a degree west of Tau Sculptoris for NGC 613. Visible in a four inch, this galaxy shows a faint bar of light across the small nucleus when viewed in an eight inch, with a ten inch making the bar obvious. On a good night, some additional detail on the ends of the bar is visible in ten inch and larger apertures.

In Cetus is the faint but interesting planetary nebula, NGC 246, located 1.25 degrees south and 3/4 degree east of Psi 1 Ceti. A p73 six inch will show it as a very faint diffuse fuzzy patch with a few faint stars inside, but again, the Lumicon UHC and OIII filters will help enhance the view tremendously. In a ten inch with the OIII filter, the nebula is obvious, with the interior taking on a scalloped look. If you want something easier, try the bright spiral galaxy M77, located one degree east and a half south of Delta Ceti. This Seyfert galaxy is notable for its bright star-like nucleus which is very apparent in a six inch, although the galaxy itself is visible in a 2.4 inch aperture. An eight inch will sometimes hint at some faint outer detail, while a ten inch at moderate power will occasionally show hints of the spiral structure.

The Prairie Astronomer
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Next Meeting October 30, 1990

Volume 31 #10
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THE Prairie Astronomer

1991 Club Election at October Meeting

by Ron Debus

Election time is here again and this year time has caught up with me. So, I'll be stepping down as President. I've really enjoyed being a club officer the past three years and I certainly feel I'll be there in one of the offices again.

Nominations made at the September meeting for 1991 PAC officers are as follows:

President	**Dave Knisely** **Erik Hubble**
Vice President	**Doc Manthey** **Steve Bornemier** **Mark Fairchild** **Cedric Gibb**
Treasurer	**Lee Thomas**
Secretary	**Mark Fairchild** **Ron Veys**
2nd Vice President	**Jack Dunn** **Mark Fairchild** **Erik Hubble**

These people running for office need our votes, so I hope we can have a good turnout for this election. Also, Doc's 'Dollar Prize' is up to $2 this month.

P.S. Remember, be there or you may get elected!!! It's happened before. Thanks for listening, I'm Ron Debus.

A Note From Lee...

Sky and Telescope has announced a rate increase. (When they--or anybody, for that matter--announces a rate decrease, I will know that, truly, The End Is At Hand.)

As of January 1, 1991, we must pay Sky and Telescope $18 per club subscription, up $2.00 from the present rate.

This will undoubtedly trigger a Club dues increase effective January 1. As Treasurer, I propose that regular memberships increase from the present $24 to $26, and family membership increase from $27 to $29. Newsletter subscriptions which are not memberships, and carry no membership privileges would remain at $10.

Unlike many politicians who, when running for re-election, dodge the bullet and avoid raising taxes until safely re-elected, your treasurer is running on a platform of fiscal responsibility. Risking political suicide, he will present this dues increase at the next meeting...the very meeting when the election is to be held! Talk about guts! (Talk about stupidity!)

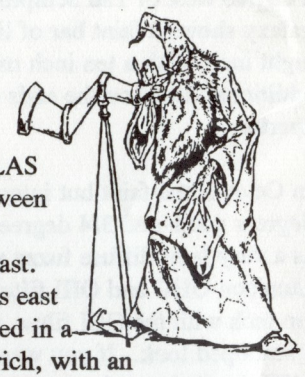
One thing is important to note: Since Sky and Tel is accepting renewals at the old rate until the end of the year, anyone contemplating joining the club, or who receives renewal notice from Sky Publishing through December should hustle their dues in to me quickly to get renewed at the old rate. (Please note: This applies only if your club membership doesn't come up for renewal until well into 1991, i.e., if you don't have a renewal notice in hand, you cannot take advantage of this offer. In short, you can't extend your membership beyond a one-year term to save $2.)

RASC Handbook Order must be placed after this month's meeting to get low rates and assure delivery. (Canada has passed a 7% Federal Sales Tax that goes into effect January 1, 1991, considerably raising the price of the books.) If we can order 10 or more, we can get them for $9.50 each. Retail price, if you

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc., and is free to all club members. Membership status and expiration date are listed on the mailing label. Membership dues are: Junior Members and Newsletter Only Subscribers...$10/yr; Regular Members...$24/yr; Family Memberships...$27/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 officers: Ron Debus (Pres)435-5688, Dave Knisely (V.Pres)223-3968, Kim Ellen Owen (Sec)423-7440, Lee Thomas(Tres)483-5639, Jack Dunn (2nd V. Pres)475-3013. All newsletter comments and articles should be sent to Newsletter Editor JOHN LORTZ, 12023 PARKER PLZ #105, OMAHA, NE 68154 no later than 7 days before monthly club meetings. Club meetings are held the last Tuesday of each month at Hyde Observatory in Lincoln,

Observing Chairman's Report

by Dave Knisely



THE NEXT SCHEDULED STAR PARTIES WILL BE ON NOVEMBER 9TH AND 16TH AT THE ATLAS SITE. Autumn skies offer the interesting contrast between galactic and extragalactic objects. Cassiopeia offers a number of interesting targets for the Deep-Sky enthusiast. NGC 663 is a fine open star cluster located 2.5 degrees east and one north of Delta Cassiopeiae, and can be observed in a four inch. It is moderate to large in size, and is very rich, with an eight inch revealing as many as 70 stars in the group. The stars are distributed in several dense sub-groups, making the system look like a cluster of clusters. A more challenging object is NGC 281, a faint diffuse nebula located 1.5 degrees east of Alpha Cassiopeiae. It is barely visible in a four inch as a moderate sized diffuse area of haze associated with a few stars. Larger instruments make the nebula a bit easier to see, but it shows little detail until you use the Lumicon UHC or OIII filters. With a 10 inch equipped with filters, much faint dark detail is visible. The nebula bears some resemblance to M16, except that it is more round. NGC 281 is situated in a fair star field, so the entire area bears sweeping.

In Pisces is one of the most difficult Messier objects, M74, located about 1.4 degrees east and a half north of Eta Piscium. This face-on spiral galaxy shows up as a small faint fuzzy spot of light with a brighter center when viewed in small to moderate sized instruments. Even large telescope users have difficulty seeing much detail in this galaxy. A ten inch will sometimes make the outer haze look a bit irregular in spots, while a 17 inch will reveal hints of the spiral structure.

Sculptor and Cetus offer a few easier galaxies for your viewing pleasure. The brightest one is NGC 253, a tilted dusty spiral located four degrees north and two west of Alpha Sculptoris. This galaxy can be seen in even a small pair of binoculars as a small faint fuzzy streak located south of a faint asterism which looks like a tall letter "Z". A six inch will show the brighter center and some hints of mottling in the outer haze, while a ten inch will reveal several faint star clouds and much patchiness over the entire galaxy. This is one deep-sky object which stands up to high power well. Recently, I used over 200x in a ten inch on the galaxy, and was surprised just how much detail was visible. Nearby is the often overlooked globular star cluster, NGC 288, located three degrees north and one west of Alpha. Although visible in a four inch, this cluster does not show stars well in moderate apertures. An eight inch will resolve the margins will, while a ten will nearly completely resolve it into a moderate sized ball of several thousand faint stars. This cluster is very compressed near the center and would probably be better known if it wasn't so far south. For those of you who would like to see an example of a barred spiral galaxy, look half a degree north and half

If the spot originated at Saturn's surface, the most probable cause would be some seasonal "weather"-type event associated with summer in Saturn's northern hemisphere. Given the speed and strength of the winds observed at Saturn by the Voyager spacecraft, a disturbance there might aptly be described as a "hurricane". The strongest argument for this origin is the association of the spots with mid-summer in Saturn's northern hemisphere. However, the behavior of sudden appearance, rapid growth, spreading, and fading of the white spot is not the behavior of typical Earth hurricanes. Moreover, to change rotation period the spot would have to move in latitude. The amount of period change would require a latitude motion of 10 degrees in a day, which is apparently much greater than what the observations suggest. One might have expected that, if the spot were a "weather" phenomenon, changes in the north equatorial belt might have preceded the spot's appearance, rather than follow it. Subjective probability for this origin: 20%.

The disturbance in Saturn's clouds which we see as a growing white spot might be the result of the impact of some mass on Saturn. A comet or minor planet of appreciable diameter would surely create quite a disturbance as it disintegrated and exploded in Saturn's atmosphere. We can imagine that such an external mass might come from the decay of material from Saturn's rings, or from outside the Saturn system. If it were ring material, the spots would all seem to originate right on the equator of the planet, contrary to observations. Moreover, ring particles are known to be of small enough size that the impact of one or a few of them would be inconsequential. And no particular periodicity would be expected for such decays. So we consider instead that the orbit of some meteor stream, perhaps from a disintegrated comet or minor planet, intersects Saturn's orbit in the direction from the Sun where most spots seem to appear. The physical behavior of the spots, spreading outward from a focus, is suggestive of such an impact-caused sudden disturbance. Moreover, the intervals between spot appearances is rather more regular than one might have expected from any cause on or within the planet. Especially, the 1876, 1933, and 1990 appearances of equatorial spots are at closely 57-year intervals, as are the 1903 and 1960 high-latitude spots, although the two series are offset from each other by three years. But the probability of collision events is very small indeed. And even if there were, by fortuitous coincidence, just such a well-populated meteor stream, we would expect sometimes no impacts, and sometimes two or more, during that part of each Saturn year when the planet passes through the stream. Moreover, the distribution in latitude of the impacts on Saturn would probably be more random than has been seen. Subjective probability for this origin: 10%.

The spots might be some sort of eruptive phenomenon, result p73 ing from a cause deep within the planet. Both the solar heating-cooling cycle and the ring-shadow cycle of 29.5 years are close to the average interval between spot appearances. Perhaps the alternation of high and low latitude spots in alternate Saturn summers is due to some reversing phenomenon, much like the reversal in magnetic polarity with each new sunspot cycle. Moreover, although the cloud thickness prevents us from seeing into Saturn's interior, a cause of disturbance which was rising within Saturn's atmosphere could certainly exhibit the slowing in rotation period which was seen for the 1990 spot. The white spot may then not be the disturbance itself, but simply the visible manifestation in the clouds resulting from a rising column of heat from deeper in the interior of the planet: an "eruption" event of sorts. The strongest argument against this origin is the presumed uniformity of the planet's interior, due to extensive mixing of the gases which comprise the planet. And the periodicity of spot appearances is more regular than one might expect for eruptive phenomena. However, Saturn's atmosphere does have visible bands which persist for at least centuries, so mixing of all ingredients in Saturn is obviously not complete. And it seems entirely possible that comets and asteroids absorbed by the planet long ago in collisions might nonetheless maintain enough physical cohesion in some of their fragments that significant bits of such bodies may float deep within the planet, where the density of the planet's gases reaches the density of a typical comet or minor planet. Subjective probability for this origin: 70%.

In conclusion, Saturn's intriguing white spot may be an impact, weather, or eruptive phenomenon, originating from outside, on, or within the planet. Available evidence is not conclusive, but suggests an eruptive origin from within the planets interior is most likely.

Letters To The Editor...

EDITORS NOTE: I received two letters this month that I'd like to share. One was from Kevin Koutnik, one of our newer club members, and the other was from Lee Thomas, who told me that Kevin had written him also. Both were refreshing insights into astronomy that I think most of us take for granted. Lee makes this comment about Kevins writings at the beginning of his letter... "What I found interesting in all this is the exuberant enthusiasm of somebody who has just found the sky and is discovering something new every time he looks up." I think after you read both letters you'll agree, and probably remember those first nights when you held a crude single-paged star chart, raised your eyes to the sky, and opened your ears to the surrounding sound of nature...

Dear John

I received The Prairie Astronomer, my first, in the mail a couple of days ago. I was anxiously awaiting this publication. I won't say that I was disappointed, because i wasn't, although I think it was a little "thin". [I agree Kevin, and starting with this issue I'll be attempting to thicken things a bit! ED.]

The one thing that I liked most about the letter was the "Observing Chairman's Report". It seems to be packed with quite a bit of information and will ready many more than casual observers with plenty of projects for a months period of viewing.

I'm really enthused about the hobby of astronomy, having acquired the interest less than a couple months ago. I decided to get a good pair of binoculars first, use them for about a year, and then invest in a good 8" or 11" Celestron, or Meade, Schmidt-Cassegrain. But until then, I have to be content with the "goggles."

And Content I've been, with five good nights of observing under my Belt. Before i got my "bi's" I familiarized myself with the constellations for about a month. That took quite a bit of time. But it paid off. When the "bi's" came I was ready to star-search.

I've maintained a diary of sorts, logging all of my viewing, both before it was aided with binoculars, and after. I'd recommend that practice to anyone who looks at the skies less than half the time that I spend looking. A well kept log with adequate comments attributed to each entry makes future observing easier to plan. It also confirms many of the observations you've made, not having to think back to where and when you saw some particular subject. Changes do take place in the skies, and the only way one can be sure that he or she doesn't miss them is to log every sighting, noting time, position, and other pertinent data.

Of course, I'm getting so into the hobby that I comment not only on the stars that I see but also the environmental changes, etc., that I experience during the evening, right down to the "coon chatters', "beaver paddlings", and curious and suspicious deer which will, I learned on my first dark-sky night 10 miles west of Columbus along the river, walk right up to within about 20 feet and stand there watching what you're doing. I really didn't know that it was there, but when I went to relieve myself after some 3 hours of steady gazing, the sound of my water on the sandy bank of the Platte River startled the deer. It leaped off the bank near where I was standing, down into the water with a great splash, and I heard two great hove steps at least 20 feet apart on the opposite bank before i couldn't hear anything. The opposite side of the river was far enough away that I couldn't have heard the crashing through the trees without really listening hard. I did that, of course, but the coons started to chatter up a storm and i couldn't make anything but them out. I really must have given all of those animals something to think about for the rest of the night. It sure put some dent into the sky for me.

It's things like that, along with the actual "getting down" with the stellar objects, that "makes" a night of star gazing "tops" in my book.

If you think that you can use this in the newsletter, please do. I think that even binocular viewing is a fascinating portion of astronomy, and I plan to glean

my "bi's" for every ounce of vision that it will give me. I've picked out a few Messier objects already. Of course, it's not the quality "seeing" that can be obtained through a telescope, but these objects do distinguish themselves (the brighter ones), and make a night of viewing through them pure pleasure. My 11x80 Celestrons work real good in a football game too. I saw Columbus lose their game with Kearney, unfortunately, but they do give a fantastic rendition of the game, resting conspicuously on the necessary tripod, eagerly capturing every ball handling maneuver like you were right on top of it. I'm having a ball.

Sincerely, Kevin Koutnik

John:

.... It [Kevin's letter to Lee] takes me back to 1973 when I got my telescope. We "old timers" get awfully jaded. We get lost in our Ultimate-2000 3-D star maps and our bookshelves loaded with the latest offerings of Astronomy Book Club (understandable to Stephen Hawking and, perhaps several hundred graduate student in physics, never actually read by us, but certainly impressive to the occasional visitor who wanders into the Library). We revel in our computer circuits and the exotica of ever more refined methods of viewing: CCD's, hydrogen alpha filters, Dobsonian-Newtonian-Plutonian hybrid optical systems with Galactico-Equatorial Mounts and gamma-ray illuminated setting circles refined by computer-controlled guidance systems upon which w have mounted the latest cold camera containing exotically-hypered film, which we develop in our personal laboratories equipped with the latest advances in photographic science. Somewhere in all the complex p73 ity, we lose sight of the sky. We lose our innocence. We become sophisticated. And bored (not to mention a bit boring). And the last thing that can be said about the sky itself, is that it is boring.

Kevin's letter got me out to Atlas Site with just a pair of binoculars and a folding lounge chair. I already had both of those, so no capital expenditure was involved. A couple of bucks worth of gasoline (the only variable over which somebody else, in this case Saddam Hussein, has control) got me to and from the show. And, it was a spectacular show! A Whole galaxy stretched from horizon to horizon--the widest wide screen imaginable. I had stereo--crickets, a few unidentifiable amphibians, and wind rustling in the trees plus occasional authentic coyote sound effects. (For short-term thrills, I could hear occasional snufflings of Unknowable Creatures wandering in the underbrush. There's nothing like shining your flashlight into a pair of beady eyes glinting in the darkness to fire a quick adrenalin charge. I defy anyone to get that kind of high from an Arnold Schwarzenegger movie!)

I didn't have to stand in line, suffer the indignities of stoic ticket sellers, indifferent concession stand attendants, sticky floors, gooey seats, rude clods who talk through the whole show, or out-of-focus picture (I got to adjust it myself!). No human being in this show got blown away in a splatter of blood; four-letter words did not appear on the "soundtrack" every-other-second, and the story, which dealt with such profound questions as "How was all this created?" and "Where is it going?" and "What does it all mean?" did not include the ruttings and gruntings of actors in various simulations of procreative activity, rated X or NC-17 or even R. Best of all, when it was over, and the lights (dawn) slowly came up, I left feeling really great.

Perhaps as a retiring film critic (after 22 years), my perspective is slightly different from most people. But, I can tell you that the best show is free. Laugh at jack Horkheimer's vaudevillian approach to bringing the public into the tent, if you will, but he's right: All you have to do is look up!

Lee Thomas

order your own, is $13.50 ($14.45 after December 31.)

I presently have orders from only 5 people, so we need a minimum of 5 more. Also, those who have ordered should bring their $9.50 to the meeting, or put it in the mail so I can get the order off.

What is Saturn's White Spot?

by Tom Van Flandern

1) Observations

In attempting to determine the cause and nature of the large, bright, new white spot which suddenly appeared on Saturn on September 25, 1990, the first step is to gather together all relevant facts. I appreciate the help of Alan MacRobert and Steve O'Meara of Sky & Telescope magazine for sharing much of the observational data they have collected.

The appearance of the new white spot on Saturn was predicted last year in Sky & Telescope, based on the regularity of appearance of four previous large white spots. These were first seen on December 7, 1876; June 15, 1903; August 3, 1933; and March 31, 1960. In each case the spot remained visible for a few months. Those spots slowly faded away as they gradually spread out in longitude.

All five large white spots which we know about have appeared in Saturn's northern hemisphere. The 1876, 1933, and 1990 spots were near the equator. The present (1990) spot resides near the south edge of the north equatorial belt, and seems to be affecting the appearance of the belt: to the west, the belt is very dark and active; to the east, it has narrowed and faded considerably. The 1903 spot appeared at about 45 degrees north latitude. The 1960 spot appeared at about 60 degrees north latitude. To judge by the reports, the overall appearance of each of these spots is rather similar.

Spots have been seen earlier in history, but dates and details are not readily available. For the five appearances of known date, Saturn has been in the southern zodiacal stars, near the constellation of Capricornus on each occasion. The period of Saturn around the Sun, hence the length of Saturn's year, is 29.5 Earth-years, which roughly agrees with the average interval between major white spot appearances.

Lavega and Battenar pointed out that when Saturn is in the part of its orbit where the spots appear, it is mid-summer for Saturn's northern hemisphere. In other words solar heating, though only 1% of what it is for the Earth, is at its greatest.

At first, the 1990 spot had a period of rotation of about
10 hours and 16 minutes, plus or minus one minute. (Since Saturn is not solid, different parts of it rotate at slightly different speeds.) Within less than a day the spot had grown 20% in diameter, and rotated with a period of 10 hours and 23 minutes. The spot diameter is about one-fifth of Saturn's diameter.

2) Analysis

The white spot is the visible manifestation of some sort of change or disturbance in the clouds surrounding Saturn. (The planet is a gaseous giant with no solid or liquid surface, at least to great depths.) The cause of the change or disturbance might have originated where we see it, at Saturn's visible outer surface. Or it might have originated from deeper within Saturn; or from something outside of Saturn.