

# the san jose astronomical association

Bulletin

september  
1982

## Ephemeris

- Sept. 4 Indoor Star Party; Los Gatos Red Cross building, 18011 Los Gatos Saratoga Road. If you're not otherwise celebrating on the Labor Day weekend, bring your meteor, lunar eclipse, Comet Austin, plus other astrophotos, and any other current work in progress, including mirrors to be ground; 7:30 PM.
- Sept. 10 Board Meeting. Don van Zandt's, 168 Waverley #7, Palo Alto. (Don promises a delicious dinner for attendees, followed by video movies.) Call him at (415) 327-3158 for directions. As with all Board Meetings, everyone is welcome; 8 PM.
- Sept. 11 General Meeting. Dr. Sy Stein, biomedical specialist at NASA's Ames Research Center since the Mercury astronaut program, will discuss past and present space medicine research. Room S-34 at De Anza College; 8 PM.
- Sept. 18 Star Party at Fremont Peak Coulter Group Camp. Central Coast Astronomical Society/SJAA joint star party at Chews Ridge in the dark skies of Big Sur country; contact Denni for further details and convoy information. Also, the China Lake, Kern, and Sacramento Valley Astronomical Societies' annual Tehachapi Star Party at 7,000 feet in the Tehachapis; call Steve Greenberg if you want to organize a convoy. Details inside.
- Sept. 25 Indoor Star Party at the Los Gatos Red Cross, 18011 Los Gatos Saratoga Road. Ongoing mirror making and telescope design by doing; 7:30 PM.
- Oct. 2 General Meeting. Slide and equipment night. Los Gatos Red Cross building. (The usual address and directions apply.)
- Oct. 8 Board Meeting at Bob Fingerhut's.
- Oct. 9 Red Cross indoor star party.
- Oct. 16 Fremont Peak star party.
- Oct 23 Red Cross indoor star party.
- Oct. 30 Red Cross indoor star party. Halloween party (if you're an Aldebaranian, come as you are...otherwise, costumes will be the order of the night.)

The SJAA Bulletin is published monthly by the SAN JOSE ASTRONOMICAL ASSOCIATION, 3509 Calico Avenue, San Jose, CA 95124. The membership year runs from July to June; dues are pro-rated if you join after June. Membership rates: \$18/year for adults, \$12/year for children under 12. Subscriptions to the Bulletin are available to non-members for \$7/year.

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BULLETIN DEADLINE IS THE 15TH OF THE MONTH PRECEDING PUBLICATION.

## Observations by Steve Greenberg

August Board Meeting Highlights. With the transfer of the SJAA check signature cards to his signature, from Shay Pratt's, Bob Finghut assumed the full duties of Treasurer of the Clu. We all owe Shea a hearty "well done" for her term as Treasurer. She straightened out a rather mixed-up set of books, and a number of other inherited snafus, as well as taking excellent care of the membership list, plus continually attacking the numerous week-to-week problems and crises that arose, with a dedicated spirit. Because of her hard work, the records and treasury that Bob received were in much better shape than when she took over.

The treasurer's report showed \$1791.09 in the club's account, before Bob paid Patti Winter the expenses incurred for printing and mailing the July and August Bulletins. Frank Dibbell was asked by the board to invest \$500 in a high-interest-rate "Certificate of Deposit", to start the SJAA Observatory Building Fund (an idea first officially broached by Frank at a recent board meeting).

Other topics that were discussed included the condition of the Bulletin, and a joint star party at Chews Ridge with the Central Coast Astronomical Society. (See items below.)

Get-Well Wishes. At the board meeting it was disclosed that Mrs. Gregory (whose husband helped found the SJAA, and educate its early members in astronomy), had just returned home from the hospital after major surgery. We all join in wishing you a swift recovery to good health, and look forward to seeing you at many future club activities.

Joint Star Party at Chews Ridge on Sept. 18th. At the August board meeting, Brad Carlson of the Central Coast Astronomical Society (centered at San Luis Obispo and new home to a number of other ex-SJAA members, including Phil Hermsmeyer and Debbie Moore), invited the SJAA to a joint star party (and reunion?) at Chews Ridge, in the Big Sur area. (Upon finding out that the site was near the Tassajara Hot Springs, Patti Winter was overheard asking how much star-gazing could be done at the hot springs, through the steam.) This site is in one of the darkest night sky areas left in the State of California, and well worth the effort to get to. One drawback -- mosquitoes -- bring insect repellent! For further details about directions, conveying down, etc., please call Denni.

Help Your Friendly Local Bulletin! This editor moved to Livermore from Menlo Park at the end of June. Patti Winter was taking the Bulletin to the "printer" in Palo Alto, and picking up the "printed" copies. She also helped me with the stapling, folding, stamping, addressing, sorting and bundling [by zip-code] for the Post Office, before mailing them herself [from 1 to 4:30 in the afternoon, only] at Menlo Park's bulk mailing facility on Bohannon Drive. Patti is now very heavily committed to contract work at Apple Computer in Cupertino, and cannot spare any time during the day for these tasks. Nor can I afford to take the time from my job in Livermore for the two-hour commute out and back for several of these tasks per month, either.

It was suggested at the August board meeting that a Saturday night ISP could be the place to staple, fold, and address the Bulletins. I agreed that, if the ISP's came at the right time, this would be the perfect solution, since only two people

can do the job in about three hours. Hopefully, not only would more be merrier, they'd also be faster.

However, the major problem has not yet been resolved. It has become very difficult to get the Bulletin into and out of the printer, and mailed each month in a timely manner. We have a desperate need for volunteers with spare free time during the last few weekdays of the month. In terms of convenience for the individual(s) who volunteer(s), and to keep commute time to a minimum, the ideal person would live somewhere between Mountain View and Belmont, but we won't turn away anyone from further out, who wishes to help. PLEASE, get in touch with me at (415) 443-6638 evenings, or at (415) 422-0719 days, or with Patti at (415) 326-8614. Help us all get our Bulletins on time.

Bulletin Articles, Reports Wanted on Club Activities. Some of you may not have noticed this tired editor at many club star parties this summer. That's because I haven't had very much spare time recently. If I were not able to see the Milky Way by just stepping out of my back door, I would have completely missed the Perseids this year, and missed seeing comet Austin. I've just moved into an old house that needs lots of time for tender love and care, not to mention my having to build a lot of new bookcases to hold my library. Even going to the WAA/AANC meetings was time taken from the Bulletin.

In addition, with the club scheduled to have at least one multiple star party, in addition to my work schedule for the next couple of months, I will not be able to go to several scheduled events. I will therefore not be able to ask individuals at these events to write about them. I hope that I'm doing the next best thing: asking in advance for those of you who want to see such reporting of club events, to send me your impressions of them. Please don't assume that what you say will duplicate someone else's comments; several reports could well be put together for interesting coverage angles, as was done with the Astronomy Day reports.

If you type any of these reports up, it will be most helpful to me if the line length were to be set at 54 characters. This length allows faster and more efficient layout of the Bulletin.

Speaking of Writing: A Contest. The University of Texas' McDonald Observatory is sponsoring its 8th Annual Popular Astronomy Writing Contest. October 1st is the deadline for submitting previously unpublished articles or essays of from 1500 to 2000 words in length. The subject can be any astronomy, astrophysics, or space science topic. Four prizes, ranging from \$250 to \$100, will be awarded, and those articles will be published in the McDonald Observatory Newsletter. Send your submission to, or request further information from: Nancy Norwood, U. T. Dep't. of Astronomy, Austin, Texas 78712.

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## General Meeting

BY PATTI WINTER

Is there hope in the war against light pollution?

Definitely yes, according to an astronomer who won a battle against it. Dr. Sandra Faber of Lick Observatory, speaking at the August SJAA General Meeting, described how Lick successfully persuaded the San Jose City Council to install streetlights that would do minimal harm to astronomical research.

Dr. Faber began by outlining the problems facing professional astronomers due to the "march of civilization". For instance, Mt. Wilson Observatory has become virtually useless, now that their night sky is eight times brighter than what it would be without man-made sky glow. Palomar has only 1.35 times the natural dark-sky brightness, but this number has risen significantly over the last several years, and the situation could get worse, since housing developments may soon encroach on the mountain's base.

Lick Observatory itself is on the verge of serious trouble, with three times the natural dark-sky brightness. Dr. Faber is optimistic, however, that the situation will not deteriorate much more. The city of San Jose is replacing its old mercury-vapor streetlights with more efficient sodium lights. Because of the efforts of the Lick staff and their supporters, the payoff (for amateurs and professionals alike) is that most of these lights will be low-pressure sodium (LPS).

This pleases the professional astronomers, because the low-pressure sodium lights have only two significant emission lines, which can be removed quite easily from spectrographs by computer. The light given off by the other major alternative to mercury-vapor lamps, high-pressure sodium (HPS) lights, is spread across the red and infrared. The HPS lamp creates a spectral interference that is almost impossible to eliminate, and in just those wavelengths most important to research on the early history of the universe.

The decision between low- and high-pressure sodium streetlighting is being made in many communities, and the relative advantages and disadvantages of each are not always easy to determine. Such factors as the cost of installation and operation, and public reaction to the different colors produced, are the subject of much dispute. The manufacturer of HPS lights has claimed that LPS lighting could cause a police officer to ignore a body lying in a pool of blood on the street, thinking that it was only lying in a pool of oil. (As I pointed out at the meeting: even if that's true, officers shouldn't be ignoring a body lying in a pool of oil, either.)

Dr. Faber concluded her presentation by discussing an issue that greatly concerns her -- whether amateur and professional astronomers have conflicting desires when it comes to streetlights. She mentioned having received a letter from an amateur astronomer in Pennsylvania whose group wanted HPS lights installed in their city, on the basis that there would be less total illumination than from LPS. She wanted to know if this is a common attitude among amateurs.

Sentiment from the SJAA audience indicated not. Dr. Jack Marling, who designs and markets light filters, agreed that a simple notch filter would take care of low-pressure sodium vapor emissions. (Only one of the LPS emission lines is in the visible part of the spectrum.) Denni Frerichs and Jim Van Nuland pointed out that the increasing sophistication of amateur equipment will soon allow for electronic removal of offending emission lights, such as is now being done by professionals. And Ed Schell noted that LPS lights were less damaging to dark adaptation than HPS.

Any opinions on the subject? You can send them to Dr. Faber at the offices of Lick Observatory, University of California, Santa Cruz, CA 95064. And, please send a copy to the Bulletin, also!

## Letters to the Editor

I still have the club 12-1/2". Bob Black, who was interested in it when I first took it, does not want the telescope until September. I would be glad to give it to anyone who wants it, but nobody seems to...

Penny Pinschmidt

(Thanks for your note, Penny. Now all I have to do is to track down the other telescope. George Deiwert, do you still have the 6"? Please get in touch with me, to let me know what's happening. Ed.)

A Reminder to All Members: the Club rule is that anyone who wants one can have a Club telescope for two months. After that time, it will be turned over to anyone else in the Club who asks for it.

Please note: the correct address for the Astronomical Society of the Pacific is 24th Avenue, not 12th Avenue. (A fifty percent error is okay for galaxy distances, but apparently not for the Post Office.)

Andy Fraknoi, A.S.P.

(I hope that you've gotten the last two issues with the correct address on them. If not, then I guess you won't be getting this one, either. Ed.)

## Ads

Club Nameplates. These attractive 1 by 3 inch black-and-gold nameplates, with the SJAA logo engraved on them, are available from Jack Zeiders. To order one, sign up at any ISP or General Meeting, or send \$3 to Jack at 2961 Magliocco Drive, #3, San Jose, CA 95128.

Quotes. Overheard during the board discussions about going to the AANC Ames Conference:

"I can't enjoy food that costs \$13. I'm a hot dog and hamburger man." Jim Van Nuland

"I can! As long as there's plenty of toast for the Caviar." Jay Freeman

## The Celestial Tourist Speaks

by Jay Reynolds Freeman

What to show the beginner? Poor solutions to this recurring problem have probably turned more newcomers away from amateur astronomy than all other things combined. I have no pat answer, but here are a few thoughts on the subject:

Explain the telescope first. I am not suggesting a monologue on mounting design, or a speech on the virtues and/or vices of this or that optical system, but a few simple matters should be addressed before a newcomer's first look. Show where one should look and how to orient the head. (About one newcomer in four or five tries to observe through the focusing knob on my C-14). And, a surprising fraction of neophytes have considerable difficulty aligning the exit pupil of the eyepiece and the eye's entrance pupil, even when they clearly understand which protrusion is the eyepiece. Speaking of the focuser, be sure the beginner knows where it is, how it works, and is not timid about adjusting it. Encourage him (or her) to move the knob back and forth, and to find the position where things look sharpest. (Encourage the removal of glasses, by stating that the telescope's focus can be adjusted to correct for most near- or far-sightedness. Ed. [However, persons with astigmatism will probably need to use their glasses while using low powers. J.R.F.]])

If you are not using an equatorial mounting that is reasonably aligned and has a functioning sidereal drive, you will have to make a judgement call on whether to explain how to track objects manually. Your judgement will presumably reflect how difficult or confusing the controls (or lack of controls) on your telescope are, and how much of a hassle it would be for you to re-acquire whatever object you are looking at if the newcomer loses it entirely. Dobsons with a "nice" bearing feel, and hand-turned slow-motion knobs with little slop or jerkiness, are not hard to get the hang of. Electrical slow motions that have two positions (either off, or moving at image-blurring speeds), and all systems that require constant fiddling with clutches, are less desirable.

If you do not have a driven telescope, and do not explain how to track objects, be sure that the beginner understands that things will move out of the field because of the Earth's rotation, and has some feel for how long it will take before this happens.

Show the familiar before the strange. This not only will keep people psychologically comfortable, but also will help cope with some of the problems mentioned in the previous section. It will be quite obvious if the Moon is out of focus, or moving, or not there at all. But, with a faint fuzzy nothing, who knows? You and I, perhaps, but not a newcomer. And, in deciding what is likely to be strange, remember that with the exception of the Moon, the planets, and clusters of bright stars, most astronomical photographs do not often closely resemble the views we have through small telescopes.

Show the bright and obvious before the faint or subtle. This point extends the last one, and for similar reasons. Show Saturn before Neptune, Albireo

before Rigel, M31 before M104, and M22 before M70. Don't forget the best objects because of your familiarity with them: the Pleiades is almost certainly the best open cluster in the northern sky.

Pay attention to physical comfort. You probably cannot control the temperature, wind-chill factor, or humidity of the night the beginner shows up, but you can take some other measures. Owners of tall Dobsons might select the first few objects near enough to the horizon so that the observer won't have to teeter on a precarious ladder. Users of fork-mounted Schmidt-Cassegrains should avoid those neck-pretzel regions between the zenith and the north celestial pole. Operators of equatorially mounted Newtonians should rotate their tubes for a comfortable eyepiece position; or, if that is not possible, select another object.

Have some structure in your observing program. I suggest that people will enjoy a series of observations that are logically tied together, better than a random selection of celestial sights. One program that has worked several times for me, when I have been giving friends an introduction to amateur astronomy, is a "tour of the universe", starting nearby and working outward. (This scheme also fits in with the suggestions given above.)

After showing how the telescope works, I begin with the Moon or with a bright planet (if the Moon is not available). After looking at all the bright planets that are handy, I set the telescope on a first-magnitude star. Most people are impressed by the dazzle, and the moment also provides a good opportunity to let them practice focusing with a non-extended object.

Stars sometimes come in pairs, I will say, showing a nice double or two, or in bunches (an easy open cluster). Sometimes the bunches are enormous and dense (globular clusters). Stars form in bunches, out of vast hazy clouds of dust and gas (showing the Orion or Lagoon Nebula, or some similar region of star formation). And, near the end of their life-times they return a lot of this material to space, either calmly (planetary nebulae) or violently (showing and explaining the Crab Nebula, if it is available. (The Veil Nebula is also a supernova remnant, but it is not easy for every beginner to see because of its large size and low surface brightness.))

There are also larger systems of stars, called galaxies. (Most people know what galaxies are; M31, M51, NGC253, NGC55, possibly a few others, are good for beginners). Galaxies also come in small groups (satellites M32 and M110 of M31), and (if the beginners are still eager and the objects are available) in large groups (the Fornax galaxy cluster, the "Avenue of the Galaxies" in the central part of the Virgo galaxy cluster, or [with the C-14 on a dark night] the Coma Berenices Galaxy Cluster).

Correction: A fraction of a sentence was inadvertently omitted from my column last month, resulting in an incorrect price being given for my Meade 12.4-mm Erfle eyepiece, and in no price at all being given for the Celestron orthoscopic. Recent prices for these items: the Meade 12.4-mm Erfle -- \$44.95; the Celestron 12-mm Orthoscopic -- \$35.00.

# IMPRESSIONS OF JULY'S LUNAR ECLIPSE

by Jim van Nuland

Although an eclipse party had been announced for Loma Prieta, I decided to journey to Henry Coe Park, in the hope that the dark sky there would permit timing occultations of fainter stars than from my city site.

I was joined by Ralph Lowd at the SJAA site, along with a number of civilians who had come to see nature's show.

The threats of clouds faded along with the twilight, and soon we were observing Jupiter, Saturn, and Mars. The excellent seeing permitted high powers and showed many fine details.

The wind, bothersome at first, disappeared about the beginning of the partial phase, and I busied myself with some crater timings, only to find that the edge of the shadow was rather too diffuse to do really good work. However, I did obtain four good timings. There was little color in the shadow: grey at the edge, and only a slight brown in the umbra, which was distinctly darker than the previous eclipses I'd observed.

As second contact approached, the shadow seemed to stop -- we waited for what felt like several minutes for that last sliver of white to vanish. My son Mike finally called it at 6:38:35, only 53 seconds later than predicted. (Unusually thin clouds over the equatorial Pacific?)

With the onset of totality, we looked up to see the Milky Way in all its splendor! The dark lane in Cygnus was readily seen; even near the southern horizon the Milky Way was distinct.

Strange indeed was the moon hanging in the sky above Sagittarius! With its northern half hardly visible at all, and the southern part a dull red, it made a rather odd pumpkin!

Returning to the telescope, I was awestruck by the sight of the full moon, surrounded by dozens of stars!

Though I had hoped for dozens of occultation timings, I was only able to obtain five (the dimmest being at 11.3 magnitude), since most stars below 10th magnitude simply faded away a few tens of seconds before the expected time; the residual moonlight was too much.

Leaving the moon, we observed various deep-sky objects. Outstanding was the Trifid Nebula, whose dust lanes were readily seen. M22 was a glorious ball of stars; the good seeing permitted resolution even across the center of this wonderful globular cluster.

The Andromeda Galaxy, M31, was steadily seen by direct vision, with nearby M33 a definite maybe! Many meteors punctuated the sky, though no particular radiant was noted.

We began packing shortly after third contact, as I had to go to work in the morning.

In conclusion, the move to a dark site was very worthwhile; city lights interfere too much! Though it may not increase the scientific yield, the awesome beauty of the sky, emerging as totality approached, added immeasurably to the splendor of the moon's adventure in the shadow of the earth.

## TEHACHAPI

### Eleventh Annual Tehachapi Mountain Telescope Makers Star Party

Sponsored by the China Lake, Kern, Sacramento Valley Astronomical Societies, and by the Tehachapi Mountain Observatory Association.

Date: Saturday night, September 18, 1982.

Location: Antelope Canyon Ranch, south of Tehachapi. (See map at the end of the Bulletin.)

Purpose: To advance the art and science of telescope making by exchanging ideas among people who build and use telescopes. Come and bring yours.

Observing Site: In the Tehachapi Mountains at an elevation of 7500 feet. Let your telescope show what it can do under near-perfect conditions. The site is reached by a 3.5-mile long, narrow, well-graded dirt road. Please plan to arrive during daylight, so that observers will not be disturbed. Because of the grade and the altitude, vehicles should be in good mechanical condition.

Bring food, water, warm clothing, camping equipment, and a thermos with a hot drink.

Motels are available in Tehachapi for those who do not wish to camp. Contact the Ranch House Motel, at (805) 822-4561, or Ranchotel, at (805) 822-4283.

No motorcycles or trail bikes.

Registration Fees: \$2 per person, or \$5 per family. Children under 12: FREE. All money collected will be used for improving facilities for this annual meeting. The above registration fees include "roughing it" at the observing site. No open fires at the site and no smoking. Open to all members of W.A.A. societies, and their guests.

Improved Campsites: Picnic tables, barbeque fire pits, running water, restrooms, and hot showers are available at the foot of the mountain for an additional fee of \$3 single, \$5 per couple, or \$6 per family, per night.

Traffic Schedule: For your safety, we have established a traffic schedule, which will be posted at each end of the one-lane road. The host societies reserve the right to further limit traffic.

<u>Uphill Traffic</u>	<u>Downhill Traffic</u>
SAT: Two-way till Noon.	SAT: 6:00 PM to 6:10 PM
SAT: 12:30 PM-5:30 PM	SAT: 10:30 PM-10:30 AM SUN
SAT: 6:40 PM-10:00 PM	SUN: Two-way after 10:30 AM

The moon will be new on Friday, September 17th, at 5:09 AM PDT. For further information, contact: Steve Greenberg, (415) 443-6638. (Adapted from the Tehachapi flier. Ed.)

## Comet Comments

by Don Machholz

One new faint comet has recently been picked up during the past month, but this month's article is concerned mainly with Comet Austin, now in the evening sky, and with two fainter periodic comets, one in the evening sky and one in the morning sky.

### Periodic Comet Peters-Hartley (1846 VI=1982h).

This new faint comet was first known as Comet Hartley when it was discovered by Malcolm Hartley, on July 11th of this year. When discovered, it was a 15th-magnitude object with a short tail in the northwest section of the constellation Hydra. When the orbit was computed, it was found that this comet is actually the long-lost Comet Peters, seen only in 1846. This comet was closest to the sun (at 1.49 AU) on May 9th of this year, and it is not expected to get any brighter. It has an orbital period of 8.12 years. Hartley has discovered two other comets this year, both of which were parts of an earlier comet (du Toit).

Comet Austin (1982g). This comet, the brightest in at least 1-1/2 years, is now in the evening sky, south of Ursa Major. Bright enough to see with binoculars, it is moving away from both the sun and the earth (as it has already passed between the earth and the sun), and is now traveling over the north side of the sun. I did not see this comet in the morning sky on August 8th and 14th. On those mornings it should have been visible some 3° above the eastern horizon, while the sun was only 12° below the horizon. In such a bright twilight, even a fourth magnitude object is difficult to see.

The Comet News Service has given us more information on the discoverer. Rodney Austin, 37 years old, works as a process camera operator for a newspaper from 6:30 PM to 2:30 AM. He has observed a lot of comets, and casually began searching for comets in 1968, first using binoculars, then a 60-mm rifle range telescope, and finally a 6", f/8 refractor at 18 power.

The night of June 18th was very windy, but at 3:53 AM he picked up this magnitude 10.5 comet. Some 3-1/4 days later he received word that it had been confirmed. It took him 151 hours of comet-hunting to discover his first one.

This is the seventh comet to be discovered by observers in New Zealand, a country of 3 million people. While at one time Japanese observers were finding many of the new comets (1960's to the mid-70's), now observers in the South Pacific (Australia, New Zealand, and the Philippines) seem to be holding the edge.

### Comet Austin (1982g)

DATE (UT)	R.A.	DEC.	MAG.
09-03	12h 19.1m	+44°02'	6.6
09-08	12h 31.5m	+42°53'	7.1
09-13	12h 39.2m	+41°36'	7.6
09-18	12h 44.3m	+40°18'	8.0
09-23	12h 48.1m	+39°04'	8.4
09-28	12h 51.0m	+37°55'	8.8
10-03	12h 53.5m	+36°53'	9.1
10-08	12h 55.7m	+35°58'	9.4

### Periodic Comet D'Arrest (1982e)

DATE (UT)	R.A.	DEC.	MAG.
09-03	17h 03.2m	-15°09'	9.8
09-08	17h 18.1m	-18°05'	9.5
09-13	17h 34.2m	-20°54'	9.3
09-18	17h 51.7m	-23°32'	9.1
09-23	18h 10.4m	-23°55'	8.9
09-28	18h 30.2m	-28°02'	8.6
10-03	18h 50.8m	-29°49'	8.4
10-08	19h 12.1m	-31°17'	8.5

This periodic comet was closest to the earth in mid-August and closest to the sun in mid-September. Large and diffuse, one will need a dark sky to see it well. Its orbital period is 6.2 years.

### Periodic Comet Churyumov-Gerasimenko (1982f)

DATE (UT)	R.A.	DEC.	MAG.
09-08	03h 18.1m	+09°26'	12.2
09-18	03h 44.3m	+11°40'	11.7
09-28	04h 11.8m	+14°07'	11.2
10-08	04h 40.4m	+16°48'	11.0

This comet is usually quite faint, but this time it passes near the earth, and should be easily visible in moderately-sized telescopes for several months. It will pass through the Hyades cluster in late September.

Great Comets: Comet Kohoutek (1973 XIII) was discovered March 7, 1973 by Dr. Lubos Kohoutek, a Czechoslovakian astronomer working at the Hamburg observatory in West Germany. He was looking for another comet (Biela), which had broken up after being observed in 1852. This was his third comet discovery: he has since found two more. Dr. Kohoutek is also known for his work on minor planets and planetary nebula.

Discovered at a distance of 400-million miles, it was expected to become quite bright in late December, as it rounded the sun at a distance of only 12-million miles. During the summer of 1973, it was on the far side of the sun. In October's morning skies, it was still a (fainter than expected) 7th magnitude, with only a trace of a tail. As it re-emerged from behind the sun in early January 1974, and into the evening sky, it was a 3rd-magnitude object with a 10° tail, much fainter than predicted. It proved a disappointment to the general public.

This was the first comet to be viewed from a manned spacecraft, as the U.S. Skylab astronauts observed and photographed it. The comet also developed a sunward pointing tail (or "spike") and changed in color from white, to orange, to yellow within a few days. This comet also carried a hydrogen cloud around its coma. It will return in over 75,000 years. Between now and then, it will travel out to 90 times the distance from the sun to the planet Pluto.

In January 1974, Comet Kohoutek was in the evening sky and, despite the publicity, many people could not see it with the naked eye. In 1986, Halley's Comet will be in almost exactly the same position in the evening sky, at an identical magnitude (5), and nearly twice as far from us as was Comet Kohoutek. If the general public was disappointed in Comet Kohoutek, it is not expected that they will be pleased with Halley's.

## Space Program Update

by Bob Fingerhut

Imaging Radar Sees Through the Sahara! On the second space shuttle flight, the imaging radar not only produced images of the Earth's surface, but also recorded details of subsurface features. The extremely dry sands of the Sahara desert allowed the radar waves to penetrate below the surface until they were reflected by bedrock.

Ancient buried terrains were revealed under the Sahara's sands, including large dry-river valleys, braided tributary and alluvial fan features, terraces, extensive faults, and other rugged features. The sub-surface imaging data have broad implications for archeological, oil, and water explorations.

Mars Mapper Mission? A joint U.S./European Mars mission is emerging as a candidate for renewed cooperation between NASA and the European Space Agency (ESA). One concept being studied would team a U.S. geochemical mapper spacecraft with a European spacecraft that would observe the atmosphere. Both spacecraft could be placed in a Martian polar orbit by a single Centaur, carried into Earth orbit by the space shuttle. The imaging radar just mentioned could be used to provide entirely new data on the planetary geology of Mars.

Additional NASA Funding! Congress did not let Centaur die! For the last several months, a knock-down, drag-out battle has been fought over the fate of the Centaur upper stage. I have spared you the gory details, and have awaited a conclusion to the fight before writing this. Congress passed (three times), and President Reagan finally signed, a Fiscal Year 1982 NASA supplemental appropriation. This money will be used to develop Centaur for the Galileo Jupiter orbiter/probe and the solar-polar missions. Galileo will lift off in May 1986, one year later than the IUS launch. However, even having lost this time, it will have a much shorter trip than would have been possible using the IUS. Arriving at Jupiter will be from 12 to 18 months earlier!

Additional funds were also provided for the Solar Maximum repair mission, and for a 30/20 gigahertz (GHz) communications test satellite.

Flaming End for Cosmos 1267/Salyut 6. On July 29th, after a four-year, ten-month mission, the Soviets guided the Salyut-6 space station into a destructive re-entry over the Pacific Ocean. This was done because its unmanned research program had been completed, and consumables were running out.

On July 30th, Soviet cosmonauts at the Salyut 7 space station were outside performing tasks related to the assembly of future large space structures.

Cosmonauts Dock with Space Station. (Three additional Soviet cosmonauts -- including the second woman in space -- docked their craft with the Salyut-7 space station at 11:32 PDT on August 20th,

joining Anatoly Berezovoy and Valentin Lebedev, who have been in orbit since May 14th. The three newcomers, Leonid Popov, Alexander Serebrov and Svetlana Savitskaya, linked their Soyuz T-7 capsule with the space station. Ed.)

Key Space Decisions to be Made Soon. Dr. George Keyworth, President Reagan's Science Adviser, indicated that decisions will be made in the Fiscal Year 1984 budget on whether to buy a fifth Space Shuttle Orbiter and to initiate development of a permanently manned space station. It was suggested that approval for a fifth Orbiter is likely, but that the go-ahead for a space station will be put off for another year.

NASA Administrator James Beggs recently told the House Subcommittee on Space Science and Applications that he believes NASA needs a fifth Orbiter, and probably a sixth. He also said NASA will seek a Venus Mapper mission as a new start in Fiscal Year 1984. It will be planned as a low-cost version of the cancelled Venus Orbiting Imaging Radar (VOIR).

New Booster Launches Landsat-D. An advanced earth resources observation satellite was launched from the Western Space and Missile Center at Vandenberg Air Force Base on July 16th. The first images returned by the satellite's thermic mapper are said to contain better data than scientists had expected.

Landsat-D's orbit has an apogee of 696 km, a perigee of 689 km, and an inclination of 98.3°. It was the first spacecraft to be launched by a Delta 3920, which has a new second stage. With a payload assist module, it can launch a 2800-lb. spacecraft into geosynchronous orbit.

Air Force Shuttle Payload Test Spoiled. The primary Defense Department experiment on board the fourth space shuttle flight was reported not to have operated because a protective cover over the instrument could not be opened.

Privately Operated Shuttle System? NASA has decided to issue a contract to a single contractor for shuttle launch processing. This could well lead the government to move responsibility for the shuttle program from NASA to the private sector.

Galileo Jupiter Probe Test. On July 17th, NASA scientists conducted a successful test of a Galileo Jupiter-atmosphere probe spacecraft over White Sands Missile Test Range.

After an early morning balloon launch from Roswell, N.M. ("powered" by 5.14-million cubic feet of helium) the probe went on a four-hour flight before being dropped from 97,000 feet. At 50,000 feet, the probe's speed had reached Mach 1, and the dynamic pressures on it were quite similar to what they would be during the parachute opening at Jupiter.

All indications are that the Galileo probe's subsystems will be integrated and tested in 1983, and be ready for launch by a space shuttle/integrated upper stage (IUS) in 1985, or a Centaur launch in 1986. Ed.)

## Rattley Rattles

by Gerry Rattley

### The Herschel Catalogue, Continued.

Over the past 10 years of my own observing, I have seen nearly a thousand of the Herschel objects. Nearly five hundred of these were from classes II and III. In the next few years, from the dark skies of Arizona, it is my plan to observe all of the Herschel objects I possibly can with my ten-inch reflector. I am keeping records, with my own description of each object as I see it.

Also, over the next few years, I am going to use this Herschel survey information to prepare a series of Bulletin articles, which I will call "The Best of the Tirion". These will comprise a chart-by-chart discussion of the best deep-sky objects to view, for each of the first 23 charts of the Sky Atlas 2000.0 star atlas. I will not be covering the charts in order, but will pick a chart that is in season. Some of the charts may need a couple of articles to cover thoroughly. Each chart will be investigated by me at the telescope before it is presented. I may or may not cover the three southernmost charts (depending on where I go to view Halley's Comet, and on which telescope I take).

Sometime in the future, I hope to prepare a printed copy of the complete Herschel Catalogue, keyed for use with the RNGC catalogue, which I will sell at cost-plus-postage. (It will be many, many pages.) Please let me know if you would be interested in a copy of this catalogue. (No commercial ventures, please, as this will be copyrighted!)

I hope someday to write a book that discusses each Herschel object individually.

**Corrections:** There are three glaring typographical errors in the first part of my Herschel object article. First, near the top of the second column (on page 7 of the July '82 SJAA Bulletin), where it lists the number of objects in each class, the last entry should be "88 in VIII" (not 88 in VII). Second, near the bottom of the same column, the companion galaxy of M51 should be listed as NGC5195 (not as NGC5194, which is M51 itself). And last, near the top of the short column on page 8; the knot in M101, with Herschel number H.II 787, is a double knot and has two NGC numbers: 5447 and 5455. (Both together are the Herschel object.)

### Update on the Coma Galaxy Cluster

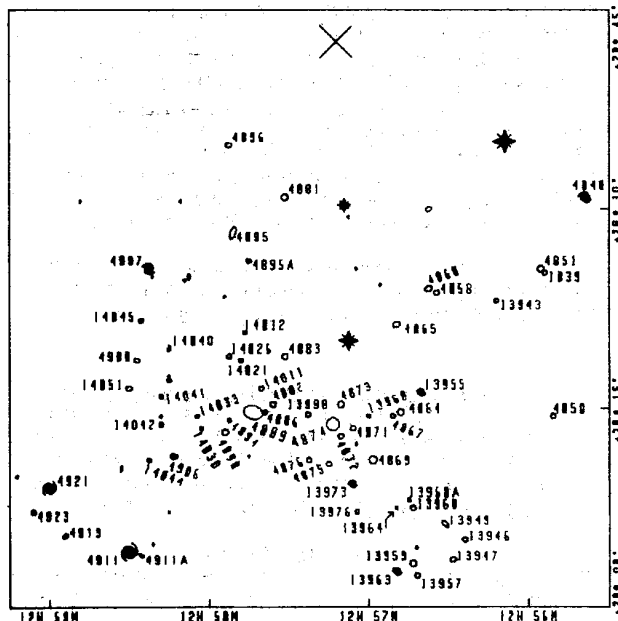
After my article, "The Coma Cluster of Galaxies", was published in the June '82 SJAA Bulletin, I received a copy of the Webb Society Deep-Sky Observers Handbook, Vol. 5 (Clusters of Galaxies). After comparing their coverage of the Coma Cluster with mine, I found two differences that I would like to pass on.

The first is an error that I made in identifying IC4021 and IC4026. (See the new diagram below.) The galaxy, which I had labeled as IC4026 (in the old diagram), does not have an NGC number now; what was IC4021 is now labeled IC4026; and a new galaxy is plotted preceding IC4026, which is labeled IC4021. This is correct!

The other difference I would like to point out is one that I will not correct on my diagram, though the Webb book may be correct. It concerns NGC4886 and NGC4882. According to my diagram: a small galaxy just preceding NGC4889 is NGC4886; and another galaxy a little north preceding this is NGC4882. Both of these small galaxies show up well on photographs, and can be seen visually well enough, so I prefer this interpretation. However, the Webb Handbook does not list or diagram the small galaxy I call NGC4886, but instead they list my NGC4882 as NGC4886, and add a note that NGC4882 is probably nonexistent. This interpretation is correct according to the RNGC (but the RNGC CAN be wrong!). I prefer my way here!!!

I might also add that there is no doubt now, in my mind, that NGC4872 is misplotted (as noted in my original article), and is in fact a small galaxy preceding NGC4874. This is a troublesome point though because (according to the NGC catalogue) NGC4872 is supposed to be H.II 389, whereas NGC4874 has no Herschel number.

Question: How could Herschel see 15th magnitude NGC4872 and assign it a number, and miss seeing 13th magnitude NGC4874? I propose that the NGC is wrong, that NGC4874 is the real H.II 389, and that NGC4872 should not have a Herschel number!

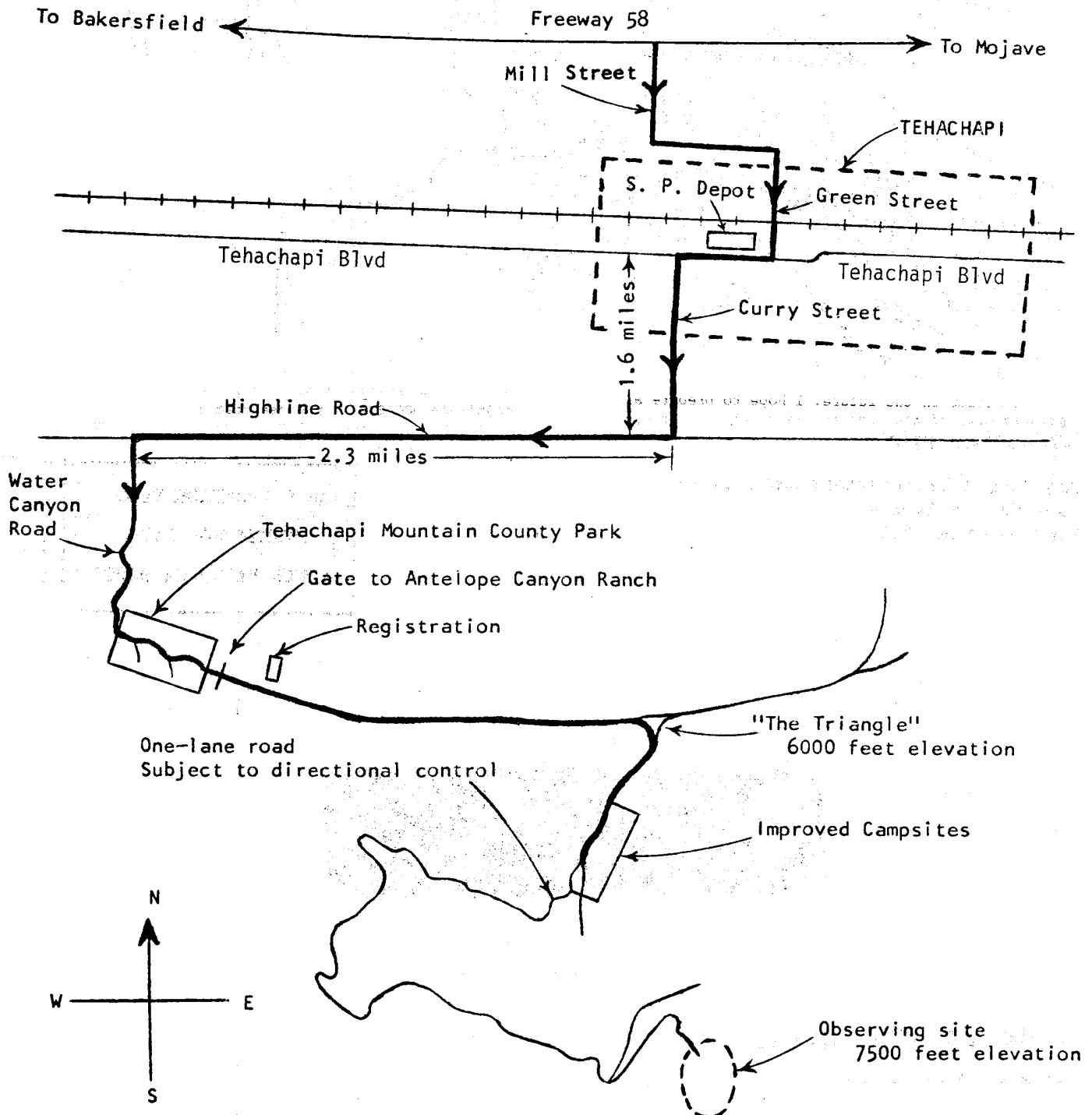




### HOW TO GET THERE

From downtown Tehachapi go south on Curry Street (which later becomes Summit Road) for 1.6 miles to Highline Road. Turn right (west) onto Highline Road and proceed 2.3 miles to Water Canyon Road. Turn left (south) onto Water Canyon Road and follow the "Tehachapi Mountain County Park" signs 3.2 miles to the Park. In the Park follow the "Antelope Canyon Ranch" signs 0.3 mile to the Ranch gate. Star Party registration is at the mobile home 0.2 mile beyond the gate.

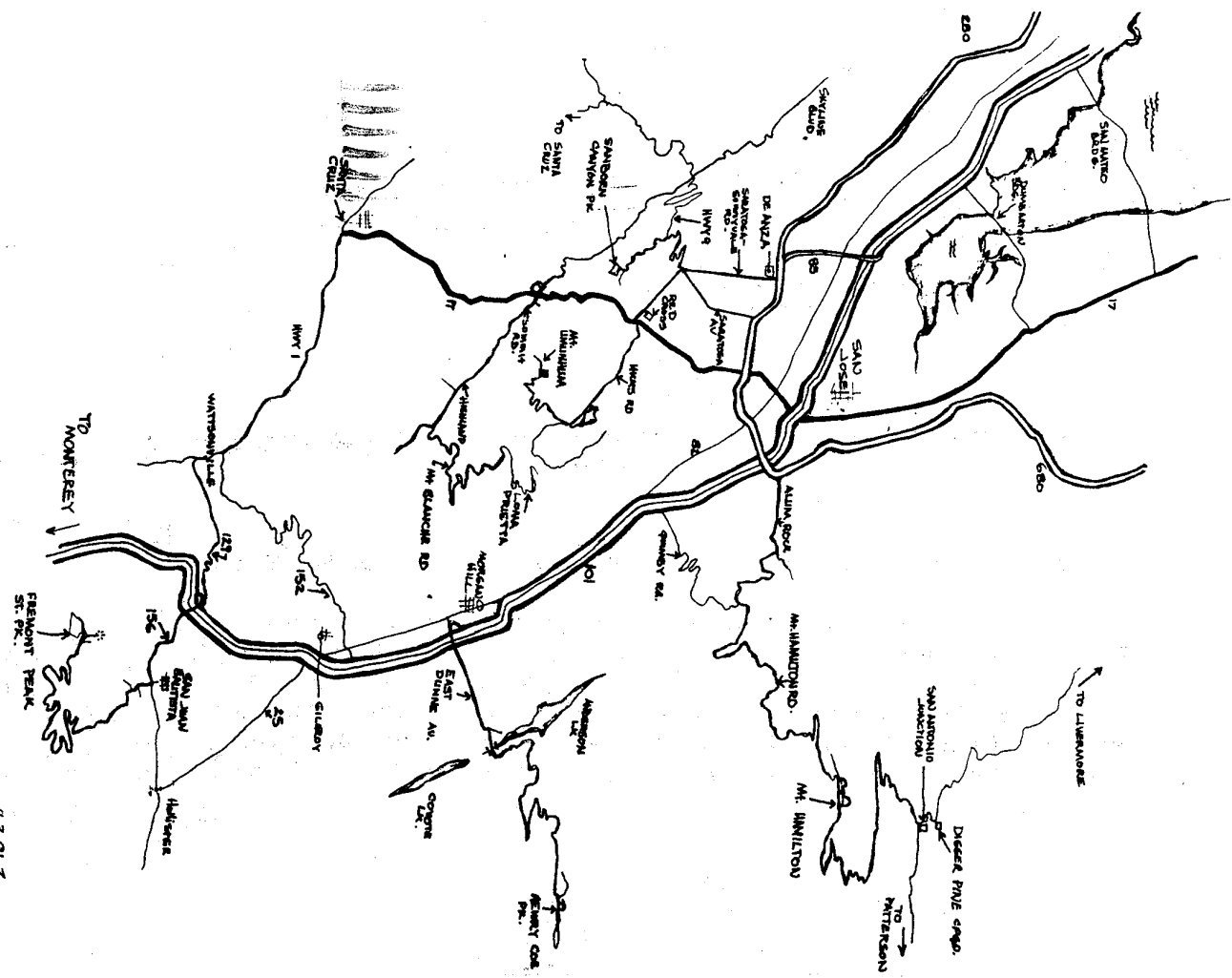
Remember! You are going by way of Tehachapi Mountain County Park to the Antelope Canyon Ranch.



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4-3-81 E

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