

# SJAA EPHemeris

Vol 3 No. 9

Official Publication of the San Jose Astronomical Association September 1991

## AUGUST MEETING

Just a brief note. The August "Eclipse Night" was very well attended by over 100 members and eclipse chasers. Several hundred slides featuring all aspects of the eclipse were presented. Many were very striking. A special thanks to all who took the time to prepare their show.

## FIELD OF VIEW

Don't miss the SJAA picnic and Bar-B-Q held this year at Fremont Peak State Park. The club is providing the main dish, members should bring side dishes. Know how to get to Fremont Peak? Please see the enclosed map with directions. The festivities are scheduled to begin around 4 pm. Observing afterward.

Changed Date! Members should note that the General Meeting has been moved to the second weekend of the month. This month's meeting is held on September 14th and is our annual slide and equipment night. Bring those eclipse photos! Bring the special camera/telescope setup you used to take them. Slide and equipment night is an annual tradition started back in 1975 and has been a favorite amongst members. You never know what might appear. Please note that the Introductory Astronomy Class has been moved to September 21.

## EMPLOYMENT OPPORTUNITY

Seeking motivated and talented individual to become the Editor of the Ephemeris. After 7 years and 84 issues, it's time to hang up the keyboard. It has given me great pleasure to be your Ephemeris editor all of these years. It has provided the opportunity to meet a number of people and to learn a little about computers. But now I must pursue other opportunities and

## SEPTEMBER 7TH SJAA BAR-B-Q/PICNIC AT FREMONT PEAK

### 4 PM SLIDE AND EQUIPMENT NIGHT SEPTEMBER 14TH 8PM

September 6: SJAA night at Fremont Peak Observatory. Dusk till Dawn on the 30-inch telescope.

September 7: SJAA Picnic at Fremont Peak State Park. Bar-B-Q starts around 4 pm.

September 14: General Meeting, Slide and Equipment Night. 8 pm at the Los Gatos Red Cross building. Board of Directors meets at 6:30 preceding the program.

September 20: (Friday) Public star party at Branham Lane Park.

September 21: Indoor star party at Los Gatos Red Cross. 8 pm.

September 28: No SJAA activity: 70% waning moon rises at only 9:56 pm.

October 5: Star party at Henry Coe State Park.

October 12: Star party at Grant Ranch with Halls Valley Group.

October 18: (Friday) Public star party at Branham Lane Park.

October 19: General Meeting at Red Cross, 8 pm. (meeting to be deter-

**SJAA HOTLINE**

24 HOUR INFORMATION

408-997-3347

pass the pen to someone new. If you are interested in becoming the Editor, please contact Jack Zeiders, 408-281-0220. October 1991 will be my last issue.

## TELESCOPE MAKING AND ASTRONOMY

It's renewal time for these fine magazines. If you subscribe thru the SJAA, send a check to Jim Van Nuland at 3509 Calico Ave., San Jose, CA 95124. If you have your own subscription, and it expires in 1992, you may extend by pro-rating the prices. In this case, a mailing label or renewal notice is needed. The bad news is that both have gone up: \$10 for Telescope Making and \$16 for Astronomy.

## SEPTEMBER STARRY NIGHTS

- Richard Stanton

I have just returned from a visit to the Midwest where I had the opportunity to meet a young man, about twelve years old, with a 60mm refractor, an interest in the starry night, and absolutely no information about how to begin. It seems that his parents had purchased the telescope for him and then tried to find some books to help him begin. You can guess the velocity at which the whole thing sped pell-mell downhill.

Perhaps for some who are natives of the Greater Bay Area you cannot envision the frustration that goes with the pursuit of an interest in the sciences for people who do not live in a major metropolitan area and for parents with no background whatsoever in science. For me, and in my opinion, for the whole of amateur astronomy, this young man's and his parents frustration was a slap in the face. If there is one thing we are supposed to do after

deriving personal enjoyment from our interest it is to let others know that we are available to help them should they ever have a need.

Have you ever prepared a recommended reading list for beginners and given it to the manager of your local book shop? Have you let your family, neighbors, friends, and colleagues know that you're willing to assist them if they have an astronomical interest? Don't feel bad, I haven't made a real shiny job of it either lately ... but I'm going to.

## DOUBLE, TRIPLE, AND MULTIPLE STARS

- *Patrick M. Donnelly*

Because of family, work, and school commitments my observing multiple star systems has been very limited. I have had to just about start over learning the locations of the multiple star in the sky. In the course of doing this I have discovered that many of the best double, triples, etc. in the sky are stars designated as Gamma. I thought it would be interesting to describe some of the stars that belong to "GG" (Gamma Gang) in the sky.

The first star to consider won't be visible till late September. It is, of course, Gamma Leonis. Gamma Leonis is one of the best doubles in the sky. Gamma Leonis is a true double system, consisting of magnitude 2.2 and 3.5 components. They are separated by 4 arcseconds, and their colors are orange and pale yellow. The stars have an orbital period of around 500 years with a maximum separation occurring around 2100. Gamma Leonis is about 90 light years from the Earth.

The second member of the Gamma Gang is Gamma Virginis. Gamma is a pretty pair of equally bright stars of magnitude 3.5 components, separated by about 4 arcseconds. Gamma Virginis is also a true binary system. The components of Gamma Virginis are virtually identical. Gamma Virginis may be the best example of identical twin stars in the sky. The orbital period of the duo is 171 years, and they are relatively close at 32 light years from the Earth. Examination of Gamma Virginis

should be made soon, since the pair is closing. By the year 2010 the pair will be separated by only .3 arcseconds and not separable. Look for Gamma Virginis early this month or in the morning in early November.

The third member of the Gamma Gang is Gamma Andromedae. Gamma Andromedae (Almach) is a beautiful double in small telescopes consisting of a bright yellow primary of magnitude 2 and a blue secondary at magnitude 5. Their separation is 10 arcseconds. Almach is a true multiple star system about 260 light years from the Earth. No period for the pair has been discovered as yet. Almach is even more interesting since both components are doubles themselves. The primary is a spectroscopic binary of two identical yellow giants orbiting about each other every 2.67 days. The secondary is a very close visual double separated about .5 arcseconds. Their magnitudes are 5.5 and 6.3 and the respective colors are blue and green. I have resolved the secondary only once with the 12 inch refractor at the University of Illinois. This star should be a good challenge for any 12 inch or large scope.

The next member of the Gamma Gang is Gamma Delphinius. Gamma Delphinius is a pair of (as I seem them) yellow and green stars. The brighter is magnitude 4.3 and the dimmer is magnitude 5.1. They are separated by a very comfortable 10 arcseconds. The system is a true physical system about 100 light years from Earth with a period of about 9000 years. The sky near Gamma Delphinius is very interesting for sweeping.

The final member of the Gamma Gang to describe is Gamma Arietis. Gamma Arietis consists of a pair of almost equal components at magnitude 4.75 separated by 7.8 arcseconds. Gamma Arietis is also a true double system about 160 light years away from us. Its period is unknown. Their color appears yellow to me although I am told the colors should be blue and white.

As a final note these are not the only spectacular members of the Gamma Gang. Also included in the club are

Gamma Ceti, Cygni, Persei, Lepi, and Cassiopeiae. In the southern skies we can look at Gamma Centauri, Ara, and Piscis Austrinus (Pisc. Aus.). Gamma Pisc. Aus. is visible from San Jose and is a fine pair separated by 4 arcseconds. Look for it this fall.

In summary, many of the finest double stars in the sky belong to the Gamma Gang. Plan to spend some time observing them.

## SPACE PROGRAM UPDATE

- *Bob Fingerhut*

**FORTH SHUTTLE MISSION OF 1991 COMPLETED IN AUGUST** - Discovery landed at Kennedy Space Center completing a mission to deploy a Tracking and Data Relay Satellite (TDRS) and test a space station thermal management system. Columbia flew a space lab Life Sciences mission in June. Columbia will not fly again for one year while it is modified into a long duration orbiter. In May, Discovery an unclassified DOD mission and in April, Atlantis launched the Gamma Ray Observatory. The three missions remaining in 1991 are: September - Atlantis Defense Support Program spacecraft. November - Discovery, Upper Atmospheric Research Satellite.

**SPACE STATION SURVIVES CONGRESS IN FY 1992** - Early this year the House Appropriation committee and Subcommittee voted to cancel the space station. That decision was reversed on the floor of the House with \$1.9 billion appropriated. The Senate appropriated \$2 billion. A joint committee will select the final amount. NASA's total budget was cut and the Comet Rendezvous Asteroid Flyby mission was cancelled. Launch of Cassini and the Advanced X-ray Astrophysics Facility were delayed one year.

**HUBBLE IS HAVING GYRO PROBLEMS** - Hubble needs three of its six main gyros for proper operation. Two have failed and a third hiccupped recently. NASA will decide in September if a shuttle mission will be needed in late 1992 to replace the gyros. The mission to fix the optics and replace the

solar arrays will not be ready for launch until late 1993. Hubble has a backup "retrieval mode" gyro pack incase of all six of the main gyros fail.

**U.S./SOVIET SPACE AGREEMENT SIGNED AT THE MOSCOW SUMMIT** - Presidents Bush and Gorbachev signed agreements on July 31 that called for launch of a U.S. astronaut on a Soviet Soyuz spacecraft that would dock with the Mir space station. The U.S. astronaut would stay on board Mir for up to 6 months. A soviet cosmonaut would be launched on board a U.S. shuttle/Spacelab flight.

**U.S. EXPERIENCEING WEATHER SATELLITE PROBLEMS** - The U.S. normally operated two meteorological satellites in geostationary orbit - GOES East and GOES West. GOES East failed and the next generation of weather satellites GOES Next is experiencing development problems. The European Meteosat 3 has been moved over Brazil and has replaced GOES East. The Europeans were using Meteosat 3 as an orbit spare and it is expected to have a useful operational lifetime through late 1993 or early 1994.

**EUROPEAN EARTH-RESOURCES SATELLITE LAUNCHED** - ERS-1 was launched July 16 on an Ariane 4 booster. The spacecraft will put ESA in the forefront of ocean based investigations of climatology and meteorology.

**SECOND PEGASUS LAUNCHED SUCCESSFULLY** - The Pegasus booster was released from its B-52 carrier aircraft and placed seven small satellites into orbit on July 17.

## IMPRESSIONS OF TOTALITY - Rick Sarrica

**MS JUBLIEE, JULY 11, 1991** - Eclipse morning began eventfully; A few hours before totality, while cruising from Puerto Vallarta to Mazatlan, we sighted a waterspout about 5 miles to starboard. Thirty minutes later we were drenched by a sudden downpour, sending us scrambling for shadow band sheets, lens covers, garbage bags and any-

thing else to cover the forest of camera tripods, telescopes and other equipment already in position.

Second contact found the ship 28 miles south of Mazatlan and 22 miles northeast of the centerline, on the threshold between the Pacific Ocean and the Sea of Cortez (Gulf of California). We viewed totality for 6 minutes and 43 seconds through wisps of high cirrus clouds.

The most distinctive features were the remarkable bright sky at totality, the streamered corona, the naked-eye prominence, and the incredibly long duration including a 4 second diamond ring at 2nd contact and a truly spectacular diamond ring at 3rd contact lasting 6 seconds!!!

This should have been enough to please any veteran eclipse chaser, but there was more to come. As the crescent Sun waxed and the passengers milled around in a daze of post-totality euphoria, thunderheads on the southern horizon repeatedly stabbed at the warm sea with lightning. And then, with startling suddenness, a line of dolphins appeared in the narrow right arm of the ship's wake. Dozens of them. Many of them up on their tails in true Flipper style, others looping out of the water in bunches, but all of them staying within the width of the wake and extending a quarter mile behind the ship. Their timing was uncanny; It was as if these creatures wished to celebrate with us this fortuitous alignment of worlds.

## REPORT ON THE JULY 11, 1991 TOTAL ECLIPSE OF THE SUN - Robert Garfinkle

I was able to view the total eclipse from the deck of the Royal Caribbean cruise ship Viking Serenade off the east coast of Baja California. The ship was chartered for the eclipse and was loaded with about 1,100 eclipse chasers.

July 11, Eclipse Day, I began to set up

my cameras near the swimming pool about 8:00 am. The sky was partly cloudy as the ship headed west along the path centerline. Cameras of every kind began to spring up all over the ship. One guy even had an old single-shot Polaroid rear-loader with B/W film. As we got closer to first contact, the sky began to get cloudy overhead. The captain sped up the ship and we raced by two other cruise ships as we headed for a circular opening in the clouds. The temperature was 100 degrees F at first contact at 10:29.04 am. We were at longitude 108, latitude +24 degrees.

At 50% eclipse, the temperature on my tripod-mounted thermometer was at 90 F. Totality was to begin at 18:54. About three minutes before totality, Venus was visible and then the other planets, except for Mars began to appear east of the Sun. Mars appeared less than a minute before totality.

No one saw a diamond ring or Baily's beads at the start of Totality. Due to the extended corona, the Mt Pinatubo garbage, and the circle of thunderheads around us, the eclipse was about as bright as a full moon night. I expected it to get darker than it did. Flashlights were not required to see camera settings. Eleanor Berry told me after the eclipse that at the 1983 eclipse in Indonesia they had to use flashlights to see their camera settings, but not this time.

The prominences on the eastern and western limbs were easy to see; even naked-eye. Long triangular coronal streamers extended from the dark lunar disk. At mid-totality (11:58 am), the temperature had dropped to 84 degrees.

At 11:57.55 am, the captain blew the ship's horn to signify we were in synergy with the center of the Sun, Moon, Earth, and the Viking Serenade all lined-up. People cheered as the horn blared the "3 minute warning."

The horizon turned a pale yellowish-orange with gray clouds above. You could see the gradual darkening of the shadow as you looked up from the horizon toward the Sun. At about 40 degrees, the sky was black with just a

tinge of blue to it. The ocean became black all around us. All colors on clothing and on the ship faded to shades of gray or very pale pinks. Third contact occurred at 12:01 pm.

The shadow was hard to see both coming and going. There seemed to be just an overall gradual darkening of the sky around us. I had expected to see a black column racing toward us. One person near me said she saw very weak shadow bands. They looked like puffs of cigarette smoke blowing across the sheet she had on the deck. At 12:00 pm, the temperature had dropped to 81 degrees. At 12:04 am, it dropped to 80 and then started to climb back up to 100 after fourth contact.

About ten minutes after totality a school of dolphins came along the port side of the ship. Five adults jumped out of the water in unison, as if trained at Marine World. An adult and youngster swam almost against the side of the ship. I could look right down on them. One adult did a back flip. During this time, I could still see the darkened sky to the east of us and watched it rapidly light, much like a sunrise on overdrive.

About two hours after fourth contact, most of us gathered in the ship's lounge for a recap of the event. Richard Berry and AP newsphotographer, Richard Horowitz, showed their slides of the eclipse. The film was barely dry. We also watched several videos of the event. Edwin Krupp declared the eclipse to be the "Mother of all eclipses". Everyone cheered and laughed..

Traveling with a large group of eclipse chasers is quiet an experience. Many people on board had never stargazed before and did not know how to find Polaris. Those who were more experienced helped each clear night to show the sky and explain it to the novices. The lectures and stargazing made this trip one to remember, along with seeing probably the most spectacular total solar eclipse of modern times.

## COMET COMMENTS

- *Don Machholz*

Two returning comets have been recov-

ered recently. Meanwhile, comet Levy (1991q) is now known to be periodic, taking about 50 years to complete one orbit.

Periodic Comet Wirtanen (1991s): T. Seki of Japan recovered this comet on July 8 at magnitude seventeen. It will be closest the Sun September 21 at 1.0 AU.

Periodic comet Hartley 2: (1991t): T. Kryachko of the USSR visually discovered this eleventh-magnitude comet on July 9. It was proved to be Periodic Comet Hartley 2 returning six days early and five degrees off. This is the second case this year where an amateur visually recovered a returning periodic comet.

## ASTRO ADS

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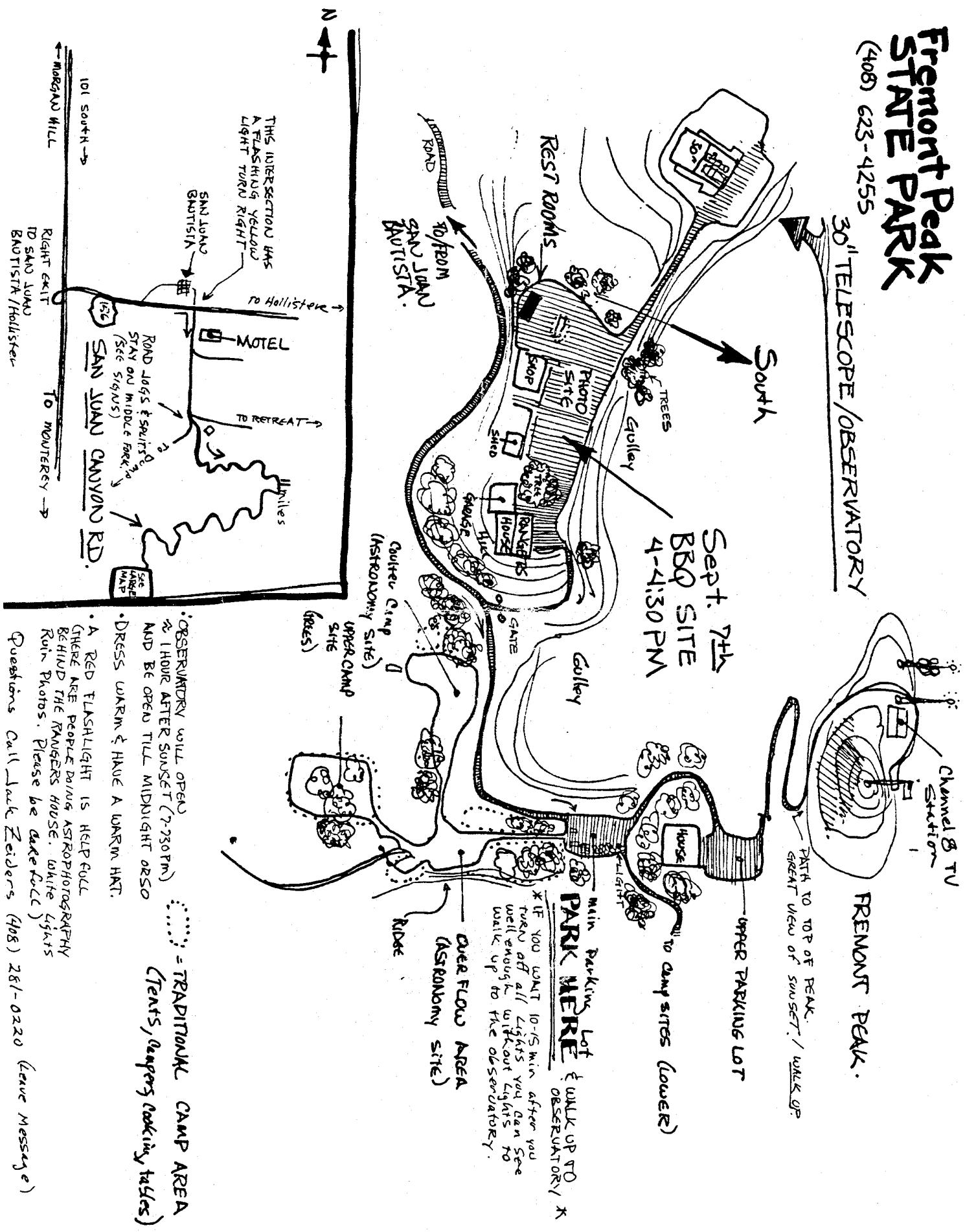
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**EPHEMERIS** is published monthly by the San Jose Astronomical Association - 3509 Calico Ave., San Jose California 95124. Members are encouraged to submit articles for publication. These should be typed and submitted no later than the 12th of the previous month. All submissions should be sent directly to the Editor, John P. Gleason, 5361 Port Sailwood Dr., Newark, California 94560.

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