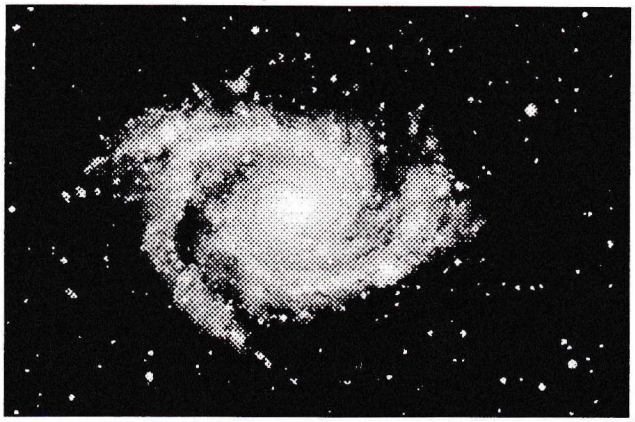
REFLECTIONS



REFLECTIONS

June 1995

NGC 2997, mag 11.0, size 8.0' x 7.0', Sc spiral galaxy in the southern constellation of Antlia
RA 9h 45m 24s, DEC -31 degrees 10' 03"

Chris Sarnecki
Editor

Of the University Lowbrow Astronomers

The University Lowbrow Astronomers is a club of Astronomy enthusiast which meets on the third Friday of each month in the University of Michigan's Physics and Astronomy building (Dennison Hall, Room 807). Meetings begin at 7:30 pm and are open to the public. Public star parties are held twice a month at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party is canceled if it's cloudy or very cold at sunset. For further information call Bill Razgunas at (313) 995-0934.

This Month:

June 16 - Meeting at Pioneer High School Steve Schaffer will host a planetarium show in the Pioneer High School planetarium. Remember to show up at this location if you expect to rub shoulders with your fellow Lowbrows.

June 12, 13, 14 - Mir Space Station - See *Sky & Telescope's* July article on sighting the Mir Space Station currently predicted to be well place for our skies. Don't forget to convert UT into EDT or you will miss this event by a day.

June 21 - Summer Solstice Summer begins at 4:34 pm EDT

June 24 - Public Star Party at Peach Mountain Observatory. Jupiter is just past opposition. Come on out and check out the view on the club's new (well slightly used) Cave 8" telescope.

May 29 - New Moon at 8:50 pm EDT

Next Month:

July 1 - Computer Subgroup meeting to be determined.

July 1 - Public Star Party at Peach Mountain Observatory. The mosquito's feast begins at Sun down for those of you that forget your repellent.

July 21 - Meeting at 807 Dennison. Caroline Cox will be speaking on recent events in the media.

June 22 - Public Star Party at Peach Mountain Observatory. Uranus (mag 5.6) is at opposition

July 27 - New Moon at 11:13 am EDT

June 29 - Public Star Party at Peach Mountain Observatory. Wow, three star parties in one month. Odds are at least one of them will not be canceled due to cloudy weather. Saturn is rising just after twilight.

Beating the High(?) Cost of Amateur Astronomy

by Doug Scobel

With all the talk these days about how expensive it is to pursue amateur astronomy, it's hard to imagine how anyone can afford it. Especially when you're faced with a dazzling array of huge apertures, CCD cameras, PEC drive controls, computer guided automatic object location, and ultra-super wide angle coma correcting eyepieces. Given all of these options, it would be easy to come to that conclusion. But is it really that expensive? I would argue (and will here) that it has never been cheaper!

Start Out Modestly Do you really need to start out with a 20 inch light bucket on a Poncet mount with 80 plus degree apparent field eyepieces, or an 11 inch, CCD equipped, Schmidt-Cassegrain telescope that can find one of a million objects at the push of a button? If you've got the money to do it, then by all means go for it. But what if you're starting out on a limited budget?

How about starting with something smaller, on a simple Dobsonian or equatorial mount? The old "standard" six inch f/8 reflector (I'm showing my age here) will show you stars down to about 13th magnitude, good views of all the Messier objects, scores more NGC objects, all the planets (except maybe Pluto), the Moon, the Sun (with protection, of course), and double stars down to under an arc second. What more could you ask for? It will literally take you years to see all there is to see with a scope this size. I enjoyed mine for fifteen years (many of which being spent observing through the murky, light polluted skies of Detroit) before I built my thirteen inch. In fact, I still use it when I want to look at the Moon or planets, or if I'm not feeling energetic enough to drag out the big one.

There are inexpensive small Dobs in six and eight inch sizes by a few manufacturers now, and some equatorial mounted ones as well. If you're so inclined, you can save even more by building your own. Simply buy or make the components and assemble them yourself. And, if you have the time and patience, you can even make your own optics. Back in the "old" days, when I was just getting started, almost everyone made their own telescopes and mirrors because the commercially available ones were relatively expensive, and there wasn't much of a variety from which to choose.

I would *NOT* recommend the small refractors you see in department stores. There are better quality small refractors you can buy, but even those may soon have you looking for more aperture. For the same price you can have a reflector with more light gathering power, which is most important if your interested in doing any deep sky observing. However, if all you want to observe is the Moon, planets, and/or double and variable stars, then a small, good quality refractor might indeed fit the bill.

Don't rule out binoculars. If you already own a pair then they'll cost you nothing! They can be excellent for helping you learn your way around the sky. A few open clusters actually look better in binoculars than they do in most telescopes, because the binocular's wide field of view lets you see the whole thing at once.

The idea here is to start out modestly. Remember that a smaller telescope that you use often will show you much, much more than something larger that sits inside all the time because it it too big and cumbersome to set up.

Eyepieces Next to the telescope, the most important item for observing is a good set of eyepieces. But don't go out and spend two or three hundred dollars (apiece!) on the latest eight element ultra-wide angle designs. Besides their high price (even used), they won't work with some telescopes, because they usually require a large, two inch focuser or a lot of "in" travel to bring them to a focus. Coupled with the right telescope they work exceptionally. However, less complex designs work quite well for a fraction of the cost. Plossl, Orthoscopic, or even simpler designs (e.g., Edmund RKEs, which are modified Kellners) are your best

choices, especially if your scope is around f/6 or slower. Every month The Starry Messenger (see below) has LOTS of used eyepieces for sale.

Another way to save money is to be selective about the focal lengths you buy. You don't need a collection of six or seven eyepieces, each separated by five millimeters in focal length. All you really need is three, one each for low, medium, and high power. Select focal lengths so that the medium power eyepiece provides about double the magnification of the lowest power one, and the highest power eyepiece doubles the magnification again. For example, if you have a scope with a focal ratio somewhere around f/6 to f/10, then focal lengths of around 32-40, 16-20, and 8-10 millimeters would be ideal. For scopes around f/4 or f/5, then focal lengths around 24-32, 12-16, and 6-8 would be good. Regardless of the scope you have, it doesn't make sense to have, for example, a 17mm and a 20mm, as the difference in magnification is too small - you won't see much of a difference between the two in the telescope. By keeping the focal lengths spread out, you won't be wasting money on eyepieces that give you nearly identical views.

Consider Buying Used Equipment
Nothing says that you need to buy everything new. Anyone that stays in the hobby for a while will inevitably upgrade to new (usually more expensive) equipment. And naturally, they'll sell their existing stuff to help fund the new. So where do you find all these used goodies? For about twenty dollars a year you can subscribe to The Starry Messenger, a monthly classified shopper full of ads for used astronomy related items. Kind of like a "Tradin' Times" for astronomy nuts. Every issue contains more than twenty pages, packed with ads for used telescopes, optics, eyepieces, filters, mounts, cameras, books, atlases, etc. You can get some great bargains through it. I know, because I have both bought and sold items through it, and the people I've dealt with have proven to be honest and trustworthy.

You can also find bargains at swap meets. Every year at Astrofest, there's a flea market where people bring their unwanted items for sale or trade. Numerous vendors with new equipment are also there selling items at a discount. If there's some item in particular you are looking for, then chances are good that you'll find it. You may even be lucky enough to win one of the excellent door prizes they hand out there! There are other swap meets locally, such as EMU's annual Freeze-Out, as well as at other clubs such as the Capital Area Astronomy Club in Lansing.

Not So Expensive After All So is it really that expensive to get into amateur astronomy? I think not. In fact, you have more options now than you ever had. While the state of the art has been steadily advancing, along with the price tag, you can still obtain excellent equipment at a moderate cost. Besides, once you're hooked, you'll have plenty of time to save up for that 20 inch Dob or eight inch refractor. And in the meantime, you'll be seeing much more than you ever imagined you could!

?????

by Bernard Friberg

Searching the heavens for the minutia of galaxies, planetaries etc. can be a lot more rewarding with the capability of computer aided positioning. The coupling of the 24" telescope to the computer is working! The star field on the monitor reflects the pointing of the telescope, and a marker points to the telescope field.

While looking for and at some fuzzballs that I havn't seen before I spotted a moving object. It was moving quite fast relative to the background stars. The 64 thousand dollar question is, what is it? There are several possibilities: a comet, a conventional satellite, a geosynchronus satellite, a weather balloon, an asteroid, or maybe an alien spaceship. If the trajectory was erractic , then maybe the last category could be a little more plausible, but the motion was very uniform. Could it be an asteroid? Detecting a typical asteroid or comet requires several hours to a full day to detect motion visually. This object was moving quite fast relative to the background stars and could be detected in real time, so it wasn't a typical asteroid or comet.

Two evenings later I searched for geosynchronous satellites in particular, since this is the most likely category for the unknown object. I found at least 5 of them. Two of them were in the same field. They were all about the same brightness, maybe 11 th magnitude, and maybe slightly more disk shape than a star of the same magnitude, but basically they don't look much different than a star. Switch the RA tracking off, and these objects will remain fixed relative to the telescope position and move relative to the background stars. The probability of an object that fits the above description that is something other than a geosynchronous satellite is very small. Tracking the object for several nights should remove the chance of it being something else, but maybe, just maybe what I saw the first night was something else.

CHARTS AND PICTURES PRINTED IN THIS ISSUE

by Bernard Friberg

The two sky charts shows the sky configuration for this month using different settings for brightness and contrast and shows the flexibility that is available in the Sky Program. Different settings adjust the size of the dot representing a given star magnitude. The large circle just touching the right and left margins is the horizon. Some stars and constellations are shown below the horizon. To view stars in the south orient the chart upright with south at the bottom. To view stars in the west, rotate the chart 90 degrees clockwise. To view stars in the north, rotate the chart another 90 degrees clockwise.

The pictures on the front and back cover (permission to publish obtained from Software Bisque) are also enlarged on page 6. The picture of the galaxy NGC 2997 shows a lot of detailed structure in the spiral arms. (printer used for the pictures: complements of Bill Razgunas)

Pluto reached opposition the first part of June, therefore the viewing of this planet is at its best right now. The location of Pluto is given on page 7.

THE GREAT ROOF DERAILMENT

by Mark Vincent.

Robin Kwong (our newest rocket scientist) and I headed up to Peach Mountain on Monday 5 June to look at Jupiter and the Moon. It started off nicely since the air glow people left the gate wide open (all night) so I didn't have to jog up to the observatory for the key. We were the only ones at the observatory and it would remain so the entire night.

The roof started rolling off just fine until it was about two feet short of clearing the telescope. Then there was a shutter and a thump. At first I thought nothing of it. When I went back to cranking the winch, it was stiff in both directions. A quick check of the pulleys showed nothing but, the roof was still too hard to move. Now for the flashlight. One glance showed the north-east wheel had derailed! It was siting about 1.25" below and pressed up against the rail. The west side wheel's rim was tightly against the rail meaning that the entire roof had shifted westward by maybe .75".

Well, no phone, and I couldn't remember anyone's phone number even if we had one. Robin's suggestion that we leave it till morning wouldn't have gone over with the club very well. Now what to do? The weight of the roof had to be lifted about 1.25" and shifted at least .5" eastward. Another look around showed the north side I-beam was well placed for a car jack! Fortunately my car's jack is a small, scissor jack style that fit right in between the rail and the I-beam. Robin held the flashlight as I slowly cranked up the roof. It shifted sideways on its own as soon as the wheel cleared the rail. But, the wheel only overlapped the rail by less than .5" (about half the overlap of what some old rust marks showed). The roof was slowly opened the rest of the way without any problems.

Within an hour of the derailment we were looking at Jupiter. The seeing wasn't great but, good enough to show 4-5 belts. It was Robin's first time to look at M13 with a large scope so she gave the usual oohhs and ahhhs of a first time observer. Then on to M57, M81 and M82. Back to Jupiter for a bit better seeing. Finally, the Moon for more oohhs and ahhhs. Its so bright!

Well by 12:15 am it was time to pack up. The roof closed normally. It had to. I left the jack out underneath the roof. I knew if I had packed the jack first, the roof would have derailed again.

Questions: has anyone else had the problem of a derailed roof? Has anyone checked to see if the rails are still parallel? Robin mentioned that the north east wheel didn't look as if it were vertical and that the shaft might not be quite straight. I had a hard time telling in the dark. Oh well, have car jack will lift.

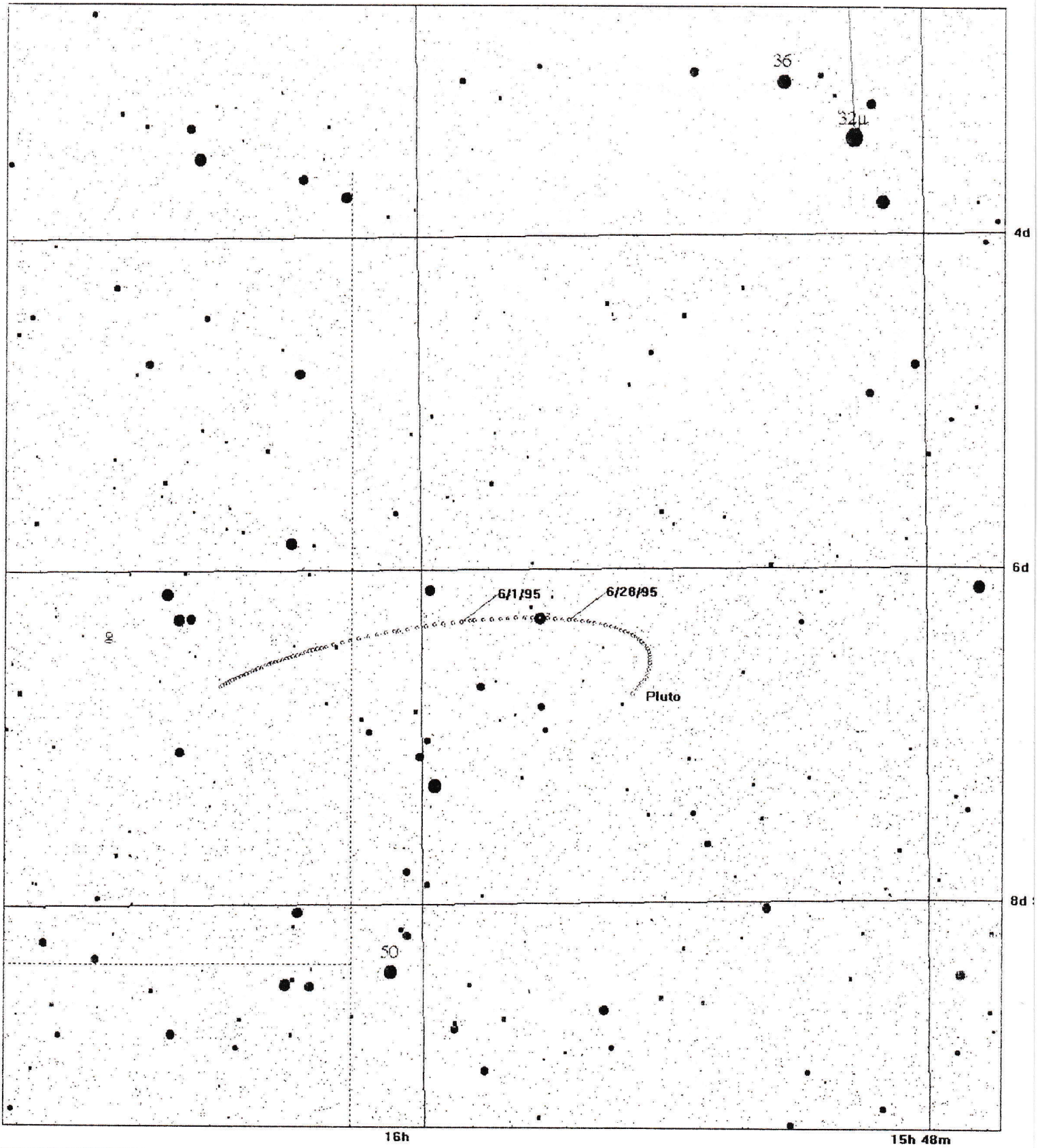
TOP TEN LIST

by Mark Vincent

Well folks, here's the TOP TEN LIST of rocket scientist jokes, bumper stickers and pickup lines never to be heard at the Brown Jug:

10. I'r a rockit pscyntest, me brillyunt.
9. What does a rocket scientist say after graduation? - Ah, ya want fries with dat?
8. My other car is a Black Brant-Terrier.
7. Yo! over here. Wanta launch my... *[We are unable to print the remainder of this joke due to a technical failure in our equipment - Ed]*
6. Rocket scientist don't get high, they reach apogee.
5. Question: How smart do you have to be to be a rocket scientist? - Answer: See #10.
4. How many rocket scientists does it take to replace a light bulb? - None, we call in an electrical engineer.
3. You don't have to be a rocket scientist to fill out a 1040 form. - Believe me, it DOESN'T help!
2. How many rocket scientists does it take to get a VCR to stop blinking 12:00? - None, our great president Bill Ragunas does it for us.
1. Hey babe, I'm a rocket scientist, wanta see my payload?

In news related to #9; I just found out that our two Senators, Bill Schuette and Jon Cisky, believe that I have graduated! This is welcome news to me since I have not even formed a thesis committee, let alone wrote or defended a thesis. I figured that the defense would be about two years down the road. But, now that I have two official letters, direct from the Senate, saying that I have graduated, I will have to pressure my advisor for a promotion to post-doc and the corresponding raise. Aren't you glad to know that: You don't have to be a rocket scientist to be a US State Senator.



Center RA:15h 58m Dec: 5d 59m S

Telescope Reference by Eric Martin

[This telescope reference been edited to indicate our club's 24" telescope and eyepieces - Ed]

Optics - 24" McMath, 15,000 mm focal length, f/24,Classical Cassegrain

Manufacturer	Type	Focal Length	**Mag**	Use
-	-	20	**x750**	Double stars
Univ Optics	Kellner	40	**x375**	Double stars
Meade	EWF	40	**x375**	Double stars
Univ Optics	Plossl	55	**x270**	Moon and planets
Cray	-	(2) 75	**x200**	Galaxies, clusters
Cray	-	120	**x125**	General viewing

Measurements

Optical	Rt Ascension	= Arc Degrees	True Field Objects	
Mag = telescope	Whole Sky	360°	Pegasus Square	15°
focal length divided	One hour	15°	Top of Dipper Bowl	10°
by eyepiece focal	Four minutes	1°	Binocular View	7°
length	One minute	15'	Orion's Belt	5°
Time	Four seconds	1'	The Pleiades	1.5°
UT = EST + 5	One second	15"	Full Moon	30'

Solar System

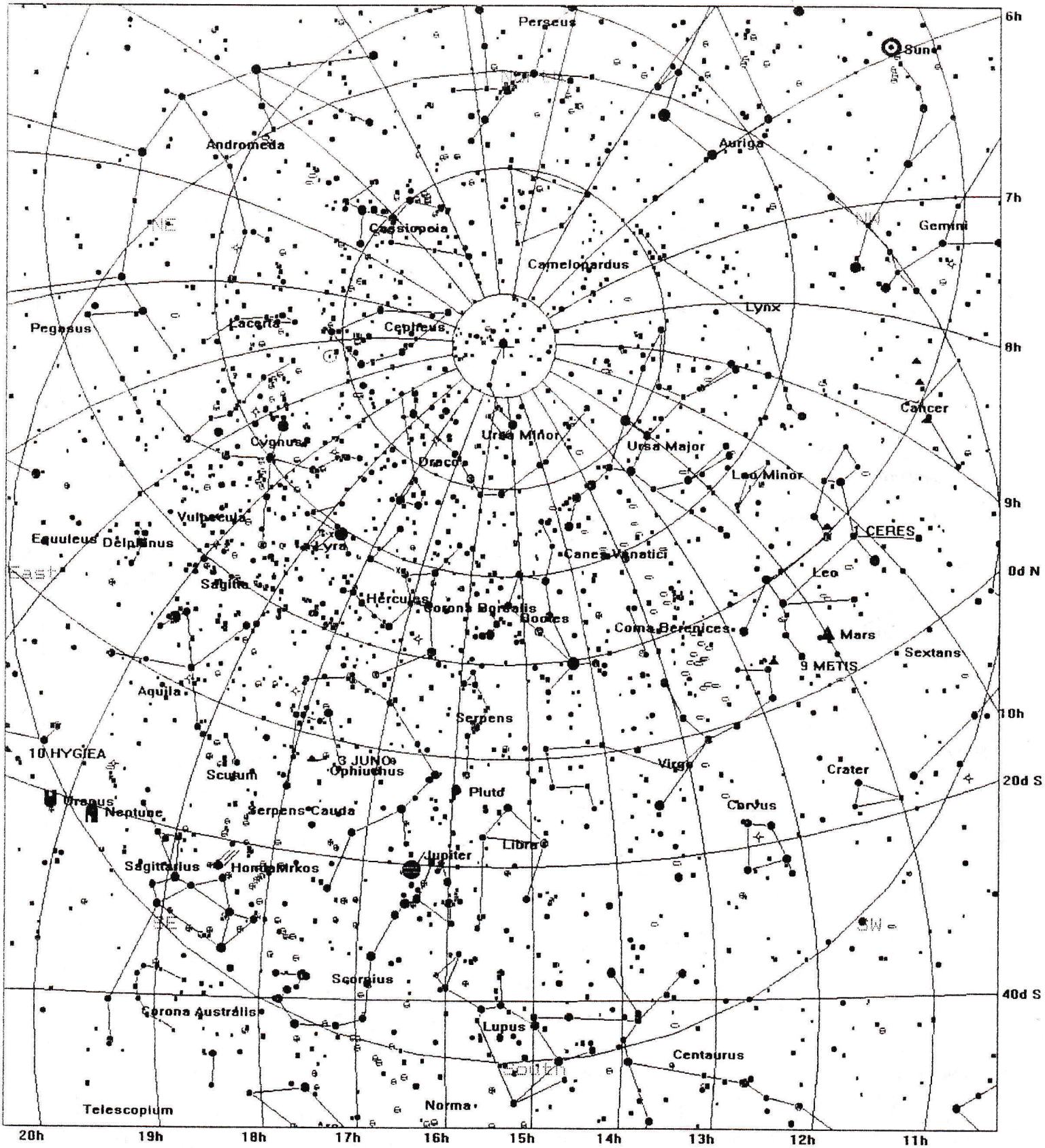
Planet	Avg Mag	Arc Diam	Power	Features
Mercury	-1.7	5" - 13"	40-120x	Phases
Venus	-4	10" - 1'	20-120x	Dramatic Phases
Mars	0	4" - 25"	100-300x	Seasonal markings
Jupiter	-2.2	40"	20-300x	Moons, Red Spot, Bands
Saturn	0	40"	40-300x	Rings, Cassini's Division
Moon	-12	31'	20-300x	Craters, Seas, Mountains
Sun	-26	31'	40-70x	Sunspots

Stars

Spring Triangle		Summer Triangle		Fall Great Square		Winter Olympics	
Arcturus	0	Deneb	1.5	Alpheratz	2	Capella	0
Regulus	1.5	Vega	0	Scheat	2.5	Aldebaran	1
Spica	1	Altair	1	Algenib	3	Algol	2
Polaris	2	Albireo	3	Markab	2.5	Procyon	.5
Castor	2	Cor Caroli	3	Fomalhaut	1	Betelgeuse	.5
Pollux	1	Antares	1			Rigel	0
						Sirius	-1.6

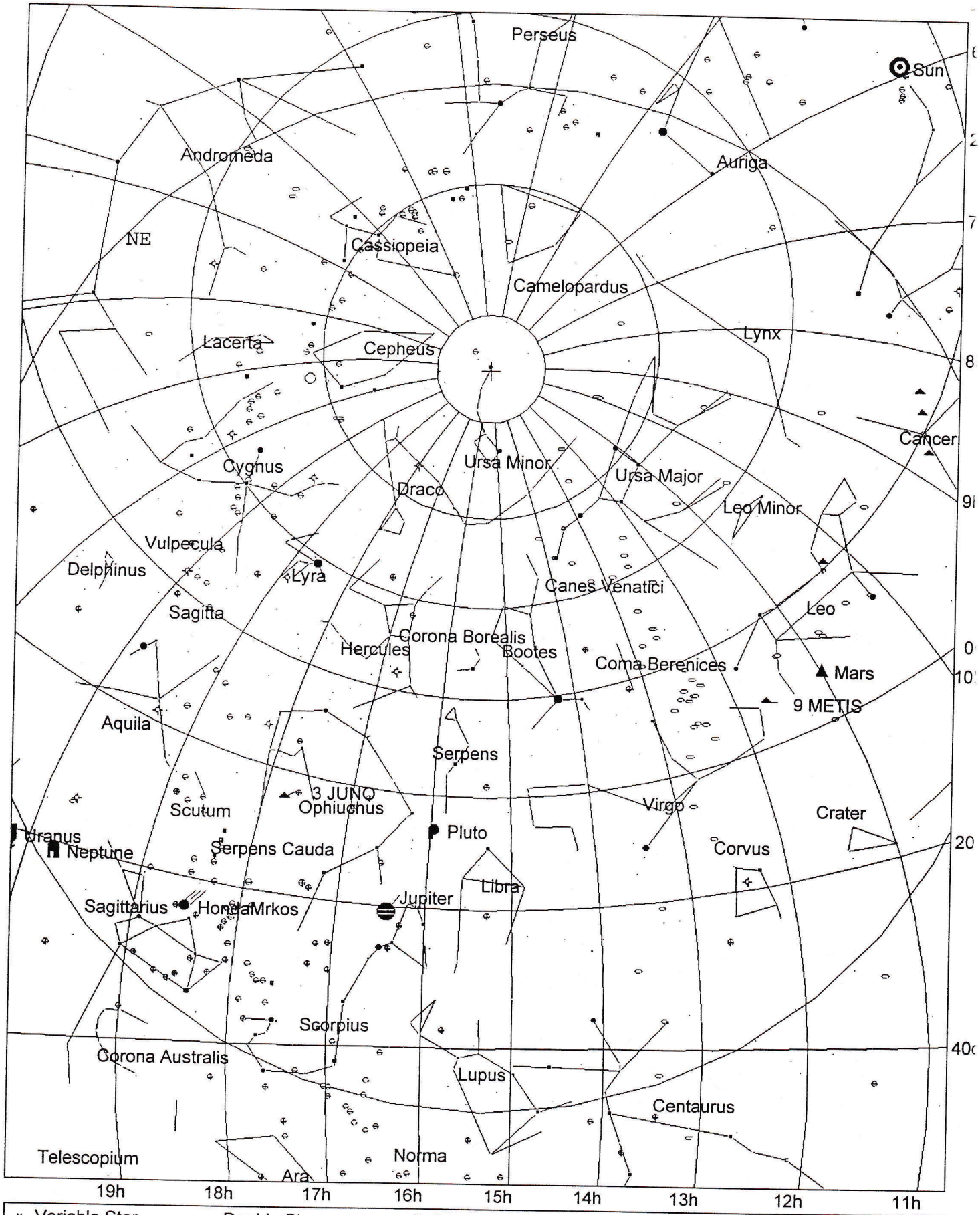
Galaxy

Object	Location	Mag	Diam	Type
The Pleiades	Taurus	4.5	1.5°	Open Cluster
Andromeda Galaxy	Andromeda	5	1°	Spiral Galaxy
Lagoon Nebula	Sagittarius	6	50'	Diffuse
Orion Nebula	Orion	5	40'	Diffuse
M-22	Sagittarius	5.9	17'	Globular
M-13	Hercules	5.6	10'	Globular
Helix Nebula	Aquarius	6.5	12'	Planetary



Variable Star · Double Star · Galaxy · Nebula · Planetary Neb.
Open Cluster · Globular Cluster · Cluster+Nebula · Prob. Star · Other NGC Objects

Center RA:15h 22m Dec: 42d 23m N Date: 6/20/95 Time: 11:00 PM Width: 235d



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Open Cluster · Globular Cluster · Cluster+Nebula · Prob. Star · Other NGC Objects

Center RA:15h 22m Dec: 42d 23m N Date: 6/20/95 Time: 11:00 PM Width: 235d

Places:

Dennison Hall, also known as The University of Michigan's Physics and Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. It is found in Ann Arbor on Church Street about one block north of south University avenue. The meeting is held in room 807.

Peach Mountain Observatory is the home of The University of Michigan's 25 meter radio telescope as well as the University's McMath 24 inch telescope which is maintained by the Lowbrows. The observatory is located northwest of Dexter. The entrance is on North Territorial Road, 1.1 miles west of of Dexter-Pickney Road. A small maize-and-blue sign marks the gate. Follow the gravel road one mile to a parking area near the radio telescopes. Walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.

Times:

Monthly meetings of the Lowbrows are held on the 3rd Friday of each month at 7:30 PM in 807 Dennison Hall. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.

Computer subgroup meetings are held on the first of each month, rotating among member's houses. See the calendar on the cover page for the location of next meeting.

Public Open House/Star Parties are held on the Saturday before and after each new Moon at the Peach Mountain Observatory. Star Parties are canceled if the sky is cloudy at sunset or the temperature is below 10 degrees F. Call 480-4514 for a recorded message on the afternoon of a scheduled Star Party to check on the status. Many members bring their telescopes and visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitos - bring insect repellent, and it does get cold at night so dress warmly !

Dues:

Membership dues in the University Lowbrow Astronomers are $20 per year for individuals or families, and $12 per year for students. This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMath telescope (after some training). Dues can be paid to the club treasurer Doug Scobel either at the monthly meeting or by mail at:

Doug Scobel
1426 Wedgewood Drive
Saline, MI 48176

Magazines:

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:

Sky and Telescope: $24 / year
Astronomy: $18 / year
Odyssey: $16.95 / year

For more information contact the club Treasurer. Members renewing subscriptions are reminded to send your renewal notice along with your check when applying through the club Treasurer.

Monthly Sky Map:

The sky map in this issue of REFLECTIONS was produced THE SKY astronomy software. See the advertisement on page 3 of this issue on how to obtain your personal copy.

Newsletter Contributions:

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call the Newsletter Editor Chris Sarnecki at 426-5772 or e-mail to chrisandi@aol.com to discuss length and format. Announcements and articles are due by the first Friday of each month. Articles should be mailed to:

Christopher Sarnecki
4835 Holly Way
Ann Arbor, MI 48103

Telephone Numbers

President:	Bill Razgunas	995-0934
Vice Pres:	Mark Cray	283-6311
	DC Moons	254-9439
	Tom Pettit	
	Tom Ryan	662-4188
	Randy Stevenson	429-5099
Treasurer:	Doug Scobel	429-4954
Observatory Director:	Bernard Friberg	761-1875
Newsletter:	Chris Sarnecki	426-5772
Peach Mtn Keyholder:	Fred Schebor	426-2363

MONTHLY MEETING:

Steve Schaffer host a planetarium show at Pioneer High School

June 16, 1995 at 7:30 pm
Enter Pioneer High
from the west entrance

NGC 3627 (aka M66), mag 9.0, Sb spiral galaxy in Leo, RA 11h 19m 58 s DEC 13 degrees 00" 28"

University Lowbrow Astronomers
1740 David Ct.
Ann Arbor, MI 48105

Check your membership expiration date on the mailing label !