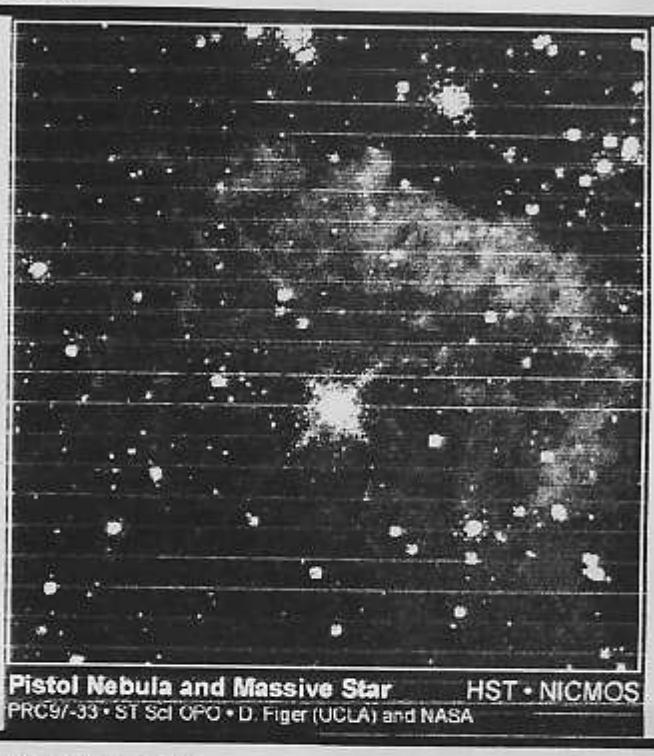
REFLECTIONS

of the University Lowbrow Astronomers

January 1998

One of the intrinsically brightest stars in our galaxy appears as the bright white dot in the center of this image taken with NASA's Hubble Space Telescope. Hubble's Near Infrared Camera and Multi-Object Spectrometer (NICMOS) was needed to take the picture, because the star is hidden at the galactic center, behind obscuring dust. NICMOS' infrared vision penetrated the dust to reveal the star, which is glowing with the radiance of 10 million suns.



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, weather permitting, at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; see inside for directions) on Saturday evenings before and after the new moon. The event may be cancelled if it is cloudy or very cold at sunset. For further information, call (313) 480-4514.

This Month		Next Month and Beyond	
January 3	Open house at Peach Mountain.	February 20	Meeting at 807 Dennison
January 16	Meeting at 807 Dennison. 7:30 pm	February 21	Open house at Peach Mountain.
January 18	ATM meeting. Time and location TBD	February 22 ...	ATM meeting. Time and location TBD.
January 24	Open house at Peach Mountain	February 28	Open house at Peach Mountain.
January 31	Open house at Peach Mountain		

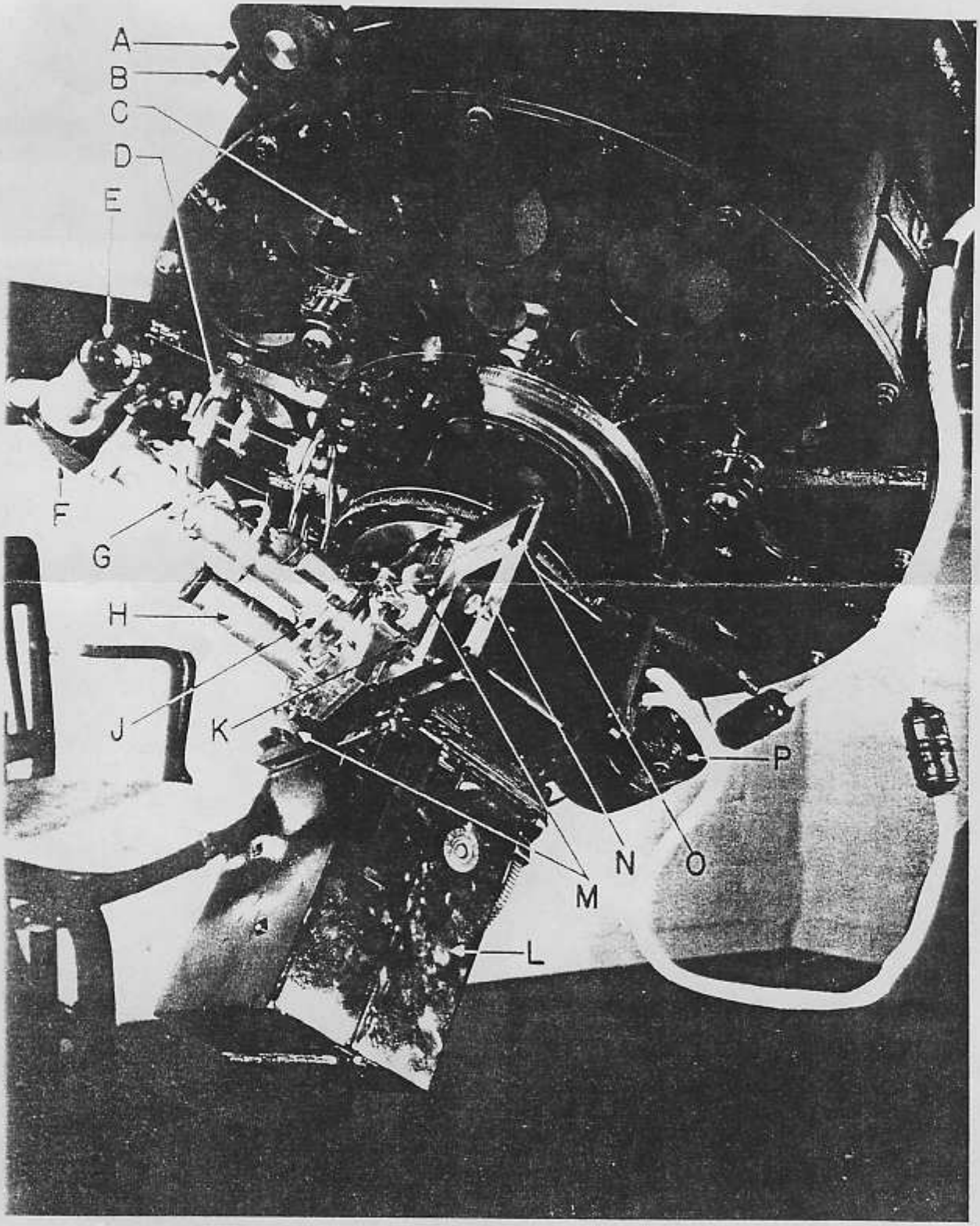


Figure 2. Camera Head Assembly.

[This is the second and final segment of the article on the McMath 24 inch telescope printed with permission from the Bentley Historical Library. - Ed]

The Francis C. McMath Memorial 24 inch Reflecting Telescope of the McMath-Hulbert Observatory

by Robert R. McMath, February, 1941

[second segment}

Camera And Guiding Eye Piece Assembly

The camera end of the new 24" reflector, Plate 5, represents a rather unique departure from standard telescope design. Since this instrument was intended primarily for work on the lunar and planetary programs of the observatory, the 35 mm camera was used as a nucleus about which the driving and guiding accessories were constructed. This general design procedure has produced a dual guiding system which embodies all the features deemed most desirable by the observing staff, based ,on several years experience experience with our particular photographic problem. The lower guiding assembly, intended for lunar or planetary work, guides directly on the central cone of light being photographed. This is accomplished by the use of the rotating shutter and mirror combination shown in the enlarged print of the camera support casting (Plate 6). S is the shutter disk carrying a semi-circular plane mirror R and the easily interchanged shutter plate T. U is the last step in the Selsyn driven gear train which operates the camera and shutter. At V is shown the small counterweight balancing the entire shutter shaft assembly.

During the guiding period the light beam from the secondary is reflected through 90 deg. by the shutter mirror R and comes to a focus on the illuminated reticule . The optical center of this reticule can easily be shifted by means of the adjusting screws to any chosen guiding point in the field. The reticule can then be rotated so that the guide point will follow the wires in both right ascension and declination. Extension tube G includes a 65 mm lens set for approximately coniugate foci to transfer the image from the reticle through the rotatable right angle prism F to the guiding eyepiece E.

Throughout the open-shutter or photographing period, the mirror lies outside of the central light cone and therefore reflects no image through to the guiding eyepiece. This important feature prevents the observer from shifting the telescope while a photograph is being taken. Also, since the reticle to mirror and camera focal plane to mirror distances were set accurately in our shop, the telescope can be focused at the guiding eye piece through use of this guiding system.

By shifting plate K against the stop plate O, the low power composition eye piece H is brought into the optical axis position. Here, by means of a focal plane diaphragm which is a duplicat of the camera aperture, the observer is able to view the exact field which will be photographed at the camera. This same setting can also be obtained on a ground glass placed at the camera focal plane, but this latter procedure requires the removal of the camera from its mounting.

The second guiding system is intended primarily for lunar and stellar work. The guiding eye piece assembly —made up of the illuminated reticule, transfer lens, right angle prism, and guiding eye piece previously described—-is slipped out of its bayonet lock on the plate K and moved to a new position at D. Flange D is part of an adjustable tube which carries a small reflecting prism at its opposite end. This prism, together with the eye piece assembly, can be moved radially, by means of the adjusting screw, from the outer edge of the cone of light coming through the central hole in the primary, to the edge of the inner central cone being photographed. The entire assembly can also be revolved about the optical axis, by use of coarse and fine setting motions, through 360 deg to insure a large field from which to choose a guiding point. Obviously, because of this set-up, the stellar images near the outer edge of the light cone are not perfectly sharp, but are of sufficiently high quality to permit their use as guiding reference points.

The new 35 mm camera is shown at L, along with camera driving Selsyn at P, primary mirror back support at C, and secondary mirror focusing

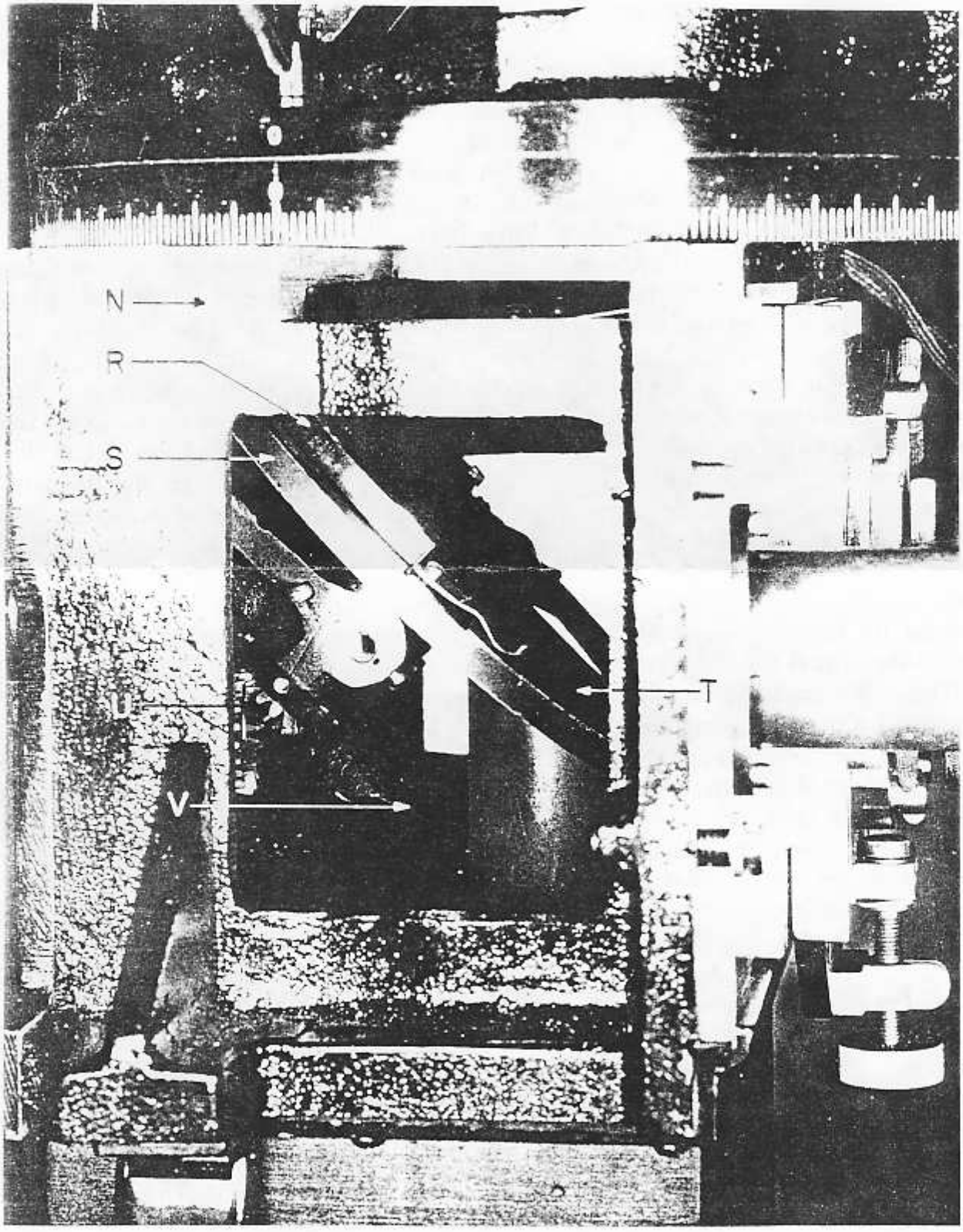


Fig. 12.—Detail of Camera Shutter Mirror.

handle at A.

An electrical contactor to record exposure times on the chronograph in the control room is mounted on the camera support casting back plate, and cannot be seen in this photograph. One additional new accessory, a comparison type photometer to be used as an exposure meter, is not complete at the present time.

Conclusion

In conclusion, it may be well to add a few words in regard to the program ahead of the new instrument. We had long discussed amongst ourselves the desirability of doing over the original lunar planetary educational motion picture films with an instrument with more resolution and better mechanical adjuncts. The first few months' use of the new telescope convinces us that we can do very much better work with this new instrument than with the old.

We have already secured several hundred feet of 35 mm motion picture negative,of the disk of Jupiter. Using the 100-foot E F L combination, the disk of Jupiter is approximately 7 mm in diameter, and a shadow transit of one of the satellites has been clearly observed on one of the above films. We have been hoping for a blue sensitive emulsion with sufficient speed and lack of grain so that enlarged pictures of Jupiter on the screen will not be too grainy. Just recently Dr. C. J. Staud of the Eastman Research Laboratories has sent us some very promising material for thois purpose. After our early experiments with Jupiter, we plan to photograph Saturn in the same way and hope to record some activity on the disk of the planet.

Our experimental lunar pictures showing the sunrise and sunset are very promising, and it is our expectation that within a year or so we can make up educational reels for distribution to institutions desiring them.

Mr. George H. Malesky of our staff collaborated with the writer in the design of this new instrument, and all drawings were made by Malesky. To our instrument maker, Mr. C. W. Guenther, we owe thanks for successfully making the difficult shutter assembly. Dr. Heber D. Curtis gave us valuable suggestions in regard to the mounting of the primary mirror. And we are greatly indebted to Messrs. Sawyer, Mohler, and Brodie of the staff for their work in the installation and adjustment of the telescope.

The entire staff of the McMath Hulbert Observatory of the University of Michigan is very grateful to the donors for making possible the acquisition of this new addition to the instrumentation of the observatory.

COMETS CURRENTLY VISIBLE

From a NASA Home Page

C/1995 O1 (Hale-Bopp)
This fading super-star comet is visible only in the Southern Hemisphere. It is currently m1~8 and steadily fading. The comet will remain a circumpolar (or nearly circumpolar) object for Southern Hemisphere observers for all of 1998. Details on this comet are provided for the non-astronomer. This page also includes some information of interest to astronomers.

C/1997 D1 (Mueller)
This comet is steadily fading (m1~13) and should be lost from visual observation within the next couple of months.

C/1997 J2 (Meunier-Dupouy)
This comet remains about 11.5-12.0 magnitude The orbit published on MPC 30738 indicates that this comet will reach perihelion on March 10, 1998 with a perihelion distance of 3.05 AU. The comet, which is currently an evening object for Northern Hemisphere observers, is drifting south and approaching conjunction with the Sun. In March, the comet slips into the morning sky as it continues its southerly course.

C/1997 O1 (Tilbrook)
This comet is in the morning sky for Northern Hemisphere bservers...it may be 14th magnitude or fainter. It will continue to fade as it moves north.

C/1997 T1 (Utsunomiya)
In February 1998, this comet will emerge in the morning sky at magnitude ~11.5. It will drift south and will be visible from both hemispheres. It should be possible to follow the comet visually through the first half of 1998.

29P/Schwassmann-Wachmann 1
This comet is a morning object for both hemispheres, although at eclination ~-20 the south is favored. By April, the comet will be visible most of the night and by July, it becomes an evening object. The comet has irregular outbursts to m1~12-13. It should be monitored.

43P/Wolf-Harrington
This comet reached perihelion last September 29 and is beginning

to fade. It is currently about magnitude 13.0 and is visible for most of the night from both hemispheres.

55P/Tempel Tuttle
The comet responsible for the Leonid meteor show only makes an appearance once every 33 years. The comet is currently a circumpolar object for Northern Hemisphere observers. However, reaching +83 degrees declination on January 17th, the comet will race southwards and into the evening sky. It may be briefly visible to Southern hemisphere observers in February. The comet's brightness variation is not well understood. It is currently m1=9.5 or brighter and could reach m1~7 or 8 around January 20-31. It should fade rapidly as it approaches conjunction in early March.

55P/Taylor
We have a report that this comet is m1= 13.5, which would make much brighter than predictions. The comet is well-placed for observation, with the Northern Hemisphere being favored as the comet moves northward. The comet should fade slowly over the next couple of months.

78P/Gehrels 2
This comet is about m1=13. The comet, which is visible from both hemispheres, is well-placed for observation, but should fade rapidly over the next couple of months.

103P/Hartley 2
This comet is about m1~8.5-9.0 and should fade rapidly. The comet will remain an evening object for both hemispheres.

104P/Kowal 2
Recent observations suggest that this comet has faded from 12.8 to 13.5 in December. The ephemeris indicates that the comet should be at or near its peak brightness for the next couple of months. The comet will remain an evening object for both hemispheres...however, the Northern Hemisphere is favored.

128P/Shoemaker-Holt 1
This comet is near its peak brightness (13.5-14.0) and should fade slowly. It is well-placed for observation from both hemispheres.

132P/Helin-Roman-Alu 2
This comet is near its peak brightness (15.0) and should fade rapidly. It is only a CCD object.

Amateur Telescope Making Group (ATM) meets monthly, See the calendar for location and time.

Dues:
Membership dues are $20 per year for individuals or families, and $12 for students.
Checks made out to: University Lowbrow Astronomers and mailed to Doug Scobel, 1426 Wedgewood Drive, Saline MI 48176 .

Magazine Subscriptions :

As a member of the Lowbrows, you are entitled to substantial discounts on *Sky and Telescope* and *Astronomy* magazines. To qualify for the discount, however, you must submit all subscription requests through the club treasurer. Make the check payable to "University Lowbrow Astronomers."

The current magazine subscription rates are:

	Normal Rate	Club Rate	Savings
*Astronomy**	$34.95	$20.00	$14.75
*Sky and Telescope***	$36.00	$27.00	$9.00

*Club rate allowed on 1 or 2 year subscriptions.
**Club rate allowed only on 1-year subscription. *NOTE*: For non-magazine purchases, simply mention your club affilliation and send your order in directly to the publisher(s).

Telephone Numbers

President:	D. C. Moons	810/254-9439
Observatory Director:	Bernard Friberg	313/761-1875
Vice Presidents:	Mark Cray	313/283-6311
	Mark Deprest	313/662-5719
	Mark Vincent	313/663-7813
Treasurer/ Membership:	Doug Scobel	313/429-4954
Editors:	Kurt Hillig	313/663-8699
	Bernard Friberg	313/761-1875
	Chris Sarnecki	313/426-5772
	Doug Warshow	313/998-1158
Publisher:	Lorna Simmons	313/525-5731
Keyholder:	Fred Schebor	313/426-2363

Newsletter Contributions:
Articles and pictures may be sent to all of the following:

Kurt Hillig	khillig@umich.edu
Bernard Friberg	Bf747@aol.com
Chris Sarnecki	chrisani@aol.com
Doug Warshow	dwarshow@ix.netcom.com

Home Page Address:
http://www.astro.lsa.umich.edu/lowbrows.html

This months newsletter assembled by Bernard Friberg

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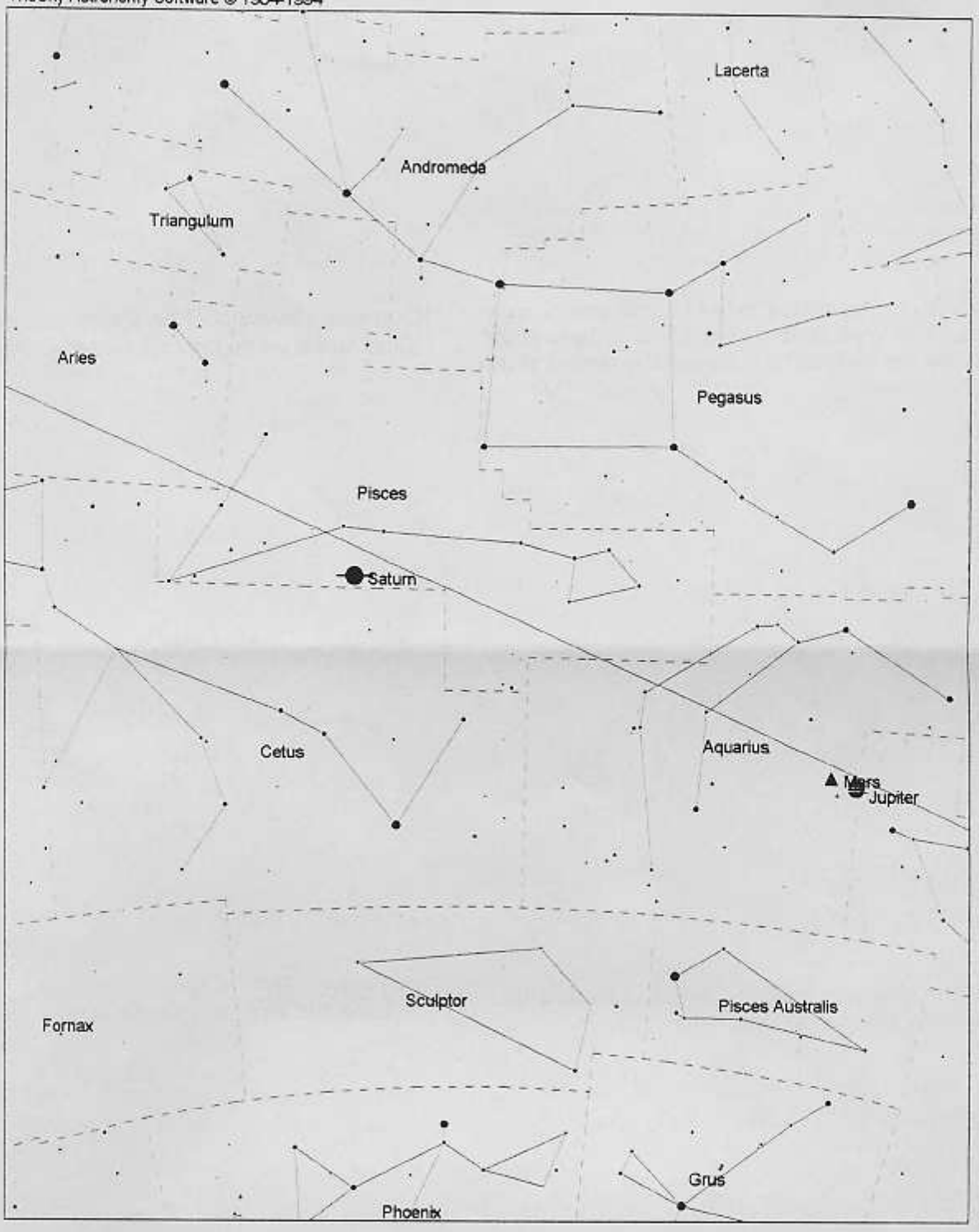


Variable Star · Double Star · Galaxy · Nebula · Planetary Neb.
Open Cluster · Globular Cluster · Cluster+Nebula · Prob. Star · Other NGC Objects

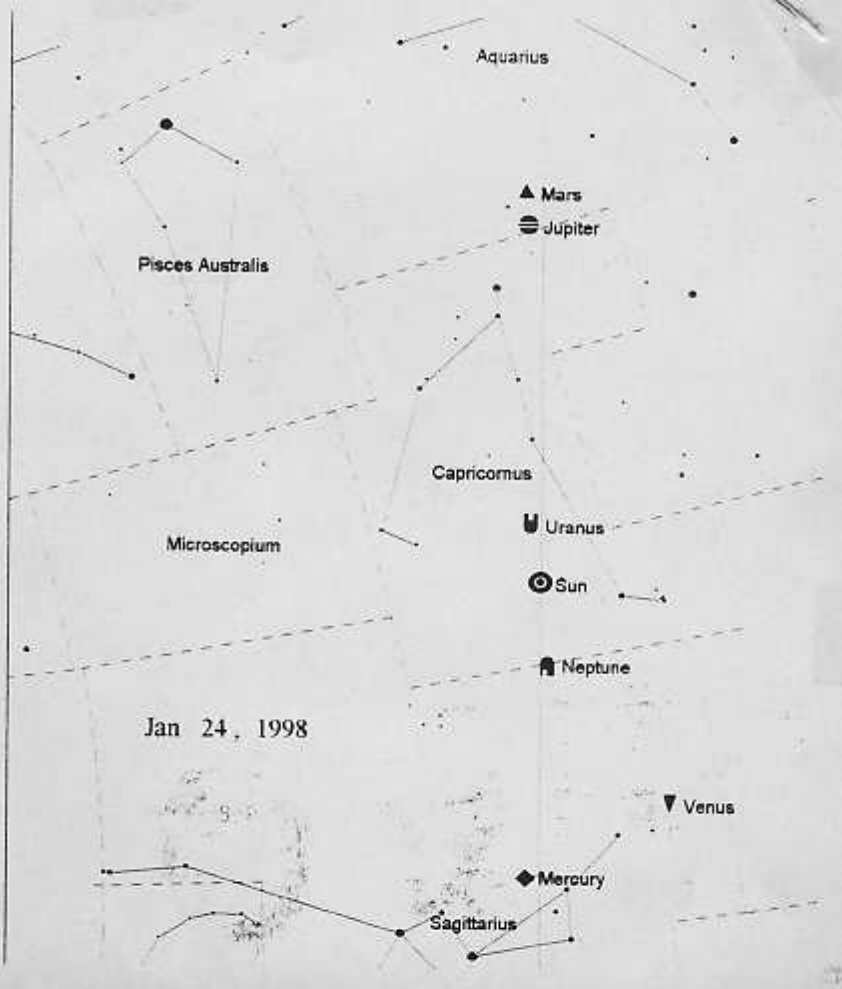
Center RA:24h 11m Dec: 0d 21m N Date: 1/24/98 Time: 8:01 PM Width: 135d 27m

Monthly Meeting: January 16, 1998 @ 7:30 pm

Room 807 Dennison Hall at the University of Michigan

Mark Deprest on the topic
"Dozen Deep Sky Delights"

Paul Walkowski
"ATM Short Subjects"



University Lobrow Astronomers
3684 Middleton Dr.
Ann Arbor, MI 48105

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