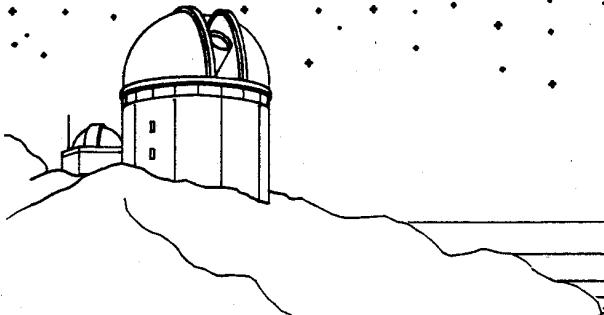


EPHEMERIS

OF THE SAN JOSE ASTRONOMICAL ASSOCIATION



AUGUST 1985

***** AUGUST 3RD *****
ERNEST W. PIINI PRESENTS:
NEW GUINEA TOTAL ECLIPSE
8PM

***** AUGUST 10TH *****
FPOA TELESCOPE SALE
FREMONT PEAK STATE PARK

***** SEPTEMBER 7TH *****
EQUIPMENT AND SLIDE NIGHT
8PM

And so ended a rather frustrating weekend for myself at Yosemite.

Frustrating you ask? Well, first of all even though there were months of advanced planning, the federal park service was not ready for our large group. In fact I think that only a handful of park staff knew we were coming since many members ended up paying entrance fees and campsite fees. Sorry folks, the park officials had a month to contact me and make changes in our camping arrangements. The frustrating part for me however was that I could not convince park employees of this. In fact there were even comments to the effect that we were taking space away from guests who come from all parts of the world to visit Yosemite. Secondly, there seemed to be some dismay on the part of the park staff that we were also bringing our families along. They thought that this was to be for astronomers and their telescopes only! Who were all of these other people for. Do they operate the telescopes too?

AUGUST 3 GENERAL MEETING, 8PM AT THE LOS GATOS RED CROSS BUILDING. ERNEST W. PIINI WILL PROVIDE COVERAGE OF LAST YEARS TOTAL SOLAR ECLIPSE THAT PASSED THROUGH NEW GUINEA; THE EAST INDIES.

AUGUST 10 FREMONT PEAK STAR PARTY, DUSK TILL DAWN. FPOA TELESCOPE SALE

AUGUST 17 STAR PARTY AT HENRY COE STATE PARK. DUSK TILL DAWN.

AUGUST 24 BOARD MEETING AT TOM AHL'S HOME. 8PM

AUGUST 31 INDOOR STAR PARTY AT THE LOS GATOS RED CROSS BUILDING. DOORS OPEN AT 8PM.

SEPTEMBER 7 GENERAL MEETING AT THE LOS GATOS RED CROSS BUILDING. SLIDE AND EQUIPMENT NIGHT. DOORS OPEN AT 8PM.

SEPTEMBER 14 AACN CONFERENCE AT NASA AMES.

FIELD OF VIEW
BY: JOHN GLEASON

YOSEMITE TRIP

Whew! Norma and I finally made it back from Yosemite, 24 hours after our Sunday morning departure and \$600 poorer. Seems that we blew a head gasket in Turlock as a result of severe overheating in the 105° valley temperatures! This was largely due to a clogged radiator which also had to be repaired. Ever been stranded in Turlock on a Sunday afternoon. This is a town where they roll up the sidewalks at 3 pm.



I finally met with Park Ranger Dave Balogh at Glacier Point who in the past had organized the yearly event. Dave told me that he was not in charge of this years formal arrangements, but due to the problems of large groups attending (PAS has over 70 people coming up on July 19/20) he would be handling everything from here on out. Next year we can all expect car limitations, a ratio of 1 telescope per every 2 people, and more formal camping arrangements; including name lists and camping passes.

Of the 30 carloads I had signed-up, I counted only 18 present at Bridalveil campground. This certainly helped the situation in the campground, and we still ended up with nearly 30 telescopes at the point on Saturday evening. And, our prime objective had been met. Yosemite park guests were enjoying every minute of observation with us and I estimate that around 600 guests wandered through the telescopes Friday and Saturday nights.

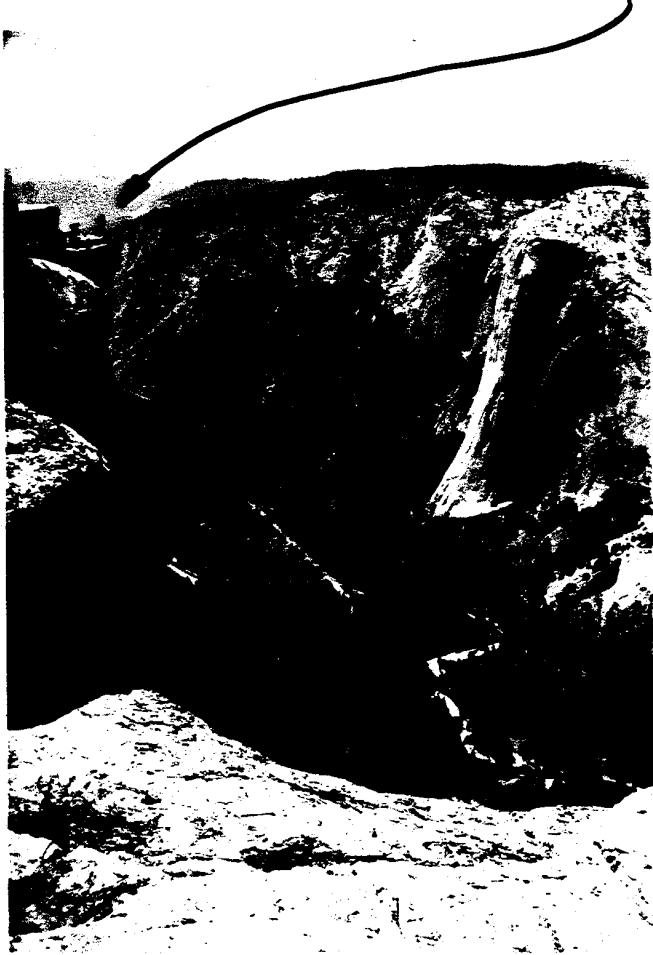
The weather was excellent for observing. Seeing was quite steady with double stars and the planets showing quite well. So well infact, that on Saturday nite, I got "Power Hungry" and cranked the Super C8 up to 1200x on Jupiter. Although the planet looked a little soft in the 4.8 Nagler and 3x barlow, the moons showed distinct disks! (No volcanic activity to report on IO this evening)

Frank Dibble was showing everyone off with his 3.5" Fluorite Refractor. I don't ever recall seeing images as clear as these with any 3.5" telescope before. Even at 400X, Planetary images were of high contrast and sharp! And talk about driving trains through the Double Double in Lyra!

New member William Phelps was there with the Celestron Sky Sensor computer controlled Super Polaris mounting and 6-inch f/5. Bill had done a number of modifications to the Sky Sensor control box to make it a little more user friendly in the dark. It was fun to watch the coordinates being entered and see the telescope move from the Veil Nebula to dead center on the Ring Nebula in about a minute or so. Maybe there is something to these computerized telescopes after all.

Saturday, a number of us climbed to the top of Sentinel Dome and checked out the Ansel Adams tree. It's dead. After morning the death of this unusual tree, a number of us tromped off to Taft Point to take some "Hero" photographs. You know the ones; where you walk onto the edge of a sheer granite cliff, and their is only 3000 ft between you and the valley floor.

Yes, that's Bob "I did it myself" Fingerhut out there contemplating the great leap!



The San Jose Gastronomical Association was also in attendance this year. What with Beef Kabob's, Filet Mignon, BBQ Chicken, Corn on the Cob, Ceasar Salid, Bacon and Eggs, Pancakes, Fine vintage wines, being divoured the whole time we were there. A Y yuppie's delight. Next year it's New England Lobster and Alaskan Smoked Salmon! BMW owners only, please!

Despite a few problems with the logistics this year at Yosemite, I think a fine time was had by all. The weather was perfect, the skies clear and steady. As I am writting this, the PAS is setting under thundershowers at Glacier Point.

COE PARK STAR PARTY

Jim Van Nuland has ask me to tell everyone to remember that the Henry Coe observing area is a lot smaller than at Fremont Peak. With the increased attendance at Star Parties this year, we want to be careful not to block the road at the Coe Park site. We don't want to have the Park Rangers telling us to move. Also, we need to be aware of the Extreme fire danger in the area. Watch where you park. Catylitic converters can become very hot and can easily set-off dry grass. NO SMOKING PLEASE!

SJAA 1955 - 1985 THIRTY YEARS AND COUNTING

This month marks our Thirtieth Anniversary. I only wish I had been able to get a hold of some historical data about the SJAA to present here. In this month's Ephemeris there is an interesting article looking some 70 years back at the Bay Area. I cannot imagine what the observing environment must have been like here 30 years ago, let alone some 70 years. But it must have been great. In 1976 I attended my first star party at Fremont Peak. Now those were some dark skies! In just 9 years, I have seen the skies go from an average of very good and excellent, to just good today.

Several of the original members are still around. Gene Cisneros was at the first meeting of the SJAA. You can usually catch Gene at the General Meetings. You can ask him what it was like "way back when".

Today we are witnessing the FPOA erect a 30" amateur telescope at Fremont Peak. The SJAA is also looking at the possibility of a permanent site at Grant Ranch Park. SJAA members have been active in all aspects of amateur astronomy and have received world recognition. SJAA telescope makers, comet hunters, and astrophotographers are in the popular astronomical magazines nearly every month. Our membership is well above the 200 mark and growing steadily each month. The monthly bulletin "Ephemeris" has gone from a single page calendar of events to the most recent 14 page July issue. The Ephemeris has also gone through about 10 different Editor's in past years, but I won't go into details here! The SJAA Annual Astronomical Auction has also turned out to be one of the biggest Bay Area amateur astronomical events.

LOOKING AHEAD: A growing Bay Area will only mean over population and more light pollution. The increase in light pollution will also mean driving further and further to dark sky sites for astronomical observation. We'll probably see a return of homebuilt telescopes as commercially made units steadily rise in price. C8's are already nearing the \$3000 mark. But the commercially available telescopes will probably become more and more computerized, as already in 1985 a major manufacturer has entered the automated telescope market. It's hard to predict what size telescopes SJAA members will be using in the 21st century. Already 17 1/2-inch scopes are common place, but the refractor is also finding its place once again in the amateur's hands.

The SJAA has been a unique combination of active and non-active members. It seems that there is always a small group of dedicated people who keep things running for the benefit of the general membership. While this is good, it would be nice to see more of the membership get involved in our activities. The return of Halley's Comet will provide an excellent opportunity for each and every one of us to do a little PR work to benefit the organization.

SJAA 2015

In the SJAA Video Magazine this month: Kevin Medlock describes his 60" space telescope project. Long time member and retired Lockheed engineer Robert Fingerhut describes viewing Jupiter from earth orbit. John Gleason, President of Astro-Photo films inc. describes enhancing your comet Halley astrophotos with your home computer. King Dibble throws a star party.

Well.....he always wanted to be king!

THE GREAT FPOA TELESCOPE SALE

On August 10th, the Fremont Peak Observatory Association will be conducting a sale of telescopes to benefit the 30" observatory project. Over a hundred telescopes will be available for purchase, some brand new. There will also be equitorial mounts and tripods available.

MOON SHADOW EXPEDITION TO NEW ZEALAND

A 14 day trip to New Zealand to observe comet Halley is in the works from Moon Shadow Expeditions. A once-in-a-lifetime experience is available next spring when Halley's Comet comes into view. Viewing is best in the Southern Hemisphere, so this trip to New Zealand has been arranged which includes three days devoted to skygazing. High on the alpine plateau of the Mckenzie Basin, far from city lights, the location will ensure a unique opportunity to peer into the dark Southern sky and observe this spectacle. Technical staff on hand will include the SJAA's own comet expert Don Machholz, and astrophotographer John Gleason. Facilities include a range of photographic and viewing equipment, with the technical staff on hand to lend advice and support. For further information; Please contact Steven Greenberg, P.O. Box 292, Livermore, CA. 94550. (415) 423-4899. days, (209) 239-6550 evenings.

CLUB 14-INCH DOBSON

Charles Carlson tells me that he is ready to pass along the club's 14" Dobson telescope to another member. If interested please contact Charles at: 923-7592 days, 923-0990 eves.

BOOK LEFT BEHIND

Ron Atwood left an Atlas of Deep Sky Splendors on a Honda car at the Glacier Point Star Party. He tells me that the car was owned by a SJAA member with the first name of Rick or Rich. Ron would really like to get this book back. Please contact him at 408-395-6130. Thx.

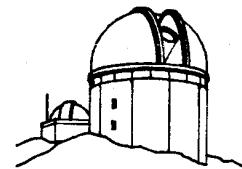
SEPTEMBER 7TH SLIDE AND EQUIPMENT NIGHT

Once a year SJAA members gather together to show off new equipment, photographs and slides. This used to be one of our best attended meetings, but in years past only a handful of telescopes were on display. I want to encourage all of you to participate. Bring a telescope for show and tell. Or a new accessorie or two. I'll try and bring a selection of my finest astrophotography. I may even have some of my work for sale in the form of mounted 8x10 Cibachrome prints. See you there!

A NIGHT AT MIRA

OR: HOW TO DEVELOP A SEVERE CASE OF
APERATURE FEVER IN ONE NIGHT
BY: CHRIS PRATT

Saturday June 15 arrived and I was ready. Kevin Medlock had invited me to accompany him for a nights viewing through the 36"



telescope at the Monterey Institute for Research in Astronomy (M.I.R.A.). With this in mind, I gathered together a list of familiar objects and their coordinates in case we got the chance to select our own objects.

Once there we were treated to a cooks tour of the telescope, observatory and support equipment by caretaker and chief electronics wizard; Mike Simmons. I was surprised at the level of self sufficiency that has been designed into the observatory. Everything is run off of batteries with a wind generator to keep the batteries charged. There is also a motor generator for back-up electricity in case of battery failure.

Anyway, on to the important stuff. The seeing that night was good with stability and transparency equal to a good night at the peak. The weather even co-operated with a comfortable temperature throughout the night.

After the roof was retracted and the scope had reached thermal stability we started our nights observing. The first object up was one of my favorites; M-51. Mike put this object up first because, in his words, "I want to blow your socks off with the best object for the 36". Well friends, my socks were truly blown off and runaway aperture fever grabbed hold of both Kevin and myself.

I will digress a little at this point to give you some idea of what we were working with. The 36" is an f/10 system and for most of the evening we were using a Tele View 40mm wide angle eyepiece. This combination yielded a power of 228x and this is about as low a power as we could get.

With the scope on M-51 and using the 40mm eyepiece, an incredible view awaited us as M-51 proudly filled half the field of view! There was no longer any question of whether we could see "spiral structure" or other details. We were now seeing plainly the spiral arms with star clouds connecting the arms to each other. The bridge to the companion galaxy was bright and there were bright clumps in the arms. In short, it looked like the photograph on my wall at home. (the one I bought at Lick)

Needless to say Kevin and I were suitably impressed. Next we looked at NGC 4565 only to discover that it would not fit in the field. Again we were able to see most of the details found in a photo. Other objects, such as M-8 and NGC 6960 (Veil Nebula) required extensive scanning to see a large portion of the detail visible.

We continued to look at the usual galaxies, planets, and nebulae throughout the night until we came to Lyra. After putting enough space between the doubles to drive a freight train through, we went on to the Ring Nebula. This was about the time we started to get a little crazy. Kevin got the bright idea to use more power to be able to see the central star. Well one thing led to another and before we knew it Kevin had the 36" up to a little over 3000 power. At this power the central star was a large fuzzy blob, the second star was plainly visible and the third star was more than "suspected". Also, we were no longer looking at the ring itself, only the inner fringe was visible at the edges of the field.

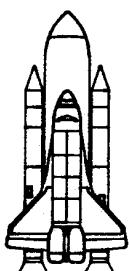
In addition to all of this excitement we were treated to not one but two satellite re-entries, a three stage rocket launch from Vandenberg, and several nice meteors. Finally Kevin and I reached a state of nearly complete exhaustion and reluctantly turned in, celestial wonders still vivid in our recollection, until finally sleep. It was a night I will remember for years to come.

SPACE PROGRAM UPDATE BY: ROBERT FINGERHUT

SPACELAB 2 DELAYED TO END OF JULY

The mission was aborted July 12 when a computer detected a problem after the

liquid fuel boosters ignited but 3 seconds before liftoff. Two other flights this year will have to be rescheduled.



GIOTTO LAUNCHED TOWARD HALLEY'S COMET

The European spacecraft was launched on an Ariane 1 booster on 2 July. After three orbits of Earth the spacecraft was put on an escape trajectory that will take it within 310 miles of Halley's comet on March 13, 1986.

THREE SHUTTLE SPARTAN PAYLOADS SCHEDULED FOR 1986

The satellites which will be deployed and retrieved by the shuttle are: 1. Spartan Halley - An ultraviolet spectroscopy experiment that will be used to observe Halley's Comet in January 1986. 2. Spartan 2 - Sun observations in ultraviolet and white light to fly in Oct. 1986. 3. Spartan 3 - a stellar spectrographic camera to observe regions of star fields, to fly in Dec. 1986

MISSION 51-F (SPACELAB 2) IS DEDICATED PHYSICS, ASTRONOMY, AND LIFE SCIENCE

Investigations are planned in Solar physics, atmospheric physics, plasma physics, high-energy astrophysics, infrared astronomy, technology research, and life sciences. Experiments include Solar Magnetic and Velocity Field Measurement System (SOUP), Solar Coronal Helium Abundance Spacelab Experiment (CHASE), Solar Ultraviolet High Resolution Telescope and Spectrograph (HRTS), and Solar Ultraviolet Spectral Irradiance Monitor (SUSIM). SOUP is designed to observe the strength, structure and evolution of magnetic fields in the solar atmosphere and to determine the relationship between these magnetic elements and other solar features. The goal of CHASE is to determine accurately the helium abundance of the Sun. HRTS will study features in the Sun's outer layers; the chromosphere, the corona, and the transition zone between. The SUSIM investigation is aimed at determining both long and short term variations of the total ultraviolet flux emitted by the Sun. The shuttle will also release the Plasma Diagnostic Package (PDP) to study natural plasma processes, orbiter-induced plasma processes, and beam plasma physics. The shuttle will fly around the PDP and then retrieve it.

Other experiments carried in the cargo bay include the Plasma Depletion Experiments for Ionospheric and Radio Astronomical Studies, Small Helium Cooled Infrared Telescope (IRT), Elemental composition and Energy Spectra of Cosmic Ray Nuclei (EGG), hard x-ray Imaging of Clusters of Galaxies and other extended x-ray sources (XRT), and Vehicle Charging and Potential Measurement (VCAP)

Mid-deck experiments include an investigation to measure the vitamin A metabolite levels of crew members, one aimed at determining the effects of microgravity on production of lignin in higher plants (lignin binds plant cells together to provide rigidity), a shuttle amateur radio experiment, one involving protein crystal growth, and tests of carbonated beverage dispenser devices developed by Coca Cola and Pepsi Cola.

AN EXCITING YEAR AHEAD FOR ASTRONOMY

Just because of the hype about Halley's, don't forget about the other exciting astronomy missions which will occur over the next year. This Sept. the International Cometary Explorer will flyby comet Giacobini-Zinner. In Jan 1986 Voyager 2 will flyby the planet Uranus on its way to a 1989 date with Neptune. In May 1986 Galileo will be launched toward Jupiter. Also in May 1986 the Ulysses Solar Polar Orbiter will be launched.

GALAXIES: The most popular galaxy below -40° dec. is NGC 5128 or Centaurus A, a well-studied peculiar radio galaxy. Though its declination is -43°, its wide dark dust band is quite evident from Digger Pines separating the dominant southwest hemisphere from the detached northeast section.

Heading further south I have observed NGC 7213 in Grus located at 22h 09m -47° 10' (2000). The field of this small round mag 11 galaxy is a snap to locate as the galaxy is situated just 16' southeast of mag 2 Alpha Grus. Alpha is the western most star in a large prominent triangle of stars near the southern horizon on fall evenings.

OPEN CLUSTERS/EMISSION NEBULAE: The open cluster NGC 6193 in Ara at 16h 41m -48° 46' is notable since its brightest star, h 4876, is a pretty double consisting of a mag 5.6 and 6.8 stars separated by a healthy 10". I viewed this grouping in my C8 at Fiddletown in the Sierra foothills in July of 1982 and in addition to the duo, recorded a number of faint stars visible with averted vision. Nearly adjacent to the cluster towards the southwest is the nebula NGC 6188. Though photographs reveal a fascinating complex region of bright and dark nebulosity, I was pleased to simply record a faint hazy glow at this declination of -48° 47'.

If others have viewed more southerly deep-sky objects from Northern California, I would like to hear from you and print your results.

THE CELESTIAL TOURIST SPEAKS BY: JAY REYNOLDS FREEMAN

The star party at Fremont Peak on July 13 was less well attended than most -- I guess a lot of people had gone to Yosemite.

When I arrived, an hour or so before sunset, temperatures were balmy rather than hot, and they remained so up till my midnight departure. The fog was in on the coastal plain, blanketing the lights of Salinas and Santa Cruz. In consequence, the sky was exceptionally dark.

My only instrument was a 11X80 Celestron binocular. I spent an hour or so with it, reviewing many old acquaintances among the Messier objects, and then exploring the rich tapestries of star clouds and obscuring matter in toward the center of the galaxy.

The 11X80 is an outstanding instrument for Messier objects. It is large enough so that they are all easy to see, and has a sufficiently wide field that they are easy to find. The Virgo galaxy cloud was setting in the west as twilight ended. The bright galaxies M-84, M-86 and M-87, at its heart, were trivially identified. Further to the north, M-51 and its companion galaxy, NGC 5195, were equally easy, as were M-81, M-82 and the soft round glow of M-101.

I had forgotten exactly where M-92 was, but here the wide field of the binocular proved its utility: It took only a few seconds of sweeping in northern Hercules to find it, almost as spectacular as the more popular nearby globular, M-13.

The southern Milky Way was of course full of detail -- most fields showed many prominent objects at once. The Dark nebulae were fascinating. The binocular has a field almost five degrees across, which is sufficient to show the interstellar obscuring matter not only as variations in star density from field to field, but as textured material in its own right, with many streaks and folded sheets, like veins in marble. Indeed, some of these features are prominent to the naked eye. I showed the "Pipe Nebula" whose stem runs nearly east-west along the Ophiuchus-Scorpius boundary, and whose bowl is a large complex of dark masses between eta and xi Ophiuchi, to several people.

It was also fun showing newcomers another prominent naked-eye object. Twice that evening I helped someone find NGC 4565 in a telescope large enough to show the long banded streak and nuclear bulge of this beautiful edge-on spiral galaxy. "And there's another one," I would say, turning the observer around and gesturing at the Milky Way arching across the eastern sky, divided by the great rift in Cygnus, expanding into the vast luminous star clouds of Sagittarius. "Oh," they would reply, "oh."

Don Machholz was there with his 10-inch, trying to find Comet Machholz after perihelion passage. No luck. I had been reported after perihelion by one of the Japanese observers, but faint and fading fast. Evidently it lost a great deal of matter on close approach to Sol. Several pundits were encouraging Don to get some comet decals and affix two of them to the side of his instrument.

It was fun looking through some of the smaller telescopes. One newcomer was there with a 60mm refractor. Could we see anything interesting through it, besides the planets? Well, a moment's search showed M-51 and its companion, plainly nonstellar. Such an instrument will show the entire Messier catalog, and at least several hundred additional deep-sky objects as well, not to mention many double stars.

Someone else had an 80mm f/5 refractor on a photographic tripod. Celestron imported some of these for a while, I think, though I do not believe this particular example had their label on it. It worked very well! We had a nice view of the Veil Nebula through it, at about 14 diameters magnification. We could see not only the brighter, eastern arc, but also the wispy western nebulosity that seems to include 52 Cygni. The owner took this telescope backpacking regularly. It was much less bulky than my 80mm binocular, weighed less, and appeared more versatile.

Other telescopes ranged from a 40mm refractor up through a 17.5-inch Dobson with coulter optics. There were several Coulter Odyssey 10's as well -- this smaller instrument is much easier to carry and set up than its larger cousins.

It was a beautiful night.

COMET RENDEZVOUS/ASTEROID FLYBY RETARGETED

CRAF (planned to be a 1987 new start) had to be retargeted due to budget changes which will delay the development of the Mariner Mark II spacecraft. Launch is now planned for 10 March 1991 to flyby a type-MP dark carbonaceous asteroid called Hedwig on Sept 23, 1991. Hedwig has a diameter of 75 miles. The spacecraft will then continue on to a Jan 8 1995 rendezvous with Comet Wild 2. CRAF will stay with the comet for more than two years until Sept 1997. Comet Wild 2 has a period of 6.4 years.

VEGA 1 AND 2 ARRIVE AT VENUS

The two Russian spacecrafsts deployed balloons into the atmosphere of Venus on June 11 and June 15. Both balloons transmitted data for 46 hours while traveling one-third of the way around the planet. The 10-foot diameter balloons carried a thermometer, pressure gauge, vertical wind anemometer, photocell and nephelometer to measure cloud density (not nephels). They flew at 180,000 ft. Venus landers were also deployed. Both appeared to work well. The Vega 1 lander lasted 21 minutes on the surface. The landers contained instruments to measure pressure, temperature, and do chemical analysis during descent. It also contained an x-ray fluorescence analyzer and gamma-ray spectrometer for determining surface composition and radioactivity. The spacecraft will continue on to flyby Halley's Comet in March 1986. They will provide television imagery and contain an infrared spectrometer, three-channel spectrometer; a counter, mass analyzer and mass spectrometer for dust particles; a low/high frequency plasma wave analyzer; neutral gas mass spectrometer; and a magnetometer.

SHUTTLE MISSION 51-6 ALMOST PERFECT

Discovery was launched June 17 and landed on June 24. During its seven days in orbit, astronauts deployed three communication satellites, tested a laser tracker, deployed and retrieved a Spartan astrophysics pallet satellite, and carried six Getaway Special canisters.

ASTRO ADS

LOOKING for a 10 or 13-inch Dobsonian or a comparable telescope. Please call Steve Pehanich at 408-226-2341

FOR SALE: Super C8 Plus w/ Starbright, latest model, w/ wedge and Meade tripod; quartz drive corrector; 7 TeleVue eyepieces incl. Widefields, Nagler; Lumicon premium filters; many other accessories too numerous to list here. All absolutely like new; forced sale. Erik Swenson 415-652-4587 (eves/weekends)

FOR SALE: 10" f/6 Newtonian tube assembly, custom mirror. Lumicon helical focuser, 10x70 finder, rotating rings. Excellent condition, must see \$500. Lumicon Newtonian Easy Guider, with 3x relay diagonal \$175. Meade 2.3" guidescope, never used \$75. Eyepieces; Teleview Plossl, 7.4mm \$50, 40mm \$60. Celestron 2", 25mm \$60, 1 1/4" - 40mm, 25mm, 12mm, 6mm never used \$40 each, \$125 for the set. Orion, illuminated double reticle, 12.5mm guiding eyepiece \$50. Contact Steve Mandel 408-425-0930

DEEP SKY NOTES - AUGUST BY: STEVE GOTTLIEB

While looking over the extreme southern declination (-47°) Halley's comet will reach next April 10 just one day prior to its closest approach to Earth. I wondered what were the most southerly deep sky objects I have recorded from our vicinity. For example, at a latitude of +47° an object with a declination of -53° will transit the meridian on the observer's theoretical horizon (excluding the positive effect of atmospheric refraction). In actual practice, such an observation is rarely possible. At the horizon, numerous factors such as natural and artificial obstructions, haze, poor seeing and atmospheric extinction combine to dim and bloat stellar images. The effect on extended objects such as galaxies is even more extreme as they fade into the murky background. Nevertheless, with perseverance quite a bit can be accomplished down to within 5° of the horizon given optimal conditions. In checking my records, I noticed many of my deep southern objects were recorded at Digger Pines which has a fine unobstructed southern horizon given optimal conditions. Generally, I have limited my own searches to -45° with some exceptions, so there are probably a number of more southerly objects a systematic observer can locate from our region.

PLANETARY NEBULE: Just inside the declination band of -40° to -50° is NGC 3132, the "Eight-burst planetary" in Vela. Even at a low elevation it is a striking object in my C8 with a prominent mag 9 central star surrounded by a bright, slightly oval disk. In the 13.1" at 312x, I noted a dark region around the central star giving a slightly annular appearance this past February 23 at Digger Pines.

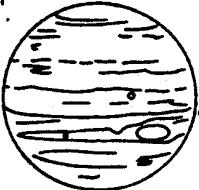
The farthest South in the sky I have travelled is IC 4406 in Lupus, located at 14h 22.4m -44° 09' (2000). Just recently on June 18, 1985 I managed to catch this planetary at Fremont Peak for about 2 minutes as it barely rose high enough to appear momentarily just east of the actual peak. At mag 10.6 and dimensions of 100" x 37" it was bright and moderately large in the 13" but no structural details were evident.

GLOBULARS: Certainly the most famous southern globular cluster is the magnificent Omega Centauri (NGC 5139), located at 13h 27m -47° 29' (2000). At Digger Pines, this object can be easily located with the slightest optical aid. At what latitude is this globular a naked-eye object? Generally the telescopic view is somewhat disappointing to me at this low elevation and this mighty clusters is reduced to a large, fuzzy, ragged snowball with possibly a few bloated stars around the periphery. But last February again was a period of exceptional steadiness, the outer regions were well resolved into numerous stragglers and the large mottled disk was plastered with a covering of faint stars. A more severe challenge would be the pair of globulars NGC 5927 in Lupus and NGC 5946 in Norma both at -50° 40' (2000). Has anyone viewed these two from our latitude?

CALICO OBSERVATORY
BY: JIM VAN NULAND

GREAT RED SPOT

Most astronomical objects seldom change their appearance, but Jupiter is a notable exception. Features come and go, belts split and re-combine, zones may darken, and even the Great Red Spot, though always present, varies markedly over the years and even from week to week.



Gerry Rattley called it "Golden ochre-yellow" and quite pale. After that, my "yellow, perhaps a hint of pink" is rather plain! The Spot is easy since it has a nice dark outline. A recent change is that there seems to be dark matter east of the Spot filling in following the Red Spot Dent. The zone south of the Spot is whiter than it's been in recent years. Although 305x was best of accuracy in timing, I saw more color in the Spot at 244 and 185x. Next, I experimented with a 3-inch off-axis mask stop on my 8" f/6, and found that I could see the Spot fairly well at 122x. Results at 305x were poor.

Timing pairs of transits separated by only two revolutions, as suggested last month, gives me some confidence that my timings are indeed repeatable to ± 1 minute most of the time. Yet the Spot's motion is very erratic, so much so that I can see no trend. To keep up with the vagaries in the Spot's motion, I revise the tracking equation each month, trying to keep the predictions reasonably close to observations. For this month's predictions, I used an average position.

| | | | | |
|-----------------|----|------|----|-------|
| Great Red Spot | Sa | 8 10 | 10 | 7 pm |
| on Meridian PDT | M | 8 12 | 3 | 48 am |
| da mo d h m | M | 8 12 | 11 | 45 pm |
| Sa 8 3 1 26 am | Th | 8 15 | 1 | 24 am |
| M 8 5 3 7 am | Th | 8 15 | 9 | 9 pm |
| M 8 5 10 59 pm | Sa | 8 17 | 3 | 2 am |
| Th 8 8 0 37 am | Sa | 8 17 | 10 | 45 pm |
| Sa 8 10 2 11 am | Tu | 8 20 | 0 | 27 am |

| | | | | |
|------------------|----|------|----|-------|
| Th 8 22 2 4 am | Su | 9 1 | 8 | 11 pm |
| Th 8 22 9 52 pm | Tu | 9 3 | 1 | 57 am |
| Sa 8 24 11 39 pm | Tu | 9 3 | 9 | 46 pm |
| Tu 8 27 1 11 am | Th | 9 5 | 11 | 31 pm |
| Tu 8 27 9 1 pm | Su | 9 8 | 1 | 6 am |
| Th 8 29 10 42 pm | Su | 9 8 | 8 | 51 pm |
| Su 9 1 0 24 am | Tu | 9 10 | 10 | 34 pm |

The times are about 10 minutes later than given in the July bulletin. What this means is, start looking for the Spot early, about half an hour before the given time, but don't be too surprised if the Spot is rather later than predicted. The Spot moves its own length in about 50 minutes.
Jim Van Nuland (408) 371-1307

THE 1985 PERSEID METEOR SHOWER
BY: DON MACHHOLZ

This year the annual Perseid Meteor Shower will peak on the morning of Monday, Aug. 12. At that time perhaps sixty meteors can be observed each hour. The moon, which will be between 15 and 20% full, rises about two hours before morning twilight and should not pose a major problem in the observation of the meteors.

The Perseid Meteors, which can be seen several nights before and after the predicted maximum, seem to radiate from the northern portion of the constellation Perseus. It is often best to look 40 to 100 degrees to the side of the radiant. Photography, often attempted, catches the brightest and slowest members. Try using fast film, a normal lens at its widest opening and 20-minute exposures with the camera on a tripod.

In recent years it had been expected that Comet Swift-Tuttle, responsible for the shower, would soon return. This would probably lead to an increase of shower activity. However, the comet has not been observed which means that either we missed it or it has yet to return. In 1980 the shower put on a great show. Last year there was a poor display. These factors alone indicate we missed the comet in the early 1980's, but this is far from being an accepted fact, and continued meteor monitoring (and comet seeking) is needed.

Two added features are present during this year's Perseids. First, Halley's Comet, at magnitude 13.5, rises shortly after the moon and is seven degrees south of it on the morning of the 12th.

Halley's coordinates are:
(1950) 05h 59.0m, +19° 04.1';
(2000) 06h 02.1m, +19° 04.1'

This places it 38 arcminutes south and 21 arcminutes west of the 5.2 magnitude star 64 Orionis. The moon will be fainter and further from the comet on the morning of Aug. 13. The comet will be moving 7.4 arcminutes towards the ENE each night.

Secondly, the "Aries Flasher" will be up all morning; this needs to be monitored with the naked eye and captured on film. The "Aries Flasher", introduced in the February issue of SKY AND TELESCOPE (p. 148) and updated in the July issue (p. 54-5), seemingly appears as a brief flash of light about ten degrees NW of the Pleiades. Watch for it and send reports to Sky and Telescope.

If the Perseids put on a bad show, the flasher doesn't flash, and you don't see the comet, don't despair. There are other meteor showers during the week. The Delta Aquarids peak on July 29, but run from mid-July through late August. The Iota Aquarids peak Aug. 7, but continue through the month. The Upsilon Pegasid shower (which is newly "discovered" and may or may not exist, see S&T, Aug. 1984 (p. 148), peaks Aug. 8. So whatever your interests, get out and enjoy those early August mornings!

PLANETARY NEBULAE IN DELPHINUS,
SAGITTA AND VULPECULA
BY: JACK B. MARLING

The Constellation of Vulpecula is well known for the Dumbbell Nebula, M-27. This giant and bright planetary nebula is a favorite among Deep-Sky observers. Nevertheless Vulpecula itself and its two small neighboring constellations of Sagitta and Delphinus are the home for a total of 22 planetary nebulae. One third of these planetaries are fairly bright NGC/IC planetaries already plotted on the Tirion Sky Atlas 2000. The remainder are more obscure of recently discovered planetaries that are little observed or perhaps even have never been observed before visually. To try to find these, it is generally best to first plot them on a Sky Atlas 2000.0 using the epoch 2000 Coordinates given in the table below.

In the table the size is given in arc-seconds. The brightness is the magnitude of the planetary if it were a disc 60 arc-seconds in diameter. The nucleus is the yellow (V) magnitude of the central star and is close to the actual visual magnitude. Where photometric data exist in professional literature, I was able to derive the actual visual magnitude given above. For some planetaries only a photographic or blue magnitude is available, designated by a "p" after the magnitude. The visual magnitude is often brighter by 0 to 1 1/2 magnitudes.

DESCRIPTION OF INDIVIDUAL OBJECTS

A-54. Discovered by Abell in 1955, this is the 54th object in a list of planetary nebulae he published in 1965. The given photographic magnitude of 16.6 was derived from old 103a-0 blue plates of the Palomar Sky Survey. This photographic emulsion has very weak sensitivity to the strong oxygen-III lines which contribute most of the visually seen light of planetary nebulae. Thus the visual magnitude can be 0.5 - 1.5 magnitudes brighter than the photographic magnitude. Thus A-54 could be seen by amateurs. Will you be the first person to even see it visually? You will need a UHC filter or more likely the new Lumicon O-III filter to see it.

A-57. Discovered by Abell in 1955, A-57 is near the border of Lyra and has almost 2 magnitudes higher surface brightness than A-54, so it should be visible in amateur telescopes. It has not yet been seen visually.

A-59. Again discovered by Abell in 1955 by examining the new Palomar Sky Survey plates. A-59 is large, but has a very low surface brightness., try to find it near the variable star U Sagittae, close to a double star plotted on the Tirion Sky Atlas 2000.0.

K 3-34. Discovered by Kohoutek in 1964, this small 11" planetary has little known data other than its 12.8 magnitude photographic surface brightness. The integrated magnitude is about 16, so good luck. Look for it 2 minutes preceding the open cluster NGC 6800.

He 2-437. Discovered by Henize in 1964, little is known about this 16" arc-second diameter planetary other than an approximate 12th magnitude red surface brightness. It may be too dim to see visually because of its small size.

M 1-71. Discovered by Minkowsky, it is N0. 71 in the list of new planetaries he published in 1946. The very compact planetary should be about 14th magnitude visually. Look for it 2 minutes following the 5th magnitude star 9 Vulpeculae. Try "blinking" for it by sliding a UHC or O-III filter in and out in front of your eyepiece. M 1-71 will be the faint star that seems to get brighter when the filter is used. Be the first to see it visually.

A 63. Discovered by Abell in 1955, A63 should be visible in large amateur scopes. It should have a visual magnitude of about 15.0 and a surface brightness of about 14. Look for it 25 arc minutes below and 1 minute following the bright star Beta Sagittae. As far as I know, it has not yet been observed visually.

M 2-48. Discovered by Minkowski in 1947, M 2-48 is not well studied and only a photographic surface brightness of 13.8 is known. Because of its small size, M 2-48 is likely to be very dim. So far as I know, it has never been observed visually.

| NAME | 2000.0 COORDINATES | SIZE | MAG. | BRIGHTNESS | NUCLEUS |
|----------|--------------------|----------|--------|------------|---------|
| A 54 | 19h 08.7, +22 55 | 72x62" | 16.6p | 16.5p | ? |
| A 57 | 19h 17.1, +25 37 | 40x34" | 16.6p | 14.9p | 17.6 |
| A 59 | 19h 18.7, +19 34 | 94x80" | 16.8p | 16.5p | ? |
| K 3-34 | 19h 24.1, +25 19 | 11x9" | 16.7p | 12.8p | ? |
| A 63 | 19h 42.2, +17 05 | 40x27" | 15.9p | 15.0p | 14.7 |
| He 2-437 | 19h 33.0, +26 53 | 16x3" | 16-18? | 12-14 | ? |
| M 1-71 | 19h 36.6, +19 42 | 5x3" | 13.9 | 7.9 | ? |
| M 2-48 | 19h 50.5, +25 55 | 10x6" | 16-18? | 13.8p | 15.9 |
| NGC 6842 | 19h 55.1, +29 17 | 57" | 13.1 | 13.0 | 16.0 |
| NGC 6853 | 19h 59.6, +22 43 | 480X340" | 7.3 | 11.4 | 13.9 |
| A 68 | 20h 00.2, +21 43 | 42X34" | 15-16? | 15.0p | 13.3 |
| WeSB 5 | 20h 01.7, +19 55 | 155X150" | 15.8p | 17.5p | 17.4p |
| We 1-9 | 20h 09.1, +26 27 | 26X23" | 16-17? | 15.1p | >21 |
| NGC 6879 | 20h 10.5, +16 55 | 5" | 12.5 | 7.0 | 15.0p |
| He 1-5 | 20h 12.0, +20 20 | 29" | 16.0 | 14.4 | 8.9 |
| NGC 6886 | 20h 12.7, +19 59.7 | 9" | 11.4 | 7.2 | 15.7 |
| NGC 6891 | 20h 15.2, +12 42 | 15" | 10.5 | 7.5 | 11.4 |
| He 1-6 | 20h 17.3, +25 22 | 18X13" | 15-16? | 14.0p | ? |
| IC 4997 | 20h 20.2, +16 45 | 2" | 10.5 | 2.7 | 14.3 |
| NGC 6905 | 20h 22.4, +20 06 | 44X37" | 11.1 | 10.2 | 14.0 |
| A 72 | 20h 50.1, +13 34 | 161X117" | 13.8 | 15.6 | 16.1 |
| A 74 | 21h 16.9, +24 10 | 870" | 10.8p | 16.5p | 17.1 |

NGC 6842. Discovered by Curtis in 1919, NGC 6842 is a large planetary, but pretty dim. Using a UHC filter on an 18" telescope, I saw a very faint disc. In a 24" telescope at 550X the 16TH mag. Central Star was visible.

NGC 6853. The famous "Dumbbell Nebula" or M-27 was discovered as a planetary by Higgins in 1864, even though Messier saw it a century earlier. Easily seen in finderscopes, M-27 assumes a football shape using a UHC filter. The 13.9 mag central star is a slight challenge. How many interior stars can you see? I once counted 18 at 420x, without any filter.

A 68. Discovered by Abell in 1955, A68 should be visible as a very faint 15th magnitude object 1° south and slightly east of M-27. I've not yet observed it, but a UHC filter or preferably Oxygen-III filter will be necessary to see Abell 68.

WeSB 5. This planetary was discovered by Weinberger and Sabbadin in 1981 by carefully re-examining the 25 year old Palomar Sky Survey Plates. With a 17.5 magnitude surface brightness, WeSB 5 may be too faint to see visually.

We 1-9 The planetary was discovered in 1977 by Weinberger while searching for galaxies on the Palomar Sky Survey red plates. We 1-9 has a 15th magnitude photographic (blue) surface brightness, so it should be visible using a UHC or Oxygen-III filter on very large scopes. It has not yet been seen visually, but lies just 3 minutes preceeding (west) of Open Cluster NGC 6885.

NGC 6879 Discovered by Pickering in 1883, this compact planetary has a pretty bright stellar image. It is centered 5' north of 2 stars plotted on the Tirion.

He 1-5. Discovered by Henize in 1961, Henize 1-5 will be a challenge to observe at 16th magnitude. The Oxygen lines are weaker for this nebula, so He 1-5 may be easier to see with a UHC filter rather than an Oxygen filter (which would reduce the visual magnitude to 16.3). This was seen by David Allen (Webb Society) in a 60" cassegrain as a ring.

NGC 6886. Discovered by Copeland in 1884, NGC 6886 is bright at 11.4 magnitude and 7.2 magnitude surface brightness. He 1-5 is just 20 arc-minutes to the NE of NGC 6886, which is itself just 10 minutes preceeding bright NGC 6905.

NGC 6891. Also discovered by Copeland in 1884, NGC 6891 is also a bright planetary in Delphinus with an easily discernible disc. It has a bright but obscured Central Star, thus NGC 6891 has a much brighter core.

He 1-6. #6 in the list of planetaries discovered by Henize in 1961. Accurate magnitude data for Henize 1-6 is not known. It has a photographic surface brightness of 14.0, so it should be visible in large amateur scopes. Look for it between and slightly East of two bright 5th magnitude stars.

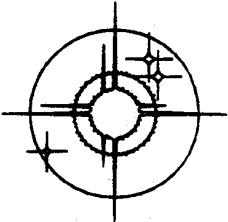
IC 4997. Discovered by Fleming in 1896, IC 4997 is stellar and has the highest surface brightness of any planetary.

NGC 6905. Discovered by John Herschel in 1831, NGC 6905 in Delphinus is a real showpiece. It is in a lovely and rich starfield, and is framed by 3 fairly bright field stars. The 14th magnitude center star was easy at 480x (24" telescope).

A 72. Discovered by Abell in 1955 by examining the recently completed Palomar Sky Survey Plates. It has an integrated magnitude of 13.8 but the large size gives it a low surface brightness of 15.6. A UHC filter is essential and an Oxygen Filter would be even better to see it. A 72 has a bright star on its west edge.

COMET COMMENTS BY: DON MACHHOLZ

One new comet has recently been discovered while Comet Giacobini-Zinner 1984e continues to brighten in the morning sky. Halley's Comet is also in the morning sky, now bright enough to be seen in many large telescopes. Comet Machholz (1985e), as of July 10, has not been observed following perihelion, it probably did not survive.



Comet Hartley (1985f): Malcolm Hartly discovered this comet on a plate taken June 13 with a 48" Schmidt. At that time it was mag. 16 and 10 degrees W. of M 61. It showed a short tail and is moving along the ecliptic at about 0.3 degrees per day.

Machholz notes
This comet was last observed June 24, it then passed 10 million miles from the sun. As it emerged into the evening sky in early July, it was not recovered. Perhaps the comet fell apart or greatly dimmed. You may want to try looking for it.

| | DATE | R.A. (1950) | DEC | ELONG | MAG. |
|-------|-----------|-------------|-----|-------|------|
| 07-29 | 12h 35.7m | +11° 11' | 59° | 10? | |
| 08-03 | 13h 10.1m | +08° 06' | 64° | 10? | |
| 08-08 | 13h 38.1m | +05° 25' | 67° | 11? | |
| 08-13 | 14h 01.2m | +03° 08' | 68° | 11? | |
| 08-18 | 14h 21.0m | +01° 11' | 69° | 12? | |
| 08-23 | 14h 37.5m | -01° 28' | 69° | 12? | |
| 08-28 | 14h 52.3m | -01° 54' | 68° | 12? | |
| 09-02 | 15h 05.4m | -03° 08' | 67° | 12? | |

Giacobini-Zinner notes
This comet moves in a large southward arc, passing 2° north of the Double Cluster on Aug. 10, and directly over the open cluster NGC 1513 on Aug. 22. In mid-Sept. it will be within 2° of Halley's Comet. These magnitudes are rough estimates, the comet may be one magnitude fainter.

| | | | | |
|-------|-----------|----------|-----|-----|
| 07-29 | 00h 44.1m | +59° 40' | 86° | 9.4 |
| 08-03 | 01h 26.4m | +59° 42' | 85° | 9.1 |
| 08-08 | 02h 10.9m | +58° 42' | 83° | 8.9 |
| 08-08 | 02h 10.9m | +58° 42' | 83° | 8.9 |
| 08-13 | 02h 55.1m | +56° 30' | 82° | 8.7 |
| 08-18 | 03h 36.3m | +53° 04' | 81° | 8.5 |
| 08-23 | 04h 13.1m | +48° 27' | 80° | 8.3 |
| 08-28 | 04h 45.0m | +42° 50' | 79° | 8.2 |
| 09-02 | 05h 12.2m | +36° 26' | 79° | 8.1 |
| 09-07 | 05h 35.5m | +29° 34' | 79° | 8.1 |

WHAT GOES AROUND COMES AROUND-HALLEY'S COMET

During August Comet Halley will be observed by many amateurs for the first time. Two factors account for this first: The comet is brightening as its distance to the sun and earth decreases. Secondly, Halley's elongation (the number of degrees from the sun as seen from the earth) increases as the comet rises earlier and earlier each morning. This places a increasingly brighter comet into an increasingly darker sky.

As seen from the earth, the comet was recently on the far side of the sun. Over the next few months it will move across our morning sky, through opposition (Nov. 18) and into the evening sky. Its next solar conjunction is Feb. 6, 1985, between now and then it will be viewed by millions as it brightens to mag. 5 by mid-January.

On August 13 Halley's Comet will be 275 million miles from the sun and 326 million miles from the earth. Here are Halley's positions, elongations and estimated magnitudes during August.

| Date | RA (1950) | Dec | Mag. |
|-------|-----------|------------|------|
| 07-29 | 05h 50.3m | +18° 49.8' | 13.9 |
| 08-03 | 05h 53.4m | +18° 55.0' | 13.8 |
| 08-08 | 05h 56.4m | +18° 59.8' | 13.6 |
| 08-13 | 05h 59.3m | +19° 04.4' | 13.4 |
| 08-18 | 06h 02.0m | +19° 08.9' | 13.2 |
| 08-23 | 06h 04.6m | +19° 13.2' | 13.0 |
| 08-28 | 06h 06.9m | +19° 17.7' | 12.8 |
| 09-02 | 06h 08.9m | +19° 22.2' | 12.6 |

The moon may also be factor in attempted observations. It will be clearing out of the morning sky on Aug. 13, and re-entering the morning sky on Aug. 27. This gives two weeks to get out and see the comet. It will help to have a large telescope, dark skies and a low eastern horizon.

The comet's nucleus is only about five miles across, but the coma, or head of the comet, is much larger. This tenuous cloud can grow to more than a hundred thousand miles across. Here's how you can make a rough estimate of its true size during August. First, measure the size of the comet's coma in arcminutes. This can be done in one of several ways, perhaps best is to turn off the telescope's clock drive and count the seconds for the comet to drift its size. (you may need a reticle eyepiece for this) No matter what the magnification, it should take about 2 to 10 seconds. Secondly, multiply the number of seconds by 0.235 (derived from the comet's present declination) to get the apparent size in arcminutes. Finally, multiply this by 90,970 miles (derived from the earth/comet distance in mid-Aug.) to get the actual size of the comet in miles. These figures will change in coming months.

Have you planned any projects for Halley's Comet? I'm hoping to make 100 useful observations of the comet during the year of visibility, plus show it to 100 people who would not otherwise see it. Don Machholz (408) 448-7077

A VISIT TO THE LICK OBSERVATORY BY: MRS. A.A. STOWE

Tourists visiting the Golden Gate should not fail to take in Santa Clara's lovely valley, which, it will be remembered, Bayard Taylor pronounced one of the three most beautiful valleys of the entire earth.

Should nothing else be attractive here, the great Lick Observatory will always claim attention. This is now visited by tourists from all parts of the world, and only lack of knowledge of its attractions can prevent thousands more from visiting it whenever possible to do so.

Thirteen miles (air line) northeast of San Jose, Cal., is Mount Hamilton, whose lofty peak is crowned with that jewel of priceless worth to the scientific astronomical world, the renowned Lick Observatory, whose monster 36-inch refractor has, as yet, no competitor. In the near future, the University of Chicago will have in use at Lake Geneva, Wisconsin, one of four inches greater diameter; but it is yet to be demonstrated whether Mount Hamilton's more favorable location will not still leave the Lick indisputable queen of observatories. Size and perfectness of instrumental equipment are not all--both will possess these; but the advantages in atmospheric conditions augur favorably for Mount Hamilton's continued ascendancy.

The approach to Mount Hamilton--the drive from San Jose--is one of unrivaled beauty, often arising to scenic grandeur.

At 12:50 P.M., a hot July day, a Mount Hamilton stage, drawn by four spirited gray horses, drew up to the hotel, where for twenty minutes we had been awaiting its arrival--12:30 sharp, they had told us--and the "A-l-i-a-b-o-a-r-d!" met with quick and glad response. Down we hurried to take our places, only to find nine passengers already seated, and the rear seat reserved for our party of three. A moment's settling into place, the "All right!" we call out, and away we dash.

Leaving San Jose we drive east for five miles, the last three and a half of them through Alum Rock Avenue--a broad, shady, level roadway, lined on either side with a double row of magnificent trees. At Junction House we leave this cool avenue and, turning to the right, enter Lick Avenue, and have now commenced our twenty three miles of foothill and mountain road, and are winding around, over, between and on one side of the lovely green slopes of the low-lying foothills of the Mount Hamilton range, whose bold, high peak, often hidden from sight, again in plain view, and seemingly so near us, crowned with the large white dome is the Mecca of our glad pilgrimage.

On either side of us vineyards and orchards of peaches, plums, prunes, pears, olives, oranges, apricots, apples and almonds diversify and enrich the landscape. Again, there may be but the hillsides covered with chaparral, the native shrubbery of this region. This, too, is lovely, and very restful to the eye.

Anon we pass two tiny lakelets closely nestled in among the green hills, their waters fed by the never-failing springs; but no resultant streams--at least, none above the ground. Continually ascending, turning and twisting in every direction while doing so, the lakelets are several times lost to sight only to reappear in fresh beauty farther below us at some succeeding turn in the road.

All too soon we leave this and commence to descend into Hall's Valley, so noted hereabouts for the fine quality of its mountain grown apples, plums, prunes and pears. Soon we cross the valley, and, turning our faces from Mount Hamilton, commence ascending once more. We wind and twist along the edge of the valley, the hills growing more and more rugged, the scenery wilder and wilder. Four miles of this and we reach Cape Horn (named from its shape), overlooking Hall's Valley 1,300 feet below. Here we make another abrupt turn in our course--we are curving and winding around all the time, but have only made three or four changes in the general course--and, descending 500 feet in the next two miles; travel, we reach Smith's Creek--Santa Ysabella now--2,000 feet elevation. The Observatory is now only two miles away by mountain trail, but requires seven miles of staging to accomplish the ascent without rising more rapidly than permitted by Mr. Lick's stipulations.

Shortly after 5 P.M. the last one of our half-dozen stage-loads reaches Smith's Creek' and tired, hungry and thirsty, we alight for lunch and rest. Are we really all mulattoes? we look it, but a few moments spent in vigorous brushing and dusting, a bathing of hands and faces, and, lo! a nice looking crowd of white tourists are they who file into the dining-room for the lunch-dinner. Hot Soup, vegetables, tea and coffee, cold meats of several kinds, pickles and other relishes, and a nice dessert engross our attention for twenty or thirty minutes; then the call sounds again, "A-1-a-b-o-a-r-d!" and we take our places for the last seven miles' ride.

At Grand View, six miles from Junction House, we halt a few moments. From here, lying nearly 1,400 feet below us on our right, we see the Santa Clara Valley with its jewel, the Garden City, as San Jose is so frequently called, spread out before us like a scenic robe; while to the northeast, just in front, on our left, towers Mount Hamilton. Eleven miles out of twenty-eight already made, and scarcely more than half past two o'clock. Glancing up at the dome, glittering in the resplendent sunlight, it is seemingly so near that our eyes refuse to accept the distance, our minds the time, between it and us; we cannot realize that three-and-a-half hours staging, omitting the time for lunch, and seventeen miles of distance, are yet to be done.

Here we overtake the stages just ahead of us, and are ourselves overtaken by the one following. A few minutes rest, a rapid glance at the scenery--a veritable gem on Nature's canvas--and away we go, a half-dozen stage-loads in one company.

From Grand View on, the lower end of the bay is often in sight, glittering and gleaming like a jewel in its misty, silver-like setting of fog, which cuts off our view of the more distant waters. There is only one drawback (there is always something!)--the dust is very annoying; but our clothes will stand it--we dressed for that; and, as the pure mountain air permits of good breathing despite the dust, we resolutely ignore what can't be helped, and feel only the exquisite beauty, sometimes the grandeur, of the Santa Clara Valley and its encircling rim of boundary foothills joining the bay on the west, both valley and hills covered with well-laden orchards of ripening fruits, the whole dotted with cozy homes, making a panorama of landscape-beauty that is charmingly picturesque. Each turn in the road discloses some new feature, and we gaze in Nature's kaleidoscope, exclaiming a succession of "Oh, look! look!" "Oh! oh!" "Isn't that lovely?" until we have nearly exhausted our vocabularies.

Only seven miles of of road, but 2,209 feet to climb in those seven miles, and 365 turns to make in doing so. We have made nearly 300 turns since leaving Junction House, sixteen miles back. We make loops, V's, and every single and combined form and curve in rapid and bewildering succession. Soon we are high enough on the mountain-side to overlook the two minor ranges--the foothills--we have crossed, and once more Santa Clara Valley and the Bay of San Francisco lie spread out before us. At Lookout Point we see below us what seems five different roads at as many different elevations--all parts of one whole--and a few rods farther on see the same number above us. At the very last we encircle the top of the mountain two or three times before reaching the main entrance.

We meet a most cordial reception and are ushered into the visitors' reception and registry room, that we may register. This done, a glance at the book shows the visitors of the evening included two from England, two from Germany, three from France, six from Honolulu, and the others from a dozen different States of the Union.

This room is adorned with portraits of Mr. Lick, Alvan Clark and sons--the makers of the great lens--and of Rev. L. Hamilton, whose graphically descriptive pen, many years ago, from his camp on this very mountain, in a series of letters written for publication, first made known the beauties of this region. The camp and, later, the mountain he and made famous, were given his name. In one corner of this room is Lick's work-bench, brought by him from South America to California--around the Horn--in 1847, and used in making the pianos and organs which laid the foundation of his great wealth, though subsequent real estate investments added to it greatly.

Quickly noting these things, we assemble on and around the steps of the west front--the main entrance--to see the setting of the sun in the bay, 4209 feet below us. Just as it seemed to touch the water's edge, its horizontal rays flashed over the water's breast, and lighted up the entire bay--the fog was dissipated now--with a glowing radiance, soul-inspiring in its grandeur. A few moments' glimpse of the glories of the infinite, then the radiance dimmed, the sun sank below our range of vision, and the spell was broken.

Our immediate party utilized the short remaining daylight, under Professor Perrine's kind lead, in noting and admiring the exquisite transparencies lining the window on either side of the Long Hall; also the equally instructive photographs on the walls--photographs of star clusters, of the moon in its many phases--perhaps and enlargement of some point of special interest--of Mars, of Saturn, and of so many other objects and things.

The transparency of the double-cluster in Perseus was very interesting; so, too, was that of the great cluster belonging to the Southern Hemisphere, where thousands of immense suns are grouped in one close mass (to our sight). But how can one particularize where there are hundreds of transparencies and photographs, each worthy of closest attention?

All too soon the waning light gave place to darkness too intense for further transparency viewing; then we were shown the library and computing-room, whose well-filled cases hold 4,000 to 5,000 volumes of fine technical specialized works--those of the Academy of Science of Paris going back in unbroken file for nearly two hundred years. These are very valuable, showing as they do the development and progress of modern scientific astronomical knowledge. Here, too, is a bust of Galileo, and also the rare old books containing his wonderful contributions to the science of astronomy as known today--the opening wedge, as it were. But time passes, and our small party wends its way to the great dome, where most of the seventy-five guests of the evening have preceded us. Filing around to the left, we take our places and await our turn. In groups of fifteen, visitors are passed through the gate in the railing to the inner circular plane, the movable floor under the great telescope. Here we were given a few minutes' instructive lecture by one of the professors, then in turn took our seats and looked through the eye-aperture of the most famous telescope in the world--the largest one yet in use.

What a glorious sight was Saturn! - bright, glowing Saturn! Even the spaces between inner ring and planet are dark only by contrast with the exceeding brightness of the rings and planet. The few moments' glance into the heavenly glories--insight denied to the unaided eye--amply repays one for the expense, the dust and discomfort of the long stage-ride. I felt Mrs. Howe's "Mine eyes have seen the glory of the Lord," but changed the emphasis slightly and applied it to the heavens, and not to war's array.

Leaving the large dome we passed to the smaller one, hoping to see Venus through the twelve-inch telescope. Most of the guests were in time to do so, but our party were just too late for this.

Next we visited and noted the various exquisitely perfect instruments with which the Observatory is equiped, their use being explained to us principally by Professor Perrine, but in part by Professor Schaeberle--both on this visit and on a subsequent one made some three weeks later, during the daytime, especially to see and note the uses of the various instruments.

The pluviometer, to register rainfall, is not only so arranged as to tell the amount of rainfall per hour, but, by means of automatic tracing of registry pencil, shows relative amount and time of greatest rainfall.

The aerograph, or wind-gauge, is also self-registering. The cylinder is spaced to show time; the notches of the red line of the tracing-pen show five miles of distance between each notch; and time and distance together show accurately the rate of the wind.

The barometer, like the pluviometer, is automatic self-registering. This is a most delicate and intricate piece of mechanism, difficult to understand from a written description, and yet very easily understood when the eye sees the instrument as a whole, and notes the various parts, whose uses are so clearly explained by the kind professors. An interesting observation made by Professor Perrine in connection with the barometer is that there are two daily maxima and two minima of pressure--maxima occurring just before noon and a little after midnight. Are there regular tides of the air as well as of the ocean?

There are two sets of seismographs, or earthquake recorders; the smaller one recording only horizontal motion. The other and larger set known as the Ewing Seismograph, designed by Professor Ewing, who made an exhaustive study of seismic disturbance in Japan, is of recent development--only fifteen or sixteen years since first introduced--and by means of its two clocks, its revolving plate, and its three tracery pens, automatically makes an accurate record of each of the three earthquake movements. The very delicate instrument is "always ready" in other words, it is so set as to take the shock at any moment. This mechanism is very ingenious.

The clocks, the plate and the pens are in a complete electric circuit--clocks, plate and pens all stopped. The slightest shock swings a pendulum in the mercury, the circuit is broken, the machinery is started, the clock pendulums released and started by magnets. The plate revolves during the time of the shock, one clock governing the revolving, the other marking time and duration of shock; and meanwhile, each of the three registry pens automatically records each of the movement specially assigned it--records being made on the face of the plate, each in its allotted place. This may not be plain from the written description; but visit the Observatory and see for yourself how intricate, and yet how interesting and easily understood withal, this seismograph is when one is viewing it and listening to the professor's patient and very lucid explanations. The pier on which this instrument rests does not touch the floor at all, as even a foot-fall would be a sufficient jar to start the machinery in motion, so perfect is the adjustment. As earth displacements are usually only a small fraction of an inch, the records are magnified four times.

The time-instruments are very interesting, and beat in San Jose simultaneously with the ones at the Observatory. Time is sent automatically, at noon, to all the principal points using Pacific Coast standard-time. The chronograph for recording time has sheets of paper placed on a cylinder, which, when in motion, revolves once per minute. A tracing pen is attached to a magnet, hence the observer at the telescope of the transit, when he wished to mark time of transit, presses a magnet, a clock breaks the circuit and starts the machinery, and the pen makes its record on the paper, though in a room quite distant from the transit building, where the observer is.

Both the transit and the meridian circle are fine, costly instruments of the most perfect mechanism, and of absorbing interest to the visitor, when they are so kindly explained by the professors.

Lick Observatory will soon be enriched with the great Crossley reflector, the magnificent gift of the English scientist, whose name it bears. The more delicate parts of the new telescope had been received just prior to our visit. On opening them they were found to be in perfect condition, not a thing sustaining injury in transit. The heavier parts are coming via Cape Horn, and will arrive during the fall or early winter. The new building to receive this telescope is built as far as can be done before the machinery arrives to be built in place; and if all goes well, the early spring will find the great reflector ready to assist the still greater refractor in its work, each kind of telescope having some special points of advantage.

In its instrumental equipment Lick Observatory stands practically unrivaled. Not so in income, which is entirely inadequate to its needs. Could James Lick have lived until now, the \$1,200,000 under the will made years ago, recently divided by the trustees of the estate between the academy of Natural Sciences and the Society of California Pioneers, would undoubtedly have been divided into three portions of \$400,000 each, the Observatory sharing equally with the others. Could this have been done, the added income would have much increased the facilities for work; but it could not be. Will not some one of our broad-minded, wealthy ones donate a half-million dollars to unfetter the management of one of the greatest scientific institutes in the world? Surely it were a worthy way to expend part of one's surplus wealth.

At 11 P.M., standing on the mountain-top, looking down on the thickly clustered electric lights of San Jose, 4000 feet below us, and in the air line thirteen miles distant, the scene was one of rare beauty. the semi-darkness dwarfed the two minor ranges lying between ourselves and the city, and its glittering lights looked almost at our very feet.

Coming down the mountain-side in the starlit night, our ride was very enjoyable--the dust no longer annoyed us; the road was very smooth and the grade easy. This is probably the finest mountain carriage-road in the world. It cost Santa Clara county \$90,000 to build it from Junction House up. Its grade was regulated by the terms of the trust deed and bequest. It is very smooth, and is broad enough for teams to pass everywhere throughout the entire twentythree miles.

As we were descending, in several places a peculiar phenomenon was noticed. In the semi-darkness--no moon, only starlight--the surrounding peaks and hilltops made a not very unequal horizon, while over the bay the stars shone brightly so far below us, it seemed as though the rim of the horizon were broken away just there, that we might look down, down, and snatch a glimpse of the glories of the underworld. The effect was very impressive.

During our homeward ride we were discussing James Lick--the ill-requital of his love in his young manhood, his strange, unsocial life, and the magnificence of his several bequests. Had the testy old Pennsylvania miller sanctioned Lick's suit for his daughter's hand, Lick's name would probably be unknown to posterity, the Lick Observatory would be non-existent, and all mankind would be so much the poorer.

Remembering the miller's pompous answer to Lick's suit. "Young man, when you own a mill as fine as mine will be time enough to ask for my daughter's hand," and Lick's reply, "I'll own a finer one some time"--remembering all this, I was interested in learning the particulars of "Lick's Folly," the paper mill he had built only four miles from San Jose, with doors and interior woodwork of mahogany and other costly woods, and hinges and door-knobs of solid silver. I did not wonder--I think I sympathized with him--that, when all was completed, he had it photographed and sent a copy to the old miller, whom needless to say, he hated as only a man of his temperament can hate those who have wronged them.

Since Lick's death the "Folly" was burned, and now a new but very unpretentious building occupies the site.

Six or eight thousand visitors are annually benefited and delighted at the Observatory, the greater number of these spending Saturday night there, as only on that night can visitors be permitted the use of the telescope. All days are open to the public.

Ed. note: This interesting and well written account was from Frank Leslie's "POPULAR MONTHLY" VOL. XLII, JULY 1896. A special thanks to Sharon Cisneros for sharing it with us.



TELESCOPE SALE !!!

The *Fremont Peak Observatory Association* will be sponsoring a fund-raising telescope sale at Fremont Peak State Park on Saturday, August 10th, 1985. The sale begins at 2:00 PM, and is open to everyone!

The equipment we are selling has been donated to us, the *Fremont Peak Observatory Association*, by **Celestron International**. All the scopes were either demonstrator models, or were factory returns; they are all functional, high-quality instruments. Proceeds from the sale will be used to finance the construction of the 30" Observatory.

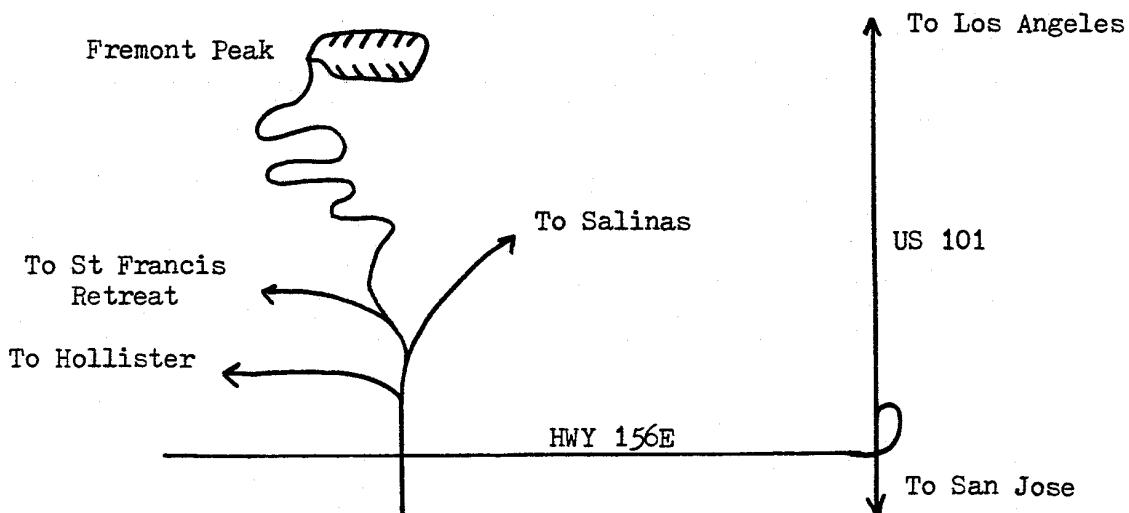
To give you an idea of the kinds of bargains you will find:

- Over 20 C-60 refractors (altazimuth and regular Polaris mounts), which retail for up to \$500.00, on sale for \$120.00 to \$200.00!!!
- Over 16 C-80 refractors (all Polaris mounts), which retail for up to \$1000.00, on sale for \$300.00 to \$400.00!!!
- Over 20 40mm and 60mm COMETRON refractors (altazimuth mounts), which retail for up to \$425.00, on sale for \$50.00 to \$175.00!!!
- Several C-8 tripods, regularly \$300.00, on sale for \$125.00!!!
- Several Super Polaris mounts with wood tripod for \$250.00!!!

Items will be sold on a first-come, first served basis. We have roughly 80 telescopes, so supplies are limited. Terms are cash or check, and equipment will be sold as is. Sales tax of 6% will be charged on all purchases. There will be people on hand to show you how to set up your new scope, and to give you some pointers on its use. For further information, contact Frank Dibbell at (408) 746-6493 during normal business hours.

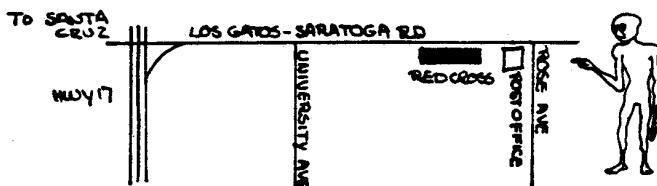
Fremont Peak State Park is roughly a one hour drive south of San Jose. To reach the park:

- Take US101 South to California Highway 156E (San Juan Bautista)
- Drive east on 156E approximately 3 miles
- Follow the signs to the park



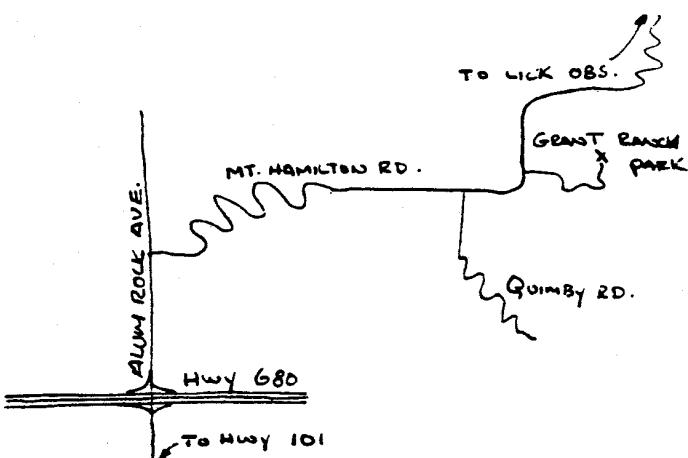
GENERAL MEETINGS:

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.



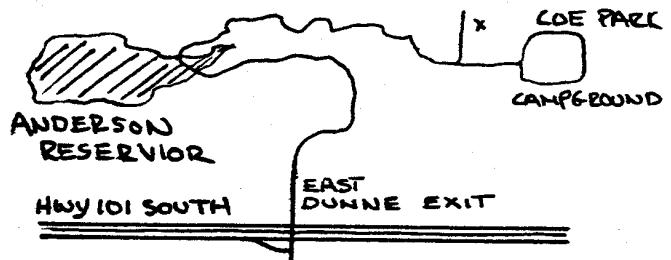
GRANT RANCH COUNTY PARK:

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.



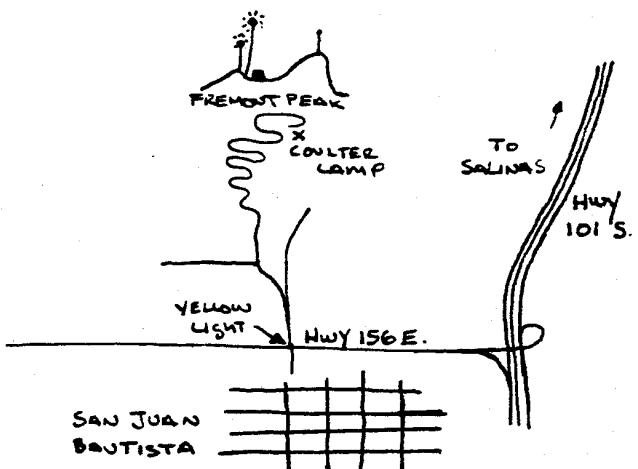
HENRY COE STATE PARK:

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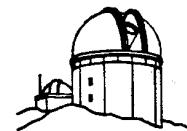
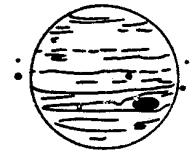
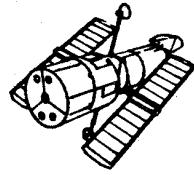
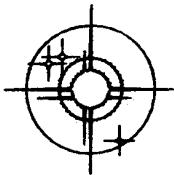
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What are your astronomical interests (e.g. astrophotography, deep-sky observation, telescope making, etc.)? _____

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

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