REFLECTIONS

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October 1994

This view of Triton shows the Neptune-facing hemisphere. At the bottom of the image is the south polar cap (which in color photographs appears pink). In this region are dark plumes produced by ice volcanic vents. Many different types of terrain are clearly visible in this image taken by Voyager 2. Courtesy of Jet Propulsion Laboratory.

Douglas Warshow
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; the is map near the rear of the newsletter) on Saturdays before and after the new moon; the star party is cancelled if it's cloudy or below 10°F at sunset. For futher information, contact Bill Razgunas at (313) 995-0934.

This Month

October 1	Open house at Peach Mountain.
October 2	Computer subgroup meeting.
October 8	Open house at Peach Mountain.
October 15	Open house at Leslie Science Center.
October 21	Meeting at 807 Dennison Hall. Fred Schebor and Doug Nelle will give a report on Astrofest.
October 22	Open house (redux) at Leslie Science Center.
October 29	Open house at Peach Mountain.
October 30	End of Daylight Savings Time. Set your clocks back and enjoy an extra hour of observing!

Next Month

Novenber 1	Computer subgroup meeting. Time and location TBA.
November 5	Open house at Peach Mountain.
November 17	Penumbral lunar eclipse.
November 18	Meeting at 807 Dennison Hall. Steve musko will speak about TOMS and Chris Sarnecki will talk about the new Angell Hall observatory.
November 26	Open house at Peach Mountain.

Help to Protect Telescopes!

by Chris Sarnecki

The UM Astronomy department is looking for ideas for weatherproof and theftproof covers for the telescopes they will be installing on top of Angell Hall. The telescopes will be Celestron C11s with the Losmandy equatorial mounts, and will be installed on piers roughly 10 to 12 feet apart. The idea of the covers is to allow them to be permanently mounted on the piers and be protected from the elements (both weather and unscrupulous individuals). Anyone interested can contact me (426-5772), and I will provide blueprints of the piers and their layout. •

Buy Jupiter (or Whatever)

by Doug Scobel

It's getting to be that time of year again - time to think about calendars, observer's guides, and official Lowbrow T and sweatshirts.

By the time you read this I will have ordered Hansen Planetarium "Wonders of the Universe" wall calendars. These calendars have excellent photos, but even better is the daily notes on the sun, moon, planets, meteor showers, eclipses, and other astronomical phenomena. I saw a copy at Borders and there's actually more astronomical type pictures than last year - even a couple from Hubble. Yeah! Prices will be the same as last year, eight dollars for club members and nine for non-members. I'm only going to order 70 of them (I ordered 80 last year) to avoid having a bunch left over. Start thinking now about possible Christmas/holiday gifts or selling them where you work.

Also, if you are interested in purchasing a 1995 Observer's Guide, by the Royal Astronomical Society of Canada, let me know ASAP. These guides have all the astronomical data the serious (or non-serious, for that matter) observer will ever need in 1995, and are highly recommended! I will only order as many as those for which I have requests, so let me know now if you want one. Your price will be $15.50 (that's my cost). Unlike the calendars, we purchase the RASC guides from Sky Publishing as a convenience to our members, as they give us a ten percent club discount. In fact, they'll give us a ten percent discount on **anything** we order through the club, so let me know if you intend to order anything from their catalog and I'll pass the savings on to you.

Speaking of holiday gifts, we still have Lowbrow T-shirts and sweatshirts. We have two excellent logos, which were designed by club members Kathy Hillig and Chris Sarnecki, and are printed on high quality 50% cotton/50% polyester blend shirts. As of this writing, we have:

Galaxy logo:

T-shirts:	Sweatshirts:
3 x medium	3 x medium
3 x large	1 x large
3 x extra large	1 x extra large

Silhouette logo:

T-shirts:	Sweatshirts:
1 x medium	1 x medium
5 x large	3 x large
	1 x extra large

Prices are $10.00 and $16.00 (members), and $14.00 and $20.00 (non-members) for the T's and sweats, respectively. We've not quite broken even (dollar-wise, that is) on them yet, and I'll be bringing them in to each month's Friday night meeting, so bring your checkbook! •

From the Observatory

by Bernard Friberg

COMET SHOEMAKER-LEVY 9 -------

We are lucky to be living in this period of time when the 1000 year event occurred. The comet Shoemaker-Levy 9 broken up into at least 21 pieces slammed into Jupiter starting July 16 and lasted for about a week. Michigan was not a very good viewing location, since most impacts coincided with the sun being up, Jupiter being near the horizon, or clouds and haze, so there was only one reasonable possibility for viewing the impact. A video camera was attached to the 24 inch telescope at prime focus and viewed on the TV screen. The bands on Jupiter were clearly discernible, but we did not see what we had hoped to see, the plume rising above Jupiter's rim. This impact was too weak to be seen by the Hubble telescope, so there was no chance of us seeing the real time event. The impact sites were clearly visible with the 24 " telescope and many

smaller telescopes after the sites rotated into view. We counted as many as 6 impact sites at one time on some occasions. Multiple impact sites produced very large dark elongated areas, and these persisted for weeks after the event.

MOON WALK --------

Friends of Stinchfield Woods sponsored an event on a Sept. Sat. evening coinciding with the full moon and billed this as a "moon walk". They expected 30-40 guests. One estimate of the number of people showing up is 1000. Other estimates were up to 600. The 24" telescope was available for all to see through in addition to the other activities, a nature walk, a bonfire with marshmallows, and a slide show etc. There were more than 100 waiting in line for viewing through the 24" telescope at one time. This was a very successful event.

OCT. 1 OPEN HOUSE -------

This Sat it rained all day, so most prospective attendees planned other activities for the evening. It did clear up later in the day and the night skies were excellent. We did have many guests, many families, girl scouts etc., and several telescopes were available. Objects of particular interest: Saturn, Jupiter, Uranus, Neptune, nebulae, globular clusters, the cluster of galaxies in Perseus, and many open clusters. The viewing was excellent, a missed opportunity for those not attending.

OCT. 8 OPEN HOUSE -------

Weather wise we were not so lucky.

OCT. 10 OBSERVING -------

A video camera was attached to the 24" telescope at prime focus and the moon was scanned and recorded on tape. This was repeated for the 4" refractor. There were several of us this evening enjoying the transparent skies. Some of the objects viewed: NGC 1270 (a cluster of galaxies 300 million light years away), M74, M76, M57, M27, M37, M35, M42 etc. The nebulae filter works very well, and M42 is great with this filter.

Mark Cray just completed the star diagonal for the large 120 mm eyepiece, it works very well. Our guests can now view overhead without risking neck spasms. The club thanks Mark for this item and also the eyepieces he has made for us in the past.

A blackboard was acquired for the observatory, and this is being installed.

Magellan: Rest in Pieces

by Douglas Warshow

On Wednesday, October 12, the Magellan spacecraft entered the Venusian atmosphere after five years of mapping the planet. The last datum from the probe was received at 3:02 AM EDT after which it was declared dead.

Magellan was sent to Venus to map the surface via radar. As an added bonus (due to several last minute reprieves), the craft also charted most of the planet's gravitational anomalies. After more than 15,000 orbits, mission controllers decided to send Magellan on a suicide course into the atmosphere in order to explore the probe's aerodynamics. Such information could lead to spacecraft that could withstand atmospheric drag for greater periods of time than currently possible.

The craft was sent on a spiraling orbit that slowed its speed from 16,500 MPH to about 30 MPH. Any surviving pieces would have reached Venus' surface during the afternoon of the following day.

The Magellan team members wore armbands of black crepe paper to mark the conclusion of the mission. •

Rule of Six

by David M. Palmer

A 6th magnitude star puts 10^6 optical photons/second into a 6" telescope. I don't remember where I heard this, or how accurate it is, but it is easy to remember. (As long as you don't get it mixed up with the rule of 5 or the rule of 7.)

An m_v=0 star puts out 3.64 x 10^(-20) ergs/s/cm^2/Hz in the V band. A 6th magnitude star puts out 0.00398 times as much energy, or 1.45 x 10^(-22) ergs/s/cm^2/Hz. The V band has a width of roughly 8.7x10^(13) Hz, so the frequency integrated energy for an m_v=6 star is 1.3 x 10^(8) ergs/s/cm^2.

The average energy per photon is hc/lambda, where lambda=550 nm, or 3.61 x 10^(-12) ergs, so for an m_v=6 star, the V band photon flux is 3600 photons/s/cm^2. A 6" aperture has an area of 182 cm^2, so there are 660,000 photons falling on this aperture every second.

If you include another 6 (660,000 instead of 10^6 [photons/s]), you are within a couple of percent of the actual number. •

Projection		Horizon View		
Time	Local	Oct 21, 1994AD, 10:00pm (Night)		
	Universal	Oct 22, 1994AD, 4:00am	Julian date	2449647.6667
	Siderial	00:25 7		
Epoch	Universal	Dec 18, 1993AD, 9:52pm	Julian date	2449647.6667
Location		Earth	Centered on	
	Lon.	83°56'12"W	RA	0h25m36s
	Lat.	42°23'54"N	Dec.	41°20'35"
	Altitude	0.000 km	Azm.	181°03'02"
	Time zone	-6.00	Alt.	88°56'40"
Zoom Factor		0.340	Field of View	180°00' * 180°00'

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

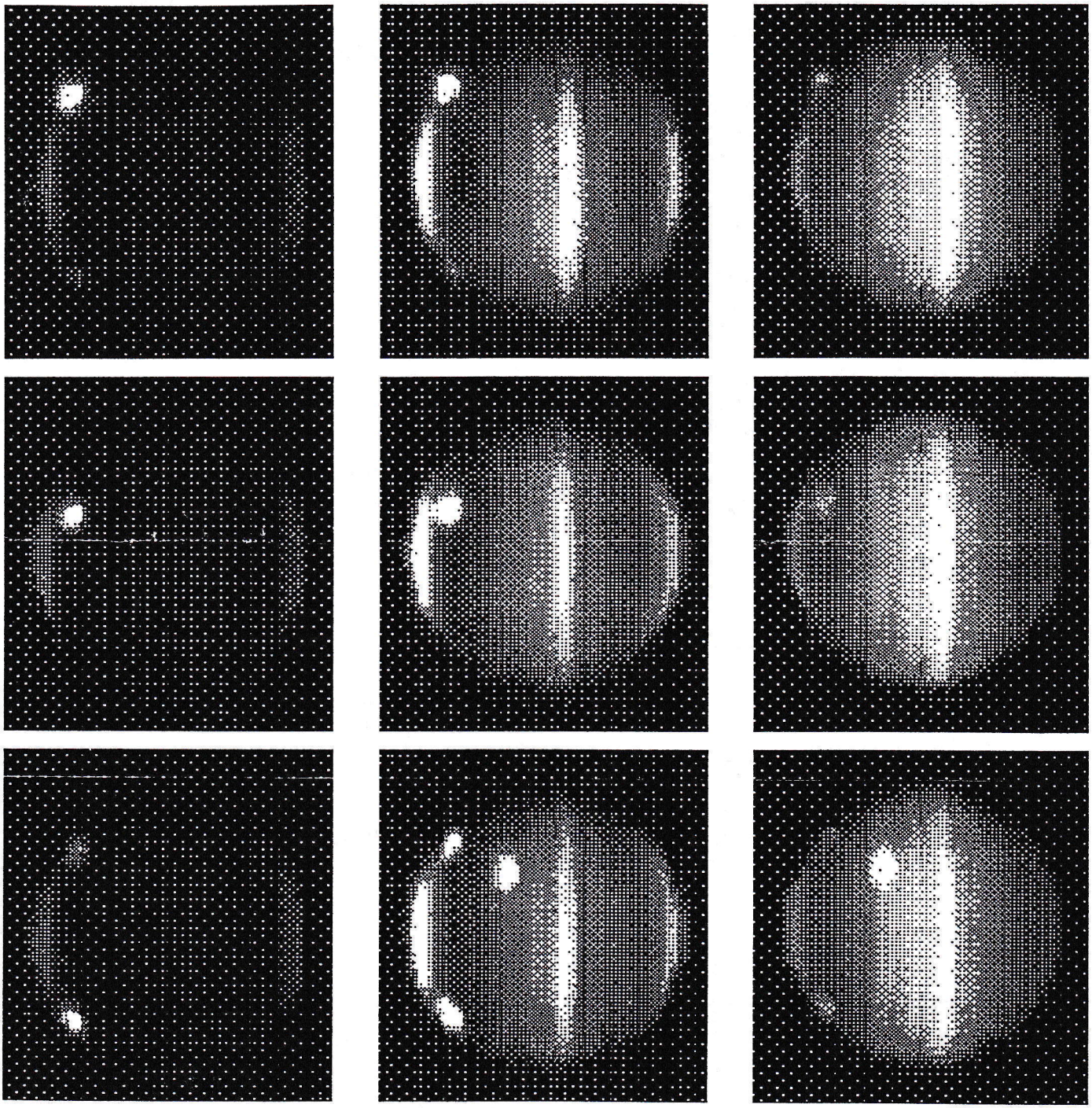
NEP Northern Ecliptic Pole NCP Celestial North Pole

SEP Southern Ecliptic Pole SCP Celestial South Pole

Lines

Horizon line Ecliptic

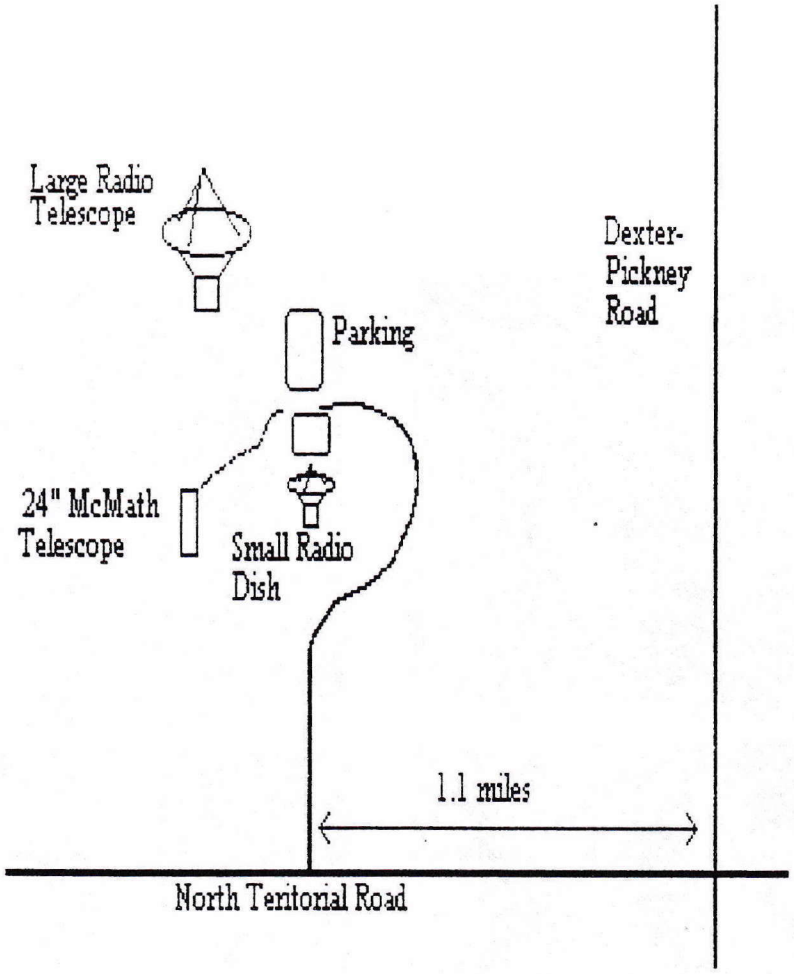
Celestial equator

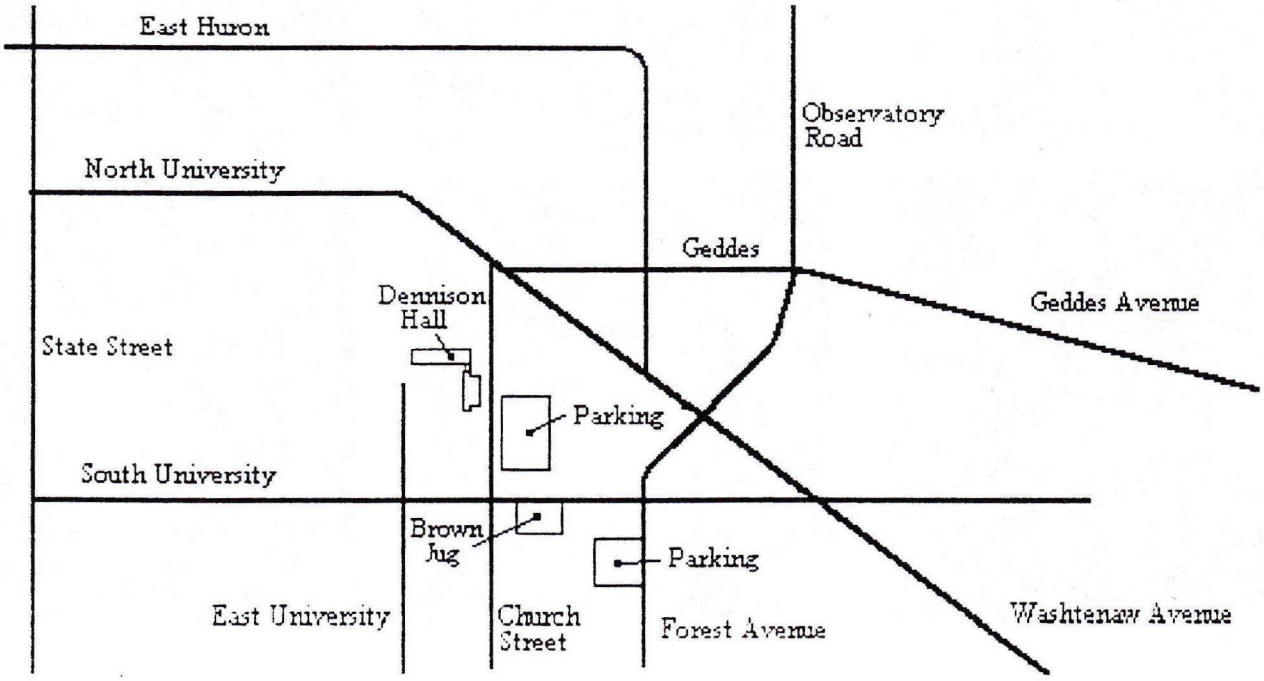


Places:

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-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:

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 subgroup 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 480-4514 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!

Telephone Numbers:

President:	Bill Razgunas	995-0934
Vice Presidents:	Kurt Hillig	663-8699
	Stewart Cohen	665-0131
	Tom Ryan	662-4188
	Steve Musko	426-4547
Treasurer:	Doug Scobel	429-4954
Observatory Director:	Bernard Friberg	761-1875
Newsletter:	Douglas Warshow	998-1158
Membership:	Doug Scobel	429-4954
Peach Mountain Keyholder:	Fred Schebor	426-2363

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 the following address:

Doug Scobel
1426 Wedgewood Drive
Saline, MI 48176

Magazines:

Members of the Lowbrow Astronomers can get a discount on subscriptions to any of these magazines:

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

For more information, please contact the club 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.

Newsletter Contributions:

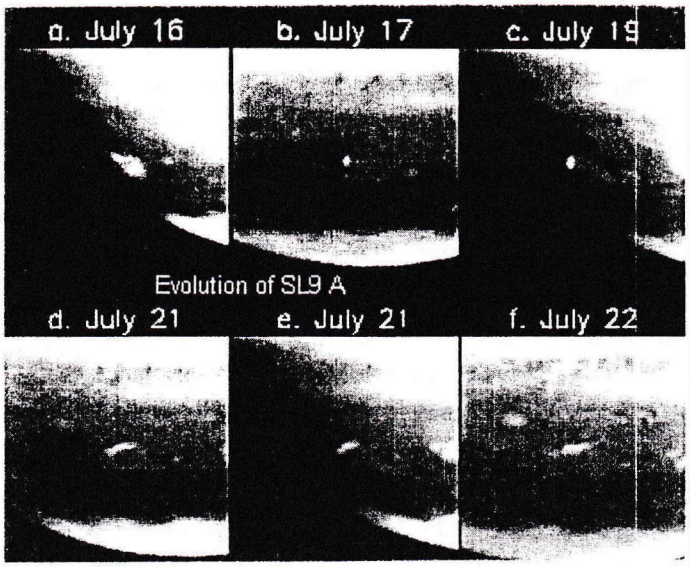
Members (and non-members) are encouraged to write about any astronomy-related area in which they are interested. Call the editor (Douglas Warshow) at 998-1158, or send e-mail to 75054,310 via CompuServe to discuss length format, etc. Submission of photographs is also welcome. Announcements and articles are due 14 days before each meeting (i. e., the first Friday of the month). Contributions should be mailed to:

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

Monthly Meeting

Fred Schebor
and
Doug Nelle
will share their adventures
at Astrofest.

at 7:30 PM
at
Room 807 Dennison Hall
Physics and Astronomy Bldg.



Jupiter undergoes a steady state
of big bangs.

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

Check your membership expiration date on the mailing label!