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# REFLECTIONS SNOITTEF

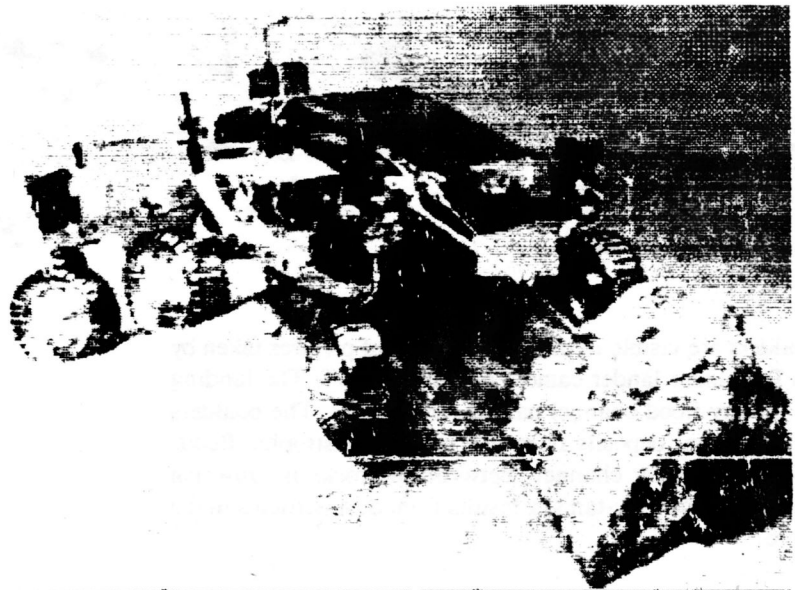
of the University Lowbrow Astronomers

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July 1997

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The robot  
buggy  
SOJOURNER  
and  
PATHFINDER  
at  
MARS



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## The University Lowbrow Astronomers

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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 the Saturday evenings before and after the new moon. The event may be canceled if it is cloudy. For further information, call (313) 480-4514.

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### This Month:

July 5            Open house at Peach Mountain.  
July 18          Meeting at 807 Dennison  
                    Bill Albe on: "The Black Sun -  
                    An Eclipse in South America"

### Next Month and beyond:

August 2        Open house at Peach Mountain.  
August 9        Open house at Peach Mountain.  
August 15       Meeting at 807 Dennison

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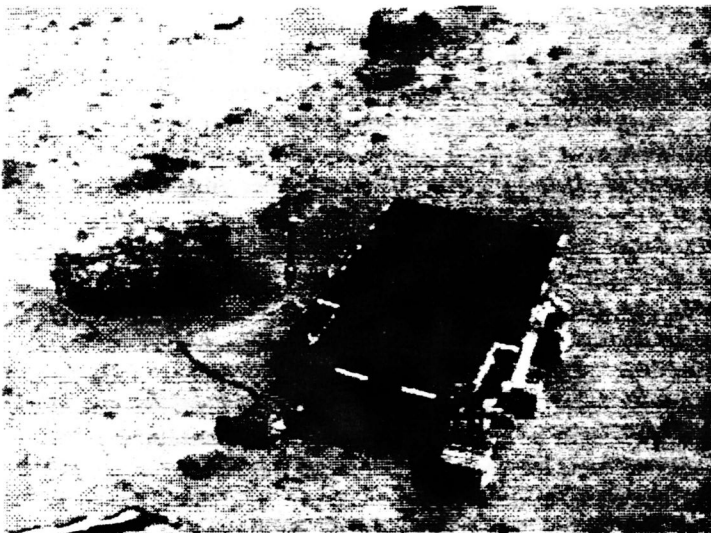
# Photos and captions courtesy of Dr. Peter Smith, Leader Mars Pathfinder Imaging Team, and NASA, Jet Propulsion Lab



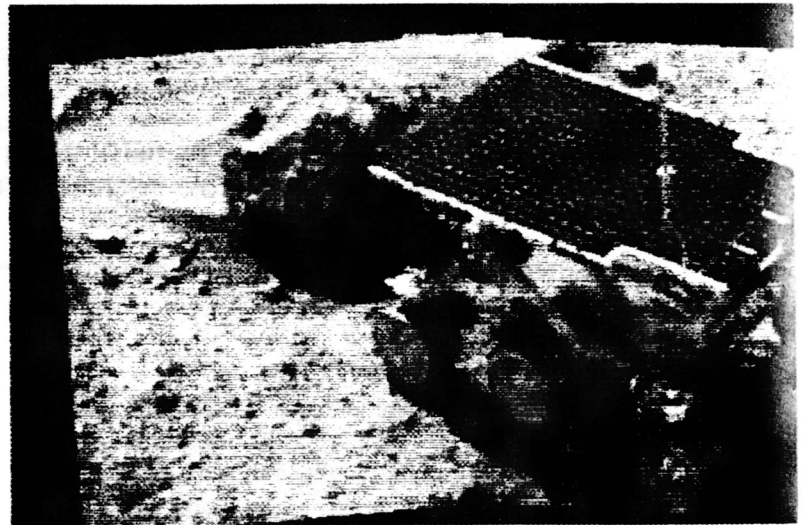
Large boulders are visible in this enlargement of pictures taken by the Mars Pathfinder lander camera on July 4, 1997. The landing site is in the dry flood channel named Ares Valles. The boulders probably represent deposits from one of the catastrophic floods that carved the ancient channel. Between the rocks is brownish windblown soil. The gray-tan sky results from dust particles in the atmosphere.



Here we see Wedge and Flat Top imaged in color as part of the "monster panorama".



Sojourner is visible in this image, one of the first taken by the deployed Imager for Mars Pathfinder (IMP) on Sol 3. The rover has moved from this position into one that later facilitated its using the Alpha Proton X-Ray Spectrometer (APXS) instrument on Barnacle Bill. The APXS, located at the rear of the rover, is not visible in this image.



This image shows the Sojourner Rover conducting its examination of "Barnacle Bill" with the APXS. The images was taken by the fully deployed (1.8 meters) IMP camera.

# The Latest from Earth's Invasion of Mars

On July 4, 1997, NASA's Mars Pathfinder landed on Mars: the next day the Sojourner rover rolled off the lander to conduct the first mobile geological and soil studies of Mars.

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## Mars Pathfinder Project Notes

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Launch Date: 04 December 1996 UT 06:58

Arrival Date: 04 July 1997

Launch Vehicle: Delta II

Mass: 264 kg (lander), 10.5 kg (rover)

Power System: Solar panels

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Mars Pathfinder Rover has backed up against the rock nicknamed "Barnacle Bill" and deployed the Alpha Photon X-ray Spectrometer (APXS) against a relatively dust-free spot in order to determine the composition of the rock. The APXS will run over the martian night and return data in the next uplink session this evening (July 7). The pop-up mast holding the Imager for Mars Pathfinder has been deployed.

The Mars Pathfinder's Sojourner Rover rolled onto Mars' surface on July 6 at about 05:40 UT (1:40 AM EDT). Image received at 2:00 AM EDT July 6 shows the rover completely off the ramp, all six wheels on the martian soil. The rover now rests about 10 cm from the end of the ramp. A 9-frame movie of the Sojourner's descent down the ramp is also available (~500 K).

Mars Pathfinder impacted the surface on July 4 at 12:57 EDT at a velocity of 10.5 m/s (23.5 mph) and bounced about 15 meters (50 feet) into the air. The entry angle into the atmosphere was about 0.3 degrees shallower than planned.

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There will be almost continuous coverage of Mars Pathfinder on NASA Select in the days leading up to the landing. A complete schedule for NASA Select TV Coverage is available.

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A large dust storm in Valles Marineris has been imaged by the Hubble Space Telescope on June 27. The storm is not expected to have any serious effect on the Mars Pathfinder landing site.

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The Mars Pathfinder (formerly known as the Mars Environmental Survey, or MESUR, Pathfinder) will be the second of NASA's low-cost planetary Discovery missions. The mission will consist of a stationary lander and a surface rover. The mission has the primary objective of demonstrating the feasibility of low-cost landings on and exploration of the Martian surface. This objective will be met by tests of communications between the rover and lander, and the lander and Earth, and tests of the imaging devices and sensors.

The scientific objectives include atmospheric entry science, long-range and close-up surface imaging, with the general objective

being to characterize the Martian environment for further exploration. The spacecraft is scheduled to enter the Martian atmosphere without going into orbit around the planet and land on Mars with the aid of parachutes, rockets and airbags, taking atmospheric measurements on the way down. Prior to landing, the spacecraft will be enclosed by three triangular solar panels (petals), which will unfold onto the ground after touchdown.

The rover "Sojourner" is a six-wheeled vehicle which will be controlled by an Earth-based operator, who will use images obtained by both the rover and lander systems. Note that the time delay will be about 10 minutes, requiring some autonomous control by the rover. The primary objectives are scheduled for the first seven sols (1 sol = 1 martian day = ~24.7 hours), all within about 10 meters of the lander. The extended mission will include longer trips away from the lander over about 30 sols.

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A landing site has been chosen for the Mars Pathfinder at 19.5 N, 32.8 W in the Ares Vallis area.

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### SUMMER READING LIST

by Tom Ryan

Doug Warshaw and I were talking the other day about books on optics and telescope design, and I thought that a list of books that I've found to be above average might be of interest to other Lowbrows, especially if it had brief descriptions of the book's contents. Most of the books are available for perusal at the U of M's Engineering Library in the Media Union on North Campus. You don't need a U of M Library card to look at them. You can buy them through Border's or Willman-Bell. The list isn't in any particular order.

#### MODERN OPTICAL ENGINEERING, by Warren J. Smith

This is the best general book on optical engineering that I know of. It covers the whole field of optical engineering with clear, understandable text and illustrations. This is not a book on theoretical optics, but describes how light can be utilized and the devices that accomplish this.

If there's a topic you're interested in, and Smith doesn't have something to say about it, you're going to have to search a whole lot harder to find it elsewhere.

Incidentally, this is the first book I ever bought. I was 15 years old, working in a city library with all the books there at my disposal, and this was the one book I wanted to own.

#### TELESCOPE OPTICS, by Rutten and van Venrooij

This remarkable book covers telescope optics; reflectors, refractors, eyepieces, field correctors, image aberrations, manufacturing tolerances, optical calculations and telescope design. It even comes with a program that lets you design telescopes and lenses, and raytrace optics of your own design. And even though the program is a little clunky, it works.

One nice feature of this book is the raytrace diagrams the authors included (made with the program that comes with the book)

when they discuss different telescopes. Ever wonder how the images at the edge of a Schmidt-Cass field compare to those in a Tri-Schiefspiegler? This book shows you.

#### HOW TO MAKE A TELESCOPE, by Jean Texereau

If you want to make a telescope, this book has the best description of that process. Reading this book is not the best way to make a telescope. The best way is to have someone show you. But after you've made one, you can read this book and say, "Yep, he's right about that!"

#### OPTICAL SHOP TESTING, ed. by Malacara

An advanced book, and expensive, but very complete in describing the methods of testing optics. It is mostly concerned with interferometric testing, because that's what most professionals use, but it also discusses Foucault, Ronchi, Hartmann, Star, and Null tests. Each chapter covers a different test method, and is either written by an expert on that test, or by the test's inventor.

#### OPTO-MECHANICAL SYSTEMS DESIGN, by Yoder

The best book for designing the mechanical parts of optical systems. Its all here; lens cell clearances, mirror cell design, deflection, characteristics of materials used in optical mounts, structural design, common practice in mounting lens systems, corrosion control and adhesives. If you're building something that has to work right, this is a good place to start.

#### AMATEUR TELESCOPE MAKING I, II, and III, ed. by Albert Ingalls

I have spent many, many pleasant hours reading and re-reading these three seminal books on telescope making. They describe practically every aspect of amateur telescope making, and I'm always delighted to see the author of an article accomplish some amazing feat of creation using only common tools and his own ingenuity, and discover that I, too, could probably do what he was describing.

These books were written in the 20's and 30's in a style that always gives me the impression that I've just had a conversation with an old friend. Probably the only books in literature that can rival these are the laboratory practice books by John Strong.

There are many other books on optics that deserve an Honorable Mention, but my experience is that most of them use an entire book to add only one or two additional facts to my body of knowledge, or that they are concerned with aspects of optics that don't concern me. Your own interests may cover a wider range than the above books do, and if the editor of this newsletter gets a request for info on any particular subject, or on some book that I've left out, I can recommend and review a wider list in the future.

These books, however, certainly deserve a place on the 100 Parsec Shelf of your library.

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## This one is from the DPS emailings

Submitted by Mark Vincent

(dps@ganesh.Colorado.EDU Wed Jun 18 16:41:33 1997):

Greetings, DPS Members-

URGENT!!

The Cassini Huygens launch in October is presently being threatened by a very active anti-nuclear lobby. These people are frightened by the use of plutonium in the Radio-isotope Thermal Generators (RTGs) aboard the spacecraft, despite repeated assurances from NASA that adequate shielding has been provided even in the case of an explosion at launch.

Letters protesting the launch and requesting cancellation of the mission are reaching the White House at a rate >30/day. The launch will not take place if the President does not approve it.

Discussions with NASA Associate Administrator Dr. Wes Huntress suggest that the best way to combat this negative campaign is to emphasize the positive aspects of this mission. Here are four: 1. International Cooperation: Scientists, students, engineers from many countries are working together to make this happen.

2. Great Science Return: Saturn! Rings! Titan! Satellites! Magnetosphere! Much new basic information plus plenty of opportunities for stunning surprises.

3. Exploration as our Legacy: When future generations look back at our era, the exploration of the solar system will surely stand out as one of our greatest accomplishments, and one of the greatest adventures humans have ever undertaken.

4. The Example of Galileo (the mission): This spacecraft also is powered by RTGs, and look at all the great science it is producing.

5. Add your own ideas!

Then send a letter (even a short one will help) to the President's

Science Advisor, Dr. John Gibbons

Assistant to the President

for Science and Technology

Office of Science and Technology Policy

Washington, DC 29599

and send the same letter to the president. The next three months are critical, so PLEASE DO IT NOW!

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Tobias Owen, Institute for Astronomy (owen@ifh.hawaii.edu)

July is the 50th anniversary of the Roswell UFO hype  
In honor of the 50th anniversary of the Roswell UFO incident,  
here is a top ten list.

Top Ten Alien Excuses for the Roswell UFO Incident

10. See, grampa is too old to pilot. Last night he ran a  
stoptlight and crashed head on into that planet.



The travel agent lists this 'as a quaint, nondeveloped

planet. The perfect spot for a weekend away from it all.

8. Don't worry Dear, the used saucer salesman gave me a great 2 year, 20,000 light year warranty. Nothin' will break. (See #5 for what happens next.)

7. Buzzing these country folks is getting boring. Let's zip past that military base to see if they put on a better show.

6. BURRPPPP.... Flip me another titanium flask of Romulan Ale %<

5. OK, I understand the confusion. Just that, back home AAA stands for the Andromeda Antigraviton Association. Now, where did you say the nearest AAA approved saucer repair station was?

4. Daddy, I gotta do number one and two... and three.

3. You men are all alike. Pull over here and I'LL ask for directions!

2. Ohh shoot cutie pie. We're outa propellant... Wanta start tentacling?

1. Ahh Honey, I found what you're looking for. The entry-start authorization units are stuck in the automatic sequence initiator, right behind the access denied portals!!! (Followed by dope slap.)

an assembly housing, a mounting bracket or pole socket, a lamp holder, a ballast, a reflector or mirror, and a refractor or lens

- Footcandle: A unit of illumination produced on a surface, all points of which are one foot from a uniform point source of one candle.

- Glare: Direct light emitted by a luminaire that causes reduced vision or momentary blindness.

- Illuminance: The level of light measured at a surface.

- Lamp: The component of a luminaire that produces the light.

- Light direct: Light emitted directly by a lamp, off a reflector, or through a refractor of a luminaire

- Light emitting surface: Any part of a fixture (lamp, diffusor) which emits light rays.

- Light pollution:: General sky glow caused by the scattering of artificial light in the atmosphere, much of which is caused by poorly-designed luminaires.

- Light shield: Any attachment which interrupts and blocks the path of light emitted from a luminaire or fixture.

- Light trespass: Light emitted by a luminaire that shines beyond the boundaries of the property on which the luminaire is located.

- Lumen: A unit of measurement of luminous flux.

- Luminaire: The complete lighting system, including the lamp and the fixture.

- Luminaire full cutoff: A luminaire that allows no direct light emissions above a horizontal plane through the luminaire's lowest light-emitting part.

- Luminaire permanent outdoor: Any fixed luminaire or system of luminaires that is outdoors and this

is intended to be used for seven (7) days or longer.

- Outdoor light fixtures: Outdoor artificial illuminating devices, installed or portable, used for floodlighting, general illumination, or advertisement.

- Roadway lighting: Permanent outdoor luminaires that are specifically intended to illuminate roadways for automotive vehicles.

- Standard methods: Methods of measurement established by a nationally recognized Board.

### SECTION 3. ADOPTION OF NEW SECTION 5-11 - OUTDOOR LIGHTING

That the Brighton Township Codified Zoning Ordinance, is hereby amended by the addition of a new section 5.1 1 to read as follows:

#### Section 5-1 1 OUTDOOR LIGHTING

##### (a) INTENT AND SCOPE OF APPLICATION

Intent The purpose of this section is to improve the travel conditions for persons and vehicles on public ways by reducing glare, to reduce light trespass, to protect the general health, safety, and welfare of the public in Brighton Township, to decrease the expense of lighting, to decrease light pollution, and to improve the aesthetics of the township In general while providing adequate night-time safety, utility, and security.

(b) PROCEDURE: Per section 5-16 (b). At the time of site plan

### TOWNSHIP OF BRIGHTON LIVINGSTON COUNTY, MICHIGAN ORDINANCE NO. 143

AN ORDINANCE AMENDING THE CODIFIED BRIGHTON TOWNSHIP ZONING ORDINANCE BY ADDING A NEW SECTION 5-11, OUTDOOR LIGHTING, TO PROVIDE FOR THE QUALITY OF OUTDOOR NIGHT LIGHTING TO CONSERVE ENERGY, REDUCE LIGHT POLLUTION, AND IMPROVE SAFETY BY LIGHT DIRECTION AND ADDING TO SECTION 2-2, DEFINITIONS.

The Board of Trustees of the Township of Brighton hereby ordains:

SECTION 1. REPEAL OF EXISTING SECTION 5-1 1.  
EXISTING SECTION 5-11 IS HEREBY REPEALED IN ITS ENTIRETY.

SECTION 2. ADOPTION OF NEW DEFINITIONS IN SECTION 2.2  
Definitions That the following definitions are added to section 2-2.

- Canopy structure: Any overhead protective structure which is constructed in such a manner as to allow pedestrians/vehicles to pass under.

- Fixture: The assembly that holds a lamp and may include

approval the applicant must supply a lighting plan in accordance with Planning Commission rules.

(c) STANDARDS:

1. For all areas:

- a) All lights shall be shielded in such a way as to direct all light toward the Earth's surface and away from reflective surfaces.
- b) Light fixtures or lamps shall be shielded/shaded in such a manner as to direct incident rays away from all adjacent property.
- c) Lights on poles shall not be taller than the building whose area they illuminate nor taller than fifteen (15) feet whichever is shorter.
- d) All fixtures must meet the building code requirements for their particular zoning district.

a) Any facilities which may require floodlighting may not arrange the light in such a way that it will shine towards roadways, onto adjacent residential property or residential use property or into the night sky.

f) Any interior lighted signs may not be lit at night when any face of the sign is

removed or damaged in such a way that the light may distract drivers or homeowners.

g) Signs shall comply with illumination requirements of section 5-10 (f) (3).

h) Except as stated elsewhere in these regulations, light levels will be limited to those published as recommendations by the Illuminating Engineering Society of North America.

2. For commercial, business, industrial, and natural resource zones and any roadway adjacent to residential zones:

a) Any light fixture must be placed in such a manner that no light emitting

surface is visible from any residential area or public/private roadway.

walkway, trail or other public way when viewed at ground

level.

b) The level of lighting shall not exceed 0.5 footcandles at any residential

property line or 1.0 footcandles at any non-residential property line.

c) Any Canopy structure used at a business location must have recessed lights with diffusers which do not extend below the surface of the canopy.

d) Any luminaire on a pole, stand or mounted on a building must have a shield, an adjustable reflector and nonprotruding diffusor.

3. Installation and operation cost: The cost of installing and operating approved roadway

lighting on any public road shall be through a financial method approved by the Township

Board of Trustees or by the Livingston County Road Commission. The costs of all other

lighting systems shall be borne by the developer/property owner.

(d) EXCEPTIONS

1. The Planning Commission may waive any of the provisions stated in section 5-11 (c)

when after a request for such an exception has been made

and reviewed, the Planning

Commission determines that such an exception is necessary for the lighting application.

Requests for such an exception shall be made to the Planning Commission in such form as

the Planning Commission shall prescribe and shall include, but not be limited to, a

description of the lighting plan, a description of the efforts that have been made to comply

with the provisions of these regulations and the reasons such an exception is necessary. In

reviewing a request for such exception, the Planning Commission shall consider safety,

design, and other factors deemed appropriate by the Planning Commission and shall

consider the following:

a) The new or replacement luminaire is a full-cutoff luminaire when the rated output of the luminaire is greater than 1,800 lumens.

b) If a lighting recommendation or regulation applies, the minimum/maximum illuminance specified by the recommendations or regulation is used.

c) If no lighting recommendation or regulation applies, the minimum illuminance adequate for the intended purpose is used, giving full consideration to safety, energy conservation, glare, and minimizing light trespass.

d) For roadway lighting, a determination is made that the purpose of the lighting installation or replacement can not be achieved by installation of reflectorized roadway markers, lines, warnings or informational signs, or other passive means

a) Adequate consideration has been given to conserving energy and minimizing glare, light pollution, and light trespass.

2. Exemptions from the provisions of this section are permitted only when:

a) Federal or state laws, rules and regulations take precedence over these

provisions.

b) Fire, police, rescue, or repair personnel need light for temporary emergency situations.

c) There are special requirements, such as sports facilities and monument or

flag lighting; all such lighting shall be selected and installed to shield the

lamp(s) from direct view to the greatest extent possible, and to minimize

upward lighting and light trespass.

d) A determination has been made by the Township Zoning Board of Appeals, established through an open, public hearing process, that there is a compelling safety interest that can not be addressed by any other method.

SECTION 2. INCONSISTENCIES REPEALED.

Any and all other ordinances or resolutions or parts thereof in conflict herewith are hereby repealed.

SECTION 3. SEVERABILITY.

Should any section, clause or paragraph of this Ordinance be declared by court of competent jurisdiction to be invalid, the same will not affect the validity of the ordinance as a whole or part hereof other than the part declared to be invalid.

SECTION 4. SAVING CLAUSE.

That nothing in this Ordinance shall be construed to affect any suit or proceeding impending in any court, or any rights acquired, or liability incurred, or any cause or causes of action acquired or existing, under any act or ordinance hereby repealed; nor shall any just or legal right or remedy of any character be lost, impaired or affected by this Ordinance.

SECTION 5. PENALTIES

Every person convicted of a violation of any provision of this Ordinance shall be punished by a fine of not more than five hundred dollars (\$500.00), or by imprisonment for not more than ninety (90) days, or by both such fine and imprisonment. Each act of violation and every day upon which any such violation shall occur shall constitute a separate offense. In addition to the penalties stated herein, the Township Board of Trustees may enjoin or abate any violation of this Ordinance by appropriate action.

SECTION 6. EFFECTIVE DATE.

The provisions of this Ordinance are hereby ordered to take effect thirty (30) days following publication in a newspaper of general circulation within the Township. This Ordinance is hereby declared to have been adopted by the Township Board of Trustees of the Township of Brighton in a meeting duly called and held on the 4th day of March, 1997.

TOWNSHIP OF BRIGHTON,  
LIVINGSTON COUNTY, MICHIGAN

Andrew F. Wardach, Supervisor  
Carla T. Chapman, Clerk

ADOPTED: March 4, 1997

PUBLISHED: March 12, 1997

EFFECTIVE: April 11, 1997

CERTIFICATION:

I, Carla T. Chapman, Clerk of the Township of Brighton, County of Livingston, Michigan, do hereby certify that the foregoing is a true and complete copy of Brighton Township Ordinance number 143, an amendment to the codified Brighton Township Zoning Ordinance, and was adopted by the Brighton Township Board of Trustees on the 4th day of March 1997, and given publication in the Brighton Argus, a newspaper of general circulation, on the

12th day of March, 1997. The following members of the Brighton Township Board of Trustees voted as follows in connection with his resolution to adopt the above amendatory ordinance.

AYES: NAYS: ABSENT:

In witness hereof, I have hereunto affixed my official seal this

\_\_\_\_ day of \_\_\_\_\_ 199\_\_.

Carla T. Chapman, Clerk Township of Brighton

Kurt Hillig writes:

If you think anyone needs a break from all the Mars stuff....

Dr. Kurt Hillig

UMNet Administration I always tell the fax (313)763-2180  
University of Michigan absolute truth phone (313)647-8778  
Ann Arbor, MI 48109-3297 as I see it. X.500  
khillig@umich.edu

>> Computers were invented to help people waste more time faster

----- Forwarded message -----

Date: Tue, 8 Jul 1997 16:46:56 -0500

From: Taras Masnyk <tmasnyk@surgery.bsd.uchicago.edu>

To: atm@shore.net

Subject: Re: ATM - Color sensitivity of the eye

>On Jul 7, 1:29pm, Jim McKay wrote:

>> Subject: ATM - Color sensitivity of the eye

I beg your indulgence for the following longish post, but it may be of interest to those of you looking around in the dark. As a student of the clinical neurosciences, I wish to correct several misconceptions about rods and cones. First, there are actually three different types of cone cells, maximally responsive to blue, yellow-green and orange light, known as blue, green, and red cone cells. They are responsible for daytime, color vision; they are relatively low in sensitivity (need several to many photons to be activated), but of quite high resolution- i.e., are able to discern very small angular separations, allowing us to see fine details. The resolution is in part due to the small receptive fields of the cone cells (each cone responsible for a small area of the retina), and in part due to the dense packing of cones in the area of maximal vision, the macula. Rods are responsible for night-time vision (in a crude way of thinking). They are very sensitive to light (theoretically capable of detecting a single photon, though various physiologic constraints limit this to a few photons), but the resolution of rods is lower than for cones; that's why you can't see very many details at night- everything is a little fuzzy. In addition, while rods respond to a variety of wavelengths of light, they are not programmed to transmit information about the wavelength (and are not really capable of doing so anyway)- they just transmit "light present"- so you see essentially in black and white (and shades of grey) if you are using rods. Dark adaptation comes from a variety of mechanisms, some purely neurological. Importantly, though, the chemical reactions responsible for the detection of light are "recharged" in the dark. After a while in the dark, more receptor proteins are available for light detection than in daylight, when they get bleached. This is true for both rods and cones, though rods are significantly more sensitive than cones. This is why DIM light is as important for dark adaptation as the color of light- a red search light will destroy dark adaptation as surely as a flashbulb. The reason RED light works well is because neither rods nor cones are very sensitive to it. Even red cones are only half (maybe less) as sensitive to red light as to orange light, and blue and green cones are essentially insensitive to red light. Rods respond to many wavelengths, most strongly in the yellow-green range, but respond least to red light; violet and blue light is intermediate in effect on rods. Therefore, no receptor is strongly stimulated by red light, though a dim red light will be seen well enough by only the red cones to allow you to read your star chart, but not enough by any other cones or the rods to destroy your appreciation of M42 (or insert your favorite Messier object here).

In summary, yes, red light is best for preserving night vision, though it should be relatively dim as well as red. If any one wants any more details (MORE? whatever for...) consult a physiology text or you may email me- tmasnyk@surgery.bsd.uchicago.edu  
Thanks for your patience and bandwidth!



# Recent News and Observations

Last Updated: 11 July 1997

Date of last update is indicated

Headlines New Comet Tabur 1997 N1 (7/7)

Long-Period Comets

C/1995 O1 (Hale-Bopp) is ~3.3 (7/11) Most recent observations...

C/1997 D1 (Mueller) is about 13.5 (6/2)

C/1997 J1 (Mueller) is about 13.2 (7/7)

C/1997 J2 (Meunier-Dupouy) is about 12.5 (7/7)

C/1997 L1 (Xinglong) is about 17.0 (7/8)

C/1997 N1 (Tabur) is about 10.0 (7/11)

Short-Period Comets

2P/Encke is a Southern Hemisphere object at m1[9.5 (7/11)

29P/Schwassmann-Wachmann 1 is in outburst at m1 brighter than

13.0 (6/5) 46P/Wirtanen is about 11.5-12.0 (6/2)

81P/Wild 2 is about 11. (7/7)

AU Circular 6688 (June 27, 1997) reports yet another discovery of a comet by the SOHO

(Solar Heliospheric Observatory) satellite. Perihelion was on February 19, 1996 UT. This appears to be another Kreutz sungrazer. It was not seen moving away from the Sun.

C/1997 L3 & L4 (SOHO)

IAU Circular 6685 (June 20, 1997) reports the discovery of two other comets by the SOHO (Solar Heliospheric Observatory) satellite. Perihelion was on June 13 and 15 UT, respectively.

These comets are Kreutz sungrazers, but apparently of different subgroups according to Brian Marsden. He also comments that "the number of small Kreutz members must be very large indeed and the process of producing new members from those that survive perihelion passage almost continuous." Marsden's work on the Kreutz sungrazers can be found in the following published articles: Marsden 1967, *Astronomical Journal*, Vol. 72, 1170; 1989, *ibid.*, Vol. 98, 2306.

C/1997 L2 (SOHO)

IAU Circular 6684 (June 19, 1997) reports the discovery of another comet by the SOHO (Solar Heliospheric Observatory) satellite. Perihelion was on June 10 UT (almost June 11) at a distance of 0.043 AU. This comet is not another Kreutz sungrazer. The comet was detected moving away from the Sun at m1~5 (mighty faint for that close to the Sun!). The comet will move into the evening sky, but will be 14th magnitude or fainter by the time its solar elongation

Comet 1996 J1 (Evans-Drinkwater)

IAU Circular 6653 (May 10, 1997) reports that this comet has split. This was discovered by J.Kobayashi (using a 0.41-m reflector at Kumamoto Civil Astronomical Observatory) on May 5.8 UT. The brighter condensation is m1=9.8 and the fainter condensation is 12.9. It is suspected that the fainter condensation actually contains the principal nucleus. A confirmation of the splitting was obtained by A. Sugie (using a 0.60-m reflector at Dync Astronomical Observatory) on May 9.8, with the condensations at m1 = 12.6 and 13.7, respectively. This come is elongated less than 30 degrees from the Sun making visual observations very difficult at best. un...none survived.

P/1997 G1 (Montani)

IAU Circular 6622 (April 10, 1997) reported the discovery of a 19th magnitude comet by Joe

Montani. Lunar and Planetary Laboratory, with the Spacewatch 0.9-m telescope at Kitt Peak. The orbit given on IAU Circular 6670 (May 24, 1997) indicates that the perihelion for this comet will occurred on April 27.8 1997 at 4.2 AU. The comet has a period of 21.8 years. It seems unlikely at this point that the comet will become visually observable.

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## Elected Officers:

President:	D.C.Moons	810/254-9439
Vice Pres:	Mark Vincent	313/663-7813
	Mark Cray	313/283-6311
	Mark Deprest	313/662-5719
Observatory		
Director:	Bernard Friberg	313/761-1875
Treasurer:	Doug Scobel	313/429-4954
Editors:	Bernard Friberg	313/761-1875
	Kurt Hillig	313/663-8699
	Chris Sarniecki	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](mailto:khillig@umich.edu)

Bernard Friberg [Bf747@aol.com](mailto:Bf747@aol.com)

Chris Sarniecki [chrisandi@aol.com](mailto:chrisandi@aol.com)

Doug Warshow [dwarshow@ix.netcom.com](mailto:dwarshow@ix.netcom.com)

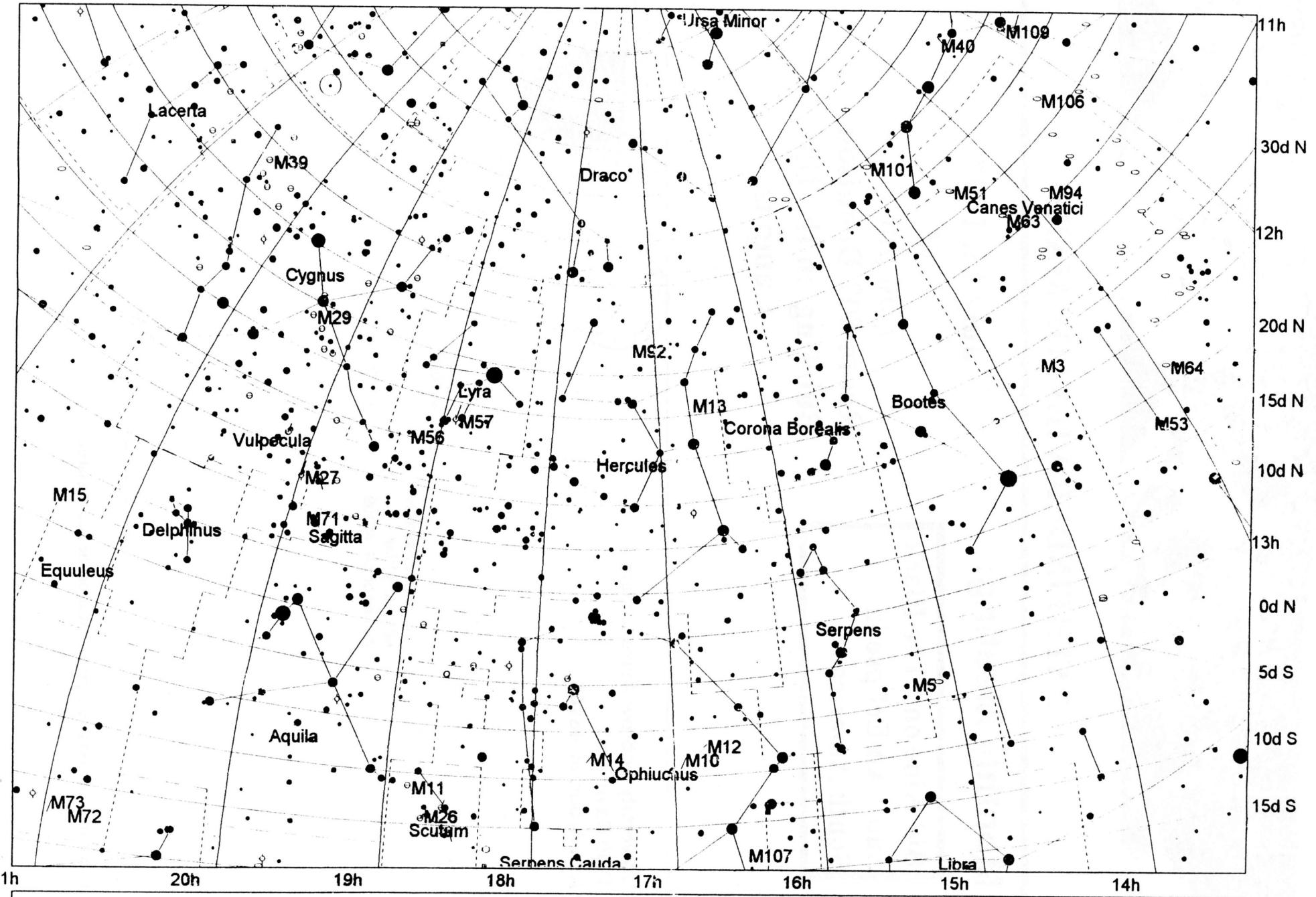
---

## Home Page Address:

<http://www.astro.lsa.umich.edu/lowbrows.html>

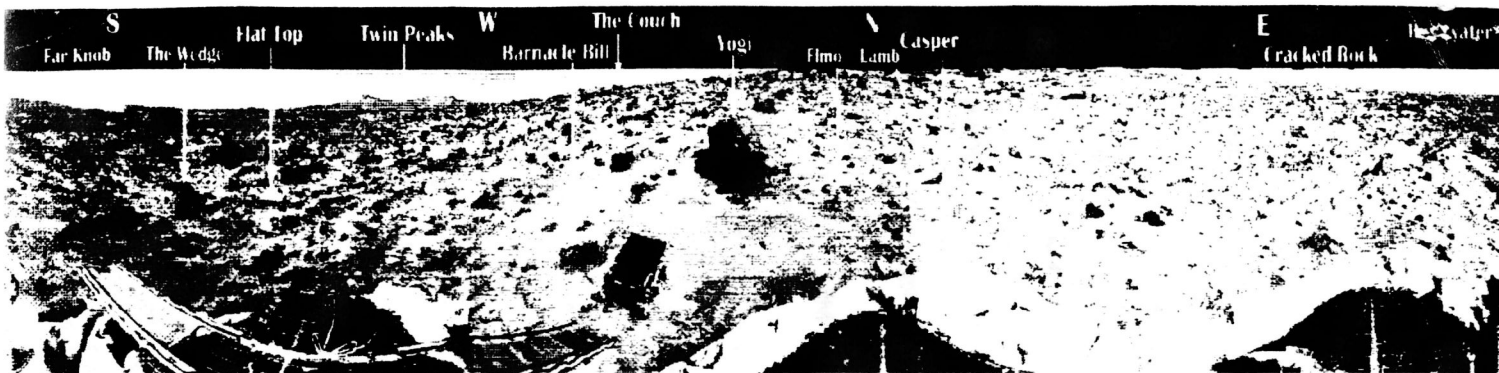
*Asteroid info:  
- Paul Walkowaki  
330 Manor Dr.  
Ann Arbor, MI 48106*





• Variable Star	• Double Star	○ Galaxy	◇ Nebula	◇ Planetary Neb.
○ Open Cluster	⊕ Globular Cluster	⊞ Cluster+Nebula	○ Prob. Star	○ Other NGC Objects

Center RA:17h 13m Dec: 32d 39m N Date: 5/10/97 Time: 8:00 AM Width: 169d 19m



## PATHFINDER VIEW OF MARS

**Monthly Meeting:**

**Bill Albe on "The Black Sun - An Eclipse in South America"**

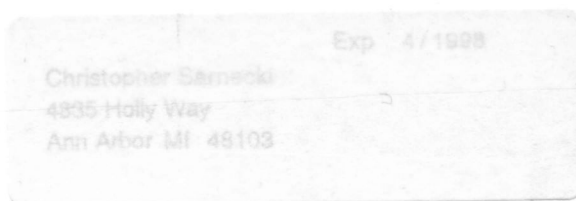
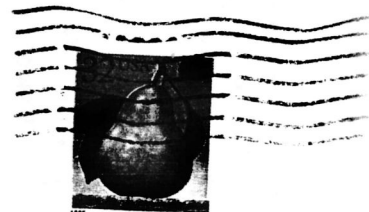
**July 18, 1997**

**at**

**7:30 pm**

**Room 807 Dennison  
Building on the UM  
Campus**

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



Check your membership expiration date on the mailing label!