

the san jose astronomical association



Bulletin

november
1982

Ephemeris

- Oct. 30 Halloween Party, Los Gatos Red Cross, 18011 Los Gatos-Saratoga Road. See a hexapod walk around a barrel while grinding two mirrors at the same time, and watch E.T.'s Banker laughing all the way to the Grisnib.
- Nov. 6 General Meeting, DeAnza College, Room S-34 (across from the planetarium). Leon E. Salanave, who teaches astronomy at the City College of San Francisco, and is the author of Lightning and Its Spectrum: An Atlas of Photographs, will talk on "Lightning Exposed!" Afterwards, Bruce de Graaf will take a few minutes to present the options for a possible group purchase of inexpensive computers. Bruce's talk will include a few slides of machines and data graphs comparing them.
- Nov. 12 Board Meeting. Your friendly local editor will have a combination barn-warming and feast. Everyone welcome. Directions: Route 17 to 580 East to Livermore; take the North Livermore Avenue exit; make a right turn (away from the freeway); go about two miles, go under the underpass, continue on and then make a right onto First Street (before the flag pole and just at the "pool" and fountain); turn left onto "L" Street at the first stop light; go past two stop lights and continue until just past 6th Street. It's the second house on the right; 627 South "L" Street (a white house between a large red house and a short green house). Dinner at 7 PM. Board Meeting at 8 PM.
- Nov. 13 Star Party, Fremont Peak State Park, at Coulter Group Camp (two days before new moon). Take 101 south to San Juan Bautista (Hwy 156); take 156 east for three miles; turn right at the flashing yellow light (road G-1). Go about a quarter mile, then take the middle fork, and wind your way up to the park. Overnight camping. Bring warm clothes; it may get chilly.
- Nov. 16 STS-5 landing at Edwards Air Force Base. Anyone interested in convoying down? Speak up at November's General Meeting!
- Nov. 20 Star Party at Henry Coe State Park. Take 101 south to the Gilroy area; get off at the East Dunne Av. exit; go east past Anderson Reservoir; wind up the mountain for 12 miles; go past the park entrance to the old ranch buildings. A horse trough stands near the locked gate on the left that leads to the SJAA site. As usual, the SJAA lock combo is 4565. Please relock the gate after you enter.
- Nov. 27 Indoor Star Party at the Los Gatos Red Cross Building. Work off that Thanksgiving Feast by pushing glass around for exercise.
- Dec. 4 General Meeting. DeAnza College. Lewis Epstein, author of the book Physics Made Fun, and lecturer at San Francisco State University, will talk about Relativity.
- Dec. 10 Board Meeting at Chris and Shea Pratt's, 474 Safari Drive, San Jose, 8 PM. Everyone welcome. For directions, call (408) 629-2994.
- Dec. 11 Indoor Star Party at the Los Gatos Red Cross, 8PM. (See map on the cover for location.) Detailed instructions next month.
- Dec. 18 Star Party at Sanborne Canyon.
- Dec. 25 No scheduled Club activities.
- Jan. 1 No scheduled Club activities.

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

Observations by Steve Greenberg

November's General Meeting. About a year ago, I had the pleasure of listening to Leon Salanave talk to the San Francisco Amateur Astronomers about his newly-published book on lightning. He discussed several lightning-related projects that he had worked on while associated with the University of Arizona's Institute of Atmospheric Physics. His talk was beautifully illustrated with a number of unique slides of lightning and lightning-related phenomena, many of which he had taken. The slides included photos of bead and ribbon lightning, lightning spectra, photos taken with Hydrogen alpha filters, time exposures, and high-speed shots. I think that the many serious photographers (and the frivolous ones, too) in the SJAA will be fascinated by these photos and the several (mostly) simple methods that were used to take them. Indeed, some of the techniques, such as slitless spectroscopy, were taken from his astronomical background. He accompanied the slides with an interesting series of anecdotes, reminiscences, and descriptions of unusual phenomena, interspersed with non-technical explanations of the atmospheric physics involved. From my experience last year, I think that anyone in the club who doesn't come to the November 6th General Meeting will miss a fine talk.

Before his work with the University of Arizona's Institute of Atmospheric Physics, which lasted from 1958 to 1971, Leon Salanave had helped design and plan the Morrison Planetarium for the California Academy of Sciences. He later conducted site tests for locating Kitt Peak National Observatory. He was also the Executive Officer of the Astronomical Society of the Pacific from 1971 to 1974. (I first met him in 1972, when he arranged to publish one of my first eclipse photos in the ASP's Mercury magazine.) Since 1979, he has been a consultant for astronomical optics at the California Academy of Sciences, and has taught astronomy at the City College of San Francisco.

Group Purchase of Inexpensive Computers? At the October 9th Red Cross indoor star party, Bruce De Graaf asked if anyone was interested in purchasing, at a substantially reduced group rate, one of several small new computers. Several people responded that they were, and Bruce gave us a quick rundown of the subject. He promised more details on models, options, capabilities, and prices in the near future.

In line with this promise, he will give a short presentation at the end of the November 6th General Meeting, and would like interested club members to attend. This will give you a chance to discuss with him what capabilities you might want or need in a personal computer, how much you might be willing to spend, and to show your interest by giving your name to Bruce after the meeting. Further information is given in the Letters section.

A Parenthetical Note. At the NASA/AMES WAA/AANC meeting, in the question and answer period after Eric Burgess' talk about his newly published book Celestial BASIC (a series of programs for amateur astronomers), Jim Van Nuland asked who in the audience had access to, or actually owned, a home computer (such as a TRS or Apple). Of the approximately 300 amateur



Top: Ribbon lightning striking chimney.
Bottom: Dart leader preceding a return stroke.



From: Lightning And Its Spectrum, by authors permission.

astronomers present, almost one-half raised their hands (my estimate). After the meeting, I asked Eric if he was surprised at the response. Apparently, when he started writing, his publishers hadn't been sure what the demand for such a book would be, but the audience's response told him that this was a book whose time had come.

If you are unaware of the many interesting things that computers can help you do in amateur astronomy,

I recommend looking either at Eric's book, or Practical Astronomy for Hand Calculators. Even just reading the software ads in Sky and Telescope or Astronomy Magazine will give you some idea of the impact Silicon Valley is having on our hobby.

The Celestial Tourist. A few words of explanation for those readers who, like myself, missed our not having a Celestial Tourist column last month. Jay Freeman, under the auspices of his employer, is attending a course on computer technology several evenings each week. He expects this schedule to keep up perhaps until next spring, and told me that it will not be possible for him to continue as a regular monthly contributor to the Bulletin till then. However, he does intend to send items in, on an irregular basis, until further notice.

Jay, many thanks for your past contributions to the Bulletin, and I hope that by next spring you can once again start writing your monthly column for us.

More Thanks. I also wish to express my sincere appreciation to Suzanne and Ralph Lowd, and Jane Miller (Cincotta) for volunteering to help get the Bulletin printed and mailed each month. You have relieved me of many hours of rush-hour travel, folding, stapling, and labeling; and I truly appreciate it.

Buying That First Telescope. The Astronomical Society of the Pacific has just announced the publication of a non-technical pamphlet written for novices in the throes of choosing a first telescope. The diagrams and text give background information about various types of instruments and mountings; which types are preferred for what purposes, how to rate a telescope, and what to do with it when you get it home (seriously). A list of major telescope manufacturers is included, as is information about astronomical resource organizations, a reading list for beginning and advanced amateurs, a list of introductory astronomy books, and a list of questions to ask before purchasing a telescope. If you are interested in obtaining a copy, send a donation of \$2.00 (for covering printing, mailing, and handling costs) to:

ASP/Telescope Guide; 1290 24th Avenue; San Francisco, CA 94122.

Building That First Telescope. Or, you can come to the SJAA's Indoor and Outdoor Star Parties, and be regaled with loads of practical experience, advice, and opinions from lots of friendly people on what to look for in a telescope. Besides that, there's almost always a batch of just about every commercial and homebuilt type for you to examine firsthand, and see how they actually perform on the stars. By taking advantage of our mirror grinding and telescope making class, and with lots of your spare time (that's what a hobby is for, right?) you can build your own telescope. And, if care is exercised, your handiwork may well outperform many commercial makes, at a fraction of the cost. (End of SJAA commercial.)

A Survey Reminder. Last month, we published a questionnaire from Sunset Magazine about our hobby, for use in a soon-to-be-published article. If you wish to see your opinions included, please take a few minutes to fill the questionnaire out, and send it back to Sunset.

A NOTE ON PUPIL SIZE OF EYES by DON MACCHOLZ

At the AANC/WAA convention in late August, there was some discussion about pupil sizes in the human eye; how large do they really get? The "book" value is six to seven millimetres, decreasing with age. This figure differs with individuals; and even for each person the size will differ, even under similarly dark conditions. (The lowest efficiently usable magnification of a telescope depends upon this size. The main reason for needing to know the size of the pupil is this: Eyepieces, particularly in richest field telescopes that use very low powers, can produce an exit beam of light with a larger diameter than that of the dark-adapted pupil. This results in inefficiency, since the optics have gathered light that can't be used by the eye.)

During the past four years I've been to two optometrists, and when I asked, each has gladly measured the maximum size of my pupils under dark conditions (before they put the atropine "eyedrops" into my eyes). One measured a size of "at least nine millimetres, and closer to ten" and the other measured a diameter of nine millimetres.

Assuming the use of a telescope mirror 10.0" (254 mm) in diameter, my lowest efficiently usable power (x) would be:

$$254 \text{ mm}/x = 9.0 \text{ mm}, \quad x = 28.2 \text{ power.}$$

The "book" value of 6.5 mm gives:

$$254 \text{ mm}/x = 6.5 \text{ mm}, \quad x = 39.1 \text{ power.}$$

How does the eye doctor measure the size of the pupil? Mine used a special ruler with different sized semi-circles cut out of the edge. You don't have to go to a doctor to get this done. I get similar results by using a millimetre ruler and looking in the bathroom mirror with only a night-light on. In the dim light the pupil expands; by holding the ruler up to the eye, the pupil diameter can be read in the mirror.

Large eye-pupil diameter does not automatically mean keen dark-adaptation. Much of the adaptation takes place in the retina, where a pigment known as "visual purple" is produced to make the eye more sensitive in dim light. While Vitamin-A deficiency will hamper the production of this chemical, a massive excess of Vitamin A will not improve night vision (if one was not suffering a deficiency to begin with). In fact, too much Vitamin A is harmful to the body. It's best to stick to a carrot a day.

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Letters to the Editor

GROUP PURCHASE OF INEXPENSIVE PERSONAL COMPUTERS

I am planning a group purchase of some type of inexpensive computers for SJAA members. The goal is to obtain significant cost reductions by buying in some limited quantity, at or near wholesale prices. I have been studying the offerings announced by Apple, Atari, Commodore, Texas Instruments, and Timex/Sinclair, and will present this information at the General Meeting on November 6th. (See the Ephemeris.) I will also ask if anyone is interested in joining the limited-life computer cooperative.

If you wish to join, please give me your name, address, and telephone number via mail to the address below, or by hand at the General Meeting. You are not bound by this: I just need to know who you are in order to contact you at the beginning of December, when (and if) the group purchase will be made.

For your planning efforts, the goal is a computer system with the following characteristics:

1. Cost less than \$600 (complete).
2. No kits!
3. Suitable for software development as delivered. There's nothing worse than spending money for a device which just requires you to spend even more money! The target system is to include everything necessary to develop software suitable for your own uses.

If you have any comments, non-negotiable demands, and/or questions, please send them to me as soon as possible, and they will be given the treatment they deserve. (No question will be treated as stupid.)

Bruce de Graaf
7130 Pt. Dunes Ct.
San Jose, CA 95139

I am sorry I cannot give my telephone number; I work odd hours (Jack Zeiders claims that I live at work), and you would probably never reach me anyway.

CLUB TELESCOPES

I now have the Club's 12-1/2" "Dobsonian" telescope. It's mine until November 12th, when my two months are up. Anyone who wishes it for the next two months should call me at (408) 293-0562 between 8:30 AM and 4:00 PM, weekdays. You'll have to pick it up from San Carlos--and the scope is 6' 11" long!

Bob Black

(Due to an unfortunate accident at Slide and Equipment Night, the Club's 6" telescope [like Humpty Dumpty] took a great fall. A strap mount broke, and the tube's sudden stop on the floor snapped the spider in several places. If any of "the king's men" are interested in helping to put Humpty Dumpty back together again, please get in touch with me. I will get you together with the right person. Ed.)

COMET NOTE

We have received and read the SJAA Bulletin now for about six months. We enjoy all departments. You are all doing a fine job.

In October, you had a footnote to Don Machholz's column asking if he knew of any other instance when an amateur astronomer discovered a comet while looking for a Messier object.

I can recall two such instances (other than Kobayashi-Berger-Milon). I would bet that Don has already told you of these, and probably more, but in the event that he missed one, I am sending you accounts of both of them.

1. Comet Seki-Lines (1962c). (See Sky and Telescope, Jan. to June 1962, pp. 211, 242a, 272, and 304.) I remember viewing this naked-eye comet 20 years ago last spring, in the evening western sky, with Don Kusterer and George Stillwell.

2. Comet Bally-Clayton (1968d). (See Sky and Telescope, July to Dec. 1968, pp. 266 and 348.) I attended the 1968 Southwestern Astronomical Conference at Las Cruces (WAA-ALPO-AL). While I was not at the star party at which the comet was discovered, I did hear a sleepless John Bally-Urban give an account of the discovery on the following morning.

Jim McMahon
China Lake Astronomical Society

(P.S. Comet Seki-Lines may not qualify since, when Seki found it nine hours after Lines, it was "3° northeast of Zeta Puppis" [Sky and Telescope, pg. 211]. This is about 15° south-southeast of the nearest Messier object (M93). Who knows what Lines was looking for? JM.)

(Included in Jim's letter were two Sky and Telescope articles [from the underlined issues]. I've abstracted the following two short quotes. Ed.)

Comet 1962c. ... Mr. and Mrs. Lines and some friends had taken portable telescopes to a desert site 35 miles east of Phoenix for an evening's observing. It was while "sight-seeing down the Milky Way" with his 8-inch reflector that he came upon an object low in the south in Puppis, an 8th-magnitude diffuse glow which Mrs. Lines insisted "looked like a comet". (May, 1962.)

Comet Bally-Clayton (1968d). August 24th ... At an informal star party, John Bally-Urban and Patrick Clayton were locating the Ring nebula in Lyra with the latter's 10-inch f/5.8 reflector when they encountered a small fuzzy object of magnitude 11 or 12. ... August 27, Comet Bally-Clayton was...only 1/4° from the Ring Nebula. (Oct., 1968.)

AD

For Sale: 55 gallon steel drums. Can be used for traditional barrel-top mirror grinding. \$5 each.
Penny Pinschmidt, 354-5545.

Rattley Rattles

by Gerry Rattley

ARIZONA REPORT NO. 1

I arrived in Arizona in time to catch the end of the rainy summer season. The first two weeks of September were completely clouded out, with flash flood warnings out all over the state. (There were some spectacular thunder and lightning storms!)

The sky broke open about mid-September and I went out site searching. On September 15th, I discovered a remote dirt road about 35 miles northeast of Mesa, in the Tonto National Forest. Eight miles to the east of this site towers a mountain called Four Peaks, so named because of its four (count them) very distinct peaks.

This Four Peaks site proves to be a nearly perfect observing site. It is darker, easily, than Fremont Peak or Coe. Metropolitan Phoenix is about 45 miles to the southwest, but it poses no serious problems (yet). There is NO light pollution to the north or east. High mountains rise to the north and east, cutting those horizons off a bit, but the southern horizon is unobstructed and still fairly dark despite the glow from the Mesa-Tempe area. From where I am in Mesa, it takes about 40 minutes to get to this site. The road, Highway 78, is straight, wide, and smoothly paved. After turning off the highway, the last 2.5 miles is a dirt road (but it's wide and not too rough).

On my first observing night at this site, I viewed Comet Austin (sans tail), and many nebulae and clusters in Cassiopeia. The open cluster (no number) plotted on the Tirion just north following Eta Cassiopeiae was easily visible. It appeared as a fairly large glow with just a couple of stars resolved at 115x in my 10-inch. Its glow was very faint but distinct, especially with averted vision. This is probably a dark-sky-only object.

One other object I have found from here, that indicates to me just how dark this site can be, is IC 10. This is a very loose broadside spiral galaxy in Cassiopeia. It is very near our Local Group of galaxies, and could possibly be a member. It is located just northeast of the variable star TV Cassiopeiae (about a degree and a half east of Beta Cassiopeiae). IC 10 appears very faint but fairly large. There are a couple of faint embedded foreground stars that interfere with seeing it, but with a dark sky and averted vision it is not too difficult.

On September 18 the Saguaro Astronomy Club (SAC, of which I am a member) had a star party at the residence of Maynard and Jeanne Clark, near Sedona, Arizona. Sedona is southwest of Flagstaff and is well known for its beautiful red-rock buttes and mesas. The sky cleared nicely that evening and the well attended (about 30 people) star party was a big success. It was DARK! I started by viewing Comet Austin (still sans tail) and the spiral structure in Messier 101. This was one of the best views of the spiral structure in M101 I have ever gotten with my 10-inch.

I then viewed a few of my favorite small planetaries, IC 1747, NGC 6578 and NGC 6804, in preparation for looking for NGC 6803, a small planetary in

Aquila that I have never been able to find before. I was able to locate it at 115x and observe it at 205x. It looked like a central star with a pale bluish disk at 205x. I confirmed this observation by locating it with a 17.5-inch Odyssey that was at the star party.

I spent the rest of the night with the Odyssey 2, where I believe the highlight of the show was when I located Campbell's Hydrogen star, a tiny (but fairly bright) planetary about three degrees north following Albireo in Cygnus. It is plotted on both the Tirion and the Skalnate Pleso atlases. It was not too difficult to locate and observe. The bright central star had a fuzzy disk with a very eerie hue; it was a sort of orange-yellow-green-blue mixture. (Try it at higher powers with a large aperture sometime, and see what you think!)

Pete Manly had a successful night with the TV camera at the star party. Maynard has a lathe, and machined Pete an adapter that allowed him to use both an f/5 and an f/7 telecompressor together: for an effective f/ratio of 3.5 on his C-8. This, combined with an image intensifier, yielded some impressive views of nebulae through the TV camera. He also obtained some Polaroid shots of the TV screen that show nebulae.

I recently obtained a copy of the Astronomical League's booklet called Observe the Herschel Objects, by the Ancient City Astronomy Club. I began looking through it and quickly noticed that it had some obvious errors. I decided to read through it completely and compile a list of all of the mistakes I could find. Even though my list seems lengthy, I feel over-all that the booklet is well done and the error list is far shorter than I had expected.

I also feel that the choice of objects and the way they are presented has been done rather well, and I highly recommend this booklet to anyone who wishes to go on to a project beyond the Messier list of objects.

Upon checking their selected objects with the list of the ones I have seen, I found that I had observed all but two of them. Both are large, loose star clusters that are not listed in the Skalnate Pleso. (One of them is mentioned in Burnham's.) A couple of nights later I went out and observed these, so I can now say that I have seen all of the objects listed in this booklet.

Anyone interested in obtaining a free copy of the error list I have compiled can get one by sending a self-addressed stamped envelope to me at:
1903 N. Country Club Dr. #C-132; Mesa, AZ 85201.

The booklet, Observe the Herschel Objects, as well as other Astronomical League Observe booklets, can be ordered from the:
Astronomical League Book Service; 103 Supreme Ct.; East Peoria, IL 61611.

I think the cost is \$2.50, but am not certain. It also takes several weeks to get it. You may be able to get it faster, but at a little more cost, from Norm Sperling's:
Everything in the Universe; 429 43rd St.; Oakland, California 94609; (415) 547-6523.

Well that's about it for now. Dark skies and good seeing!

Comet Comments

by Don Machholz

As Comet Austin fades out in the morning sky, two periodic comets will remain visible for the next few weeks. No other comets have recently been discovered or recovered.

In the September 1982 issue of Sky and Telescope there is an article by Edgar Everhart about his construction of a measuring machine, followed by an article by Dr. Brian Marsden on converting photographic comet images to astrometric coordinates.

During the past few years, there has been a shortage of accurate positions of newly-discovered and returning periodic comets. During this time I had asked each of these men to publish their articles in Sky and Telescope, in the hope that amateurs will take up this endeavor. Those of you with machining abilities and/or a good photographic telescope may wish to review these articles and start such a hobby.

Last month, in connection with my discussion of Doug Berger's discovery near M2, the editor asked about other instances of comets being discovered by those looking for Messier objects. At this time, I can remember no other instances where this happened.

Professional astronomers usually "accidentally" discover comets while photographing the sky for other reasons. The first Messier object (the Crab Nebula, M1) was originally observed when the comet of 1758 (Comet 1758I) passed by it on September 12th of that year.

A interesting recent case occurred in December, 1960 when M. P. Candy discovered a comet while testing out an eyepiece on the star Kappa Cephei. He was using a 5-inch refractor with a 5-1/2 degree field of view. The comet, near the star, was 8th magnitude, and a nine-day-old moon was in the sky.

Great Comets of the Past: Comet West (1975n, 1976VI). Discovered by Richard West of the European Southern Observatory (Chile) on November 8th, 1975, in eastern Sagittarius, this comet became one of the brightest and most spectacular of the century. At discovery, Comet West was 15th magnitude. It brightened to 0.0 magnitude in late February 1976, and was even visible in the daytime. In early March, it displayed two tails, each over 25 degrees long, in the pre-dawn sky. Its nucleus split into four parts at about this time. The comet will be back in 15,000 years.

Comet Austin (1982g)

| DATE (UT) | R.A. | DEC. | MAG. |
|-----------|-----------|---------|------|
| 11-02 | 13h 03.4m | +33°17' | 11.1 |
| 11-07 | 13h 04.2m | +33°05' | 11.3 |
| 11-12 | 13h 04.6m | +33°00' | 11.5 |
| 11-17 | 13h 04.6m | +33°03' | 11.7 |
| 11-22 | 13h 04.2m | +33°14' | 11.9 |
| 11-27 | 13h 03.2m | +33°31' | 12.1 |

Moving less than a degree during November, Comet Austin is north of the sun and pulling away

from both it and the Earth. It is better seen in the pre-dawn hours now.

(Positions from Mr. George East.)

Periodic Comet D'Arrest (1982e)

| DATE (UT) | R.A. | DEC. | MAG. |
|-----------|-----------|---------|------|
| 10-28 | 20h 38.9m | -33°40' | 8.9 |
| 11-07 | 21h 20.0m | -33°00' | 9.6 |
| 11-17 | 21h 58.0m | -31°27' | 10.3 |
| 11-27 | 22h 32.5m | -29°13' | 10.9 |
| 12-07 | 23h 03.7m | -23°44' | 11.8 |

Comet D'Arrest has not been as bright as the magnitude figures would indicate. In addition, it has been seen against a Milky Way background for the past few months. It will be moving along the southern evening sky. Get out and see it.

(Data from MPC 6533.)

Periodic Comet Churyumov-Gerasimenko (1982f)

| DATE (UT) | R.A. | DEC. | MAG. |
|-----------|-----------|---------|------|
| 10-28 | 05h 38.8m | +22°53' | 10.4 |
| 11-07 | 06h 06.3m | +26°11' | 10.1 |
| 11-17 | 06h 30.6m | +29°31' | 10.0 |
| 11-27 | 06h 49.8m | +32°42' | 10.0 |
| 12-07 | 07h 02.9m | +35°33' | 10.1 |

This comet is above the horizon nearly all night, and is also high in the northern sky. It will be traveling through a rich background north of Orion.

(Data from MPC 6535.)

PRODUCT REVIEW*

by DR. JACK MARLING

At last! A simple process for developing slides at home. The new Unicolor Rapid E-6 Developing Kit for Color Slides provides a simple three-step E-6 process for developing slides, and is a tremendous improvement for several reasons. Normally, (reversal process) development of slides at home required about eight to ten steps, with six to eight bottles of various chemicals, all of which had to be maintained near 100°F. This older E-6 process took 30 to 40 minutes, and you always had to be careful not to forget, or switch around, one of the many steps; Murphy was always lurking nearby. The new Unicolor process has only three steps, each of which is six to seven minutes long: developing in a First Developer, Color Developer, and Blix, with a brief water rinse between each step. Total time for me was only 20 to 24 minutes. The process temperature is still 100°F.

A second very important advantage of this process is in color rendition. It always seemed that Kodak Ektachrome slides came back with greenish skies when sent in for normal commercial processing. The new Unicolor E-6 process yields a much more pleasing black or bluish-black sky*. Thus, the background color balance is better, too.

The kit is available in pint, quart, and larger sizes.

(*This should interest our Club astrophotographers. Ed.)

Space Program Update

by Bob Fingerhut

Soviet Spacecraft Aids Four in Three Rescues. The Soviet search and rescue satellite, COSPAS, assisted in locating three downed aircraft in the last month, helping to rescue four men. COSPAS is part of the international Search And Rescue SATellite (Sarsat) system. (The U.S. will launch its part of the system in February 1983, on the NOAA-E meteorological spacecraft.) The spacecraft listens for the 121.5 and 243 MHz emergency locator transmitter beacons on aircraft.

Sersat Makes It Seven in Four. (Note added in press.) During the second weekend of October, Sersat played its first role in a maritime rescue. Three hundred miles east of Cape Cod, a 60' Trimaran, with three people aboard, capsized. Although their emergency beacon was heard by two airplanes, their location could not be pinpointed until the U.S. Guidance Station, at Scott Air Force Base in Illinois, located them with the aid of COSPAS. Following Scott AFB's directions, a C-130 spotted the three in 30' waves. The rescue was completed by a Coast Guard cutter.

Although results have been dramatic, the false alarm rate for COSPAS has been running from 97 to 98 percent, due to emergency transmitters that were either accidentally or deliberately turned on.

"Poor Man's" Comet Mission. The International Sun Earth Explorer (ISEE-3) spacecraft has been diverted from its orbit to fly by comet Giacobini-Zinner in September, 1985. Although ISEE-3 has no imaging capability, it can provide particles and fields data that will be helpful to the international Halley spacecraft project, to be launched by the Europeans. After flying a multiple moon-assist trajectory, ISEE-3 should pass about 1864 miles from the comet's nucleus, with a closing velocity of 13 miles/second.

On the way to the comet, it will also pass through the Earth's magnetospheric tail, where it can also collect important data. The cost of the mission will be about \$3 million. Barrato!

Ariane-1 Flight Failure. The crash of the first operational Ariane's payload was caused by a mechanical failure of the turbo pump in the third stage.

Intelsat-5 Orbiting. The fifth Intelsat-5 was launched into a geosynchronous orbit on board an Atlas-Centaur vehicle. After orbital testing (from October 12th to November 6th), the spacecraft will be moved from its position over the Fucino, Italy, tracking and monitoring station to its assigned station over the Indian Ocean (63° E. longitude). It should begin commercial service by early December.

Otrag to Market Sounding Rockets. The private German launch organization Otrag (Orbital Transport und Raketen AktienGesellschaft) is preparing to market a series of liquid-propelled sounding rockets, as an interim step toward developing a satellite orbital-launch vehicle. A new factory in Garching, West Germany, has been established, and tests should begin in March or April of 1983.

STS-5. On September 21st, Columbia was rolled out to the launch pad. It is scheduled for a November 11th launch, at 4:19 AM (PST). Using the first Payload Assist Module (PAM) upper stages, it will deploy two satellites: the Telesat-Canada Anik-C satcom, and a Satellite Business Systems SBS-3 satcom. The five-day mission is scheduled to land at Edwards Air Force Base. Astronauts Vance Brand and Robert Overmyer will pilot the mission, while payload operations will be conducted by mission specialist astronauts Joseph Allen and William Lenoir.

Columbia Modifications Postponed. Columbia will be kept on line until the delivery of Discovery, the third orbiter, in late 1983. Columbia was originally scheduled to be fitted with more powerful engines and upgraded displays after this month's flight.

NASA Funds Approved. The NASA FY'83 appropriations and authorization bills have passed Congress, and have been signed by President Reagan: 6.809 billion was appropriated, of which \$6.771 billion was authorized. Among the projects approved were the Centaur upper stage, a 30/20 GHz communications satellite, and the Solar Maximum Repair Mission. A fifth Space Shuttle Orbiter was authorized, but it was given no funding. However, the appropriations committee did recognize the need for the fifth orbiter.

A top-level NASA study has shown that a fifth orbiter would be needed by 1987, a sixth by 1991, and most likely, a seventh after 1991.

The Centaur will be developed in two versions. The Department of Defense and NASA will each pay half of developing a "short" Centaur. NASA will then fund the extra cost of the "long" Centaur, which will be used for planetary missions.

Spacelab-1 Payload Specialists Selected. The first launch of Spacelab-1 is scheduled for September 30th, 1983, on the orbiter Columbia. The first two payload specialists, one of whom is a European, have been selected. They are: Ulf Merbold, a West German physicist employed by the European Space Agency; and Byron K. Lichtenberg, a biomedical engineer on the research staff of MIT. The other astronauts on this flight will be:

John Young, Brewster Shaw, Owen Garriott, and Robert Parker.

San Jose Astronomical Association

A.B. Gregory Award

Picnic

Equipment Night

Star Parties

Conventions

Telescope-Making Class

SJAA Bulletin

Astronomical Auction

Indoor Star Parties

Astronomy Day

Halley's Back!! On the 16th of October, Halley's comet was recovered in Canis Minor at the following position:

7h 12m 48.5 \pm .3 s; $+9^{\circ}29m.45 \pm .5$ s (Epoch 1982.81).

Four images taken at the prime focus of the Hale 5-metre telescope at Mt. Palomar, using the charge coupled device (CCD) developed for the Space Telescope, showed an object within 0.8 arc-seconds of the comet's predicted position. The image sequence showed motion in the correct direction and at the right rate for Halley's comet. Each CCD exposure was eight minutes long, and the comet's estimated magnitude was 24.2. The work was done by a large team, headed by Jewitt and Danielson.

As of the 23rd of October, no other observations had verified the comet's presence. However, on the 19th, the 5-metre team found nothing at the locations at which the new object had previously been observed. The comet has also not yet been seen by search teams using the Kitt Peak and the Canada-French-Hawaii 4-metre instruments to an estimated 25th magnitude.

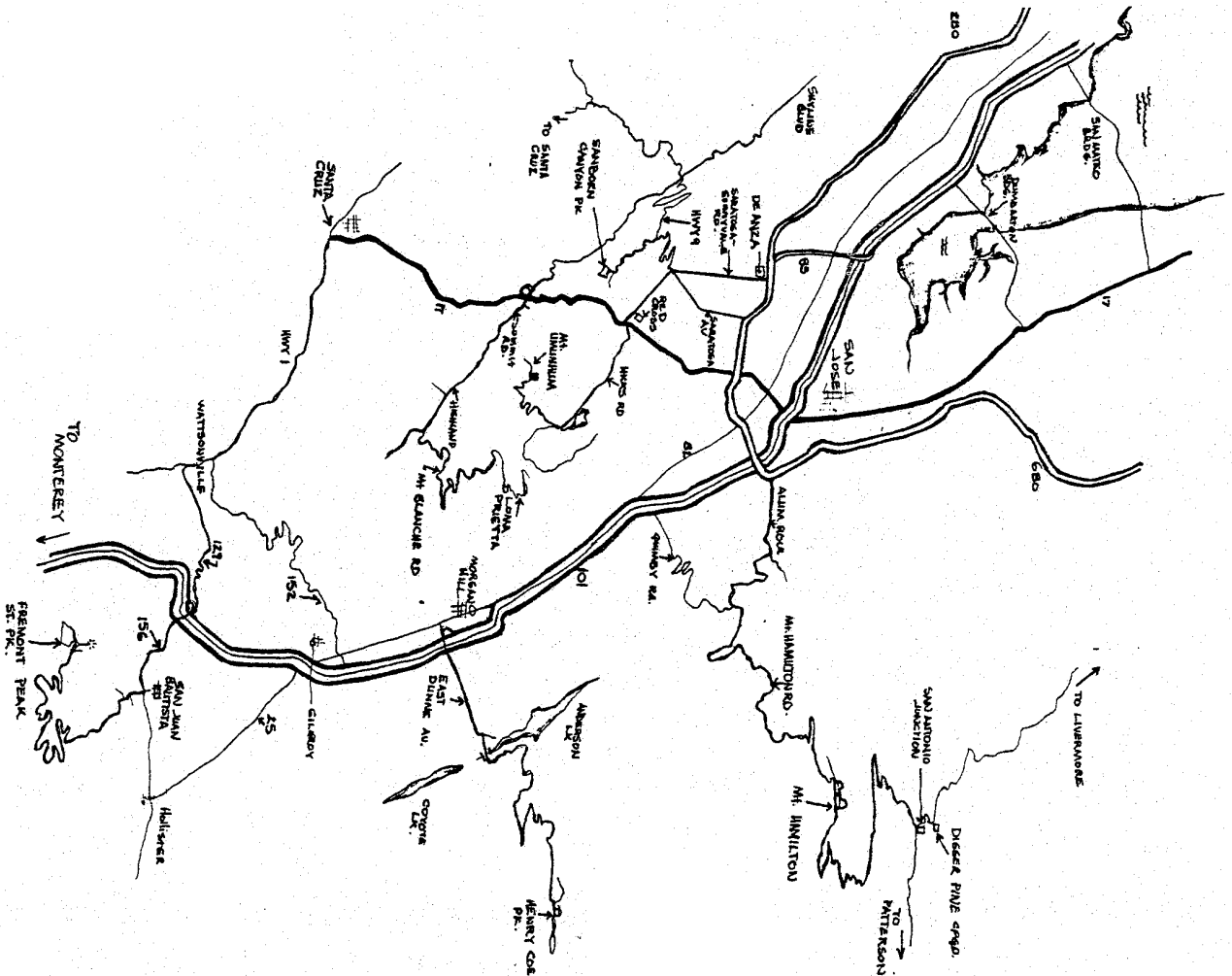
Brian Marsden has assigned 1982i to Halley's comet.

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