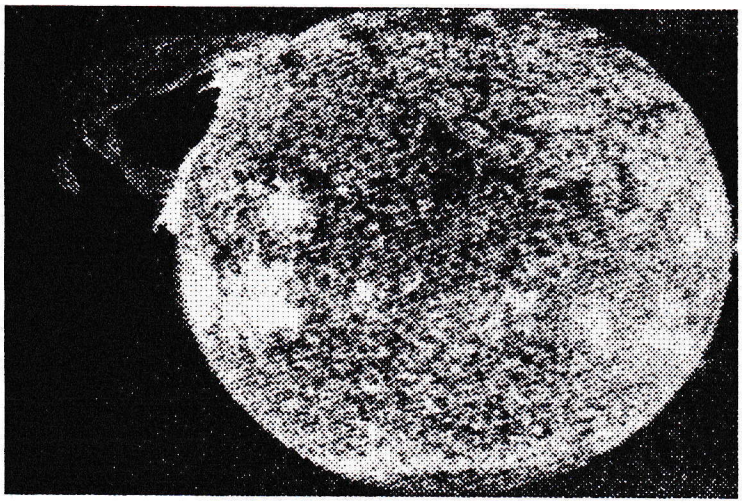
REFLECTIONS



REFLECTIONS

Solar prominence measuring 365,000 miles across recorded by astronauts aboard Skylab. The light imaged is that of ionized helium in the ultraviolet band (lambda = 30.4 nm).

January 1995

Bernard Friberg and Douglas Warshow, Editors

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; there is a map near the end of the newsletter) on Saturdays before and after the new moon; if it's cloudy or very cold just before sunset, call (313) 480-4514 to see if the event is cancelled. For further information, contact Bill Razgunas at (313) 995-0934.

This Month

January 1	National Hangover Day. See stars all day long (like it or not).
January 3-4	Peak of Quadrantid meteors.
January 4	Earth at perihelion.
January 5	Computer subgroup meeting at Bill Razgunas' house. Call (313) 995-0934 to confirm or to receive details.
January 7	Open house at Peach Mountain.
January 20	Meeting at 807 Dennison. Mario Mateo will discuss "New Light on Dark Matter."
January 28	Open house at Peach Mountain.

Next Month

February 2	Computer subgroup meeting at Bill Razgunas' house at 7:30 PM. Call (313) 995-0934 for details.
February 4	Open house at Peach Mountain.
February 11	Mars at opposition (magnitude = -1.2).
February 17	Meeting at 807 Dennison. Deano Smith will speak about cataclysmic variables.
February 25	Open house at Peach Mountain.

TREASURER'S REPORT

by Doug Scobel

Observer's Handbooks are in! We've got calendars and even some shirts left, too. I'll be bringing them all in to the meeting, so be sure to be there to pick up all your goodies. Give me a call if you need to make other arrangements for pick-up.

Here is an overview of the club's finances over the past year. For comparison's sake I've included 1993's figures as well. If you want to know more about any details, just give me a call or find me at the meeting.

	1994	1993
Starting Balance	$1,510.54	$1,479.73
Income		
Dues	1,148.00	1,368.00
Fundraisers (calendars, shirts, etc.)	982.33	1543.75
Magazine subscription and purchases	698.83	428.00
Interest	31.21	41.52
Gifts	15.00	123.00
Miscellaneous	0.00	39.57
Total income	$2,875.37	$3,543.84
Expenses		
Newsletter (printing & mailing)	841.20	950.96
Fundraisers (calendars, shirts, etc.)	983.07	1216.99
Magazine subscriptions and purchases	764.55	428.00
McMath 24" expenses and improvements	503.92	803.32
Meetings/talks	54.00	63.00
Miscellaneous	125.21	50.76
Total expenses	$3,271.95	$3,513.03
Ending Balance	$1,113.96	$1,510.54

SAGAN SPEAKS

by Christopher Sarnecki

On December 13th, The Library Cooperative of Macomb and The Detroit Free Press hosted the famed Carl Sagan, in its author luncheon series. Speaking on the publication of his most recent book, "Pale Blue Dot - A Vision of the Human Future in Space," Dr. Sagan's talk was filled with basic "Saganisms" we have all come to know like the back of M31. The following excerpts should be read using your best Sagan imitation:

For 99.99% of man's history we have been hunters and gatherers. The nocturnal entertainment was provided by the clear night sky, devoid of city lights. Even today, go and sit back in an open field so that you see only the night sky in your view. A "reverence and awe" for the stars overcomes you. You notice, after about an hour, that the stars begin to move, rising in the east, setting in the west. Psychological patterns form constellations. These constellations are important to hunters and gatherers as they form a kind of time binding from generation to generation. The stars are a great calendar. Telling us when to hunt and when to plant. "We are involved with the stars".

Today, except for Astronomers, we are

(Continued on page 2)

(Continued from page 1)
not involved with the stars. History tells of an Earth centered universe. Mankind believed that we are the center of the Universe. "We are privileged." We are the only ones who use the stars. The stars are for us. It feels great! Copernicus and Galileo prove otherwise. The church suppressed this revelation until compelling evidence convinces mankind of a Sun centered universe. You can't keep a good truth down.

Our position in the Cosmos is not special, not centered. This is a downer. Science has demoted mankind. The human spirit wishes to be special. If we wish to be special, then we should do something to be special (presumably in space). We live on an ordinary planet, orbiting an minor star, in a back water area of the galaxy. Considering all the galaxies, all the stars and all the planets orbiting those stars, how is it that we are special?

Voyager 1 and 2 sweep through the planets and now are wandering the vastness of space for eternity. As Voyager flew past Neptune, the craft was turned around and the Earth photographed. Not as the planetary image we have come to know (from the Apollo-Moon images), but as a "pale blue dot". Everyone we have ever known, ever loved, lives on this mote of dust. Every creator, and destroyer, every king, and peasant, every tyrant, every politician, everyone who has ever lived out their lives. The Earth is a small stage in the great cosmic arena. All we have ever known is on that point of light, that pale blue dot. Our observation indicates no one is on his way to help us. We must, therefore help ourselves. Help ourselves to act more kindly to our fellow man. Cherish that pale blue dot.

Like I said, basic Saganism.

A question and answer session followed the talk. I have culled a couple of the more interesting ones for your amusement.

Q: (when a member of the audience was trying to think of something intelligent to ask Carl Sagan) Did you really say, "Billions and billions" ?

A: No, I never said, "Billions and billions". It's a lie. Billions and billions is an inexact amount. Just as Sherlock Homes never said, "It's elementary, my dear Watson." Somehow these expressions get associated with your name.

Q: What can you say about the December 9th, near miss, (barn size) asteroid passage of the Earth by approximately 65,000 miles ?

A: Why do they call it a near miss when the proper term is a near hit ? The Earth lives in a bad neighborhood. How long do we have to wait for a collision ? The odds are 1/2,000 that an object will hit the Earth. The odds are 1/2,000,000 that you will die in an airplane crash. For odds of that nature you take out an insurance policy. We need an insurance policy for the Earth. We should monitor asteroids. We need to be doing something (to save the Earth). •

ASTRONOMY BULLETIN BOARDS

by Douglas Warshow

The following is a list of astronomy BBS 's (as of December 1993) that you may wish to explore. If you find any that are not on this, let me know and I will publish them in a future issue.

Astronomical Society of the Atlantic BBS
Atlanta, GA
404-321-5904
Astronomy

(Continued on page 3)

(Continued from page 2)

Fullerton, CA
714-738-4331

Canadian Space Society BBS
Toronto, ON
416-458-5907

Celestial BBS
Fairborn, OH
513-253-9767
Includes up-to-date elements of Earth-orbiting satellites.

Dallas Remote Imaging Group BBS
Dallas, TX
214-394-7438
Specializes in amateur radio, satellite tracking, and NOAA weather satellite telemetry. There is a fee for full access.

Digital Circus
Ocean Beach, CA
619-223-5348
Includes NASA images libraries.

Enviro BBS
Arlington, VA
703-524-1837

HAL 9000
Ann Arbor, MI
313-663-4173

Homer
Tustin, CA
714-939-1041

Homeschool BBS
Bossier City, LA
318-746-8360
Includes Space Shuttle status reports and spacecraft imagery.

Kingmont Astro Observatory BBS
Loomis, CA
916-652-5920
Specializes in astronomy software.

Minnesota Space Frontier Society
Minneapolis, MN
612-920-5566
Includes NASA press releases, shuttle reports, and imagery.

New Jersey Astronomical Association BBS
High Bridge, NJ
908-638-8593
Includes calendar of astronomical events and current sky reports. NJAA members get greater access to materials.

NOVAC BBS
Springfield, VA
703-256-4777
Includes conferences on astronomical sciences, comets, space history, and image processing.

The Observer's Database
Old Greenwich, CT
203-637-6710

Rancho Palos Verdes Astronomy
Rancho Palos Verdes, CA
310-541-7299

Rochester Astronomical Information Network (RAIN)
Rochester, NY
716-224-0078
Includes imagery and over 80 message bases (including Internet).

Skywatch
Regina, SK
306-569-0581

Space Base BBS
Vancouver, BC
604-875-6259

Spacelink
Huntsville, AL
205-895-0028
NASA's news and information database.

SpaceMet Physics Forum
Amherst, MA
413-545-1959
Mainly for Massachusetts teachers.

StarBase BBS
Woodbridge, CA
209-339-0220

Stargate BBS
Plano, TX
214-578-7618

Starry Night
Shawnee, KS
913-631-0761
Includes conferences on radio astronomy, observing data, telescope construction and

(Continued on page 4)

astrophotography.
Universal Worlds
Granite City, IL
618-931-8226
Zeke
Del Mar, CA
619-755-5675
Specializes in radio astronomy and SETI (search for extraterrestrial intelligence). •

SPICA OCCULTATION

by Louis Mamet

For observers in Ottawa, there will be an occultation on January 23rd of the star Spica at about 11:30 UT. The path along which the occultation will be grazing goes through the city of Ottawa. I would like to have more precise coordinates giving the exact position of this path near the location 45 27' N, 75 36' W (i. e. near Ottawa). If the trajectory can be given as an equation or some other precise form, it would have to be accurate enough to determine the position to within a few hundred meters! Congratulations! Being treated to a grazing occultation of a 1st magnitude star so very near your city is rare, about as rare as atotal solar eclipse near your city! Do observe it! Below you'll find the data you wanted. It was generated by OCCULT, one of the two occultation generation programs used by IOTA, the International Occultation Timing Association. HOWEVER NOTE THIS: the lunar profile (not included

(Continued on page 5)

Grazing Occultation of 1925 zB2 Mag 1.2 **1995 January 23** **Nominal Site Altitude 0 m**

Longitude (o ' ")	Latitude (o ' ")	UT (h m s)	TanZ (o)	PA (o)	CA (o)
-78 00 00	+46 35 49	11 30 12	1.68	22.6	-0.46N
-77 45 00	+46 27 56	11 30 44	1.68	22.6	-0.44N
-77 30 00	+46 20 07	11 31 16	1.68	22.6	-0.41N
-77 15 00	+46 12 20	11 31 48	1.68	22.6	-0.38N
-77 00 00	+46 04 36	11 32 20	1.67	22.5	-0.35N
-76 45 00	+45 56 55	11 32 53	1.67	22.5	-0.32N
-76 30 00	+45 49 17	11 33 25	1.67	22.5	-0.29N
-76 15 00	+45 41 43	11 33 58	1.67	22.4	-0.26N
-76 00 00	+45 34 12	11 34 30	1.67	22.4	-0.23N
-75 45 00	+45 26 44	11 35 03	1.67	22.4	-0.20N
-75 30 00	+45 19 19	11 35 36	1.67	22.3	-0.16N
-75 15 00	+45 11 58	11 36 09	1.66	22.3	-0.13N
-75 00 00	+45 04 41	11 36 41	1.66	22.3	-0.10N
-74 45 00	+44 57 27	11 37 14	1.66	22.2	-0.06N
-74 30 00	+44 50 16	11 37 47	1.66	22.2	-0.02N
-74 15 00	+44 43 09	11 38 20	1.67	22.2	0.01N
-74 00 00	+44 36 07	11 38 53	1.67	22.1	0.05N
-73 45 00	+44 29 07	11 39 26	1.67	22.1	0.09N
-73 30 00	+44 22 12	11 39 59	1.67	22.0	0.13N
-73 15 00	+44 15 21	11 40 33	1.67	22.0	0.17N
-73 00 00	+44 08 33	11 41 06	1.67	22.0	0.21N
-72 45 00	+44 01 50	11 41 39	1.67	21.9	0.25N
-72 30 00	+43 55 10	11 42 12	1.67	21.9	0.29N
-72 15 00	+43 48 35	11 42 45	1.68	21.8	0.34N
-72 00 00	+43 42 04	11 43 18	1.68	21.8	0.38N

(Continued from page 4)

here) was significantly SOUTH of the average lunar limb for this occultation (which is a northern-limit graze). If you position yourself exactly on the limit line as given below, you'll probably just see a "near miss," i. e., no occultation at all. To see an occultation you should position yourself AT LEAST TWO kilometers south of the limit line.You may go as far south as 5 or even 8 km and still see interesting stuff. How far south you're going is a matter of judgment and depends on what you want to see (which admittedly is not easy for a first-time graze observer to decide). If you can't decide, I would suggest you position yourself about 4 km south of the graze line. This distance is counted perpendicular to a line between you and the moon -- along the ground, multiply by the factor TanZ below, i. e., position yourself 1.68*(2,4,5,8) = 3.4, 6.7, 8.4 or 13.3 km south of the graze line. I would suggest you position yourself 7 km south of the graze line, counted along the ground. Also note the rightmost quantity CA ("Cusp Angle") in the table below. A negative CA means that the graze occurs along the sunlit limb of the Moon, and you'd like to avoid that if possible.Therefore try to position yourself EAST of 74 deg W longitude, if possible. It'll really be too close to the sunlit limb anyway, but it may make some difference. Good Luck! Note: 1925 is the ZC catalog number of Spica (Alpha Virginis).

Magnitudes: A: 1.3 B: 4.5
Separation: 0.05 arc seconds
Position Angle: 225 deg
Graze Path of Secondary: 0.17 km N, and 0.0 secs. earlier as compared to the primary.
With a tertiary star:
Magnitude: 7.5
Separation: 0.50
Position Angle: 180 deg
Graze Path of Tertiary: 1.68 km N, and 0.4 secs. later as compared to the primary.
Librations: Long: -4.11 deg Lat: +2.76 deg
Illumination of moon: 58%
Elongation of Moon: 99 deg
Vertical Profile Scale: 3.61 km/arcsec at mean distance of moon
Horizontal Scale Factor: 1.48 deg/min
Limiting magnitudes for Different Telescope Apertures:

Telescope Diameter (mm)

CA	50	100	150	200	250	300	350
-3.6	2.9	4.3	5.0	5.4	5.7	5.9	6.0
-1.6	2.9	4.3	5.0	5.4	5.7	5.9	6.0
0.4	2.9	4.3	5.0	5.4	5.7	5.9	6.0
2.4	4.7	6.1	6.9	7.3	7.6	7.8	8.0
4.4	5.1	6.5	7.3	7.7	8.0	8.3	8.4

SEEN R LEPORIS LATELY?

by Bob Norton

Has anyone tried to observe R Leporis lately? The atlases that I have identify it as a "rare" carbon star in the Lepus constellation. It is a variable star with a period of 432 days, varying from 5.5 to 10.5. It's supposed to be a beautiful deep red star. I have tried several times to see it with my 8" Schmidt-Cassegrain telescope with no luck. I'm pretty sure that I'm looking in the right place. Just my luck that it is at it's minimum now! Ha! Please, if you are seeing it and/or you know it's minima and maxima dates, let me know. Thank you!

Responses:

You really want to see this one at its minimum. At maximum it's a washed-out coppery color. At minimum it's just like a little ruby or a backlit drop of blood. It's so red that you can scan right past it and your mind will subconsciously reject it as a possible star.

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I've never seen a redder star. The last few maxima of R Lep occurred ROUGHLY at 9 Dec 1991, 24 Feb. 1993 and 23 May 1994. Expect the next maximum around August 1995 (when Lepus isn't visible) and November 1996 (when it IS visible, late at night). On the other hand, even at minimum, R Lep should be bright enough to be seen in an 8-inch! I've seen 12-mag stars in a 4-inch (although with some difficulty), so a 10.5 mag star in an 8-inch shouldn't be difficult. For a good finder chart of R Lep, check Sky and Telescope, March 1994, p 72.

—— Paul Schlyter

I just happened to look at R Leporis just last Friday night with my 13-inch in Arizona. It's a beautiful sight right now, as it is nearminimum (fainter than 10th mag.). The person who said you want to see it near minimum is correct, as it is an unimpressive, washed-out orange at maximum. You may want to use Uranometria 2000.0 as your star chart, since this star will be lost among the Milky Way field otherwise. Also, you need to use direct vision to see the color, in order to excite the cones in the center of your eye. Keep trying, as it is definitely worth checking out. Actually, there is a much redder star than this one. It is V Hydrae. When at its minimum, it is just ruby red. We'll have to wait a few months for that one to come back around, though.

——Tom Polakis •

SUNFIRE ANNOUNCES FALCON SERIES CELESTIAL FILTERS

Sunfire Optical Technology, a leading developer and manufacturer of accessories for amateur astronomers,today previewed the latest addition to their product line, the Falcon Series Celestial Filters. The Falcon Series is a line of specially designed, custom-coated glass filters which are designed to aid astronomers in observing nebulae and other celestial objects that are otherwise hidden from view, while enhancing the subtler details hidden in brighter objects.

The Falcon Series is also the first line of products that Sunfire has introduced that takes advantage of a specialized manufacturing process that has been dubbed "Inline Spectral Sensitization" (ISS). This process allows for the production and sale of high quality filters at a fraction of current market prices. For example, these two latest filters from Sunfire carry a manufacturer's suggested retail price of $69.95 Cdn, $59.95 U.S. - approximately half the price of competitors' filters.

Although the line-up currently consists of the Contrast Enhancement Filter and the Nebulae Filter, there are several other celestial filters that Sunfire plans to release over the coming months to add to the Falcon Series.

A. Stephen Fraser, president of Sunfire said, "Our field development team is currently working with a number of final prototypes that we will be releasing over the next eighteen months. All of these, we anticipate, will remain at the price levels we have set for the Contrast Enhancement Filter and Nebulae Filter.

"Sunfire devoted itself to optical filter development over six years ago,"said Mr. Fraser, "and it is only now that we deem our products worthy of public release. Now we have the Falcon Series which transmit the same wavelengths and have identical transmission percentages as other filters on the market, but the retail price is within reach of all amateur astronomers.

"We have an ongoing commitment to be inventive and innovative," he went on to say, "while providing amateur astronomers with what they really need at a price they can afford. Our long term commitment to research and development will ensure that we keep exciting our customers for some time to

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come."

The Falcon Series Celestial Filters have been made available to select Canadian retailers and are scheduled for volume shipment starting in December, 1994. Other products in the Sunfire line include the Colour Keys - Basic, Amateur, Professional and Lunar Editions which are in use by private individuals and educational/govern-ment institutions worldwide. The company is headquartered in Bracebridge, Ontario, Canada. <Falcon Series Celestial Filters, Nebulae Filter, Contrast Enhancement Filter, Colour Keys and Inline Spectral Sensitization are all trademarks of Sunfire Optical Technology>. •

TEXAS STAR PARTY

by Keith (_____?)

The 1995 Texas Star Party will be held May 21 - 29 at the Prude Ranch near Ft. Davis Texas. As in previous years, the local accommodations are done by the Prude Ranch and are not associated with the Star Party Registrar (me). The Prude Ranch will accept reservations for tent camping, RV camping and lodge accommodations beginning Jan. 3 at 9am CST. If you want to stay on the ranch, get your phone DTMF fingers nimble, and call on schedule. The lodges go very quick, the bunk rooms fast and RV spots almost as fast. I will be the TSP registrar again this year, so if you did not attend the TSP last year, and are not a member of the Astro league, you will need to send me your name and address if you want on this years mailing list (if you are not really interested, please refrain, we are a non-profit group). The registration packets will be sent out in 1st quarter of 1995; there will NOT be an early mailing as done in the past!!!! Only the large packet of info will be sent, and it will not contain any lodging information, only registration info. So, on Jan 3, call the ranch for lodging. If you are not on our mailing list, drop me a letter (address in S&T, Astronomy, Reflector...) or send me your address here, and I'll put you on the mail list. Look for a mailing in March at the earliest. Otherwise, see you under the stars or rain (whichever) at the TSP. Keith. Remember, all you need is a towel, and a pint of good beer. •

NASA'S UARS CONFIRMS CFCs CAUSED ANTARCTIC OZONE HOLE

by Michael Boschat

Three years of data from NASA's Upper Atmosphere Research Satellite (UARS) have provided conclusive evidence that human-made chlorine in the stratosphere is the cause of the Antarctic ozone hole.

UARS instruments have found chloro-fluorocarbons (CFCs)--human-made products used in electronics and refrigeration systems--in the stratosphere. The satellite's global data set also has traced worldwide buildup of stratospheric fluorine gases corresponding to the breakdown of CFCs, according to NASA scientists.

For many years, scientists have warned that the widespread use of chlorofluoro-carbons in refrigeration, spray cans and foam packaging was responsible for stratospheric ozone loss. The stratospheric ozone layer protects people, animals and plants from too much ultraviolet sunlight. The Antarctic ozone hole is a dramatic example of stratospheric ozone loss, which most scientists believe is a new phenomenon caused by the release of chlorine from human-made chlorofluorocarbons.

In the past few years, some debate has occurred over the origin of ozone-destroying chlorine. Sea spray and volcanic gases have

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been put forth as possible sources for chlorine reaching the stratosphere. The UARS data have ended that debate. "These new results confirm our theories about CFCs," said Dr. Mark Schoeberl, UARS Project Scientist. "The detection of stratospheric fluorine gases, which are not natural, eliminates the possibility that chlorine from volcanic eruptions or some other natural source is responsible for the ozone hole." In addition to CFCs, UARS has detected hydrogen fluoride, a product of the chemical breakdown of CFCs, in the stratosphere.

"Hydrogen fluoride has no natural source, it is not produced by volcanic eruptions or salt spray," said Dr. Anne Douglass, UARS Deputy Project Scientist. "Furthermore, scientists can calculate how much chlorine in the stratosphere is man-made using the hydrogen fluoride data." This calculation shows that almost all of the chlorine in the stratosphere comes from human-made chlorofluorocarbons.

The UARS measurements of chlorofluorocarbons were made with the Cryogenic Limb Array Etalon Spectrometer, operated by Dr. Aiden Roche of Lockheed Palo Alto Research Laboratory. The hydrogen fluoride measurements were made with the Halogen Occultation Experiment, operated by Dr. James Russell of NASA's Langley Research Center, Hampton, VA.

Each year since 1979, the ozone layer thins dramatically over Antarctica. This sudden change in the ozone was first noticed by researchers in Antarctica and soon confirmed by NASA satellites. The unpredicted Antarctic ozone loss gave scientists a challenging puzzle. Aircraft observations in 1987 showed convincingly that the high concentrations of chlorine monoxide over Antarctica were destroying ozone in the lower stratosphere. Most scientists were convinced that a series of chemical reactions involving chlorine monoxide and ozone led to the formation of the ozone hole.

Two questions, however, remained: why was the change in the ozone layer taking place over Antarctica, and what was the source of the chlorine monoxide? Meteorologists long have known that the Antarctic stratosphere can be one of the coldest places on the planet. Air is so cold that wispy clouds can form even in the super-dry stratospheric air. These clouds, called polar stratospheric clouds, form in the dead of winter. Scientists believe that chemical reactions on the surface of the cloud crystals release chlorine from "reservoir" gases, which do not react with ozone. The chlorine reacts quickly with ozone to form chlorine monoxide. This reaction begins the catalytic cycle in which one chlorine atom can ultimately destroy many ozone molecules, leading to the polar ozone hole.

UARS has measured the winter build up of chlorine monoxide within the south and north polar regions every year since its launch. UARS has found that chlorine monoxide appears suddenly in the stratosphere after the formation of the polar stratospheric clouds. Infrared and microwave sensors on board UARS are able to track stratospheric clouds and the chemical changes they cause.

UARS measurements have confirmed that the chlorine monoxide can build up to extreme levels in the polar regions after polar stratospheric clouds appear. UARS data also have shown that the meteorology of the polar stratosphere prevents the chlorine monoxide from dispersing, thus increasing the ozone loss.

"We are getting daily polar maps of ozone-destroying chemicals," said Douglass. "These measurements are adding tremendously to our knowledge of the stratosphere."

The UARS data set also has provided a clearer picture of the overall chemistry of the stratosphere.

UARS instruments have tracked the levels of chlorine "source" gases (CFCs),

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intermediate products (chlorine monoxide) and reservoir gases (hydrogen fluoride, hydrogen chloride and chlorine nitrate). Under international treaties controlling the use of ozone-depleting chemicals, the amounts of CFCs in the atmosphere no longer are increasing. However, CFCs survive in the atmosphere for many years before being destroyed by ultraviolet light, and the ozone hole is expected to persist at current levels through this decade. (Their stability was one of their biggest assets when they were developed for industrial use in the 1930s.) Unless other conditions change, scientists expect the ozone hole to weaken and disappear in the 21st century.

UARS was the first satellite launched as part of NASA's Mission to Planet Earth, a comprehensive study of how the Earth's global environment changes, and how human activities contribute to that change. Mission to Planet Earth includes satellites, Space Shuttle instruments, aircraft research and ground teams. Goddard Space Flight Center, Greenbelt, MD, manages UARS for NASA's Office of Mission to Planet Earth, Washington, DC. •

JASPR LAUNCH CHALLENGE

by Mark Vincent

Since I just finished a summary on the payload for the SPRL (Space Research Laboratory) annual report, I decided to aid in the newsletter's never-ending quest for more stuff. I would like to say that the integration of the Jovian Auroral Spectrometer Rocket at Wallops Flight Facility, Virginia went quite well. It did, however, take from late October to early December to complete. We will launch from White Sands Missile Range between late March and late April. The exact launch windows are determined by these criteria:

(1) Jupiter must be 30° above the horizon as seen from the ground.
(2) The moon must be more than 30° from Jupiter.
(3) Jupiter's central meridian longitude is near 180° (System III).
(4) For the reflight (one month later), the moon must also be 30° above the horizon.
(5) The sun must be below the horizon as seen by the rocket at 160 nautical miles above White Sands.

Does anyone want to use their planetarium software to determine the launch window? If I remember, I will bring them with me to the next meeting to check your work. We should know on January 25 when White Sands wants to launch our payload. •

SPRL COLLOQUIUM SERIES PRESENTS TALK

by Terri Maxwell

Last summer, the Shoemaker-Levy 9 comet impacts made a big splash both in the media and on Jupiter. The Space Physics Research Laboratory's 1995 Colloquium
Series is proud to host Dr. Heidi Hammel, of Massachusetts Institute of Technology, one of the leading experts in the field of Planetary Sciences. Her presentation, "The Spectacular Swan Song of Shoemaker-Levy 9," will feature Hubble Space Telescope images of the events and discuss the latest scientific conclusions.

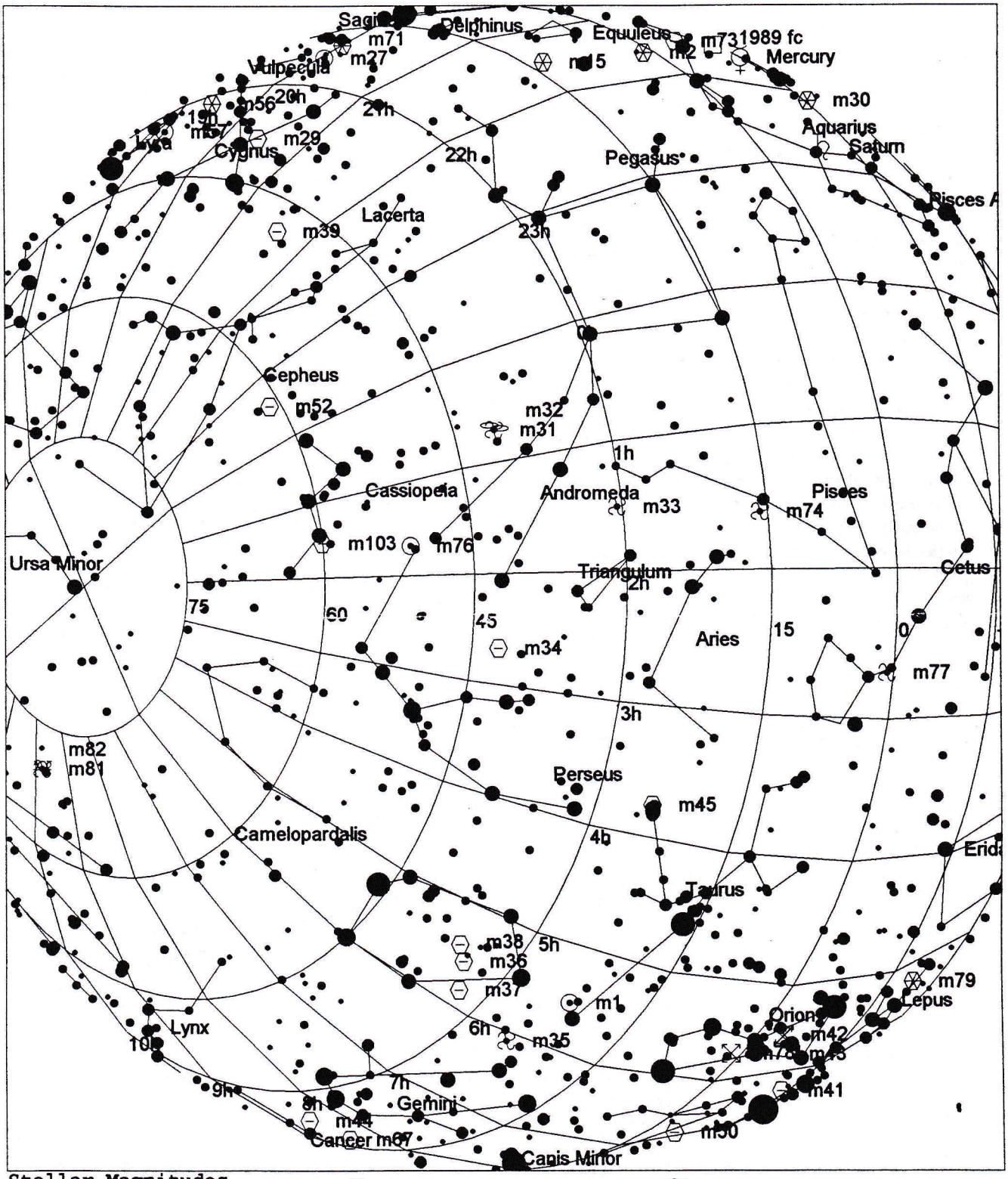
The talk will take on January 27th at 3pm in the Boeing Auditorium of the F. X. Bagnold building on North Campus. •

Distant Suns

Date/Time: Jan 20, 1995

View From: Earth (horizon mode), 42:20 N lat 83:03 W lon

Aimed At : 90:00 alt 90:00 az 180 fov



Stellar Magnitudes

-1 0 1 2 3 4 5 6

Globular Cluster

Open Cluster

Diffuse Nebulae

Planetary Nebulae

Spiral Galaxy

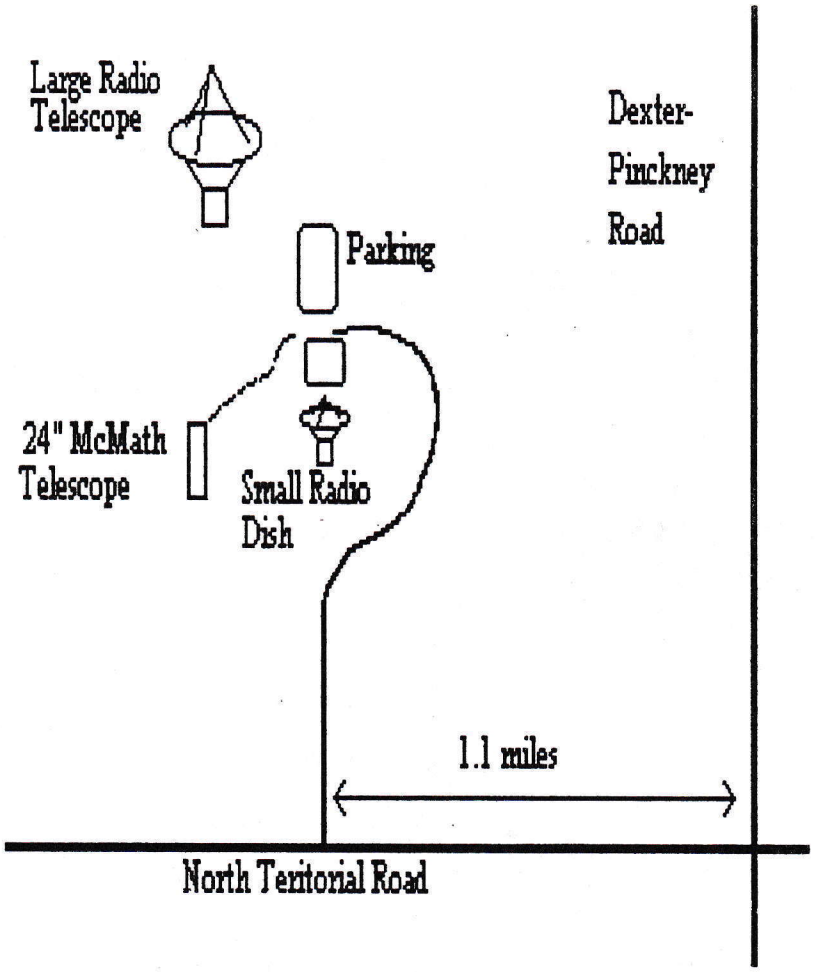
Elliptical Galaxy

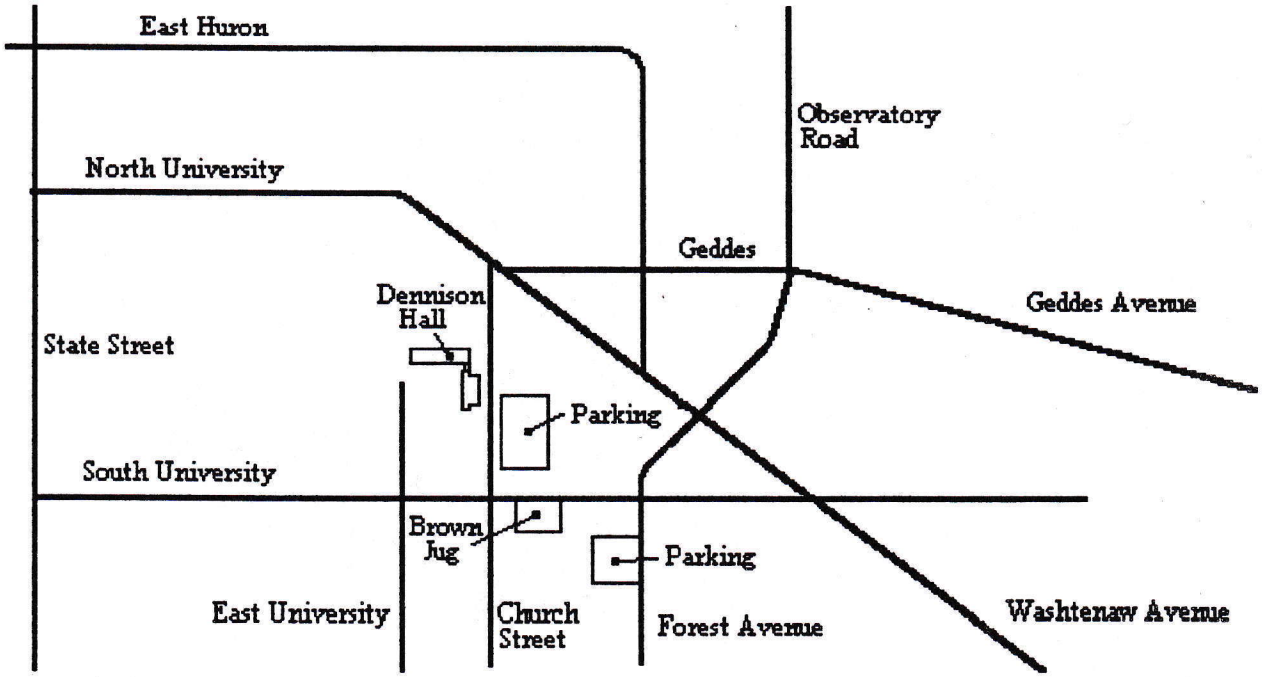
Irregular Galaxy

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-Pinckney 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 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 1st 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 Mtn. 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 Pres:	Kurt Hillig	663-8699
	Stuart 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
	Bernard Friberg	761-1875
Membership:	Doug Scobel	429-4954
Peach Mtn. 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 Douglas Warshow using Distant Suns 2.0 for Windows drawn for the end of twilight on the monthly meeting date.

Photographs:

All photographs converted for publishing by Douglas Warshow.

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 (or 75054.310@CompuServe.com via Internet) 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

Mario Mateo
brings us up to date
with
New Light on
Dark Matter"

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

The Great Galaxay in Andromeda (M31)
with its satellite galaxies
M32 (just above the nucleus)
and M110 (lower left).

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

Check your membership expiration date on the mailing label!