

SJAA ephemeris apr '80

- April 4 Board meeting at Frank Dibbell's, 710 Georgia Ave., Sunnyvale. 8:00 PM. 733-7208.
- April 5 Indoor star party at the Los Gatos Red Cross building. 7:30 PM.
- April 12 Star party, Fremont Peak State Park.
- April 14 New Moon
- April 19 Indoor star party, 7:30 PM.
- April 26 National Astronomy Day. Telescope stations will be at the Rosicrucian Planetarium, the Minolta Planetarium, and the K-Mart on Lawrence Expwy and El Camino Real. Observing starts at sunset and continues to about 11 PM.
- April 27 Daylight savings time starts.
- April 30 Full Moon
- May 2 Board meeting at Chris & Shea Pratt's, 474 Safari Dr., San Jose'. 8:00 PM. 629-2994.
- May 3 Indoor star party. 7:30 PM.
- May 10 Star party, Henry Coe State Park.
- May 14 New Moon
- May 17 Star party at Fremont Peak State Park.
- May 24-26 12th annual Riverside Telescope Makers' Conference, Big Bear City, Ca.
- May 29 Full Moon
- May 31 General meeting at the Los Gatos Red Cross building. This will be an equipment and slide night. 7:30 PM.

Back in the July, 1979 bulletin Bobby Fingerhut, and Norm Neinchel suggested an annual award to club members in memory of Dr. A.B. Gregory. This award, in the form of a plaque, would be given by the SJAA to one of its members in recognition of outstanding contribution of time and effort in encouraging and assisting interests in amateur astronomy. These interests may be help with equipment or the sharing of ideas or techniques with either new or experienced astronomers. At the March board meeting three club members (Bobby Fingerhut, Norm Neinchel, & Chris Pratt) were selected to serve as a nominating committee. They shall present their nominations at the June board meeting and the Board will select the recipient. If you know of anyone, even yourself, who fits the above description, write up a brief description and submit it to Bobby Fingerhut (263-4455). The award shall be presented at the annual SJAA banquet.

Gerry Rattley, pres. 732-0202

Denni Medlock, ed. 278-8475

Observations

From all reports it appears that those SJAA members and friends who made the African eclipse tour all survived and not only saw the solar eclipse but also plenty of lion, elephant, monkeys, and rhino. Like last year the astronomical event itself was plagued with high clouds during the partial phases but had clear skies for totality. There appeared to be less sunspot activity and hence, fewer prominences, but in some slides I've seen there were a few complete loop type displays in the upper atmosphere. Very beautiful.

Coming up this month is, of course, Astronomy Day. (National Astronomy Day officially now). The SJAA so far has three stations planned: the Rosicrucian Planetarium, Minolta Planetarium, and the K-Mart at Lawrence Expwy & El Camino Real. The Rosicrucian Planetarium will have both planetarium and slide shows going and at the Minolta Planetarium a slide show is planned. There are still plenty of people to man other sites so if there is a suitable spot in your neighborhood let either Gerry Rattley (732-0202) or myself (278-8475) know. Newspaper and radio coverage of the event is planned and Patty Winter, SJAA's p.r. person, has a great display designed for use at the stations. If you don't want to start a station show up with your scope, your family, and your friends from work at one of the sites. Observing starts at sunset and continues until around 11 PM (or whenever the public or the attendees conk out). It's a great way to tell others about your hobby.

General meeting attendance has been good with over sixty people showing up for Don Machholz's Messier Marathon talk in February. Phil Hermsmeyer reports he signed up about six new members that night. April's general meeting is, of course, Astronomy Day, but for May the meeting is moving to the Los Gatos Red Cross for a slide and equipment night. Hopefully, by that time we'll have our slides of Riverside back to show.

Most of the members should be getting little yellow cards from Sky & Telescope magazine in the mail. These are renewal cards that should be mailed, along with \$18 (\$12 junior), to SJAA Treasurer Phil Hermsmeyer, 20900 Alves Dr., Cupertino, 95014, in order to renew both your membership in the club and Sky & Tel. Most memberships expire in June so I'll try and run the membership list by August's bulletin.

At the last board meeting a club group subscription to Astronomy magazine was discussed. Evidently we can get it at a rate without having to have everyone subscribe. Anyhow, this rate is being looked into, but if you're interested let this editor know and I'll relay the information to the board.

Because Cathy Finheiro is leaving us for the sunny skies and sandy beaches of Santa Barbara, her board position was vacated. At the March board meeting Chris Pratt was nominated and elected to fill that position for the remainder of Cathy's term, (which I don't remember when it's up).

Cathy also left the club's library to Phil Hermsmeyer for safe keeping. Feel free to ask him what's available for take out. (No, Jack, no hamburger and fries!)

Speaking of food: if you've been to any of the general meetings lately you know that Rita Miram's been doing a fantastic job as refreshment chairperson. Many thanks to her and to the donations for the cause! As always, the suggestion box will be located by the coffee pot and will accept donations, suggestions, insults, tax shelters, next month's speaker, and an occasional faint fuzzy nothing.

I know not everyone reads the bulletin (though Wolfgang's pet cockatoo probably loves it as a floor covering to his cage), however, no one, not ONE person responded to Kevin's request that everyone having a piece of club equipment at least let him know where it's at. He doesn't want to take it away—he just wants to catalogue it, so please, if you have something of the club's tell Kevin Medlock (278-8475) so I don't have to keep badgering the membership for him....

Back to astronomy and the pursuing thereof: Chris and Shea Pratt report that on the weekend of the Messier Marathon at Loma Prieta they went further south to Fremont Peak. Thinking to set up their various telescopes behind the Ranger's house as usual they drove on back only to find the place swamped with people and scopes from another club. This immediately brings to my mind a serious problem and one I'm sure I'll hear about from other clubs for mentioning, however, the original agreement for use of that area was between the ranger and the SJAA for the purposes of photography ONLY! I'm not saying this is considered a private spot, only that it is there for use when Coulter camp has flashlight wielding amateurs using their scopes and the photographers wish a more light proof area. By principal, Dobsonian telescopes really shouldn't be back there. Also, and this is a threat to anyone who uses that area, one of the parking lot lights was unscrewed and the ranger (rightfully) pointed a finger at the astronomers present. Not so good for our reputations, group. A little more cooperation in the future will save us all a lot of problems in the future. Fremont Peak's skies may be deteriorating but it's basically all we've got. Getting permission from the rangers goes a long way in public relations. 'Nuf said.

I hope that lack of bulletin articles this month means that everyone is too busy getting their equipment ready or observing to write some pages. I want to thank those who did write—Don Machholz, Jim van Nuland, and Bobby Fingerhut. Coming next monthly (fingers crossed) should be an article by Kevin on how to baffle your C-90. Rather confusing subject.....(All right, all right, I'll get off the air waves!) Danni

Great Red Spot On Meridian PST/PDT

| Da | Date | | | | |
|----|--------|-------------|----|--------|--------------|
| M | Mar 31 | 8:40 PM PST | Th | Apr 24 | 0:41 AM |
| W | Apr 2 | 2:26 AM | Th | Apr 24 | 8:31 PM |
| W | Apr 2 | 10:19 PM | Sa | Apr 26 | 10:16 PM PST |
| F | Apr 4 | 11:59 PM | Tu | Apr 29 | 0:45 AM PDT |
| Sa | Apr 5 | 7:52 PM | Tu | Apr 29 | 8:41 PM |
| M | Apr 7 | 1:39 AM | Th | May 1 | 10:20 PM |
| M | Apr 7 | 9:29 PM | Sa | May 3 | 11:58 PM PDT |
| W | Apr 9 | 11:11 PM | | | |
| Th | Apr 10 | 6:57 PM | | | |
| Sa | Apr 12 | 0:41 AM | | | |
| Sa | Apr 12 | 8:42 PM | | | |
| M | Apr 14 | 10:11 PM | | | |
| W | Apr 16 | 11:54 PM | | | |
| Th | Apr 17 | 7:50 PM | | | |
| Sa | Apr 19 | 9:24 PM | | | |
| M | Apr 21 | 11:07 PM | | | |

Jim van Nuland

COMET COMMENTS

So far this year no new comets have been discovered nor old comets recovered. Additionally, Comet Bradfield (1979 L) is now a 12th magnitude object in the evening sky near the Pleiades. More info on this comet follows.

However, towards the end of the year three periodic comets are expected to return and be within reach of small telescopes. Comet Encke will reach perihelion on December 28th—in the weeks preceding it should be as bright as magnitude 8 in the northern skies. Around the same time Comet Tuttle should be visible at magnitude 9. Thirdly, Comet Stephan-Oterma will be about magnitude 12. More about these in future issues.

Comet Bradfield (1979L): Leaving the vicinities of both the Earth and Sun, this comet is almost overhead at evening twilight. During April it will be going from magnitude 12 to 13. An ephemeris follows.

| Date 1980 | R.A. | Dec. | Est. mag. |
|-----------|------------|---------|-----------|
| 3-22 | 04hr 00.4m | 26° 11' | 11.7 |
| 3-27 | 04 04.4 | 26 50 | |
| 4-1 | 04 08.6 | 27 25 | 12.3 |
| 4-6 | 04 12.8 | 27 57 | |
| 4-11 | 04 17.0 | 28 28 | 12.9 |
| 4-16 | 04 21.3 | 28 56 | |
| 4-21 | 04 25.6 | 29 23 | 13.4 |

(From IAU Circular 3453)

COMETS in Their Eyes: Caroline Herschel (1750-1848): Besides helping her brother to record and reduce his observations, Caroline did some observing of her own. Using a 4" reflector, Caroline discovered a total of seven comets—one of them a periodic comet. The telescope she used, although it was a reflector (which is uncommon for a comet-seeker), was made for comet work. It had a focal length of 27", and at 20 power it had a 2-degree field.

David Seargent: Living in The Enterance in New South Wales (in Australia), David discovered a 5th magnitude comet on October 3, 1978. It was designated 1978M and was rather close to the sun when discovered. The unusual thing about this discovery is that David used binoculars for the find. When not seeking comets he makes magnitude estimates of known comets.

Don Machholz
(246-5274)

"You have to have a good imagination to be a professional astronomer."
—Jay Freeman

PHOTOGRAPH THE MOON & PLANETS

by Bob Fingerhut

Mars, Jupiter, and Saturn are all prominent now in our evening sky. This article will explain everything you need to know to photograph them and for making high magnification photos of the moon.

At 9:00 pm PST Mars and Jupiter are about 20 degrees east of the meridiam. Saturn is about 20 degrees east of the other two.

| <u>Planet</u> | <u>Date</u> | <u>R.A.</u> | <u>Dec.</u> | <u>Mag.</u> |
|---------------|-------------|-------------|-------------|-------------|
| Mars | 3-15 | 10hr10.5m | 13°29.3' | -0.8 |
| Jupiter | 3-15 | 10 21.2 | 11 40.9 | -2.0 |
| Saturn | 3-15 | 11 40.2 | 4 45.9 | +0.8 |

The technique used to photograph thses planets and the moon is called eyepiece projection. This is because the telescope's eyepiece is used to project a highly magnified image onto the film. The camera is mounted without its lens a few inches behind the telescope's eyepiece. A tube from the camera to the telescope, over the eyepiece, provides a rigid mounting and keeps out stray light. Additional equipment needed includes a sturdy equitorial mount, a clock drive, a cable release, and a piece of black cardboard. The camera should have a 'B' or bulb setting and a clear focusing screen, and a mirror lockup. A critical focuser or magnifying viewer helps with the vital task of getting a sharp focus. In addition, the telescope should be well aligned (I can supply you with numerous methods for aligning a telescope) so that the drive will track accurately.

Now, a little bit of math. The reason for this will soon become clear. Note, it helps to do the calculations in millimeters. Effective focal length (EFL) equals the focal length of the telescope ($F_{L_{tel}}$) multiplied by the distance between the eyepiece and the film ($DIST_{proj}$) divided by the focal length of the eyepiece ($F_{L_{eye}}$)

$$EFL = \frac{F_{L_{tel}} * DIST_{proj}}{F_{L_{eye}}}$$

Magnification at the film (MAG) equal EFL divided by 55.

$$MAG = \frac{EFL}{55}$$

Focal ratio of the system (f/sys) equals EFL divided by the diameter of the telescope's objective (DIA_{tel}).

$$f/sys = \frac{EFL}{DIA_{tel}}$$

The maximum magnification that you should use is about 50X for

every inch of diameter of the telescope's objective. Lets work out the shortest FLeye that I should use with my C-8 which has the following dimensions:

$$FL_{tel} = 2000 \text{ mm}$$

$$DIST_{proj} = 127 \text{ mm (extension tube purchased from Celestron)}$$

$$DIA_{tel} = 203 \text{ mm (8inches)}$$

MAG should be no greater than $50*8 = 400X$

$$MAG = \frac{EFL}{55} \text{ or } EFL = MAG*55 = 400*55 = 22,000 \text{ millimeters}$$

$$f/sys = \frac{EFL}{DIA_{tel}} = \frac{22000}{203} = 108$$

$$EFL = \frac{FL_{tel}*DIST_{proj}}{FL_{eye}} \text{ or}$$

$$FL_{eye} = \frac{FL_{tel}* DIST_{proj}}{EFL} = \frac{2000*127}{22000} = 11.5 \text{mm}$$

The shortest FLeye that I should use is an 11.5 mm. You should work out the MAG and f/ for each of your eyepieces so that you will know what to expect from each and will be able to select the proper length exposure.

The exposure depends on only three factors: ASA of the film, f/sys, and the length of the time that the shutter is open. The relationship between them is as follows: If the ASA is increased by a factor of 2, the length of exposure is halved. If the f/sys is increased by one f stop, the length of exposure is doubled. A listing of f stops follows: 1.4, 2, 2.8, 4, 5.6, 8, 11, 16, 22, 32, 45, 64, 90, 128, 181, 256, 362, 512, 724, 1024.

If you changed the f/sys from, lets say, 64 to 128, that would be 2 f stops. You would increase the exposure by 4 times. (Doubled twice.)

The following exposure are my recommendations for starting points:

| <u>Object</u> | <u>ASA</u> | <u>f/</u> | <u>Exposure (sec)</u> |
|---------------|------------|-----------|-----------------------|
| Moon | 400 | 45 | 1/8 |
| Mars | 400 | 128 | 1 |
| Jupiter | 400 | 90 | 3 |
| Saturn | 400 | 90 | 9 |

Exposures should be bracketed and several pictures taken at each exposure. The mirror lockup on the camera is for the exposures of the Moon and Mars. For Jupiter and Saturn, open the shutter with the black cardboard over the telescope. Let the vibrations die down (wait ten seconds) and then remove the cardboard. Recover the telescope before releasing the shutter.

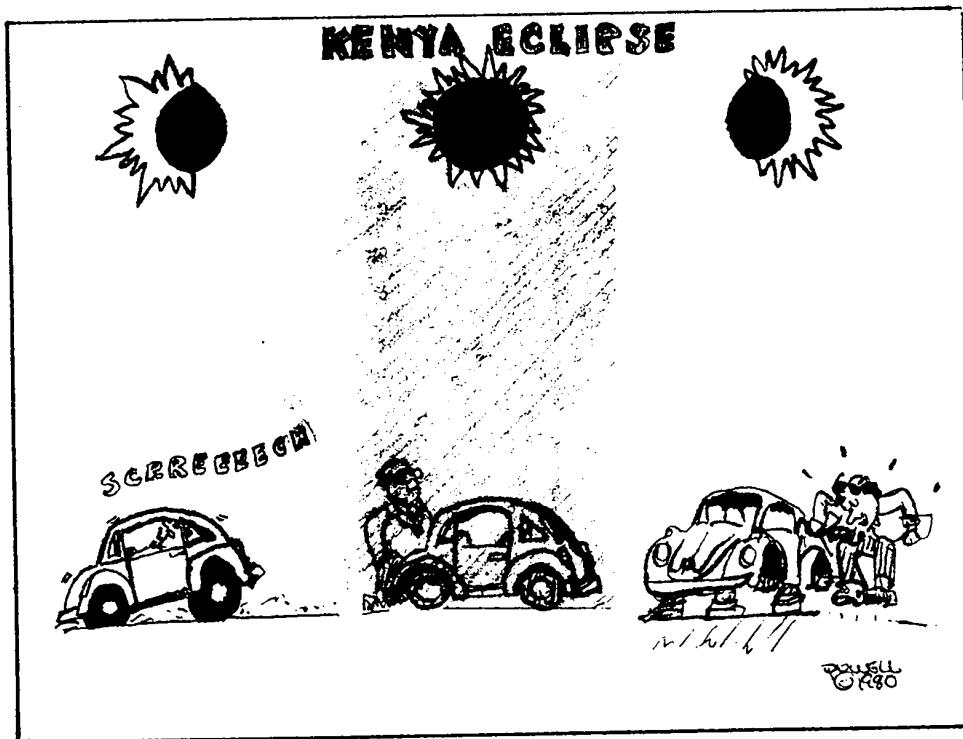
Fine grain films are recommended for the best resolution. Ektachrome 64, 200, and 400 are good. Plus-X, Tri-X, SO 115, and VTE are good for black and white. Commercial processors are terrible at printing astronomy photos so I recommend slides, but do not let

the processor mount them. They do not know where to start cutting so they may cut your prize photo in half!

On black and white pictures of Mars and Jupiter, some features such as the polar caps and the red spot, respectively, can be enhanced by the use of colored filters. Number 58 green and number 47 blue are recommended for Mars and Jupiter respectively. They cause an increase of one or two f/.

I hope that some of you will try eyepiece projection and let me know how you make out.

Next month I will write an article on piggyback photography.



(Reprinted from the Nairobi SUNDAY NATION, Feb. 17, 1980)

"Man must rise above the Earth, to the top of the atmosphere and beyond, for only thus will he fully understand the world in which he lives."

Socrates

The Ultimate Principal: By definition, when you are investigating the unknown—you do not know what you will find.

"Time is just nature's way of keeping everything from happening at once."

OMNI, Jan. 1980

MURPHY'S LAWS for AMATEUR ASTRONOMY (thanks to Shea Pratt)

1. All important astronomical events occur:
 - a) After midnight on winter nights
 - b) On cloudy or rainy nights
 - c) Before you get your telescope set up & aligned
 - d) When you have a previous engagement
 - e) In inaccessible areas
 - f) When your car or your telescope or both are on the fritz
2. Achromatic lenses, parabolic mirrors, and accurate clock drives don't stay that way during a star party.
3. Celestial objects you wish to photograph will be found:
 - a) Behind trees, clouds, or other obstructions
 - b) Near or below the horizon

This will be discovered only after the telescope is set up and collimated.
4. (Zero-power law) Batteries brought to a star party to power telescope drives and other equipment will be:
 - a) Found DOA
 - b) Expire during an important non-repeatable observation

This can include the battery in your car, if used to power the telescope drive,
5. Equipment will operate properly only when you do not need it and will fail immediately when someone stops to watch you struggle.
6. The most vital and necessary piece of gear will be the one forgotten in the rush.
7. When you are nearly finished with a 40 minute exposure of a faint deep sky object, some toad will drive into the star party site at 50 mph, raising dust, with his headlights on high beam. Curses, yells, thrown rocks, tools and bottles, land mines in the road, shotgun blasts, tear gas, Mace, and grenades tossed in his direction will not discourage him from trying it the next time.
8. Dropped tools, parts, and accessories will land so as to do (or suffer) the most damage.
9. The least available and accessible parts of your equipment will be most likely to fail. These will be the parts for which you have no spares.
10. No rock which resembles a meteorite will be one.
11. Star party temperature measured in degrees C will feel like degrees K.
12. Experience in astrophotography will vary directly with the film wasted.
13. Seeing & observing conditions at a star party site will vary inversely with:
 - a) Number and quality of roads into the area
 - b) Attitude of local authorities and neighboring land owners
 - c) Wind velocity and temperature after midnight
 - d) Sanitary facilities available (e.g. number and density of bushes)
 - e) Available hot coffee and warm clothing
14. If everything is working as planned you're using the wrong equipment.