

EPHEMERIS

OF THE SAN JOSE ASTRONOMICAL ASSOCIATION.



DECEMBER 1985

***** DECEMBER 7TH *****
BOB SMITHSON
ACTIVE MIRROR TELESCOPES
8PM

***** JANUARY 28TH *****
STEVEN MENDA
AURORA AND ATMOSPHERIC PHENOMENA
8PM

DECEMBER 7 BOB SMITHSON OF LOCKHEED WILL DISCUSS SEGMENTED MIRRORS. THESE ARE CALLED ACTIVE MIRROR SYSTEMS THAT REDUCE ATMOSPHERIC SEEING. MEETING STARTS AT 8 PM. AT THE LOS GATOS RED CROSS BUILDING

DECEMBER 14 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT HENRY COE STATE PARK. OUR ANNUAL CHILL PARTY AT HENRY COE STARTS DUSK TILL DAWN. AN IDEAL TIME TO CHECK OUT HALLEY'S. BRING YOUR FAMILY AND FRIENDS!

DECEMBER 21 AND 28 NO ACTIVITY SCHEDULED DURING THE HOLIDAY SEASON.

JANUARY 4 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT GRANT RANCH PARK. DUSK TILL DAWN.

JANUARY 11 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT FREMONT PEAK STATE PARK. DUSK TILL DAWN.

JANUARY 18 BOARD MEETING AND INDOOR STAR PARTY AT THE LOS GATOS RED CROSS BUILDING. JACK ZEIDERS' INTRODUCTORY ASTRONOMY COURSE STARTS. 8 PM

JANUARY 25 GENERAL MEETING AT THE LOS GATOS RED CROSS BUILDING. LEARN ABOUT ATMOSPHERIC PHENOMENA FROM STEVEN MENDA.

STARTING JANUARY 1986 ----- GENERAL MEETINGS MOVED TO THE FOURTH SATURDAY OF EVERY MONTH.

FIELD OF VIEW
BY: JOHN GLEASON

ACTIVE MIRROR TELESCOPES

Last month we heard about how the Space Telescope will work well above the earth's atmosphere. I want to especially thank Steve Pehanich for his excellent presentation. This month we will hear a talk about "Active" mirror systems used with earth based telescopes to greatly improve image resolution. Bob Smithson will be our guest speaker at the December 7th general meeting, discussing these pioneering techniques.



* * * NEW GENERAL MEETING DATES * * *

To adjust our meeting dates to favorable observing weekends, the SJAA General Meetings have been moved from the first saturday of the month to the fourth saturday of every month in 1986. Please mark your calendars.

NEW EPHEMERIS DEADLINE DATE

I wish to extend special thanks to our regular Ephemeris contributors. They have made our monthly news bulletin one of the finest in the country.

Continuing in an effort to get the Ephemeris out to the readers earlier in the month, I am asking that all Ephemeris contributions be submitted to me by the 12th of each month. No article will be included if received after the 15th.

A number of members have indicated to me that they do not get their bulletins until the second or third week in the month. I have made it a goal to have the Ephemeris in the mail no later than the 26th of each month for 1986.

But, we have experienced problems with the mailing list data base. Names have been dropped off, zip codes transposed, members listed 2 and 3 times. My staff of computer experts are attending to the problem and we hope to have the data base cleaned up by January.

I would like to know how many members are getting their bulletins after the 15th of the month. Please call at 415-790-9250 and leave a message, or write to John Gleason, Ephemeris Editor, 5361 Port Sailwood Dr., Newark, CA. 94560.

INTRODUCTORY ASTRONOMY

Starting January 18th, Jack Zeiders will begin an introductory astronomy course at the Los Gatos Red Cross indoor star parties. No prior knowledge of astronomy is required, nor do you have to be a member of the SJAA to attend. The course is planned to run on a month to month basis, as long as there is continued interest in the program.

MORE ON KONICA 1600

If you have not found Konica 1600 in any of the local Bay Area camera stores I'm not surprised. Although a lot of camera shops have heard about the film, they are reluctant to order it in any quantities. The only source so far has been Lumicon. \$6.95 for unhypered rolls and \$12.95 for hypersensitized rolls. There is a discount of 10% if you purchase 3 or more rolls of film. If you think that \$6.95 is a bit high for a 24 exposure roll of 35mm film, then consider the remarkable high speed, color balance, and fine grain properties of this previously unheard of film.

Poor weather this month has prevented me from testing the hypered version of this film.

COMET HALLEY ASTROPHOTO'S AVAILABLE

Be the first to own an original astrophoto of the Great Comet! I have a limited number of $3\frac{1}{2} \times 5$ inch color prints of Comet Halley that was photographed on October 13, 1985 with the SUPERIOR C14. I plan a complete series taken with the 14 and can be purchased for \$.50 each print. See me at the General Meetings and Indoor Star Parties. 5X7's and 8X10's done on request. Prices subject to change without notice.

PHOTOGRAPHING HALLEY'S COMET:
DIGGING THROUGH THE ACCESSORY CASE
BY: JOHN GLEASON

Tried your hand at photographing Halley's yet? One of the first problems that owners of the popular Schmidt Cassegrain telescope will encounter is the fact that using an off-axis guider to track on the comet is next to useless.

Since the comet's motion is independant to that of the star background, you must be able to track precisely on the comet itself in order to prevent its image from trailing. If you use an off-axis guider to track on the "star-like" nucleus, the comet will be positioned out of the camera's field of view! You might be lucky and get part of the tail, but the nucleus and coma will be obstructed by the off-axis guider prism. If you center the comet, and then guide on a field star, the motion of the comet will cause it to trail against the field of "fixed" stars.



There are two alternatives. One is to forget about prime focus through the main instrument altogether and photograph the comet by using the "piggy back" method. That is; mounting a camera to the top of the telescope and then using the telescopes main optics to guide precisely on the comet. Or, you can mount a separate guide scope on your Schmidt cass, and use it to track on the comet. This is easier said than done.

Before off-axis guiders became popular, using a separate guide telescope was the only way that amateur's guided their astrophotos. Oh there were a few off-axis systems around, but for the most part a separate telescope was used.

Differential flexure played a major roll towards the development of off-axis systems. The flexure occurred between the guidescope and the main photographing instrument during the length of the exposure. Loose fittings, temperature changes, and incompatible materials are all major causes of flexure. What you thought was a perfectly guided exposure, turned out to have trailed star images due to independant movement of both telescopes.

Separate guidescopes do work well however on some Newtonian systems. It is important to have both the guide scope and main scope made out of the same materials, and the optical train of the Newtonian can be easily made ridged enough to hold a large primary mirror and secondary steady during a long exposure.

But the commercially made Schmidt cassegrain telescopes do not have a fixed primary mirrors. They float on the cassegrarian mirror baffle in order to allow you to focus easily. Now while adjusting the mirror for focus is excellent in achieving a lot of backfocus for accessories, it is not suitable for long exposure astrophotography when using a separate guide telescope. Schmidt cass owners can testify to the unusual amount of play that is in the the mirror cell of their telescopes. Any time you go to focus there is a minor mirror shift that causes the focused image to slightly change position. This shift is due to a somewhat wide machine tolerance between the cass light baffle and the mirror holder. What's even worse, is that some of the smaller Schmidt cassegrain scopes are sold as separate guide telescopes. Now you have 2 "sloppy" mirrors to contend with during the exposure. I tried guiding a C8 for a year with a C5 as a guide telescope. Every exposure was trailed badly even though I had guided accurately. So now we know why the manufacturers sell the off-axis guider as an accessory.

For purposes of photographing Comet Halley at prime focus with our Schmidt cass., we might have to look at locking up the mirror during the exposure. Interestingly enough, the C14 does have 2 mirror locking screws in the rear mirror cell. These are used to facilitate shipping and handling of the large telescope, but we could use this to our advantage to hold the primary mirror in position for a short 20 min exposure. Nylon screws are ideal for this purpose, as they can be compressed slightly against the rear of the primary mirror without the risk of mirror damage.

As for the other Schmidt's? You might want to consider holding the mirror in place by using duct tape to wrap around the mirror holder and baffle tube. Then make an external focusing device to use on the rear cell. The mirror would be positioned so that there would be enough back focus to accept this external focuser and camera. These 2" diameter, low profile, helical focusers on the market today could be easily machined to fit onto the back of a Schmidt cass telescope. Hey! This would eliminate the mirror shift problem altogether!

As for guidescopes? A well made refractor, with lockable drawtube will work very well. Make sure that there are no loose parts. Diagonals and reticle eyepieces should be locked down tight. The guide scope should be mounted rigidly to the main scope via tube rings or accessory holders that will not move or flex when pressure is applied. Position these mounting rings as far apart as possible to increase stability of the guidescope.

Another key is to keep your exposure short. Try Konica ISO 1600 in a cold camera or hypersensitized. At f/10, 10 min will provide you with breathtaking shots of the comet's inner structure. Or, try 3M 1000. If the astrophotos from this film don't come out, you can use it to finish your furniture!

How much magnification should I use when guiding on the comet? For piggyback photography with a 135mm lens, use between 50 and 100x to see the comet nucleus clearly. Guiding at 100x is almost 40 times the photographic magnification of the 135mm lens. Without this much magnification, the independant cometary motion will not be easily noticed.

What about prime focus at the telescope? Here the magnification will need to be even higher, since the photographic magnification of a telescope will be dramatically greater than most camera lenses. A C14 has a prime focus magnification of nearly 80X! You may need to crank up your guide scope magnification to at least 5 times this number to very accurately guide on the comet. That's 400X!

Of course for short exposures of 5 or 10 minutes with a 50mm lens, you will not have to worry about tracking directly on the comet at all. The cometary motion will hardly be noticeable and a photograph with round and sharp star images will be more pleasing to the eye.

Remember that the best photos of Halley's will be those of the wide field variety. 135mm lens mounted piggyback to your clock driven telescope will work quite well. Guide on the comet, and expose for 5, 10, 15, and 20 min or more using ISO 400 film. This is assuming that you are photographing the comet in dark sky. Try some guided on the comet and some not. The best results can be obtained by stopping your lens down 1 f-stop. This will give you nice star images to the edge of the film frame. If you haven't tested your camera lens yet, do it now!. Some lenses work extremely well when used with the aperture wide open. Others are terrible, with the stars looking more like umbrellas; getting worse from center to the edge of the field.

Don't use zoom lenses for astrophotography. The additional optical elements in a zoom lens will only serve to absorb more light, and often add additional lens aberrations.

When doing piggyback photography with your Schmidt cass, be sure to use counterweights to balance your system. You'll find that the clock drive will work very well, even with the telescope heavily loaded. But remember that every additional ounce that you add to your telescope will add to a portable mountings instability.

CALICO OBSERVATORY BY: JIM VAN NULAND

GREAT RED SPOT

Although we have not returned to the halcyon days of a "brick-red" Spot, visibility is now as good as it's been in many years. Smaller instruments are providing a fine show at 150X or so. The Spot is readily seen with moderately - good seeing, and looks nicely pink at times of best seeing. Pretty!



The Spot continues jumping around as it has for the last several apparitions. There is a recent slight trend to increasing longitude, but this is swamped out by fluctuations over several degrees. My thanks to Paul Maxson for the precise timings: A tree southwest of my telescope now obscures Jupiter for all but the very early Spot transits.

In January, the Sun sets later again, quickly closing the window on this apparition of Jupiter, and writing the closing chapter of this column. My thanks to those of you who have provided the important feedback to allow me to continue. Especially helpful have been Rich Watkins and Bob Rea's reports and comparisons. Precise timings from Gerry Rattley and Paul Maxson have filled in the gaps when I was not able to make observations.

Astronomy clubs may obtain this column by sending me a supply of stamped, addressed envelopes. I hope to recover the Great Red Spot by June, and prepare articles from July through January, 1987.

STAR PARTY, HENRY COE PARK NOVEMBER 9

Despite a promising start, the Coe Park star party was taken over by clouds on November 9. Following an excellent sunset, the clouds gradually solidified, and about 8 pm the rain began. And I'd hoped to see four (count'em, 4) comets that night. As I said a month or two ago (regarding this same site). "If you stay away from the bad ones you'll miss the good ones." This was a bad one. See y'all there on December 14 for three comets.

Great Red Spot on Meridian PST

	da	mo	d	h	m	da	mo	d	h	m
Su	12	1	7	38	pm	M	12	23	6	1 pm
W	12	4	5	9	pm	Sa	12	28	5	11 pm
F	12	6	6	55	pm	Sa	1	4	5	57 pm
W	12	11	6	0	pm	Th	1	9	5	6 pm
M	12	16	5	7	pm					indent 18
W	12	18	6	46	pm					

COMET COMMENTS
BY: DON MACHHOLZ

So many comets...so little time! These next few months should be exciting for comet-eers. The new Comet Thiele is in the evening sky, as is comet Hartley-Good.

Halley's Comet is well placed in the evening sky too, as it brightens to near naked-eye visibility this month. Comet Giacobini-Zinner, our bright summer comet, has now faded in the winter sky as it pulls away from both the earth and sun. One faint returning comet has been recovered, it will remain a dim object.

Periodic comet Boethin (1985n): A. Gilmore and P. Kilmartin of New Zealand recovered this comet on Oct. 11 at magnitude 15. At that time it was in the bowl of the "Milk Dipper" of Sagittarius. This comet was first found by the Rev. Leo Boethin of the Philippines in Jan. 1975. It has an 11 year orbital period. It might get as bright as mag. 12 this time around, but the comet is believed to be unstable in brightness.

EPHEMERIDES

COMET HARTLEY-GOOD

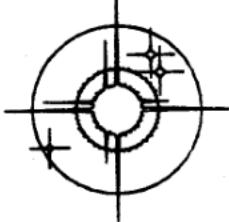
DATE	R.A. (1950)	DEC	ELONG	MAG.
11-26	17h 51.6m	+14° 30'	44°	7.2
12-01	17h 38.9m	+15° 17'	41°	7.1
12-06	17h 26.3m	+15° 34'	41°	7.1
12-11	17h 13.9m	+15° 22'	38°	7.1
12-16	17h 02.0m	+14° 41'	39°	7.3
12-21	16h 50.7m	+13° 36'	40°	7.4
12-26	16h 40.0m	+12° 09'	43°	7.6
12-31	16h 30.0m	+10° 25'	46°	7.9
01-05	16h 20.2m	+08° 28'	50°	8.1

This is a fine comet, compare it to Halley's. Comet Hartley-Good is closest the sun on Dec 9 (0.62 AU) and remains 1.1 AU from the earth for the entire month. It appears quite large and diffuse, making for difficult observation under light-polluted skies. It's in the evening sky until mid-month.

COMET THIELE (1985M)

DATE	R.A. (1950)	DEC	ELONG	MAG.
11-26	21h 43.8m	+20° 38'	93°	10.6
12-01	21h 28.0m	+17° 30'	84°	10.9
12-06	21h 17.2m	+15° 10'	76°	11.1
12-11	21h 09.5m	+13° 23'	69°	11.3
12-16	21h 03.9m	+12° 01'	63°	11.5
12-21	20h 29.8m	+10° 57'	57°	11.7
12-26	20h 56.7m	+10° 07'	52°	11.9
12-31	20h 54.4m	+09° 28'	47°	12.0
01-05	20h 52.6m	+08° 57'	42°	12.2

This comet will be closest the sun on Dec. 19 (1.32 AU) but it is pulling away from the earth all month. It will probably continue to appear diffuse and small (3' dia.). Comet Thiele was within three degrees of Comet Halley during the first ten days of Oct., but a Full Moon hindered discovery until Oct. 8.



WHAT GOES AROUND COMES AROUND - HALLEY'S

The comet travels through Pisces and into Aquarius this month. On December 14 Halley's Comet will be at RA: 23h 20m, DEC: +4.5°. This location was visited by Comet Encke (1.5° N.) and Comet Crommelin (crossed paths) within the past two years. What do they have in common? The three comets are the only ones to have been named after their orbit calculators rather than their discoverers!

The moon will be out of the sky from Nov. 29 through Dec 12. It will then be an increasing crescent, passing 10° south of the comet on Dec 17th and becoming first quarter on Dec 19th. Observations will become more difficult as the moon will be full on Dec. 27. Comet watching can resume Dec 29.

During moon-free periods this "dirty snowball" will be under constant observation as astronomers around the world keep a watch on the comet. This could be referred to as "Rock Around the Clock".

In addition to viewing the comet with a variety of instruments, try different eyepieces giving low, medium and high power. Under each magnification, look carefully at the comet. Ask yourself these questions:

How many minutes does it take to detect motion against the background stars?
Does the brightness vary at all?
What is its shape? Round, oblong or regular?
Is any color visible?
Is it much brighter in the center?
Can stars be observed through the head (coma)?

And if it has a tail:
Is it curved?
Is it uniform in brightness, or does it have "knots"?
Is it fan-shaped or narrow?
Is there more than one tail?

Finally, using high power look at the very center of the comet. Under good conditions you might see jets or streamers inside the head (coma) of the comet. The more time you spend looking, the more you will see. Try drawing pictures of it, this will further help sharpen your vision.

Halley's Comet positions for December are given in the table below. The comet will be increasing its distance from earth during the month: from 59 to 106 million miles. With rapid western and southern motions the comet sets much sooner each succeeding night.

Periodic Comet Halley (1982i)

Date	RA (1950)	Dec	El.	Mag.
11-26	02h 00.7m	+17° 30'	151°	6.6
12-01	01h 05.0m	+13° 38'	131°	6.4
12-06	00h 17.1m	+09° 34'	114°	6.3
12-11	23h 39.2m	+05° 58'	99°	6.2
12-16	23h 10.4m	+03° 05'	86°	6.2
12-21	22h 48.2m	+00° 49'	75°	6.1
12-26	22h 31.7m	-00° 31'	66°	6.0
12-31	22h 17.2m	-02° 20'	57°	5.9
01-05	22h 05.7m	-03° 29'	49°	5.7

DESPERATELY SEEKING HALLEY
A LATE UPDATE
BY: JOHN GLEASON

Driven by the "once in a lifetime" event, comet seekers and photographers descended upon favorite Bay Area observing sites on the weekends of Nov 9th and the 16th. But, observing and photography successes were not to be realized as Ol' Murphy struck back against this October's clear nights.



Both weekends were hampered by overcast and inclement weather. Nov. 9th was windy, cold, and overcast at the Peak and Coe. Nov 15th and 16th were an instant replay. As I rolled into Fremont Peak saturday night Nov. 16th, there were the clouds where I had left them a week before, and there were the same comet hungry faces: Frank Dibbel, Mike Ryan, Debbie Moore, Ranger Rick, and James Eiselt.

All of us had returned to the Peak to record on film the passing of Halley near the Pleiades. Certainly a "one time" event in our life. And an excellent photographic opportunity.

Jim Eiselt seemed to have out-smarted everyone by coming up on Thursday the 14th. The skies were clear and the humidity was a low 68%. Jim was gloating a bit over this as he showed off his slides, but.....Murphy struck back hard as Jim's astrophotography looked like it had been shot through the "Red Skies of Mars". Seems that his film got sandwiched together in the processing reel during development. Well, I guess that's better than no astrophotos at all.

What was worse, was the fact that I had been setting on a roll of 9 day old hypersensitized Konica 1600. This was to be used to settle once and for all the color balance/speed gain question when using hypered film as compared to chilled film. The film had been kept in its original gassing chamber under a vacuum to maintain high sensitivity when finally used. Originally the film was to be used within hours after the 20 hour gas and bake time. Now it looked like I would have to wait until next month.

Finally, the skies cleared on Sunday evening the 17th. I knew that the Superior C14 needed a major collimation adjustment, so I decided to set up the Superior C14 on my second floor patio. Here I have a good eastern horizon to zenith view of the sky. Besides the collimation adjustment, I could also check the x/y alignment of the 3.5-inch fluorite refractor I had planned to use as a Halley guide telescope.

After spending nearly an hour making fine adjustments to the C14 secondary mirror, I did a quick search for Halley. Bingo, there it was about 3° SW from the Pleiades. It was easy in the 10 x 40 finderscope and was even found in a hand held 5 x 24 finder. Using a 38mm Erfle eyepiece in the C14 revealed a nearly 6th magnitude "snow ball" with a sharp star-like nucleus. Needless to say that I was amazed at the view considering my location in the middle of a sea of streetlights. If it looked this good from the city, I can only imagine what it looked like from dark skies.

In a desperate attempt to preserve this view, it dawned on me to try and photograph the comet from Newark with the slowly ageing hypered film. "I'll use the deep sky filter", I said to myself as I completed a not so critical polar alignment. The results could at least answer a couple of questions; Will there be problems with differential flexure between the guide telescope and the 14? Will the deep sky filter, designed mainly for emission nebulas, work on the comet from deep within the city? Has the Hypered 1600 film maintained any sensitivity after 9 days since gassing? How easy will it be to track on the comet?

Four exposures were tried. 5, 10, 25, and 45 minutes at the 154-inch prime focus of the C14. All with the deep sky filter. The 3.5-inch fluorite was used in conjunction with a 12mm reticle eyepiece, guiding on the comet. In the middle of the 45 min exposure I suddenly realized that I had violated one of my own rules, and that my guiding to photographing ratio was only 1:1! Using a barlow lens for the 25 min exposure raised this ratio to 2:1. The comet was barely visible in the guidescope!

The neat advantage to the Konica 1600 is that I can run over to 1hr photo and have prints from negatives without the home processing mess and fuss. Boy was I surprised when I got the results back. The comet came through the deep sky filter without any problem. The filter successfully blocked out nearly all of the light pollution! The guidescope performed very well, with no differential flexure noticeable, even in the 45 min exposure! Even the film showed remarkable speed gain. Remember that I was using an f/11 system, with a major filter factor using the deep sky filter. Yet the prints yielded final results similar to my visual impressions. There was not much difference between the 25 min and the 45 min exposure as far as image density goes. Just what would this film have done without the filter?

A few problems were evident. One being the guiding. There is a pronounced zig-zag pattern in the background stars as I attempted to guide on the comet. More magnification is needed here. Secondly, the stars appear slightly out of focus. Of course a roof-top patio is not the most stable place to do long focus deep sky photography. The out-of-focus images might be due to vibrations from the patio.

These minor problems aside, I never would have dreamed that deep sky photography like this would have been possible from the city. My desperate attempt to get Halley on film proved to be an overwhelming success, and I encourage city-bound photographers to give it a try.

ASTRO ADS

FOR SALE: C8 loaded. Contact: Ira Weiss, 415-253-1080. By the way, he is also interested in finding someone to gather 20+ people together for a comet tour. That person goes free. Requires only some astronomy knowledge to chat with tour group. Rest of responsibilities handled by others. Weiss is a travel agent.

THE CELESTIAL TOURIST SPEAKS
BY: JAY REYNOLDS FREEMAN

This epistle should run in the last Bulletin issue before Christmas, so I will wish my readers a happy holiday season, and scrupulously avoid the chance to make a horrible pun on the subject of the Halley and the ivy.



The second October Star Party was clouded out, and I spent much of the evening of the first one -- October 12 -- at Henry Coe State Park: Jim Van Nuland and I lectured volunteer helpers on the wonders of naked-eye astronomy. It was a lot of fun, for the "docents", as the park's unpaid assistants are called, were enthusiastic and eager. A little constellation lore went a long way, and views through Jim's eight-inch Newtonian were cause for ecstasy.

Probably any member of the club could give a decent beginning star talk, and many no doubt will have occasion to do so some time. With a little planning and a couple of accessories, things happen almost automatically.

The accessory I find most useful is a powerful flashlight with a narrow beam. I use it as a pointer -- the effect of perspective, as the beam fades into the atmosphere at the vanishing point, allows me clearly to indicate specific stars and planets. Don't forget to dress warmly, and if you are not used to extensive speaking you might want cough drops or something else to keep from getting hoarse.

And it doesn't take much planning, either. Think how you would orient yourself to the night sky -- how do you find north, what are the bright patterns of stars that can guide you to the constellations, and so on. Then show them. With a telescope at hand, look at such planets as are up; and then wander through deep-sky objects, perhaps with some unifying theme such as the birth, evolution and death of stars.

A deep-sky tour might start with a view of a single bright star, then a couple of binaries, a region of star formation such as the Lagoon or Orion Nebula, open clusters in several stages of dissipation, older objects like globular clusters, and finally a planetary nebula or two. Wrap things up with an entire galaxy, and you will have put on quite a show!

On leaving the docents, I wandered over to Fremont Peak. It had clearly been a big star party. Frank Dibbell kindly allowed me to use his Celestron 14 for some observing I wanted to do, of number 347 in the Abell catalog of galaxy clusters. This fine field in Andromeda is full of faint galaxies. Ronald Morales described it in the December 1984 SKY and TELESCOPE. My observations generally paralleled his, so I will not go into them further.

Not far from Abell 347 is another, much brighter galaxy, which is a little neglected. I refer to NGC 891, a couple of degrees east of Gamma Andromeda. This object is an excellent example of an edge-on spiral, with prominent dark lane and pronounced central bulge. It is not quite as spectacular as the better-known NGC 4565, but the latter is not placed for autumn viewing. At 156X, the C-14 showed much texture and detail in 891's obscuring band. The northerly declination of this 11.5-magnitude galaxy means that it is easy to view during a large part of the year. By all means, add it to your repertoire of interesting things to look at.

I did not get around to Comet Halley until the evening of November 7. My first views were from my own back yard in central Palo Alto, and illustrated an interesting point about observing extended objects: The comet appeared unsusceptible to magnification! It seemed to subtend the same apparent size through my eight-inch reflector at 40X, and through my 11 X 80 binocular. How can that be? It should have been almost four times larger.

The answer is probably that comet Halley had a large, extremely faint coma surrounding a relatively brighter nuclear region. With the 5-mm exit pupil at the higher power, the coma was so spread out as to be all but indistinguishable from the background skyglow, so all I saw at first glance was the nuclear brightening. With the 7-mm exit pupil of the binocular, the coma's increased apparent brightness made it more obvious, notwithstanding that the skyglow was increased in the same proportion. The response of the eye is sometimes hard to predict. Careful attention through the eight-inch did indeed reveal a large, diffuse coma, but it was not nearly as obvious as with the smaller instrument.

I have had good luck observing deep-sky objects from my present home. Perhaps it is the unusually clear skies of autumn, or perhaps all the local trees help keep city lights confined. On the same night that I just mentioned, with the 11X80, I was pleased to see the Merope Nebula in the Pleiades, and to suspect the presence of the "Tank Tracks" -- NGC 2024, a blob of diffuse nebulosity approximately adjoining Zeta Orionis to the northeast.

On a subsequent evening, observing with my 4-inch refractor at 40X, I saw of NGC 2023, a smaller nebula surrounding a 9th magnitude star about a quarter degree southeast of Zeta Orionis. Several stars of similar brightness, but with no nebulosity (or at least with less -- the whole region is full of dust and gas) like nearby, so that by comparison I could tell that I was not misled by cloud or dew. I looked again for the Tank Tracks, but there was no trace of them, or of the Horsehead nebula, which lies southwest of Zeta. But I was able to detect the complex nebulosity at 42 Orionis, just north of the famous Orion Nebula. Its NGC numbers are 1973, 1975 and 1977. Not bad for a small telescope at an in-town location.

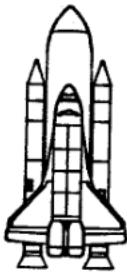
Messier 81 and 82, positioned like fleas in the ear of the Great Bear, were also interesting to observe from this relatively bright-sky site. At 40x, the four-inch refractor clearly showed the differing characters of these two galaxies. M81 was oval with a pronounced central brightening, whereas M82 took additional magnification much better than its neighbor, showing tantalizing hints of regular detail at its edges, at 83X. The higher power had darkened the sky considerably, so that the view was probably comparable to what I would have seen from a more remote place.

With larger telescopes, it is possible to see the wispy, extended spiral arms of M81, appearing much as they do on photographs. A Celestron 14, at 122X, has shown them well.

SPACE PROGRAM UPDATE BY: BOB FINGERHUT

CHALLENGER COMPLETES GERMAN SPACELAB FLIGHT

Challenger was launched 30 Oct. and landed 6 nov. at Edwards AFB. The mission (61-A) was the first in which payload control was shifted to outside the U.S. More than 80% success was achieved in conducting the 76 experiments onboard. As usual, several of the experiments were saved due to inflight repair by shuttle mission and payload specialists. During landing, nose wheel steering tests were conducted. As a result, Columbia could land at the Kennedy Space Center after its December flight.



ATLANTIS SETS ALTITUDE RECORD

During mission 51-J in Oct. Atlantis reached an altitude of 320 miles. The highest launch currently planned is the Hubble Space Telescope (368 mi) scheduled for launch 8 Aug. 1986 on the orbiter Atlantis.

ATLANTIS SCHEDULED FOR 27 NOV. LAUNCH

On Atlantis' next mission (61-B) the payload will be three communication satellites and an electrophoresis drug purification system. It is scheduled to be a five day flight with a crew of 7.

COLUMBIA SCHEDULED FOR 20 DEC LAUNCH

The last shuttle flight of the year (61-C) is scheduled to carry 2 communication satellites, the Materials Science Laboratory (MSL-2), and the Experimental Assembly of Structures in (EVA (ease/access)). This mission is planned for a duration of 7 days with a crew of 7.

LEASAT 3 ACHIEVES GEOSYNCHRONOUS ORBIT

The satellite, which was repaired by the crew of Discovery during Mission 51-I, successfully fired its perigee kick motor on 27 Oct. It should be operational by 30 Nov.

REPORTER TO BE SELECTED FOR A SHUTTLE FLIGHT

NASA has decided to select a pool news reporter to fly under the Space Flight Participant Program. The flight will be in the fall of 1986. (I wonder if editor of the Ephemeris counts? - ED)

SOVIET VERSION OF NASA

The USSR has formed a civilian space agency to manage Soviet space science, space applications and cooperative international space ventures. It is called Glavkosmos for Main Administration for the Creation and Use of Space Technology for the Economy and Scientific Research.

SOVIETS BUILDING NEW SPACE STATION

A new modular Salyut is being built for launch in 1986. It is expected to be capable of being expanded beyond the size of previous stations.

SOVIET PHOBOS MISSION PLANNED

The Soviet Union plans to launch a dual spacecraft mission in 1988 to study the Martian moon Phobos. The spacecraft would go into a 30 Km orbit around Phobos occasionally dipping down to 50 m above the surface.

U.S. MARS MISSION PLANNED

The scientific goals of the mission are being influenced by increasingly strong evidence that a large amount of water exists on Mars. The Mars Observer mission is planned for a 1990 launch.

SHUTTLE HALLEY COMET MISSION SCHEDULED

Columbia will be launched 6 March on mission 61-E to study Halley's Comet from Earth orbit. The payload will include three ultraviolet telescopes and a visible light, wide field camera. It is scheduled for a duration of 8 days and a crew of 7.

GALILEO UNDERGOING FINAL TESTS

The spacecraft is scheduled for shipment to Kennedy Space Center in December. The launch is scheduled for late May.

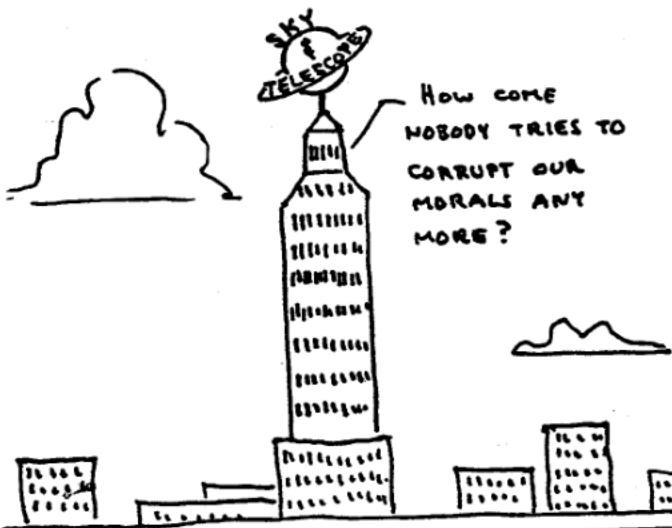
AGREEMENT TO DEVELOP SATELLITE TRANSFER VEHICLE SIGNED

NASA and Scott Science and Technology have agreed on development of a commercial, liquid-fueled upper stage for boosting shuttle-deployed satellites into geosynchronous orbit. It will have a capacity to boost satellites ranging from 2000 to 19000 lbs. On some missions, the stage would be recoverable.

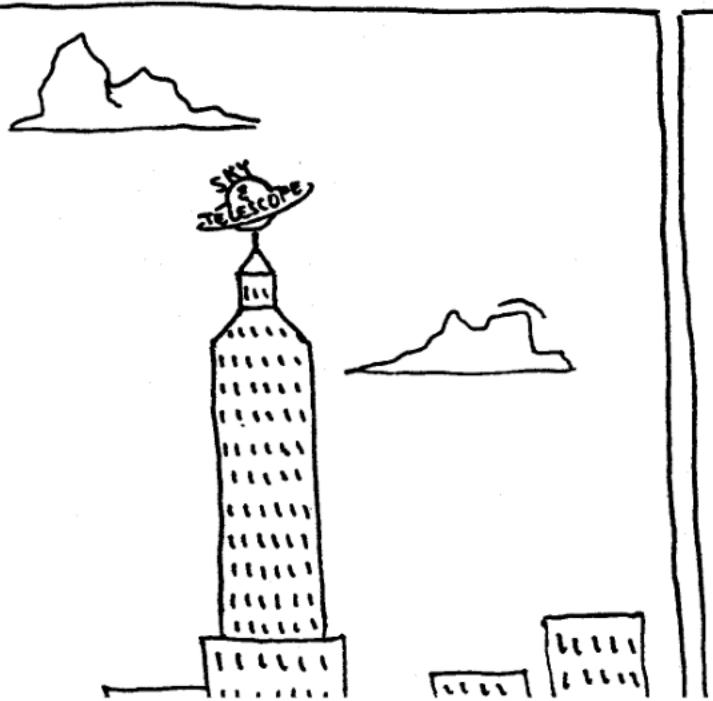
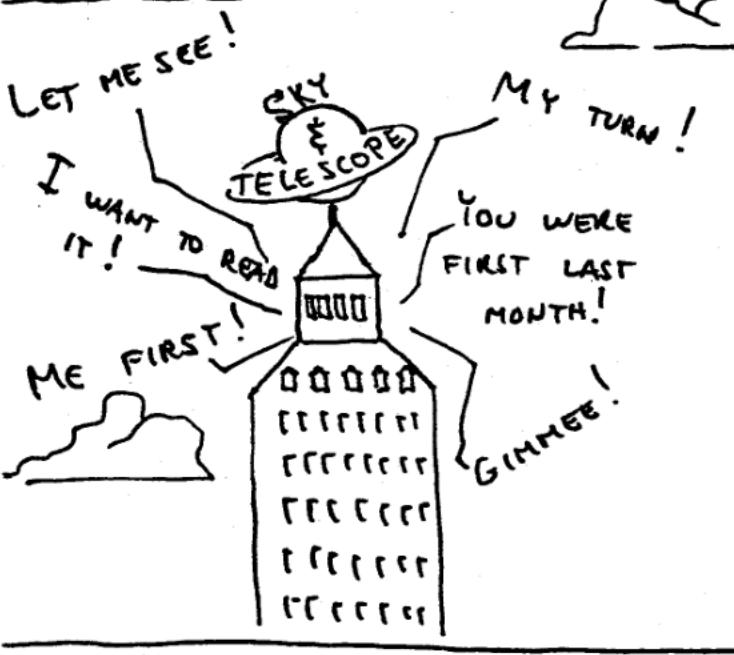
ASTRO ADS

FOR SALE: Excellent 6" F/17 refractor, professionally made for \$1600. The 100" F1. objective is fitted to a machined aluminum tube with an adjustable collimating cell - tube has interior light baffles. The tail piece is aluminum, brass and chrome with rack & pinion focusing. It will take 1 1/2" to 2 1/2" oculars. With the tube are large spotting scope brackets and adjustable balancing assy. A heavy duty saddle made for a "German" mounting is also included, but not the mount or base. Should any members be interested they may call me at (415) 635-6020, Bob Jensen.

-- MEANWHILE, IN A VERY PRIM
AND PROPER PART OF BOSTON...

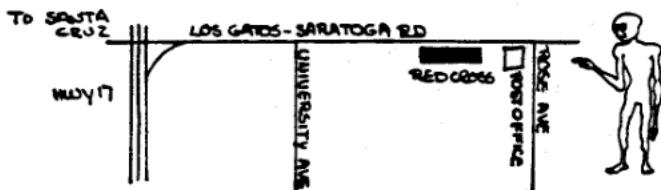


SO WHAT'S
IN TODAY'S
MAIL?



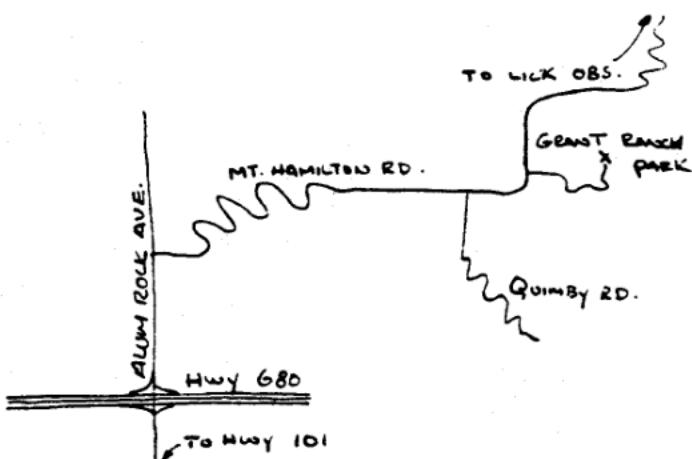
GENERAL MEETINGS:

General Meetings are held once a month at the Los Gatos Red Cross building, Los Gatos California. This is also the location for the SJAA's "Indoor Star Parties". The building is located at 18011 Los Gatos-Saratoga Rd. From Hwy. 17 south, take the Hwy 9 (Saratoga) exit and continue up Los Gatos-Saratoga road for about 1.5 miles. Turn right at Rose Ave. Then turn right immediately into the parking lot of the Red Cross building. MEETINGS BEGIN AT 8 PM.



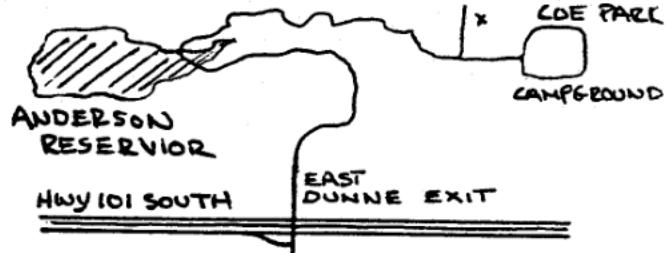
GRANT RANCH COUNTY PARK:

This site is becoming a popular one for the SJAA so come and try it out. Located on Mt. Hamilton Road, take Hwy 101 (either direction) to Alum Rock Rd. Go east up Alum Rock Rd. and turn right onto Mt. Hamilton road and follow it. Grant Ranch is just past the Quimby road intersection. After sunset the park's front gate will be locked with the SJAA's combination lock. Use the sequence 4565 to open, but be sure to lock the gate behind you, coming or going. There are two gates, the lock may be on the exit gate, if so, enter the park from this gate. There is also an observing area further up the Mt. Hamilton road that is also part of the county park. Contact the SJAA for directions.



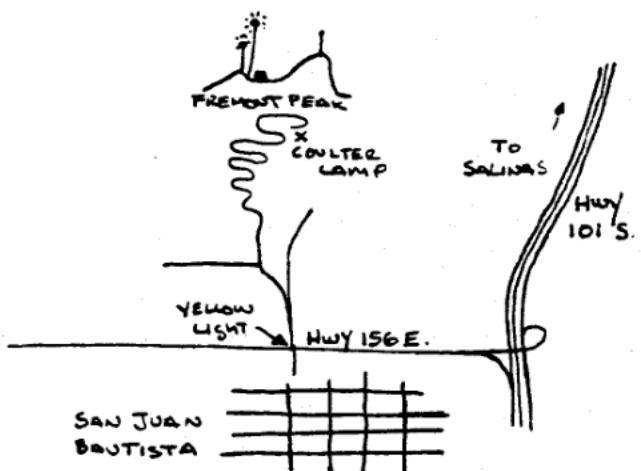
HENRY COE STATE PARK:

Take Hwy 101 south towards Gilroy and take the East Dunne exit. Continue east towards the hills (past Anderson Reservoir) for about 12 miles to the park. Past the park entrance you will see old ranch type buildings on the right and a horse trough. The gate (on the left) is locked but the club combination is 4565. Always lock the gate after yourself. If arriving after dark please park outside the gate and hike in first to find an observing site before driving in. Parking lights only after dark, please.



FREMONT PEAK STATE PARK:

Take Hwy 101 south towards Salinas. Then take Hwy 156 east (San Juan Bautista exit) for two miles to a yellow flashing light. Turn right and go about 1/4 mile to where the road curves slightly to the left and splits. Stay left for about 25 yards and then bear right. (watch for the Fremont Peak sign). Follow the road for about 11 miles up into the park. SJAA sets up at Coulter Camp. It's visible on your right as you drive up into the main area of the park. Parking lights only after dark, PLEASE!



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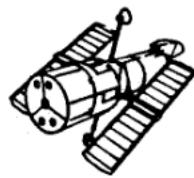
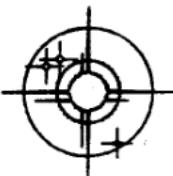
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SAN JOSE ASTRONOMICAL ASSOCIATION MEMBERSHIP APPLICATION

MEMBERSHIP ONLY: \$8.00

MEMBERSHIP/S&T: \$21.00

JUNIOR (UNDER 18): \$15.00

Name _____

Questionnaire (optional)

Address _____

Telephone (____) _____

What are your astronomical interests (e.g. astrophotography, deep-sky observation, telescope making, etc.)? _____

Please bring this form to any SJAA meeting, or send to:

Jack Peterson, Treas.
San Jose Astronomical Association
1840 Yosemite Dr.
Milpitas, CA. 95035

[Phone: (408) 262-1457]

Please check type of membership and if new
or renewal.

Membership Only _____ Membership/S&T _____

Junior (Under 18) _____

New _____ Renewal _____

Do you own a telescope? _____ If so, what kind?

Is there any specific area of astronomy that you feel
qualified to help others with? _____

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NEWS MATERIAL

COMET MACHHOLZ (1985e)

On the morning of Mon. May 27, I discovered a new comet. I was comet hunting from the Riverside Telescope Makers Conference near Big Bear City in Southern California. The comet was confirmed the next morning.

This is my second find. My first comet was found Sept. 12, 1978 and took 1700 hours of sweeping. This find took 1742 hours. For both finds I used a 10", f/3.8 reflector.

This comet is presently in the morning sky and brightening as it nears the sun. We will lose it in the solar glare in mid-June. It seems as though the comet will be brightest when within a few degrees of the sun, it might be seen in the daylight, if filters are used and one knows just where to look. It will emerge into the evening sky in mid-July, then dim rapidly-we will lose it in our scopes in mid-Aug.

Daniel Green of the Smithsonian Astrophysical Observatory has calculated an orbit from three positions, one of which is uncertain. So the orbit is not accurate but the necessary updates are not yet available. Here are the preliminary elements:

T= June 28.76, 1985. Peri. dis.= 0.1069 AU. Arg. of peri.= 274.16°.

Asc. node= 194.96°. Incl= 16.22°. Eccen= 1.00 (assumed)

.48

-2446245.26

EPHEMERIS

DATE (00hr UT)	R. A.	Dec.	Mag.	Elong	Sky	Sun Dis.	Earth Dis.
05-30	01h 04.4m	+16° 20'	9.2	48° Morn	1.18 AU	1.51 AU	
06-09	02h 19.1m	+20° 53'	7.6	39° Morn	0.71 AU	1.12 AU	
06-19	04h 05.4m	+23° 38'	5.2	23° Morn	0.42 AU	1.01 AU	
06-29	06h 37.5m	+21° 39'	-0.6	3° Even	0.11 AU	1.11 AU	
07-09	08h 59.4m	+21° 52'	4.9	25° Even	0.44 AU	0.87 AU	
07-19	11h 01.4m	+17° 45'	7.0	45° Even	0.73 AU	0.83 AU	
07-29	12h 34.8m	+11° 04'	8.6	59° Even	0.97 AU	0.95 AU	
08-08	13h 37.2m	+05° 19'	9.9	66° Even	1.19 AU	1.16 AU	
08-18	14h 19.9m	+01° 06'	11.0	69° Even	1.40 AU	1.41 AU	

A SHORT SEARCH EPHEMERIS:

DATE (4AM PDT) RA DEC MAG.

06-01.4	01h 19.8m	+17° 27'	8.8
06-02.4	01h 26.7m	+17° 55'	8.7
06-03.4	01h 33.8m	+18° 23'	8.5
06-04.4	01h 41.2m	+18° 51'	8.4
06-05.4	01h 48.9m	+19° 18'	8.2
06-06.4	01h 56.9m	+19° 46'	8.0
06-07.4	02h 05.1m	+20° 12'	7.9
06-08.4	02h 13.8m	+20° 38'	7.7
06-09.4	02h 22.7m	+21° 03'	7.5

For updated data call the Sky and Telescope hotline at:
(617) 497-4168

Don Machholz (408) 448-7077

