



STAR STUFF

The Newsletter of the Ford Amateur Astronomy Club

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New Editor: John Kmiecik — Please send articles to westpark@mediaone.net by January 31st

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Barney — Ultra Astronomer? By Dave Beard

If you have ever wanted to turn your very young children or grandchildren on to astronomy or outer space, yet were afraid that they would either drool on your scope or tip it over instead of appreciating the wonders of the cosmos, then here is a way to expose them that is sure to work. With the holidays soon upon us, here is a gift that is certain to be used (viewed) at least a thousand times (well, if our house is any example, anyway). That popular children's morning show host Barney has a tape out titled "Barney in Outer Space", which I have seen many, many, many times, and can recommend to you.

The tape starts out appropriately enough, with a star party being hosted at one of the local schools where Barney hangs out a lot. The teacher, a Mrs. Kepler (I'm guessing at most of the names here, as they are not listed as such in the credits), has set up a small refractor (more on this later) in the play yard

of the school, and attracted a small group of four children (perhaps the F.A.A.C. could lend her some advice on getting more people to show up!) to the party. There are a few props about, a model rocket the children are playing with, a model of the solar system, and a large banner proclaiming the party. The children have their club shirts on, and the fun begins.

Mrs. Kepler produces a star map, I think it goes down to magnitude -1, and proclaims that Mars is not due up for another 20 minutes (oddly enough, the remaining length of the tape!), and immediately lays down on a lawn chair for a little nap. Suddenly, Barney pops up, driven by the children's power of imagination. He steps over to the scope and peers through. Now, this scope is an interesting thing, which I would like to purchase some day, if I could find out who makes it. It looks like an ordinary 60mm refractor on a German equatorial mount, but has a 90-degree diagonal, and a straight through prism erector attached to that! No finder, but about six inches from the focuser is another eyepiece mounted at 45 degrees to the tube. I think this arrangement must be investigated as it gives the scope amazing powers! I estimate that the F number on this scope is about F ten billion, which ought to cure any chromic aberration, and probably explains the sharp detail seen through the scope.

Barney spies a purple and green and pink planet, and zooms into a backyard on the planet, where we see a little girl looking through another scope (which defies description, but has the same amazing power as the one Barney is using). The little girl waves at Barney, but when Barney gives the scope to one of the children to look through,

he clumsily bumps it and the view is lost. This is a very realistic show here.

So, Barney, using the children's imagination, turns the model rocket into a life size model, and the children all climb aboard for a trip to outer space, with plenty of songs and games to boot. Give Barney credit, he does talk about the nature of space: no air, no day or night, and no gravity! Boy, do they have fun with that one.

As they leave the earth, they come upon the Space Shuttle going about its business, and an astronaut comes aboard (after politely ringing the doorbell). I think the astronaut's name is Ken Ridler, again, no credits. He talks about space suits, shows short clips of the space program and NASA, and leaves with this bit for the kids; "... and someday we'll go even further, to other planets and maybe even other stars".

The ship flies through a meteor field composed of amazing computer generated geometric objects (and a few giant hotdogs???) and comes upon the sun, and the moon. While zooming in on the moon with their magic video screen, to see where the astronauts landed, they find another Barney character on the moon, Baby Bop, stranded there because she was riding a cow, and her "blankie" fell off and she went after it (There is a lesson here, but I just can't put my finger on it).

Another character, BJ, almost runs into them on his space scooter, and he is brought aboard as well, just before they are about to crash into the planet Barney lost sight of at the backyard tape. Happily, they are beamed safely to the strange planet, right in girl's parents know

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

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Officers:

President	Dan Kmiecik
Vice President	George Korody
Secretary	David Beard
Treasurer	Ray Fowler

General Meetings:

The Ford Amateur Astronomy Club holds regular general meetings 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: \$ 25 renewal: \$ 20
Lifetime -- \$ 100

Membership includes a subscription to the STAR STUFF newsletter, discounts on ASTRONOMY and SKY & TELESCOPE magazines, after-hours access to the observing site, and discounts at selected area equipment retailers.

what type of beings she is beaming into their backyard!).

They engage in all sorts of games and songs, and the little girl brings out here life size dancing robot. I mention this because ever since my own daughter saw this tape she has been after me to build a life size dancing robot.

Eventually, they are beamed back aboard the spaceship for the ride back home, landing perilously close to the sleeping Mrs. Kepler, again without burning her legs off, and moments after the children are all back in their astronomy club jackets, she wakes up, and declares the star party a success.

All in all, I think this is a good tape to turn youngsters on to space and astronomy in a fun and harmless way, it certainly has an effect on my daughter, she now has in her possession two paper towel tube rockets, one wooden robot, a wrapping paper tube telescope she made herself, and a daddy who is frantically looking for a good deal on a used life size dancing robot.

Lake Erie Metropark Ice Daze Festival & Star Watch

By Bob MacFarland

The Ford Amateur Astronomy Club will again be hosting a one hour beginners level astronomy presentation on January 15th as part of the Lake Erie Metropark Ice Daze Festival at Huron-Clinton Lake Erie Metropark Marshlands Museum and Nature Center at 4:00 PM. This hour long presentation includes a slide presentation and discussions which will run through what can be seen, what you'll need to get started and how to find objects in the night sky. Examples of various types of binoculars, telescopes and other equipment will be displayed and their differences will be reviewed. You will have plenty of opportunity to ask any astronomy related questions. Overall, this is a great way to find out more about the hobby of astronomy.

With weather permitting (clear skies, reasonable temperature and wind conditions), FAAC club members will return after dark (est. 7:00 PM) to set up their equipment to show the heavens to everyone while the park authorities build a bonfire adjacent to the museum which will be open for warm ups, restrooms etc. This is a great opportunity to

experience the practical side of the hobby and have veterans available to answer questions.

There are many other interesting activities planned for the Saturday and Sunday Ice Daze event. These tentatively include ice fishing, dog sledding, ice carving, dulcimers, snow snake racing, winter camping and others. Contact the park for details on event date and times.

The Lake Erie Metropark is located at 32481 West Jefferson Ave. in Brownstown, MI. (734-379-5020). From I-75, take the Gibraltar Road exit east 1 1/4 miles to Jefferson. Turn right (south) and travel about 2 miles to the park entrance. There is no cost nor registration fee for any of these activities. However, as always, you'll need either the \$3 daily or the \$15 regular/\$8 senior (62 and older) annual vehicle permit to get into any Huron-Clinton Metropark.

BTW, check out other Huron-Clinton Metropark events at www.metroparks.com.

Lunar Librations by Greg Burnett

Everyone knows that the Moon shows the same face to the Earth all the time. The Moon rotates, relative to the stars, once each time it orbits around the Earth. It didn't start out this way. This synchronous rotation is the result of "tidal locking" between the Earth and the Moon. Initially, the Moon rotated relative to the Earth and the gravitational field of the Earth raised tides in the body of the Moon, which generated "friction" of a sort. The result was a gradual slowing of the Moon's rotation until it fell into lock-step with its orbit, at which point the tidal forces essentially ceased.

However, unnoticed by many is the fact that the Moon does not keep *exactly* the same face pointed at the Earth. It rocks slightly back and forth, and up and down, so that over time we can see somewhat more than half of the moon, actually about 59%. These motions are called "librations" and result from three distinct causes.

"Libration of Longitude" is the apparent side-to-side oscillation of the Moon (the Man in the Moon shaking his head "no") due to the eccentricity, or elliptical shape, of the Moon's orbit. The Moon rotates about its axis at a constant rate, but it orbits around the Earth at a varying speed... a little faster when it is near

perigee, the point in its orbit closest to Earth, and a little slower when it is near apogee, the point farthest away. As a result, the rotation of the Moon gets a bit ahead or a bit behind its movement along its orbit, so it seems to us standing on the Earth that the Moon turns a little bit, first one way then the other, as its rotation leads or lags its orbital position. In fact, the Earth does a similar thing relative to the Sun, since the orbit of the Earth is also slightly eccentric. But the Earth does not exactly exhibit librations relative to the Sun, because the Earth's rotation is not tidally locked. Instead, we see the effect in the "equation of time," which defines the difference between the "Mean Sun," the Sun we tell time with, and the "Apparent Sun," the Sun we actually see in the sky. The Sun moves along its annual path through the sky at a varying speed, so it gets a little ahead or behind the clock, which of course runs at a constant speed.

"Libration of Latitude" is the up and down motion of the Moon (the Man in the Moon nodding his head "yes") caused by the inclination of the Moon's axis of rotation relative to the plane of its orbit. As the Moon orbits around the Earth, it tilts a bit forward, then a bit backward, so we see a little way over the top of the Moon, then a little way under the bottom. This is exactly the same kind of motion that causes the seasons on Earth, since the earth's axis of rotation is inclined 23-1/2 degrees relative the plane of its orbit around the Sun. Thus, in an analogous way, the Sun "sees" more of the Earth's northern hemisphere during our Summer and more of the southern hemisphere during the Winter. The tilt of the Moon is only about 1-1/2 degrees, so its apparent motion is not as large.

Finally, "Diurnal Libration" is the third source of apparent motion in the Moon. This motion occurs over the period of a day, rather than over the course of a lunar orbit as for the other two librations, hence the term "diurnal." As the Moon rises, we view it from one side of the Earth, and as it sets about 12 hours later, we view it from the other side. This change of viewpoint allows us to peek slightly around the edge of the Moon, first one way then the other. To help understand this effect, think of the Moon looking back at us standing at a particular place on the Earth. As he rises, he sees us coming up over the left-hand edge of the Earth (assuming north is up), and as he sets, he sees us disappearing behind the right-hand edge. In that time we will have moved

perhaps a degree or two in his sky, a significant change of vantage point. (Remember, the Earth is about two degrees wide when viewed from the Moon.) This change of position lets us see a little way around the sides of the Moon, first one way as it rises, then the other way as it sets.

The combination of these motions gives us a Moon that wobbles as it moves across the sky. The motions are large enough that they can be detected in naked-eye sketches of the Moon made over the course of several lunations. Your sketches can be checked against librational positions published in the major astronomical magazines.

You can learn a lot more about the Moon at... <http://www.inconstantmoon.com/index.htm> ...which includes a link to a stunning animation showing the librations... http://www.minervatech.u-net.com/moon/not_libr_ac.htm

Book Review By Clay Kessler

"Astrophotography for the Amateur"
Second Edition
By Michael A. Covington

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First Printing 1999

The second edition of this authoritative tome on astrophotography is a welcome update to the revised first edition that I purchased several years ago. Originally published about 15 years ago and revised about 5 years ago the continuing evolution of films and techniques makes frequent updates of this type of work almost a necessity. This is not a book that you will sit down and read cover to cover in one fell swoop. This is far too information packed inside for that. I found it better to read it a chapter at a time and then take some time to "think" about the material presented. The author is very complete in his explanations so when you finish a chapter you understand the processes involved.

All aspects of astrophotography are covered here from simple "camera on tripod" type shots to the most exotic high magnification stuff. There are excellent discussions on methods, film, processing and darkroom techniques, digital processing and cameras. The various appendixes discuss exposures, polar alignment, film, and filters, give plans

for an electronic drive corrector and list resources.

It is hard to call any book on astrophotography a "Definitive Work". Films alone change so fast that data true last week could be totally invalid today, as we have seen with Fuji Supria 400 film. This being said, if I had to choose just ONE astrophotography book - this would be the one I would take.

Highly Recommended!

Leonids From Spain By Bob Lunsford

I was fortunate to witness the Leonid outburst from the southern coastal ranges of Spain. I was with a group fellow observers, which included Rainer Arlt, Cathy Hall, Ralf Koschack, Pierre Martin, Sirko Molau, Juergen Rendtel, and Manuela Trenn. After a quick flight from Berlin to Malaga to avoid clouds and bad weather we stocked up on supplies and set out to find a suitable observing site. We came upon an abandoned hacienda well off the main road that offered a bit of shelter from the elements. We arrived sometime around 2100 local time, some 5 hours before the expected maximum activity. We had time to explore the area searching for the best possible sites to set up. Several people set up close to the hacienda to protect themselves from the wind, which was blowing quite strongly out of the east. Others and myself decided to set up in a field across from the hacienda, which allowed a better view of the sky. To lessen the effect of the wind some of us stacked material from the house beside us on the ground. I faced due east while the others faced in a more northerly direction. The wind was blowing in my face but the excitement of the night lessened the impact the wind was producing.

I started watching at midnight local time, which was 2300 Universal Time. The sky was perfectly clear but the moon was still in the western sky. Luckily it would soon encounter a hill in that direction and be out of our way. Rates were excruciatingly slow that first hour. It took me nearly one half hour to see any activity at all. I was actually happy not to see any Leonids as I was hoping that the maximum would occur a bit late and allow us a better view. My first Leonid was a faint earthgrazer seen at 2354 UT. After 0000 UT rates picked up with 6 being seen during the next 30 minutes and 19 during the next 30-minute period. A surge of activity seemed to commence at 0049 when 3 Leonids were seen

in fairly rapid succession. After 0100 UT rates slowly climbed from 2 meteors per minute to 5 per minute at the bottom of the hour. It was not soon after 0130 that we all knew we were in some something special. Rates soon increased tremendously and we were seeing activity every few seconds with many simultaneous meteors. At 0145 rates were near 10 a minute with Leonids appearing all over the sky. While there were many bright Leonids in the 0 to 2nd magnitude range, most of the activity seemed composed of 3rd and 4th magnitude meteors. Fifth magnitude Leonids were also common near the center of my field of view (which was in Gemini at this time). Between 0145 and 0200 UT it became difficult to assign magnitudes to all the activity seen. I was constantly rambling numbers into my cassette recorder and soon just let it run as there were very few breaks of more than 5 seconds with a meteor being seen. Often there were bursts of 3-4 meteors a second resulting in shrieks of joy and laughter and it was impossible to record all the activity. A one second period at 0156 produced 7 Leonids, 3 simultaneously. At the top of the hour I abandoned all hope of recording magnitudes as I was just missing too many meteors. I simply said "now" each time I saw a meteor and I was often repeating "now" as fast as I could to keep up with the activity. At 0207 the tape ran out without any warning and some activity was lost. Luckily I was checking the recorder every minute and quickly changed the tape. I was also running a camera, which I promptly neglected to advance due to all the excitement.

Rates were still quite strong until 0215 UT when it became apparent that the display was waning. At this point I resumed recording magnitudes and still managed to record an average of 20 meteors per minute until the bottom of the hour. After 0230 UT rates were falling quite steeply and it was then apparent that there would be little left over of the outburst for North America. During all the excitement I was constantly battling my outer bag, which was constantly flapping and being a real nuisance. Also by this time my air mattress had gone flat and I was lying on the

ground. The pillow I had was also too small and I had to prop my duffel bag beneath my head.

One positive note while viewing the waning activity was that the Leonids were becoming brighter with several in the minus magnitude range. The brightest Leonid of the night occurred at 0344 when an -8 shot low into the southern skies creating a train that was seen for 110 seconds. It could be followed in binoculars for another couple of minutes.

Once again at 0401 my tape ran out and this time I could not get the cassette door to open. After fumbling with it for 5 minutes I finally resumed counting. Unfortunately I did not realize that the tape was jammed until 15 minutes later so all activity was lost between 0401 and 0424. I watched for another 12 minutes before being forced to take a 10-minute break due to back pain. I resumed at 0445 lying on my side looking north but I was too exhausted to continue beyond 0500.

It was a crazy night but well worth all the turmoil Mother Nature and Murphy threw at us. I had finally seen my meteor storm! It may not have provided 40 meteors a second but I will take 40 a minute in a heartbeat. Now when and where is the forecast for that next one?

Heard On The Net

From the sci.astro.amateur newsgroup
By Bob Lambeck

In answer to the perennial question "How many astronomers does it take to change a light bulb?" Jim Smith has collected the following answers:

- 1). Ten! One to change the bulb, and nine to argue how their own bulb gives better color.
- 2). None! Astronomers aren't afraid of the dark.
- 3). See the FAQs:
"What sort of light bulb should I buy?"

"Should I start with a candle?"
"Where should I buy my light bulb?"
"Where NOT to buy a light bulb."
"What type of light bulb to avoid?"
"What will I be able to see with my bulb?"
"How do I deal with telescope-pollution?"
"Can I buy a bulb for a friend?"
"Can I use my bulb in the daytime?"

And, finally:

- 4). Just one, if he can shoot straight.

Jim goes on to wonder about mounting an air rifle in place of his finder scope, thereby providing the rifle with an 8" Schmidt-Cass telescopic sight.

NEXT GENERAL MEETING

The next meeting of the Ford Amateur Astronomy Club will be held on Thursday, January 27, at 5:00PM in conference room 1491 in the Ford Credit building in Dearborn.

The program for the meeting has not yet been determined, but as always, pizza and pop will be provided.

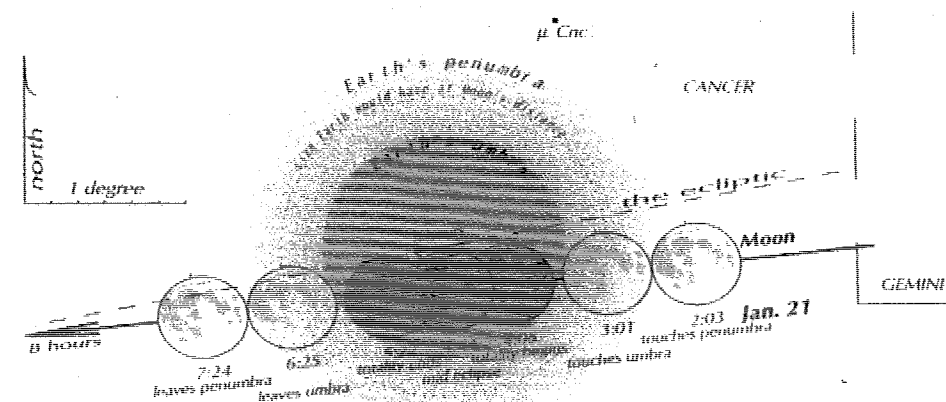
The Ford Credit building is the low building immediately northeast of (but not attached to) Ford World Headquarters. The building is secured with a card entry system. The easiest way to enter for meetings is to park in the lot east of the building and enter thru the lower east or lower northeast doors. At 5:00p no one seems to have much trouble entering, because many people are leaving about that time. At the lower east door there is a manned security desk. Identify yourself, and say you are attending a Ford club meeting, and the guard will admit you. The meeting room is on the lower floor, on the east side of the building, about mid-way along the north-south corridor. Usually, signs will be posted to direct you to the room. ☆

The 2000 FAAC Calendar will be here in February because it is not yet complete. Sorry for the inconvenience. (-John)

Lunar Eclipse at Lake Erie

By John Kmiecik

Attention members! Please come out to Huron-Clinton Lake Erie Metropark Marshlands Museum and Nature Center on January 20th at 8pm to support the FAAC! Greg Burnett will be showing slides of past Lunar Eclipses. Afterwards we will have telescopes setup outside for everyone to view the eclipse. Please see the Ice Daze article by Bob MacFarland on page 2 for directions. Times are in UT right to left on the chart below.



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(All times in text are EST)

Jan. 20

9:03 P.M. – Penumbral eclipse begins: first contact of Moon with Earth's shadow.

10:10 P.M. – Partial eclipse begins: first contact of Moon with Earth's umbra.

11:05 P.M. – Total eclipse begins: Moon becomes wholly inside Earth's umbra.

11:41 P.M. – Full Moon (Moon at opposition to Sun in ecliptic longitude). Moon's center is exactly south of center of Earth's shadow, as measured perpendicularly to ecliptic.

11:44 P.M. – Middle of eclipse: Moon nearest to center of Earth's shadow. The umbral magnitude of the eclipse is 1.330; that is, the umbra reaches across the Moon and another 0.330 of its diameter.

11:47 P.M. – Moon at opposition to Sun in right ascension; its center is exactly south of center of Earth's shadow, as measured perpendicularly to equator.

Jan. 21

0:22 A.M. – Total eclipse ends: Moon reaches farther edge of Earth's umbra.

1:25 A.M. – Partial eclipse ends: last contact of Moon with Earth's umbra.

2:24 A.M. – Penumbral eclipse ends: last contact of Moon with Earth's shadow.

out here to turn in your survey

Please take a few minutes to fill out this very important survey. Please circle your answers. Written surveys must be submitted at the January general meeting or mailed to the FAAC P.O. Box (see page 2 for the address) by January 31, 2000. You may also take the survey online at the FAAC web sites until February 8, 2000.

A proposal has been made for the FAAC to purchase club equipment for members' use.

Should the FAAC purchase equipment for use by club members?

Yes

No

If you answered **No** to the above question you are finished with the survey. See the bottom of this form for directions.

Thank you.

If you answered **Yes** to the above question please continue the survey:

As a condition of keeping our good standing as a club in the Ford Employee Recreation Association we must participate in FERA fundraisers. A proposal has been made to use the funds generated from FERA fundraisers to purchase club equipment.

Would you support and participate in the raising of funds to purchase club equipment?

Yes

No

Are you willing to be the chairperson for a fundraiser during the next year?

Yes

No

Name: _____

If you attend the January general meeting please give your completed survey to Dan Kmiecik, FAAC Club Equipment Committee Chairperson. Thank you.



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