

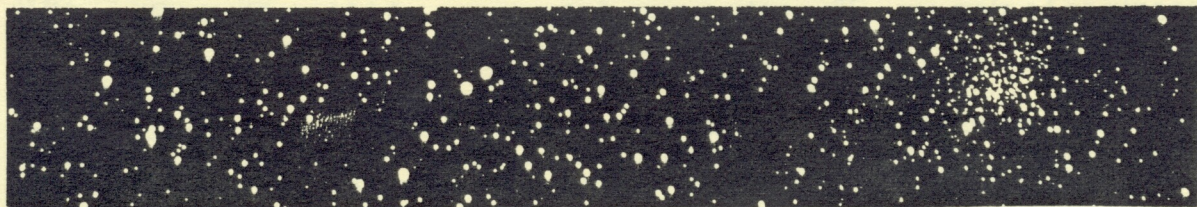


Annual Star Party and Picnic Saturday, August 22nd

The Prairie Astronomy Club's Annual Star Party and Picnic will be held this Saturday, August 22nd. The festivities will begin about 5 p.m. at Hyde Observatory where club members and guests will meet to visit and solve as many world problems as possible. At 6 p.m. the pot-luck supper will begin with the PAC providing beverages. Be sure to bring your own eating utensils!

At about 8 p.m. a caravan will be formed and everyone will trek down to the new Atlas Observing Site to try out the new-found skies. Be sure to bring your observing tools, as well as lots of bug-spray to keep the critters off. The cooler of pop will follow the group to the site so there will be lots to drink!

This year's event should be one of the best, so be sure to leave the evening open on your calendar. See you at the observatory!



A Note From the Treasurer...

Norma would like to let all those who subscribe to either Astronomy Magazine, Deep Sky Magazine, or Telescope Making Magazine know that renewals are due by the September meeting. We need at least 5 subscriptions for each of the above to qualify for the discount prices. Listed below are those who are currently subscribers:

ASTRONOMY MAG	DEEP SKY MAG	TELESCOPE MAKING
Del Motycka	John Lortz	Andy Corkill
Rick Johnson	Ron Veys	John Lortz
Ron Veys	Dave Knesely	Dan Neville
Roger Grant	Russ Alberts	Rick Lapp
Lee Thomas	Rick Johnson	Russ Genzmer
Diane Casey	Lee Thomas	Ron Veys
John Lortz	Russ Genzmer	John Johnson
Allen Thompson		Russ Alberts
Norma Coufal		
Dan Neville		
Russ Alberts		

This is also a good time for anyone who does not now subscribe to these magazines to sign-up. The rates are: Astronomy - \$14/yr; Deep Sky - \$7/yr; and Telescope Making - \$7/yr.

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc., and is free to all club members. Membership status and expiration date is listed on the mailing label. Membership dues are: Junior Members and Newsletter Only Subscribers... \$8/yr; Regular Members... \$22/yr; Family Membership... \$25/yr. Address all membership 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: Lee Thomas (Pres) 483-5639, David Knisely (V.Pres) 1-223-3968, John Lortz (Sec) 1-390-9821, Norma Coufal (Tres) 483-5685, Dan Neville (2nd V.Pres) 476-7772. All newsletter comments and articles should be sent to Newsletter Editor JOHN LORTZ, 9255 CADY AVE #14, OMAHA, NE 68134 no later than 6 days before monthly club meetings. Club meetings are held the last tuesday of each month.

Observing Chairmans Report

by David Knisely

There are two star parties scheduled in September. The first is on the 18th and the second is a public star party scheduled on the 25th. I would like everyone with ANY size telescope (even just a pair of binoculars) to be at the Atlas Observing Site the night of September 25th by 7:30 p.m. so we can show the public and our neighbors just what amateur astronomy is all about.

The early fall sky offers the best variety of objects of the year, ranging from the rich open clusters of the northern Milky Way to the Great Andromeda and Triangulum galaxies. Start your search with the so-called "Garnet Star", Mu Cephei. This is one of the reddest stars known and is presently near its brightest. It is especially red in binoculars and small telescopes. For you galaxy lovers, the nearly face-on spiral NGC 6946 should fill the bill. Located about 1.75 degrees south and 1.5 degrees west of Eta Cephei, the galaxy is visible in a four inch as a moderate sized diffuse oval patch of light with a brighter middle. An eight or ten inch will begin to show some vague patches of light in the outer haze. My ten inch makes it look a bit like M33 does in a six inch rich-field telescope.

Nearby is the small open cluster NGC 6939, located about a degree south and 1.75 degrees west of Eta. It is rather compact and its faint stars are arranged in several rows, making it look like a set of stadium lights. It should be easy in a six inch under good conditions.

In Cygnus is the elusive Veil Nebula, which has several NGC numbers depending on which part of the supernova remnant you are referring to. One section goes right through 51 Cygni and should be



visible in an eight inch as a faint wispy streak of light. The other major section is a long arc of gas located about two degrees east and a half north of 52. I have seen the arc in a pair of 10x50 binoculars, but it is very faint. This object is best seen in a large telescope equipped with a Lumicon UHC nebular filter. My ten inch with the filter makes the Veil look like a ghostly curved spider web.

In Vulpecula is the large open cluster NGC 6940. It can be found about two degrees south and one east of 41 Cygni. Its large size and richness makes it an ideal target for those with binoculars or rich-field telescopes. The open cluster NGC 6885 is better seen in at least a four inch. It can be found near the stars 18, 19, and 20 Vulpeculae, and is rich in stars. Those of you who like planetary nebula should look at M27, the "Dumbell" nebula, located about three degrees due north of Gamma Sagittae. It appears as a small fuzzy spot of light in binoculars, with a three or four inch instrument showing the dumbbell form. Larger telescopes will show some faint out detail as well as the faint central star.

A nice binocular cluster can be found about eight degrees south and one west of Alberio (Beta Cygni). This group known as "The Coat Hanger" consists of about 12 to 15 stars arranged over a two degree area and does look like its name. Those of you with six inch and larger apertures may want to look near the east end of the line of stars in the cluster for the faint open cluster NGC 6802. At low power, it looks like an edge-on galaxy, but high magnification reveals several small groups of very faint stars arranged in a line.

At the Last Meeting

The July 28th meeting started at 7:35 p.m. with 24 members and 3 visitors present. Lee began the meeting by showing the membership the actual title to the new land. It had been about 22 months since the entire plan had gotten off the ground.

Ron Veys reported that the shaft would be covered over with dirt and that we would cement it over in September sometime. What about restrooms at the site? An out-house would probably work the best.

Keys to the site gate are \$15 per year.

Those that attended the Midstates Convention reported that the Powell Observatory is quite impressive, but that our new site was better as far as dark skies and the hard surfaced access road. We have a goldmine to work with, let's take full advantage of it!

The Annual Star Party and Picnic will be held on Saturday, August 22nd. The picnic itself will begin about 5 p.m. at Hyde Observatory, and then about 8 p.m. the group will move out to the Atlas Site for a night of observing. The picnic is pot-luck with beverages provided by the club.

Steve Myatt was in town and showed the members some pictures of the big scope in Tucson. The evening's program was presented by Jack Dunn and concerned the recent visit by the "Star Hustler" himself!

Einstein's Gravitational Redshift Measured to Within One Percent

From Computer's Astro Forum

According to Einstein's General Theory of Relativity, gravity is the

geometric curvature produced by concentrations of mass and energy in the spacetime "fabric" of the universe, and should produce certain observable effects not covered by Newtonian physics. Einstein in 1911 predicted that light from the Sun is redshifted -- that is, its wavelengths shifted toward the longer, redder end of the spectrum -- as seen from Earth. His theory holds that the "gravitational redshift" should be about two parts per million, or about one one-hundredth Angstrom (an Angstrom is a ten billionth of a meter). This is often expressed by astronomers not as a shift in wavelength, but as equivalent velocity -- the speed at which the Sun would have to be receding from us to produce a Doppler shift equivalent to that fractional Angstrom of wavelength, or 636 meters per second. However, since the solar atmosphere is full of many kinds of motion, all producing Doppler shifts of varying magnitudes, it has been very difficult to isolate the gravitational redshift with great accuracy. Until recently, a measurement to within five percent of the predicted value was as close as astronomers had come.

In their paper, two astronomers working at the National Optical Astronomy Observatories (NOAO) in Tucson report measuring the Einstein gravitational redshift to within one percent. Drs. James C. Lopresto, of Edinboro University of Pennsylvania, and Keith Pierce of NOAO's National Solar Observatory, report results from the latest set of measurements made at 7772 Angstroms, on the triplet of oxygen lines in the near-infrared solar spectrum.

These measurements are part of a continuing series undertaken to obtain more precise measurements of the gravitational redshift. Their technique involves studying the redshifts of strong Fraunhofer lines -- dark absorption lines in the solar spectrum -- produced by elements high in the chromosphere, or atmosphere, above the confusing tangle of motions closer to the Sun's surface, or photosphere.

Previous work had measured the gravitational redshift at various other wavelengths to within five percentage points. The present set of measurements, taken from the center to the limb, or

edge, of the Sun, showed a gravitational redshift of 636 meters per second, plus or minus one percent, as theory predicts.

Time-line for Atlas Site Set

The PAC Board of Directors held a meeting to discuss the possibilities ahead for the Atlas Observing Site. From the meeting a general time-line was set up, with an eye toward the priorities and when they needed to be done. Here's what the board came up with...

August - Seed ground for cover

August 22nd -- check site out at star party

August 29th -- make form for cement pad

-- dig hole for out-house

(Meet at 9 a.m.)

Sept 12th -- pour cement for pad

- work on out-house

(Meet at 9 a.m.)

Sept 25th -- open house for Firth

Note that on the 29th and the 12th we

will be meeting at 9 a.m. to work for a few hours at the site. Please try to keep those two saturday mornings open on your calendar. We need lots of warm bodies to get the work done!

Sky & Telescope News

On August 11th William Bradfield of Australia bagged his 13th comet - 1987s. Enough precision observations have now been gathered for Dan Green of the Center for Astrophysics to calculate its orbit (IAU Circular 4434). The preliminary parabolic orbit is:

T = 1987 Nov. 4.16 ET
q = 0.8477 AU
Peri = 73.38 degrees)
Node = 269.00 ") 1950.0
i = 32.54 ")
e = 1

Predicted 1950 positions are:

		R.A.	Dec.	Mag.
Aug. 13	14h 12.21m	-22d 57'.6	8.6	
	18 14 18.99	21 44.8		
	23 14 26.54	20 34.5	8.2	
	28 14 34.82	19 25.7		
Sept. 2	14 43.85	18 17.8	7.8	
	7 14 53.60	17 09.7		
	12 15 04.08	16 00.4	7.3	

Comet Bradfield is an evening-sky object, though very low in the south for most of us, and currently about magnitude 9.

THE REVIEWER

BY David Knisely

INTRODUCTORY ASTRONOMY AND ASTROPHYSICS

2nd Edition, by Michael Zelnik and Elske Smith

1987 Sauders College Publishing

Some advanced amateur astronomers and students of the science sometimes reach the point where they can't find a book that bridges the gap between simple introductory texts and the advanced college works that are simply too technical to read easily. A few years ago, I found just such a book when I took my first astronomy course in college, namely INTRODUCTORY ASTRONOMY AND ASTROPHYSICS. Now, a new edition is available that improves greatly on the old one (I wore out my first edition copy!)

First, I must state that this book is NOT for the average amateur, although there is some useful material in it for those interested in the technical aspects of astronomy. The work is intended as a text book for undergraduate majors in astronomy or physics, and as such requires at least some knowledge of calculus and advanced algebra, along with first year college physics in order to be completely understood. The first third of the book concerns the solar system excluding the sun, while the last two thirds deal with the sun and the rest of the universe. The reading is typical college level and can seem dry at times, but if you need to know something technical, this book is a good place to find it. The section on the solar system has been completely re-organized and updated with findings from space probes such as Viking and Voyager. Interestingly enough, the subjects of planetary moons, rings, asteroids, comets, and meteoroids are dealt with in a separate chapter instead of cramming them in with each of the sections on the various planets. The early chapters cover the basic Newtonian mechanics of orbital motion. The solar system coverage includes many photographs and diagrams based on spacecraft data all the way out to Uranus.

The second part of the book starts out with a fairly detailed review of electromagnetic radiation and matter. Chapter 9 deals with telescopes and detectors, and is the least satisfactory of all those in the book. It does not even mention optical telescope designs such as the Classical Cassegrain, which is the real workhorse of modern ground-based astronomy. Nor does it deal with astronomical spectrographs and spectrum scanners, which are the single most important instruments used in astronomy today. This section needs to be expanded greatly to better cover this vast and ever changing subject.

The remaining chapters cover just about every aspect of astrophysics, from the sun and single stars to entire galaxy clusters and cosmology. Stellar motions, spectra, atmospheres, and evolution are covered extensively with few gaps. Variable stars are dealt with in detail, along with X-ray sources and interstellar gas. The structure of our galaxy as well as others is covered fairly well, although the authors might have given more attention to galaxies in the local group. At the end of the book is a set of ten appendices covering everything from unit conversions and constants all the way to a review of the math techniques needed to understand the technical details in the book. For those who want to test their knowledge, there are a set of questions at the end of each chapter (and they aren't very easy!). All in all, this book is ideal for college students and for anyone who is thinking of pursuing a career in Astronomy. It can either help you in your studies, or convince you that it might be better to remain just an amateur!

Lessons in Astrophotography

Recently while keying my way around Compuserve, I ran across a new astronomy area that contained lots of interesting articles on amateur astronomy. One series of writings by Greg Beach of Sudbury, Ontario, Canada caught my eye! Greg has written a long series of articles concerning astrophotography that appeal to both beginners and the more experienced. He has given me permission to publish those articles here in the newsletter, and they will be a regular feature from here on out... [Editor]

ASTROPHOTOGRAPHY - AN INTRODUCTION

Why do your own astrophotographs? Getting all the best equipment together can be expensive. Guiding a long exposure can be tedious and tiresome at best. Not to mention the "skeeters", biting cold, and complete body cramps. Fighting the Moon, twilight, and the wind seems to be the norm. So many beautiful photographs already exist in magazines and books. Let somebody else do all the hard work and you can reap the benefits! Not so. With all these disadvantages, why do so many amateur astronomers continue to beat the odds and present exquisite celestial photos at club meetings, to friends, to magazine and book publishers?

"Because I did it!". Self-satisfaction. A personal conquering of the unknown.

Why do you make your own clothes? Why do you do your own tune up on your car? Why do you build that oak bookshelf for your den?

"Because I did it!". Self-satisfaction.

Too much philosophy? Perhaps, but a good description of the amateur astrophotographer. Who is a typical astrophotographer? You and me, that's who! You know all about YOU; let me tell you something about ME:

My name is Greg Beach. I'm a warehouse supervisor for a major food products company in Canada. I have a beautiful wife and two wonderful young daughters. We live in the city of Sudbury (pop 160,000) in central Ontario at 46.5 degrees N. latitude and 81.0 degrees W. longitude. Yes that's right! It can get darn cold in our long winter months but nothing we can't handle.

I am a co-founder and vice-president of the SUDBURY ASTRONOMY CLUB, a young, vibrant organization of observers, astrophotographers, and telescope makers. I own (in partnership with club president and brother-in-law, Fred Boyer) a 17.5 inch f/4.5 newtonian telescope we have named CHAMELEON. At times it sits in a roof-top observatory here at LAURENTIAN UNIVERSITY on a massive german equatorial mount. At other times you can find it miles from nowhere in a dobsonian mount once autographed by JOHN DOBSON himself. A 4 inch f/15 refractor (with Jaeger's lens) can be found in my backyard for our solar system neighbours. I have use of several members scopes ranging from 6 inch refractors and 8 inch Meades to a 22 inch newtonian.

At SCIENCE NORTH, a world-class science centre here in the city, I use a 17.5 inch Heliostat (constructed by club members) for observing and photographing the sun. Along side it is a 4 inch f/20 refractor with a 0.6A Daystar filter I'll be using for photographing the sun in the light of Hydrogen-Alpha. Not sure what some of these terms are? Not to worry. You will by following this feature and others in DISPLA and the ASTRONOMY FORUM.

I took my first astrophotograph twenty years ago at

the tender age of eleven. The moon was the subject and I used an old German camera with bellows and lens "hand held" in front of a 25mm Ramsden eyepiece at the business end of my first telescope project - a 6 inch f/8 newtonian on a GEPM - German Equatorial Pipe Mount! It wasn't a good astrophoto. In fact it was downright terrible! But that's all it took. The bug was set in stone (silver?).

Years later the photographic hobby became a part-time business. Recording weddings and smiling faces. A darkroom was now necessary. Fully equipped for custom colour processing. No money was to be made with my hands in the "soup" all the time so a professional lab was acquired while I snapped the shutter. You see what I'm getting at? A hobby should stay a hobby. A hobby is meant to be FUN. I ended the business five years later, sold much of the equipment gathered over the years, and turned my eyes back to the sky with a couple of telescopes, a computer and printer and many new friends in the exciting hobby of amateur astronomy. The darkroom is still intact. Galaxies appear in the "soup" instead of smiling faces. Those smiles are now on my face and my friends. "Because I did it!". Self-satisfaction.

That's enough of me now. I wanted to introduce myself to you. I hope this astrophotography feature will be informative and FUN! We'll cover the basics in astrophotography and explore the wonders above and bring them down to earth. Our workshop will be all around us. We'll attend another wedding; the marriage of camera, telescope, and distant stars.

If you have any questions you are welcome and encouraged to ask them of me on the Astronomy Forum ("GO ASTROFORUM" to get there). Address all questions to Greg Beach [73016,1114] on Compuserve.

ASTROPHOTOGRAPHY - A LOOK AHEAD

Books on astrophotography exist today in limited supply. There are however some fine examples by Covington, Gordon, and Little to name a few. Some great astrophotographic articles can be found in SKY & TELESCOPE, ASTRONOMY, THE ASTROGRAPH, and DEEP SKY MAGAZINE.

In the Sixties, the photographic medium was at a standstill, almost "boring". Advancements were few and emulsions were static. Something written in 1963 was still up-to-date in 1968. Not so today! The colour explosion hit us in the Seventies and astrophotography really took off at the close of that decade.

The trouble with today's authors is by the time all their researching, experimenting, and writing has been finished and the final manuscript has been delivered to the publisher, much of what they have worked so hard at is already out-of-date.

The medium you are using now to read this feature will change all that. Overnight? Hardly, but think of the possibilities:

Well, we all know it could take months or even years before anything hits the racks. With computer and modem and the ASTRONOMY FORUM you'll know results as soon as that "magical" little box of film has met the business end of a telescope. Amateur astrophotographers will chat back and forth discussing the problems they've encountered and great wonders they've discovered.

Now. What areas of astrophotography will be covered in this feature? We'll look at the basics for beginners, advances for the veteran, and we'll even creep into an astrophotographers darkroom.

"What camera should I buy for 'shooting the stars'?" (pun intended) We'll have an answer for that one.

"I spent ninety cold minutes guiding this shot of M51 and it's STILL too low in contrast". We'll show you

continued from page 8

what accessories or tricks may help prevent that AND what you can do to salvage M51 from lack of 'photons'. Below is a lineup of topics to be covered. It by no means intends to be exhaustive and I welcome any ideas you may have. From time to time I'll have guest authors sharing with you their area of expertise. The list is not in any particular order.

- o EQUIPMENT & ACCESSORIES
- o FROM LENSES TO TELESCOPES
- o HOW WIDE THAT LENS?
- o FILM CHOICE
- o CAMERA CHOICE
- o COMPUTER PLAN FOR ASTROPHOTOGRAPHY
- o RECORD KEEPING
- o TURN THOSE LIGHTS OFF!!
- o ARE WE REALLY BETTER OFF THAN 20 YEARS AGO? o ASTROPHOTOGRAPHY IN 2061
- o AN ASTROPHOTOGRAPHERS STARTER KIT
- o METEOR PHOTOGRAPHY
- o LUNAR PHOTOGRAPHY
- o AURORA PHOTOGRAPHY
- o PLANETARY PHOTOGRAPHY
- o PHOTOGRAPHING THE SUN
 - WHITE LIGHT & HYDROGEN ALPHA
- o FILTERS FOR ASTROPHOTOGRAPHY
- o TELESCOPES FOR ASTROPHOTOGRAPHY
- o MURPHY'S LAWS OF ASTROPHOTOGRAPHY
- o THE FIX SYSTEM
- o DO IT IN THE DARK!
 - IMAGE ENHANCEMENT
 - OUTFITTING A DARKROOM
 - HYPERSENSITIZING FILM
 - COLOUR OR BLACK & WHITE??
 - DUPING SLIDES AND NEGATIVES FOR CONTRAST
 - PROCESSING TIPS
- o GUIDING FOR LONG-EXPOSURE ASTROPHOTOGRAPHS

- o PREPARING YOURSELF AND YOUR TELESCOPE FOR ASTROPHOTOGRAPHY
- o LET'S NOT FORGET THE BASICS!
- o SOLAR & LUNAR ECLIPSE PHOTOGRAPHY
- o ASTROPHOTOGRAPHY ON A BUDGET
- o FILING YOUR ASTROPHOTOGRAPHS
- o CHOOSING A TELESCOPE FOR ASTROPHOTOGRAPHY
- o DESIGNING A TELESCOPE FOR ASTROPHOTOGRAPHY
- o BALANCING A TELESCOPE FOR ASTROPHOTOGRAPHY
- o A SIMPLE EQUATORIAL MOUNT FOR ASTROPHOTOGRAPHY
- o WATCH THE WEATHER!!
- o A SUPER PORTABLE OBSERVATORY
- o DEEP SKY ASTROPHOTOGRAPHY
- o QUESTIONS AND ANSWERS
- o PRODUCT REVIEWS
- o PHOTO NEWS BULLETINS
- o PHOTOGRAPHIC POLAR ALIGNMENT OF YOUR TELESCOPE
- o PHOTOGRAPHIC TERMS - IN ENGLISH!
- o ASTROPHOTOGRAPHY WITH A SCHMIDT CAMERA
- o MEADE'S NEW 622
 - A WONDER FOR THE NIGHT SKY?
- o A COPY-SCOPE "COPY-CAMERA"
- o COLD WEATHER OBSERVING
- o NEGATIVE/SLIDE HANDLING AND EVALUATION

Next month, let's get down to business!



"Planetaries"

A New Basic Candle

Named for their resemblance to the large outer planet such as Uranus or Neptune, planetary nebulae are clouds of gases illuminated and heated by a hot, dying star within. Because they are quite common—wherever there are old stars there are “planetaries”—these relatively faint objects have offered promise as distance indicators to nearby galaxies, but their faintness has greatly limited the distance at which they could be seen. With the introduction of the highly sensitive charge-coupled devices (CCDs), it has now become possible with a large telescope to detect planetaries out to distances of some 15 megaparsecs (a parsec, or parallax second, is about 18 trillion miles).

According to Dr. George Jacoby, of NOAO's Kitt Peak National Observatory, (co-author with H. Ford, Space Telescope Science Institute, J. Booth, Kitt Peak, R. Ciardullo, Carnegie Institution), surveys of the brightest planetary nebulae in the spiral galaxy M81, a bright galaxy outside the Local Group, led to a calculated distance of about 3.4 megaparsecs, a value that compares well with similar distances obtained by other, more complicated means. The observations described in this paper used the Kitt Peak 4-meter telescope, looking in a narrow ionized-oxygen (OIII) emission line. “By isolating that wavelength,” Jacoby reports, “most of the light from stars in the galaxy is rejected, allowing you to see heated gas, and the planetary nebulae.” Looking at the center of M81, where most of the light originates, Jacoby and his colleagues detected some 185 planetaries, then took the brightest ten and averaged their brightness to obtain a measurement of standard. Using that absolute brightness as a standard, they calculated the 3.4 megaparsec distance to the galaxy. “It's a simple measurement,” Jacoby says, “but it gives you reasonable answers.” The advantage of the technique is that planetaries are abundant in elliptical galaxies, which have rela-

tively few conventional standard candles.

Future work will attempt to reduce uncertainties of calibration. By observing planetaries in clusters of galaxies some 8 megaparsecs away, Jacoby and his co-workers expect to verify their technique, since planetaries in each galaxy in a cluster should be nearly the same distance from us. But, at the moment, Jacoby says, “We are pretty sure we have a new standard candle in planetary nebulae.”

Some Regional Planetariums To Check Out...

** INDIANA **

Koch Science Center & Planetarium
Evansville Museum of Arts & Science
411 S.E. Riverside Drive
Evansville, IN 47713
(812) 425-2406

Nature Center Planetarium
Department of Natural Resources
Turkey Run State Park, RR 1
Marshall, IN 47859
(317) 597-2654

** IOWA **

Planetarium Grout Museum
W. Park Avenue & South Street
Waterloo, IA 50701
(319) 234-6357

Sargent Planetarium
Center of Science & Industry
4500 Grand Avenue
Des Moines, IA 50312
(515) 274-4138

**** KANSAS ****

Planetarium
Kansas Cosmosphere
1100 North Plum
Hutchinson, KS 67501
(316) 662-2305

Wichita Omnisphere and Science Center
220 S. Main Street
Wichita, KS 67202
(316) 264-3174

**** MINNESOTA ****

Minneapolis Planetarium
300 Nicollet Mall
Minneapolis, MN 55401
(612) 372-6644

Paulucci Space Theater
E. 23rd St. & Hwy. 169
Hibbing, MN 55746
(218) 262-6719

**** MISSOURI ****

Planetarium
The Kansas City Museum
3218 Gladstone Boulevard
Kansas City, MO 64123
(314) 483-8300 x224

McDonnell Star Theater
St. Louis Science Center
5100 Clayton St.
Forest Park
St. Louis, MO 63110
(314) 289-4439

**** NEBRASKA ****

Ralph Mueller Planetarium
Elephant Hall, 14th & U Sts.
University of Nebraska - Lincoln
Lincoln, NE 68588
(402) 472-2641

J.M. McDonald Planetarium
Hastings Museum
1330 North Burlington Avenue
Hastings, NE 68901
(402) 461-2399 x395

**** NORTH DAKOTA ****

Divide County Planetarium
Divide County School District
Crosby, ND 58730
(701) 965-6392

Planetarium
Valley City State College
Valley City, ND 58072
(701) 845-7452



A short note from the Editor

By now you have probably noticed another change in the newsletter format... (MY GOD!!! HE'S CHANGED IT AGAIN!!!). Well, one thing that makes my job as editor fun is the chance to mess around with new programs on the computer. When I first started putting out the *Prairie Astronomer* a few years ago, it was done entirely via a typewriter, press-on letters and glue. Since then I've progressed all the way from a small grade word processor to a very powerful desk-top publishing system called Pagemaker.

Pagemaker is one of those programs that is so vast in what it can do, that you never really can learn it. This edition of the newsletter is the first chance I've had to try the program out, and so far I am impressed (even though it took me almost 8 hours to finish this thing up!). The only thing I really lack to provide you with a top-notch looking newsletter is a laser printer. You can bet that it's on my wish-list...

Finally, you'll also notice that the newsletter is a bit longer than usual. In the past I've always had a dickens of a time finding things that both interest the club and yet don't appear in the mainstream magazines such as *Sky & Telescope*, *Astronomy*, and *Scientific American*. There are some off-beat astronomy journals around, but most of them deal with highly technical material you most likely would not enjoy. My solution (and savior) has been the CompuServe Information Service. I've spoken about CIS in the past so I won't dwell on it here, but there is a new section on the service that contains series articles about astronomy. The one which appears in this issue concerning astrophotography is just one of many topics that are covered. With this fine source of information, I can provide you with information that you probably haven't seen before, at least not in the exact form presented.

For those members that regularly log-on to CompuServe, my apologies for the repetition. But as long as Dave keeps churning out those book reviews and observers reports, you'll at least have his fine columns to read. (Oh, and be sure, there's ALWAYS room for any articles YOU would like to submit.) Hope to see you all at the Annual Star Party!!!

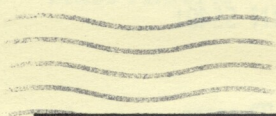
John Lortz

The Prairie Astronomer

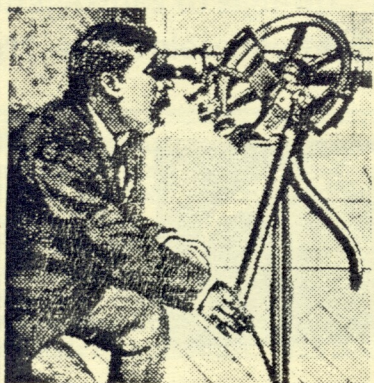
c/o Prairie Astronomy Club, Inc

P.O. Box 80553

Lincoln, NE 68501



1st Class Mail



Earl Moser
Hickman, NE 68372

Next PAC Meeting August 25th PAC Star Party August 22nd

Prairie Astronomer

Page 12