

**August
1994**

A detail of the Eagle Nebula (M16) in Serpens. This photo was taken with the 5.1-meter Hale telescope at the Mount Palomar Observatory. (From *Burnham's Celestial Handbook: An Observer's Guide to the Universe Beyond the Solar System* by Robert Burnham, Jr.; Dover, New York, 1978.)

**Douglas
Warshaw
Editor**

Of the University Lowbrow Astronomers

The University Lowbrow Astronomers is a club of enthusiasts 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 also held twice a month, at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; map on page 5) on Saturdays before and after the new moon; the star party is cancelled if it's cloudy or below 10°F at sunset. For further information, Bill Razgunas at (313) 995-0934.

This Month

August 1 -- Computer subgroup meeting.
 August 6 --- Open house at Peach Mountain.
 August 11-12 -- Perseid meteor shower peak.
 How will it compare to last year?
 August 13 -- Open house at Peach Mountain.
 August 19 -- Meeting at 807 Dennison Hall.
 Tom Pettit will show us, "Jupiter
 Impact Images from NASA Select
 (News conference and images
 with Shoemaker and Levy)" on
 video.

Next Month

September 1 -- Computer subgroup meeting at
 Bernard Friberg's house (3684
 Middleton in Ann Arbor) starting
 at 7:30 PM.
 September 3 -- Open house at Peach Mountain.
 September 10 -- Open house at Peach Mountain.
 September 16 -- Meeting at 807 Dennison Hall.
 Topic to be announced.
 September 23 -- Autumn equinox (2:19 AM EDT).

Letter from the Editor

As you may have noticed on the front page, the editorship has changed hands again. This is because our own Keith Bozin is about to embark on a major graduate research project in the field of chemistry. Hence, the amount of free time he will have available will be drastically reduced. Good luck on your endeavors, Keith!

You may have also noticed that the newsletter is a bit thinner than usual. This is not due to its relativistic velocity (as evidenced by its somewhat late arrival), but two other factors: 1) this is the first time that I have ever used a desktop publisher, much less done any editing and 2) I need people to submit more articles. Granted that this is the vacation season and some confusion probably exists about where to send said articles. The former I have little control over, but I shall try to alleviate the latter.

First I should probably mention that as of this writing, I have not received an e-mail address, having only recently entered the realm of cyberspace. The address will be given in the September issue of the newsletter. In the meantime, you can contact me at (313) 998-1158 or write to me at 1010 Catherine, Apt. 408, Ann Arbor, MI 48104, and we can work out some arrangement.

I should also mention that I would that material be submitted on a floppy diskette (either 5.25" or 3.5"). In theory, this program can convert from the following formats: text(ASCII), rich text, MS Word (DOS) 3.0-5.x, MS Works (DOS or Windows) 2.0 and 3.0 (with.WPS extension), WordPerfect 5.0 and 5.1, MS Word (Windows) 1.x-2.x, MS Windows Write 3.0 and 3.1, PC-8, and Ami Pro (Windows) 1.0-3.0. I will look the possibility of using a scanner for visual material. Please have your submissions in by the first Friday of the month.

This is, of course, *your* newsletter. Any suggestions for improvement (such as articles to include, newsletter graphics and layout, etc.) will be greatly appreciated.

One last item: I would feedback from club members on the possibility of article/information exchanges with other astronomy groups such as the Saguaro Astronomy Club in Phoenix (the city, not the constellation).

Thank you for your patience.

-Ed.

Choosing an F-Ratio

by Tom Ryan

Whether you're thinking of building or buying a Newtonian telescope, one of the most important things to consider is the choice of f-ratio, which is the number of mirror diameters between the mirror and the eyepiece.

High (long) f-ratios of 10 or 12 are good for observing planets and double stars at high magnification. Images are sharper, sky backgrounds are blacker, the mirror is much easier to make accurately, and the slowly converging light cone enables you to get perfect images from all eyepieces, including very inexpensive ones. Inexpensive eyepieces often have only two lenses, rather than seven or eight, which results in higher contrast images and less scattered light for critical observing. Unfortunately, the telescope's tube is very long and may require a step ladder to reach the eyepiece.

Low (short) f-ratios of 4 or 6 are good for low magnification sweeping of large areas of the sky. Extended objects like nebulae and comets appear brighter in these telescopes, but so too does sky fog. Boosting the magnification to get a better look at planets can be an iffy proposition, since it is much harder and more expensive to make a mirror that is diffraction limited at these f-ratios. If the mirror has zonal errors (and the author has seen very few mirrors which don't), then the high-magnification images will never be sharp. If the mirror is diffraction limited, then the area of good definition in the eyepiece is small because of the presence of the aberration called coma (so called because it transforms stars into comet shapes). The only way to extend the area of good definition is to use expensive (\$200) coma-correcting eyepieces like the Nagler or the Pretoria. On the other hand, short-ratio telescopes are quick to record images on film and CCDs, and a short telescope is unbeatable for portability and convenience. The author's own 8" f/4.5 made a cross-country trip as carry-on baggage in the overhead compartment of an airplane.

The illustration shows the images at the focus (not through the eyepiece! The eyepiece modifies them even more) of a 10" Newtonian reflector. The images all have the same plate scale, so you see the Airy disk shrinking with smaller f-ratios, as expected. Images are plotted on-axis, at 0.25 degrees off axis, at 0.50 degrees off axis, and at a distance of

one half inch from the axis. One half inch represents the edge of a one inch diameter circle of film, or the edge of the field in a typical 25 mm eyepiece.

In our next article, we'll look at these images through several commercial eyepieces.

To scale these images to other size Newtonian telescopes, do the following:

1.) AIRY DISK - The size of the Airy disk in a telescope depends only on its f/ratio, not on the mirror's diameter. The disk's diameter in microns is the same for both a 3" f/4.5 and a 40" f/4.5.

2.) COMA BLUR SIZE, BY DISTANCE FROM AXIS - The coma's blur size at a particular distance off axis doesn't change with mirror diameter. In other words, at one half inch off axis, the blur sizes in a 10" f/6 and a 100" f/6 are the same.

3.) COMA BLUR SIZE, BY ANGLE OFF AXIS - On the chart, find the f-ratio of your mirror. Move across to the desired off axis angle. Multiply the resulting blur size by the ratio of mirror diameters, (Your Mirror Diam./10"). A 20" f/8 mirror would have twice the blur size as a 10" f/8. The Airy disk diameter would stay the same. □

An Excerpt from *Mortal Lessons*

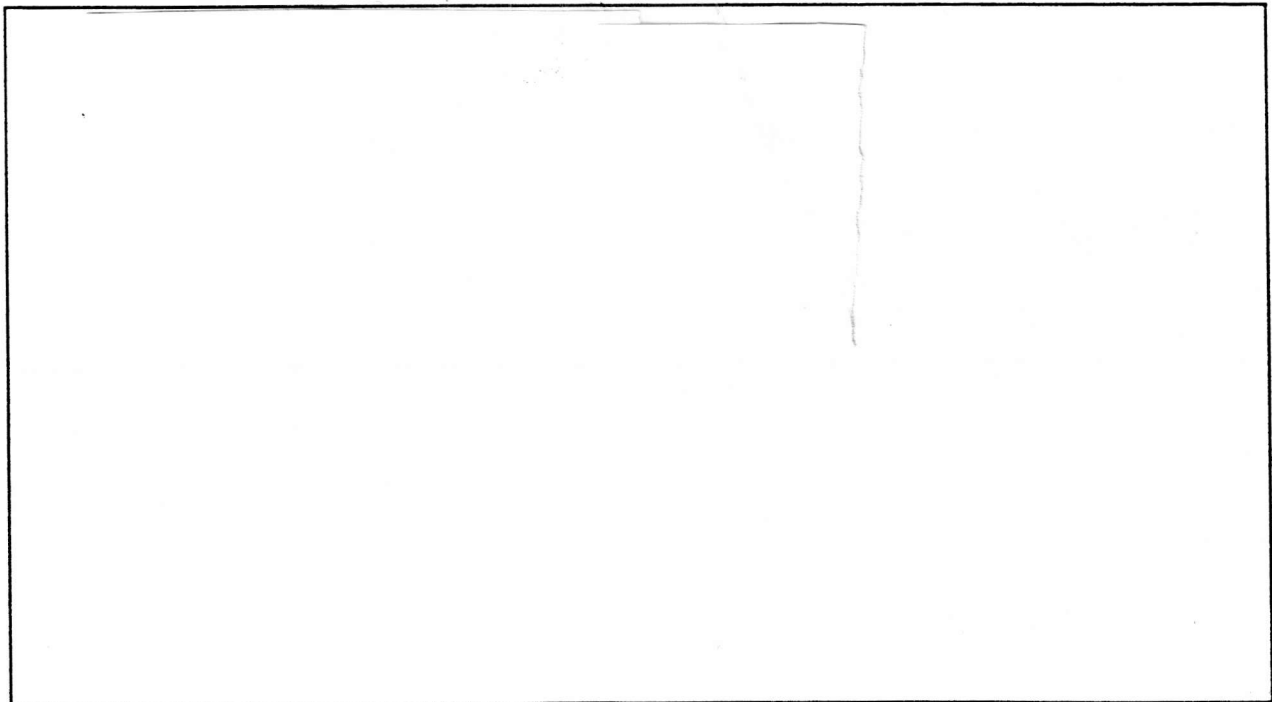
by Dick Selzer

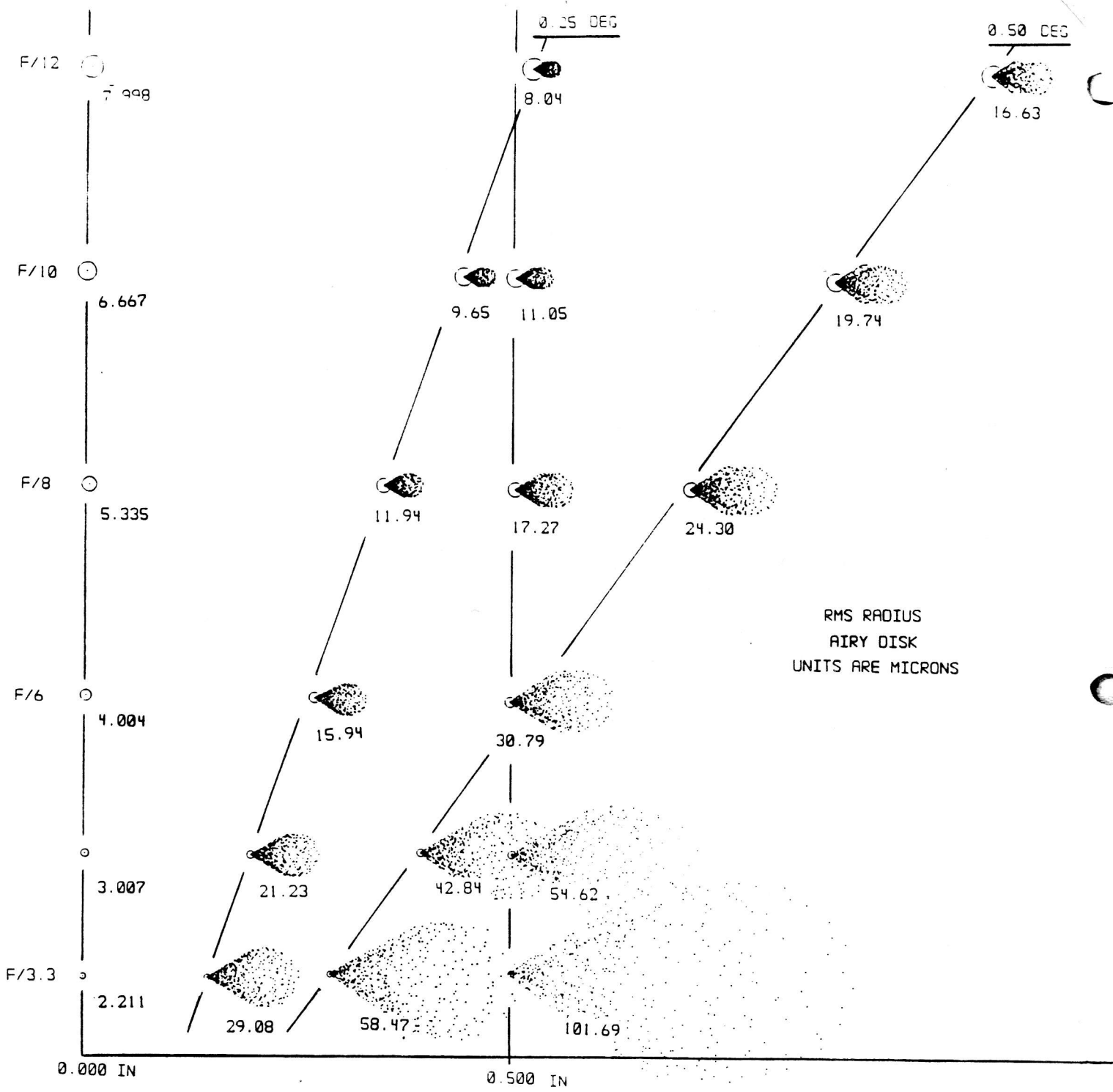
(contributed by Bill Razgunas)

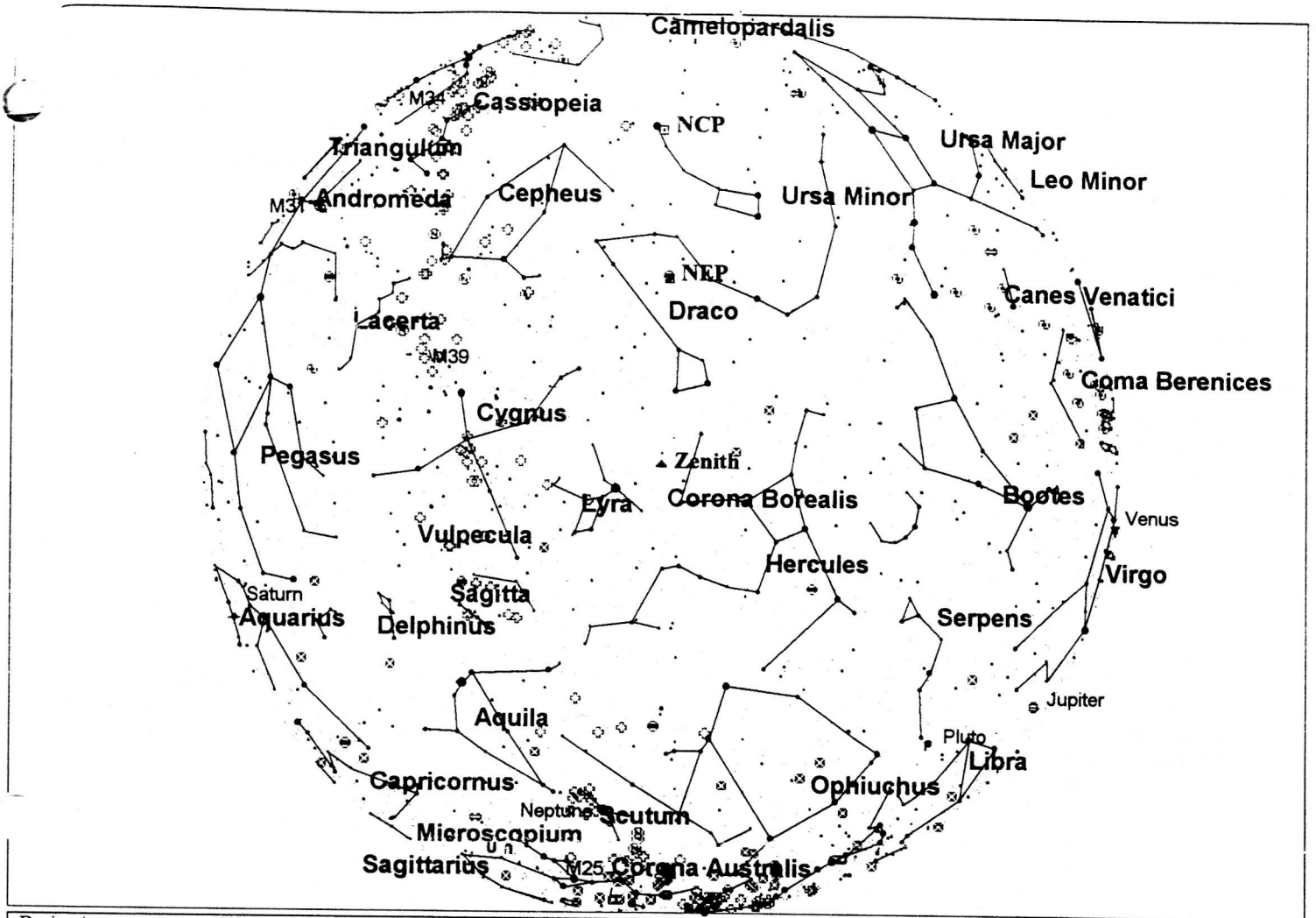
Not long ago, operating rooms had windows. It was a boon and a blessing in spite of the occasional fly that managed to strain through the screens and threaten our very sterility. For the adventurous insect drawn to such a ravishing spectacle, a quick swat and, Presto! The door to the next world sprang open. But for us who battled on, there was the benediction of the sky, the applause and reproach of thunder. A Divine consultation crackled in on the lightning! And at night, in Emergency, there was the pomp, the longevity of the stars to deflate a surgeon's ego. It did no patient a disservice to have Heaven looking over his doctor's shoulder. I very much fear that, having bricked up our windows, we have lost more than the breeze; we have severed a celestial connection.

* * *

To work in windowless rooms is to live in a jungle where you cannot see the sky. Because there is no sky to see, there is no grand vision of God. Instead, there are the numberless fragmented spirits that lurk behind leaves, beneath streams. The one is no better than the other, no worse. Still a man is entitled to the temple of his preference. Mine lies out on a prairie, wondering up at Heaven. Or in a many windowed operating room where, just outside the panes of glass, cows graze, and the stars shine down upon my carpentry. □







Projection	Horizon View		
Time	Local	Aug 16, 1994AD, 10:00pm (Twilight)	
	Universal	Aug 17, 1994AD, 2:00am	Julian date 2449581.5833
	Siderial	18:08.6	
Epoch	Universal	Apr 19, 1994AD, 6:00pm	Julian date 2449581.5833
Location	Earth		Centered on
	Lon.	83°05'00"W	RA 18h08m35s
	Lat.	42°23'00"N	Dec. 42°23'00"
	Altitude	0.000 km	Azm. 180°00'00"
	Time zone	-4.00	Alt. 90°00'00"
Zoom Factor	0.354	Field of View	180°00' * 166°18'

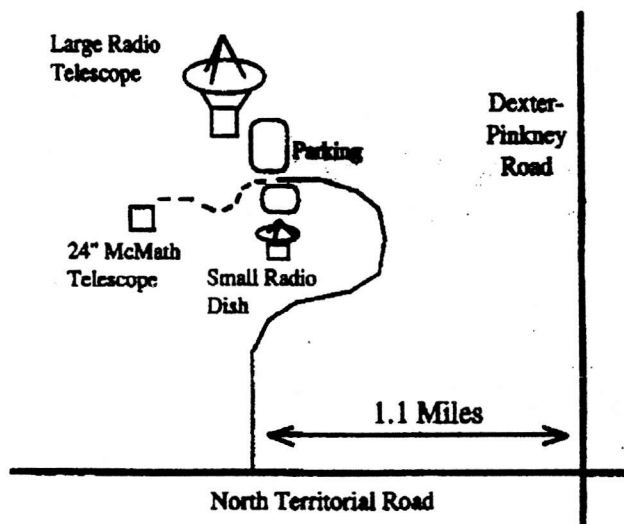
Solar System Objects		Stars	Galaxies	Nebulae	Star clusters	Quasars
◆ Mercury	♃ Neptune	● -1.6	☾ Elliptical	☉ Reflection	◇ Open	≡ Quasars
▼ Venus	♇ Pluto	● -1.0	☉ Spiral	☾ Planetary	□ Globular	♁ BL Lacertae
♁ Earth	☾ Moon	● 0.0	☉ Spiral bar	☾ Bright	⊛ Associated with nebulosities	
♂ Mars	☼ Sun	● 1.0	☉ Irregular	◇ Dark		
♃ Jupiter	♁ Asteroid	● 2.0	☉ Peculiar	☾ HII region		
♄ Saturn	☄ Comet	● 3.0	● Undefined	× Other regions		
♅ Uranus		● 4.0				
		● 5.0				

Markers		Lines	
NEP Northern Ecliptic Pole	NCP Celestial North Pole	— Horizon line	— Ecliptic
SEP Southern Ecliptic Pole	SCP Celestial South Pole	— Celestial equator	

Places:

Dennison Hall is also known as University of Michigan's Physics and Astronomy building. It is found in Ann Arbor on Church Street about one block north of South University Avenue. This is also one block north of the Brown Jug, our after meeting eating place. We meet in room 807.

The 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 and used by the Lowbrows. The observatory is located northwest of Dexter: the entrance is on North Territorial Road, 1.1 miles west of Dexter-Pinkney 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:

The monthly meetings of the Lowbrows are held on the third 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 group meetings are held on the first of each month, rotating among members' houses. See the calendar on p. 1 for the location of the next meeting. Public Open House / Star Parties are held on the Saturdays before and after each new moon at the Peach Mountain Observatory. Star Parties are cancelled if the sky is cloudy or the temperature is below 10°F at sunset - call 426-2363 to check on their status. Many members bring their telescopes; visitors are welcome to do likewise. Peach Mountain gets cold at night so dress warmly - and bring mosquito repellent!

Dues:

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

Doug Scobel
1426 Wedgewood Dr.
Saline, MI 48176

Magazines:

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

Sky and Telescope: \$20 / year
Astronomy: \$18 / year
Odyssey: \$16.95 / year

For more information, contact the treasurer, Doug Scobel @ 429-4954

Sky Map:

The sky map in this issue of Reflections was produced by Keith Bozin using Redshift for Windows CD-ROM drawn for the end of twilight on the monthly meeting date.

News letter Contributions:

Members (and non-members) are encouraged to write about any astronomy-related area in which they are interested. Call the editor (Douglas Warshow) at 998-1158, or send e-mail to ***** via compuserve to discuss length, format, etc.. Announcements and articles are due 14 days before each monthly meeting. Contributions should be mailed to:

Douglas Warshow
1010 Catherine, apt. 408
Ann Arbor, MI 48104-1647

Telephone Numbers:

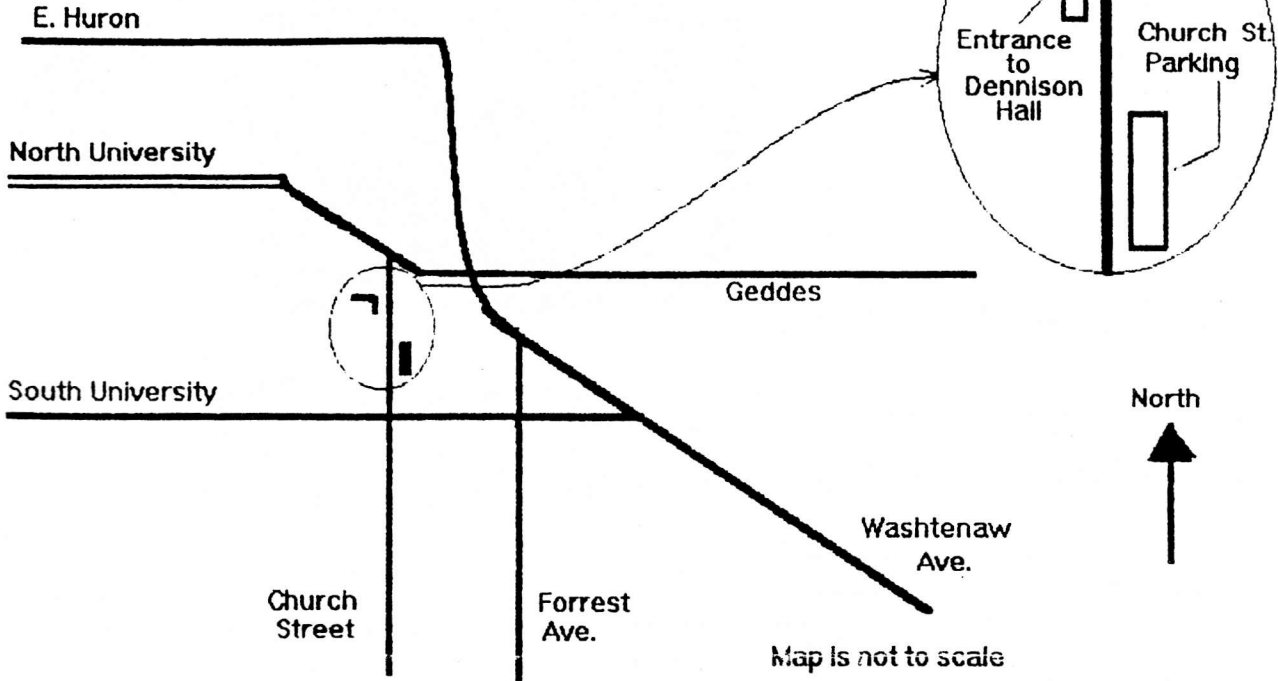
President:	Bill Razgunas	995-0934
Vice Pres:	Kurt Hillig	663-8699
	Stewart Cohen	665-0131
	Tom Ryan	662-4188
	Steve Musko	426-4547
Treasurer:	Doug Scobel	429-4954
Observatory:	Bernard Friberg	761-1875
Newsletter:	Douglas Warshow	998-1158
Membership:	Doug Scobel	429-4954

Peach Mountain Keyholder:

Fred Schebor 426-2363

Lowbrow Astronomers Meeting Location:
Enter Dennison Hall (see ① on Detail)
Find the Elevators: Go to the 8th Floor
Walk Down the Hallway to Find Room 807
Meeting Time: 7:30 PM

Detail



North

Map is not to scale

Monthly Meeting

Tom Pettit will present
footage from NASA
Select in re
The Jupiter Impacts

August 19, 1994 at 7:30 PM
At
Room 807 Dennison Hall
Physics and Astronomy Bldg



Western portion of the Veil Nebula (NGC 6960) and the star 52 Cygni. Mount Wilson Observatory photograph.

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

Check your membership expiration date on the mailing label!