

SPECTRUM

Northern Cross Science Foundation Newsletter

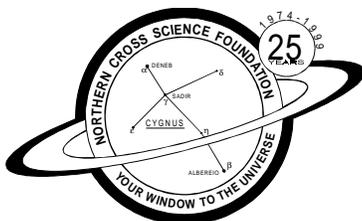
February 2002

LOOKING UP

Feb. 7 Thursday
Monthly Meeting
7:00 p.m.
Telescope Clinic
8:00 p.m.
Show & Tell
Carlson Tool & Mfg.

Feb. 9 Saturday
Ski and Stars
6:00 p.m.
Pike Lake State Park
Hartford, WI

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



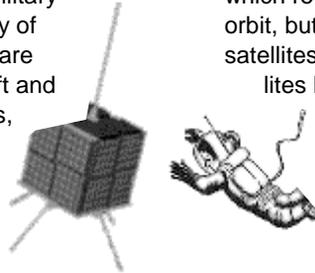
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Satellites

By Dan Bert

Since the first launch of Sputnik in 1957, thousands of, "man-made moons," have been put into Earth's orbit. These objects put deliberately into orbit around our planet are known as artificial satellites. Today satellites are used in everything from communications and military intelligence to scientific study of Earth and space. Satellites are complex pieces of spacecraft and come in many different types, which are used for many different purposes.

Satellites require a tremendous amount of energy in order to reach an orbit high above the earth. This is usually done by the use of a launch vehicle such as a multistage rocket using chemical fuels. Stage one will help lift the spacecraft off the ground and into the atmosphere. Once used, the first stage is released falling back to earth and the second stage takes over, carrying the rocket the rest of the way to a sufficient altitude. Further-



more, if the mission requires it, such as for a geostationary orbit of 22,000 miles, a third stage can be used. Final thrusters will fire to precisely position the satellite and orbit desired. Other methods include launching from a high altitude aircraft, which requires less force to put them in orbit, but it can only be done for smaller satellites. However, placing larger satellites by space shuttle is another option and can even be used to bring satellites back for repairs. Currently, development of a single stage piloted launch vehicle would make launching even more efficient and decrease cost and increase reusability.

Its shape, altitude and the angle it makes with the Earth's equator, defines the satellites orbit. The orbit that will best serve the mission will be chosen with some being elliptical, but most being circular. The altitude will determine how long an orbit

(See *satellites* on page 2)

Special Interest Groups

By Kevin Bert

The last business meeting of the NCSF brought up the possible start up of special interest groups or SIG's. At the previous board of directors meeting I presented a rough outline on how the groups might proceed.

My original thought was to replace a few of the regular monthly meetings through out the year with the interest group meetings. What follows is that original outline.

To complement our future monthly meetings, the NCSF will try something new this

year. Specialized Group Meetings will be held three times a year in place of the traditional Thursday meetings. March, July and November are the selected months. Here ongoing special attention will be given to a topic for a more in depth discussion. A leader or leaders will organize each group and come up with activities or topics of discussion that would be appropriate for the groups specialized interest. In addition to leaders, other participants of the group could be involved in giving presentations if they

(See *SIG's* on page 4)

January Minutes

By Kevin Bert

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

President Jeff Setzer opened the meeting at 8:50 p.m. to over 21 members.

Jeff welcomed all members and shared the results of the board of directors last meeting with regards to officer positions. Jeff will remain as president, Al Steinberg will continue as Vice President. Kevin Bert and Brad Plaumann will continue on with their duties as Secretary and Treasurer.

Polly Frank was nominated and seconded without any objections.

Treasurer Brad Plaumann warned members to beware of some scrupulous telemarketers selling Astronomy magazines at some low rate. It is only a scam. Members were told to ignore them and only order through the club where they will get the lowest rates.

Brad gave the latest balance for the checkbook and savings accounts. He was happy to see a number of membership dues come in and encouraged others that haven't renewed, to do so

soon.

Brad said that he was in contact with Vince Condella from Fox-6. Vince received a 2002 calendar and remembers the interview he did at the NCSF observatory several years ago.

Secretary Kevin Bert reported that he might have gone a little overboard with the photos in the last Spectrum. It was mainly due to the lack of time and articles. He was reluctant to constantly be using internet sites for material and was hoping that more would come from within the club.

He said that he recruited his son to come up with a few future articles. One member offered to contribute to the cause.

Kevin said that work was now progressing on the focusers for the 20 Inch Panarusky telescope. He said that three were started and that he was back on track scheduling modifications for the mirror cell.

Jeff asked for any new club business.

Kevin said that the board was entertaining the idea of starting special interest groups. Kevin briefly explained the ba-

sic idea and how it might work. It was agreed that we should get a feel from the members if a particular topic or topics would be pursued. Several possible topics were tossed out and Kevin said that the program would be detailed in the next Spectrum.

Joe La Piene suggested that we have a show & tell type of meeting for a change. Members that are willing could bring in some thing of interest and give a brief presentation. All those in attendance thought that it was a good idea and it was agreed to try it out at the next meeting.

With no further new business, Jeff noted that he was going to the Nebraska star party this year and was looking for someone interested in sharing expenses at a cabin near the observing site to contact him.

The business meeting was closed by Jeff at 9:00 p.m.

Respectfully submitted,
Kevin Bert, secretary

(satellites from page 1)

takes, with orbiting counter clockwise, and the amount of the planet visible at one time. They can pass over different ranges of the Earth's latitude, some along the equator or the North or South latitudes. All satellites are tracked and if they are too close to each other, they can interfere with radio signals. Therefore they must be kept certain distances apart.

To operate in the harsh environment of space, satellites require special technologies that will be dependable and help to cope with extreme conditions. They must provide their own power

supply, which will vary depending on the satellite's mission and size. Solar panels will unfold and convert the sun's energy into electricity and batteries are used when the spacecraft is not in the sun and during launch. The orientation of the satellite must also be adjusted to keep the solar panels facing the sun and sensors and antennae facing the earth or the object being observed. To do this, an onboard gyroscope and magnets that interact with the Earth's magnetic field are used to direct the spacecraft, using only electric power. Small thrusters can also be fired but have only a limited amount of fuel and are used only for emergency maneuvering. The satellite must also dissipate

the heat from the sun. It is usually equipped with panels that can be adjusted to help radiate heat and will spin to distribute the heat evenly. Finally, a satellite needs shielding from cosmic radiation and micrometeoroid protection for its computers. Overtime, this radiation will cause the materials to become brittle and gradually weaken the solar panels. Overall, a satellite is a highly intricate item, but all will not last forever.

Satellites reach the end of their use when the instruments fail and/or they re-enter the atmosphere. Many fall out of orbit and burn up upon reentry or

(see satellites on page 3)

Star Party Astro Nuggets.

By Kathy Bert

I have had several requests for the recipe for caramel corn puffs. Here are the ingredients and steps.

8 oz. Corn puffs (Old Dutch)
1 1/2 sticks butter.
3/4 cup brown sugar.
3/8 cup light corn syrup.
3/4 tsp. baking soda.

Place corn puffs in a large roaster.

In a large kettle, mix together butter, brown sugar, & syrup, and boil for 2

minutes.

Mix in baking soda, pour over puffs and stir to coat.

Bake at 250 Deg. for 45 minutes stirring every 15 minutes.

Pour on wax paper to cool.

Enjoy.



(satellites from page 2)

continue to orbit lifelessly as "space junk." Specially shielded satellites can be purposely brought down to retrieve information onboard. The amount of orbit decay depends on the altitude, which will determine the level of atmospheric friction the satellite encounters.

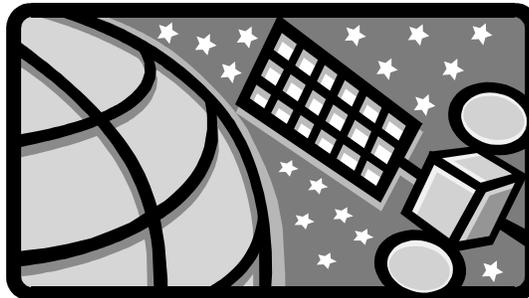
The Franklin Science Institute's web site on satellite history and the benefits they have provided to society states most appropriately that:

"Since Sputnik, the science of satellites has advanced significantly. Specialized satellites now orbit the Earth for telecommunications, global broadcasting, oceanic observations, scientific research, and military purposes, as well as for atmospheric observation. It's amazing to consider the rapid progress and evolution of satellites."

Engineers have developed many kinds of satellites each designed to do a specific mission. To begin with, communication equipment was found on most early satellites. NASA launched the first telephone and television satellite called Telstar 1 in 1962. The Department of Defense's launch of Syncom 3 was the first geostationary orbit satellite which moves near the same speed as the earth thus remaining over the same spot above Planet. Since 1957 over 300 spacecraft have been launched for voice, data and TV that can send sig-

nals around the world and help us communicate quickly with others worldwide.

To help locate the positions of ships, aircraft and cars, they can be equipped with special radio receivers, which will calculate their own location with the use of navigational satellites. Often, more than one satellite is used to give a more exact location with accuracy from 100 m to 1 cm depending on the receiver. The Air Force has a Global Positioning System network of 24 satellites that are available to the public for use.



Satellites have had an enormous impact in the field of meteorology. For the first time man was, "on the outside, looking in." Carrying cameras and other instruments directed at the Earth's atmosphere, they provide advanced storm warning and help with forecasting. Currently NASA has a Geostationary Operational Environmental Satellite series, which provides forecasting and storm tracking info.

They are also very useful today in the scientific field, where they can map the earth and determine its size and shape. Hi-resolution radar can reveal different kinds of features on Earth's surface. Satellites can study the movement of the oceans and the atmosphere. In addition, they can observe the Sun, Moon and stars as does the Hubble Space telescope observatory launched in 1990. Furthermore, there are even artificial satellites orbiting other objects. Ulysses is in orbit around the sun and Galileo, orbiting Jupiter since 1995, are valuable tools in enabling astronomers to study the universe.

Satellites are also crucial in the defense and operations of the military. They are similar to commercial ones but have encrypted data only special receivers can decipher and they are able to take pictures with higher resolutions. The Defense Satellite Communications System uses 5 satellites to transmit voice, data and TV signals between military sites. The Defense Support Program provides warning of missile launches and was put to use in Desert Storm to alert the military of scud missile launches by Iraq. Some like the GPS satellites provide public data as well.

The possible impacts on society from this technology have already been felt

(see *satellites* on page 4)

(satellites from page 3)

in many ways. For instance, cellular phones and telecommunications have expanded considerably from the use of satellite technology. Satellites were the first step in space exploration and sent the first living creature into space. They sent back the first ever pictures of our planet from space. Over 4,800 satellites have been launched into orbit, approximately 2,300 still functional ones

were counted as of May 1997. Whether looking at our own planet or out into the depths of space, "Artificial satellites orbit the Earth, communicating with us from a unique vantage point high above the atmosphere." Overall, I think that they have, and will continue to help people see things that have never been seen before, allowing us to better understand, communicate and exist in the environment, world and universe in which we live.



(SIG's from page 1)

have experience in a relating topic or are willing to research one. These leaders would provide updates in the Spectrum prior to each of the meetings to keep the entire membership clued in on what things each group is doing. The three group meetings each year are the minimum leaders should plan for. They will start at 7:00 p.m. and run for 2 to 2 1/2 hours. There would be no Astronomy 101 class given for that month.

In addition to the yearly three meetings special supplemental meetings can be made within each group independent of the other groups if desired.

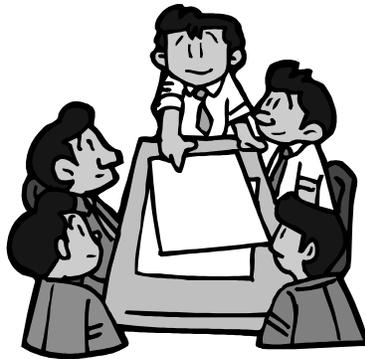
Such might be the case for a particular viewing program that would schedule independent telescope viewing opportunities. A field trip to the planetarium or museum might be appropriate for another group. There could be a workshop session for a group at a members home.

Getting all the members involved in at least one of the groups is the goal. A minimum of three topics will be offered early each year and highlighted in the Spectrum. A sign up would take place to see if any members are drawn to a particular group. If you sign up for a particular group the minimum commitment on your part is to sit in on your groups three yearly meetings if possible. The groups independent meetings are all optional. If any member does not want to commit to any of the groups

for whatever reason, they would be welcome to sit in on any of the three group meetings during the year.

After presenting and talking about SIG's at the board meeting it was felt by some that it might be best to leave the standard format of monthly meetings in place. There was some

doubt that there would be enough interest in even starting a group. As presented it came across like you would be forced into a group too. It was also pointed out that members could only participate in one SIG because they would run at the same time.



I tend to agree with most of those thoughts after thinking it over. The general direction of SIG's might be best served if it were a separate function of the NCSF held independently of regular monthly meetings. It would still be supported by the club and could turn out to be a source for future programs and articles in the Spectrum.

There did seem to be interest in starting some groups at the last meeting. It was agreed that the next step would be to pole the membership on topics for SIG's. Other details of how they would meet and operate will follow later. A list of possible topics were brought up by the membership and are listed next.

- 1) Computers
- 2) Cosmology & other theoretical topics

- 3) Microscopes/Biology
- 4) Asteroids / Solar System
- 5) Astrophotography
- 6) Video Astronomy

Other possibilities.

- 7) Telescope making
- 8) Telescope accessories and 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

I would ask members that have an interest in one or more of the topics listed and a willingness to spend extra time meeting, (above and beyond the normal monthly meetings), to bring your selections to the next meeting. Sheets will be distributed at the Feb. meeting for you to make your selections known. I would also ask if you are willing to help lead and plan activities for any group, that you acknowledge this too.

This is only the first step and could turn out to be an interesting and rewarding venture.



Astronomy 101

By Kevin Bert

There is no 101 class this month.

In place of 101 there will be the annual "Telescope Clinic." Start time is 7:00 p.m. This class will help members and the public if they are having problems with a telescope or related equipment.

Those members that are willing to help

out or give advice for struggling astronomers should bring some tools along.

Next months 101 class will be described in next months Spectrum.



From The Editor

By Kevin Bert

Greeting NCSF members. Public activities have slowed down for winter but a lot of other things are brewing for later this season.

The lead article this month is an informative one about satellites by Dan Bert.

The second article is about special interest groups. Be sure to think about what topics you might want to participate in so we can come up with a list at the next meeting. You are not limited to the ones listed in the article. I think the hardest thing will be to get leaders for each group. We will



cross that bridge when the time comes.

My wife has included recipe for a snack that I like. Give it a try.

There is one public viewing opportunity this month. Harold Rogers informed me that Ski & Stars is set for Feb. 9th. at Pike Lake State Park. If conditions are good there could be close to 1000 skiers. If that is the case we could use a lot of telescopes. As in the past, we will set up in the beach parking lot. No park

New Member

Robert Powell from Mequon

Show & Tell

At the February meeting following the "Telescope Clinic," there will be a show and tell for those members that are willing to bring something in and give a brief presentation. Somewhere in the 4 to 10 minute range would be a good length. Any topic will be welcome.

pass will be needed if you have a scope. The line of cars getting in to the park is usually long after 7:00 p.m. I would recommend getting there by 6:00 p.m. To set up equipment. Remember that the park closes at 11:00 p.m.

I hope we have a few members that will bring in something for show & tell. Please consider a brief presentation.

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



The NCSF 2002 Events

By Kevin Bert

Each year at the January board meeting an attempt is made to set up favorable astronomy dates with events. This year was no different. A tentative list of members and public events were scheduled and will follow next. **Please watch the Looking up section of the Spectrum for specific times and any changes that might take place.** Members nights, in particular, will be added as the year goes on.

MEMBERS EVENTS

May 3 - 4: Fri. – Sat.

NCRAL Convention
Minneapolis, Minnesota

May. 10 -11: Fri. – Sat.

NCSF Camp Out (Marshfest)

Ledge Park
Horicon, WI

Jun. 7 - 10: Fri. – Sun.

W.O.W. Hartman Creek
State Park, Waupaca, WI

Aug. 4 - 9: Sun – Fri

Nebraska Star Party
Merritt Reservoir
Valentine, Nebraska

Aug. 9 -10: Fri – Sat

Northwoods Starfest in
Beaver Creek Reserve
Eau Claire, WI

Sep. 12 -15: Thu. – Sun.

Astrofest
Camp Shaw-wa-nas-see

Kankakee, Illinois

PUBLIC EVENTS

Feb. 9: Saturday

Ski & Stars
Pike Lake State Park
Hartford, WI

Apr. 19 & 20: Fri & Sat

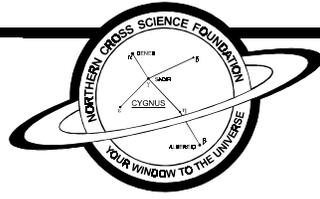
National Astronomy Days
Concordia University
Mequon, WI

May. 17 & 18: Fri & Sat

Public Viewing Night
Pike Lake State Park,
Hartford, WI

(see **EVENTS** on page 6)

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

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Jun. 15: Saturday
Public Viewing Night
Pike Lake State Park,
Hartford, WI

Jul. 13: Saturday
Public Viewing Night
Concordia University,
Mequon, WI

Jul. 31 – Aug. 4 : Wed. – Sun.
Ozaukee County Fair
Fireman's Park
Cedarburg, WI

Aug. 16: Friday
Public Viewing Night
Pike Lake State Park,
Hartford, WI

Sep. 13: Friday
Public Viewing Night
Concordia University,
Mequon, WI

Oct. 12: Saturday
Public Viewing Night
Pike Lake State Park,
Hartford, WI

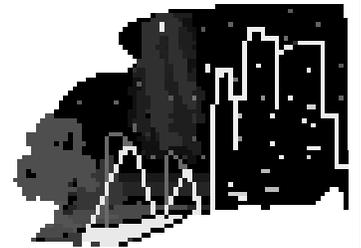


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