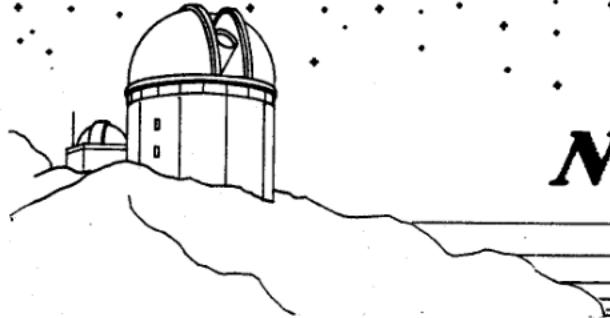


# EPHEMERIS

OF THE SAN JOSE ASTRONOMICAL ASSOCIATION



## NOVEMBER 1985

\*\*\*\*\* NOVEMBER 2ND \*\*\*\*\*  
TED CARLSON  
SPACE TELESCOPE UPDATE  
8PM

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

BEATING MURPHY AT HIS OWN GAME  
BY: JOHN GLEASON



NOVEMBER 2 GENERAL MEETING AT THE LOS GATOS RED CROSS BUILDING. THERE WILL BE A LOCKHEED ENGINEERING UPDATE ON THE HUBBLE SPACE TELESCOPE THAT IS CURRENTLY BEING ASSEMBLED IN SUNNYVALE. 8 PM.

NOVEMBER 9 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION (FEAO) DUSK TILL DAWN AT HENRY COE STATE PARK (DIRECTIONS INSIDE)

NOVEMBER 16 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION TO BE HELD AT GRANT RANCH COUNTY PARK (WEATHER PERMITTING) UPPER AND LOWER SITES. DUSK TILL DAWN.

NOVEMBER 23 BOARD MEETING, 8 PM AT CHRIS AND SHEA PRATT'S NEW HOME.

NOVEMBER 30 INDOOR STAR PARTY AT THE LOS GATOS RED CROSS BUILDING. DOORS OPEN AT 8 PM.

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.

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

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

You know that Murphy has crashed your party when 48 minutes into a 60 minute exposure, a large 4x4 truck with high beams on rolls to a stop next to your telescope. You know that Murphy hasn't given up yet, when only 10 minutes into the next exposure, 2 more vehicles enter the observing area! Things are really getting out of hand when just as you are in the process of transferring film from the cold camera to the film box that another truck chugs into your observing site, quartz halogens ablaze! You barely get the light tight box closed before your blinded by the artificially produced sunlight.

And so it went during a night of observing and astrophotography behind the rangers house on October 12th. It seems that during the afternoon a 60 year old man got separated from a group of students on a geology field trip and was soon reported missing. As search teams were organized, Ranger Rick's home became a focal point of activity. Much to the dismay of the astrophotographers who set up there.

As if the lights were not bad enough, strong gusts of wind blew through the site on a regular basis. I need not say that it was a bit chilly, as I am still thawing out my feet!

But wait, what's this? None of my exposures were ruined. Nothing was light struck, and all were unhampered by the gusts of wind. That's because I was setting snug in my "Blue Cube" astrophotography shelter.

Years ago I would have packed up early and headed home on a night like this one. But then I got the idea to construct what can essentially be called a "duck blind" that would be set up around my telescope. This last weekend really proved its usefulness as none of my photos were light struck, and I did not suffer from the wind chill as my fellow observers were. To top it all off, the telescope remained nice and steady throughout the night. So take that! Mr. Murphy!

This evening also produced a number of observing surprises. First, there was a chance to take a look at comet Hartley/Good. Expecting to see a lot, I think a number of us were disappointed that the comet appeared rather faint and very diffuse. Let's hope it gets better in Nov. Secondly, Jupiter was superb in my superior C14. A multitude of fine details were seen across the equator. Including one fine "comma" like festoon stretching from the north to south latitudes. The great "Pale" (formerly Red) Spot was razor sharp and very elongated. No color was seen here. Trailing the Spot was a well defined white oval mixed in with turbulent clouds. Very pretty. Third, Comet Halley actually appeared a lot brighter than the predicted mag. 10. It was easily found in Jim Eisele's C11, then in the superior C14, and finally in Ron Walton's and Mike Ryan's C8's. The coma was a well defined sphere with a light halo about it. Very nice as compared to last's months faint fuzzy nothing. I bet if we had a smaller telescope, like a 90mm refractor, we could have seen it in that too.

The clear skies this evening allowed me to finally test a roll of Konica ISO 1600 color print film in the cold camera. (see field of view) Wind and headlights were not going to stop me after seeing Dr. Marling's results. The film promised good results, as Dr. Marling pointed out that it was nearly 2-times as fast as Fujichrome 400 hypersensitized. Well Ol' Murphy was beaten again as all 4 of the astrophotos came out very well! And the film does indeed show promise. 3 of the 4 exposures were 60 minutes in combination with the cold camera and a Lumicon Deep Sky Filter. (premium grade, 95% transmission) The 4th was a short 20 min cold camera shot of Comet Halley without the filter. All were taken at f/11 through the superior C14 telescope. The short exposure of 20 minutes on 10th magnitude Halley's clearly shows the coma. Very little background sky fog is apparent. Meaning that I could have gone longer. A 60 minute exposure of M1, the Crab Nebula is most spectacular, as it exhibits a mass of streamers radiating from the center of the nebula. And get this, the best part is that there is virtually no background sky fog visible. A daring astrophotographer might be tempted to go 70 or 80 minutes with this film and filter combination. But a larger telescope with a faster effective f/ratio would be better. Now if I could only get my hands on a certain 30" f/5..... Initial reactions to the negatives is that they do not appear to be any grainer than Ektachrome 400 film. But they will have to be converted into slides via 5072 copy film. Jack Marling has offered to do this for me since I had bad luck with the Fujichrome copies.

I can't say that Konica 1600 is twice as fast as Fuji 400 processed as a negative. There is no overwhelming difference between the two as far as film speed in the cold camera goes. Perhaps Konica 1600 works better hypersensitized like TP 2415 does. (Remember that TP 2415 does not respond to chilling) Successful testing of Hypered film will come when I can take freshly hypered color film right out of the gas chamber and expose it through the telescope. This will at least give me maximum sensitivity. If this process works as well at f/11 as the cold camera does, I might just be converting over to hypered Konica 1600. Time and more testing will tell.

Next month I want to try Tri-X and Ilford HPS in the cold camera. Ilford shows promise as a fine grain (though not as fine as 2415) black and white film. Tri-X has historically worked very well in the cold camera. I would like to combine the Deep Sky Filter with these two films for very deep black and white astrophotos on faint objects like the Horsehead. Film grain would be at a minimum with these films as the image scale of the superior C14 minimizes the need for enlargement. What I am talking about here is literally burning an object into the negative, while at the same time eliminating sky fog via the deep sky filter. I want to record the outer gas shells of planetary nebulae, connecting bridges between galaxies, and outer nebular envelopes of hydrogen regions. This process will bring me a step closer to a process called un-sharp-masking. A technique that professional astronomers use to extrapolate fine detail out of heavily exposed negatives.

Does it make sense for an amateur to go to all this trouble when the professionals have already done it? Well...No, but it does give me an excuse to go out and photograph the Lagoon and Trifid nebula again!

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

At the AANC star party on September 14, I spent several hours observing with Frank Dibbell's 90mm Celestron fluorite refractor. When I walked up, Frank was looking at Jupiter at a magnification of 405 -- very high for so small an instrument. I had never bothered to raise the power on an telescope to over a hundred per inch ( $90 = 3.5$  inches, and  $3.5 \times 100 = 350$ ), and I was quite curious to see what would happen to the image.



Jupiter was rock-steady -- the seeing was excellent. The effects of diffraction on the extended image were readily apparent: The edge of the planet was not abrupt -- the brightness fell from full to nothing over a narrow band at the disc's boundary. Atmospheric detail seemed to have been air-brushed -- but we know from NASA travel pictures and from larger telescopes, that these features are often quite sharp. Indeed, 100x per inch of aperture is too much.

There were some stars nearby, of brightness comparable to the Galilean satellites. We compared the two kinds of objects: The images of the moons were noticeably larger. The angular diameter of these tiny bodies is much smaller than the diffraction disc of a 90mm objective, so it would not be correct to say that the moons were resolved -- it is better put, that their sizes were sufficiently large so that the consequent diffraction images were distinguishable from those produced by a point.

I tried the instrument on some low-power objects next, at only 20x. M8 showed a wide range of brightness. M20 showed a hint of red and blue color in its two lobes. Barnard's galaxy, NGC 6822 in Sagittarius, was easy with averted vision. The little telescope was performing very well.

"Now let's try the hard stuff," I said.  
"Yeah, like Stefan's Quintet?" Frank replied with a touch of sarcasm.  
"Precisely."

Readers of these pages will recall that a year ago, several of us succeeded in spotting this group of five faint galaxies in Pegasus in successively smaller telescopes, all the way down to a five-inch Celestron Schmidt-Cassegrain. When you go through the coefficients of reflection and transmission, and allow for the light blocked by the secondary of the C-5, it turns out that the 90mm refractor transmits three quarters as much light as the larger instrument. What's more -- a telling point -- refractors are generally superbly baffled against stray light, and the 90mm is no exception: Its field is very dark. So despite Frank's doubts, I was in fact expecting to see Stefan's Quintet in his telescope.

And I was not disappointed! At 20x it took averted vision and persistent attention to holding the eye fixed, to pull it in; and even then it would only pop into view briefly, every five seconds or so. But it was detectable. I took care to decide firmly where it was in the field, before I confirmed the position in a larger instrument.

Frank has a nice set of eyepieces, whose magnification spans the range likely for deep-sky work in small steps. We tried them all. The visibility of the Quintet improved with power, until at 48x and 78x, I could hold it almost steadily in view with averted vision. Detectability diminished with higher powers, until at 168x it was as hard to see as it had been at 20x. The optimum power was clearly in the range of 50-80x.

I should also point out carefully that this observation has nothing to do with fluorite optics. I would be distressed if anyone went out and duplicated Frank's instrument because of the work described here. What was making the little refractor perform was more likely high throughput -- the product of square inches of unobstructed aperture by the coefficients of reflection and transmission of all the surfaces in the optical path -- together with good baffling against stray light. And of course, the same money that will buy a 90mm fluorite will alternatively buy a Dobson three or four times as large. Do not confuse my admiration of craftsmanship with a recommendation for a cost-effective telescope.

Similarly, although Frank's TeleVue Plossl eyepieces are high in quality and justly respected, they are not magic. I would expect a good 4.25-inch reflector with a Ramsden eyepiece to show the Quintet, provided all optical surfaces were clean, with coatings in good condition. Possibly an 80mm refractor would also detect it.

We were able to show Stefan's Quintet to about a dozen passers-by as well, whose observing experiences ranged from vast to almost none. It is located roughly half a degree north and a quarter of a degree west of NGC 7331, which is in turn plotted on most of the popular star charts.

This object used to be regarded as kind of an informal test for telescopes of sixteen inch aperture and more. If patience and good technique will allow it to be seen in a three and a half inch refractor ... then what is a sixteen-inch really capable of showing?

#### FIELD OF VIEW BY: JOHN GLEASON

#### "LOVELY ASTROPHOTOS"

The October 5th General Meeting was one of the best attended gatherings of SJAA members in 5 years. Over 60 people listened to Dr. Jack Marling (Lumicon) portrayal of viewing and photographing from Mauna Kea observatory, Hawaii. Jack presented 140, (yes we counted them all) spectacular color slides of the observatory site and southern deep sky wonders.



For those of you who attended, and marveled at Jack's astrophotography here's how his process works.

First, Fujichrome 400 film has been changed by the manufacturer in the last 8 months. When hypersensitized, the film becomes extremely blue sensitive. Virtually no red image is recorded. Early batches of Fuji were extremely sensitive to red emission type nebulae and worked well on galaxies. Now, the "new, bad Fuji" fails to record any red.

Jack has been exclusively using Fuji 400 hypersensitized in Forming gas (95% nitrogen, 5% hydrogen) and then processes this slide film as a negative. Jack then takes these color negatives and converts them back into slides using a special order film 5072 designed for this particular purpose. This process of color negative development of slide film and then copying it into slide form greatly increases the contrast between the object being photographed and the sky background. So that's why we were so impressed with the rich colors of Jack's astrophotography.

The only drawbacks to this process is that the film grain is also enhanced. This problem can be overcome by over-hypersensitizing the film and then under-developing it. Another drawback is the conversion back into a slide. I used up 4 36-exposure rolls of the film trying to get the correct exposure and color balance to get a decent looking slide. Jack tells me that the recommended filtration for magenta and cyan (on the 5072 film box) are fairly close to what you will use, but that it's the yellow filtration that may need gross adjustment.

Anyway, back to the problem of the "bad new Fuji." To overcome the blue sensitivity of the new Fuji film, Jack has come upon a new ISO 1600 emulsion manufactured by Sakura of Japan. The film is currently sold under the name Konica in the U.S., and might be found at Fotomat stores. The 1600 ISO may not be stocked by all Fotomats but Lumicon is now carrying the film. The results that Jack showed by using this film were excellent. The film displays a good balance of red and blue when hypersensitized. Best of all the film grain appears to be less than that of Fuji 400, and it is nearly 2-times as fast at recording faint deep sky objects! (when hypersensitized)

This color negative film is developed in standard C-41 processing. Like Fuji 400 it can be converted into slides by using 5072 film.

Another key to success when using any hypered film, is to keep your color film in the pressurized gas chamber just prior to using it at the telescope. This will insure maximum sensitivity. You would want to estimate your 20-hour hypering time to the estimated time of use. Over-hypered film can be under processed and finer film grain will result. Unlike hypered black and white films, (which can be stored in a freezer for several months) hypered color films loose their sensitivity rather quickly.

Weather permitting, I will be trying this new film in the ol' chilly camera this month. Un-hypersensitized of course!

#### AND YET ANOTHER COMET HALLEY TOUR

Bill Dellinges has passed this information along to me in regards to an Australian comet tour. The Explorer's Travel club in England offers a one week trip to Australia departing April 2nd out of Los Angeles for (U.S.) at \$1050.00. It includes round trip L.A. - Sidney airfare on a U.T.A. 747, tour of Sydney and Sliding Spring Observatory, and a meeting with PATRICH MOORE.

For another (U.S.) \$450.00, you can get a weeks extension to Alice Springs and return flight back to Sydney. During this second week, while driving on a bus outfitted for camping, you'll sleep in a tent for five nights, and a motel for three nights. Sounds rustic, but fun! Bill has found it hard to say no and has signed up himself and his wife for the trip.

Contact: EXPLORER'S TRAVEL CLUB, 2 YORK RD., MAIDENHEAD, SL6 1SF ENGLAND. PH (FROM US) 01144 628 23564

Don't forget that our own Don Machholz, Steve Greenberg, and your lowly editor are conducting a 2-week tour of New Zealand next April!

#### COMBINATION CHANGE

The SJAA padlock has been changed on the gate leading to the Grant Ranch upper site. There is a certain matter of security involved here, as the local county police might mistake you as a cattle poacher (russler). There is no problem getting into the site. Just contact a board member before you want to use it, and let the Grant Ranch park rangers know that you are going to be there that evening. THX!

#### ANOTHER MEDLOCK ROLLS OUT ONTO THE RAMP.

After setting in the hanger for nearly 10 months, Kevin and Denni Medlock were blessed with a baby boy; Paul Alan, on August 26th. Both parents are doing fine.

#### NEW COMET

Watch for comet Hartley/Good in evening northern sky early this month. It could brighten up to around mag 6.5 by December. Should be better than Halley will be for the rest of the year. (more info. in Comet Comments)

#### TED CARLSON TO SPEAK ON SPACE TELESCOPE

Lockheed engineering manager, Ted Carlson will give us and inside look at the space telescope assembly operations currently underway in Sunnyvale. Ted was going to try and bring the telescope with him, but it won't fit through the double doors of the Red Cross building. So, I suppose we will have to settle for some slides of the project.

#### ROYAL ALMANAC

SJAA members can get a group discount on the popular Royal Astronomical Society of Canada's Observers Handbook. Please contact Jim Van Nuland by December 1st. I highly recommend this small paperback volume that is chalked full of information for the 1986 observing season.

CALICO OBSERVATORY  
BY: JIM VAN NULAND

#### GREAT RED SPOT

At Chews Ridge on September 14, seeing was extraordinarily steady, and transparency was excellent, as



witnessed by the finest Milky Way since Yosemite. Yet markings on Jupiter were not much more distinct than seen under the mediocre conditions at home. Why? I can only conclude that Jupiter really is rather pale presently. Back at home, 244x seems to show more color than 305x, the seeing being only fair. There is a definite pink during moments of best seeing, and the Spot is quite large and well-defined.

I was shown some excellent drawings of Jupiter at a meeting a few weeks ago; my apologies to the observer, and to my readers, for not noting his name. His experience confirms the long-standing contention that sketching is a very powerful technique to develop your observing skill. This applies to faint objects, too, not just planets.

Timings of the Spot have been very erratic lately, varying up to five minutes over a week. This, too, seems to be really happening, i.e., not due to inaccuracies in the observations. There seem to be runs for a few weeks, interrupted by sudden jumps or periods of instability. I'm gaining a bit of understanding of what weather forecasters have to contend with.

Jupiter now sets well before midnight, but with sunset earlier, the list shortens a bit slowly, lulling the careless into putting off some serious Jupiter watching. Now is the time! Jupiter is well up at dusk, when seeing is often better than for the rest of the night. So drag out the scope, and let me hear from you.

#### Great Red Spot on Meridian PST

|       | d  | h | m     |       | d  | h | m     |
|-------|----|---|-------|-------|----|---|-------|
| Th 10 | 31 | 6 | 52 pm | Tu 11 | 19 | 7 | 42 pm |
| Sa 11 | 2  | 8 | 33 pm | F 11  | 22 | 5 | 9 pm  |
| Tu 11 | 5  | 6 | 6 pm  | Su 11 | 24 | 6 | 47 pm |
| Th 11 | 7  | 7 | 41 pm | F 11  | 29 | 6 | 2 pm  |
| Su 11 | 10 | 5 | 15 pm | Su 12 | 1  | 7 | 45 pm |
| Tu 11 | 12 | 6 | 56 pm | W 12  | 4  | 5 | 11 pm |
| Th 11 | 14 | 8 | 35 pm | F 12  | 6  | 6 | 55 pm |
| Su 11 | 17 | 6 | 3 pm  | W 12  | 11 | 5 | 58 pm |

COMET COMMENTS  
BY: DON MACHHOLZ

Three comets have been discovered during the past several weeks.

Although there were few comets found in the early months of 1985, recent discoveries and recoveries have made this one of the most active years yet. Newly-discovered Comet Thiele was found only a few degrees from Comet Halley. Another new comet (Hartley-Good) is now visible in the evening sky. Comet Giacobini-Zinner parks itself just south of Canis Major as it dims considerably. Finally, Comet Halley passes just south of the Pleiades and becomes an evening object by mid-month.

**Comet Maury (1985k):** Alain Maury found this comet on plates taken at Mt. Palomar on Aug. 16. The comet was magnitude 16 and not far from M2. We now know that this comet has an orbital period of 8.8 years, it will not get much brighter.

**Comet Hartley-Good (1985L):** This comet was found by M. Hartley and A. Good of Sliding Spring Observatory in Australia on Sept. 11. Then at mag. 12 and not far from the galaxy NGC 253, the comet has moved north-westward and has brightened. It will be closest the sun (0.69 AU) on Dec. 9. Before that time it will be in our northern evening sky, after that it will be in our morning sky. If the comet behaves "properly", it will be brightest (mag. 7) in early Dec., and should remain brighter than mag. 11 through Feb. 1986.

**Comet Thiele (1985m):** I have just received word of a new comet found by Thiele on Oct. 9. At that time the comet was mag. 13 and three degrees NW of Halley's Comet, moving NW at 1 degree/day.

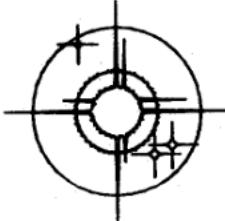
EPHEMERIDES

PERIODIC COMET GAIACOBINI-ZINNER (1984e)

| DATE  | R.A. (1950) | DEC      | ELONG | MAG. |
|-------|-------------|----------|-------|------|
| 10-27 | 07h 22.3m   | -23° 31' | 94°   | 10.0 |
| 11-01 | 07h 24.3m   | -26° 26' | 96°   | 10.3 |
| 11-06 | 07h 24.9m   | -29° 01' | 99°   | 10.5 |
| 11-11 | 07h 24.1m   | -31° 16' | 101°  | 10.7 |
| 11-16 | 07h 22.0m   | -33° 12' | 103°  | 11.0 |
| 11-21 | 07h 18.6m   | -34° 49' | 105°  | 11.2 |
| 11-26 | 07h 14.0m   | -36° 07' | 108°  | 11.5 |
| 12-01 | 07h 08.4m   | -37° 05' | 110°  | 11.7 |
| 12-06 | 07h 02.0m   | -37° 43' | 112°  | 11.9 |

NOTES

This comet didn't produce many meteors in early October, but it was a fine-looking comet in Aug-Oct. By month's end it is 144 million miles from the sun, 84 million miles from earth. Gee. No, that's 6-7!. Wave good-bye, we'll see it again in six years but we'll get a better view in 13 years.



COMET HARTLEY-600D (1985L)

| DATE  | R.A. (1950) | DEC      | ELONG | MAG. |
|-------|-------------|----------|-------|------|
| 10-27 | 19h 27.1m   | -00° 01' | 81°   | 7.9  |
| 11-01 | 19h 05.4m   | +03° 45' | 72°   | 7.8  |
| 11-06 | 18h 47.4m   | +06° 53' | 65°   | 7.7  |
| 11-11 | 18h 31.8m   | +09° 28' | 58°   | 7.6  |
| 11-16 | 18h 17.8m   | +11° 35' | 53°   | 7.5  |
| 11-21 | 18h 04.5m   | +13° 16' | 48°   | 7.3  |
| 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  |

This new comet cuts across the Milky Way early this month. In the evening sky, it passes the discovery location of Comet Levy-Rudenko close to one year after it was found. Comet Hartley-Good may appear large (5-10 arcminutes in dia.) and diffuse. The magnitudes listed here are rough estimates.

WHAT GOES AROUND COMES AROUND--HALLEY'S

Are you getting tired of hearing about Halley's Comet? It can't go on forever, the media should run out of things to say about it by next summer. That's because "hype" consists more of prologue and less of epilogue. And after mid-April the comet will get fainter and will be "going away", taking the hype with it. Next year at this time it will be visible only in large telescopes at magnitude 13.

This month the comet finally becomes visible in binoculars and small telescopes. Some comet experts had been advising you to buy these instruments for Halley's Comet, yet for the past three months the comet has been visible only in large and medium-sized telescopes. Similarly, next summer, for the last two months of good viewing, medium-sized instruments will again be essential. Between now and then use every optical and photographic instrument you can get your hands on, if you wish to make the most of Halley's Comet.

In viewing the comet yourself, or in showing it to others, you might have noticed it doesn't seem as bright as our magnitude figures the "integrated magnitudes". That is, the comet, appearing fuzzy when in its best focus, is as bright as an out-of-focus star of the same magnitude. Using the same method, the Andromeda Galaxy, barely visible to the naked eye in most rural areas, is magnitude 4.5, while stars of magnitude 5.5 (2.5 times fainter) appear as equally visible. Using a more common "picture", a spot of paint is easier to see than the same amount of paint spread over a large surface. Likewise, a six-inch reflector can view stars to mag. 12.0 but extended objects to only about mag. 11. Observation of extended objects becomes even harder when the background (actually the foreground) is lit up by artificial lights or moonlight, thus reducing contrast.

While we are on the subject, let me mention two more factors concerning comet magnitudes. First, a comet in a larger telescope, while appearing brighter than in a small scope, will not be enhanced as much as the gain in star visibility. That is, as aperture increases, the comet brightens but not as rapidly as the stars. A 10" telescope will yield a comet magnitude estimate about 0.4 magnitude fainter than what the standard aperture of 2.6" would yield. This is due to the nature of extended objects viewed by the eye. A second factor to remember is that photographic comet magnitude estimates are nearly always 1-4 magnitudes fainter than visual magnitudes.

The table below gives positions for Halley's comet for November. The comet moves very rapidly during this month. It will be 57 million miles from the earth in late Nov., further away before and after. The comet will be at opposition Nov. 18, it will be above the horizon all night long as it crosses from the morning sky to the evening sky. By late November it will be high in the eastern sky at evening twilight, setting by 4 AM. At that time it will be just within Mars' orbit. In the following weeks we will swing past it. (we're still on the inside track.) The comet, in a retrograde orbit, enters our evening sky and we'll see it as we look behind us while we orbit the sun.

| Date  | RA (1950) | Dec        | El.  | Mag. |
|-------|-----------|------------|------|------|
| 10-27 | 05h 38.5m | +21° 25.8' | 128° | 9.2  |
| 11-01 | 05h 22.2m | +21° 48.6' | 137° | 8.8  |
| 11-06 | 04h 59.8m | +22° 08.0' | 147° | 8.3  |
| 11-11 | 04h 29.2m | +22° 14.0' | 159° | 7.8  |
| 11-16 | 03h 48.6m | +21° 47.0' | 173° | 7.3  |
| 11-21 | 02h 57.8m | +20° 18.8' | 169° | 6.9  |
| 11-26 | 02h 00.7m | +17° 29.9' | 151° | 6.6  |
| 12-01 | 01h 05.0m | +13° 38.2' | 131° | 6.4  |
| 12-06 | 00h 17.1m | +09° 33.9' | 114° | 6.3  |

As seen from our planet, the path traced by Halley's Comet is parallel to and 2 degrees south of the path traced by Comet Machholz last May and June. Halley, however, is traveling in the opposite direction. Note that Halley's Comet will be eight degrees north of the Hydes on Nov. 11, two degrees south of the Pleiades on Nov. 16-17, and right over M74 on Nov. 28. It will be at its most northerly declination on Nov. 10. The moon will be bright enough to interfere before Nov. 6 and after Nov. 20. Viewing can begin again after Thanksgiving (Nov. 28), when the comet will be visible in the evening sky before moonrise.

#### ASTRO ADS

FOR SALE: Meade 8-inch Newtonian telescope with clock drive and extras. Contact: Arno Granados, (408) 926-8190

LASER for sale: Industrial Smw Helium/Neon laser made by Hughes. 10 times the power output of most lasers of this type. Works great and has little use. \$175.00. Also selling a tangent-arm assembly for mounting a guide scope on your telescope. Very heavy duty with X and Y control. \$65.00. Call Jim Baumgardt at (415) 579-3621 days or at (415) 347-2261 weekends and evenings.

WANTED: Equatorial mount and tripod for C90. Call George Falotico at 408-226-5575

TELESCOPE making equipment available. Optical working equipment for any person wishing to start or finish a mirror, including aluminizing for preliminary star tests. Also, machine lathe to help make metal parts, along with full welding equipment. Call, Joe Perry at 408-379-8568.

#### NEWS NOTZ: Late bulletin arrivals

Charles Carlson tells me that he has been successful in observing comet Halley from east San Jose. During the week of Oct. 17th, Charles tracked down the comet with his 10-inch f/6 Newtonian reflector. He estimated the comet's magnitude to be around 11.0 by comparing it to galaxies of similar magnitudes and angular diameters. Using the finder chart in the August Astronomy, greatly facilitated Charles' search for the faint comet within the city limits.

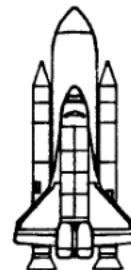
There is now a locked gate at the beginning of the dirt road leading to our usual observing site at Loma Prieta. Call Don Machholz ((408) 448-7077) for the combination.

Since Don's announcement in the September newsletter, a half-dozen of you have signed up to show the comet to the public. There is room for more. If you wish to help, call Don at (408) 448-7077. Observing sessions will be held at Branham Lane Park. This is on Branham Lane, one-half mile east of Camden Ave. Dates are Nov. 16 & 19, Dec. 7 & 10, and Jan 4 & 7. Times are 6:30 to 8:30 PM. In case of rain, clouds or fog, the observing session will be cancelled.

#### SPACE PROGRAM UPDATE BY: BOB FINGERHUT

##### ATLANTIS COMPLETES FIRST MISSION

Mission 51-J was launched on 30 Oct. and ended with touchdown at Edwards AFB on 7 Oct. It was a classified Air Force mission.



##### CHALLENGER READIED FOR 30 OCT. LAUNCH

Mission 61-A is scheduled to carry the German Spacelab D-1 payload on a seven day mission with a crew of eight. The experiments are primarily studies of materials, life sciences, communications and navigation.

##### U.S. SPACE STATION REDESIGNED

The "power tower" has been replaced with a configuration called the "dual keel". The long backbone of the power tower has been joined by a second long beam. The new structure looks something like a boxy figure eight with solar panels mounted on a long beam across the center. Habitable modules are mounted near the center, also in a boxy figure eight orientation.

## GIACOBINI-ZINNER COMET FLYBY YIELDS RESULTS

Theories about the interaction of the solar wind and a comet were confirmed when the International Cometary Explorer (ICE) flew by comet 6Z and detected a narrow neutral sheet between two polarized lobes surrounding the comet. The issue of whether the comet has a bow shock is less clear. There was some activity where the bow shock should have been but its nature is not yet understood. Inside the tail ICE confirmed the dirty-snowball theory of comet construction. Ice was found to be the primary element present.

## COMET RENDEZVOUS MISSION KILLED

NASA has decided not to seek funding for the mission to rendezvous with comet Wild-2 and drop a penetrator into its surface. It has been decided instead to pursue an International Solar/Terrestrial (ISTP) satellite program and the TOPEX oceanography spacecraft.

## SALYUT 7 HAS NEW CREW AND MODULE

A three man crew was sent up to the Salut 7 space station on Sept 17th to join the 2 men that had been there since June 6. Two returned to earth on Sept. 25, including one Cosmonaut who had been there for 111 days. This was the first time that overlapping crew operations were demonstrated. On Sept 27th, a large module was launched to dock with the space station. It nearly doubles the stations size and provides it with a Gemini capsule sized reentry vehicle for returning products to earth.

## NEW SHUTTLE LAUNCH PAD BEING READIED

Pad 39B is being readied for its first launch, Mission 51-L, on 22 Jan. The launch is a validation of the pad for the launch to the Ulysses and Galileo missions next May, just 6 days apart.

## CAUSE OF ARIANE FAILURE ATTRIBUTED TO VALVE

Leakage in the third stage hydrogen injection valve used to pre-cool the stages engine is being blamed for the Sept. 12th launch failure.

## PLANETARY NEBULAE IN AQUARIUS, PEGASUS, AND ANDROMEDA BY: JACK MARLING AND STEVE GOTTLIEB

This month we head south below the Fall Milky Way overhead to examine planetary nebulae in Aquarius, Pegasus, Andromeda, and Grus. Since most planetary nebulae are concentrated in the plane of the galaxy

where all the stars are located, constellations away from the Milky Way tend to be almost empty of planetary nebulae. If a planetary is located in one of these constellations, the planetary will tend to be relatively nearby and hence bright and/or larger in angular size. This month we have some large planetary nebulae such as NGC 7094, IC 5148/50, NGC 7293, and Jones 1. We also have two bright showpiece planetary nebulae, NGC 7009 and NGC 7662. All these planetary nebulae are summarized in the table.



## DESCRIPTION OF INDIVIDUAL OBJECTS

NGC 7009 Discovered by William Herschel in 1792, NGC 7009 is a real showpiece. Most observers try to see the two faint ansae, which give NGC 7009 its nickname "Saturn Nebula". However, if you look at the core at high magnification, you will see a lovely double shell with roughly circular outer shell and a very elongated bright inner shell, similar to the "Eye Nebula" NGC 3242. Using a 13" Odyssey at 288X Steve noted, "A faint outer shell encasing the bright central region is just visible, and the 2 ansae are faintly visible with western extension easier".

PEASE 1 Discovered by Pease in 1928, this planetary is also called K 648. This planetary is highly unusual since it is located right inside the globular cluster M-15 and is the only planetary known to be located in a globular. So far as we know, it has not been seen visually and the brighter stars in M-15 will hinder sighting a 15 mag. stellar planetary. To see Ps 1, trying using a UHC filter to suppress the stars in M-15, and look 28 arc-seconds north and 10 arc-seconds east of the core of M-15

NGC 7094 Discovered to be a planetary by Kohoutek in 1963, this object already had an assigned NGC number. It is a large, low surface brightness planetary identical to many that Abell found. With a 14.4 magnitude surface brightness, you will need a high performance filter to see it well. Using a 13-inch Odyssey from Fremont Peak, Steve noted, "Without a filter at 62X the faint 13.5m central star is visible surrounded by a very low surface brightness halo. With O-III filter, the nebulosity is moderately large, round, fairly faint". NGC 7094 is almost a "blinking planetary" where you see only the star without a filter, and only the nebula with a filter.

IC 5148/50 This far southern planetary in the constellation of Grus was discovered by the astronomer Hoffmeister in 1961, who assigned it a photographic magnitude of 13. When I was on Mauna Kea in June, 1985 to photograph planetaries, I routinely aimed the 24" telescope at one more obscure planetary to see if it was worth looking at. Based on its published 13th magnitude, I expected it to be almost invisible with a 14.5 magnitude surface brightness. When I observed it at 280X with a UHC filter I was astonished to see a bright 11th magnitude showpiece object. My observing notes say, "Exquisite giant ring! 15-16m central star visible, irregular circle with darker center". For me IC 5148/50 was a real "discovery" as it retrieved an object from obscure anonymity to a known showpiece for deep-sky observers. The -39° declination hinders observation from California, but using his 13" Odyssey from Digger Pines, Steve noted, "Not readily visible without a filter, but at 79X with an O-III filter the planetary is moderately bright, fairly large, and with averted vision appears annular". You will need to plot IC 5148/50 on the Tirion Atlas, as it is not marked.

NGC 7293 Determined to be a planetary nebula by Curtis in 1918, NGC 7293 at magnitude 7.3 matches the Dumbbell Nebula M-27 in integrated overall brightness. However, the huge size of nearby NGC 7293 results in a low 13th magnitude surface brightness, making it harder to see without a filter. From Digger Pines, it is just barely visible in a 12x80 Super-Finder. However, in a 17½" telescope at 82x with an O-III filter it is astounding! It appears as a really bright elongated disc darker in the middle. From Fremont Peak Steve notes, "easily visible in an 8X50 finder using a UHC filter. At 88X in the 13" Odyssey (unfiltered) many superimposed stars are visible including the mag. 13.4 central star. Using the UHC filter the huge planetary is clearly annular with a bright rim which dims slightly on the western edge".

Vy 2-3 Although named after Vyssotsky, Vy 2-3 was first determined to be a planetary nebula by Miller in 1945. You will need to "blink" with a filter to find this nearly stellar 13.6m planetary. I observed it on September 14, 1985 from Digger Pines, and simply noted it as a "pretty bright 13m Stellar Planetary" as seen with a 17½" telescope.

NGC 7662 Discovered by William Herschel in 1784, NGC 7662 is a bright 8th magnitude showpiece. With mag. 6.8 surface brightness, some observers will even see it in color. It is a lovely double shell planetary like NGC 7009 and NGC 3242. Using a 13" Odyssey at 288x Steve noted, "A second fainter outer shell is visible encasing the bright main body and the center is slightly darker giving an annular appearance".

JONES 1 Discovered by a Mr. Jones in 1941, there still seems to be no planetary yet discovered by Smith. This giant planetary in Pegasus has an exceedingly low 15-16 mag. surface brightness, so it is completely invisible without a good filter. However, it becomes a "showpiece" for an obscure planetary when using an O-III filter to observe it. I was probably the first person to see Jones 1 visually (on November 1, 1984). Using a UHC filter at 105x from Digger Pines I noted, "Superb, large but very faint planetary invisible w/o filter. Dark in middle, non-uniform ring-like appearance, No central star, but one interior star is visible". Using his 13" Odyssey Steve noted, "At 62x the O-III filter shows a large, fairly faint annular planetary! Brighter arcs are visible along the north and south portions of the rim, which is dimmest towards the east. To locate, go 33 arc-minutes south of a 7 mag star on the Tirion".

K 1-20 Discovered by Kohoutek in 1963, this last planetary is a real killer! I finally saw this 16th magnitude planetary on August 25, 1985, and was definitely the first person ever to see it. K 1-20 is the faintest deep-sky object I've yet seen, and is about 2 magnitudes fainter than NGC 7317, the faintest member of Stephan's Quintet. Using an O-III filter at 150x from the Digger Pines 17½" telescope I noted, "Extremely faint, visible only part of time with averted vision, appears circular, just south-west of a pair of stars". Full dark adaption with well rested eyes was necessary. To find K 1-20 go 47 arc-minutes south and 12 arc-minutes east of a mag. 7.1 star plotted in the Tirion.

#### PLANETARY NEBULAE in AQUARIUS, PEGASUS, and ANDROMEDA

| Name       | Constell. | 2000.0 Coordinates | Size    | Mag.    | H    | Nucleus |
|------------|-----------|--------------------|---------|---------|------|---------|
| NGC 7009   | Aquarius  | 21h 04.2, -11°22   | 30x26   | 8.0     | 6.4  | 11.5    |
| Pease 1    | Pegasus   | 21h 30.0, +12°10.5 | 1"      | 15.5    | 6.6  | 7       |
| NGC 7094   | Pegasus   | 21h 36.9, +12°47   | 99x91   | 13.4    | 14.4 | 13.6    |
| IC 5148/50 | Grus      | 21h 59.6, -39°23   | 120"    | 11±.5   | 12.5 | 15-16   |
| NGC 7293   | Aquarius  | 22h 29.6, -20°48   | 880x720 | 7.3     | 12.9 | 13.4    |
| Vy 2-3     | Andromeda | 23h 23.0, +46°54   | 5"      | 13.6    | 8.0  | 14.4    |
| NGC 7662   | Andromeda | 23h 25.9, +42°32   | 32x28   | 8.3     | 6.8  | 11.8    |
| Jones 1    | Pegasus   | 23h 35.9, +30°28   | 350x314 | 12.1    | 15.0 | 16.1    |
| K 1-20     | Andromeda | 23h 39.2, +48°13   | 37x31   | 16.1±.6 | 15.0 | 20.1p   |

The table gives the name, constellation, and epoch 2000.0 coordinates so you can plot the obscure ones on the Tirion Sky Atlas 2000.0. The size is in arc-seconds, and the magnitude is the true visual magnitude as seen by dark-adapted eyes. The brightness H is the magnitude of a 60 arc-second planetary of the same surface brightness. The nucleus is the yellow (v) magnitude of the Central Star, which is close to the visual magnitude.

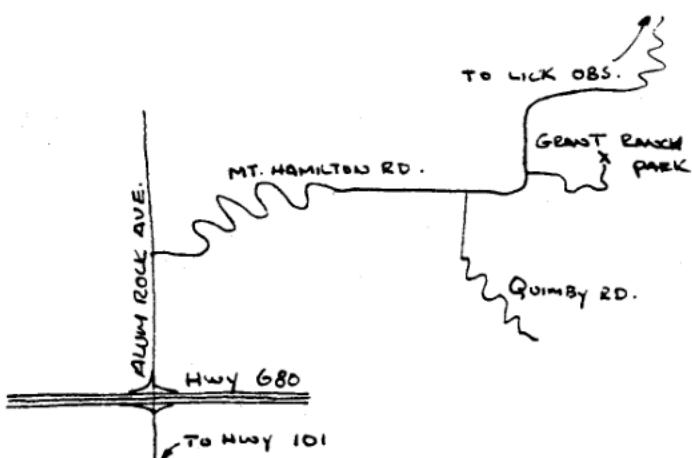
## GENERAL MEETINGS:

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.



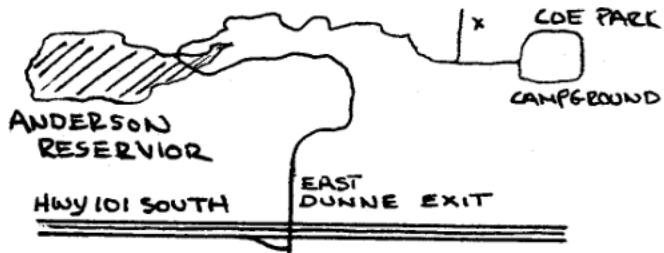
## GRANT RANCH COUNTY PARK:

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.



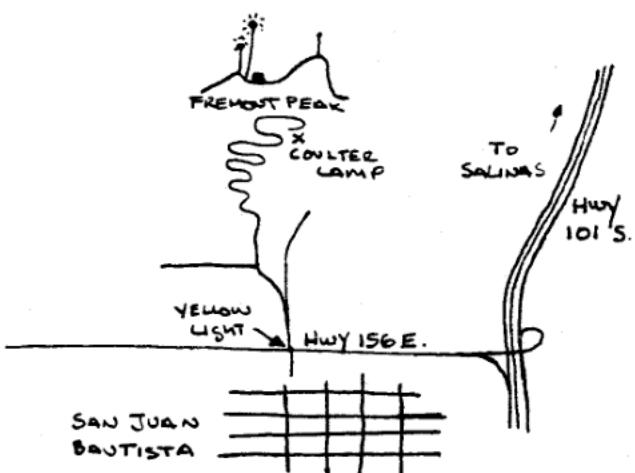
## HENRY COE STATE PARK:

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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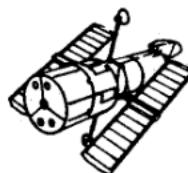
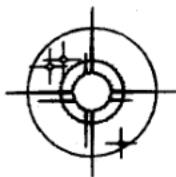
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What are your astronomical interests (e.g. astrophotography, deep-sky observation, telescope making, etc.)? \_\_\_\_\_  
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Please bring this form to any SJAA meeting, or send to:

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San Jose Astronomical Association  
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Milpitas, CA. 95035

[ Phone: (408) 262-1457 ]

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