). After describing the portability and versatile uses of the scope, he presented a new book called "Sky-watching" by David Levy. "It's a very good book", he said and he recommends it to anyone, especially beginners.

In the awards section of the agenda, Kelly Erlandson (since April, lost to San Mateo Astronomical Society in San Francisco, but is still a PAC member) has earned the Messier Award for observing and recording 84 Messier objects. Congratulations! By the way, most of her observations were accomplished in relatively short order with our very own 13 inch club telescope.

Larry Hancock has observed all 110 Messier objects, so he has acquired the Honorary Messier Award. Congratulations!

A updated membership list is slated for the October P.A. issue, so I urged everyone to examine the previous published list in the April issue and let me know of any corrections or changes. A few members let me know immediately and that's greatly appreciated!

I showed a collection of spheres - mostly Styrofoam balls - that are scaled to represent planets and moons of the solar system. The solar system model can be utilized on Saturday night public observing sessions at Hyde, particularly when the weather is too cloudy for telescope use in the observatory. The idea is that it can be used as a tool to explain astronomy concepts like day and night (rotation), moon phases, planet phases, occultations, eclipses, double stars, etc.

Mark Dahmke provided the program after the meeting adjourned at 8:30 P.M. He showed deepsky CCD ST7 images and NSP daytime video of people at the site - both of which he accumulated during NSP last month. He demonstrated "smoothing", X-ray and false coloring options as well as other image manipulations to bring out deep-sky details of such favorites as: M31, M33, M13, M8, M57, NGC 7331, NGC 6960 and Comet Hale-Bopp and others that I can't remember.

COMET TABUR Q1: NEW BRIGHT COMET!

Yes, that's right! There's another bright comet! It was discovered by Vello Tabur from Australia. Comet Tabur Q1 was estimated to be magnitude 10 when it was discovered by the shield of Orion (RA 4h 44m 30s, Dec 9o23.2') on August 19th. It's size was estimated to be 3 arc-minutes across; by Sept. 15th: 7.5 magnitude, 6 arc-minutes across. On Sept. 21st it will be (52 arc-minutes) near the 6th magnitude open star cluster NGC 2169, about 5 degrees north-northeast of Betelgeuse in Orion.

Size and brightness estimates vary, but Brian G. Marsden said it could be as bright as magnitude 6 by early October.

The closest approach to Earth will be on October 7th, at a distance of only 0.41 astronomical units.

October 13-15, it will be within the bowl of the big dipper, with the nucleus only 9 arc minutes from the rather dim 11.6 magnitude galaxy NGC 3998 (roughly between Delta and Gamma Ursa Majoris) on the morning of October 14th.

I'm excited about this comet, because it was discovered so recently and is already binocular brightness and well placed for viewing. Although it isn't expected to become much brighter than 5th magnitude, if that much, it will be a fun comet to follow with binoculars in the intervening time that we wait for Comet Hale-Bopp's spectacular appearance next Spring. I've been following it with 7x50 binoculars since September 17th.

WELCOME NEW MEMBER!

Luis Lopez, 402-477-8381
4301 N. 7th Street
Lincoln, NE 68521

The Prairie Astronomy Club

October 1996

S	M	T	W	T	F	S
Venus (mag. -4 0) is 0.5 deg. S of Regulus on morning of Oct. 4th. **Mercury** (mag. -0.9) is visible 2.4 deg. SSE of cresent moon on morning of Oct 11th. Use binoculars to see it! **Mars** is 1 deg. N of Regulus on the morning of Oct. 29th. **Jupiter** (mag. -2.2) is the brightest planet shining above the south horizen in the very early evening and sets before midnight. Because Jupiter is aligned in a 90 degree angle with the Sun and Earth this month, it is well positioned for observations of Galilean moon shadow transits. **Saturn** (mag. 0.6) shines 20 degrees above the eastern horizon an hour after sunset and is higher above the south horizon at midnight. *Clear skies!*		**1** **Moon passes 0.8 deg. N of Aldebaran 5 PM** **Jupiter at eastern quadrature**	**2**	**3** **Mercury greatest western elongation, 18 deg.** **Venus 0.2 deg. S of Regulus 7 PM** **Luna 3 launched, 1959**	**4** **LAST QUARTER MOON 7:04 AM** **Asteroid Juno at opposition, magnitude 7.5** **First satellite, Sputnik 1, launched, 1957**	**5** **Robert Goddard born, 1882** **Edwin Hubble identifies Cepheids in M31, 1923**
6 **Moon at apogee, 252,800 miles 12:54 PM**	**7** **Comet Tabur closest approach to Earth (0.41 AU), visible in morning** **Luna 3 returns first photos of lunar far side, 1959** **Moon passes Mars, dawn**	**8** **Galileo Spacecraft Orbital Trim Manuever # 12** **Moon passes Regulus, dawn**	**9** **Draconids Meteor Shower peaks** **Moon passes Venus, dawn**	**10** **Triton, moon of Neptune, discovered by William Lassell, 1846**	**11** **BEHLEN OPEN NIGHT** **First manned Apollo flight, Apollo 7 launched into Earth orbit, 1968**	**12** **STAR PARTY** **AT ATLAS SITE** ***(Come on out and look at Comets Tabur and Hale-Bopp)*** **NEW MOON 9:14 AM**
13 **Comet Tabur Q1 (discovered Aug. 19th) is within the bowl of the big dipper tonight through the 15th. Estimated mag. 5-6. Tomorrow: close to dim galaxy NGC 2169**	**14** **In the News, 1977: Pioneer 11 is nearing a position in space where a crucial decision must be made of whether to send it inside or outside Saturn's rings for 1979 encounter**	**15** **Comet Macholz 1 at perihelion** **In the news 1976: Salyut 5 space station docking mission, Soyuz 23 launched**	**16** **In the news 1976: Soyuz 23 fails to dock and prepares to return to Earth**	**17** **In the news 1976: A manned Soviet mission, Soyuz 23, ends with an unplanned water landing in Lake Tengiz (Kasakhstan) during a raging snow storm.**	**18** **Moon passes 6 deg. N. of Jupiter 11 AM**	**19** **FIRST QUARTER MOON 1:09 PM** **Moon passes 6 deg. N of Uranus 10 PM** DEADLINE FOR NEWSLETTER SUBMISSIONS
20 **Jupiter occults 9.1 magnitude star, SAO 187307**	**21** **Orionid Meteor Shower peaks, fast meteors, usually 20 per hour**	**22** **PAC MEETING 7:30** **PM AT HYDE MEM. OBS.** **Moon at perigee, 230,100 miles 3:46 AM** **Asteroid 1989 UQ near Earth flyby (0.1505 AU)**	**23** **Asteroid 4947 Ninkasi near Earth flyby (0.2131 AU)**	**24** **Moon passes 3 deg. N of Saturn 5 AM** **Umbriel & Ariel, moons of Uranus, discovered by William Lassell, 1851**	**25** **Iapetus, moon of Saturn, discovered by Giovanni Cassini, 1671** **Asteroid 4197 1982 TA near Earth flyby (0.0846 AU)**	**26** **FULL MOON 9:11 AM**
27  **Change backward one hour at 2 AM**	**28** **Mars passes 1.2 deg. N of Regulus 10 PM** **Comet Hale-Bopp 1/3 deg. W of globular cluster M14 in Ophiuchus**	**29** **Moon passes 0.9 deg. N of Aldebaran 2 AM** **Asteroid 1991 VE near Earth flyby (0.0853 AU)** **Comet IRAS at perihelion**	**30** **Venera 13, Soviet Venus Lander launched, 1981**	**31** **Scheduled launch of STS-80, Columbia Space Shuttle, Wake Shield Facility experiment**	**October 22nd:** **First recorded solar eclipse, 2136 BC** **Luna 12, Soviet Moon orbiter, launched 1966** **First photos returned from Venus' surface, Venera 9, 1975**	

Moving slowly northeastward **Comet Hale-Bopp** (5th mag..) is an easy binocular object this month in Ophiuchus and visible with the unaided eye from a dark site in the southwest sky. On October 18th Comet HB will be 27 degrees above and to the right of the Moon. It's tail will be pointed "up" and slightly to the left. Comet HB will disappear behind the Sun in December and reappear in February 1997 as a spectacular comet!

Questions & Answers

Conducted by AstroMan

Q: How are all of these astronomers able to locate the planets outside of our solar system? What techniques and technologies are they using and why the sudden influx in those being found?

A: There have been many *extra-solar planets* discovered in the past two decades utilizing many techniques and technologies; some theoretical and some confirmed recently. I'll list some chronological events about the search for extra-solar planets and describe some methods used.

In May 1983 a new feature was detected around a star called *Beta Pictoris*. From the data extracted from analysis of the star's infrared light, a disc of particle material was discovered to be orbiting around the star. It is thought by some that the disc is undergoing a process *(accretion)* of particle attractions and collisions to form *(coalesced)* larger bodies and ultimately form into a planetary system. No planets as yet have been directly observed or confirmed in the Beta Pictoris *accretion disc* or dozens of other known accretion discs.

Astronomers have been observing the eclipsing variable star *Epsilon Aurigae* and deriving it's variability by graphing it's *light curve* for many years. Two researchers tried many computer simulations in an effort to match the light curve that was recorded during an eclipse of the star from 1982-1984. Their best simulation that matches the light curve record was a tilted disc of material that was partially transparent and clear in the center region - very similar to what's called a *proto-planetary cloud*. Epsilon Aurigae is by some thought to be undergoing accretion, much like that of Beta Pictoris.

The first presumed extra-solar planet was discovered in May 1984 orbiting a faint star. The star is called Van Biesbroeck 8 or VB-8. The new planet was designated VB-8B and was estimated to be 30-80 times the mass of Jupiter , but only 9/10 the size. Such a star is sometimes called a *brown dwarf*, because it is far cooler (perhaps only 2000 degrees F.) than the coolest known stars called *red dwarfs*.

VB-8B was discovered by *speckle interferometry*, a technique of computer controlled flexing of telescope mirrors *(adaptive optics)* up to a 100 times per second and gathering many very-short-exposure images to compensate for the blurring effects of atmospheric turbulence of Earth. When the speckle image data is processed and combined electronically, astronomers have a clearer image to work with, from which they can extract valuable data. Too bad that improved interpretations of speckle interferometry in 1985 and 1986 discredit the existence of VB-8B - itself possibly a artifact of subtle atmospheric phenomena of Earth. The VB-8B effort did, however, encourage more brown dwarf researchers to look for them and there are many brown dwarf candidates being scrutinized now.

Astronomers have long utilized *spectroscopic* technology of dividing "white light" into it's component colors - like a rainbow - and analyzing the unique signature-like *spectral lines* (two major types: *absorption* and *emission lines*) nestled inside the rainbow colors that reveal the element and molecule compositions present in the stars and stellar material. The rainbow or *spectrum*, as it's called, with the spectral lines data is helpful to estimate stellar temperatures and categorize the many types of stars. The science of *spectroscopy* is the foundation on which all calculations of celestial distances and motions are built.

The method to detect stellar motion is the technique of measuring the Doppler effect by which the spectral lines are shifted along the color spectrum toward the red (indicating motion away from us) or blue (indicating motion toward us) parts of the spectrum. The concept of Doppler shift, referred to as *red shift* for the light counterpart, is similar to that of the high to low shift of pitch in sound heard from a passing car or train, for example.

Furthermore, redshift can reveal rotation of a star or stellar material by measuring a star's receding limb (edge) on one side and the approaching limb on the other side. By measuring these relative motions to and away from us, a rotation rate can be calculated.

A high resolution spectrograph aboard the Hubble Space Telescope was aimed at the Beta Pictoris accretion disc in January and February 1991 and it recorded ultraviolet absorption lines of ionized iron. Some of the lines were displaced or "redshifted" toward longer wavelengths which in the context of the experiment indicated that clumps of material are spiraling inward toward the star at a rate of about 50 kilometers per second. Although these clumps are too close and fast to last long enough to coalesced into planets, there was speculation that there are other bodies on the outer edge of the disc that have stable orbits. They would be larger than Jupiter-sized clumps to be seen with the HST wide field and planetary camera.

Revolution rates in a binary star system... or a star-planet system can be figured by measuring the relative "to" and "from" *(radial)* motions of the components. This method, in fact, is often used to detect unseen candidate planets or other objects by measuring the minuscule wobble motion of a star theoretically caused by influences of the companion.

Probably the most unusual example of evidence for a extra-solar planet was announced in July 1991. A team of astronomers reported they found evidence of a planet circling PSR 1829-10; a *pulsar* (a rapidly rotating star that emits a pulse of radiation once per rotation, similar to a lighthouse beacon). A unusual irregularity in the pulse period of the pulsar suggested that it is a binary pulsar system! On top of that irregularity was another with a period of EXACTLY SIX MONTHS that they surmised must be a orbiting planet.

Theorists tried to account for such a bizarre arrangement. However, at a meeting of the American Astronomical Society in January 1992, Andrew Lyne, a team member, apologetically retracted his discovery of the pulsar-planet. They hadn't adjusted their calculations to discard the revolution motion of ANOTHER planet - Earth! Once they corrected the embarrassing error, the evidence for the pulsar-planet "evaporated".

By coincidence two more researchers at the same meeting announced their own finding of at least two Earth-sized planets and possibly a third Moon-sized planet orbiting PSR 1257 + 12; another pulsar! Their findings were accomplished by noting the same kind of irregular pulses, and all three were confirmed in late 1993.

Just in the last year three more extra-solar planets of stars 51 Pegasi, 70 Virginis and 47 Ursa Majoris have been discovered and confirmed, by measurements of radial velocities.

As methods of extra-solar planet searches and their respective interpretations advance in the future, more planet candidates will be discredited or confirmed. We live in a time when astronomy is at a new threshold.

Questions about astronomy or PAC can be confidentially sent to AstroMan in care of Bryan Schaaf (see address and phone number at the bottom of page 2).

BEHLEN OBSERVATORY OPEN NIGHT

Behlen Observatory will be open the night of Friday, October 11th. The public is being told this starts at 8:00 P.M., but PAC members who would like to set up telescopes outside are welcome to come early to set up. The University people will probably be there from 7:00 or 7:30 P.M.

Last year we had "The Great 30-inch Shoot-out". I think the unanimous verdict was that Tom Miller's 30-inch 'scope won!

The observatory will be open even if the weather is bad. In this case there will be talks and slide-shows.

For more information call 472-3686 (mornings) or 472-4788 (afternoons).

- Martin Gaskell, gaskell@unlinfo.unl.edu

Dr. Cranium visits the Nebraska Star Party

by Dr. Richard Cranium as told to Steven and Susan Carroll

Strange rumblings, vague rumors, wild, unsubstantiated claims coming from deepest, darkest Nebraska, where it be said "the corn doth grow", have finally reached the attention of Dr. Richard Cranium, noted science popularizer at his nerve center, located in that nexus of learning and culture, St. Louis. Always striving to expand the envelope of knowledge, Dr. Cranium decides to investigate the bizarre rituals said to occur in that far-off, uncharted land. He mounts an expedition for the summer of 1996, expecting to reach the fabled Merritt Reservoir on or about the new moon of August. An account of what he found there follows:

DAY 1. After crossing the legendary Platte River and several of it's tributaries the expedition gradually leaves behind the cultivated lands of corn and bean and enters a land of grass covered sand dunes quite unlike anything Dr. C. has encountered before. Upon reaching the banks of a lovely, if languid stream, known to the inhabitants as the Niobrara River, Dr. C. finds a gathering of people from far and wide engaged, not in frenzied dance and blood ritual but rather, in the peaceful and civilized convention known as the "Star Party".

It turns out that, contrary to all reports, the peoples of Nebraska are as cultured, industrious, and technologically advanced as any other folk, anywhere. And so it is no surprise that their regional star party is the equal of any other and superior to most. As he makes camp and takes to his bunk on his first night in Nebraska, Dr. C. is pleased.

DAYS 2 through 6 are a blur to Dr. Cranium as he is virtually bombarded by the sights and sounds of the Nebraska Star Party. So excited does he become at the plethora of new experience that he loses his professional edge. He forgets the scientific method. He fails to record each minute detail for later study. However, among the events and personalities he can later recall are these:

* A high level of organization. Nicely scheduled and smoothly run, the staff do a great job.
* Dark skies; darkness and a steady atmosphere-the likes of which the doctor has rarely encountered in all his many travels.
* Lectures by learned speakers such as Vic Winter, Astronomical Society of Kansas City, "The Southern Skies Star Party", Dr. Bruce Twarog, Kansas State University, "Searching for Precious Metals: The hunt for the Galactic Missing Link", Dave Knisely, Prairie Astronomy Club, "Solar Observing", Brenda Culbertson, Northeast Kansas Amateur Astronomer's League, "Archeo-astronomy", Joel McCleary, U. of Nebraska and Sean O'Corrain, "The Nebraska Math-Science Initiative and Nebraska Science Odessey", and Dr. Richard Pirko, "Echoes from the Space Race" - a line-up that impresses even the renowned Dr. Cranium.

After seven days and nights of social activity, astronomical observation, and discovery, the expedition returns to St. Louis, exhausted, contented and overwhelmed by the events transpired.

Dr. Cranium is elated with his achievement in bringing the truth of these events to the rest of the world. This, along with his recent triumph of being the first human to officially interview an alien visitor to Earth, will surely add to his long list of credits. Dr. C. quickly points out, however, he seeks no fame for himself, but rather the broadening of mankind's knowledge.

PRAIRIE ASTRONOMY CLUB LIBRARY 9/96

BOOKS

Amateur Telescope Making / Scientific American / 1955
Ascent to Orbit: The Technical Writings of Arthur C. Clarke / Arthur C. Clarke / 1984
Astronomy and Telescopes / Robert J. Traister, Susan E. Harris / 1983
Astronomy: A Guide to the Stars and Planets / Iain Nicolson / 1983
Astronomy for Everybody / Simon Newcomb, Robert H. Baker Ph.D. / 1942
Astronomy Made Simple / Meir H. Degani / 1963
Astronomy Maps and Weather / C. C. Wylie / 1942
Beyond the Moon/Paolo Maffei / 1978
Black Holes and Warped Spacetime / William J. Kaufmann, III / 1979
Burnham's Celestial Handbook, Volume One / Robert Burnham, Jr. / 1978
Burnham's Celestial Handbook, Volume Two / Robert Burnham, Jr. / 1978
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Cambridge Atlas of Astronomy, The / J. Audouze, G. Israel / 1985
Carrying the Fire: An Astronaut's Journeys / Micheal Collins / 1975
Celestial Mechanics: A Computational Guide for the Practitioner / Laurence G. Taff / 1985
Comet / Carl Sagan, Ann Druyan / 1985
Coming of the Age of the Milky Way / Timothy Ferris / 1988
Cosmological Distance Ladder, The / Michael Rowan-Robinson / 1985
Design of the Universe: The Heavens and the Earth / Fritz Kahn / 1957
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Entering Space: An Astronauts Odyssey / Joseph P. Allen, Russell Martin / 1985
Exploration of the Universe / George Abell / 1969
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From Falling Bodies to Radio Waves / Classical Physicists and their Discoveries / Emilio Segre / 1984
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Guide to the Planets, A / Patrick Moore / 1954
Introduction to the Special Theory of Relativity, An / Robert Katz / 1964
Leslie Peltier's Guide to the Stars: Exploring the Sky with Binoculars / L. Peltier / 1986
Life in Space / Time-Life Books / 1983
Mars & the Mind of Man / Ray Bradbury, Arthur C. Clarke, Bruce Murray, Carl Sagan, W. Sullivan / 1973
Meteorites: Their Record of Early Solar System History / John T. Wasson / 1985
Mission to Mars: Plans and Concepts for the First Manned Landing / James E. Oberg / 1982
Monsters in the Sky / Paolo Maffei / 1976
Murmurs of Earth: The Voyager Interstellar Record / Carl Sagan, F. D. Drake, Ann Drunyan, Timothy Ferris, Jon Lomberg, Linda Salzman Sagan / 1978
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Pictorial Guide to the Moon / Dinsmore Alter / 1973
Report of the Presidential Commission on the Space Shuttle Challenger Accident / 1986
Skyguide: A Field Guide for Amateur Astronomers / Mark R. Chartrand III, Helmut K. Wimmer / 1982
Skyshooting-Photography For Amateur Astronomers / R. Newton Mayall, Margaret W. Mayall / 1968
Space Shuttle Operator's Manual, The / Kerry Joels, Gregory Kennedy, David Larkin / 1982
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Starwatch / Ben Mayer / 1984
Story of the Starry Universe, The / David Todd, Donald H. Menzel / 1941
Telescopes and Observatories / Science Service / 1970
Time for the Stars / Robert A. Heinlein / 1956 / Sci Fi
To The Ends of the Universe / Isaac Asimov / 1967
Universe, The / David Bergamini and The Editors of LIFE / 1966
Webb Society Deep-Sky Observer's Handbook, Volume 1, Double Stars / Webb Society / 1986

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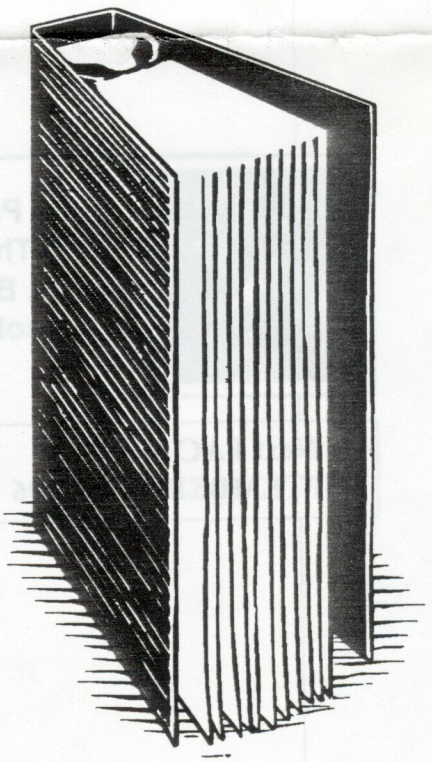

MAGAZINES

Sky & Telescope magazine issues: August 1982-July 1984, November 1984-October 1987, December 1987-December 1993
Final Frontier magazine bi-monthly issues: April 1988-February 1991

PICTURES & POSTCARDS

Voyagers at Saturn-Astronomy Postcards / Hansen Planetarium, JPL
Astronomy Day at Ralph Mueller Planetarium-Snap shots / Jim Atkins / April 27, 1996

FOR SALE:

An assortment of 1 1/4 inch standard eyepieces are for sale. The sizes are: 40 mm, 26mm, 17mm, 15mm, 10 mm and 7.5mm. If interested, please contact Larry Hancock at 421-2827.

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