SPECTRUM

Northern Cross Science Foundation Newsletter March 2002

LOOKING UP

Mar. 7 Thursday
Monthly Meeting
7:00 p.m.
Astronomy 101
7:30 p.m.
General Meeting
Carlson Tool & Mfg.

New Event!

Mar. 15 & 16 Fri. & Sat.
NCSF Messier Marathon at Ledge Park, Horicon

Mar. 21 Thursday
Board Meeting
7:30 p.m.
Jeff Setzer's Home

A Publication Of
The Northern Cross
Science Foundation

Astronomical Pyrotechnics

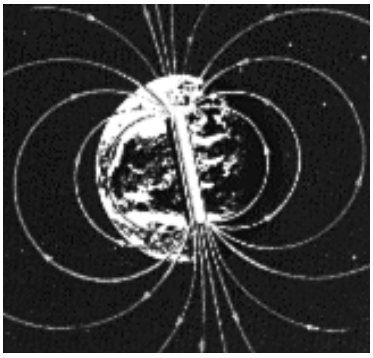
By Dan Bert

Eyes open wide, looking up with wonder into the evening sky. Oohs and ahhs can be heard as individuals watch the show above. No, this is not the Fourth of July, but the Aurora Borealis or Northern Lights. This past November, there was a large display of the lights, which no words can really describe. After seeing something so spectacular one may ask how does such a phenomena occur and why?

To understand how the Aurora takes place you must recognize sun activity and how the two are connected. Larger displays that happen farther from the poles, that we would see, occur most often while the sun is very active. In this way, you can often predict when the Aurora may occur by observing storms on the sun. Not rain or snowstorms but magnetic storms, which appear as sunspots. Emanating from these spots are tiny atomic particles that are carried to Earth by the solar winds. Furthermore, solar flares produce huge bursts of solar winds packed with even more of these particles. The intensity of the winds and flow of particles therefore increases when the sun is more active.

Recognize that earth has its own magnetic field and an iron core therefore, much like the bar magnet it has a north and south magnetic field. To better visualize the solar winds and how it compresses the earth's magnetic field to form what is called the *magnetosphere,* observe the included diagrams.

The solar particles eventually hit the earth and are then drawn to the areas around the north and south magnetic



Earth's Magnetic Field Lines

*(See **AURORA** on page 2)*

NCRAL Convention

By Kevin Bert

This year the Minnesota Astronomical Society (MAS), will be hosting the 56th Annual Convention of the North Central Region of the Astronomical League. It will be held at the Earle Brown Continuing Education Center of the University of Minnesota in Saint. Paul. The event will run from Friday May 3rd through Saturday the 4th.

An open house is planned for Friday evening at the Onan Observatory at Baylor Regional Park. It is located approximately 1 hour southwest of the Earl Brown Center. It is an impressive roll off roof observatory. Saturday's events start at 9:00 a. m. With the MAS president's address, keynote speaker is Dr. Leonard V. Kuhi Ph.D. from Berkeley, California. He will talk about the Large Binocular Telescope on Mount Graham in Arizona. Paper sessions, the business meeting and the banquet round out the day. Ralph Plaisted (Explorer/Adventurer) will talk about his North Pole exploration at the banquet.

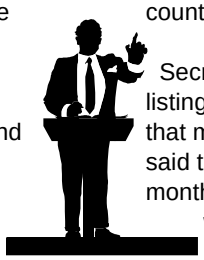
*(See **NCRAL** on page 3)*

January Minutes

By Kevin Bert

The February business meeting of the Northern Cross Science Foundation was held in the conference room of Carlson Tool & Mfg. in Cedarburg.

Secretary Kevin Bert opened the meeting at 9:15 p.m. to over 28 members.



Kevin welcomed all members and guests in attendance.

Treasurer Brad Plaumann gave the latest balance for the checkbook at $1,133.00. In addition to standard transactions he noted that one major expenditure was for the Sky Commander navigation system that will be used on the 20 Inch telescope. One large deposit of $362 had been made and consisted of membership dues and magazine subscriptions. Savings account balance remained the same.

Secretary Kevin Bert passed around a listing of several special interest groups that members could sign up for. He said that he would pass it around next month also before any further steps would be taken.

Kevin brought attention to the list of members and public events for 2002. As listed the Pike Lake Ski and Stars would be held this weekend Details for the A.L. Regional Convention would be given in the March Spectrum.

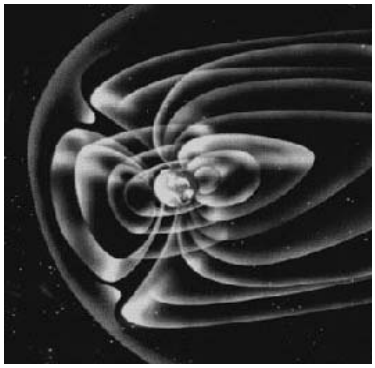
Kevin asked for any new club business.

With no further new business the business meeting was closed by Kevin at 9:40 p.m.

Respectfully submitted,
Kevin Bert, secretary

*(**AURORA** from page 1)*

poles. Eventually, this creates the light displays that extend far from the poles. How then do these magic particles do this?



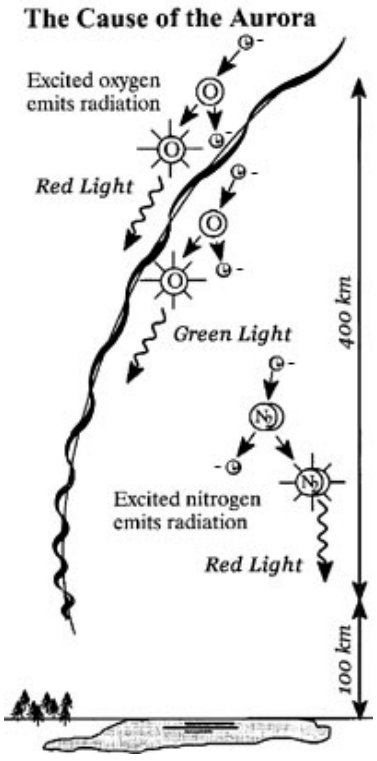
Earth's Magnetosphere

The true secret behind the displays has to do with electromagnetic radiation and the visible part of the spectrum. That is, not what you can see on this newsletter but the spectrum of "various waves of extremely high frequency and short wavelength to extremely low frequency and long wavelength". Visible light is only a small part of the electromagnetic spectrum. Remember ROY-G-BIV?

To understand the Aurora, you can compare it to a neon sign. Like a neon tube sign the aurora is electrical in nature. The particles that arrive in the earth's magnetosphere are electrically charged and energetic. Like little children running around with lot of energy, the particles accelerate along the Earth's magnetic field lines and form an electrical current. As a result of this motion they collide violently with gas atoms in the earth's ionosphere. As a result, the gas molecules also become excited and give off electromagnetic radiation or as we see it light. Similar to a neon sign, the gases are in the Earth's ionosphere not a glass tube and there are magnetic field lines instead of copper wire. Like the signs in windows, the Aurora also consists of many different colors from yellow to green and red. Why then all the different colors?

Our atmosphere is a mixture of several gases, mostly nitrogen and oxygen with traces of hydrogen, helium and other elements at times. In your mind, picture a streetlight. Most likely they are sodium vapor lights, which produce that annoying shade of yellow and light pollution. Basically every element produces a certain atomic spectra or color of light. The Northern Lights various hues therefore are determined by the specific spectra of gasses in the Earth's atmosphere. The aurora can occur from about 60 to 600 miles up in the air. Basically particles collide with different gases at different heights to produce different colors. The following diagram gives a more visual explanation of this idea.

The Aurora, often appearing as something out of Star Trek, has many shapes and forms. Usually as "rapidly shifting patches and dancing columns of light of various hues." The lights can take the shape of arches, filaments and streamers, luminous circles near the Zenith, nebulous masses high in the



sky and can have filaments diverging to the Zenith much like this past November's lights. Furthermore, Earth is not the only planet known to have

*(see **AURORA** on page 4)*

Astronomy 101

By Kevin Bert

The topic for the March 101 class will be "Telescope Optics" by Kevin Bert. Start time is 7:00 p.m. Learn the basic concepts on how a telescope works and the special terms associated with all telescopes. See what criteria is used to judge telescope performance.

The featured constellation will be Cepheus

Next months 101 class will be about the Moon by Al Steinberg.

Main Program

By Joe La Piene

In March, video tape lecture number nine will be shown featuring professor Alex Filippenko from the University of California, Berkeley. This video is entitled "The Early History of Astronomy."

Other members willing to give a presentation should call Joe La Piene at 262-335-6757, or e-mail ...g@alexssa.net

From The Editor

By Kevin Bert

Greeting NCSF members. I felt that last month's meeting was one of the best in quite a while. There were a lot of new faces attending. Weather was mild and clear to allow for the telescope clinic to be held outdoors. The show & tell that followed was great. There is a lot of talent in our group. Thanks to all of the members that gave a presentation. We should make the show & tell an annual event.

The lead article this month is about the Northern Lights by Dan Bert. The second article is about our regional convention of the Astronomical League. This year it is in Minnesota.

We are close to ordering NCSF apparel. Shirts, hats and jackets. Be at the March meeting to see what we are considering. We need to know quantities so final prices can be determined.

At the March meeting I will send around the special interest groups listing for a final time. See the listing in the Current Clack.

I hope to see you at the next meeting or under the stars.

CURRENT CLACK

SIGs

It is not too late to make your preference known. If you haven't had a chance to signup and can't make the next meeting let Kevin Bert know by phone.

1) Computers
2) Cosmology & theoretical topics
3) Microscopes / Biology
4) Asteroids / Solar System
5) Astrophotography
6) Video Astronomy
7) Telescope making
8) Telescope accessories & gadgets
9) Astronomical League observing programs
10) Ancient astronomy
11) S&T review of articles
12) Constellations myths and legends
13) Astronomy book reviews
14) Observatories of the world
15) Astronomical Poetry

FOR SALE!

Meade 8 Inch Dobsonian. New!
2 Inch Focuser, 6x30 Finder,
17mm & 26mm 1 1/4 eyepieces.
Asking $400
Contact - Carl Hively (262) -334-0389

EVENT CHANGES & ADDITIONS

Change the October 12th PVN from Pike Lake to Concordia and add the Community Campfire at Pike Lake on September 21st. Another additional public event is the Family Fun Night at Concordia. It will be held on June 14th starting at 5:00.

A Messier Marathon for NCSF members and other groups will be held on March 15 & 16. Start planning for clear and cold viewing and see how many you can find. Contact Jeff Setzer for details.

*(**NCRAL** from page 1)*

Registration postmarked on or before March 31st is $35.00 per person. After the 31st it is $50.00. The Saturday banquet is an additional $23.00 if you elect to attend. I will provide registration forms at the March meeting or you can print your own from the web sites listed later.

Lodging includes blocks of rooms reserved at the Radisson Hotel and the Days Inn, both in Roseville. Both offer shuttle service to the convention site. Each person is responsible for making his or her own accommodations.

You can find out more about the Minnesota Astronomical Society at http://www.mnastro.org/index.html There is a link to a convention site too.

The MAS would like to suggest that non astronomers among family and friends might come to the Twin Cities to enjoy some of the good things to be found there: Mall of America, Como Zoo, Minnesota Zoo, the Science Museum of Minnesota, Children's Museum, and more. I would like to know if you are interested in going to this event. Car pooling is an option. Let me know by phone or see me at the next meeting.

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Check out our great site
On the World Wide Web
http://www.gxsc.com/ncsf

(***AURORA*** *from page 2)*

Auroras, as such phenomena have also been observed on Jupiter and Saturn. For even more information about Auroras explore the Internet or look up: *www.exploratorium.edu/auroras/ .*

In conclusion, the Aurora Borealis is not something millions of light years away but a spectacle that takes place right here above our planet. Anyone can see an Aurora, provided they are in the right location and under dark enough skies. You don't need and expensive telescope, computers or special equipment. All one needs is two eyes and a bit of good timing to catch this celestial treat.

Dear Harold,

Thanks to all of the NCSF folks for coming out to provide an evening of telescope instruction to the guests at this year's candlelight ski/hike evening. It always makes the evening more fun when the NCSF is present with the scopes. When I go over the comment sheets after the event is complete, one of the items mentioned over and over is the fun the visitors had looking through the telescopes. You give them an experience in astronomy that many have never had in their entire lives.

I greatly appreciate your yearly participation in the life of KMSF-Pike Lake. We can contribute many visitor satisfaction and success at the forest directly to your group.

Thanks again.

Sincerely,
Terry Jensen Park Superintendent
Kettle Moraine State Forrest-Pike Lake Unit

SPECTRUM

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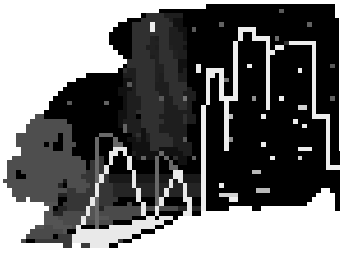

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This Issue, along with back Issues of SPECTRUM, can be found on the NCSF Web Site.