SAN JOSE ASTRONOMICAL ASSOCIATION

SJAA

EPHEMERIS

NOVEMBER 1984

EVENTS CALENDAR

NOVEMBER 3	Los Gatos Indoor Star Party. Open at 8 p.m.
NOVEMBER 10	General Meeting at 8 p.m. at the University of Santa Clara Alumni Science hall. Nick Vojvodich, Project Mgr. for NASA's Galileo Jupiter probe will be this evenings featured speaker. This should be an extremely informative lecture, since Galileo is one of the last planetary probes that the United States will be launching this century. Bring a friend.
NOVEMBER 17	Board Meeting at 8 p.m. at the Los Gatos Red Cross. Come and argue with the best of them.
NOVEMBER 24	Another Fremont Peak "Freeze Party" Dusk till Dawn. Bring your "powder pants".
DECEMBER 1	Los Gatos Indoor Star Party. Open at 8 p.m.
DECEMBER 8	General Meeting at 8 p.m. at the University of Santa Clara Alumni Science hall. Program to be announced.

COMET COMMENTS

BY: DON MACHHOLZ

During the past month we've heard of the discovery of three comets and the recovery of two more. In the past we have seen a large number of new comets in Autumn months, this seems to hold true this year too. One of the five comets should be visible in our scopes.

PERIODIC COMET SCHAUMASSE (1984m):
This comet was first discovered in 1911, it has a period of 8.2 years but has not been seen on each return. However, J. Gibson of Palomar recovered it on Sept. 5 at mag. 19 in southern Gemini. It may be visible in amateurs' scopes and positions are included below.

PERIODIC COMET KOWAL-MRKOS (1984n):
Charles Kowal of Palomar discovered this comet on April 23 of this year. It was also photographed by Antonin Mrkos, at mag. 16. It was assumed to be a minor planet, but observations now show it to be a comet with a 7.2 year period. It is not expected to get any brighter.

COMET MEIER (1984o):
Rolf Meier of Ottawa discovered this, his fourth comet, on Sept. 17 at mag. 11.7. It was in the evening sky about 10 degrees north of M5. It was closest the Sun (0.86AU) on Oct. 13 and is not expected to get much brighter.

PERIODIC COMET TSUCHINSHAN (1984p):
T. Seki of Japan recovered this comet on Sept. 4, when it was just north of Orion in the morning sky. It has an orbital period of 6.7 years and will remain faint.

COMET SHOEMAKER (1984q):
Carolyn and Eugene Shoemaker of Palomar found the 13 mag. comet the Square of Pegasus on Sept. 27. It was closest the Sun in late June and will be getting fainter.

EPHEMERIDES

Comet Austin (1984i)

DATE	R. A. (1950)	Dec.	Elong.	Mag.
10-27	03h 24.9m	+47°20′	141°	9.5
11-01	02h 37.2m	+43°56′	150°	9.8
11-06	02h 00.3m	+39°50′	154°	10.2
11-11	01h 32.9m	+35°44′	153°	10.5
11-16	01h 12.9m	+31°59′	148°	10.9
11-21	00h 58.5m	+28°44′	141°	11.3
11-26	00h 48.1m	+25°59′	135°	11.7
12-01	00h 40.7m	+23°43′	128°	12.0
12-06	00h 35.5m	+21°50′	122°	12.4

This fine comet is above the horizon nearly all night long as it pulls away from the Sun. But it is roughly 1 AU from the EArth. It moves rapidly against the stars. Get out and see this one as it fades into the night sky.

Periodic Comet Schaumasse (1984m)

10-27	09h 55.2m	+17°06′	68°	11.4
11-01	10h 16.2m	+16°06′	68°	11.2
11-06	10h 37.2m	+14°59′	68°	11.1
11-11	10h 58.3m	+13°46′	68°	11.0
11-16	11h 19.2m	+12°29′	68°	10.8
11-21	11h 39.8m	+11°07′	68°	10.8
11-26	12h 00.1m	+09°44′	68°	10.7
12-01	12h 20.0m	+08°19′	68°	10.7
12-06	12h 39.4m	+06°53′	68°	10.6

This small periodic comet brightens in the morning sky. It is faint but try to get that large telescope out to track this one down.

Periodic Comet Arend-Rigaux (1984k)

10-27	07h 07.3m	-02°11′	103°	12.4
11-06	07h 30.6m	-02°25′	107°	12.1
11-16	07h 52.4m	-02°14′	111°	11.9
11-26	08h 12.2m	-01°26′	116°	11.7
12-06	08h 29.5m	+00°10′	122°	11.5

This is the recovered comet we discussed above. It will be closest the Sun in early Dec. (at 1.2 AU) and nearly an equal distance from the Earth. It will be at a constant elongation from the Sun in the morning sky.

DEEP SKY NOTES

BY: STEVE GOTTLIEB

If you are considering making a move upwards from a 6" - 8" scope, here are my experiences in directly comparing a Celestron 8 (C8) and a 13.1" Odyssey I on globulars and galaxies during the last two years.

GLOBULARS: An 8" will highly resolve about a dozen well placed globulars providing very pleasing views. My top 10 would include M13, M22, M5, M4, M92, M3, M10, M12, M55 and M15 In that order. In a dark sky, from several dozen to several hundred stars can be observed in these clusters. In addition, a second group of 15-20 (including M53, M28, M69, M70, M56, M71, M30, M79 and M107) show resolution of a few stragglers and a mottled, uneven appearance. The remaining clusters (over 50 others within reach of an 8") are unresolved.

In a 13", the brighter globulars are spectacular and resolved down to their cores. In the second group, generally a few dozen faint stars are visible in faint stars scattered across their disks.

GALAXIES: An 8" will reveal hundreds of galaxies in a dark sky with careful searching. The Virgo and Fornax galaxy clusters are available for quite fruitful searches. Though the brighter galaxies are beautiful, many from Mag. 12 to Mag. 13.5 appear as undistinguished faint blurs with their main characteristics being size, shape and orientation. Slightly brighter ones may reveal more intense cores or stellar nuclei. Unfortunately, details in galaxy structure are generally beyond the 8" range. A few exceptions include dust lanes in M31, dust and mottling in NGC 253, dust in M82 and 64 and large emission nebulosity. NGC 604 in the outer part of one of the spiral arms in M33.

The 13" class will reveal a few thousand galaxies if you have the time and patience. A number of rich galaxy clusters from the Abel catalogue including the Coma Berenices, Perseus and Hercules galaxy clusters. Lastly, scopes over 12" will now reveal some interesting galaxy structure. The spiral arms appear in a few of the bright face-on spirals including M51, M33, M101, M61, M66, M99 and length of edge-on systems can be glimpsed in NGC 4565, 3628, 891 and of course, M104. Huge emission nebulae are visible in the arms of M33, M101, NGC 2403 and NGC 4631.

CONCLUSIONS: As the brightest stars in many globulars appear around Mag 13, these objects can really be appreciated in scopes from 8" and up. Since a 13" will reach one magnitude deeper the views will be more stuning. For galaxies, an 8" will probably provide enough aperature for a lifetime of objects to search out. But to clearly see structure such as spiral arms and dust lanes, 12" to 16" aperture is necessary.
GOOD VIEWING THIS MONTH!
STEVE GOTTLIEB (415) 524-4678

EDITOR NOTE:
Focal ratio, magnification and eyepiece type, sky transparency and the deep sky observers experience are the factors that influence what we can see through a telescope. To understand the effect that a telescope has on the surface brightness of extnded objects like galaxies and nebula,I highly recommend reading an article written by Philip L. Plante called: Visual Image Brightness. It can be found on page 47 of the September 1979 issue of Astronomy magazine. Mr. Plante states that under the right conditions, an amateures present telescope can produce an image as bright as the 200-inch telescope on Mount Palomar.

HALLEY'S COMET IN NOVEMBER:
11/14: RA:06hr 31.8m; Dec; +12deg.04.3' Distance from the Sun: 5.71 AU. Distance from the Earth: 5.0 AU. Magnitude: 18.6.

DAYLIGHT OBSERVATIONS OF DOUBLE STARS
BY: DR. A. B. GREGORY

Splitting double stars in daylight? Why in daylignt? Isn't it hard enough to split close doubles on clear, dark nights? The answer may be surprising: it is easier, once the star is found, because of the absence of glare, of diffraction rings and because of lesser contrast. Obviously, I am speaking of a time 1-3 hours before sunset or after sunrise. But, what is particularly difficult at night, the separation of two bright companions, is not only easier in daylight, but also sharper, more definite.

A case point is Castor, Alpha Geminorum, with components of 1.96 and 2.89 magnitudes respectively, with a separation of about 1.9 seconds of arc at this time. The two components appear as sharply defined, dull discs, of greenish-yellow color, with ample sky between them, like twins floating in the sky. That was done with a 7 or 8mm eyepiece, giving a magnification of 285 and 250X for the Celestron 8. Even at much lower power you could clearly make out that Castor was a double.

But, in my experience the observing and splitting of doubles was not confined to binaries with components of about equal magnitudes. One good example is Izar, Epsilon Bootis, where the primary is of 2.70 and the companion of 5.12 magnitudes, with a separation of 2.9 seconds of arc, at night a very tricky double. In fact, it was because of Izar that I became interested in daylight double star work. It was on July 6, 1971 at about 5:50 p.m. Pacific Daylight Time that I pointed my telescope at Izar, after having observed the 1st magnitude Arcturus, Alpha Bootis. A young astronomer friend who had suggested our looking at stars in the daylight, knowing that my speciality was locating stars with setting circles and sidereal time, exclaimed upon seeing Izar: "But that is a double!" It was not even at high magnification.

LOW MAGNITUDE SPLITTING

And daylight splitting can go down further in magnitudes. On March 24, 1972, I could identify the companion of Rigel, Beta Orionis, easily, although it is on mag. 7.0 (separation 9.2 sec., primary 0.34 mag.) That was at 5:40 on a day when sunset was at 6:30. On the same day, just a few minutes later, I was able to see the companion of Procyon, Alpha Canis Minoris, which is of mag. 9.5, with a primary of 0.48 and a reasonable good separation of 4.3 sec. As I did not want to trust my own observation, I had a friend verify the position angle. For these observations I used a 3-inch diameter stop-down, described further down. The most difficult split was, of course, that of Sirius, with a primary of -1.37, a companion of 8.7 and a separation of 7.6" (1950). Here I used an 8mm eyepiece with a Polaroid filter in addition to the stop-down diaphragm. Here again I had my friend verify the position angle. However, I doubt that many will believe my observation. An easy split should be Algieba (Gamma Leonis) with a separation of 4.3" and a binary system of 2.61 and 3.80 magnitudes. By experimentation you should find out how far down you could go in magnitudes.

The trick in this procedure is, of course, finding the stars in daylight. It is the great difficulity and the great challenge with a resulting great satisfaction when successful. And it is as much of an attraction, as much proof of your skill as the actual separation of difficult doubles. It is a severe test of your observing skill, of your skill in precisely orienting and aligning your telescope and your skill in the use of setting circles and sidereal time.

KNOW YOUR SIDEREAL TIME

Thorough knowledge of sidereal time is essential. You must be able to ascertain, before beginning to look for stars, which ones would be visible from the viewpoint of your location at a specific time. Charts for sidereal time, calculated for 8 p.m. local mean time, are readily available. If, for instance, you know that sidereal time is 9:40 for April 16 at 8 p.m. local mean time, you know that at 5 p.m. sidereal time is 6h, 39.5 min. You can get any cheap clock and set it for sidereal time for any specific moment. For 1 or 2 hours of observation the deviation would be very small indeed. One word of caution: in computing your sidereal time, if you are west of the time meridian of your time zone, you must subtract the difference between local mean time and your own local (true) time, and add the difference if you are east of the meridian. For instance, in San Jose, Calif., at my location west of the meridian there is a time difference of 7 minutes, to be subtracted from the sidereal time of the chart. Therefore, in the example above, at 5 p.m. April 16, the sidereal time would be 6h, 32.5 min. A star with the right ascension of 6.32 would be stright overhead, at the zenith. In the same example Regulus, Alpha Leonis, Decl. +12 13deg. R.A. 10h07' would be well suituated, 3h, 34.5 min. or about 52 degrees east of the zenith. It should be a great satisfaction to all amateur astronomers to know the approximate position of objects in the sky for any specific time.

My own sidereal watch is an ordinary wrist watch converted to sidereal speed by a local watchmaker and former astronomy student of mine. The price for such a watch would be about $30.00. There is a curious fact about this year, 1972 concerning sidereal time. It is a leap year, but the stars do not know it, so that there is a time error of about 4 minutes (3.56). On March 1 sidereal time is 4 minutes behind of what the charts say. You can compensate for that in the calculation of the time differential between your local time and mean time of your time zone.

POINTING YOUR CELESTRON

How to translate sidereal time into the position of your Celestron? The right Ascension Circle has a pointer which moves with the telescope and which, at night, is to give you the right ascension of a bright star that you have in your field. That does not work in daylight. You need a second pointer to give you sidereal time for the moment, a pointer which will give you the overhead meridian. Therefore, you swing your tube around in right ascension until the aperture end of the tube is precisely level, measured across the center from the tines of the fork mount. Opposite the movable pointer (or venier pointer) you put another marker on the base of the clock drive. That new pointer or marker will always be the point to which you set your sidereal time. The gap between the two pointers is the hour angle of the star. In the example of Regulus, you turn your right ascension circle until the new marker points to 0.6.32.5. Then swing the movable pointer to 10.07, the R.A. of Regulus, and you will have the angle. In all that it is assumed that your telescope is properly aligned to true north and that your mount is level. How to align your telescope is not within the scope of this discussion. However, in my opinion, the best way to ascertain latitude and longitude of your location is to call the county surveyor's office and ask for the coordinates of a public building nearest to you, a school, a shopping center or a church. You need the longitude for figuring the correct sidereal time for your location. The time difference is not difficult to compute on the basis of 1 hour = 15 degrees.

To find stars in the daytime, it may be necessary to stop down the aperture of your instrument by placing a diaphragm in front of your tube, with an off-axis opening of about 3 inches diameter, to darken the sky and sharpen definition. Just as for night viewing, it should be standard procedure to start with a long focal length eyepiece with the widest field, like an Erfle, in order to have the largest net possible to catch the elusive starfish. Before going to higher magnifications, you should center the star in your field, as it is very easy to lose it when focusing in daylight for shorter focal length eyepieces. Parfocal eyepieces would come in handy here. The less refocusing necessary, the better. It will also be a good idea to use a Polaroid filter, either in place of the diaphragm or in conjunction with it, in order to darken the sky.

A word of caution as to focus: it is extremely difficult to focus in daylight because the out of focus blur is too dim to be visible. Therefore, the focus should be preset for the first eyepiece to be used, by an observation the night or day before. If your finderscope is too small to show deep sky objects at night, it is also too small to show even bright stars in daylight. You must achieve a bull's eye.

The thrill you will experience upon finding your first star in daylight, upon splitting your first double in daylight, will be well worth all your efforts and preparations.

EDITORS NOTE:
This facinating article by Dr. Gregory first appeared in an October 1972 issue of Celestron Techniques, Volume 1 No. 4. I would be interested in hearing from any members who have attempted daylight observations such as those described by Dr. Gregory.

A PHOTOGRAPHIC MAP OF THE HEAVENS
BY: DON MACHHOLZ

A few years ago I made my own photographic map of the night-time sky, perhaps you to would like to undertake such a project. I used simple equipment, it took several months, and the result is a set of color slides showing all the stars down to eighth magnitude.

First, I divided the whole observable sky (down to my southern horizion at -53 degrees) into 76 sections. Each section was to be photographed on a single frame, so I kept them rectangular and no larger than 30 deg. by 20 deg. Sky between 60 deg. N. declination and the North Star was divided into eight sections, while ten sections were used for the +40 deg to +80 deg. strip. From +40 deg. to -40 deg. I split the sky into 48 sections (4x12) and below -40 deg. I had ten sections.

Next, I took the pictures. For the photographs I used my 35mm Single Lens Reflex camera and 400 ASA film. The camera was unguided and either on a tripod, or mounted piggyback on the telescope. I found that when the camera was on the telescope (mounted equitorially), it was easier to aim. Each picture, using a 55mm lens from dark-sky sites, was 25 seconds long; this short exposure prevented trailing, even near the equator. The slides were developed commercially.

Finally, I put them all into one slide tray. I now have my whole visible sky at my fingertips. I really haven't made a lot of use of them, but it was a learning experience to plan and carry out this endeavor.

Alternatives to this plan could include a photo of each constellation. these would probably appear more attractive than my set. Or one could photograph a star field containing a planet (major or minor) every few days for several months. Once again, only simple equipment is needed, so taking these types of astrophotos is a snap.

SPACE UPDATE

BY ROBERT FINGERHUT

SHUTTLE COMPLETES MISSION 41-G

The shuttle orbiter Challenger landed safely at the Kennedy Space Center on Oct. 13. Among the accomplishments of the 7 member crew was the release of the Earth Radiation Budget Satellite (ERBS), designed to measure the amount of solar radiation Earth returns to space. The SIR-B shuttle imaging radar was used to provide high-resolution imagery of ground surface features and to detect features 2-6 meters below the surface. It was used in the hope of locating the buried city of Ubar, believed located on the border between Saudi Arabia and Oman and to find unknown sedimentary bases in northern Kenya where evidence of early man could be found. The large format camera, which uses 9X18" film, was used to return images which will be used to update maps. An oceanographer and a geologist spent time observing and documenting features in the oceans and on surface terrain. Refueling techniques needed to rescue the Landsat 4 satellite were demonstrated in a space walk.

DISCOVERY SCHEDULED FOR LAUNCH ABOUT NOV. 5

The next shuttle mission, 51-A, is planned for 6 days. The crew will include Frederick H. Hauck, commander; David M. Walker, Pilot; and mission specialists Anna L. Fisher, Dale A Gardner and Joseph P. Allen. Their mission will include recovery of the Palapa B-2 and Westar 6 communication satellites, deployment of the ANIK and LEASAT communication satellites and the operation of the continious flow electrophoresis experiment and a materials science laboratory.

COSMONAUTS END RECORD STAY ON SALYUT 7

Cosmonauts Leonid Kizin, Vladimir Solovyev, and Oleg Atkov landed their Soyuz T-11 spacecraft on Oct. 2nd after 237 days in orbit. The old record was 211 days.

ASTEROID FLYBY BY GALILEO POSSIBLE

NASA has tentatively approved a trajectory for the Galileo Jupiter orbiter/probe mission which would allow a flyby of the asteriod Amphitrite. Galileo would encounter the 125 mile thick asteriod on Dec. 6, 1986 at a closest distance of 6200 miles. The highest imaging resolution would be 656 ft. and up to 5 of its 5 hour rotations could be observed.

SPACE TELESCOPE'S OPTICAL TELESCOPE ASSEMBLY COMPLETED

Final electrical tests have been completed at Perkin-Elmer Corp. The telescope is scheduled for shipment to Lockheed in Nov. for final component assembly and verification tests. It will be flown in by a Super Guppy aircraft to Moffett Field. The Space Telescope is scheduled for launch on Mission 61-J in August 1986.

EARTH OBSERVING SATELLITE CO. (EOSAT) SELECTED TO OPERATE THE LANDSAT SPACECRAFT

EOSAT will take over operation of LANDSAT 4 and 5 immediately and will build and launch LANDSAT 6 AND 7 in 1988 and 1991

MEDLOCK 30" MIRROR SEES COMPLETION

After nearly 3 years of work, the highly touted 30" Medlock mirror has completed final figuring. Telescope maker Kevin Medlock says; "it is a very smooth quarter wave parabola.....work on the mounting has already begun."

ASTRO MART

Make offer: All parts for 6" reflector. Includes mirror kit (rough grinding begun), Edmund driven mount, all components for tube assembly, camera mount, 2 eyepieces. Price is open. Contact: Mark Yamonoka, (408) 248-2294 home, or (408) 429-8062 (UCSC).

For Sale: 300mm f/5.6 Celestron Mirror/Lens telephoto, Nikon Tmount, Nikon F camera body, new lens, camera recently overhauled by EPOI of San Francisco. Equipment like new. $375. Contact Steve Greenberg (415) 443-6638 eves. or (415) 422-1606 days.

CLUB TELESCOPE

David York currently has the clubs 14" Dobson telescope. If you are interested in using it, than please contact David at: 800 Richmond Ave San Jose, CA. 95128 (408) 947-7573.

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