

*The  
Ford  
Amateur  
Astronomy  
Club  
Newsletter*



*Astronomy Day!*

April

16

Volume 3 Number 4

April 1994

## BASIC OBSERVING SERIES

by Greg Burnett

This tenth installment of "Basic Observing" was to have been the last in the series. However, upon considering the topic, deep-sky observing, it seemed best to address nebulae and galaxies separately; galaxies will be handled next month. Previous entries have addressed star cluster (also usually considered deep-sky objects), solar, asteroid, lunar, double star, variable star, meteor, and comet 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.

### Nebula Observing

Nebulae can be divided into three general classifications: bright nebulae, dark nebulae, and planetary nebulae. They are all what we would call "extended objects," and they vary in size from tiny planetaries that are easily mistaken for stars, to gigantic supernova remnants that span many degrees of sky. They are perhaps the most beautiful and certainly the most colorful deep-sky objects.

Bright nebulae comprise two very different types. "Emission" nebulae are characterized by bright emission lines in their spectra. They are clouds of gas, mostly hydrogen, that is ionized by the ultra-violet radiation from stars embedded in the cloud. The ionized gas fluoresces as free electrons recombine with ionized atoms. The H-alpha spectral line at 6535 Angstroms predominates in the emitted light, giving emission nebulae their characteristic red color. The nebula gas is very tenuous, having only about 1000 atoms per cubic centimeter (as opposed to around  $2.7 \times 10^{19}$  in normal air) and it is very hot, about 10,000 Kelvin. Well known examples of emission nebulae include M42, the Great Nebula in Orion, and M8, the Lagoon Nebula in Sagittarius.

"Reflection" nebulae are composed mostly of dust rather than gas. The dust particles reflect the light from nearby stars, so the spectrum of a reflection nebula is continuous, with dark absorption lines, characteristic of the illuminating stars. The dust particles are several ten-thousandths of a millimeter in size and therefore tend to scatter blue light more than red, causing the nebula to appear somewhat

bluer than the illuminating stars. The dust is composed of various forms of silicon and carbon. Examples of reflection nebulae include M1, the Crab Nebula, which is a supernova remnant, and the nebulosity associated with the Pleiades, M45.

Contrary to what their classification would imply, most bright nebulae are somewhat faint, requiring moderate to large telescope apertures to observe them well. High resolution is not real important, even though many bright nebulae exhibit considerable detail. Several can be seen in binoculars, but most reveal their full extent only in long exposure photographs.

Dark nebulae, the second major class, are composed of the same type of dust as reflection nebulae, but have no nearby stars to illuminate them. They can only be seen in silhouette against a background of stars or bright nebulosity. Usually some stars can be seen through the nebula, and these stars will be reddened due to the blue scattering characteristics of the dust, as mentioned earlier in connection with reflection nebulae. The densest dark nebula will attenuate starlight by as much as five magnitudes. Well known dark nebulae include the Coalsack in Crux (southern hemisphere) and the famous Horsehead Nebula in Orion.

Dark nebulae are not very popular as amateur observing targets because they are usually difficult to see. In general, the same equipment requirements apply as for bright nebulae, but dark nebulae are more challenging and reveal themselves clearly only in photographs.

Planetary nebulae are the third major class of nebulae. The name "planetary" was coined by William Herschel based on their visual similarity to the planet Uranus; planetary nebulae actually have nothing at all to do with planets. A planetary nebula is a spherical shell of gas surrounding a hot star, which provides the energy for its light emissions. They often have a circular appearance, and glow in the green light of doubly ionized oxygen, O-III. Perhaps the most famous planetary is the Ring Nebula in Lyra.

The following description of the origin of planetaries comes from *Sky Catalog 2000.0*, Alan Hirshfeld & Roger W. Sinnott eds., Sky Publishing, 1985.

(continued on page 2)

## STAR STUFF

Monthly Publication of the  
Ford Amateur Astronomy Club  
Star Stuff Newsletter  
P. O. Box 7527  
Dearborn, Michigan 48121-7527

### 1994 CLUB OFFICERS

President:	Greg Burnett	24-81941
Vice President:	Brian Gossiaux	39-03935
Secretary:	John St. Peter	535-2755
Treasurer:	Al Czajkowski	84-57886

### 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

Editor:	Brian Gossiaux	39-03935
Contributing	Patti Smith	Doug Bock
Editors:	Greg Burnett	

### 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)

"The progenitors of planetary nebulae ("Protoplanetaries") are bloated red-giant Mira variables. Although each starts with one to six times the Sun's mass, it continuously loses material in a slow stellar wind of typically 20 kilometers per second. When the bulk of the atmosphere is gone and the hotter, underlying layers are revealed, the surrounding gas is ionized and begins to glow. The wind increases sharply to perhaps 1,000 kilometers per second and plows the matter into a shell that is typically 0.15 parsec across. (This is about 30,000 times the distance from the Sun to the Earth.) The star then quickly evolves into a white dwarf, and the glowing nebula remains visible for less than 100,000 years. The entire process is described in more detail by Sun Kwok in *Sky and Telescope*, 62, May 1982, page 449."

Planetary observing has slightly different equipment requirements from other nebula observing. Most planetaries are compact but fairly bright (exceptions being the "Owl" and the "Eskimo" among a few others), so large apertures aren't generally necessary. Good resolution at high magnification is helpful in detecting structural detail. Some planetaries are very small and can be difficult to distinguish from nearby stars. Special filters are available that isolate the unique O-III light from the planetaries to aid in identifying them.

As you can see, there is a wide variety of nebulae available to the amateur astronomer. Most catalogs include lists of the most interesting objects, and many are included in the Messier catalog of "M" objects.

★

### PRESIDENT'S CORNER

With the recent spate of reports of UFOs over Lake Michigan, I feel moved to editorialize on the subject (Hey, it's MY corner!). Over the years there have been many compelling accounts of flying saucers, visitations, abductions, and you name it. There was a time when I voraciously devoured every Von Daniken book I could find. However, these days the blood is a bit thinner and the mind a bit more cautious, leading me to posit the following hypotheses: 1) There is most certainly other intelligent life in the universe, probably within our galaxy, and possibly nearby (in astronomical terms); and 2) the Earth has never been visited by any of them and is not likely to be in the foreseeable future. I base these opinions on two fairly simple observations: 1) there are just too, too, too many stars for us to be unique in the universe, and 2) in all the years of reports of sightings and encounters, there is still not a single piece of physical evidence of extraterrestrial origin or an unmistakable photograph that would demand our belief in any of the various claims. I welcome your comments.

Hope to see you soon!

*Greg Burnett*

## SKY & TELESCOPE NEWS BULLETINS

### NOVA IN SAGITTARIUS

Japanese amateur Minoru Yamamoto has discovered a nova in Sagittarius, about 1 1/2 degrees southeast of the star Xi-2 Sagittarii. He first imaged the new star on February 24th, when it was magnitude 8.9. Over the next few days the nova fluctuated between magnitude 8.5 and 8.7, brightening to 8.0 on the 28th. But now it seems to be fading, having dropped to at least 8.5. Photometric observations suggest that the light coming from this star is highly reddened. Here are coordinates in equinox 2000.0 coordinates: right ascension 18 hours 50 minutes 37 seconds, declination -21 degrees 23.5 minutes.

### CLEMENTINE'S MOON

Planetary scientists working on the Defense Department's Clementine mission have released a series of images of the Moon and Earth -- even the Big Dipper -- taken by the spacecraft. It has been in orbit around the Moon since February 19th; the orbit is polar, varies in distance from the lunar surface between 400 and 3,000 kilometers, and takes nearly 5 hours to complete. The images show crisp detail of lunar features at ultraviolet, visible, and infrared wavelengths. One of the views shows the landing site of Apollo 16. 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. [NOTE: The Clementine images are available online in CompuServe, the Space Forum. GO SPACEFORUM and BROWSE in Recent Upload Library 17 with keyword CLEMENTINE]

### ASTEROID IDA'S SATELLITE?

According to scientists at the Jet Propulsion Laboratory, the asteroid Ida has a satellite of some kind. They discovered it as they were getting ready to process more images of Ida that have been patiently waiting on Galileo's tape recorder since the spacecraft flew by last August 28th. Because the images can only be trickled back slowly to Earth, one preliminary step is to radio back thin strips of each image, like a picket fence, to see what's there. That's where a glimpse of the extra asteroid was spotted. Scientists won't be able to say much more about it until more complete images are in hand, and that will take another couple of weeks. But it's clearly another object. In all likelihood it's in orbit around Ida, though imaging-team leader Michael Belton cautions that there's a remote chance that a small, previously undetected asteroid just happened to be whizzing past Ida at just that moment.

In recent years there has been lots of speculation -- and more than a few bets -- about whether asteroids have satellites. The biggest champion of the idea has been Tom Van Flandern, an astronomer who once worked at the U. S. Naval Observatory. Van Flandern's ideas were never widely accepted. But radar observations of the near-Earth asteroids Castalia and Toutatis show both to have multiple lobes. And Ida may prove to be the first asteroid known to have its own moon. For now the Galileo project is keeping details to a minimum -- but watch for a press conference later this month, probably on March 23rd.

### HUBBLE AND "THE COMET"

You may recall that back in late January the Hubble Space Telescope took pictures of the unique periodic comet Shoemaker-Levy 9. This is the comet whose 20 separate nuclei will plunge into Jupiter this coming July. HST also imaged the comet last summer, at which time astronomers estimated the largest individual fragments were 2 to 5 km across. Since then HST has been refurbished, and it was hoped the January imagery would settle the question of just of big those nuclei are, and thus how big an incandescent splash they'll make when the hurtle into the planet. To astronomers' surprise, the new images do not show the characteristic bright spots of distinct nuclei. In fact, according to HST team member Michael A'Hearn, there is "zero direct evidence for a solid nucleus in any fragment. Has something gone wrong? Apparently not, says A'Hearn. But the comet has definitely changed, such that now the concentration of dust very close to each nucleus is more opaque than it was last year. A'Hearn adds that the individual cores could still be a few km across, but they could just as likely be much smaller and thus unresolved by HST. All this has major implications for observing the upcoming Great Crash. If none of the nuclei are very big, then the kinetic energy of each impact will be much lower, the resulting fireballs much smaller, and the chance of observing the effects from Earth diminished. More HST observations are planned for later this month, after which astronomers may have a better idea of the true size of each comet fragment.

### LUNAR GEOLOGY'S BUMPER CROP

In 1969 planetary geologists met in Houston, Texas, to describe their initial analyses of rocks returned from the Moon by the crew of Apollo 11. Last week nearly 800 researchers returned to Houston for the 25th such meeting. The anniversary celebration was tempered by last year's loss of Mars Observer and the shaky state of planetary-science funding in general, but there were still plenty of new results to talk about.

High on the list was the first rush of data from the Clementine mission, which continues to return a deluge of ultraviolet, visible, and infrared imagery as it orbits the Moon every 5 hours. It's amazing to realize that, despite all the lunar exploration that occurred during the 1960s and '70s, the Moon has never been completely mapped at all these wavelengths. One Clementine presentation showed the interior of the crater Tycho, whose central peak and inner rim appear to have a different composition than the crater floor. Project scientist Eugene Shoemaker hinted that Clementine might be dropped briefly into a much lower orbit. From there it could, among other things, image the site where Apollo 15 landed in July 1971 and conceivably resolve the base of the lunar module left behind.

### SUPERNOVA 1994D BRIGHTENS MORE

The automated supernova search program at the University of California at Berkeley chalked up another discovery with their March 7th finding of a 15th-magnitude star in the 10th-magnitude galaxy NGC4526 in Virgo. Subsequent spectra indicated that Supernova 1994D was caught about a week before peak brightness. Indeed, as of the 17th, the star was 12th magnitude. The equinox 2000.0 coordinates for NGC4526 are right ascension 12 hours 34.0 minutes, declination +7 degrees 42 minutes. The galaxy is easy to locate about 7.5 degrees west-southwest of 3rd-magnitude Epsilon Virginis, and

between a pair of 7th-magnitude stars. The supernova is located 11 arc seconds northwest of the galaxy's nucleus.

#### COMET MCNAUGHT-RUSSELL WORTH A LOOK

Comet McNaught-Russell is showing signs of being something worth watching. Observers have reported that it was visible in binoculars at about 7th magnitude. The comet is gradually moving north through Eridanus in the evening sky. Here are its positions for this week in 2000 coordinates for zero hours Universal Time:

Date	R.A.	Dec.
Mar 18	4 h 00 m	-14 dg 38 m
Mar 20	4 05	-11 18
Mar 22	4 11	-07 40
Mar 24	4 17	-03 43

#### ANOTHER COSMIC CLOSE CALL

And closer to home -- a bit TOO close -- was Earth's close-call with minor planet 1994 ES1. This chunk of cosmic debris -- estimated to be 20 meters across and travelling at 19 km per second -- passed about 165,000 kilometers from our planet on March 15th.



#### A FAAC MEMBERSHIP BENEFIT

When you renew your membership with the FAAC for 1994, you now receive more besides this excellent publication and a fancy membership card. City Camera/Precision Optics of Dearborn has now officially extended a discount offer with the FAAC. Present your FAAC membership card at time of purchase and receive a 10% discount off of telescope accessories (eyepieces, adapters, filters, etc) and books. Also, various other discounts may be available on the purchase of telescopes and binoculars depending on type and model. Speak with Howard or Jerry regarding telescope purchases.

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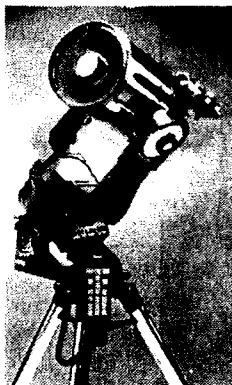
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## From Doug's Declination

Observing log from the Northern Cross Observatory

By Doug Bock

March 21, 1994

Hello fellow observers. The last couple of months have had a few clear nights, of which several were used for observing. The freezeout at EMU was a great success, with several interesting talks, and demonstrations. Norbert Vance showed us some of the physics demos he uses in his classes. There were talks on telescope making and modifications. There was a computer demonstration showing a 3D look at the nearest 2500 galaxies. The weather was clear and cold. I enjoyed the day quite a bit.

The Star parties in March were partly clear to mostly cloudy, but the Ford club did get together at Island lake on March 11. It was hazy, but several people practiced finding Messier objects in preparation for the Messier Marathon that was scheduled the next day. I left at about 11:00 but the party went on. On the 12th, we had about 15 people come out to the Northern Cross Observatory for the Vernal Equinox Star Party. It was clear most of the afternoon. We had a cookout at about 4:30 and did a little solar observing. There were a few sunspots to look at. Later on in the evening I opened the observatory up and Roger Tanner put his CCD on the 12 inch. As we started to take images the clouds started rolling in. Most people left there equipment packed in their cars, due to the inclement weather that was supposed to move in. We decided to take the CCD camera off the scope and just show things to everybody that was there. We had to look between the clouds, until it clouded over completely. After that we went inside, and Roger showed some of the images he had taken at the Winter Star Party in Florida. Then a did a little astrophotography slide show. The evening activities ended at about 10:00. However, Frank and Roger stayed and played cards until about 2:00 am. The next star party I have scheduled is April 9th. Then the Summer Solstice Star party on June 11, 1994. The Solstice Star Party is the same format as the Vernal Equinox party. We get started at about 2:00 pm for outdoor activities, a cookout at 4:30, and observing until dawn. I hope to see you there.









#### DO ASTEROIDS HAVE SATELLITES?

*Submitted by John Paul St. Peter*

This question may have an answer at last. On March 12th scientists M. Belton and R. Carlson of the Galileo spacecraft team reported a small object close to the asteroid (243) Ida. The suspected satellite shows up in samples of data from both the visual and infrared cameras taken on Aug. 29th. A direct image has not yet been received from Galileo because of the slow rate that data can be sent due to the antenna failure. The data indicates that the satellite is about 10 to 20 times smaller than Ida and was about 100 km away. Resolved images of the object should be returned in the next several months. The tentative identification given to the object is 1993 (243)1.

# April 1994

SUN	MON	TUE	WED	THUR	FRI	SAT
* Crestwood Planetarium - 1 hour program featuring: OUR MILKY WAY GALAXY, view the majesty of the spinning spiral we call home. Starts at 7:30pm. \$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			Jupiter 2° N. of Moon		1 	2  LAST QUARTER MOON
3  Mercury 1.5° S. of Mars	4	5	6	7	8	9
10  NEW MOON	11 Moon at apogee	12 Venus 1° S. of Moon	13	14 Saturn 7° S. of Moon	15 Mars 6° S. of Moon	16 Star Party at Doug Bock's
17	18  FIRST QUARTER MOON	19 Crestwood Planetarium *	20 Crestwood Planetarium *	21 Lyrid meteors	22 Lyrid meteors	23 Lyrid meteors
24	25  Moon at perigee FULL MOON	26 Jupiter 3° N. of Moon	27	28 The Ford Amateur Astronomy Club meeting.	29	30 Jupiter at opposition Mercury in superior conjunction

## NEXT MONTH

The Ford Amateur Astronomy Club general meeting is May 26th!  
 Annular Solar Eclipse May 10th, Crestwood Planterium May 18-19, Partial Lunar Eclipse May 24th!



## MEETING ANNOUNCEMENT -- April 28, 1994

The Ford Amateur Astronomy Club holds regular general meetings on the fourth Thursday of each month. Our next meeting will be Thursday, April 28, 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. Hope to see you at the meeting!

By Ratti Smith

*This month's Star Stuff interviews John Paul St. Peter. He is a recent member to the club and was voted club secretary at the beginning of this year. I know you will find him to be interesting.*

**SS:** How did you get started in amateur astronomy?

**JP:** I was 9 years old when my Dad brought home the visitor guides from Mt. Wilson and Mt. Palomar observatories from a trip he was on in California. The deep sky photos were the most fascinating things I ever saw, and still are. Next, the telescopes, what magnificent instruments. I was hooked from then on. I still have the guides and they inspire me just as much now as they did back then.

**SS:** What kind of observing do you like the best?

**JP:** I like deep sky observing the best. It may be a bad attitude but I find the Moon to be a nuisance and planets just don't hold my interest. Somewhere out beyond the Oort Cloud is where my heart lies. Be it a double star, clusters, nebulae or galaxies, that is where I am drawn.

**SS:** Please relate your most memorable observing experience.

**JP:** I can't pin down any as being my most memorable, there have been a few like seeing Halley for the first time after waiting all those years. But most of all it had to be all the times out observing with my Dad. That was the closest we ever were and I miss him a lot.

**SS:** What do you think observing will be like 25 years from now?

**JP:** I don't want to predict what observing will be like 5 years from now. At the moment I use a computer to assist in observing and will probably get a CCD camera in a year or so. It is real easy to get caught up in the technology not that that is bad. But to relax and have fun there is still nothing like just using a chart and star hopping. I just hope that in 25 years eyepieces are still being manufactured.

**SS:** What do you think is the most important function of a amateur astronomy club?

**JP:** There are all types in amateur astronomy; diehard observers, glass grinders, armchair astronomers, etc. A club should provide a focal point where they can all get together and share their thoughts and ideas. Most of all a club and its activities should be fun, a place where all feel comfortable regardless of their skill or understanding of astronomy. Over the past years Barb and I have visited several clubs' meetings and observing sessions but this is the first club we have ever joined. (I hope this says something about you all.)

*John Paul is a Supervisor in the Detroit Police Communications Systems. His has a wife, Barbara and two sons, Jeremiah age 8 and Montgomery just 4 months old. His other hobbies include being a private pilot and WWII naval wargaming. He has been interested in astronomy all his life and has been active for the last 10 years. John Paul has an 8" Newtonian with a 4" SCT piggybacked ("The good one"). He also has a 17.5" Dobsonian ("The big one"). If you have ever been out observing with John Paul, you will see his enthusiasm and most likely catch some of it. He is very helpful and always takes the time required to explain something or show you what he is looking at in his scope. Next time your out there, look him up!*

March 3, 1994:

More news from the Island Lake refugees. Before leaving, Harry and I had heard conflicting weather reports, everything from clear to overcast. As a whole they were right. It went from clear to overcast in about 45 minutes. Even so we accomplished part of our goals. This was going to be training for the upcoming marathon. We wanted to survey the track, maybe do some wind sprints...

Anyway we found the first six objects on the list from the March issue of Astronomy. This was done pretty much in twilight conditions. We should have had eight but M32 & 110 were obscured by the thin overcast that M31 could be seen through. Also it gave me a chance to try out the eyepiece acquired at the EMU Freezeout after many, many trips to the swap tables and gnashing of teeth. I'm not going to tell you how it performed. You will have to come out and see for yourself. That's all for now. John Paul.

March 16, 1994:

Well gang, it was a cold and windy night. Brian dropped by for a quick astronomical fix then retreated for warmer places. I left not much later when I found that the can of coke setting on the tailgate had frozen solid.

I did have enough time to break out a new 80mm finder I just built thanks to the objective lens from Doug Bock. Boy does it work nice! (grunting is appropriate here)

Trying out an idea, I observed the Crab nebula with a polarizing filter to see if rotating it would cause any change in appearance like the photos in Burnham's book. I did not see any variation at all. The crescent Moon was not to far away and washed out the contrast a bit. Have any of you tried this and what were your results?

I finished up the night in Leo bagging 10 NGC galaxies. You've got to check out NGC 3226 & 3227. They are very close and appear to share a common envelope. Looks like one galaxy with two small, bright nuclei. That view made my night. With the crescent Moon setting in the West at 11:00pm I was out of there shivering all the way home. John Paul.

★

## REQUEST FOR ARTICLES

Do any observing lately? Have an interesting astrophoto or drawing? If you would like to share your 'astronomical experiences' with us just send it to the FAAC Star Stuff Newsletter. You can mail material to the FAAC address on page 10, or within Ford send it to Brian Gossiaux, 2269/2256E, PTO Systems, R.O.B. Of course you can also send it electronically over PROFS, BGOSSIAU, or the Internet at USFMCZK6@IBMMAIL.COM. Hope to hear from you!

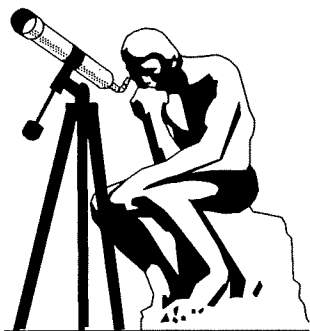


# ASTRONOMY WORKSHOP

by Greg Burnett  
PROFS=GBURNETT  
InterNet

USFMC6SH@IBMMAIL.COM

Gary Miller, the previous author of this column, has been forced to turn it over to me because of his workload. We hope Gary will find some time to spend with us this summer. In the meanwhile, I will try to keep the column going. Please send questions and answers (at present there are more questions than answers!) to the address(es) above. No question is too basic; there is always someone besides yourself who is looking for the answer too!



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

**A16.** Because we (the Solar System, that is) are kind of on the outskirts of our galaxy, it's possible to get a reasonable picture of it by looking in toward the center (toward the constellation Sagittarius) and taking an extremely wide-angle picture. Sort of like trying to take a picture of your house from the front porch. Photos of whole galaxies that are claimed to represent the Milky Way are usually actual photos of other nearby galaxies (e.g. Andromeda) that have a similar structure and are believed to look more or less the same as ours. G.B.

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

**A17.** Colored filters can slightly enhance image contrast under certain observing conditions, but their effects are subtle and their utility should not be overemphasized. With this caveat, they are useful for planetary observing. Orion offers a nice starter set of four filters, and two follow-on sets. Other, specialized filters are available for specific purposes. "Light Pollution Rejection" filters come in a couple of flavors, depending on how narrow their bandpass is. They filter out some light from mercury vapor and high pressure sodium lamps, thereby reducing the effects of these light pollution sources. Under the right conditions, they can be quite effective, but they are relatively expensive. "O-III" filters are used to identify the particular wavelength of light from doubly ionized oxygen (yes, "III" means "double" when dealing with ionization; "I" is neutral) found in most planetary nebulas. Thus they are effective in distinguishing small planetaries from nearby stars. They are also expensive. I wouldn't consider the LPR or O-III filters "basic," but that depends on the type of observing you want to do and the conditions under which you will be doing it. G.B.

## Q18. What basic star charts do you recommend?

**A18.** Selecting a star chart can be a very personal thing; everyone has their own preferences. As a basic chart, I would recommend Tirion's Sky Atlas 2000.0. Norton's Star Atlas was a standard for a long time, but I believe Sky is better. Sky Atlas comes in three flavors: the deluxe edition, which is spiral bound and in color; the field edition, which is on heavy stock single sheets with white stars on a black background; and the desk edition, which is on heavy stock single sheets with black stars on a white background. The field edition is

probably the best for use at the telescope. G.B.

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

**A23.** Probably the most important "accessories" are two: 1) You should have a reasonable selection of eyepieces suited for the types of observing you do. Having a good scope and only one or two mediocre oculars is like having a good stereo with crummy speakers. 2) You should have a good finder. This may be a TelRad-type finder if you prefer that sort of thing, or a more traditional type. At least a 50mm aperture is needed, in my opinion, and the straight-thru type is preferable to the right-angle type because you can see the sky with the eye that's not looking through the finder; a help in slewing in to a particular location. After that, you might add a motor drive and/or setting circles if your scope is not already equipped with them. G.B.

## Q30. What exactly is the vernal equinox?

**A30.** "Vernal" comes from the Latin word for spring. Equinox refers to the situation when the sun is exactly over the equator, and the length of day and night are exactly the same (from Latin, "equal night"). Imagine the globe of the Earth illuminated by the Sun placed exactly over the equator, then imagine the earth turning. No matter where you are on the Earth, you spend exactly as much time in the dark as in the light.

Now, the Sun is not always over the equator, because the Earth's axis of rotation is tilted with respect to the plane of its orbit around the Sun (known as the "ecliptic"). This is a little harder to explain and to visualize. Suffice it to say that an equinox happens only twice each year, once in the spring when the Sun is moving from south to north (vernal equinox) and once in the fall as it moves from north to south (autumnal equinox). When the Sun is over one of the tropics, Cancer or Capricorn, 23-1/2 degrees north and south of the equator, respectively, that is a "solstice" (derived from Latin for "Sun standing still") and marks the beginning of summer or winter. The reason the equinoxes and solstices occur at the beginning of the corresponding seasons and not in the middle, as symmetry might suggest, is because of the thermal inertia of the atmosphere, which causes the climatic seasons to lag about six weeks behind the position of the Sun. G.B.

## Q21. What are "deep-sky" objects.

## 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 it's resolution, e.g. for planetary observing, you have actually created a new optical configuration. What is that configuration called and why was it so named?

## Q28. What is the planetary motion which is responsible for the recurring ice age that effects the earth's orbit?

## Q29. If you were on a small life supporting world that was traveling through space at 50% the speed of light and a star is traveling toward you at 50% of the speed of light, how much blue shift would you measure from your frame of reference, gravitational forces notwithstanding?

# 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	SR	Sunrise
FM	Full Moon	SS	Sunset
LQ	Last Quarter Moon	MR	Moon Rise
NM	New Moon	MS	Moon Set
UT	Universal Time		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
					SR: 6:16 SR: 6:14	
					SS: 18:59 SS: 19:00	
					MR: 0:23 MR: 1:18	
					MS: 10:01 MS: 11:03	
					LQ: 21:56	
3	4	5	6	7	8	9
SR: 6:12 SR: 6:11	SR: 6:09 SR: 6:07	SR: 6:06 SR: 6:04	SR: 6:02			
SS: 19:01 SS: 19:02	SS: 19:03 SS: 19:04	SS: 19:06 SS: 19:07	SS: 19:08			
MR: 2:05 MR: 2:44	MR: 3:18 MR: 3:48	MR: 4:16 MR: 4:42	MR: 5:08			
MS: 12:06 MS: 13:10	MS: 14:12 MS: 15:13	MS: 16:13 MS: 17:13	MS: 18:11			
10	11	12	13	14	15	16
SR: 6:01 SR: 5:59	SR: 5:57 SR: 5:56	SR: 5:54 SR: 5:52	SR: 5:51			
SS: 19:09 SS: 19:10	SS: 19:11 SS: 19:12	SS: 19:14 SS: 19:15	SS: 19:16			
MR: 5:35 MR: 6:03	MR: 6:35 MR: 7:10	MR: 7:49 MR: 8:34	MR: 9:25			
MS: 19:09 MS: 20:07	MS: 21:05 MS: 22:01	MS: 22:54 MS: 23:45	MS: None			
NM: 19:19						
17	18	19	20	21	22	23
SR: 5:49 SR: 5:48	SR: 5:46 SR: 5:45	SR: 5:43 SR: 5:41	SR: 5:40			
SS: 19:17 SS: 19:18	SS: 19:19 SS: 19:20	SS: 19:21 SS: 19:23	SS: 19:24			
MR: 10:20 MR: 11:21	MR: 12:25 MR: 13:32	MR: 14:41 MR: 15:53	MR: 17:08			
MS: 0:31 MS: 1:12	MS: 1:50 MS: 2:25	MS: 2:58 MS: 3:30	MS: 4:03			
FQ: 21:35						
24	25	26	27	28	29	30
SR: 5:38 SR: 5:37	SR: 5:36 SR: 5:34	SR: 5:33 SR: 5:31	SR: 5:30			
SS: 19:25 SS: 19:26	SS: 19:27 SS: 19:28	SS: 19:29 SS: 19:30	SS: 19:31			
MR: 18:24 MR: 19:41	MR: 20:56 MR: 22:05	MR: 23:07 MR: 23:59	MR: None			
MS: 4:37 MS: 5:16	MS: 5:59 MS: 6:50	MS: 7:47 MS: 8:49	MS: 9:54			
FM: 14:46						

## Planet View Info Report for 4/ 1/1994 to 4/30/1994

Date	Rise	Set	RA	Mercury Dec	Elongation	Ill	Fr
DIST (AU)							
4/ 1/1994	5:35	16:50	23h14m08s	-7°26'31"	24°35'11"	0.707	1.09764
4/ 8/1994	5:32	17:18	23h53m48s	-3°21'18"	20°49'42"	0.786	1.18404
4/15/1994	5:30	17:53	0h37m12s	1°36'52"	15°46'19"	0.866	1.25854
4/22/1994	5:29	18:35	1h25m06s	7°17'30"	9°22'59"	0.945	1.31265
4/29/1994	5:32	19:26	2h18m31s	13°19'08"	1°43'48"	0.998	1.32937

Date	Rise	Set	RA	Venus Dec	Elongation	Ill	Fr
DIST (AU)							
4/ 1/1994	7:02	20:30	1h48m43s	10°34'45"	17°59'10"	0.952	1.60333
4/ 8/1994	6:55	20:48	2h21m31s	13°46'30"	19°42'25"	0.942	1.57997
4/15/1994	6:49	21:06	2h55m04s	16°41'53"	21°25'54"	0.930	1.55406
4/22/1994	6:45	21:24	3h29m27s	19°16'36"	23°09'34"	0.918	1.52555
4/29/1994	6:43	21:41	4h04m42s	21°26'33"	24°53'08"	0.904	1.49450

Date	Rise	Set	RA	Jupiter Dec	Elongation	Ill	Fr
DIST (AU)							
4/ 1/1994	21:27	7:47	14h44m11s	-14°26'25"	147°57'16"	0.998	4.55965
4/ 8/1994	20:56	7:18	14h41m29s	-14°13'22"	155°31'50"	0.999	4.50434
4/15/1994	20:24	6:49	14h38m25s	-13°58'43"	163°09'51"	0.999	4.46246
4/22/1994	19:52	6:19	14h35m06s	-13°42'57"	170°48'12"	1.000	4.43483
4/29/1994	19:20	5:49	14h31m38s	-13°26'36"	178°01'37"	1.000	4.42183

## Planet Apsides Report for 1994

Mars	4/ 4/1994	Perihelion	Distance from Sun:	1.38 AU
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## Planet Conjunction/Opposition Report for 4/ 1/1994 to 4/30/1994

Mercury	Date	Hour	Event
	4/30/1994	4	Superior Conjunction (Occultation)

Jupiter	Date	Hour	Event
	4/30/1994	1	Opposition

Date	Hour	Apsis	Distance (km)	Diameter
4/11/1994	19	Apogee	406480	0.4900"
4/25/1994	12	Perigee	356934	0.5580"

Date	Meteor Shower	ZHR	RA	DEC	Illum. Frac.	Longitude
4/11/1994	Virginids	5	14h04m	-9°	0.01	22°
4/21/1994	Lyrids	12	18h08m	32°	0.78	32°
4/27/1994	alpha-Scorpiids	5	16h32m	-24°	0.94	38°

Date	Sun	Rise	Set	Astronomical Begin End	Nautical Begin End	Civil Begin End
4/ 1/1994	6:16	18:59	4:35	20:40	5:10	20:05
4/ 8/1994	6:04	19:07	4:21	20:50	4:57	20:14
4/15/1994	5:52	19:15	4:07	21:00	4:44	20:23
4/22/1994	5:41	19:23	3:53	21:12	4:31	20:33
4/29/1994	5:31	19:30	3:39	21:23	4:19	20:43



## MEETING MINUTES - MARCH 24TH, 1994

The meeting was called to order at 5:00pm by President Greg Burnett. There were 26 club members in attendance. Fried chicken and biscuits were available for all.

President's Report: Greg Burnett passed around the minutes from the recent FERA general council meeting and the March newsletter of the University Lowbrows club. Several ideas for Ford Club bumper stickers were shown to the members. On the 23rd the Free Press ran a news article on 'The Great Attractor'.

Vice President's Report: Brian Gossiaux announced the formal discount policy between the club and City Camera. Upon presenting your club membership card a 10% discount will be granted on telescope accessories and on books purchased. Discounts may or may not be available for telescope purchases. Contact Howard Penn of City Camera for information.

Treasurer's Report: Al Czajkowski stated the club's financial standing and announced that there are currently 38 paid club members. Discounts are available for items from Kalmbach Publishing. Check with Al for details.

## Upcoming Events:

April 9th; Observing at Doug Bock's.

April 16th; Astronomy Day. Greg has faxed a letter to Mr. Dan Kirk of the Henry Ford Museum concerning the club putting on a presentation during the day on the museum grounds.

May 10th; Annular Eclipse. Mark Ten Brink explained the track of the center-line and had graphs and charts available to view.

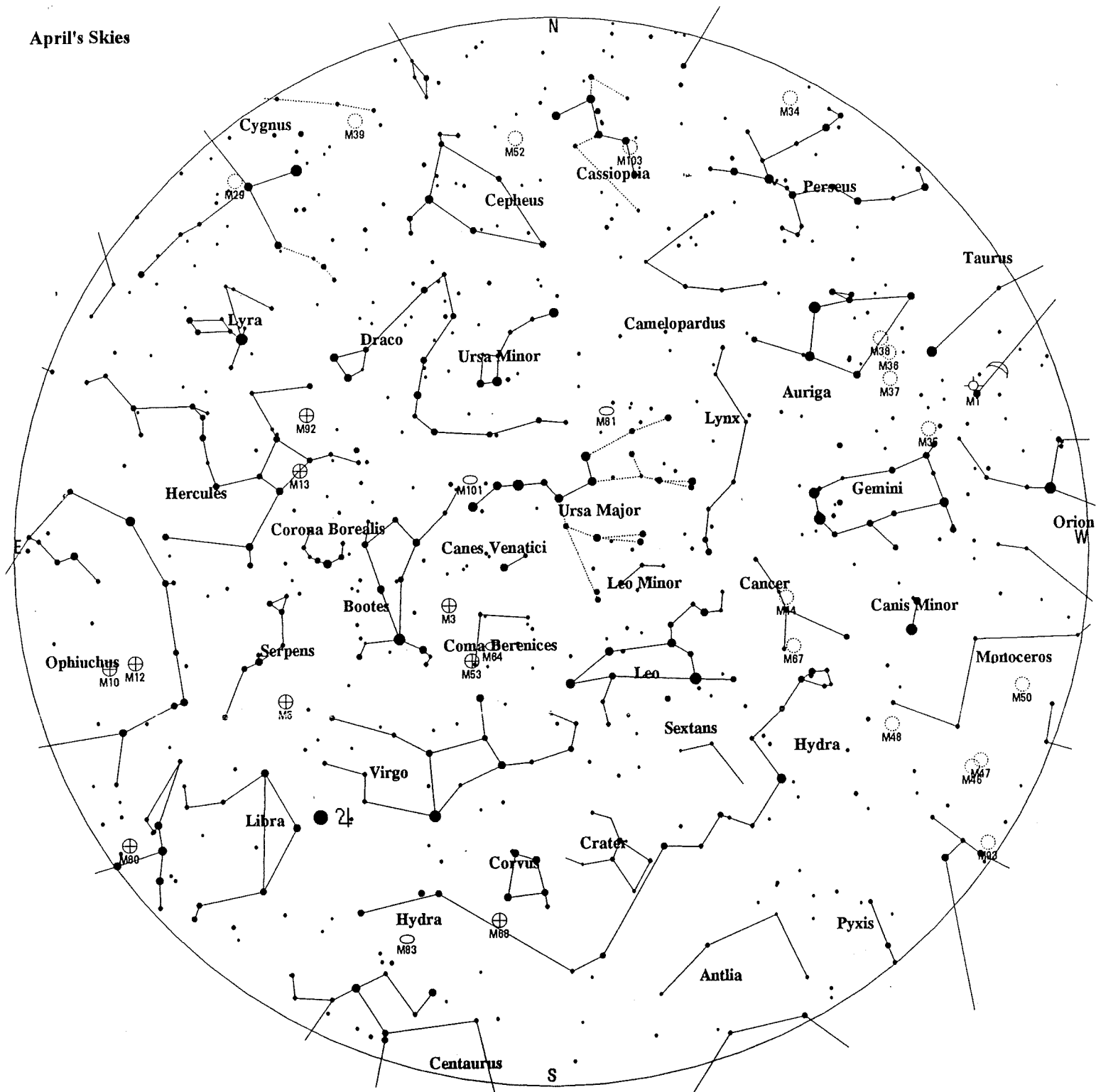
May 13-15; EMU Fish Lake under the Stars.

## Main Presentations:

Jeremiah St. Peter demonstrated the star tracking camera platform he had built and showed astrophotos taken with it.

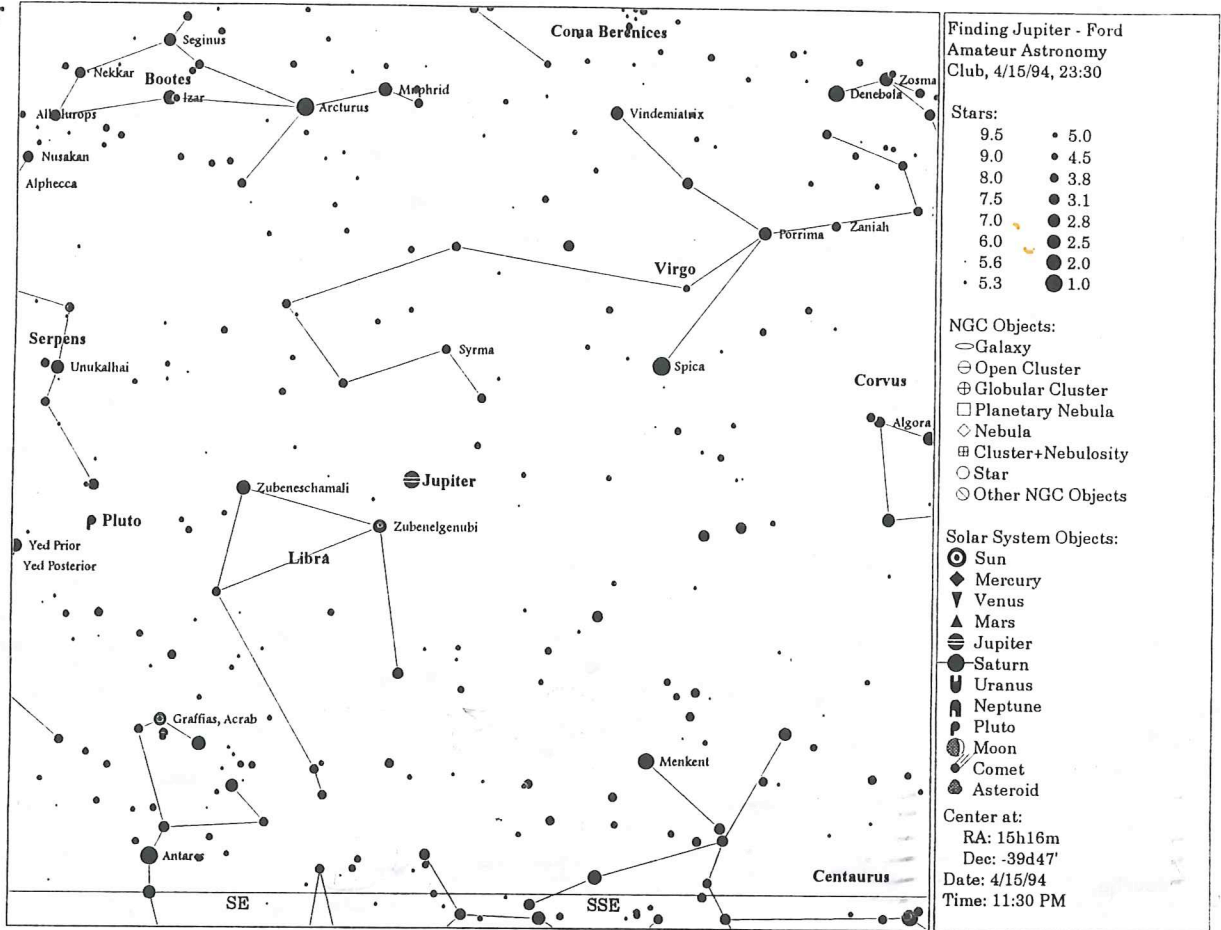
Greg Burnett gave an astronomy quiz which was taken at the recent freeze-out conference and conducted the discussion of quiz answers afterwards. During the quiz club members sketched a planetary image placed on the front board. This was to show how distance and size of the image affects what the observer sees. The sketches were displayed on the wall for all to view.





STARS	SOLAR SYSTEM		NOTES
<ul style="list-style-type: none"> <li>• &lt;1</li> <li>• 1.5</li> <li>• 2</li> <li>• 2.5</li> <li>• 3</li> <li>• 3.5</li> <li>• 4</li> <li>• 4.5</li> <li>• &gt;5</li> </ul>	<ul style="list-style-type: none"> <li>☿ Mercury</li> <li>♀ Venus</li> <li>♂ Mars</li> <li>♃ Jupiter</li> <li>♄ Saturn</li> <li>♅ Uranus</li> <li>♆ Neptune</li> <li>♇ Pluto</li> <li>☄ Comet</li> </ul>	<ul style="list-style-type: none"> <li>○ Galaxy</li> <li>⊕ Globular Cluster</li> <li>○ Open Cluster</li> <li>⬠ Planetary Nebula</li> <li>□ Diffuse Nebula</li> <li>○ Other Object</li> </ul>	
Local Time: 23:00:00 15-Apr-1994 Location: 42° 22' 0" N 83° 17' 0" W		UTC: 04:00:00 16-Apr-1994 Centre Az: 180.0° Alt: 90.0° Field: 180.0°	
		Sidereal Time: 12:03:10 Julian Day: 2449458.6667	

# Finding Jupiter



**Ford Amateur Astronomy Club**  
**Star Stuff Newsletter**  
**P. O. Box 7527**  
**Dearborn, MI 48121**

