STAR STUFF

The Newsletter of the Ford Amateur Astronomy Club

June 2001
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FERA
Ford Employees Recreation Association

Editor: Chuck Boren

^^-- *BEGINNER'S NIGHT MAY 5* --^^

IN THIS ISSUE...

DEPARTMENTS...

President's Note

By Dan Kmiecik

To save the FAAC some money each month, the STAR STUFF editor and I have proposed the following to the board:
"Anyone with a valid email address will no longer receive a copy of STAR STUFF through the U.S. Postal Service. The newsletter will be available online in Adobe Acrobat (*.pdf) format."
The proposal was approved by the board and voted on during the April General meeting by the attending members. The proposal passed.

What we need now is for every member with an email address to write an email to faac1992@hotmail.com. This will allow us to know who to remove from the USPS mailing list and update the current email list for the club.
We are aware that some of you have an email address, but no computer. Please mention this in your email and we will leave your name on the USPS mailing list. If there are any other special considerations that would not allow you to retrieve STAR STUFF online, please let us know. Our intention is to save the club a few dollars every month in postage, not make it difficult for you to get your newsletter.

STAR STUFF online will be password protected. This is done to preserve your member benefits. The password will be 'faac92' (don't type the quotes). Please do not give this password to non-FAAC members. When you click on the link to view STAR STUFF, your computer will launch Acrobat Reader. (Doug has added a link to get this free software on the newsletter web page.) You will be asked for the password. After you enter it, you may read the newsletter online or you may print it.
Thanks for your cooperation and support. ✝

Anatomy of Auroras
By C.Boren

The following is a piece I wrote for the news letter in 1994 when I first became interested in the Club. It was a response to a question concerning Aurora displays, what are they, where can I see one. I hope you find it interesting.

An aurora event occurs when solar particles (solar wind made up of hydrogen ions - protons and electrons) interact with gas atoms in the ionosphere. When our Sun develops a coronal hole or solar flare the solar wind will surge. A coronal hole is a region of the solar corona, low in density that allows the sun's energy to escape in to space. A solar flare is a release of energy that can last for minutes to hours from which x-rays and particles can be emitted in to space. It is these surges of solar wind that is the starting point for an aurora event.

If the earth is in alignment with one of these events, then the particles in the solar wind have a chance to interact with the earth's magnetosphere. This is the top layer of the geomagnetic field. When the electrons and protons encounter the magnetosphere they separate, moving apart and creating a large electrical potential. Much like the sweater and sock in a dryer, one gets an increase of electrons and the other gets an increase of protons. This galactic "static cling" can develop a potential of 20,000 to 150,000 volts. Earth's magnetic field is always conducting some of this current along the magnetic field lines but there are times when the electrical potential is so great that a sudden release must occur and an aurora will be formed.

One of two theories deals with the mechanics that triggers this release. The most popular model required that the magnetotail can become disconnected. The magnetotail is a portion of the magnetosphere located on the lee side of the earth and formed much like a comet's tail by the solar wind. This disconnecting process is a lot like peeling the sock from the sweater. You can hear the result. As the tail separates itself, the formation of an electrical imbalance takes place. An electrical discharged then travels down the magnet lines of force to the ionosphere where the charge interacts with gases causing them to glow.

STAR STUFF is a monthly **E-publication** of the Ford Amateur Astronomy Club, an affiliate club of the Ford Employee Recreation Association.

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http://www.boonhill.net/faac

Your submissions to STAR STUFF are welcome Please write to the address above or contact the editor:

Chuck Boren
Cboren@ameritech.net
Dead line is the 15th of each month for the following month of publication.

Officers:

President	Dan Kmiecik
Vice President	John Ford
Secretary	Mike Kruskie
Treasurer	Mike Bruno

General Meetings:
The Ford Amateur Astronomy Club holds regular general meeting on the fourth Thursday of each month (except the combined November/December meeting held the first Thursday of December) at 5:00 PM in conference room 1491 in the Ford Credit building in Dearborn, Michigan

Observing:
The Ford Amateur Astronomy Club observes at Spring Mill Pond within the Island Lake State Recreation Area near Brighton, Michigan. The club maintains a permit for after-hours access. Weather permitting, the club observes on Friday nights, Saturday nights, and nights before holidays.

Hotline:
Observing schedules and additional Club information is available by calling the Observing Hotline at: (313) 390-5456.

Club Membership:
Membership in the Ford Amateur Astronomy Club is open to Ford employees and non-employees. Write or call for an application.

Annual - New Member: $25; Renewal: $ 20 (before Jan 31 of each year)
Lifetime - $ 150
Membership includes:
A subscription to the STAR STUFF newsletter and the quarterly newsletter the REFLECTOR published by the Astronomical League.
Discounts on ASTRONOMY and SKY & TELESCOPE magazines, after-hours access to the observing site and discounts at selected area equipment retailers.

Membership Dues Are Due

By Michael J. Bruno, Treasurer

Your dues payment should be sent to: P.O. Box 7527 Dearborn, MI 48121 and make your check payable to the Ford Amateur Astronomy Club. You may also pay your dues at the next general meeting to be held on June 28, 2001. Your payment was due by January 31, 2001 to remain an active member with all benefits of the Club. If received after that date you will need to rejoin at the new member rate of $25.

If you have any questions as to your membership status, please get a hold of Mike Bruno through e-mail or by leaving a message on the Hotline. †

Magazine Discounts

Do not send money to FAAC for SKY & TELESCOPE or ASTRONOMY magazine subscriptions. We have a form that you send in with your subscription directly to the publisher to receive a $10 discount. Pick up a form at the next meeting, or contact a club officer. †

Advertisements

For Sale: NEW 800-1200 F9.9 zoom lens. Will fit any camera with t-adapter. $450.00
Chuck Boren 248-777-2108 cboren@ameritech.net

Cont. from page 1
Anatomy of an Aurora
A competing idea revels that turbulent waves of solar wind which move along the magnetotail's outer boundary, inject charged particles onto the magnet lines of force. Like large waves on a lake, a wave's energy slaps up to and long the shore line. The wave deposits whatever it is carrying at the time on to the shore. Successive waves of solar wind will develop a growing electrical potential, and if a particularly energetic wave of solar wind slams into the tail, an electrical discharge takes place. Whatever the trigger mechanics are, each theory agrees that electrons spiral down along the magnetic field lines toward the magnetic north or south pole. When a charged particle enters the ionosphere and encounters an atom of gas, it gives off a given amount of energy to that atom. When the atom of gas receives an amount of energy that it can't hang onto it releases it. In that process, a wavelength of light will be emitted in the color unique to the type of gas the atom is.

As for finding the right place to see an aurora, the farther north (or south) you can be the better. This is because of how the magnetic field converges at the magnetic poles. It is, for the northern lights (Aurora Borealis, Aurora Australis is the southern counterpart) where the charged particles accumulate and the most likely spot to view a display. Places like Alaska or northern Canada experience displays every clear night. However, during solar cycle's

maximum, any place may experience at least one aurora event. A friend of mine who was living on Grand Cayman in the British West Indies, observed one in 1988 at the start of the last solar maximum. During the solar cycle, a period of about eleven years the sun experiences a peak of activity. It's at this time when aurora events are most likely to occur. When an aurora does take place, depending on the aurora's intensity, it can play havoc with Hydro-electric power stations, radio and television transmissions, Satellites, and telephone communications.

The best time during the year is around the vernal and autumnal equinoxes. It's at this time when the angle of the magnetosphere is at the best angle to conduct electrical charges. The most frequent time of the day is around local midnight. This is when the midnight side is under the apex of the magnetotail. However, there have been times when an aurora such as the 8 NOV 91 that started around 6:00 PM local time and lasted all night ✝

2001 Ford Amateur Astronomy Club Calendar of Events and Other Activities

JUNE 15-17, 2001 Doug Bock NCO 18th Annual Summer Solstice Star Party
http://www.boonhill.net/NCO/calendar.html

JUNE 15-17 2001WOW WISCONSIN OBSERVERS WEEKEND sponsored by north east wisconsin stargazers http://www.new-star.org/index.html

JUNE 15-16 2001 APOLLO RENDEZVOUS DAYTON OHIO http://www.mvas.org

JUNE 21-24 2001 The 15th annual Rocky Mountain Star Stare, RMSS
http://www.rmss.org/rmss2001.htm

JUNE 23 2001 Lake hudson state park stargaze
http://home.earthlink.net/~tlcrsr/aaj.html

JUNE 29 JULY 1 2001 Astronomical Convention Londen Ontario
http://www.rasc.ca/ga

Check for updates:
on the FAAC hotline (313) 390-5456
Ford Intranet: www.be.ford.com/astro/faac.html
or the Internet: www.boonhill.net/faac

Observing Asteroids

By Greg Burnett

[This article was first published in Star Stuff, the newsletter of the Ford Amateur Astronomy Club, in June, 1993.]

Asteroids, or "minor planets," are small bodies (by planetary standards) thought to be debris left over from a planet that failed to form due to orbital perturbation resonances. Several thousand asteroids have been identified in orbit around the sun, generally between Mars and Jupiter, forming the so-called "asteroid belt." Many of the orbits are quite eccentric, and there is even a family of asteroids known as the "Earth-Crossers" whose orbits intersect that of Earth. Asteroids range in size from Ceres, the largest with a diameter of 623 miles, down to meteor- and dust-sized particles. There are only about 65 known asteroids with a diameter greater than 100 miles.

As targets for amateur observation, asteroids are generally faint and fast moving. They are too small to show a visible disk, and are difficult to distinguish visually from stars. Their rapid motion usually betrays them, however, and an asteroid can often be identified among a field of stars by simply making an accurate sketch of the field, and then checking back in a few hours to see which "star" moved. More typically, observations on subsequent nights will be required to reveal the asteroid's motion.

There are only 25 asteroids brighter than magnitude 10 at opposition. Vesta, the brightest, reaches magnitude 6 at opposition and can then be seen with the unaided eye under very good sky conditions. Because most are faint, larger telescope apertures are necessary to see them, but there are numerous asteroids within reach of a 6 inch telescope.

The locations of the brighter asteroids are published in the major astronomy magazines from time to time (For example, see "Asteroids Through the Eyepiece" in the June ASTRONOMY, page 53.). More in-depth information on asteroid positions can be obtained from a number of sources, including the Association of Lunar and Planetary Observers and the International Occultation Timing Association.

From time to time an asteroid will occult (eclipse) a visible star. When this occurs, the starlight shadow of the asteroid will sweep a narrow path across the Earth. Anyone in the path at the time will see the star briefly dim or disappear. Because the star is so much farther away than the asteroid, the shadow casts a perfect silhouette and allows the approximate size and shape of the asteroid to be determined from carefully coordinated ground observations. A line of many observers is deployed across the predicted path of the occultation. Each observer accurately (generally +/- 1/10 second) times the beginning and end of the event. From these timings the size and shape of the asteroid are reconstructed. Such observations, by amateur astronomers, are coordinated by the International Occultation Timing Association (IOTA). Occultation timing expeditions offer an exciting and unique opportunity for amateur observing.

the clubspOt
By Daniel J. Kmiecik

The observing clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club and the Herschel 400 Club, the Deep Sky Binocular Club, the Southern Skies Binocular Club, the Meteor Club, the Double Star Club, and the newly formed Lunar Club.

When you have reached the requisite number of objects, your observing logs are examined by the appropriate authority and you will receive a certificate and pin to proclaim to all that you have reached your goal. Many local astronomical societies even post lists of those who have obtained their certificates.

I'll cover the **Lunar Club** in a 3 part series. Included in this issue are the binocular objects. Next month will conclude the series with the telescope objects. If you have a computer and are able to get online, you may visit the Lunar Club page at http://www.astroleague.org/al/obsclubs/lunar/lunar1.html and work at your own pace. You will need a Moon map that lists the features of the Moon and their locations.

Lunar Club Program

The binocular features to be observed for the Lunar Club are listed below. There are five columns: CHK, Object, Feature, Date and Time. The "CHK" column should be used to check off the feature as you observe it. The "Object" column lists the features and tells you what you are observing and when the best time is to observe it. The "Feature" column lists the features to be observed. Finally, the "Date" and "Time" columns allow you to log when you observed the objects.

LUNAR OBSERVING LIST – BINOCULAR OBJECTS

CHK	OBJECT	FEATURE	DATE	TIME		CHK	OBJECT	FEATURE	DATE	TIME
		Lunar Rays					~ 7 days old	Cassini		
		Sinus Iridum						Hipparchus		
		Sinus Medii						Albategnius		
		Sinus Roris						Aristillus		
		Palus Somnii						Autolycus		
		Palus Epidemiarum						Maurolycus		
		Mare Vaporum					~10 days old	Plato		
	CRATERS							Archimedes		
	~ 4 days old	Langrenus						Ptolemaeus		
		Vendelinus						Alphonsus		
		Petavius						Arzachel		
		Cleomedes						Walter		
		Atlas						Maginus		
		Hercules						Tycho		
		Endymion						Clavius		
		Macrobius						Eratosthenes		
	~ 7 days old	Piccolomini						Longomontanus		
		Theophilus						Copernicus		
		Posidonius						Bullialdus		
		Fracastorius						Aristarchus		
		Aristoteles						Gassendi		
		Eudoxus					~ 14 days old	Kepler		
								Grimaldi		