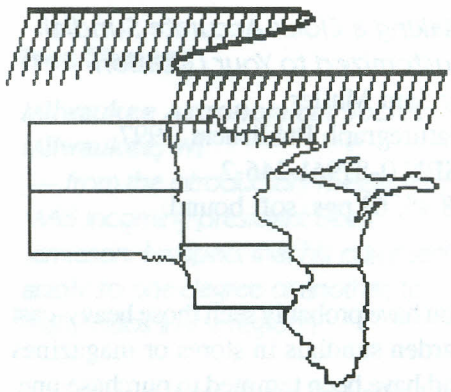


Northern Lights

ASTRONOMICAL LEAGUE
NORTH CENTRAL REGION

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Editor's Corner

R. Klappal



Please, ALCORs and others who receive *Northern Lights* as a representative of your Societies and Clubs. Share this newsletter, and its information, with your organization. In recent months I have managed to attend ALCON '98 in French Lick, Northwoods Starfest near Fall Creek, WI, and Astrofest—Chicago AS' convention near Kankakee, IL. I have been surprised by the number of club members from around the country that do not know that the Regions even publish newsletters.

As is mentioned elsewhere in this newsletter, amateur astronomy can be a lonely hobby. Those of us in urban areas may have the opportunity to find other enthusiasts. Rural members can find themselves spread really thin. (I grew up in Winner, SD, a little above the Nebraska state line, about the middle of the state, east-to-west. Everything

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ALCON '98



Julie Frey, ALCOR Rep. Milwaukee AS

I am happy to report an absolutely superb convention hosted by The Louisville Astronomical Society and the Evansville Astronomical Society! ALCON'98 was held at French Lick, Indiana from July 22 to July 25.

The resort-style, historical convention site, offered a beautiful setting for amateur astronomers to convene. Featured guests included Dr. F. Story Musgrave, Jack Horkheimer, Dr. J. Richard Gott, Dr. James Kaler, Dr. John F. Kielkopf, Sarah A. Gavit, Warren Stephenson, Dr. Suketu Bhavsar and Dr. Thomas H. Crawford. Topics included: *Einstein's Universe; Escher's Art*–(Bhavsar), *Popullution*–(Crawford), *The Comet That Killed Cleopatra*–(Horkheimer), *Artist's View of the Universe*–(Musgrave), *Deep Space 2: Probing the Subsurface of Mars*–(Gavit), *Extreme Stars: At The Edge of Creation*–(Kaler).

If you are a teacher or amateur interested in public education of astronomy, you may be interested

"Project ASTRO", which was presented at ALCON for the first time. This new program provides materials and training for those who wish to bring, astronomy to the classroom.

Astronomy conferences are highly recommended for both new and experienced amateurs. You can meet other amateurs from all over the country, try your observing equipment in typically better conditions, display your astrophotos in contests, collect observing information sheets, and view presentations from both professional and amateur astronomers. There's also plenty to do, even for the non-astronomer, so you can bring your entire family.

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Editor's Corner
Continued from page 1

gets spread really thin out there! The only thing they have a lot of is **dark**, ..., oh, and **cold** in the winter! As you head towards North Dakota, and the Canadian line, it only gets more-so.)

So, share this information with your colleagues. I'll try to include local news and interest items to help out with the camaraderie. A quarterly newsletter can't always be used to announce events, but if I know in time, I'll publish your announcements. Send me Email at `klappal@xnet.com` if you want something announced and your publication schedules don't match mine for getting the news out.

Other articles and submissions can be sent to the same address. I can scan photos (prints) in, if necessary.

Thank you. And please update my postal address in your databases. We're still getting mail forwarded from the Rolling Meadows address, but the PO Box has been closed.

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Book Reviews

Paul R. Castle
Astronomical League Book Service

Welcome to the Moon!

by Robert Bruce Kelsey
Naturegraph Publishers, 1997
ISBN 0-87961-245-2
$11.95, 112 pgs. soft bound

What is the favorite astronomical target for the young beginning star gazer?

The Moon, of course. Fascinating as it can be, unless you have some idea of what you are looking at, all the details and features can be confusing and, perhaps, cause you to lose interest.

Welcome to the Moon details a dozen self guided expeditions to lunar areas.

However this book is more than an observer's guide. Kelsey helps you understand not just what you are looking at, but when and how these features were created. This allows you to decipher for yourself the evidence provided by lunar clues found in other areas.

In addition to this brief course in lunar topography, you will find detailed instructions on locating the Apollo landing sites.

No matter what your age you will find something of interest in *Welcome to the Moon*. Along the way you will also gain experience in the use of your telescope.

I recommend this book for all beginners. The experienced observer who has neglected our nearest neighbor in space may also reawaken their lunar interest.

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Making a Clock-Accurate Sundial: Customized to Your Location

by Sam Muller
Naturegraph Publishers, 1997
ISBN 0-87961-246-2
$8.95, 63 pgs. soft bound

You have probably seen those heavy-cast garden sundials in stores or magazines and have been tempted to purchase one. After all, sundials are dramatic demonstrations of not only our planet's daily rotation, but also the effect of the Sun's yearly and seasonal motions. But perhaps you have been put off by both the sundial's cost and also the likelihood that it has not been manufactured for your latitude.

If this is the case, you can use this book. Sam Muller shows you how to make your own dial, not only out of inexpensive materials, but customized to your location! His simple instructions lead you through the construction process while at the same time helping you learn the hows and whys of this marvelous "time honored" instrument.

I found specially useful Muller's easy method for converting this homemade sundial back and forth so it directly reads both Standard and Daylight Savings Time. I intend to build this one!

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Sarah Spindler passes

Sarah (Sal) Spindler, wife of John (Jack) and mother of John and Tanya, passed away Tuesday, August 4, 1998. She had suffered a heart attack a few weeks earlier and never regained conciousness.

Our sympathy goes out to Jack (former president of the Racine AS and the Chicago AS), John (Lake County AS) and Tanya.

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Free Photons

Milwaukee Astronomical Society Milwaukee, WI

[— from the introductory message of MAS incoming president Scott Jamieson. I suspect that his comments apply, to one degree or another, to many clubs in the region.]

... Now on to my feelings about the MAS and its future. Perhaps this can best be expressed by addressing several issues that have come up recently:

1) that a small, elite group of people is in danger of taking over club. I don't know of any takeovers, but all clubs are run by a very special group of people, those that participate in the club activities on a regular basis. Most of us have severe restrictions on our time that make it difficult to donate significant amounts to the club. This has been true throughout our history but there is always been, and, I believe still is, people that feel this club is important enough to help out.

There has also been an ebb and flow of the primary interests of the club members. Some of us have specialized interests such as telescope building, deep sky observing, or variable star work but many have a more general interest in astronomy. One of the things I enjoy about astronomy is the range of subjects and the many types of people that are interested in it. Like those before me, I would encourage members to get involved in the club activities. Astronomy can be a very lonely hobby or an activity that builds a good friends. The choice is yours.

2) That our club facilities are old and run down. Old? Yes, but after seeing what other clubs have over the last couple of years, I must say that we have the core of a fantastic set of observatories and related facilities that many would love to have. Our mean handicap is the high ambient light level, but even that is not prevent useful work in many forms of imaging. As you have seen in this newsletter recently we have been updating the drives of the Z-scope, and are well along our way to completing the automatic control of the telescope from computers displaying modern star charts. The observatory committee is in the process of formulating plans and recommendations for updating the two 12-inch telescope. One of the primary efforts will be to make all of the telescopes and observatories easier for all members to use.

A major consideration is the clubhouse itself. It has become obvious that it is time we start planning on replacing this building with a more modern structure. My goal is to complete planning this year and to finish building by the fall of next year .

The financial condition of the club is such that we can consider all of these projects that there is a lot of work to be done and we need the interest and participation of all club members to complete the conversion to a modern facility usable by all club members. There will be discussion of these projects at the board meeting at the picnic on July 18. All members are invited to attend.

3) That most of the longer term members are no longer active so that little as being done. I will agree that many members active in the past do not participate in all aspects of the club and I would strongly encourage them to help guide us newer members through the joys of astronomy. I must also say that in the past year I've seen more encouraging signs of members were really want to get involved in astronomy and this club. We have a board that is very interested in improving the facilities and giving members a reason to be active. This is probably the hardest part of building a club and I believe we have a dedicated people to do it, but we will need and will be requesting the help of all members.

Let me end by saying that I believe in the future of MAS, I recognize the diversity of our members' interests and will do everything that I can to promote the usefulness of our facilities and the advantage of being active in the club. With your help, I look forward to real progress in the coming year.

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Cedar Amateur Astronomers Cedar Rapids, IA

Entering the Platinum Age

Doug Slauson

I have often heard the last half of the 20th century described as the 'golden age' of astronomy. With the Hubble Space Telescope churning out ground-breaking discoveries almost daily and new huge ground-based telescopes now coming on-line, it has become a challenge to decide which discovery should grace the pages of this newsletter! The discovery announcement are so rapid-fire, and so large in their implications, perhaps we should refer to the 21st century as the 'platinum age' of astronomy. in one of several such recent reports, for example, California Institute of Technology astronomers announced a new class of stellar object they have dubbed "L dwarfs." These stars are too cool to support nuclear fusion; thus are cooler than class M stars. This new designation is expected to force revision of the now-famous OBAFGKM of stellar classification to include class L objects. Consequently, the sequence will now read OBAFGKML. The familiar mnemonic to remember this will now change to read 'Oh Be A Fine Girl/Guy, Kiss My Lips!'

L dwarfs are considered to have formed like stars, but lack sufficient mass to compress themselves to trigger nuclear fusion which is the engine that causes stars to shine in visible light.

L dwarfs glow faintly and may equal the number of all other classes of stars combined.

The Cal-Tech sky survey covered about 1 percent of the sky out to 100 light-years distance. Twenty L dwarfs were found in this narrow sample.

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Sheboygan Astronomical Society Sheboygan, WI

From The President:

Wonderful news ! For those members whom I haven't notified, the Sheboygan Astronomical Society has won the National Astronomy Day award! Take this time to pat yourself on the back, as our group has worked very hard over the past 4 years to make this award possible.

It's fun to look back 4 years ago to our first Astronomy Day. We were in the Wombat Room at the UW. Sheboygan, and we barely had enough exhibits to fill the room- Remember the bean bag toss? I still have those bean bags! I had just purchased my telescope, and barely knew how to assemble it. Now it's traveled in my car all over the neighboring counties, and I'm finally starting on my Messier list. Also, I can find more than the Moon in the sky as well. Our group has really grown up over the past 4 years, and I look forward to what the group will accomplish in the next 4 years.

Good viewing, and congratulations everyone!

Diane Van Minsel
President

Astronomy Day Award!

(Excerpt of the letter informing our group of winning the Astronomy Day award)

Congratulations! You are the winner of the Sky & Telescope Astronomy Day Award. Your efforts, along with that of all the other organizations that hosted special events for Astronomy Day, have touched thousands of people and has brought the wonderful science of astronomy to the public's attention. I hope you will continue your efforts and your entry into the award for years to come.

This award is presented at the League's annual convention (July 21-25, 1998) in French Lick, Indiana during the Saturday (July 25) evening banquet.

... We were impressed with the two day event in a mall and the radio controlled Sojourner.

Again, congratulations!
Sincerely,
Gary E. Tomlison
Astronomy Day Coordinator

Seen on the Internet...

Q: How can one figure out what day it is and what time it is by observing the stars?

A: In Michigan, if you can't see the stars because there's 6' of snow covering your scope, it's winter. If you can't see the stars because of heavy ground fog, it's spring. If you can't see the stars because you're weak from blood loss to mosquitoes it's summer, and if you can't see the stars because of thunderstorms, it's fall. And if you can't see the stars because it's too bright out, it's either daytime or you live next door to a car dealership.

Hope this helps.
Michael Edelman
http://www.mich.com/~mje

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Northern Cross Science Foundation; Grafton, WI

Northwoods Starfest Part I

By Jeff Setzer

Standing under a starlit sky, the air sweet with humidity, I can't believe my luck. The very first night I bother with critical alignment of my telescope optics, I get sub-arcsecond seeing. We're looking at Jupiter and Saturn with eyepiece combinations that I've never used before. As people **stream by the** eyepiece of my 22" Starmaster, they ask, "What power is this?" To which I reply, "I'm not sure I've never used this much before. I know we're well over 500... " The humidity which brought the steady seeing reduces the transparency, so deep-sky objects are not very good. But that's okay because I've already logged super-faint targets like the Crescent Nebula and Stephan's Quintet from observing earlier in the evening. I don't mind studying the planets for the few hours until the sun comes up. When it does, and after I put the scope away, I realize that we were actually using 751x for our planetary observing. And to think I was considering skipping this star party altogether - thank goodness that meteorologists aren't always right.

The Northwoods Starfest began on Friday, August 21 and ran through the 23rd. I came from a business trip in Madison, and was able to get out of town a little early to boot. So, for once, I would actually arrive early enough to set up during full daylight. The drive to Beaver Creek Reserve, site of the Hobbs Observatory and location of the Starfest, was depressing at first: it was raining and cloudy from Madison half the way past Mauston. But as I continued further northwest on 1-94, 1 could see that I was literally driving out of the clouds and into a clear, blue sky some kind of front seemed to have pushed the bad weather south. That turned my spirits

around 180 degrees, and I cranked up the Jimmy Buffet.

The Beaver Creek Reserve is a woodsy expanse a few miles outside of Fall Creek, WI. Hobbs Observatory is situated at the head of a large observing field. Adjacent to that is a separate "youth camp" separated only by a thin tree line. Following the paved path from the observatory takes you through the camp, which has several heated cabins, a roomy lodge with full kitchen, and a bathhouse. When I arrived early on Friday evening, Nick and Jeanie Nichols, Charlotte Nelson, and Gene DuPree already had camp set up adjacent to the observatory's front door. So much for being early! After I registered and started setting up the telescope, Kevin and Danny Bert showed up, and got their famous binocular mount set up next to the rest of us. Then the three of us headed off in search of our cabin, stowed the gear, and came back to tour the observatory.

Hobbs Observatory is impressive. It consists of a large rectangular building of around 2000 square feet. We're talking double-door front entry, vaulted ceiling, carpeting and insulation. We're talking doors each leading to a small kitchen, fully-finished lavatories, and a few offices. Attached to the west and east sides of the main building are cylindrical 2-story structures topped by 18-foot Ash domes. The east dome holds a Celestron C-14, while the west dome houses a 24" f/5 Newtonian. The 24" was procured form Edwards Air Force Base, where it was used to visually track planes in the 1960s. It is all steel, including the solid steel tube, and weighs over 20,000 pounds! A homebrew computer systems allows the giant altazimuth mount to track the stars, as well as compensate for field rotation at the eyepiece. UW-Eau Claire owns the scopes, while the building is owned by Beaver Creek Reserve. The Chippewa Valley Astronomical Society gets to use all of this in exchange for hosting public viewing sessions, and so they even hold all of their regular meetings in the observatory.

End Of Part 1

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Sheboygan Astronomical Society

A Goldin Opportunity: The Dedication of the Space Shuttle Computer Learning Center

On Saturday, August I in De Pere, WI, NASA Director Dan Goldin attended a press conference and dedication for a new space teaching tool. The teaching tool is a school bus which has been converted to a mock space shuttle. Inside the space shuttle are laptop computers which were all connected to the Moonlink program. This space shuttle, which is part of the Einstein project, will be traveling to schools in N.E. Wisconsin.

Sue Theno, the Executive Director of the Einstein Project, stated that the main idea behind the Einstein Project is "Hands on means minds on". Schools are advancing the standards regarding at what age children must have a grasp of certain items. Sue stated that now by grade 5, students must understand planetary motion, motion of stars, and the phases of the moon-among other things.

Education Congressman Jay Johnson stated that seeing a man walk on the moon, and the announcer who described what was going on inspired him to become a television broadcaster. Now, he is working with Dan Goldin and NASA to keep funds and programs alive. Jay stated that "our children should know a better world. Dan Goldin makes this possible with hands on science".

NASA Director Dan Goldin opened his comments by talking about a memorable visit to Sheboygan several years ago. He saw a rocket go up a bit, and then come back down. "Young people need to be exposed to science via computers and hands on". Dan talked about the differences in schooling 10 years ago, verses now and in the future. "Education even 25 years from now will be vastly different from now. Right now we have computers, back years ago we didn't have them. In 10-15 years, students who don't concentrate on their math and science skills will not be able to obtain a job. Students need the wonders of science and technology to grow." The younger members of the audience were asked if they would like to walk on the surface of Mars. Several hands went up. Dan stated that we "absolutely will walk on another planet. Research stations are being designed right now to land on comets and asteroids". The probe being designed to land on Europa was also described. NASA plans to have this probe land on that moon, bum a hole into the ice, free float in the ocean, turn lights on and look around.

Once Dan Goldin finished speaking, Jay Johnson gave Dan an official cheesehead hat, which Dan put on his head, and posed for photos for the press. Guests at the press conference included Dan's wife Judy Goldin, Dr. Alan Binder - the principal investigator for the Lunar Prospector, and Astronaut John Grunsfeld. Jay Johnson was given a gift from NASA for all his efforts towards education. The montage he was given contained a crew patch, a picture of the shuttle launching and landing, a crew picture and a miniature WI flag which was flown in space. Dan Goldin then posed with all the younger members of the audience and had his picture taken with them.

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Popular Astronomy Club
Rock Island, IL

FORMULAE FOR ASTRONOMERS

Mathematical formulae are not everyone's idea of fun, but certain optical formulae are incredibly useful. Here are some of the most widely used (whether using metric or English measurements be consistent):

Magnification: You can determine the magnification of any eyepiece by dividing the focal length of the telescope (F) by the focal length of the eyepiece (f).

$$M = F / f$$

If you are using an 8-inch f/4 Newtonian and a 12mm eyepiece, the telescope has a Focal Length of 8 x 4 or 32-inches. 12mm is approximately ½-inch so the scope has a magnification of 64 power.

Exit Pupil: The exit pupil is the smallest diameter of light which emerges from the eyepiece. If the exit pupil is larger than the pupil of your eye, some of that light bounces off the iris of your eye and you cannot see the entire field of the scope. Since the pupil of your eye opens to a maximum of 7mm (5mm in older people), the eyepiece you buy, therefore, must not produce an exit pupil greater than the diameter of your eye's pupil. The exit pupil of an eyepiece in millimeters (e) equals the focal length of the eyepiece in millimeters (f) divided by the focal *ratio* of your telescope (r).

$$e = f / r$$

Could you use a 55mm eyepiece with a 8-inch f/6.3? No, because 55mm divided by 6.3 is 8.7mm. You could not see all the field of view.

Upper Useful Magnification: The upper limit of useful magnification (m) under conditions of perfect *seeing and using diffraction-limited optics* is equal to approximately 50 times the diameter of the telescope objective in inches (D).

$$M = 50 \cdot D$$

So a 60mm retractor (less than 2½-inches would be , not exactly the power some department or discount scopes would have you think!

True Field: Each eyepiece has an apparent field, i.e. the size of the unfocused field you see if you look through an eyepiece held in your hand. Most eyepieces have an apparent field of 40°. Some new brands have 50°, 65° and even 82°. Coupled with a telescope you are seeing a magnified image of this field. Therefore the True Field (Ø) is the eyepieces apparent field (a) divided by the magnification of the telescope-eyepiece combination (M).

$$Ø = a / M$$

If your telescope-eyepiece combo is producing 80 power and the apparent field of the eyepiece is 40°, the true field is 0.50° or ½°, the same size as the Full Moon.

Exposure Time Ratio: If you move your camera from one telescope or lens to another and want to achieve photos of equal intensity, your exposure time needs to be adjusted. Compare the *squares* of the focal ratios of the two instruments. If one was an f/4 and the other was an f/10. For example: 4 squared is 16, 10 squared is 100, 100 divided by 16 is 6.25. The exposure in the f/10 scope would have to be 6.25 times the exposure of the f/4 telescope to get the same intensity on your film.

Relative Image Size: When changing scopes or lenses the change in image size can also be compared using the *squares* of the focal ratios. If you move an eyepiece from an f/4 to an f/8 telescope (same apertures) you are increasing the image diameter by two because you doubled the focal length and hence, the magnification. You increased your image area by four. 4 squared is 16, 8 squared is 64. 64 divided by 16 is four. Your exposure time, if you are photographing, will need to be four times longer.

Prime Focus Magnification: It you want to know your magnification when photographing at prime focus, just treat your camera as if it were a 50mm eyepiece. Divide 50mm into your scope's focal length in millimeters and you have it. A 2000mm Cassegrain scope would therefore yield a magnification of 40.

From a talk by Charles E. Allen at ALCON '98.

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