

DIRECTIONS TO DOUG'S PLACE

BASIC OBSERVING SERIES

by Greg Bumett

This article is the ninth in a series on basic observing techniques. This month's entry discusses planetary observing. Previous installments have addressed solar, asteroid, lunar, double star, variable star, star cluster, meteor, and comet observing; the last remaining topic to be covered next month is deep sky observing. Each article discusses the basic techniques and preferred equipment for each type of observing. The goal is not technical depth, but to provide exposure to a wide range of observing alternatives. This may help a novice get started, or broaden the interest of a more experienced observer.

Planetary Observing

Planetary observing presents a variety of challenges to the amateur astronomer. The planets are constantly changing in appearance and position. With few exceptions (e.g. the Sun and the Moon), this is a unique characteristic among astronomical objects, many of which are the very definition of constancy and changelessness. The continuous movement of the planets requires planning and some ability to navigate in the sky for successful observations. Several of the planets present a level of detail in their appearance that will challenge the resolving ability of the amateur scope and the observing capabilities of the amateur.

Only three of the planets, Mars, Jupiter, and Saturn, are really interesting to "look at." The others are interesting mainly to locate and to follow their movements. However, Mercury and Venus do exhibit interesting phases, similar to the Moon, that add to their attraction even though no surface features may be visible. In what follows, we will look at each planet in turn and discuss its noteworthy features.

Mercury is a difficult planet to observe because it is never very far from the Sun. It is best seen at maximum elongation, and even then it is very small and reveals no surface features in amateur scopes. It does exhibit phases, but is usually observed

near half phase because at other times it is just too close to the Sun. It can be challenging even to locate Mercury, and it is worth your while to do so when favorable presentations occur. It is said that Johannes Kepler, who studied planetary motions in great detail, went to his grave without ever seeing Mercury.

Venus is much more easily observed than Mercury, and exhibits very interesting phases and variations in size, which can be followed through nearly a complete cycle. Strangely enough, Venus is seen best during daylight, when its bright glare is suppressed. Through the telescope it looks like a beautiful miniature Moon against the blue of the sky. It is often bright enough to be seen with the naked eye during full daylight, if you know exactly where to look. There have been some claims of seeing surface features on Venus, but such observations are very doubtful in amateur scopes.

Mars provides many interesting surface features and surface activity. Landform markings are easily visible near opposition, and can be compared with the detailed surface maps provided by orbiting spacecraft. The polar caps are visible most of the time, and can be seen to shrink and grow with the Martian seasons. From time to time huge dust storms will obscure the surface features, and their progress can be followed from night to night. The apparent size of Mars varies greatly with its position, from less than 10" (arc seconds) to almost 24" during a favorable opposition. Due to the relative orbital geometry of the Earth and Mars, some oppositions are much more favorable than others. Mars' apparent diameter at opposition varies from 13.8" to 23.8", almost a 2 to 1 ratio, which can make a significant difference in the amount of visible detail.

Jupiter also presents interesting surface detail, although it's not really a surface we are seeing, but the tops of Jupiter's gas clouds. The appearance of Jupiter is fairly constant, although in the past several years significant changes in the Great Red Spot and one of the major belts have been observed. Some short-lived features can also be observed at times. A major attraction

(continued on page 2.)

STAR STUFF

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1994 CLUB OFFICERS

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GENERAL MEETINGS

The Ford Amateur Astronomy Club holds regular general meetings open to the public on the fourth Thursday of the month at 5:00 pm. Meetings are held at the Ford Motor Credit Company (FMCC) building, northeast of the World Headquarters building in Dearborn, in conference room 1583, lower floor, East side of the building.

OBSERVING SITE

The Ford Amateur Astronomy Club has an established observing site, by permit, at the Spring Mill Pond area of the Island Lake Recreational Area in Brighton, Michigan located near the intersections of I-96 and US-23. Observing at this location is usually held on any clear weekend and holiday evenings or as specified in the observing hotline phone message.

OBSERVING HOTLINE NUMBER (313) 248-1941

On Friday and Saturday nights, or nights before holidays, you can call the hotline numbers up to 2 hours before sunset to find out if we will be observing that night. Assume that any clear Friday or Saturday night is a candidate observing night unless something else is going on or if none of the club officers are able to make it.

MEMBERSHIP AND DUES

Membership to the Ford Amateur Astronomy Club is open to both Ford and Non-Ford Motor Company employees. The general public is also welcome to join. The dues structure is as follows:

Annual Individual/Family	\$20.00
Lifetime Membership	\$100.00

Membership benefits include a subscription to the Star Stuff newsletter, discounts on subscriptions to Astronomy and/or Sky & Telescope magazine(s), after hour use of the observing site at Island Lake Recreational Area, and discounts at selected local area astronomical equipment retailers.

NEWSLETTER STAFF

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NEWSLETTER SUBSCRIPTION

A yearly subscription at a rate of \$12.00 is available to those who are not members of the Ford Amateur Astronomy Club. Subscriptions are free to any other Astronomy Clubs wishing to participate in a newsletter exchange.

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(Continued from page 1.)

of Jupiter is the set of four ever-changing Galilean moons, which present an almost continuous parade of transits, eclipses and appulses of every sort. The apparent size of Jupiter varies only a little. At opposition it can be from 44.7" to 49.8" in diameter.

Saturn's main attraction is, of course, its famous ring system. The rings show a great deal of detail that will challenge the best telescopes. They also vary their angle to the Earth, disappearing completely as the Earth crosses the ring plane about every twelve years or so. Saturn is probably the most exciting sight for a non-astronomer to see through a telescope. Saturn varies only slightly in size at any time. Several of Saturn's satellites are visible, but they are constantly up-staged by the wonderful rings and consequently are not nearly as popular as Jupiter's four visible moons.

Uranus and Neptune are something of a challenge to locate and identify. They are too small to present any surface detail in amateur scopes, and indeed Neptune is sometimes easy to mistake for a star. Uranus is at times barely visible to the naked eye in very dark skies, reaching a maximum magnitude at opposition of 5.7. Neptune only reaches magnitude 7.8 at opposition. Neptune's moon Triton is visible in scopes of 6 inches of aperture or more.

Pluto is always a challenge to locate, never being brighter than magnitude 13 to 14. Right now Pluto is actually closer than Neptune, but since it is so small, it is a consistently difficult target. The attraction of observing Pluto is mainly the satisfaction of observing the outermost planet of our Solar System.

Since planets are generally bright (except for Pluto) aperture is not a factor in choosing planetary observing equipment. The name of the game is resolution! This makes refractors, unobstructed reflectors (e.g. tri-schifspiegler), and specialized long-focus Newtonians highly recommended for planetary observing. Apertures of six to eight inches and under are usually adequate. Larger apertures can suffer more from bad seeing than smaller ones, and owners of large reflectors often stop them down with an off-axis aperture mask for planetary observations.

Choosing the right magnification is important for planetary observing. For a particular set of conditions (i.e. target, scope, and seeing), the observer needs to select a magnification that provides sufficient image size for visibility of available detail, but not so much magnification that seeing effects or resolution limitations begin to dominate the image. Therefore, a wide range of eyepieces is desirable. To assist in seeing surface detail, some observers use colored filters. Their purpose is to enhance certain color contrasts, but their effects are subtle at best and their utility should not be overemphasized.

The planets provided the amateur with an endless variety of observing challenges. While deep-sky objects may hold more romance for some, our neighbors close to home should not be neglected.

PRESIDENT'S CORNER

As your club president, I am obliged to provide each month in this column a nugget of sage wisdom, presumably concerning amateur astronomy or some related subject. Well, I am discovering that coming up with a poignant topic on a regular basis is somewhat difficult! I asked my family to suggest some topics, and they came up with a couple of good ideas. One was to give Lambchop's recipe for bubble stuff. Here it is: combine 1/2 cup water, 4 tablespoons of liquid dish soap, and 1-1/2 tablespoons of corn syrup. Mix well, but do not shake. Another suggestion was to consider the question "Should amateur astronomy be admitted as an Olympic sport?" I thought that had a bit more substance as a topic, but really didn't have time to research it sufficiently. Perhaps next month I will be prepared to render an opinion. Till then, good seeing!

Hope to see you soon!

Greg Burnett

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SKY & TELESCOPE NEWS BULLETINS

NEWS OF NOVA CASS

Nova Cassiopeia 1993 has stabilized from a near free-fall in brightness, when it dropped from magnitude 8.5 to near 10.5 in less than a week. Belgian observer Patrick Schmeer pegs the nova near 10.7 now. According to astronomers Steven Shore, Sumner Starrfield, and others, observations with the International Ultraviolet Explorer satellite confirm that the nova's outward-flowing bubble of hot gas has started to condense into an opaque, dusty nebula. They add that the newly formed particles appear to be larger than normal interstellar dust. The equinox 2000 coordinates of Nova Cas 1993 are right ascension 23 hours 41.8 minutes, declination +57 deg 31 minutes.

CLEMENTINE DELIVERS

Planetary scientists are starting to pore over a glut of lunar data being relayed by the Clementine spacecraft, which slipped into orbit around the Moon on February 19th. The orbit is polar and nearly circular, coming about 425 kilometers from the lunar surface at its closest. For the next two months, the probe will survey the moonscape below, creating a huge database of imagery at ultraviolet, visible, and infrared wavelengths, plus a comprehensive map of surface relief thanks to a laser altimeter aboard. Clementine is to leave lunar orbit on May 3rd, the first step en route to an encounter with the near-Earth asteroid Geographos on August 31st.

NEW TIMES FOR COMET SL9

Now we head outward in the solar system. Celestial dynamicists have again refined the times for the forthcoming impact of Periodic Comet Shoemaker-Levy 9 with Jupiter. Its score of nuclei will strike the planet beginning July 16th at 19:26 Universal Time and ending 5 1/2 days later on the 22nd at 7:41 UT. The stated precision here is deceptive, because these times

are still uncertain by some 40 minutes. But they do include the 43 minutes light-time that phenomena from these events will take to be seen at Earth. The brightest nucleus, which is variously designated number 7 or Q, will hit July 20th at 19:12 UT. That will be most favorable for observers in western Europe.

1993 FW's ORBIT REFINED

And from **very** far out in the solar system, we have word on the orbit of the object designated 1993 FW. This 23rd-magnitude blip was discovered last March 28th by Jane Luu and David Jewitt. At the time, it was estimated to lie between 38 and 56 astronomical units from Earth. Now an updated orbit suggests that the orbit of 1993FW averages 43.9 a.u. from the Sun, with an eccentricity of 0.04. That puts it several hundred million miles farther than Pluto. This body is probably a largish member of the Kuiper Belt of comets thought to reside at the outer fringes of our planetary system.

HST CAPTURES "THE" COMET

An early target for the recently repaired Hubble Space Telescope was Periodic Comet Shoemaker-Levy 9, the celebrated train of objects that will crash into Jupiter in mid-July. This past week scientists at the Space Telescope Science Institute unveiled HST's latest images of the comet. Twenty of its nuclei appear in a mosaic made with Hubble's new Wide Field and Planetary Camera between January 24th and 27th. The nuclei now span more than 2.5 arc minutes, which is 605,000 kilometers at the comet's distance. By the time they come crashing in that spread will have grown to many millions of kilometers. The HST images are stunning in that they show that the individual nuclei, none brighter than magnitude 24, have distinct dust tails pushed outward by the Sun's radiation pressure. More material fills the gaps between them. [See COMET.GIF, PEARL*.GIF, SL9*.GIF and SL9_*.GIF in the Astronomy Forum for pictures. GO ASTROFORUM from any "!" prompt.]

NASA: ONE SMALL STEP BACK

For the first time in more than two decades, the budget proposed for NASA is smaller than what the agency received the previous year. President Clinton's fiscal 1995 target of \$14.3 billion for the agency is \$250 million less than last year's. Since the administration remains committed to spending \$2.1 billion on the international space station and sending \$100 million to the Russian Space Agency, cuts will have to come from elsewhere. One major program dealt a severe blow is the advanced solid rocket motor, or ASRM, for the Space Shuttle. There's even some talk of mothballing one of the shuttle orbiters. But the Clinton administration and NASA both say that funds will be available for two major space-science programs already under way. One is AXAF, the Advanced X-ray Astrophysics Facility; the other is the Cassini orbiter, which will head toward Saturn early in the next decade.

Another bright spot for planetary scientists is \$77 million that's been allocated for a spacecraft to survey the Red Planet. Mars

Surveyor will largely take up the mission of the ill-fated Mars Observer, which disappeared last August just before arriving at its destination. Like its predecessor, Mars Surveyor will be a polar-orbiting spacecraft with sensors for a variety of geologic studies. Mission costs will be held at or below \$100 million per year. The launch is tentatively planned for November 1996.

JUPITER ACTIVITY

Spanish observer Agustin Sanchez-Lavega reports interesting happenings on the planet Jupiter. The dark South Equatorial Belt has become something of a mess, with turbulent patterns at all longitudes. Because of this the South Tropical Zone, to the north is no more than a narrow white strip at some longitudes. Meanwhile, the Great Red Spot has shifted abruptly in longitude, and through a blue filter the normally dark spot actually appears white, surrounded by a dark ring. If you've got observations, please drop us a line at P. O. Box 9111, Belmont, Mass. 02138.

CASTALIA, THE PEANUT

Radar specialists Scott Hudson and Steven Ostro have produced the first- ever detailed, three-dimensional reconstruction of a small asteroid that buzzed the Earth in 1989. The object, 4769 Castalia, was discovered by Eleanor Helin of JPL at the Palomar Observatory in 1989. Quick work on the part of Ostro resulted in a set of radar echoes using the Arecibo telescope. From those data, he and Hudson have shown that Castalia is about 2 km across and has two distinct lobes, much like an exaggerated peanut.

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AURORA REPORTS

Several members observed the auroral activity on the evening of February 21 and filed these reports:

On the way to Island Lake I first spotted the aurora out of the truck window while approaching the 275 - 96 interchange. This was at about 9:40pm. Traffic was heavy making it difficult to watch the rest of the way there. Arrived at Spring Mill pond at 10:00 and immediately set up a camera and tripod to try some photographs. The aurora was a diffuse glow spreading about 60 degrees either side of due north and extending about 30 degrees up from the horizon. Occasionally there were curtains in small areas, 10 to 20 degree square, that showed some shimmering but no movement. They would only last for a minute or two. Most noticeable were narrow vertical streamers about 5 degrees wide that would extend from the horizon up 30 to 50 degrees. They were stationary but would last from 3 to 8 minutes. The best show lasted under a minute. These were narrow horizontal bands that started near the horizon and swept rapidly toward the zenith. There were about 4 or 5 bands visible at a time and it looked like waves sweeping along. For the most part the aurora was pale white, only the very brightest patches show a pale green tint. The nearly full moon washed it out quite a bit. The peak was over by 10:30 and all hints of the aurora were gone by 11:00pm.

- John St. Peter

I saw the aurora from my bedroom window in Saline at between 9:50 and 10:00 PM. It was quite green at times and several times got very bright in patches just above the tree line and covering areas of sky about the angular size of the house on top of the hill (you had to be there to appreciate it.) I was the first on I have seen. My wife and daughter also enjoyed it. My wife said it gave her goose bumps. My daughter said it looked liked clouds.

- David W. Lee

I too saw the aurora, it was pretty much the same at my place as John reported. The moon played havoc on the dimmer sections. I was able to see the first hint of aurora about 8:30, as it slowly expanded above the din of Flint. It was mostly a ghostly white band that arched from the NW to the NE. Later several vertical spikes came and went through the next hour or so. I was fortunate in that I could watch it out the northern doorwall from inside the house. It was quite clear last night and I did venture out for awhile. Overall it was fun to see an aurora again.

- Doug Bock

My wife and I saw the aurora last night between 9:15 and 10:30 from our home in West Bloomfield. The aurora peaked around 9:30. There were parts that became exceptionally bright green. Patches of aurora would form and then move across the sky. In fact, I'm pretty sure I saw the auroral oval starting northwest from the horizon, rising to about just below the north star, and going northeast. The oval was at first a diffuse greenish glow. I thought at first that perhaps it was cirrus clouds. I looked around and Orion was crystal clear! Then all of a sudden bright patches would form from the oval. the oval would grow extremely bright green. When it did, all kinds of streamers encircling the north would broaden and grow taller. The patches would dance back & forth and pulsate in brightness. When the patches would first form, the leading edge would turn red for only an instant.

From 10 p.m. on, streaks of green would sweep the sky from west to east as high extremely fast as the pan of the big dipper. It was awesome! I got cold so I started watching from my bedroom window which faces northwest. I could see the aurora easily through my windows. I finally went to bed around 11:30 and the aurora seemed to have gone. I listened to WWV at 18 minutes past the hour. They announced a boulder a index in the 20's and k index from 5-7. They also said there was a polar cap disturbance and a satellite proton event in progress. This display I'm sure ranked high among the best auroras during the last solar maximum.

- Greg Miller

From Clinton Township MI: At 11:00pm EST I step out for a few minutes and observed from my very light-polluted deck. I saw a faint glow about 10 degrees above the north horizon extending east and west 45 to 60 degrees. From time to time one or two narrow vertical streamers were visible, extending to about 60 - 70 degrees altitude. Observed about 10-12 minutes total; saw 4-5 streamers all together.

- Greg Burnett

ASTRONOMY WORKSHOP

By Gary W. Miller, Star Gazer



PROFS: gmille12
FAX: 84-55349
(call if something has been sent)
PHONE: 84-54150

This is the seventh installment of this column. This month's offering comes from Chuck Boren and because of its completeness, I've used it for the entire column. Excellent job, Chuck!! You others out there in Astronomy land don't have to provide such detailed answers as Chuck, even one liners are acceptable. Come on people....take out your trusty pens (or keyboards) and write something. You never know how good you are unless you try.

Q20. What causes the aurora? Where is the best place to see it?

A20. 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 this surge 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 discharge then travels down the magnet lines of force to the ionosphere where the charge interacts with gases causing them to glow.

A competing idea reveals 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 along 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 electrical power supplies, radio and television transmissions 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 started around 6:00 pm local time and lasted all night long. CBoren

Q16. How can anybody (earthly being) take a picture of Our Own Galaxy?

Q17. What would be a basic set of filters to acquire?

Q18. What basic star charts do recommend?

Q21. What are "deep-sky" objects?

Q23. Would you recommend some "necessary" accessories to add?

Q24. What are "enhanced coatings" and what do they do?

Q25. What are your suggestions to reduce light pollution?

Q26. Is it ever the same day all over the world? If so, when, and what time is it here (EST) then?

Q27. When you place an off-axis aperture mask on a Dobsonian (or any large Newtonian reflector) to increase its resolution, eg. for planetary observing, you have actually created a new optical configuration. What is that configuration called and why was it so named?

OBSERVATIONS: Well, from where I sit the sky is still overcast and probably will be for some time to come. This can sure be a frustrating hobby...if you let it be. I think that the purpose of a hobby like Astronomy is not necessarily to be out under the stars all the time (although it would be nice to SEE them sometime). But rather to read about other aspects of the hobby, maybe discover how we fit into the grand scheme of

things, understand your equipment better, talk to and learn from others, contribute to Star Stuff, and to plan your future observing sessions so that when the "chance" observing session occurs, the time spent will be utilized to the max! I am developing an observing method that forces me to plan several "seasonal sessions". A seasonal session is one where, when certain portions of the sky are available, they are studied in greater depth, like the Zodiac. It forces me to learn portions of the sky better. This way my productivity goes up based on pre-planned session. It's easy to prepare several sessions ahead and wait for the proper portion of the sky to "come to you". Another way would be to make a catalog of objects to find based on seasonal observing and organized on a standard logsheet. Then when you are "out there", all that has to be done is to fill in the blanks. Don't despair, the clouds WILL go away....we just need to hire the proper person to chant or dance for us. Is there a "clear skies" chant or dance?

Until next time.....clear skies.

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OBSERVATIONAL POTPOURRI

From John Paul St. Peter...

Last night (2-17) Harry Kindt and myself made our first expedition of the year to Island Lake. The parking lot at Spring Mill Pond is plowed and dry. The sidewalks and all else are snow covered. We observed from 9pm till midnight. Even with the half moon deep sky objects were fairly easy. The seeing was very good. The 7.5" double star in the middle of M47 looked wide enough to drive a shuttle through even with the lowest power eyepiece. We used Burnham's handbooks as our guide and worked through all the objects in Canis Major and Puppis that had writeups. Then off to Leo and Canes Venatici for some of their highlights. We also spent some time looking at stars of various spectral types to see how good we could judge subtle differences in color. The night was warm, compared to the last couple of observing sessions, with a slight breeze. The only problem was that our feet got very cold very fast on the asphalt. That's what caused us to pack up at midnight. That's all for now.

Also from John Paul St. Peter.....2/21/94

Occultation of 52 Europa: I set up the 17.5" dob and managed my first glimpse at about 10:30. The field was easy to find because of the bright stars which bracket it. I was surprised to see how far the asteroid was from the target star, almost a full arc minute. Never having tracked the motion of an asteroid before I found it hard to believe that it could cover that much distance in under two hours (it did). Seeing was very good and even near the moon I was able to see stars slightly fainter than 13th magnitude. The asteroid appeared about half a magnitude brighter than the target star and occasionally showed a yellow tint otherwise it was pale white. The target star appeared white. At midnight the separation was about 10 arc seconds and the seeing was staring to turn bad. Closest approach was at about 12:20. I was unable to resolve the pair within 5 minutes before and 10 minutes after this time. I don't think I would have been able to detect the occultation even if we were under the path due to the

poor seeing. At 12:30 I was thoroughly frozen. A strong north wind had kicked up about midnight and low clouds were moving in. By 12:45 it was overcast. The Pond: Shortly after arriving I heard what sounded like a gunshot then a long guttural groan that lasted many seconds then finally a splash and water gurgling. Did someone bag a moose crossing the pond? No, just the ice breaking up. Even though I knew what it was it still sent a shiver up my spine each time it happened. That's all for now.

Excerpts from the *Starlog of Judy Doelker* - 2/13/94...

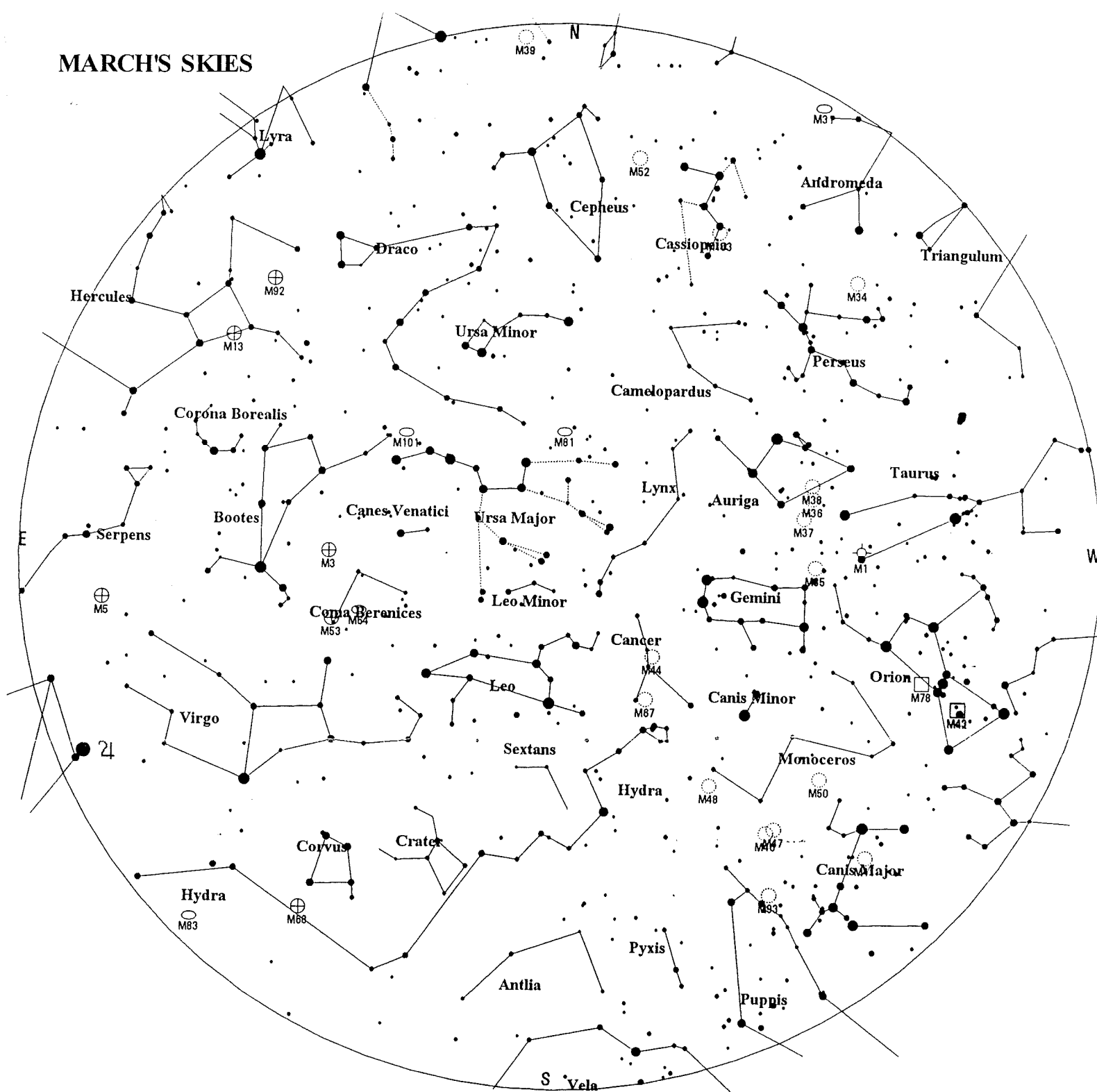
A glorious day with an eye on the sky!. And quite busy. Some friends and my husband, Fred, and I ski about 12 kilometers of the Vasa Trail in Acme, MI. Temp is about 25-27° and some wind in the open areas. It's mostly cloudy, but there is some blue sky here and there. The skiing is wonderful-great snow with about 3-4" of fresh powder on top. All the while I watch the sky in anticipation of the clear night forecast by the weather service. Weatherman says we'll be able to see stars tonight!!! Oh, yeah!!! I have brought my 8" Celestron SC "Tele 1" in hopes of a clear night in the north country where the air is clean and the stars are bright. I am not disappointed...

...Now the fun really begins. On the way out we witness the first of many great sights of the night - as we make our way out from the trees lining the beach a meteor plunges into the atmosphere in a fiery trail that seems so close we could touch it. The meteoroid burns up with a streaking bright white fire that turns to orange and grows fatter and then finally seems to break up and fade. The meteor had a definite "head" that was orange-like and burning the entire time. I first noticed it coming out of Andromeda and passing through Cassiopeia and Cepheus, finally breaking up just inside Draco. The train lingered a bit, but faded a little faster than I thought it would. I thought I noticed a burning smell, but that could have been someone's fireplace. The entire event lasted only about 4-5 seconds, but I think we missed the first part. I estimate the time to be 8:05 p.m.

After I catch my breath, we continue onto the ice - to about 100 yards out. The water underneath us is about 40 feet deep and it's quite unsettling to think that I'm trusting a mere 10 inches of ice to keep my scope and myself above water. ...I turn on the clock drive and the stars seem to stand still in my view so we must be pretty closely aligned. I'm just about to locate the Great Orion Nebula when Fred yells out "Oh no!!!" My first thought was that the ice was cracking underfoot, but I soon realized this was going to be an extraordinary night in other ways. Fred has discovered a faint light in the northern sky that is growing brighter and brighter, forming an arc from NW to NE covering about 90° of the horizon. Then a double band appears - a bright greenish-white glow. They merge into one dense band and fingers start reaching up, alternating into a curtain of greens. Tints of red begin to appear. The show of the Northern Lights goes on and on and I don't know what to do. I'm frantic trying to decide where to look - at the spectacular aurora borealis or through the scope to take advantage of these extremely clear skies. I decide to watch the Northern Lights since they are so

(continued on page 10)






MARCH'S SKIES



STARS	SOLAR SYSTEM	Legend	NOTES
<ul style="list-style-type: none"> • <1 • 1.5 • 2 • 2.5 • 3 	<ul style="list-style-type: none"> ☿ Mercury ♀ Venus ♂ Mars ♃ Jupiter ♄ Saturn ♅ Uranus ♆ Neptune ♇ Pluto ☄ Comet 	<ul style="list-style-type: none"> ☐ Galaxy ⊕ Globular Cluster ○ Open Cluster ⊛ Planetary Nebula □ Diffuse Nebula ○ Other Object 	
Local Time: 23:00:00 15-Mar-1994	UTC: 04:00:00 16-Mar-1994		Sidereal Time: 10:00:52
Location: 42° 30' 0" N 83° 17' 59" W	Centre Az: 180.0° Alt: 90.0° Field: 180.0°		Julian Day: 2449427.6667



March 1994

SUN	MON	TUE	WED	THUR	FRI	SAT
		1	2	3	4 	5
			Jupiter 2° N. of Moon		LAST QUARTER MOON	
6	7	8	9	10	11	12 
			Mercury 5° S. of Moon	Mars 7° S. of Moon Saturn 7° S. of Moon		Messier Marathon at Doug Bock's, 2:00pm NEW MOON
13	14	15	16	17 	18	19
	Mars 0.4° N. of Saturn	Moon at apogee	Crestwood Planetarium *	Crestwood Planetarium *	Crestwood Planetarium *	EMU Astronomy Club Open House
20 	21	22	23	24	25	26
Vernal Equinox, 3:28 p.m. FIRST QUARTER MOON				The Ford Amateur Astronomy Club meeting .		E.M.U. "Freeze Out" Conference
27 	28	29	30	31	* Crestwood Planetarium - 1 hour program featuring: SPRING SKIES FOR LITTLE PEOPLE, a program for children ages 3 to 8. Starts at 7:30pm. Cost-\$1 adult, \$0.75 children. Reservations recommended. Call during school hours at 278-0424. Crestwood School District Planetarium, 1501 N. Beech Daly, Dearborn Hts., MI	
FULL MOON	Moon at perigee	Jupiter 2° N. of Moon				

NEXT MONTH

The Ford Amateur Astronomy Club general meeting is April 28th!
Star parties at Doug Bock's, Crestwood Planterium April 19-20, Astronomy Day April 16th!



MEETING ANNOUNCEMENT -- MARCH 24, 1994

The Ford Amateur Astronomy Club holds regular general meetings on the fourth Thursday of each month. Our next meeting will be Thursday, March 24, at 5:00 p.m.

The program for the meeting has not yet been determined, but you can be certain that it will be well worth your while, as always!

WE HAVE ADOPTED A NEW CONFERENCE ROOM FOR OUR MEETINGS:

The Ford Amateur Astronomy Club meets in the Ford Motor Credit Company (FMCC) **conference room 1583**, located on the lower floor on the east side of the building. FMCC is the low building immediately northeast of (but not attached to) Ford World Headquarters in Dearborn. The FMCC building is secured with a card entry system. The easiest ways to enter the building for meetings is to park in the northeast lot (Employee Lot 7) and enter through the lower northeast door or the lower east door. At 5:00 p.m. no one seems to have much trouble getting in because many people are leaving around that time. At the east door you can press the security button and advise the "tele-guard" that you are here to attend a F.E.R.A. club meeting, and they will admit you. You may, of course, find your way into the building any way you see fit, but I will post direction signs only between the lower northeast and lower east doors and the meeting room.

IMPORTANT UPDATE about building access: Controlled doors are presently being installed to secure access to the lower floor from the front (south) building door. If any folks have been entering there because there was no security, that will no longer be the case. Your best bet will be the lower northeast door; the receptionist will not let you in at the front door.

STATISTICALLY SPEAKING....

Dearborn, MI

Latitude: 42°22'00" N Longitude: 83°17'00" W

Local Time = UT - 5.00 hours Elevation: 180 meters

Times are in 24 hour format.

Abbreviations used in reports:

FQ First Quarter Moon
FM Full Moon
LQ Last Quarter Moon
NM New Moon
SR Sunrise
SS Sunset
MR Moon Rise
MS Moon Set
UT Universal Time
MEQ March Equinox

March 1994

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		SR: 7:09	SR: 7:07	SR: 7:06	SR: 7:04	SR: 7:02
		SS: 18:23	SS: 18:24	SS: 18:25	SS: 18:27	SS: 18:28
		MR: 23:16	MR: None	MR: 0:27	MR: 1:33	MR: 2:32
		MS: 8:52	MS: 9:33	MS: 10:19	MS: 11:11	MS: 12:08
				LQ: 11:55		
6	7	8	9	10	11	12
SR: 7:01	SR: 6:59	SR: 6:57	SR: 6:56	SR: 6:54	SR: 6:52	SR: 6:50
SS: 18:29	SS: 18:30	SS: 18:31	SS: 18:32	SS: 18:34	SS: 18:35	SS: 18:36
MR: 3:23	MR: 4:06	MR: 4:44	MR: 5:16	MR: 5:45	MR: 6:12	MR: 6:38
MS: 13:09	MS: 14:12	MS: 15:16	MS: 16:18	MS: 17:20	MS: 18:20	MS: 19:19
						NM: 2:07
13	14	15	16	17	18	19
SR: 6:49	SR: 6:47	SR: 6:45	SR: 6:44	SR: 6:42	SR: 6:40	SR: 6:38
SS: 18:37	SS: 18:38	SS: 18:40	SS: 18:41	SS: 18:42	SS: 18:43	SS: 18:44
MR: 7:04	MR: 7:32	MR: 8:01	MR: 8:33	MR: 9:09	MR: 9:51	MR: 10:38
MS: 20:18	MS: 21:17	MS: 22:15	MS: 23:12	MS: None	MS: 0:07	MS: 1:00
20	21	22	23	24	25	26
SR: 6:37	SR: 6:35	SR: 6:33	SR: 6:32	SR: 6:30	SR: 6:28	SR: 6:26
SS: 18:45	SS: 18:46	SS: 18:48	SS: 18:49	SS: 18:50	SS: 18:51	SS: 18:52
MR: 11:31	MR: 12:30	MR: 13:34	MR: 14:41	MR: 15:52	MR: 17:05	MR: 18:20
MS: 1:50	MS: 2:35	MS: 3:16	MS: 3:54	MS: 4:29	MS: 5:02	MS: 5:35
EQ: 7:16						
MEQ: 15:26						
27	28	29	30	31		
SR: 6:25	SR: 6:23	SR: 6:21	SR: 6:19	SR: 6:18		
SS: 18:53	SS: 18:54	SS: 18:55	SS: 18:57	SS: 18:58		
MR: 19:37	MR: 20:54	MR: 22:09	MR: 23:19	MR: None		
MS: 6:09	MS: 6:46	MS: 7:26	MS: 8:12	MS: 9:04		
FM: 6:11						

Planet View Info Report for 3/ 1/1994 to 3/31/1994

Mercury							
Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST (AU)
3/ 1/1994	6:15	16:55	21h40m14s	-11°06'17"	16°44'43"	0.150	0.66820
3/ 8/1994	5:55	16:24	21h39m57s	-12°48'45"	24°11'51"	0.326	0.75437
3/15/1994	5:45	16:16	21h56m56s	-12°52'18"	27°17'08"	0.471	0.85714
3/22/1994	5:40	16:22	22h24m27s	-11°29'37"	27°30'03"	0.582	0.96019
3/29/1994	5:36	16:40	22h58m17s	-8°53'29"	25°47'12"	0.672	1.05793
Venus							
Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST (AU)
3/ 1/1994	7:41	19:13	23h27m24s	-5°02'05"	10°27'11"	0.984	1.67800
3/ 8/1994	7:32	19:31	23h59m20s	-1°28'43"	12°08'21"	0.979	1.66513
3/15/1994	7:23	19:48	0h31m03s	2°07'01"	13°49'59"	0.972	1.65000
3/22/1994	7:14	20:05	1h02m49s	5°40'52"	15°32'13"	0.965	1.63248
3/29/1994	7:06	20:23	1h34m51s	9°08'37"	17°15'00"	0.956	1.61259
Mars							
Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST (AU)
3/ 1/1994	6:39	16:59	21h50m22s	-14°15'03"	15°16'59"	0.991	2.32094
3/ 8/1994	6:25	17:00	22h11m37s	-12°21'31"	16°47'22"	0.989	2.30718
3/15/1994	6:11	17:01	22h32m33s	-10°22'09"	18°16'21"	0.987	2.29320
3/22/1994	5:56	17:02	22h53m13s	-8°18'07"	19°44'00"	0.985	2.27903
3/29/1994	5:41	17:03	23h13m37s	-6°10'37"	21°10'25"	0.983	2.26476
Jupiter							
Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST (AU)
3/ 1/1994	23:37	9:53	14h50m01s	-14°57'39"	115°36'17"	0.993	4.93467
3/ 8/1994	23:09	9:26	14h49m42s	-14°54'54"	122°42'19"	0.994	4.83499
3/15/1994	22:40	8:57	14h48m46s	-14°49'31"	129°56'06"	0.995	4.74279
3/22/1994	22:11	8:29	14h47m15s	-14°41'38"	137°16'56"	0.996	4.65972
3/29/1994	21:40	8:00	14h45m12s	-14°31'27"	144°43'57"	0.997	4.58719
Saturn							
Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST (AU)
3/ 1/1994	7:01	17:40	22h23m50s	-11°33'07"	6°48'38"	1.000	10.77997
3/ 8/1994	6:35	17:17	22h27m02s	-11°15'15"	12°54'46"	1.000	10.75996
3/15/1994	6:10	16:53	22h30m11s	-10°57'40"	19°03'06"	1.000	10.72770
3/22/1994	5:44	16:30	22h33m16s	-10°40'31"	25°11'39"	1.000	10.68358
3/29/1994	5:18	16:06	22h36m14s	-10°23'56"	31°20'15"	0.999	10.62822

Planet Apsides Report for 2/94

Mercury			
3/23/1994	Aphelion	Distance from Sun:	0.47 AU

Planet Conjunction/Opposition Report for 3/1/1994 to 3/31/1994

No Events

Moon Apsides Report for 3/1/1994 to 3/31/1994

Date	Hour	Apsis	Distance (km)	Diameter
3/15/1994	12	Apogee	405887	0.4907*
3/28/1994	1	Perigee	357968	0.5564*

Twilight Report for 3/1/1994 to 3/31/1994

Date	Sun	Rise	Set	Astronomical	Begin	End	Nautical	Begin	End	Civil	Begin	End
3/ 1/1994	7:09	18:23	5:31	20:00	6:04	19:28	6:36	18:56				
3/ 8/1994	6:57	18:31	5:20	20:09	5:52	19:36	6:25	19:04				
3/15/1994	6:45	18:40	5:07	20:17	5:40	19:44	6:13	19:12				
3/22/1994	6:33	18:48	4:54	20:26	5:28	19:53	6:01	19:20				
3/29/1994	6:21	18:55	4:41	20:36	5:15	20:01	5:48	19:28				

MEETING MINUTES - FEBRUARY 24TH, 1994

The meeting was called to order at 5:00pm by President Greg Burnett. There were 30 club members and visitors in attendance. Menus for ordering food were passed out by Carolyn Patterson and introductions were made.

President's Report: Greg Burnett made general announcements concerning upcoming events; EMU Freezeout Conference, Feb 26th. Messier Marathon at Doug Bock's, Mar 12th and general observing on Mar 5th. An invitation was received from the Eagle Astronomers to observe in Ontario.

Vice President's Report: Brian Gossiaux announced that the idea of changing the FAAC name to Ford Astronomy Club received a very negative response and that the idea will be dropped. Brian further announced that he has made our Star Stuff newsletter available on the Stargate BBS (214-578-7618) based in Dallas, TX. Copies of the Spyglass Network Newsletter acquired from Stargate were passed out. Treasurer's Report: Al Czajkowski stated the club's financial standing and reminded members that it is time for annual dues. There is a March 1st deadline for dues with subscriptions to S&T or Astronomy magazines.

Observing Reports: Judy Doelker described the aurora of the 21st as she observed it from Traverse City. Judy also demonstrated a 'hands free' red observing light. John St. Peter gave his report on the aurora and 52 Europa observations from Island Lake. Chuck Boren is seeking all auroral observation reports so that he may forward them to the Aurora Hotline and Spotting Network. There is a chance of upcoming auroral activity Mar 6th, +/- 3 days. Paul Mrozek has available a contact correction chart for the May eclipse.

May Annular Eclipse: Through discussion it was decided that club members would split into two groups. Those wishing to observe on the 'center line' and those wanting a local event. Leaders were chosen for each group. Center line: Mark Ten Brink, 59-41266, Profs=MTENBRIN Local event: Chuck Boren, 24-83664, Profs=CBOREN

Main Presentation: Guest speaker Barry Craig of the Detroit Astronomical Society gave a presentation on Video Astronomy followed by questions and answers. Greg presented Barry with a copy of the Audubon Handbook on Stars and Planets as a memento of his visit. The meeting was adjourned at 6:30pm.

MESSIER MARATHON - MARCH 12TH

The details of the March 12th Messier Marathon at Doug Bock's Northern Cross Observatory were somewhat poorly communicated at the last club meeting.....

Doug will be hosting an astronomical extravaganza beginning at 2:00pm and lasting until the last weary observer drops over. A Messier Marathon will be conducted for those wishing to participate, with general observing for everyone. The festivities will include games and a barbecue. Here are directions to Doug Bock's Place.....

I-96 West to US-23 North...

US-23 North about 10 miles to Clyde Road (exit 70) east (right)...

Clyde road east about 1/2 mile to Hartland Road north (left)...

Hartland Road north about 2 miles to 6383 Hartland, on the left (west) side of the road.

If you've not been to Doug's before, try to arrive before dark to drive in and set up. Call the FAAC Hotline for any additional information.

□

COMET HALLEY STILL BEING TRACKED

On January 11th astronomers at the European Southern Observatory used the 3.5-m New Technology Telescope to image Comet Halley. They did this by making nine 25-minute exposures with a CCD camera and visual filter tracking at the comet's predicted position and

motion. The exposures were then combined into three trios of images which showed the comet's motion to be within 5 percent of what was expected. The comet's visual magnitude was estimated to be 26.5 making it the faintest images of Halley ever recorded. Comet Halley is currently on the outbound leg of its orbit at a distance of 18.8 AU from the Sun. This information is from IAU circular 5935 dated February 18th.

□

Starlog of Judy Doelker - 2/13/94...(continued from page 6)

rare to me. Finally they die down a bit and I'm drawn to my scope.

The green-white nebulosity in the Orion Nebula is showing it's usual beauty, but the dark clouds obscuring the path of light are showing an extraordinary amount of detail. It looks to me like an eagle with wings outspread as far as possible. Next I get out my list of star clusters I'd like to find this weekend (preparing for the March 12 Messier Marathon) and search out M41 in Canis Major. Next is Melotte III (Klingon opera?) and M53 in Coma Berenices. These northern skies are very friendly, and finding these clusters is very rewarding. As I begin to search for M46 & M47 in Puppis, the Northern Lights are turned on again and I am treated by Act II. These spires reach even higher in the sky, but are very thin and hair-like. The stars behind them are beautiful. The show takes an intermission, and it's back to "Tele 1" and M93...These are the nights I dream about all summer long.

Ford Amateur Astronomy Club

Star Stuff Newsletter

P.O. Box 7527

Dearborn, MI 48121

