

STAR STUFF

The Ford Amateur Astronomy Club Newsletter



Sept. 10th! *The Second Annual* Island Lake

Volume 3 Number 9
September 1994

Star Party

STAR STUFF STUFF

Normally, the Star Stuff newsletter would begin with a feature article of some sort on the first page. (Usually by our fearless and beloved leader, Greg Burnett.) This month will take a different twist as the newsletter has been swamped by personal submissions and timely astro-related facts. Thanks folks! Therefore, since space is at a minimum, here are YOUR contributions.

GALILEO MISSION STATUS submitted by Chuck Boren

The Galileo spacecraft captured an extensive range of data on the impacts of the fragments of Comet Shoemaker-Levy 9 on Jupiter July 16 through 22. Because of its position 240 million kilometers (150 million miles) from Jupiter and in the direction of the impact sites on the planet's night side, Galileo was able to make unique direct observations of the impact events which were not visible from Earth.

The data from Galileo's science instruments were stored on the spacecraft's onboard tape recorder. Science teams are now carefully evaluating data stored on tape to select portions to be transmitted to Earth starting in August.

The spacecraft's photopolarimeter-radiometer has already obtained and transmitted light-intensity readings from the impacts of comet fragments H, L and Q on Jupiter's far side. The B impact did not produce a significant indication; data from fragment P was recorded on tape for later playback.

Engineering telemetry indicated that Galileo's computer directed the imaging system, the near-infrared spectrometer, the ultraviolet spectrometer and plasma wave instrument to observe the impacts as planned. The camera observed the fragment D, E, K, N, V and W events, the infrared instrument the C, F, G and R impacts. Their observations are stored on tape, intended for gradual transmission to Earth beginning this month and continuing through January 1995.

The spacecraft continues to operate normally, spinning at about 3 rpm and transmitting at 10 bits per second to ground stations of the NASA/JPL Deep Space Network. Galileo is about 640 million kilometers (400 million miles) from Earth, so that a command takes 36 minutes to reach Galileo, and the response another 36 minutes

to return. The spacecraft will reach Jupiter on December 7, 1995, when its probe will descend into the Jovian atmosphere and the orbiter spacecraft will begin two years of observation and measurement of the planet, its moons and magnetosphere.

NEW SOLAR CELLS WITH RECORD EFFICIENCY submitted by Chuck Boren

Under contract with ESA, European industry has recently developed high efficiency solar cells for use in future demanding deep-space missions such as the recently approved ROSETTA cometary mission. The new solar cells reach a 25% efficiency under deep space conditions. The efficiency is the ratio between the electrical energy produced by the cell and the incoming solar energy. The higher the efficiency, the "better" the solar cell. Unlike telecommunications and Earth satellites which orbit near the Earth and are normally powered by solar cell arrays, spacecraft operating at a very large distance from the Sun (typically deep-space probe) experience a solar intensity which is only about 5% or less of that near the Earth. This was the case for ESA's ULYSSES for instance which, before reaching the Sun's poles had first to travel to Jupiter at 780 million km from the Sun (Jupiter is five times further away from the Sun than we are!). Moreover, the equilibrium temperature of solar arrays at those distances goes down to about -100 degrees Celsius. Current solar cells used all over the space world are not generally made to operate at these low temperatures and solar intensities. They allow for 10 to 20% efficiencies in near-Earth orbits but shows anomalous behavior at deep space conditions.

For this demanding environment deep-space probes have to use power sources other than solar panels, because their electrical performance degrades too much at these low light intensities and low temperatures. Until now, deep space probes had to use thermonuclear power generators, like the so called RTGs (Radioisotope Thermoelectric Generators). As RTG's technology is not available in Europe, ESA therefore attempted to develop a power source based on very high- efficiency solar cells.

Under low-light low-intensity conditions, 25% efficiency has been achieved on 6 x 4 cm Silicon cells. The 25% mark represents the highest efficiency ever reached worldwide with Silicon cells without special optical concentration devices to increase the amount of sunlight collected to be converted into electricity. Another breakthrough had already been reached by ESA a little

over one year ago with solar cells of a different technology, the Gallium Arsenide (GaAs) type, where 23% efficiency was reached on 2 x 4 cm cells.

This technology milestone in Silicon solar cells was reached by an industrial team led by DASA (Heilbronn, Germany) with CISE (Milano, Italy) as sub-contractor (CISE being also responsible for the development of high efficiency GaAs solar cells)

ESA expects that the new high performance Silicon cells could profitably be used in deep space missions for Europe and that this technology could also be of interest for near-Earth orbit space applications as well as for Earth based ones.

NASA APPOINTS NEAR-EARTH OBJECT SEARCH COMMITTEE submitted by Chuck Boren

NASA announced the establishment of a committee which will develop a plan to identify and catalogue, to the extent practicable within 10 years, all comets and asteroids which may threaten Earth.

Dr. Eugene Shoemaker was appointed as Chairman of the eight-member Near-Earth Object Search Committee. Shoemaker, an astronomer with the Lowell Observatory and professor emeritus with the U.S. Geological Survey, also was co-discoverer of Comet Shoemaker-Levy 9 which collided with Jupiter last month.

The committee was formed in response to Congressional direction to NASA to develop a plan in coordination with the Department of Defense and the space agencies of other countries. The plan's objective is to identify and catalogue, to the extent practicable, the orbital characteristics of all comets and asteroids greater than about 1/2 mile (1 kilometer) in diameter in orbit around the sun that cross the orbit of the Earth. The plan is to include estimated budgetary requirements for fiscal years 1996 through 2000.

The Chairman of the House Committee on Science, Space and Technology, Representative George Brown, introduced the legislation as an amendment to the NASA Authorization Bill. The amendment calls for the NASA Administrator to submit the plan to the Congress by Feb. 1, 1995. Also appointed to the committee are:

Dr. Jurgen H. Rahe, Executive Secretary, NASA Headquarters, Wash., D.C.
Dr. Gregory Canavan, Dept. of Energy Los Alamos National Laboratory, N.M.
Dr. Alan J. Harris, NASA Jet Propulsion Laboratory, Pasadena, Calif.
Dr. David Morrison, NASA Ames Research Center, Mountain View, Calif.
Dr. David L. Rabinowitz, Carnegie Institution, Wash., D.C.
Dr. Michael J. Mumma, NASA Goddard Space Flight Center, Greenbelt, Md.
Col. Simon P. Worden, U.S. Air Force Space Command, Colorado Springs, Colo.

METEORITIC GLOW submitted by Chuck Boren

Like past years, August 12 might see shortlived enhanced activity of the Perseid meteor stream. Associated, might be a rare phenomena: Meteoritic glow. It has been observed in 1993 by Dutch observers. They noted a glow, dimensions about 5x10 degrees, magnitude +4.5-5.5 (faint!) in Perseus at approx. location 3h 45m, +40 (2000.0), for about one quarter of an hour some 2.5 hours BEFORE peak activity. Given the characteristics, atmospheric conditions and spacing between observing locations (500 km!) it can not have been an atmospheric phenomena (one of

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P. O. Box 7527
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1994 CLUB OFFICERS

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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 1491, 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) 390-5456

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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the observers is a professional meteorologist). It must have been the advancing meteoroid cloud shining by reflected sunlight in space. Criticism has been that it was observed at the 'wrong' location. Theoretically wrong as it might be, it WAS observed in Perseus however! This year, look for the phenomena several hours around August 12, 7h 30m UTC (ascending node passage). Photographic survey of the area using fast focal ratio lenses on fast black and white film (and guided) is recommended. If you have positive observations, please be so willing to report to Pegasoft@cc.ruu.nl as fast as possible.

COMPTON GAMMA-RAY OBSERVATORY FINDS BRIGHT NEW X-RAY SOURCE submitted by Greg Burnett

An unusually bright X-ray source -- one of the three brightest in the sky -- has been discovered in the southern constellation Scorpius by an instrument aboard NASA's Compton Gamma-Ray Observatory. The new source, which was discovered on July 27 by the Burst and Transient Source Experiment (BATSE), has been named X-ray Nova Scorpii, or GRO J1655-40.

X-ray novae such as the one just discovered are thought to be caused by matter spilling from a normal star onto a black hole, which are collapsed stars so dense that not even light can escape them. About 10 such novae have been discovered in the past 30 years.

"We are anxious to determine whether the new source is a black hole, a pulsar (a spinning star that emits signals in short, regular bursts), or perhaps even a new type of object," said Dr. B. Alan Harmon of NASA's Marshall Space Flight Center, Huntsville, Ala. Harmon leads the research team analyzing data from a Marshall-managed BATSE instrument.

"The X-ray emission from the new source rivals that of two other dominant X-ray sources in the sky, the Crab Nebula and Cygnus X-1. The new object poses several puzzling questions for astrophysicists. For example, Nova Scorpii had an unusually rapid rise to maximum brightness, which may put significant constraints on theories of how X-rays are produced in such objects," Harmon said.

"During an X-ray nova outburst, it is thought matter from a normal star spills onto a disk of matter surrounding a companion black hole, causing the disk to heat up dramatically. How this happens, however, is not well understood, and the rapid rise to maximum brightness of Nova Scorpii adds to the mystery," Harmon said.

In addition, a property conspicuously absent in Nova Scorpii is a rapid flickering in the intensity of the source. Such flickering is typical of other X-ray novae. Scientists speculate that the lack of flickering may be because the central source that would produce it is obscured, preventing a view deep into the X-ray producing region.

Discovery of the new X-ray object has been announced to astronomers around the world so more detailed observations may be made. Another instrument on the Compton Observatory, the Oriented Scintillation Spectrometer Experiment, already has made preliminary spectral observations and obtained an improved

location for the object. Meanwhile, plans are being made for other orbiting spacecraft to observe the X-ray source and a search is underway by astronomers in the Southern Hemisphere to find an optical counterpart to Nova Scorpii.

"We are especially pleased that BATSE detected the X-ray source. Now, the entire capabilities of the observatory can be used to study this new and exciting object," said Compton Observatory Project Scientist Dr. Neil Gehrels of the Goddard Space Flight Center, Greenbelt, Md.

Goddard manages the Compton Observatory for NASA's Office of Space Science, Washington, D.C. The observatory was placed into orbit around the Earth by the Space Shuttle Atlantis in April 1991.

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SKY & TELESCOPE NEWS BULLETINS

PULSES OF PERSEIDS

Some astronomers predicted that this year's Perseid meteor shower would be as active -- or better -- than 1993's impressive display. So far, reports reaching S&T from Europe and the eastern U. S. reveal no unusual activity; the zenithal hourly rates (ZHRs) varied between 50 to 100. But the show picked up farther west. Peter Brown (International Meteor Organization) says an outburst occurred over the western U.S. starting around 9:30 Universal Time. The ZHRs began climbing significantly, peaking near 300 per hour around 11:00 UT before falling "like a rock." Veteran meteor observer Anthony Cook of California says this was the strongest Perseid shower he has seen since 1980. At one point he saw a meteor per second for 10 seconds. California amateur Paul Strasser says that it was a very, very spectacular show -- during a "low" period, he counted 17 Perseids in one minute. There were many fireballs, he adds, which ranged from magnitude 0 to -5. Howard Brewington and his wife also witnessed the outburst in New Mexico, seeing one spurt of 25 meteors in five minutes. Brown cautions that these reports are preliminary, and he has yet to hear from observers in Hawaii or Asia.

GALILEO SEES "THE CRASH"

There's news about Galileo's observations of Comet Shoemaker-Levy 9. Because of its position with respect to Jupiter, the spacecraft was able to see and monitor the comet's impact sites directly. One of the experiments aboard, the photo-polarimeter, registered flashes from the impacts of H and L, and near-infrared data on the fireball from G is waiting to be played back. Mission scientists now have their first glimpses of Galileo's imaging data. Attempts to record the flashes from D and E failed because a software error had the camera point somewhere other than at Jupiter. But the camera sequences for four other impacts -- K, N, V, and W -- used a different scheme and should be OK. In particular, partial frames of K's collision are now on the ground. The bolide phase of K's atmospheric entry lasted about 35 seconds and at one point became about 10% as bright as Jupiter itself. The full set of K impact images should get beamed to Earth within a week.

COMET N-N-M & CASSIOPEIA

The presumed brightness of Comet Nakamura-Nishimura-Machholz, 1994m, is near 8th magnitude, though S&T's editors have no recent reports to pass on. The comet is still slowly working its way among the bright stars of Cassiopeia, but this week the waxing Moon will become a problem. Here are equinox 2000 positions for 0 hours Universal Time:

R.A. (2000) Decl.			
=====			
Aug 13	0h 42m	+61.4dg	
Aug 15	0 25	59.2	
Aug 17	0 08	56.6	

SOLAR DOLDRUMS

Casper Hossfield reports that solar activity continues to wallow in the summer doldrums. The sunspot index had a mean of 6.1 for the week ending August 3rd and 14.3 for the week ending the 10th.

WHITE SPOT ON SATURN

Jupiter's new Dark Spots aren't the only planetary atmospheric features to be on the lookout for. Observers at Pic du Midi and the U. S. Naval observatories report a low-contrast white spot on Saturn. The blemish is about 12 degrees long at situated at 65 degrees south latitude. The French astronomers first saw the spot on August 14th at a position of 305 degrees longitude. Astronomers at USNO's New Zealand station at Black Birch report that it had moved to 277 degrees longitude by August 20th. Saturn rises just after sunset.

A PAIR OF COMETS

Comet Nakamura-Nishimura-Machholz, 1994m, remains near 8th magnitude. This week, the comet is moving south through Pegasus, just west of the Great Square, well placed nearly all night. Here are equinox 2000 positions for 0 hours Universal Time:

R.A. (2000) Decl.			
=====			
Aug. 26	22h 56m	+36.5 dg	
Aug. 28	22 42	+30.0	
Aug. 30	22 29	+23.0	
Sep. 1	22 17	+15.8	

And over in the morning sky, Comet Machholz, 1994o, remains 10th magnitude, as it heads southwest, skirting the border between Lynx and Auriga. Here are its positions for the week:

R.A. (2000) Decl.			
=====			
Aug. 26	7h 04m	+49.7 dg	
Aug. 28	7 18	+47.2	
Aug. 30	7 30	+44.8	
Sep. 1	7 41	+42.5	

SUPERNOVA IN CANES VENATICI

And there's a new supernova to try for. William Wren discovered the supernova visually through the 36-inch telescope at McDonald Observatory on August 19th. Supernova 1994Y is located in NGC 5371, an 11th-magnitude galaxy in Canes Venatici at R.A. 13h

56m, +40.5 deg. The star, estimated to be 15th magnitude at discovery, is situated about 1/2 arc minute west and 1/4 arc minute north of the galaxy's nucleus.

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PRESIDENT'S CORNER

Observing... enjoyable... relaxation... camaraderie... investigation... exploration... visualization... imagination... discovery... inconvenience... mosquitoes... driving... darkness... dew... loading... unloading... loading... unloading... isolation... solitude... awareness... self-discovery... reward... nature... communion... perspective... renewal.

Hope to see you soon!

Greg Burnett

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U of M RADIO TELESCOPE OPEN HOUSE

Thanks to Steve Nagi for the following info.....

Recently I contacted U of M regarding an open house they have for their radio telescope (I think it is right off of N. Territorial Rd, you can see it from the road). They are having one this year on the 3rd Sunday of September from 2:00pm-4:30pm. Their number is 426-8441. If I can, I plan on attending that.

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From Doug's Declination

By Doug Bock

Observing log from the Northern Cross Observatory
August 5, 1994

Well summer is coming to a close and my favorite time of year will soon be here. Starting with the Autumn star party on September 3, 1994 at the NCO complex. This will be an all day event starting at 2:00 pm running till dawn the next morning.

I like fall observing because it provides about 6 weeks of clear, cool weather from mid-September to the end of October. During this time usually 50 to 70 percent of the nights are clear. The temperature drops into the 40's at night, so the bugs are not out, and the sun sets early to give us plenty of observing time each night.

This is also the time of year that we trek up to our northern observing site west of Cadillac. This year I plan on going up the weekend of September 29th thru October 2nd or maybe 3rd which is Monday. If anyone would like to join us for any or all of this trip, please let me know so we can organize the event. There is electricity on the property but no running water. However, we usually go down to the cemetery in town and draw water from the well that is there. Bring those 5 gallon water jugs. Also there is an outhouse available. Pretty snazzy eh.

(Continued on Page 7.)

September 1994

SUN	MON	TUE	WED	THUR	FRI	SAT
				1	2	3
				Saturn at opposition		
4	5 Labor Day NEW MOON	6	7	8	9	10 ISLAND LAKE STAR PARTY 6:00pm
			Mercury 3° N. of Moon	Venus 2° S. of Moon Moon at perigee	Jupiter 1.4° N. of Moon	
11	12 FIRST QUARTER MOON	13	14	15	16	17
18	19	20	21	22	23	24
Saturn 7° S. of Moon	FULL MOON		Mercury 0.1° S. of Spica	The Ford Amateur Astronomy Club meeting	Autumnal Equinox, 2:19 am	Moon at apogee
25	26	27	28	29	30	
	Mercury at greatest eastern elongation (26°)	LAST QUARTER MOON	Venus at greatest brilliancy (-4.6 magnitude)			

NEXT MONTH

The Ford Amateur Astronomy Club general meeting is October 27th!

MEETING ANNOUNCEMENT -- September 22, 1994

The Ford Amateur Astronomy Club holds regular general meetings on the fourth Thursday of each month. Our next meeting will be Thursday, September 22nd, at 5:00 p.m.

The program for the meeting, unless something else comes up in the mean time, will be the long-awaited presentation by Greg Burnett on Time: What it is, how it's measured, and it's relation to astronomy. Topics will include explanations of sidereal time and sundials. **It's about time!**

The Ford Amateur Astronomy Club meets in the Ford Motor Credit Company (FMCC) **conference room 1491**, 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 dial 0911 on the security phone and say that you are here to attend a Ford club meeting, and security 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.

Hope to see you at the meeting!

OUR GANG

FROM THE STARLOG OF JUDY DOELKER

8-07-94 SMURFS Roundup! Somewhere near Atlanta, Mich.

Joyce and I are the last to leave - but reluctantly. It's been a beautiful weekend filled with dark skies. With a little help from Brian and Joyce I've bagged my 70th Messier object and quenched my thirst for time travel through my Celestron (even tho I left my Questar in Traverse City -- DUMB, DUMB!!!)

After we pack up we take a walk and survey the area. Everyone has cleaned up nicely, but evidence of the astronomical event still remain. It's like aliens landing in a field and leaving their marks on the land. Where once there was a nice smooth airstrip of freshly cut grasses there are squares of vegetation crushed under some unknown heavy weight. The squares are situated around the perimeter, much like a small community with sleeping quarters protecting the main activity of the interior. Each square path leads to an odd triangular pattern. At each point of the triangle there are holes in the earth, but the grass is still tall within. Around each triangle the grass is flattened more than anywhere else on the strip as evidence of some strange ritual that must have taken place here; almost as if something within this boundary had power enough to require supreme worship. A bond existed here in the dark night.

I close my eyes and imagine beings wandering around making contact with each other sharing information, ideas, images and every matter of nourishment. I can almost hear the hushed sounds of voices in the night and the quiet purr of some strange mechanism keeping pace with the cosmos.

In this dark and mysterious environment the only things visible are small beady red eyes. Something strange and wonderful had happened in this place - glad I was part of it.

As we depart I can still hear Harry snoring.

S.M.U.R.F.S. from Greg Burnett

Here's a quick report on the Southern Michigan Universal Regional Festival of Stargazers (SMURFS) held this past weekend.

The event was held at a grass airstrip (well, it was almost an airstrip; they never finished clearing it entirely) near Atlanta, Michigan (about 20 miles north of Mio). Both Friday and Saturday nights were very clear (Friday was pretty damp, tho) and the location was VERY dark. It was so dark that you really had some trouble seeing where you were walking. M31, the double cluster in Perseus, and several other objects were easily visible to the naked eye. I was able to view faint NGC objects with my 6-inch that I don't usually mess around with. The only complaint was that the horizons were a little high, with trees.

There were many other observers from other clubs, although the event was not quite as well attended as in past years, doubtless because of the new venue. I saw the Veil Nebula thru an O-III filter on a 13-inch scope, and it was astounding! Looked just like the

photos in Burnhams. Also saw the Omega nebula thru Judy Doelker's 8-inch SCT and it was very bright. Judy now has scored over 70 Messier objects, and qualifies for the Astronomical League Messier certificate.

The facilities this year were Spartan to say the least. The Genessee Astronomical Society (GAS), the host club, arranged for chemical toilets and sold hotdogs, coffee, and pop, but besides that you had only what you brought with you. Mosquitoes were not much of a problem because it was pretty cold. It got down below 50 Friday; good sleepin' weather! AC power was available in limited quantity, and water was provided.

GAS plans to continue to hold the event at this location in future years, and I'm sure many of us will continue to attend. We (our club) should perhaps think about holding our own event at the RV park near Clare; that location provided a nice family-style outing that SMURFS will no longer be.

Our club was represented by Harry and Ada, Judy and Joyce, and me. In the door prize drawing, Harry won the "Official SMURFS grey-scale imaging system" consisting of a dozen No. 2 pencils, sketch pad, and sharpener. Judy won a roll of red filter cellophane, and I won a Russian-made "Bertele" eyepiece, the "grand prize" from all appearances. (It's actually quite interesting!) A good time was had by all. Hope to see you there next year.

ASTROPHOTOS from Steve Nagi

I finally made it out to Island Lake two Sunday's ago, to try my hand at astrophotography. Fortunately the night was clear as a bell. I did not even try the F/6.3 reducer/corrector, as I will explain later. I shot 2 5 minute, a 7 minute, and a 10 minute exposure of the Lagoon Nebula. I went to shoot another 10 minute exposure, but unfortunately the cable release for my shutter on my camera broke. bummer to say the least. At least I got four exposures, I would have loved to have set up everything and then after trying one shot, have it break. I used Kodak 400 Gold film. The results aren't that bad, I did not do that good of a job tracking the first 2 exposures, but it got a little better. I also only polar aligned using my polar aligning finder scope, not the two star method, which would have probably helped. I also wanted to try the 6.3 reducer, but with a cable release in two parts, I had a small problem. (I happened to see the four photos that Steve did. They were GREAT for a first time effort. We'll be looking forward to more from Steve for inclusion into the newsletter. -Ed.)

NEW MEXICO ADVENTURE by Greg Burnett

This past July, I took an extended vacation from work so my family and I could visit my sister and her family in New Mexico, where they have lived for the past eight years or so. I explained to everyone that the trip was actually an astronomical expedition disguised as a family vacation. In fact, arrangements really were made in deference my hobby, to the extent that my wife and daughter flew down while my son and I drove (3 days!), because my car can only accommodate one passenger when it's loaded with all my astronomy gear!

So off we went, looking forward to clear, dark skies and dry air. Our destination was the small town of Clovis, near the eastern

border of New Mexico, situated on the high plains; not quite desert, but close. You can get a T-shirt that reads, "Clovis, New Mexico: 30 miles from water, 3 feet from hell!" The area is unmistakably cattle country; the last towns of any consequence that you drive through before reaching Clovis are Hereford, Texas and Bovina, Texas! The "essence de bovine" was in the air nearly everywhere.

Well, to make a short story even shorter, we had a great time from a vacation standpoint, but as a astronomy expedition it was something of a fizzle, at least in terms of observing. I was able to get out only a couple of times. While we were there, the weather settled into a pattern of clear days and stormy nights. I suppose, if I were hard-core, I could have done the early morning observing thing, but family activities made that sort of impractical. Anyway, the times I did get out to observe were nice. The air was very clear and dry, with no dew whatever. There were almost no mosquitoes, and the few that did come around were not aggressive like the ones we have. You just shooed them away and they sort of buzzed "excuse me..." and went somewhere else. The sky was pretty dark, but I never got far enough away from town to really appreciate it.

As soon we arrived in New Mexico, I hooked up with Michael Rowley of the Clovis astronomy club, and most of the observing I managed to do was in company with him or his group. Mike was teaching an astronomy class at the local community college, so I was able to sit in on a couple of sessions and even do a little teaching about eyesight and dark adaptation and such. We had two observing sessions at Mike's home observatory, which is equipped with a motorized dome housing a 11-1/2" AstroMak, a unique instrument that was the prototype for the commercial 12-inch version. One session was for solar observing. The class viewed the sun in white light through my scope and in H-alpha through Mike's. The other session was at night, but under an almost full moon, so we shared some of the "standard" and brighter objects with the class. Unfortunately I wasn't able to stay very late that night because we were starting the long drive home the next morning.

As it happened, the SL-9 impact on Jupiter was going on during our vacation. The first and only time I was able to view the impact was from the motel parking lot in Oklahoma City on the way home! We had been hearing about it on CNN and elsewhere, and when finally the chance came, we simply had to deploy the Pronto in the parking lot and take a peek. Sure enough, the G fragment impact spot was barely visible at 100x. With all the light pollution from the city and the ground light from the motel and the car dealership next door, I was amazed we were able to see it at all.

So all in all, it was a trip I'd make again, but I'd choose a different time of year when perhaps the weather might be more accommodating. I want to publicly thank Mike Rowley of the Clovis Astronomy Club for his hospitality, and I hope we will be able to get together again sometime. I should also thank my sister and her family for putting up with us for the duration, but they don't subscribe to Star Stuff! I guess I should tell them personally, eh?

From Doug's Declination (Continued from page 4.)

A camper tent trailer would be perfect for this trip. There is a small shack there, with a refrigerator, and a hotplate. Maybe 3 people could sit down at a small table inside. But in general it is for storing items we don't want to haul back and forth from home.

There are several places to observe from on the property, since there are 60 acres there. From our regular observing sight in the middle of the property, there is no electricity, and if the trees have not blocked the way by now, it is possible to drive back there. If it is blocked, the front of the property is fairly open. Bring some long extension cords if you need electricity. The skies are great there and the land is high, (no swamps or lakes nearby). Lots of woods to go exploring through, but bring your compass if you do. Our property is right next to the Manistee forest. You can get lost if your not careful. The place is a real spirit revitalizer. I will give maps to the property for those that are interested.

The 12" is back in operation!!! (yahoo). Roger, after much consternation and time, found the problem. A couple of wires were crossing intermittently, which would cause the controller to overheat, blow fuses and stop working. One big bad fan, and circuit breaker later, he found the wires. (tee hee). Now I know when the controller is still on. You can here the fan from 30 feet away. He also replaced the tape that held the controller door closed with some nice knurled nuts on bolt posts. Great job Roger. I hope it lasts forever, cause I can't send it to you in Arizona. The freight cost would buy a new mount.

I also saw the comet crash of 94 on Jupiter. Great stuff. Most impressive was the size of the impact areas. I had a chance to look through several scopes at Island lake, and I agree with several of the people that have looked through Brian's scope. It had the best view. There's gonna be a bidding war on that scope, if Brian ever decides to dump it. Incredible images. I also observed some aurora this last month. I don't remember the days though. Age showing again. I guess I need to write everything down now. HmMMM. I am heading down to Hudson State park next weekend for the Perseid shower watch the WAS is doing. I'll let you know what happened next time.

It's been a great summer, average golf, and lots of astronomy events. Sorry I missed SMURFS, but I've been busy with work. I'll make some of the Island lake star parties in August. Then the Sept. 3 party at my place, and the Island lake biggie the next weekend. And then the Northern trip. I hope to let you know how it is all going next time. Clear skies until then.

September 8, 1994

Can you believe the great weather we have been having the last few weeks? I am actually losing sleep because of all the observing opportunities we have had.

As I stated in my last report this is a great time of the year to do observing. The Fall star party was a great success. We had clear weather all day and it even stayed clear all night. The dew was pretty hefty until about 1:30 am.

(continued on page 9)

OFF AXIS

ADVENTURES OF

BY JOHN
ST. PETER

THE ASTRO BOYS

INTRODUCING OUR HEROS...

DREG DAGBURNIT & BRAIN GOSLOW



HOWDY!!

AD
ASTRA!



GREAT IDEA, BRAIN!
SEE YA LATER!



I WONDER WHERE
THESE BOLTS
WENT TOO?



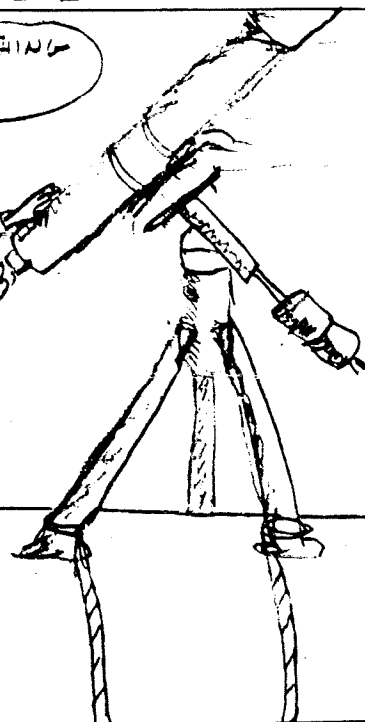
BRAIN, ITS BEEN
CLOUDY SO LONG I'VE
FORGOTTEN WHAT
STARS LOOK LIKE!



WELL DREG, I HAPPEN
TO KNOW THAT THE
KUIPER AIRBORNE
OBSERVATORY IS
PASSING METRO TODAY,
PERHAPS...?



DAGBURNIT! THIS THING
IS COMING LOOSE!



YA
HOO!



IT'S A COMMUNIST
PLOT! FLOURIDE!
FIRST THEY PUT IT
IN THE DRINKING
WATER, NOW ITS
IN THE OPTICS!

COL. SAINTLY LONGNAME

NEXT MONTH THE ASTRO BOYS GRIND A
MIRROR IN... 'PAIN IN THE GLASS!'

ASTRONOMY WORKSHOP

by Greg Burnett



PROFS=GBURNETT
InterNet
USFMC6SH@IBMMAIL.COM

No submissions this month. Guess you folks already know EVERYTHING, huh!?! Well, how 'bout sharing your wisdom for the benefit of others who may just be starting out? Send questions and answers to the address(es) above, or to the club PO box if you're not electronically inclined. No question is too basic.

Q32. What is a good light-weight 35mm camera for taking pictures through a telescope?

In the absence of any specific suggestions from the more photo-knowledgeable among us, I will attempt to offer some very general guidelines. First, as the question implies, the 35mm format is the most popular choice, for a number of reasons, including manageable size and weight, availability of many different films, availability of cameras, and general popularity for non-astronomical use. A single-lens-reflex (SLR) model is almost imperative to allow proper focussing. The removable lens of most SLRs allows use of various adapters for attaching the camera to the telescope, an arrangement that is far superior to the "afocal" method, where the camera-as-eye is just pointed into the telescope eyepiece.

In general, a camera intended exclusively for astronomy functions pretty much as a film holder. The other features the camera may offer, such as variable shutter speeds, light metering, etc. are seldom if ever used. There are exceptions to this, but most astrophotography involves long duration exposures that do not utilize the camera's shutter mechanism to time the exposure. Thus, the camera must offer a "B" shutter setting (B = "bulb", referring to the old-fashioned air bulb release.) that will allow the shutter to be held open for long periods of time. This brings us to another important point: Newer cameras often have electronic shutters that use battery power all the time that they are held open. This can drain small camera batteries in a hurry. Older models tend to have mechanical shutters that don't suffer from this particular foible. When you choose a camera, be sure you know how it operates in this respect.

Finally, a camera that offers interchangeable focussing screens will be superior for astrophotography. Accurate focussing is a major problem when the target is a faint fuzzy. There are a number of external focussing aids available (I haven't tried any of these), some costing upwards of \$100 or more. If your camera can be equipped with a bright, plain, fine ground glass screen, it will usually see you through. Micro-prism and split-image focussing screen are generally useless through a telescope, and a coarse ground glass can be difficult.

Left-over questions:

Q31. What is meant by an Astrometric night and a Photometric night, are they the same? What are the differences and what type of astronomy are they related to?

★

From Doug's Declination (continued from page 7)

After that it was clear sailing for the optics. It got down into the upper 40's and the mosquitos were nowhere to be found. It was great. We had several new astronomy enthusiasts there and we worked on there scopes to get them running. We also showed them how to find some objects. It is really great to hear their reactions when the look at something for the first time.

Unfortunately the 12 inch is back off-line. Controller problems again!!! Roger is sending me the schematics. I may get dangerous and try to find the problem myself. Oh no, a software person working on hardware!!! Could be scary.

John St-Peter is coming out to my place tonight. He has been missing alot of the clear weather and needs to get his astronomy fix. He has a bad case of the shakes, I guess.
Clear skies.

★

STATISTICALLY SPEAKING....

Dearborn, MI

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

Local Time = UT - 4.00 hours(EDT) 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	SEQ	September Equinox

September 1994						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
				SR: 6:58 SR: 6:59 SR: 7:00		
				SS: 20:07 SS: 20:06 SS: 20:04		
				MR: 2:33 MR: 3:34 MR: 4:38		
				MS: 17:20 MS: 17:59 MS: 18:34		
4	5	6	7	8	9	10
SR: 7:01 SR: 7:02 SR: 7:03 SR: 7:04 SR: 7:05 SR: 7:07 SR: 7:08						
SS: 20:02 SS: 20:01 SS: 19:59 SS: 19:57 SS: 19:55 SS: 19:54 SS: 19:52						
MR: 5:46 MR: 6:55 MR: 8:07 MR: 9:19 MR: 10:32 MR: 11:44 MR: 12:55						
MS: 19:08 MS: 19:40 MS: 20:13 MS: 20:47 MS: 21:24 MS: 22:06 MS: 22:53						
	NM: 14:33					
11	12	13	14	15	16	17
SR: 7:09 SR: 7:10 SR: 7:11 SR: 7:12 SR: 7:13 SR: 7:14 SR: 7:15						
SS: 19:50 SS: 19:48 SS: 19:47 SS: 19:45 SS: 19:43 SS: 19:41 SS: 19:40						
MR: 14:00 MR: 15:00 MR: 15:52 MR: 16:37 MR: 17:16 MR: 17:50 MR: 18:21						
MS: 23:46 MS: None MS: 0:45 MS: 1:48 MS: 2:52 MS: 3:57 MS: 5:02						
	FQ: 7:36					
18	19	20	21	22	23	24
SR: 7:16 SR: 7:17 SR: 7:18 SR: 7:19 SR: 7:20 SR: 7:21 SR: 7:22						
SS: 19:38 SS: 19:36 SS: 19:34 SS: 19:32 SS: 19:31 SS: 19:29 SS: 19:27						
MR: 18:49 MR: 19:17 MR: 19:45 MR: 20:14 MR: 20:45 MR: 21:19 MR: 21:58						
MS: 6:05 MS: 7:07 MS: 8:07 MS: 9:07 MS: 10:06 MS: 11:04 MS: 12:00						
	FM: 16:00				SEQ: 2:20	
25	26	27	28	29	30	
SR: 7:24 SR: 7:25 SR: 7:26 SR: 7:27 SR: 7:28 SR: 7:29						
SS: 19:25 SS: 19:24 SS: 19:22 SS: 19:20 SS: 19:18 SS: 19:17						
MR: 22:40 MR: 23:28 MR: None MR: 0:21 MR: 1:19 MR: 2:20						
MS: 12:53 MS: 13:44 MS: 14:31 MS: 15:14 MS: 15:53 MS: 16:29						
		LQ: 20:24				

Planet View Info Report for 9/ 1/1994 to 9/30/1994

Mercury						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	8:26	20:47	11h42m03s	2°29'42"	16°33'46"	0.877 1.29792
9/ 8/1994	8:55	20:39	12h20m39s	-2°38'45"	20°39'59"	0.816 1.23298
9/15/1994	9:20	20:28	12h55m39s	-7°23'10"	23°45'55"	0.748 1.15179
9/22/1994	9:39	20:16	13h26m56s	-11°31'58"	25°42'05"	0.664 1.05535
9/29/1994	9:49	20:01	13h52m55s	-14°49'06"	26°00'23"	0.550 0.94479

Venus						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	11:00	21:35	13h25m15s	-11°53'10"	45°50'53"	0.448 0.62681
9/ 8/1994	11:06	21:18	13h47m25s	-14°51'14"	45°13'02"	0.406 0.57227
9/15/1994	11:10	21:00	14h07m52s	-17°32'43"	44°01'23"	0.360 0.51884
9/22/1994	11:10	20:40	14h25m52s	-19°53'24"	42°05'24"	0.309 0.46716
9/29/1994	11:05	20:18	14h40m23s	-21°48'18"	39°11'26"	0.254 0.41812

Mars						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	1:59	17:12	6h42m42s	23°29'45"	58°33'33"	0.910 1.76425
9/ 8/1994	1:52	17:02	7h01m46s	23°12'53"	60°57'52"	0.907 1.72403
9/15/1994	1:44	16:51	7h20m21s	22°48'35"	63°28'46"	0.904 1.68165
9/22/1994	1:37	16:39	7h38m25s	22°17'39"	66°06'34"	0.901 1.63716
9/29/1994	1:30	16:26	7h55m56s	21°40'57"	68°51'55"	0.898 1.59052

Jupiter						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	12:11	22:31	14h30m33s	-13°49'53"	61°23'40"	0.993 5.81552
9/ 8/1994	11:49	22:07	14h34m52s	-14°11'58"	55°43'13"	0.994 5.90692
9/15/1994	11:27	21:42	14h39m31s	-14°35'07"	50°06'11"	0.995 5.99213
9/22/1994	11:06	21:18	14h44m28s	-14°59'04"	44°32'03"	0.996 6.07037
9/29/1994	10:46	20:54	14h49m40s	-15°23'37"	39°00'01"	0.997 6.14103

Saturn						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	20:08	7:02	22h44m30s	-10°06'23"	177°59'24"	1.000 8.73727
9/ 8/1994	19:39	6:31	22h42m30s	-10°18'41"	172°49'17"	1.000 8.74353
9/15/1994	19:11	6:01	22h40m34s	-10°30'28"	165°38'11"	1.000 8.76457
9/22/1994	18:42	5:31	22h38m42s	-10°41'26"	158°21'43"	1.000 8.79997
9/29/1994	18:13	5:01	22h36m59s	-10°51'21"	151°04'30"	0.999 8.84913

Uranus						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	17:52	3:08	19h38m46s	-22°01'50"	134°25'58"	1.000 18.95363
9/ 8/1994	17:24	2:40	19h38m07s	-22°03'14"	127°29'46"	1.000 19.04495
9/15/1994	16:56	2:12	19h37m37s	-22°04'16"	120°34'22"	1.000 19.14503
9/22/1994	16:28	1:44	19h37m17s	-22°04'55"	113°39'53"	0.999 19.25235
9/29/1994	16:00	1:16	19h37m07s	-22°05'10"	106°46'07"	0.999 19.36541

Neptune						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	17:39	3:03	19h29m45s	-21°13'26"	132°29'39"	1.000 29.48489
9/ 8/1994	17:11	2:34	19h29m20s	-21°14'33"	125°36'28"	1.000 29.57795
9/15/1994	16:43	2:07	19h29m00s	-21°15'27"	118°43'21"	1.000 29.67938
9/22/1994	16:16	1:39	19h28m47s	-21°16'08"	111°50'21"	1.000 29.78764
9/29/1994	15:48	1:11	19h28m40s	-21°16'35"	104°57'14"	1.000 29.90125

Pluto						
Date	Rise	Set	RA	Dec	Elongation	Ill Fr DIST(AU)
9/ 1/1994	12:54	0:20	15h45m35s	-5°47'28"	77°30'10"	1.000 29.99745
9/ 8/1994	12:28	23:49	15h45m58s	-5°52'28"	71°02'01"	1.000 30.10862
9/15/1994	12:01	23:21	15h46m27s	-5°57'39"	64°34'51"	1.000 30.21526
9/22/1994	11:34	22:54	15h47m02s	-6°02'58"	58°09'05"	1.000 30.31593
9/29/1994	11:08	22:27	15h47m42s	-6°08'21"	51°45'01"	1.000 30.40935

Planet Apsides Report for 1994

Mercury			
9/15/1994	Aphelion	Distance from Sun:	0.47 AU

Venus			
9/ 7/1994	Aphelion	Distance from Sun:	0.73 AU

Planet Conjunction/Opposition Report for 9/ 1/1994 to 9/30/1994

Saturn		
Date	Hour	Event
9/ 1/1994	6	Opposition

Moon Apsides Report for 9/ 1/1994 to 9/30/1994

Date	Hour	Apsis	Distance (km)	Diameter
9/ 8/1994	10	Perigee	365156	0.5454"
9/24/1994	8	Apogee	405265	0.4914"

Meteor Showers Report for 9/ 1/1994 to 9/30/1994

Date	Meteor Shower	ZHR	RA	DEC	Illum.	Frac.	Longitude
9/ 8/1994	Piscids	10	0h36m	7°	0.13		166°
9/20/1994	Piscids	5	0h24m	0°	0.99		178°

Twilight Report for 9/ 1/1994 to 9/30/1994

Date		Sun	Astronomical	Nautical	Civil
		Rise Set	Begin End	Begin End	Begin End
9/ 1/1994		6:58 20:07	5:14 21:52	5:50 21:15	6:25 20:41
9/ 8/1994		7:05 19:55	5:24 21:37	5:59 21:02	6:33 20:28
9/15/1994		7:13 19:43	5:33 21:23	6:07 20:49	6:40 20:16
9/22/1994		7:20 19:31	5:42 21:09	6:15 20:36	6:48 20:03
9/29/1994		7:28 19:18	5:50 20:56	6:23 20:23	6:55 19:51



MEETING MINUTES - August 25th, 1994

The meeting was called to order at 5:00pm by President Greg Burnett. There were 22 club members present.

President's Report: Greg Burnett announced that the Star Party fliers have been mailed. On September 11th is the Ford Engineering Open House. Volunteers are needed to represent the Astronomy Club at this event.

Upcoming Events: September 3rd, Autumnal Equinox Star Party at Doug Bock's home. September 11th, Second Annual Island Lake Star Party.

Misc: A collection of Profs notes on various astronomical topics collected by Chuck Boren from the Internet. An article on planetary and space exploration submitted by Bill Colwell was also passed around. John St. Peter demonstrated a device he has designed for drying moisture from inside SCT tubes.

Main Presentation: Measuring distances in the Universe, a lecture by John St. Peter.

September's Skies

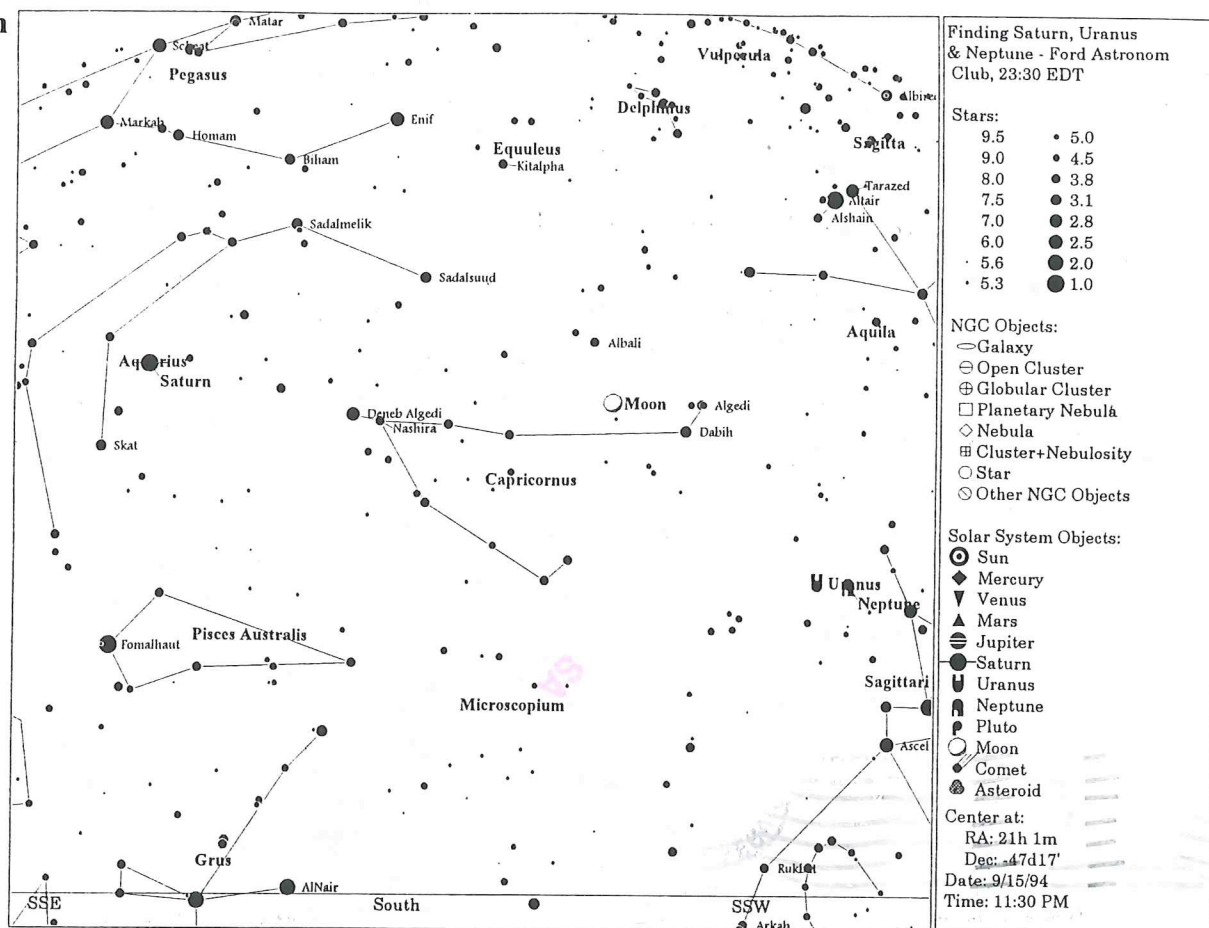
This circular star chart displays the constellations visible in September. The chart is oriented with North (N) at the top and South (S) at the bottom. The constellations shown include:

- Ursa Major
- Ursa Minor
- Perseus
- Cassiopeia
- Andromeda
- Pegasus
- Aquarius
- Pisces
- Aries
- Taurus
- Auriga
- Lynx
- Camelopardus
- Draco
- Corona Borealis
- Bootes
- Canes Venatici
- Serpens
- Ophiuchus
- Scutum
- Sagittarius
- Capricornus
- Piscis Austrinus
- Grus
- Microscopium
- Sculptor
- Cetus
- Delphinus
- Equuleus
- Vulpecula
- Cygnus
- Lacerta
- Triangulum

The chart also marks various Messier objects (M1 through M70) and deep sky objects like the Ring, Keyhole, and Helix nebulae. The chart is oriented with North (N) at the top and South (S) at the bottom.

September, 1994

Finding Saturn



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

