GEMINI
publication of the
Twin City Astronomy Club

Vol. 1 No. 6 November, 1976

COLOR FILTERS FOR LUNAR AND PLANETARY OBSERVING AND PHOTOGRAPHY

By Hubert Brueckner

The celebrated British physicist, Lord Rayleigh was the first to point out that shorter wavelengths of light, blue and violet, scatter more than longer wavelengths, red and orange. That's why, for example, the setting sun appears red. The shorter wavelengths of the sun's light are scattered in our atmosphere and only the longer wavelengths are able to filter through.

In observing the planets, filters can be used to increase contrast between areas differing in color and even to penetrate a planet's atmosphere to various levels by eliminating certain colors.

When observing Jupiter and Saturn, light yellow and orange are useful for cloud banks and zones. Very light blue is helpful in determining the latitudes of faint cloud and wisp formations. Green is most effective in the low-contrast regions. Switching between blue and red filters will reveal the Jovian atmosphere in suprising detail.

When observing Venus, a violet filter is good for low-contrast shading and at the same time cuts irradiation.

Filters are particularly useful when observing Mars. In the atmosphere of Mars, the scattered blue light can be filtered out with an orange or deep yellow filter. These will also reduce the light from the blue and green areas. A red filter, on the other hand, will transmit red and yellow light and cut all blue and green, thereby creating maximum contrast. A violet filter will sharpen high-lying clouds near the top of the Martian atmosphere, while a green filter can be used for observing clouds lying closer to the planet's surface. The height of clouds can often be determined by comparative filter tests.

Filter studies of Mars are valuable for determining meteorological conditions and for watching the daily changes in the Martian atmosphere, especially in the near polar regions. The polar haze is detected with blue and green filters, and a red filter will penetrate the haze and show the surface markings beneath.

A yellow-neutral filter will reduce the dazzling brilliance of the moon and will give eye comfort especially when one observes for long periods of time, such as watching lunar sunrise along the terminator. Yellow-green, deep-yellow, orange, or orange-red filters are all useful in revealing details and improving contrast on the lunar surface.

Here is a list of the Wratten filters referred to above:

Wratten number	Color	Wratten number	Color
25	red	11	yellow-green
23A	orange-red	58	green
21	orange	80A	light blue
15	deep yellow	82A	blue
12	yellow	47	violet
8	light yellow	3N5	yellow-neutral

Because the eye is part of the optical system when one is engaged in making visual observations, we want to stress two points. First, when observing a bright object such as Venus, the eye is dazzled and detail is lost because of a phenomenon known as irradiation. It takes place in the observer's eye and is caused by unequal brightness. This is overcome by selecting the proper filter.

Second, when the eye becomes "dark adapted," the pupil expands and the retina secretes visual purple, a fluid which fills in between the rods and cones and increases the light sensitivity of the eye. The drug nicotine retards the formation of visual purple.

LOCAL NOTES

About 35 persons attended the October observing session at the Metcalf Nature Center. An estimated 40 persons attended the Nov. 19 observing session.

Members wishing to observe at the Metcalf site on nights other than those scheduled should call Andy Fraser, 733-6944 days.

Our next meeting will be Tuesday, Dec. 7. We will meet in the Members' Lounge of the Science Museum of Minnesota.

Herb Grika will continue the discussion of Stonehenge begun by Professor Ivan Policoff at the Nov. 2 meeting.

-to other side-

LOCAL NOTES--continued from page 1

Become a member of the Science Museum of Minnesota. You will receive Explorer magazine the calendar/newsletter of museum activities, a 10 per cent discount at the museum shop and many other benefits. Family membership is only $15 per year; individual membership is $10.

During 1977 the club will meet in the auditorium of the Science Museum the first Tuesday of the month. The only exception will be the March meeting, which will be held in the Members' Lounge.

FLASH FLASH FLASH FLASH FLASH

Electricity is now available at the Metcalf site to all who bring an extension cord. Northern states Power Company provided the service lines and the Science Museum paid for the box and instalation.

FOR SALE: 8" f7 Newtonian reflector, tube only, no eyepieces. If interested call James Baszuro, 9733 Russell Ave., Bloomington, MN 55431. $325.00. 884-6767

FOR SALE: Dynascope RV-6, eyepieces, electric drive, variable speed control. $275. Please contact Kevin Milani, 940 Franklin Terrace, Minneapolis, MN 55406. 339-5129 after 5 p.m.

TCAC
Science Museum of Minnesota
30 E. 10th St.
St. Paul, MN 55101

GEMINI

Vol. 1 No. 6

Editorial staff Hubert Brueckner
Andrew Fraser
Carl Harstad
Alan Ominsky

Gemini is issued monthly by the Twin City Astronomy Club (TCAC), an affiliate of the Science Museum of Minnesota, St. Paul, Minn.

The TCAC strives to promote amateur astronomy through its publications, meetings and public programs. Membership is open to anyone. Annual Regular Member dues are $16 and Student Member dues are $5, of which $1.50 is allocated for a subscription to Gemini. Subscription to Gemini is available to non-members at $2.50 per year. Inquiries may be directed to: TCAC, Science Museum of Minnesota, 30 E. 10th St., St. Paul, MN 55101.

Advertisements for publication in Gemini are welcome and inquiries may be directed to Lauren Nelson c/o TCAC.

Application to mail at 2nd class rates is pending at St. Paul, Minn.

Application to mail at 2nd class rates is pending at St. Paul, MN.