

REFLECTIONS



REFLECTIONS

December, 1990

R. Tanner, ed.

University Lowbrow Astronomers

The University Lowbrow Astronomers is a club of astronomy enthusiasts which usually meets in the historic Detroit Observatory on the corner of Observatory and Ann Streets. The meetings start at 7:30 on the third Friday of each month and are open to the public. For further information, call Paul Etzler at 434-2574.

This Month:

Meeting, Detroit Observatory, December 21. Fred Schebor will present a talk on the record setting ASTROFEST Star Party. All members of the club are invited to bring their slides of interesting telescopes and events at ASTROFEST.

Next Month:

Meeting, Detroit Observatory, January 18. Tim Killen of the U of M Atmospheric Sciences Department will talk about a sky glow measurement experiment to be installed at Peach Mountain.

Mirror Recoating

Brian Close will pick up the recoated mirror for the Peach Mountain 24" telescope on December 24th. In order to make the fine refractor on the side of the 24" usable, Tom Ryan has replaced the mirror with 175

lbs of lead. The scope will be usable in this state until permission is received from the University to perform sorely needed maintenance on the truss and mount. The truss assembly needs a new coat of paint to stop the rust and the mount could use a grease job on the bearings. Tom reported that the scope moved much easier with the slightly lighter lead counter weight. More information on the telescope work is inside under the 24" Mount Maintenance heading.

Sky & Tele Subscription Increase

Dick Sider has reported that Sky and Telescope will increase the subscription rate for club members in January from \$16 to \$18. Any club members wishing to renew at the old rate of \$16 should contact him by December 24 and give him the information on their mailing label and their money.

1991 Observers Handbook

Dick Sider has received a batch of the 1991 Observers handbooks from the Royal Astronomical Society of Canada. The price has gone up this year to \$13.95 retail. However, the club gets a discount, and club members can get the handbooks from Dick for \$10.00. The handbooks have information on the objects visible in the sky each night and other useful information for the observer.

Molded Mirror Blanks

Tom Ryan is always on the lookout for new sources of glass for telescope mirrors and other projects. In the latest issue of Sky and Telescope he noticed an ad by Newport Glass Works Ltd. for molded mirror blanks. Upon calling them up he discovered that they are the supplier of premolded mirror blanks for Mead and Celestron. This could mean low cost premolded lightweight mirror blanks due to the high volume of blanks used in the 8" and 10" Schmidt Cassegrain telescopes. Tom has sent away for the catalog and pricing information. These mirror blanks would be great for a 8" or 10" F 2 schmidt camera.

24" Mount Maintenance

The Peach Mountain 24" telescope is in need of paint to preserve it. As soon as permission is received from the University, the truss assembly will be removed and taken to a warm place for sanding, priming and painting. As was mentioned on the front cover, when a lighter weight was installed in place of the mirror and the scope rebalanced, it was noticeably easier to move. Since the friction in the mount is related to the weight on the bearings, reducing the weight will reduce the friction. Since the truss assembly was built to balance with an instrument mounted to the back of the telescope, the missing instrument weight was replaced by many pounds of lead bars attached to back of the telescope. I have a

fond remembrance of them after finding them with my head several nights.

One way to improve the situation is to move the mirror back in the tube to rebalance the telescope without the weights. This would also allow a smaller counter balance weight on the opposite side. This would probably make the telescope easier to move. This may make the scope easy enough to move that the lubrication doesn't have to be perfect.

In spite of the massiveness of the mount, it was only designed to hold a 12" to 16" telescope, and the 24" is much heavier even though it is a lightweight Pyrex honey comb design. Incidentally, this mirror is also said to be one of two test mirrors cast to try out the new casting processes and Pyrex glass which were used to make the 200" Hale Telescope mirror.

Pier Project Status

Brian Close and Tom Ryan are working a project to install some piers out at the Peach Mountain site for members use. The intent is to set the piers up to take any of the popular Schmidt Cassegrain telescopes up to 11" or so. This would mean that you could show up with just your scope and mount it on to a very solid permanently mounted and aligned pier in just a few minutes. However, they need the mounting requirements for all the members scopes. If you want to use your scope on these piers you have to get together with Tom Ryan and either take the base of your scope over to him or get him the dimensions.

Tom will be marking the piers for all the cutting and drilling shortly, and then Brian Close will take them to his relatives over the holidays for cutting. The concrete foundations are poured and are ready for the piers. The next step after the parts are cut is have them welded. The welding cost will be covered by a generous donation promised by a club member.

The new drive for the 24" - What Can We Expect - Tom Ryan

As planned right now, the telescope will be under full motor control with respectable drive rates, and will have digital position readouts accurate to one minute of arc. The system will also contain a list of Messier and NGC objects along with their coordinates. The observer will have to close the loop, that is, they will have to push the handpaddle buttons until the position of the telescope agrees with the position of the desired object.

An observer would start their observing session by first removing the covers over the telescope optics, then power up the drive. Next, the drive rate would be checked to ensure that the desired rate was set on the thumb wheels. The thumbwheels will indicate the number of minutes for one complete rotation of the scope; 1440.0 for solar tracking, 1436.1 for sidereal rate, and 1436.5 for photography, etc. The system would be controlled by a hand paddle which contains pushbuttons for slewing and guiding, the digital readout, and some buttons for controlling the computer.

Ensuring the locks were off on both the RA and DEC axis, the scope would be positioned to point at one of several bright stars as prompted by the

handpaddle display. Then the locks would be set and the star centered with the fine motion buttons. When the star was centered, the observer would signal the computer, and then the computer would then know where the telescope was pointed. For the remainder of the night, the locks would remain on and the handpaddle would display the current position accurate to one minute. The handpaddle would also display the position of any Messier and NGC objects.

To slew the telescope to another position, the observer would move a switch from Guide to Slew, at which time the paddle will start beeping. (a warning that pressing a direction button will make the telescope move). The observer can then press one of the direction buttons to drive the scope to a new position, checking the position with the handpaddle readout. When close to the target, the switch would be moved back to the Guide position, and then the target zeroed in. To park the scope, the observer would turn off the drive, unlock the clutches, move the scope back to the 'park' position, and cover the optics. These changes should make the scope easier to use.

New 24' Drive and Electronics

Stuart Cohen has provided a chart summarizing the status of the work he and Tom Ryan are doing on the new drive system for the 24".

The developments regarding the push-button control of the 24 inch telescope went well this month. The Bodine motor control board was repaired, and the power supply was designed both mechanically and electronically. In summary, we continue to be on schedule.

Summary of Electronics made for 24 inch Telescope as of 11/16/90	R.A. Guide	Old Paddle	Dec Slew	Dec Guide	Interface	New Paddle	R.A. Slew	Pwr Supply	R.A. Retrofit
Mechanical Design	✓	✓	✓	✓	8	✓		✳	10
Mechanical Built	✓	✓	✓	✓	8	7		5	11
Electrical Design	✓	✓	✓	✓	✓	✓		✓	10
Prototype	✓	✓	✓	✓	✓	✓		✓	10
Circuitboard Design	✓	✓	✳	✓	5	✓		✳	10
Circuitboard Hardware	✓	✓	4	✓	5	✓		7	10
Circuitboard Built	✓	✓	4	✓	6	✓		8	11
Installation	✓	✓	9	9	9	9		9	11

✓ = Previously finished.

✳ = Finished since last Meeting.

1,2,3... = Month to be finished. (1 = Sept 1990 Meeting)

Sky Scannings

December, 1990
 Matthew P. Linke, The University of Michigan Exhibit Museum, 1109 Geddes Avenue, Ann Arbor, MI 48109-1079 (313) 764-0478

SUN:

All times are Eastern Standard Time (EST)

The Sun enters Sagittarius on the 18th. The winter solstice occurs at 10:07 PM on the 21st. The days are now shortest and the nights longest.

Date	Rise	Set
01	7:46 AM	4:55 PM
05	7:51 AM	4:54 PM
10	7:55 AM	4:54 PM
15	7:59 AM	4:55 PM
20	8:02 AM	4:56 PM
25	8:04 AM	4:59 PM
30	8:06 AM	5:03 PM

MOON: The Moon passes 2° south of Jupiter and 0.7° north of Antares on the 15th. It passes 2° south of Neptune on the 18th, and 0.2° south of Saturn on the 19th. The Moon passes 2° north of Mars on the 29th and is at perigee on the 30th. The second full Moon of the month occurs on the 31st and is sometimes called the long night moon.

Phase	Date	Rise	Set
Full	02	5:19 PM	9:52 AM (3)
3rd Qtr.	09	1:22 AM	12:54 PM
New	17	8:52 AM	5:28 PM
1st Qtr.	25	12:40 PM	2:55 AM
Full	31	5:19 PM	9:10 AM (1)

Mercury: Mercury passes 1.3° south of Uranus on the 10th and begins retrograde motion on the 14th. Mercury is closest to Neptune (3.8°) on the 15th, and passes only 0.62° north of Uranus and 1.4° north of Venus on the 18th. Mercury is in Sagittarius at midnight.

Venus: Venus is in Sagittarius and passes 0.6° south of Uranus, in the evening sky on the 19th. It passes 1.8° south of Neptune in the evening sky on the 23rd. Venus is at aphelion on the 29th.

Mars: Mars is in Taurus, and will make a beautiful sight just below and to the east of the Pleiades at mid month. Mars will reach its greatest apparent diameter this month.

Jupiter: Jupiter closes out the year in Cancer, having moved very little since November. Everything seems to be going well on board the Galileo probe bound for Jupiter. The spacecraft still has several dangerous planetary encounters to make before making its final push to Jupiter.

Saturn: Saturn completes one whole year in Sagittarius this month. On the 18th, look for Saturn, Mercury, and Venus forming an elongated triangle low in the southwest after sunset. The crescent Moon will be in the middle.

Outer Planets: Uranus and Neptune are also found in the scene described for Saturn, but are too dim to be observed with the unaided eye. Uranus and Neptune are in Sagittarius, Pluto in Serpens.

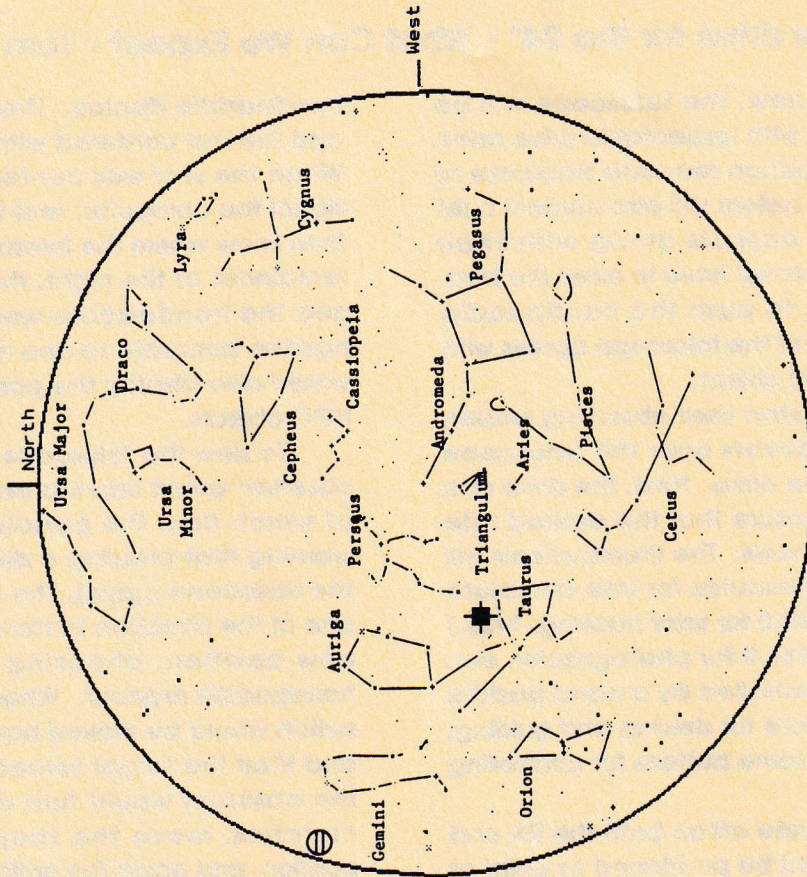
Great moments in astronomy: Tycho Brahe, the greatest observational astronomer of all time was born on December 14th, 1546. On December 20th, 1900, the astronomer Giacobini discovered a comet destined to be the first comet visited by a spacecraft.

Sources: "Astrocalc plus" by Zephyr Services, "Astronomical Calendar 1990" by Guy Ottwell, "Key Dates" by Ralph Winrich, NASA.

Sky Map

December, 1990
 Matthew P. Linke, The University of Michigan Exhibit Museum, 1109 Geddes Avenue, Ann Arbor, MI 48109-1079 (313) 764-0478

42° 27' 00" North 82° 55' 00" West 12-15-1990 AD, 9:00 PM New York Time



STELLAR MAGNITUDES

- 0.499 or brighter
- 0.5 to 1.499
- 1.5 to 2.499
- 2.5 to 3.499
- 3.5 to 4.499

PLANETS

- ♂ MARS
- ♃ JUPITER

Source: "PC Planetarium" by Marilyn Davis Ph.D.

The new drive for the 24" - What Can We Expect - Tom Ryan

As planned right now, the telescope will be under full motor control with respectable drive rates, and will have digital position readouts accurate to one minute of arc. The system will also contain a list of Messier and NGC objects along with their coordinates. The observer will have to close the loop, that is, they will have to push the handpaddle buttons until the position of the telescope agrees with the position of the desired object.

An observer would start their observing session by first removing the covers over the telescope optics, then power up the drive. Next, the drive rate would be checked to ensure that the desired rate was set on the thumb wheels. The thumbwheels will indicate the number of minutes for one complete rotation of the scope: 1440.0 for solar tracking, 1436.1 for sidereal rate, and 1436.5 for photography, etc. The system would be controlled by a hand paddle which contains pushbuttons for slewing and guiding, the digital readout, and some buttons for controlling the computer.

Ensuring the locks were off on both the RA and DEC axis, the scope would be positioned to point at one of several bright stars as prompted by the

handpaddle display. Then the locks would be set and the star centered with the fine motion buttons. When the star was centered, the observer would signal the computer, and then the computer would then know where the telescope was pointed. For the remainder of the night, the locks would remain on and the handpaddle would display the current position accurate to one minute. The handpaddle would also display the position of any Messier and NGC objects.

To slew the telescope to another position, the observer would move a switch from Guide to Slew, at which time the paddle will start beeping. (a warning that pressing a direction button will make the telescope move). The observer can then press one of the direction buttons to drive the scope to a new position, checking the position with the handpaddle readout. When close to the target, the switch would be moved back to the Guide position, and then the target zeroed in. To park the scope, the observer would turn off the drive, unlock the clutches, move the scope back to the 'park' position, and cover the optics. These changes should make the scope easier to use.

New 24' Drive and Electronics

Stuart Cohen has provided a chart summarizing the status of the work he and Tom Ryan are doing on the new drive system for the 24".

The developments regarding the push-button control of the 24 inch telescope went well this month. The Bodine motor control board was repaired, and the power supply was designed both mechanically and electronically. In summary, we continue to be on schedule.

Summary of Electronics made for 24 inch Telescope as of 11/16/90	R.A. Guide	Old Paddle	Dec Slew	Dec Guide	Interface	New Paddle	R.A. Slew	Pwr Supply	R.A. Retrofit
Mechanical Design	✓	✓	✓	✓	8	✓		☼	10
Mechanical Built	✓	✓	✓	✓	8	7		5	11
Electrical Design	✓	✓	✓	✓	✓	✓		✓	10
Prototype	✓	✓	✓	✓	✓	✓		✓	10
Circuitboard Design	✓	✓	☼	✓	5	✓		☼	10
Circuitboard Hardware	✓	✓	4	✓	5	✓		7	10
Circuitboard Built	✓	✓	4	✓	6	✓		8	11
Installation	✓	✓	9	9	9	9		9	11

✓ = Previously finished.

☼ = Finished since last Meeting.

1,2,3... = Month to be finished. (1 = Sept 1990 Meeting)

Sky Scannings

December, 1990
 Matthew P. Linke, The University of Michigan Exhibit Museum, 1109 Geddes Avenue, Ann Arbor, MI 48109-1079 (313) 764-0478

SUN:

All times are Eastern Standard Time (EST)

The Sun enters Sagittarius on the 18th. The winter solstice occurs at 10:07 PM on the 21st. The days are now shortest and the nights longest.

Date	Rise	Set
01	7:46 AM	4:55 PM
05	7:51 AM	4:54 PM
10	7:55 AM	4:54 PM
15	7:59 AM	4:55 PM
20	8:02 AM	4:56 PM
25	8:04 AM	4:59 PM
30	8:06 AM	5:03 PM

MOON: The Moon passes 2° south of Jupiter and 0.7° north of Antares on the 15th. It passes 2° south of Neptune on the 18th, and 0.2° south of Saturn on the 19th. The Moon passes 2° north of Mars on the 29th and is at perigee on the 30th. The second full Moon of the month occurs on the 31st and is sometimes called the long night moon.

Phase	Date	Rise	Set
Full	02	5:19 PM	9:52 AM (3)
3rd Qtr.	09	1:22 AM	12:54 PM
New	17	8:52 AM	5:28 PM
1st Qtr.	25	12:40 PM	2:55 AM
Full	31	5:19 PM	9:10 AM (1)

Mercury: Mercury passes 1.3° south of Uranus on the 10th and begins retrograde motion on the 14th. Mercury is closest to Neptune (3.8°) on the 15th, and passes only 0.62° north of Uranus and 1.4° north of Venus on the 18th. Mercury is in Sagittarius at midnight.

Venus: Venus is in Sagittarius and passes 0.6° south of Uranus, in the evening sky on the 19th. It passes 1.8° south of Neptune in the evening sky on the 23rd. Venus is at aphelion on the 29th.

Mars: Mars is in Taurus, and will make a beautiful sight just below and to the east of the Pleiades at mid month. Mars will reach its greatest apparent diameter this month.

Jupiter: Jupiter closes out the year in Cancer, having moved very little since November. Everything seems to be going well on board the Galileo probe bound for Jupiter. The spacecraft still has several dangerous planetary encounters to make before making its final push to Jupiter.

Saturn: Saturn completes one whole year in Sagittarius this month. On the 18th, look for Saturn, Mercury, and Venus forming an elongated triangle low in the southwest after sunset. The crescent Moon will be in the middle.

Outer Planets: Uranus and Neptune are also found in the scene described for Saturn, but are too dim to be observed with the unaided eye. Uranus and Neptune are in Sagittarius. Pluto in Serpens.

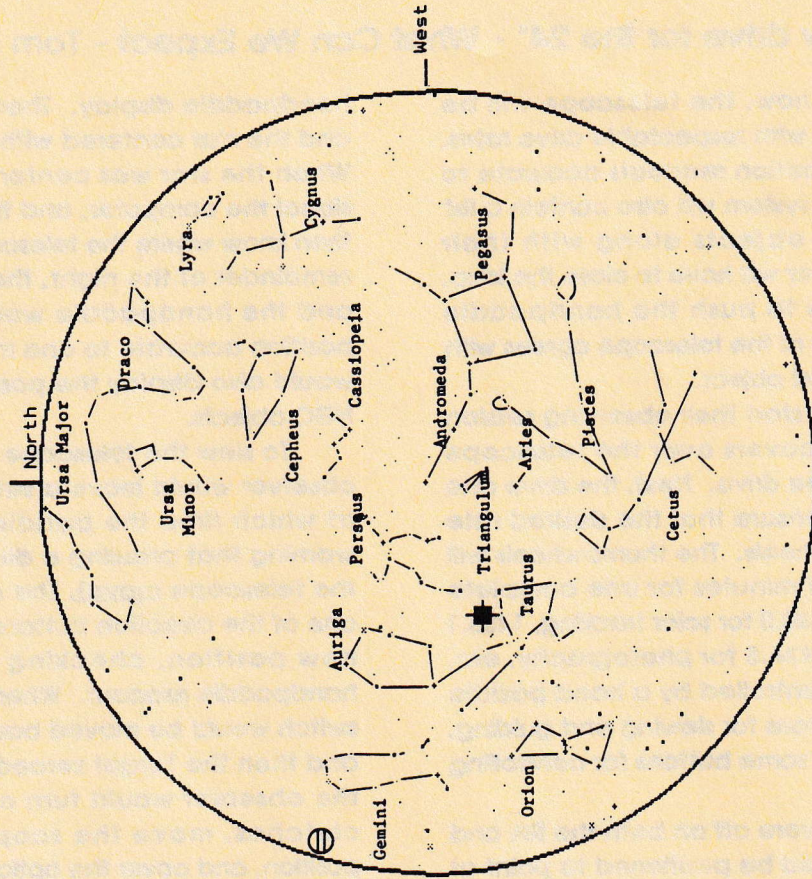
Great moments in astronomy: Tycho Brahe, the greatest observational astronomer of all time was born on December 14th, 1546. On December 20th, 1900, the astronomer Giacobini discovered a comet destined to be the first comet visited by a spacecraft.

Sources: "Astrocalc plus" by Zephyr Services, "Astronomical Calendar 1990" by Guy Ottwell, "Key Dates" by Ralph Winrich, NASA.

Sky Map

December, 1990
 Matthew P. Linke, The University of Michigan Exhibit Museum, 1109 Geddes Avenue, Ann Arbor, MI 48109-1079 (313) 764-0478

42° 27' 00" North 82° 55' 00" West 12-15-1990 AD, 9:00 PM New York Time



STELLAR MAGNITUDES

- ⋆ 0.499 or brighter
- ⋆ 0.5 to 1.499
- ⋆ 1.5 to 2.499
- ⋆ 2.5 to 3.499
- ⋆ 3.5 to 4.499

PLANETS

- ♂ MARS
- ♃ JUPITER

Source: "PC Planetarium" by Marilyn Davis Ph.D.

Places:

The Detroit Observatory is at the corner of Observatory and Ann Streets in Ann Arbor, across from the old U of M Main Hospital. The Detroit Observatory is an Historic Building which houses a 19th century 12-inch refractor and a 6-inch transit instrument.

The Peach Mountain Observatory is the home of the U of M radio telescope and the 24-inch McMath telescope used by the Lowbrows. This observatory is located northwest of Ann Arbor, off North Territorial Road, West of Dexter-Pickney Road. The entrance is just west of Sportsman's party store and is marked by a small maize and blue university sign. Go through the gate and follow the gravel road. Once parked at the observatory parking lot, follow the path away from the radio telescope and around the fenced in compound to the telescope.

Times:

The monthly meetings are held on the 3rd Friday of each month at 7:30 pm. Meetings are either at the Detroit Observatory or at the Peach Mountain Observatory. Meetings held at Peach Mountain are cancelled if the sky is not clear at sunset.

Public Star parties (Open Houses) are held on the Saturday nearest the new moon at the Peach Mountain Observatory. Star parties are cancelled if the sky is not clear at sunset. Many members will bring their own telescopes. Your scope is welcome. Wear warm clothes for the season and bring insect repellent. The next scheduled Open House is probably in March of 1991.

☆ Planetarium:

The Lowbrows are interested in putting a advertisement (poster) next to the U of M Exhibit Museum Planetarium. If there are any artists in the group that would to design and

create the poster, please call Paul Etzler at (313) 434-2574.

Magazines:

The Lowbrow Astronomy Club offers discount subscriptions to popular astronomy magazines:

Sky and Telescope : \$16/yr. \$18/yr aft Jan 1.

Astronomy : \$14/yr., 12 issues.

Deep Sky : \$8/yr., 4 issues.

Odyssey : \$10/yr., 12 issues.

Telescope Making : 48/yr., 4 issues.

All except Sky and Telescope require 5 club members to subscribe for the discounts.

Contact Dick Sider (663-3698) for more info.

Sky Scannings:

The *Sky Scannings* and *Sky Map* section in the issues of the *REFLECTIONS* are produced by Matt Linke of the U of M Exhibit Museum.

Newsletter Contributions:

Please send any information, short articles, or drawings to the address below. The closing date is January 8 th. The more you contribute, the better the newsletter.

University Lowbrow Astronomers Reflections
1770 Walnut Ridge Circle
Canton, Mich. 48187

Important Numbers:

President: Paul Etzler 434-2574

Treasurer: Richard Sider 663-3968

Observatory: Bob Klose 761-8488

Newsletter: Roger Tanner 981-0134

Membership: Ron Avers 426-0375

Peach Mountain Keyholders:

Tom Ryan 662-4188

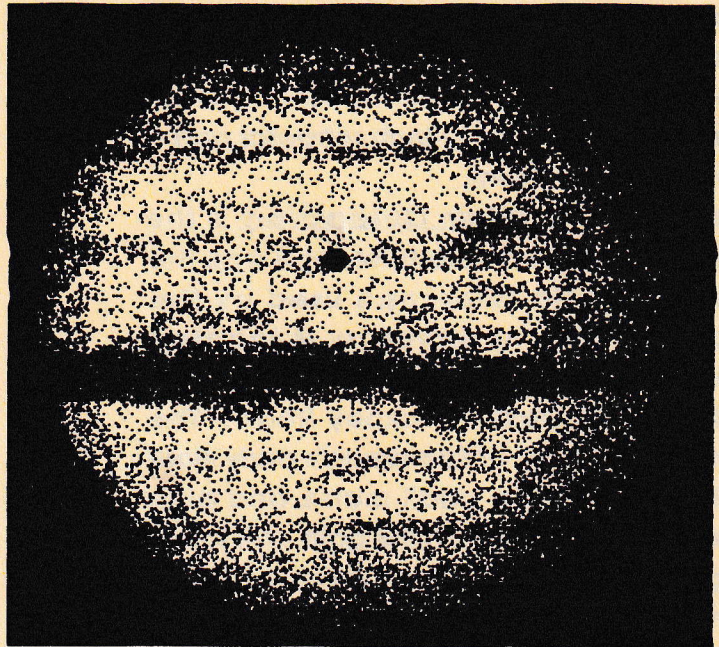
Fred Schebor 426-2363

Doug Nelle 996-8784

Monthly Meeting:

**ASTROFEST
STAR PARTY
REPORT &
SLIDE SHOW**

**Detroit Observatory
Observatory & Ann St.
Ann Arbor, Mich.**



**University Lowbrow Astronomers
9287 Chestnut Circle
Dexter, MI 48130**