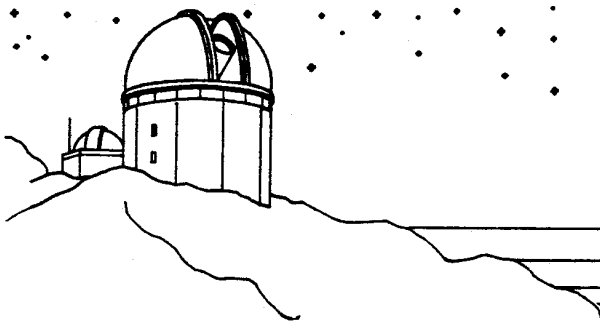
# EPHEMERIS

## OF THE SAN JOSE ASTRONOMICAL ASSOCIATION.


## JANUARY 1986


**** JANUARY 25TH ****
STEVEN MENDA
AURORA AND ATMOSPHERIC PHENOMENA
8PM

| | | |
|---|---|---|
| JANUARY | 4 | FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT GRANT RANCH PARK. DUSK TILL DAWN. SET UP EARLY AND VIEW THE COMET! (HALLEY) |
| JANUARY | 11 | FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT FREMONT PEAK STATE PARK. DUSK TILL DAWN. SET UP EARLY AND VIEW THE COMET! |
| 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. |
| FEBRUARY | 1 | FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT GRANT RANCH COUNTY PARK. DUSK TILL DAWN. |
| FEBRUARY | 8 | FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION AT HENRY COE STATE PARK. DUSK TILL DAWN |
| FEBRUARY | 15 | BOARD MEETING AND INDOOR STAR PARTY AT THE LOS GATOS RED CROSS BUILDING. DOORS OPEN AT |

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

**FIELD OF VIEW**
**BY: JOHN GLEASON**

### MAILING LIST

A note of thanks to Gene Cisneros for straitening out the mailing list data base. You have no idea how much time was saved during the zip code sort for our monthly mailing. If anyone is still not receiving a monthly bulletin please let me know by calling (415) 790-9250.

### ACTIVE MIRRORS

I missed the December 7th meeting featuring Bob Smithson and Active Mirror Telescopes. Those who did attend were most impressed with Bob's talk which also included a video tape of before and after results of solar photography. I wonder if there might be some way to adapt Bob's techniques to amateur instruments? The techniques that Bob described are ideally suited for solar and planetary photography.

### SEE HALLEY'S COMET

SJAA members have been setting up telescopes for the public to view Halley's without having to drive to a dark sky site. The place is Branham Lane Park, on Branham Lane, San Jose, located one-half mile east of Camden Ave., between Ross Ave. and Kirk Rd. A Safeway store is just west of the park. Dates: Saturday, January 4th and Tuesday, January 7th. If it is raining, cloudy or foggy, the observing session is cancelled.

### ELECTRONICS ORIENTED ASTRONOMY SEMINAR II

Will be held at Cypress College (near Whittier) on Saturday, February 8th, 1986. The event is sponsored by the Orange County Astronomers in cooperation with Cypress College. Doors open at 8:30 AM with program at 9:00 AM. Cost of $20 includes .5 hour of college credit and the precedings book, plus free refreshments at 2 coffee breaks. Topics include low light tv, intensifiers, CCD cameras, computer telescope control, digitized images, steppers, computing for astronomy, photometry, etc.

## INTRODUCTORY ASTRONOMY CLASSES START

Don't forget that Jack Zeiders will begin his introductory astronomy classes at the Red Cross Indoor Star Parties on January 18th. If you are new to amateur astronomy, please feel free to "come on down" and join in the fun. No prior knowledge of astronomy is required, nor do you have to be a member of the SJAA to attend.

## HALLEY NAKED EYE

Our famous visitor has finally reached a brightness level that renders it visible to the naked eye from dark observing sites. If you know exactly where to look the comet can be easily spotted as a fuzzy snowball about half the diameter of the full moon. See Comet Comments for more information and precise coordinates. Personally, I have not observed any tail yet, but the comet is distinctly egg-shaped as observed through the Superior C14. It has a very large coma with a bright star-like nucleus.

I am still experimenting with the guidescope on the C14 as mentioned in last months; "Digging Through the Accessory Case". So far I have not had any problem with differential flexure between the refractor guide telescope and the 14. Exposures have been kept to 30 minutes with the Deep Sky filter and Konica 1600 chilled.

It will be worth trying 30 second and 60 second exposures with Konica 1600 for tripod mounted cameras with 50mm lenses of f/1.4 or f/1.8. If successful in recording the comet, this would be a good way for those of you who do not have a guiding platform to get a photographic record of the comet on this approach.

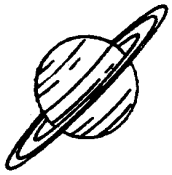
Ron Walton tells me that Kits Camera carries their own brand of SR 1600 film that they claim is manufactured by Konica. Jim Eiselt has also found a source of Konica 1600 in Idaho! That seems like a pretty far drive for a roll of film, but you can save several dollars off the Lumicon price!

## FPOA: FULL STEAM AHEAD!!!!

Detailed observatory plans have been approved for the Fremont Peak Observatory Association's 30-inch telescope project. Ground breaking took place on Saturday December 14th. There are just a few loose ends that need to be taken care of before construction can begin. The telescope, constructed by Kevin Medlock is now at a point of initial assembly and mechanical testing. This will be done before the telescope can even be considered to be moved to the peak. Kevin has also told me that most likely, the instrument will be fully computer controlled upon initial operation. Just punch in your favorite object by name or enter the coordinates and away the telescope goes. Even better would be a voice actuated system where the observer would just say,"M13 please" and the telescope would move to the object. Of course I hope we don't spend too much telescope time looking at M13. I recall last years Big Bear Conference where 90% of the instruments were pointed at the much popularized globular cluster.

Watch for a major media event during the building dedication cerimonies. Just a few years ago, there was actual talk of closing Fremont Peak. The construction and operation of a public observatory at the park, with a major astronomical instrument will have a dramatic impact on Fremont Peak's general plan for the 90's. High ranking state officials are most interested in the outcome of the project, as the FPOA will be setting a precedent for the general plan process of other state parks. Look for a possible appearence from the "Duke".

## THE CELESTIAL TOURIST SPEAKS
## BY: JAY REYNOLDS FREEMAN



Most people find amateur astronomy a seasonal hobby. Though the winter nights are long, they are often cold and wet enough to deter all but the most steadfast, even when the sky is clear enough for observation to be possible. Observing habits change, too -- owners of refractors and Schmidt-Cassegrains look at objects near the horizion, so they won't have to kneel on the damp ground; while those with Newtonians are similarly motivated to work close to the zenith. Equipment that takes a long time to set up remains indoors, giving way to simpler instruments that can be put into service before the body goes entirely numb. Trips to dark-sky sites are few.

My continuing Messier survey with my four-inch refractor took me into the wintertime Milky Way recently. The position and nature of most of these objects is well-suited to the observing habits I just mentioned: Nearly all of them are bright galactic clusters, and many of those are in the southern part of the sky. Galactic clusters can generally be observed at moderate magnification, enough to spread out the background skyglow from a suburban area, and still remain pretty and impressive.

The Pleiades and the Beehive, respectively M45 and M44, are of course the showpieces of the Messier open clusters, so much so that telescopic views are occasionally disappointing because the field is too narrow. In binoculars, they are magnificent. Four additional clusters, M35 through 38, ride high in Gemini and Auriga. But the region southeast and east of Orion contains no less than six additional Messier clusters -- M41, 46, 47, 48, 50 and 93 -- which were splendidly resolved by my four-inch at 40x. These objects are all easy to locate in binoculars, as well.

Let's talk about binoculars. These instruments ought to take a prominent role in aiding beginning amateur astronomers, not only because they are easy to use and relatively inexpensive, but also because many people already have one.

Binoculars are described by two numbers separated by an "x", like 6X30, 7X50 or 11X80. The first number is the magnification, and the second is the diameter of the objective lenses in millimeters. For astronomical purposes, the more light the better, so that for example a 7X50 is preferable to a 7X35. High power binoculars are more difficult to hold steady, and perhaps the most useful astronomical role for binoculars is to complement telescopes by providing low-power, wide-field views, so I would recommend that a binocular have approximately a 7-millimeter exit pupil: When you divide the first number into the second, you ought to get 7 as the result.

The most common binocular meeting this criterion is the 7X50. Almost anyone can hand-hold one of these steady enough for observation. Several firms offer 11X80s: It is possible to use these hand-held, but some finesse and experience is required to do so effectively -- the greater mass and magnification of the larger instrument tends to make the viewing much more jiggly. Orion Telescope Center, in Santa Cruz, offers a 10X70, which is a good deal lighter than most 11X80s and therefore much easier to work with.

Even with the magnification and aperture fixed, the buyer of binoculars will find a bewildering variety of optical designs and mechanical styles to choose from. Let's take these in turn:

The greatest variation in binoculars is in mechanical quality, and with good reason. The working conditions of a binocular vary dramatically from application to application. The Navy used to keep shipboard binoculars in service twenty-four hours a day during the entire time its ships were at sea, continuously exposed to salt spray and engine vibration. That's though on a fine instrument, and in consequence the occasional military-surplus binoculars that hit the market are extremely well-built. I am going to take a heretical position and say that amateur astronomers do not need equipment of this quality, and would be ill-advised to pay of it. With reasonable care, a simpler, lighter and less expensive instrument will give good service for a long time. (Notwithstanding, don't buy one that rattles when you shake it.)

The primary mechanical things to look for are those that might cause to the two sides of the binocular to become misaligned with one another. Flex the hinge back and fourth, and work the focusers. There should be no sign of play or looseness. Also remember that the least desirable "fix" for slop is to tighten everything down within an inch of its life; so be suspicious as well of excessive tightness. These parts should be fine mechanisms working smoothly.

One thing that can raise the price of a binocular is sealing it against dust. Fortunately, this is easy to fix up after purchase -- get some duct tape (black vinyl might be classier) and wrap it around all the places where subassemblies fit together. And for that matter, get some lens caps for objectives and eyepieces. And keep in in the case when not in use.

It is not hard to tell the optical quality of a binocular, but it is quite hard to explain how to do so without lots of pictorial aids, so I shall forbear. Fortunately, it is pretty easy to find good optics these days. I am a little reluctant to generalize, but I will venture that almost all binoculars imported from Japan have good to excellent optics. The major optical options are wide-field eyepieces (which I don't find particularly useful for astronomy), low-reflection coating on all surfaces (all but mandatory) and the kind of prisms used to erect the image. On this last point, it almost doesn't matter; though I find the older style instruments, whose porro-prism erecting system makes their tubes dogleg-shaped, fit the hand better than the newer, more compact "straight-through" designs.

Some instruments have prisms that are too small. To test, hold the binocular at arm's length and look -- not through the eyepieces, but at them. You will see a little round disc of light in each one -- the light that would be entering your eyes if you were looking through the instrument. Tilt the binocular this way and that, and make sure the disc stays completely round, With no slices or cusps or cut off at its edges, as it slides back and forth across the eyepiece lens. At or near the edge of the lens, the disc will suddenly disappear entirely -- that's fine -- what you are checking is that it remains round, or nearly so, up to that point.

A 7X50 that meets all these criteria can be had for a hundred dollars or less. It will show all the Messier objects, all the stars in the popular observing atlases, all the planets except Pluto, a generous handful of asteroids, and many passing comets. It will show the Galilean satellites of Jupiter, the rings of Saturn, and a huge amount of detail on our own Moon.

A decent 11X80 will cost two or three times as much and gather two and a half times as much light. If you are clever enough to hold it or mount it steadily, it will provide some of the most magnificent views of the star clouds and bright and dark nebulae in our own Milky Way, that you can imagine.

Each of these instruments can be out of its case and at work within thirty seconds, and can be put away with no more effort. When you're not doing astronomy, they can do double-duty for looking at concerts, sporting events, and wildlife. And they're fantastic for spying on the neighbors.

**NGC 7331:**
**UNRAVELING INDENTIFICATIONS**
**BY: JEFFREY CORDER & STEVEN GOTTLIEB**

The brightest galaxy in Pegasus is NGC 7331. It lies high overhead for northern viewers after midnight on late summer evenings. This spiral galaxy was on of William Herschel's earliest discoveries, over 200 years ago. It has been carefully studied by astronomers over the years and is considered a galaxy much like our own Milky Way.

Although visible in large finder scopes, NGC 7331 was apparently missed by Messier. In many respects this galaxy resembles the famous Andromeda spiral. Like M31, the Pegasus galaxy is much elongated. This appearance is caused by the nearly edge-on alignment of this system, only 20° from edge-on. The western side is nearer to us and the galaxy is believed to be "right-handed", rotating with the spiral arms trailing. Lying 23 times more distant than M31 and with an angular size one-=twentieth that of the nearer galaxy it can be seen that NGC 7331 is comparable in size. Also, like M31, NGC 7331 is rich in HII regions, over 125 catalogued by astronomers. These ionized Hydrogen regions allow the mass, rotation and distance to be measured with fair accuracy. The main difference between these two is the much greater abundance of younger, bluer stars in the Pegasus galaxy.

Recently sources of radio emission have been observed in the region of the galaxy. The sources seem to also engulf the area of the Stephen's Quintet. This, along with very faint and extensive nebulous material stretching between the two groups, argues for a very real connection that once existed between Stephan's Quintet and NGC 7331. NGC 7320, the largest member of the Quintet, lies in the foreground of its distant neighbors, and is the most likely candidate for an age-old association with NGC 7331.

Observers with even small telescopes can note the prominent features of NGC 7331 quite readily. It has a well-defined oblong core, and a very compact and bright nucleus. The north-south orientation is also quite plain. Spiral structure is evident in 12-inch and larger scopes. Remarkably, some of the associated HII regions can be seen in larger instruments, especially in the 16-inch class. Careful observers with large telescopes, keen eyesight and black skies may catch glimpses of the string of HII knots aligned along the western edge of the galaxy. As with M31, a dust-lane is visible here also.

Known as "nebulae" to early observers, galaxies like NGC 7331 were often found accompanied by smaller, fainter neighbors. Our Pegasus galaxy was no exception.

Over the years following Herschel's discovery, various observers noted the presence of 8 supposed companions. Likely there is a group here, but chance alignment place the foreground NGC 7331 along the same line-of-sight as the small group.

Discoveries of new galaxy companions were often a pathway to fame and success for early astronomers. Monstrous telescopes employed by these observers were able to reveal innumerable small "nebulae", but were cumbersome to use, making the note-taking process difficult and drawn-out. Errors were inevitable. Moreover, the telescopes were often situated in poor locations subject to extended spells of bad weather. Astronomers therefore found it difficult to recheck their notes and observations. The NGC 7331 group proves no exception to being the subject of error.

There are a total of nine NGC entries in the vicinity, including NGC 7331. Again, although the galaxies seem to be companions of NGC 7331, even a casual inspection of photographs reveal NGC 7331 to be a foreground object. Hence, this is not a true group. Observers using eight-inch telescopes will be able to see only a couple of the galaxies near NGC 7331. This being partly due to their faintness, but also as a result of the many ambiguous galaxies listed in the region. Let's explore the NGC entries for the NGC 7331 region in historical detail and discover the true group members.

NGC 7325 and 7326 were studied by the Irish observers at Birr Castle in 1874. Accurate positions were measured in reference to nearby NGC 7331 and it is clear that the original observers mistook close double stars for very minute galaxies. The authors of the RNGC evidently used these two ambiguous NGC designations to incorrectly label two nearby anonymous systems, both 10-minutes NW of the NGC positions. In actuality, NGC 7326 is a close pair of magnitude 15 stars just west of the core of NGC 7331, and NGC 7325 is a courser double easily resolvable in a 10-inch scope, 3-minutes south. Probably the older telescopes had poor resolution, even compared to the smaller compound telescopes of today, misleading the earlier astronomers into making such false discoveries as these two galaxies. The newer RNGC 7326 is catalogued in the CGCG as 514.066 at magnitude 15.7P and is visible in backyard scopes.

The next object for scrutiny would be NGC 7327, discovered by Tempel with a refractor of 11-inches aperture. Although Tempel gave only a vague position in his original paper, Dreyer gave an exact position in his NGC which closely matches Tempel's description of "preceding the northern end of NGC 7331". This information was undoubtedly conveyed through private correspondence. This time no double star is noted at the exact position from the NGC, but a single faint star lies very near the expected position. Dr. Harold Corwin of the University of Texas at Austin conveys that he suspects some of the nebulosity involved with NGC 7331 may have caused the star to appear non-stellar to early observers, but he is guarded in his opinion. A visual inspection of the star in question shows not the slightest hint of nebulosity, and likely Tempel was misled during a period of poor seeing. Since Tempel claims to have seen all nine "nebulae" in this region it is also assumed this could not be a duplicate of another of his observations. We may never know exactly which object Tempel actually saw, but is is plain that no galaxy exists at the given (NGC) position.

NGC 7335 is one of the galaxies that do indeed exist. This galaxy, discovered by William Herschel, is the brightest of the group of four on the eastern side of NGC 7331. It lies in Herschel's class III, "very faint nebulae". Because of its great distance only photographs reveal much detail, but observers will note its distinctly elongated shape and large bright core.

Our next object, NGC 7333, was discovered by Dr. Schultz at Upsala and published in January 1875. Fortunately, Dr. Schultz gave a precise position for his new "nova" to the east of NGC 7331. The astronomers at Birr Castle in Ireland using their tremendous 72-inch reflector did not notice the Schultz object, which right away casts some doubt on its existence. At the precise location there lies an extremely close double star, just elongated on a Hale 200-inch plate. Possibly, Schultz might have noted this elongation visually in his "13-foot" (10-inch?) refractor. The exact match in position leaves little doubt as to the certainty of the identification. The RNGC correctly notes this as a double star.

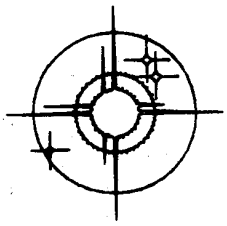
Three other galaxies are visible along with NGC 7335 on the eastern side of NGC 7331 in ten-inch or larger telescopes. One of these is a nearby companion to NGC 7335, the barred spiral NGC 7336 only 2' NNE. This system was discovered by Lord Rosse but seems to have been skipped by Zwicky in his CGCG. Otherwise, all of the early observers seem to have their identifications correct in this case. Visually NGC 7336 is very faint and elongated in a NE/SW direction. It appears very small and contains a bright core. Although the faintest of four galaxies to the east of NGC 7331, it should present no challenge to 17-inch telescopes.

The third small galaxy which can be viewed in large backyard telescopes in NGC 7337, again discovered by Lord Rosse. this Barred-Spiral system is found about 7' nearly directly south of the NGC 7335/36 duo. A 13th magnitude star appears nearly attached on its SE side. The galaxy is very faint, very small and round. It seems to have an even surface brightness. Brighter NGC 7340 is nearby to the northeast. Also, Tempel supposedly made the second of his two "discoveries" at a position nearby. This has been catalogued as NGC 7338.

The final galaxy for consideration in the NGC 7331 area is NGC 7340, a faint elongated system 8' to the east of NGC 7331. The galaxy was the third and final discovery by Lord Rosse at Birr Castle, Ireland in 1849. His description is indeed apt for this galaxy is considerably faint, at only magnitude 14.9, which places it as second brightest among its three faint companions. It appears round visually with a small bright core. This galaxy is at the very limits of an 8-inch telescope.

From our considerations of the field surrounding NGC 7331 it is obvious that early astronomers realized that "nebulae", or galaxies as we know them, often appear in groups. Observers evidently searched the area around the brighter galaxies quite carefully, hoping to make a discovery of their own. A good example of this method is illustrated in the catalogue of the astronomers using the 72-inch telescope at Birr Castle. Even Dreyer noted that the Birr Castle "discoveries" were usually found clustered together around brighter galaxies. In our case, in the vicinity of NGC 7331, early visual observers correctly identified 4 neighbors (NGC 7335,7336,7337 and 7340), but also mistakenly observed 5 others. It is also evident from this one case that many errors still exist in the catalogues employed regularly by amateurs. It is important to spend some time to research observations so that we can be certain of what we are seeing and recording. This requires some effort but the rewards are truly worthwhile.

## COMET COMMENTS
## BY: DON MACHHOLZ



A faint comet has been discovered, two faint comets have been recovered and evidence has been uncovered showing that two Comets have crashed into the sun in recent years. Comets Halley and Thiele open the year in the evening sky while Comet Hartley-Good is visible in the morning sky.

Periodic Comet Kojima (1985o): T. Geherels and J.V. Scotti recovered this comet from Kitt Peak on Oct. 19. At that time the comet was mag. 20 in the southwestern corner of Gemini. It will be closest the sun Apr. 5, 1986 at 2.4 AU and will not get brighter than mag. 16. It has a 7.9 year orbital period.

Comet Ciffero (1985p): This new comet was discovered on Nov. 8 by Jacqueline Ciffero on a photographic plate of Halley's Comet, which was five degrees away at that time. The find was made from the CERGA observatory at Caussols, France. Ms. Ciffero used a 36" Schmidt for the photo. Comet Ciffero was mag. 11.5 at discovery and it is getting fainter as it pulls away from both the earth and sun. This is the second time in a month that a new comet has been discovered in the vacinity of Halley's Comet, and, counting Comet Giacobini-Zinner, the third time in three months that a comet has appeared to visit Halley's.

Periodic Comet Wirtanen (1985q): This faint comet was recovered by A. Gilmore and P. Kilmartin at Mt. John Univ. Observatory in New Zealand on Nov. 13. Then at mag. 19 and in the constellation Microscopium, this 5.5-year periodic comet will be closest the sun on Mar. 20, 1986 and may reach mag. 13, according to veteran comet observer Alan Hale.

The late comets Solwind 4 and Solwind 5: It has been learned recently that the P78-1 Solwind Satellite recorded two more comets crashing into the sun. Solwind 5 hit Nov. 4, 1981 and may have been part of the Kreutz Sungrazing Comet Group. Solwind 5 hit the sun on July 28, 1984 and was a member of the Kreutz group. Incidently, during June and July 1984 I conducted 13 daytime comet sweeping sessions (within 5 degrees of the sun) using a variety of instruments and a special comet hunting filter. I ceased my daytime sessions on July 25, three days before this comet hit the sun. I don't know if I would have seen it if I had searched on the 28th. The Solwind satellite has discovered at least five comets, and all the data have yet to be examined. All five comets hit the sun and no longer exist. Now the satellite no longer exists, it was destroyed in a "Star Wars" test on Sept. 13th.

### COMET HARTLEY-GOOD (1985L)

This comet was closest the sun on Dec 9, passing far north of the sun, remaining under constant observation. It is now moving slowly through S. Hercules and Serpens Caput. By midmonth it will be 1.0 AU from both the earth and sun. Comet 1985L should remain brighter than mag. 11 through the middle of March.

## Comet Hartley-Good (1985L)

| DATE | R.A. (1950) | DEC | ELONG | MAG. |
|---|---|---|---|---|
| 12-26 | 16h 40.2m | +12° 10' | 43° | 7.1 |
| 12-31 | 16h 30.1m | +10° 27' | 46° | 7.4 |
| 01-05 | 16h 20.4m | +08° 30' | 50° | 7.6 |
| 01-10 | 16h 10.7m | +06° 23' | 55° | 7.9 |
| 01-15 | 16h 00.7m | +04° 05' | 60° | 8.1 |
| 01-20 | 15h 49.9m | +01° 39' | 66° | 8.3 |
| 01-25 | 15h 37.9m | -01° 58' | 73° | 8.5 |
| 01-30 | 15h 24.3m | -03° 45' | 80° | 8.7 |
| 02-04 | 15h 08.4m | -06° 40' | 88° | 8.8 |

## COMET THIELE (1985M)

Recent observations show this comet to be two magnitudes brighter than predicted. Its motion appears very slow as it sinks in the morning sky.

| DATE | R.A. (1950) | DEC | ELONG | MAG. |
|---|---|---|---|---|
| 12-26 | 20h 56.8m | +10° 08' | 52° | 9.9 |
| 01-05 | 20h 52.7m | +08° 59' | 42° | 10.2 |
| 01-15 | 20h 50.3m | +08° 18' | 34° | 10.5 |
| 01-25 | 20h 48.8m | +07° 58' | 28° | 10.8 |

## WHAT GOES AROUND COMES AROUND - HALLEY'S

Halley's Comet is brighter than nearly anyone expected. The comet surged in brightness during October and November, thus making it roughly 1 mag. brighter than previous predictions. The first naked eye sighting occured on Nov. 8 by Charles Morris and Stephen Edberg. My first such sighting was on Nov. 19. The tail has also been observed.

The comet appears to slow down as it travels through Aquarius, towards the sun and away from the earth. Halley's Comet will sink into the evening twilight by the end of January, going around the sun while traveling in the opposite direction as the earth.

The moon will be out of the evening sky from Dec. 29 through Jan. 11. The brightning moon will pass 133 south of the comet on Jan. 12. The moon will continue to brighten, but its increasing distance from the bright comet will not hinder observations as in past months. Instead, twilight and low altitude will be the obstacles. Although the comet will be south of the equator, the longer nights (early sunsets) of the Northern Hemisphere make our latitudes ideal for following the comet. For example, if the comet can be observed until it sets at astronomical twilight, then the last date of observation from -40° latitude is Jan. 3, from the equator it's Jan. 22 and from +40° latitude it's Jan. 26th.

Last month I mentioned that only three comets (Halley, Encke and Crommelin) have been named after their calculators. I over-looked a fourth comet, non-periodic Comet Lexell, which was also so named. Thank you, Bill Dellinges, for pointing this out.

During this time you might notice that Halley's Comet is displaying three tails: a gas tail, a dust tail, and retail! Happy Halleydays! Don Machholz, 408-448-7077

## Periodic Comet Halley (1982i)

| Date | RA (1950) | Dec | El. | Mag. |
|---|---|---|---|---|
| 12-26 | 22h 31.0m | -00° 56' | 66° | 5.0 |
| 12-31 | 22h 17.2m | -02° 20' | 57° | 4.9 |
| 01-05 | 22h 05.7m | -03° 29' | 49° | 4.7 |
| 01-10 | 21h 55.6m | -04° 29' | 41° | 4.4 |
| 01-15 | 21h 46.4m | -05° 25' | 34° | 4.1 |
| 01-20 | 21h 37.6m | -06° 18' | 26° | 3.8 |
| 01-25 | 21h 28.8m | -07° 13' | 19° | 3.5 |
| 01-30 | 21h 20.0m | -08° 12' | 13° | 3.2 |

## RUSTLIN' THE COMET
**BY: JIM EISELT**

Well it seems that when I talk to people about Halley's Comet, many is the time I hear folks say: "Hey aren't we supposed to get earthquakes, tidal waves, and firestorms?" I try to explain to them that Halley's comet is one of many comets orbiting around our sun and the press just loves to sensationalize on anything they don't understand. Now I'm having my doubts about if Halley's isn't affecting some things at least in the area of getting photographs of it. For me it seems that the comet is extremely shy, finding comfort in hiding behind clouds (storm fronts) when conditions are otherwise perfect for taking photographs.

On the weekend of Nov 9-10 we were blessed with high clouds which didn't do a thing for my spirits. On Thursday the 14th of Nov. I caught a satellite weather report and it looked like another storm was coming in for the weekend of the 16/17th, so I made for Fremont Peak that night and got rewarded with extremely dark winter like skies and low relative humidity.

I managed to get 4 shots of the comet, 2 through my C-130 reflector and 2 piggyback shots. Unfortunately, I got the two different film strips sandwiched together in the developing tank and the results were rather bizarre. As John Gleason mentioned in the December issue of the Ephemeris, the background of the slides (taken through the C-130) were red not black! I did however manage to salvage the piggyback shots. These came out low density, grainy, and had a reddish cast. I had about given up on these when I remembered about John using a technique of registering 2 slides of the same object together to increase contrast and picture quality. Having taken the 2 ten minute shots back to back, I did not expect the comet to move too much so I did just that and now have an acceptable slide of Halley's Comet poised just below the Pleiades!

The next decent time to get out and "rustle" Halley's was Dec. 7th but it looked like the pulsating storms that had been the bill of fare since mid November were to be the victor. I talked with John Gleason early in the day about his latest photographic attempts, found out he was out the night before and struggled with peak-a-boo all night. The same skies, if not worse, were outside as we talked and consigned that evening to a loss. But wait! Five thirty rolls around and winds out of the northwest are blowing all the crud out and it's clear skies again. Mike Ryan calls me and wants to "rustle" Halley's, so I asked him to "choose his poison" as to where we could go. He hecided on Grant Ranch and I met him there at 7 p.m.. Well no it wasn't clear skies. It was cloudy. I thought they just might be hanging in the valley there, so decided to go up to Lick observatory and "punch through" the stuff. No luck! Lick was socked in. In remembering winter time in the Bay Area I recalled that after a storm, clouds will hang on the mountain ranges forming a circle around the bay so I told Mike that we should go another few miles down the back side behind Lick where finally it started getting better. We wound up on the valley floor behind Lick with clear an fairly dark skies. Now that we had arrived, time was against us as it was already 8:30 p.m., and Halley was past the meridian droping into the San Jose sky glow. A hasty polar aligment was all I could afford to do and left the 3M 1000 slide film in my camera.

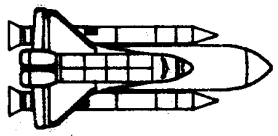
At about 9:50 I took my first shot of Halley and finsihed with 5 in all; time ranged between 4 and 10 min. 3M 1000 may be grainy but it's ability to record faint light sources in short periods of time pays off if you don't have much time in which to work. Being without a seperate guide scope and being marginally aligned also makes 3M 1000 a good choice if you want little movement showing up from the comet and stars that don't look like footballs. Mike Ryan took 2 piggyback shots of the comet using Ektachrome 200 and hopefully those shots will come out fine.

After I had finished taking my photos of Halley, two ranchers and their sister stopped and asked what we were looking at. I invited them to look at the comet through our telescopes and they were quite interested and also quite inebriated.

They told us about their cattle ranch and "picking up strays", and we told them about Halley's Comet and astronomy. The ranchers left us wiser and hopefully a bit more sober. The slides I now have are the right color, a bit grainy, and not prize winners, but it feels good to have captured the elusive comet on film.

As this year winds down and the new year comes into being I'll be using Konica SR 1600 film and hopefully will improve on the quality of my work.

That's all for now "lil doggies". See you out under the stars.



## SPACE PROGRAM UPDATE
**BY: BOB FINGERHUT**

### BIG YEAR PLANNED FOR SPACE SCIENCE

Among the 15 space shuttle missions planned for 1986 are 8 with major space science objectives. They include: * Spartan-Halley (51-L) Jan 20; contains a mini-observatory including ultraviolet instrumentation to observe Comet Halley just before it reaches its closest approach to the Sun on Feb. 9th. * Astro-Halley (61-E) March 6; Contains 3 large ultraviolet telescopes and 2 special film camera systems timed for simultaneous observation with the Soviet Vega 2 and European Giotto. * Ulysses (61-F) May 15; planned for launch toward Jupiter for a gravity assist to throw it out of the ecliptic plane and over the south pole of the Sun. * Galileo (61-G) May 21; Planned to make an inspection of the asteroid Amphitrite on Dec 7, 1986, on its way to Jupiter orbit in Dec. 1988. * Space Telescope (61-J) Aug 8; The Hubble Space Telescope is to be the first of a new generation of space borne observatories which will image across the electromagnetic spectrum. * SHEAL-1 (61-L) Oct; The shuttle high-energy astrophysics laboratory will be devoted to X-ray astronomy. * Astro-2 Telescope (71-A) Oct 30; This mission will contain the largest ultraviolet instruments ever focused on deep-space objects. The Spartan-2 mission will be flown on the same flight to study the Sun. * Spartan 3 (71-D) Dec. 1986; A MK.2 Schmidt electrographic camera will be used to observe young stars and white dwarfs.

In addition to the new missions to be launched, Voyages 2 will fly-by Uranus in January and 3 nations will have Halley flybys in March.

### SPACE ASSEMBLY TECHNIQUES DEMONSTRATED

The recently completed shuttle mission (61-B) featured two space walks in which the erection of large structural assemblies were demonstrated. ACCESS consisted of building a 45 foot long truss and EASE consisted of constructing a large pyramid-shaped truss. The experience will be important when a decision is made to use either a deployable or erectable structure on the space station. Three communication satellites were also deployed during the mission. The landing was on the concrete runway at Edwards AFB.

### DECISION ON FINAL SPACE STATION CONFIGURATION TO BE MADE IN JANUARY

Key decisions to be made include: 1. The distance between the two keels. 2. The number of U.S. Modules (each will be 44 ft long) 3. European module placement. 4. Japanese module placement. 5. Electrical power system, solar dynamic or solar cells. 6. Electrical power distribution (20K-Hz or 400 Hz). 7. Interior module configuration (Horizontal or vertical) 8. Propulsion (self-contained or central feed system) 9. Propellants (Hydrazine, bipropellant or cryogenic)

### FIRST VANDENBERG SHUTTLE LAUNCH DELAYED

The launch has been delayed four months to mid-July, 1986.

IMAGE new ...a photographic society

ANNOUNCES IT'S

FIRST EXCITING PROGRAM FOR 1986

# PICTURE THE STARS

GUEST SPEAKER -- JOHN GLEASON -- ASTRO-PHOTOGRAPHER
San Jose Astronomical Assoc. EXTRAORDINAIRE

TOPICS -- STAR PHOTOGRAPHY TECHNIQUES

- WITH TELESCOPE - WITHOUT TELESCOPE

-- SLIDE SHOW

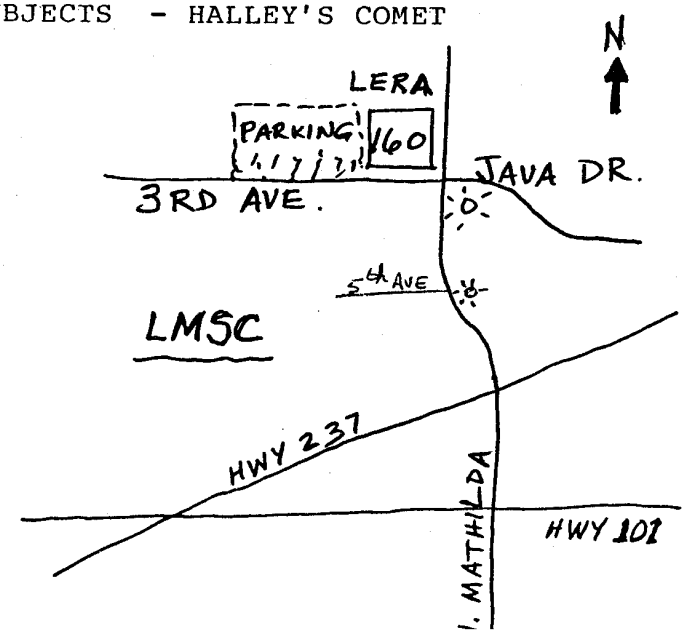
- STELLAR SUBJECTS - HALLEY'S COMET

LERA AUDITORIUM - BLDG 160

9 JAN 1986 - 6:30 PM

PUBLIC IS INVITED TO ATTEND
REFRESHMENTS WILL BE SERVED

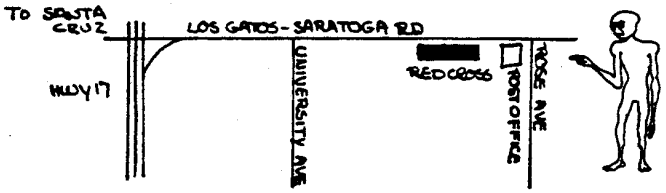
FOR INFORMATION CALL CARL ORTA
408-74(3-7804)




LERA

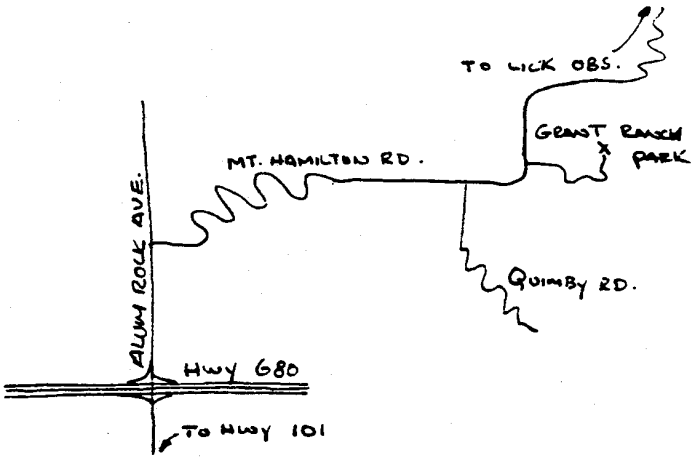
GENERAL MEETINGS:

General Meetings are held once a month at the Los Gatos Red Cross building, Los Gatos California. This is also the locaton 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.



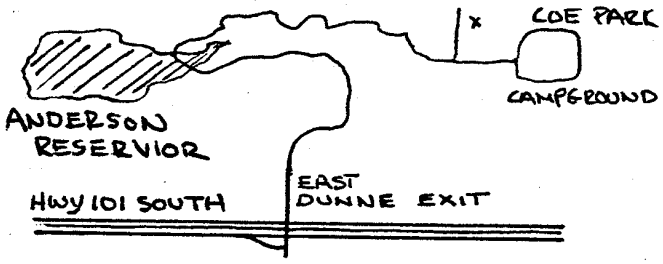

GRANT RANCH COUNTY PARK:

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 parks 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.



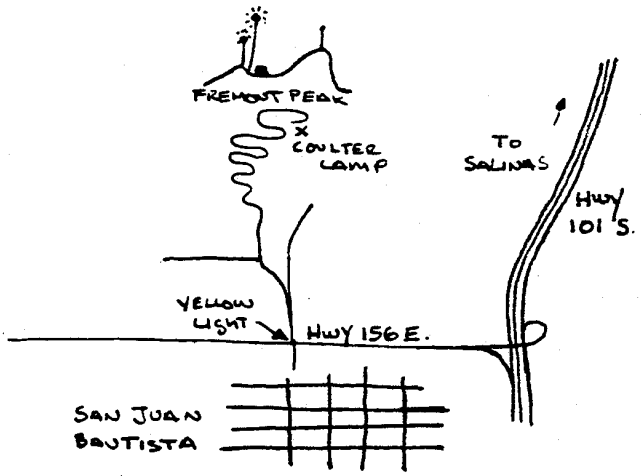

HENRY COE STATE PARK:

Take Hwy 101 south towards Gilroy and take the East Dunne exit. continue east towards the hills (past Anderson Reservior) 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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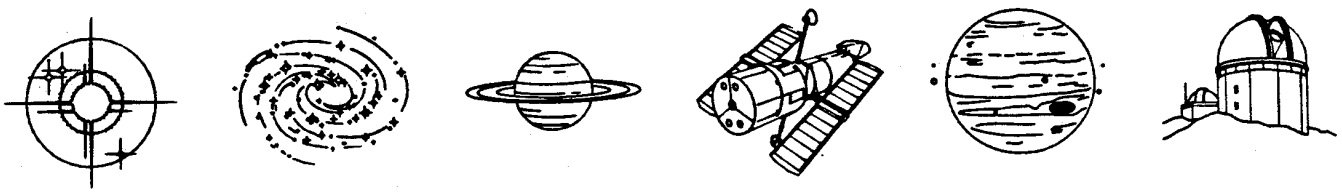

## SAN JOSE ASTRONOMICAL ASSOCIATION MEMBERSHIP APPLICATION

MEMBERSHIP ONLY: $8.00  MEMBERSHIP/S&T: $21.00  JUNIOR (UNDER 18): $15.00

Name _____

Address _____

_____

Telephone (____) _____

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____

Questionnaire (optional)

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

_____

_____

_____

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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