EPHEMERIS

Vol. 1 No. 12 Official Publication of the San Jose Astronomical Association December 1989

SJAA EVENTS THIS MONTH

The Holiday season is upon us! Time to get out that winter star party gear and bundle up for those clear,crisp, starry nights! On December 9th, our General Meeting will feature SJAA member John Briggs. John will be presenting, "Early American Telescopes and Their Makers". John is an outstanding speaker and always presents a few surprises in his talks. Program begins promptly at 8 pm. Also this month we have several Star Parties planned at the local parks. December 2nd is the date of a Star Party at Fremont Peak. The 30-inch telescope is currently under repair, but most SJAA members can be found in Coulter camp. December 8th is a public star party at Branham Lane park as part of our continuing "bringing astronomy to the people" program. The monthly Board Meeting is going to be held on December 16 at 7 pm. Members are encouraged to attend. The Board is always in need of new ideas. This will be followed by an Indoor Star Party. During the Christmas holiday there will be a no-host Star Party conducted at Fremont Peak. The following weekend there is a New Years freeze party at Henry Coe State Park, December 30th..

MEETING SCHEDULE FOR 1990

In 1990, the SJAA General Meetings will be moved to first Saturdays, and the Introductory Observational Astronomy class will be conducted on second Saturday. Most other Saturdays will be star parties.

BRANHAM LANE STAR PARTIES

The continuing drama at Branham Lane Park has had a few hundred visitors each time. For 1990, we expect to hold Star Parties on the following Fridays: January 5, February 2, March 2, April 6, May 4, June 1, June 29, July 27, August 31, September 28, October 26, December 28.

You will see that the formula is first Fridays until the summer solstice; then last Fridays. A few are allowed to fall rather close to the Full Moon, in order to yield a regular pattern.

EARTHQUAKE NEWS

Though the damage was widespread and some people lost homes and businesses, most of us escaped with only toppled bookshelves and minor damage. Quick calls to Lick Observatory and to Fremont Peak report no damage. Chabot Observatory was also undamaged. Owners of fluorite telescope should inspect their telescope's objectives closely. Low frequency seismic vibrations have been known to cause micro fissures in the fluorite elements. The Japanese have apparently known this for years.

The SJAA Board of Directors has voted $500 for Earthquake Relief, to be sent to the American Red Cross. (This is in addition to our customary donation for the use of the hall.) We have benefited much by our use of the Red Cross' building, and their emergency funds are depleted.

Members are encouraged to make donations of their own. You may wish to send through "our" Los Gatos office: American Red Cross, 18011 Los Gatos-Saratoga Rd., Los Gatos, Calif. 95030

Donations of blood are always needed. Though Los Gatos' blood drives are temporarily suspended, donations may be made at other offices, check your local phone book.

CELESTRON PHOTO CONTEST

Celestron is sponsoring a photo contest for entries taken with Celestron products in the following 8 categories: ASTRONOMICAL PHOTOS (Color or B&W), Moon, Planets, Sun, Deep Sky, Unusual (comet/eclipse,etc.). TERRESTRIAL PHOTOS (Color or B&W), Sports Action, Wildlife/Animals, People and/or

DECEMBER 9TH 8 PM
JOHN BRIGGS
EARLY AMERICAN TELESCOPES

DECEMBER 2: STAR PARTY AT FREMONT PEAK STATE PARK.

DECEMBER 8: (FRIDAY) PUBLIC STAR PARTY AT BRANHAM LANE PARK. DUSK TILL DAWN.

DECEMBER 9: GENERAL MEETING. JOHN BRIGGS 8 PM

DECEMBER 16: SJAA BOARD MEETING AT THE RED CROSS, 7:00 PM. FOLLOWED BY AN INDOOR STAR PARTY.

DECEMBER 23: NO-HOST STAR PARTY AT FREMONT PEAK STATE PARK.

JANUARY 5: (FRIDAY) PUBLIC STAR PARTY AT BRANHAM LANE PARK. DUSK TILL DAWN. 5 PM.

JANUARY 6: GENERAL MEETING: SPEAKER TO BE ANNOUNCED.

JANUARY 13: SJAA BOARD MEETING, 6:30 PM. NEW INTRODUCTORY ASTRONOMY CLASS BEGINS AT 8 PM.

JANUARY 20: SJAA STAR PARTY AT GRANT RANCH PARK. DUSK TILL DAWN.

JANUARY 27: STAR PARTY AT FREMONT PEAK STATE PARK. DUSK TILL DAWN.

Unusual. Three prizes per category: 1st Prize: $300, 2nd Prize: $100, 3rd Prize: $50.00. Deadline for receipt of entries: April 30, 1990. Winners Chosen: May 31, 1990. Photos submitted may be used for Celestron advertising and promotional purposes. For additional information and contest rules, contact: CELESTRON INTERNATIONAL, 2835 Columbia St., P.O. Box 3578, Torrance CA 90510. (213) 328-9560

LOST & FOUND

A child's jacket, size 4, was found at Branham Lane Park after the public star party on November 3. Owner should contact Jim Van Nuland at (408) 371-1307 or at the next Branham Lane Park star party.

DECEMBER STARRY NIGHTS

-RICHARD STANTON

METEORS THIS MONTH - There are two major showers during the month. The better of the two, the Geminids, will unfortunately be hitting maximum just a couple of days after Full Moon. Despite this fact the Geminids is a very active shower showing up to 50 meteors per hour. Our "never say never" meteor observers may still be able to spot up to 20 per hour of the brighter shower members. The Ursids will be running near the Last Quarter Moon so observe them during the earlier evening hours ... while someone that loves you is out buying that super Christmas present you've always wanted.

DECEMBER METEOR SUMMARY
DEC 14 - GEMINIDS - MAJOR
DEC 22 - URSIDS - MAJOR

ENCYCLOPEDIA GALACTICA - The shortest day of the year ... well not actually, but the day with the least number of daylight hours pays us a visit this month. The "winter Solstice" will be on December 21st at 13:22 hours Pacific Standard Time. This is when the Sun will be at its southern-most point as viewed from Earth orbit. On the other hand this is also the "Summer Solstice" for some our our fellow space travelers. Think about it!

DEEP SKY CHALLENGE - For those with telescopes of 25 cm apertures or better we'll fly off to Cygnus this time. Residing at 21:02+36:42 is a very small and faint proto-planetary nebula called the "Egg Nebula" shining at magnitude 13.5. If you look real carefully can you see the polarization?

DECEMBER OCCULTATION - The 97% illuminated moon will once again wonder through the Pleiades cluster on the evening of December 10th around 2300 hours. This is always a fun event to observe and is especially pretty through binoculars. A nice way to introduce a friend to the night sky.

ASTRO ADS

ASTRO ADS are free to all non-commercial advertisers wishing to sell astronomically related products or services. Please send your ad directly to the Editor, John P. Gleason, 5361 Port Sailwood Dr. Newark, CA 94560 **NO LATER THAN THE 15TH OF EACH MONTH.** Your Astro Ad will run approximately 3-months.

MEADE LX5 8-inch Schmidt cassegrain with equatorial wedge and field tripod. With Extras, $1350. Call Alexandra, 415-652-8420 or 415-428-9474. 12/89

FOR SALE: SKY & TELESCOPE January 1962 to September 1989, complete set. $1 takes them all; no single issues. Bob Caldwell 408-245-3762 12/89

LUMICON Solar prominence filter. 1.5A bandwidth for 2" focuser. Great for this upcoming very active solar maximum, $250.00. Lumicon 2" premium + deep sky filter $95.00. Hand scanner $65.00, VGA board $125.00, 1.2 Mb floppy disk drive $40.00 all for PC/XT/AT computer. Call Jim Baumgardt 415-692-5337 12/89

20-INCH F/4.5 NEWTONIAN on machined aluminum German equatorial mounting. Optics made by Earl Watts, Surrier truss tube assembly. Many extras including: Meade 620 3-inch refractor finderscope, Telrad, secondary heater, quartz drive corrector, Lumicon off-axis guider, Sure Sharp focusing device, Meade computer aided telescope computer, and more! $11,000 or best offer. Contact: Dan Beck 408-439-6020 days, 408-338-3001 evenings. 10/89

MEADE 6-INCH F/6 reflecting telescope on equatorial mount w/motor drive. $550 or best offer. David Richmond 408-378-3635 12/89

FOR SALE: CELESTRON 14 with wedge, tripod plus many C14 specific accessories: permanent pier plate, latitude adjust, heated dewcap, electric focus, f/5.6 to f/3.5 RFA, dual-axis drive corrector/slew, etc. No eyepieces. $6000 or best offer. 408-353-4781 10/89

SPACE PROGRAM UPDATE

- BOB FINGERHUT

GALILEO PICKS UP WHERE VOYAGER LEFT OFF

The Galileo spacecraft is on its way to provide a sustained study of the first planet that Voyager flew by. Galileo was launched from the shuttle orbiter Atlantis on Oct. 18th, using a two stage IUS booster. Galileo's sun shield and clamshell doors protecting the energetic particle detector have been opened, the ion counter activated (just as a large solar flare showered the spacecraft with radiation), the thrusters tested and the spacecraft was put into Earth/Venus cruise mode. Galileo will swing past Venus in Feb. 1990. After launching Galileo, the crew of Atlantis performed several scientific experiments and then landed on Oct. 23rd. The orbiter was returned to Kennedy Space Center on Oct. 29th to get ready for its next flight on Feb. 1st.

TWO MORE SHUTTLE FLIGHTS SCHEDULED FOR 1989

The orbiter Discovery is scheduled for the next launch on November 19. Carrying a classified military payload. The last flight of the year is scheduled to be the orbiter Columbia on December 18. Columbia will take up the Syncom 5 communication satellite and bring back the Long Duration Exposure Facility.

SOVIET SPACE PROGRAM UPDATE

The Soviets launched the Intercosmos-24 spacecraft on September 28th. The primary objective of the mission is to study

how very low frequency radio waves propagate through the magnetosphere and interact with charged particles in space. The spacecraft will deploy a 66 ft. antenna during the flight and also carries a small Czech-built sub satellite.

The launch of the first large building block module to the Mir space station has been delayed until late Nov. (1989). The Soviets have approved a 1994 Mars mission that will feature a balloon carrying an imaging system at low altitude across the Martian surface.

NEWS BRIEFS

The NASA Solar Maximum Satellite is expected to fall out of orbit and re-enter Earth's atmosphere this month. A second shuttle mission to save Solar Max could not be accommodated in the shuttle schedule.

The first launch of the new Pegasus winged booster is now scheduled for December 7th.

Astronaut Bob Crippen has been named as the NASA director of the National Space Transportation System.

The joint congressional committee for appropriations has completed its work on NASA's Fy 1990 budget and the bill has been sent to the White House for signature. The amount appropriated for NASA is $12.38 billion, including 1.8 billion for the space station.

"A baseball hit on the surface of Eros would immediately reach escape velocity, fly off the asteroid, and go into orbit around the Sun -- a pop fly that would never come down."

THE CELESTIAL TOURIST SPEAKS

- JAY REYNOLDS FREEMAN

Winter weather deters amateur astronomers in many ways. Most of us can cope with dew and cold, but a subtler problem stems from not the presence of bad weather but its probability: Many amateurs do not know enough meteorology to make an intelligent mid-afternoon judgment about whether it is worth driving to a remote site for an evening's observing. If a major storm is passing through and it's raining cats and dogs, the answer is "no", but what if a storm is forecast but hasn't shown up yet? What if it is raining only lightly? What if there are higher clouds? What if there is fog? There are a couple of general points about meteorology and a few specific details of the weather patterns of the central California coast, that might help you decide.

The thing to remember about forecasts of bad weather is that it is pretty easy to predict the sequence of events, but hard to get the times right. A storm off the coast will sooner or later come ashore, but a meteorologist cannot accurately predict when. Furthermore, newspaper forecasts are often twelve hours or more old by the time you see them, and that is a long time in trying to outguess weather. Therefore, when using a forecast, you must be aware of what has been happening outside. If a forecast in the Saturday morning paper said "rain tonight and clearing Sunday", but there was rain in the morning and clearing trend by noon, then the system has probably picked up speed and gone through. But if it called for rain in the morning and clearing the in the afternoon, yet is is only starting to sprinkle by 3:00 PM, then things have probably showed down. The evening is likely to be wet.

Even if the weather does go through in time, too much afternoon rail will put a damper on the evening's astronomy: There will be dew, and probably fog and low clouds. A little rain, or a "dry" front that produces no precipitation, is less of a problem. But if it isn't raining, how do you keep track of what the weather is doing?

The answer is, watch the clouds. The key to figuring out what weather systems are doing is how much cloud cover there is and what direction the clouds are moving.

The presence of fog and low clouds - up to the level of the ridges surrounding the Bay Area - need not in itself worry you, for most of the good observing sites are higher. Low clouds are your friends, they block the city lights.

During much of the year, the Bay area and the coastal regions are often covered with the so-called "marine layer" of low clouds and fog. This condition often brings the BEST observing at Fremont Peak and other hilltop sites, with city lights blocked and perhaps a temperature inversion above the fog. However, the marine layer is not associated with stormy weather: Indeed, storms tend to blow it away.

The type of low clouds is a valuable indicator of storm activity: Flat clouds ("stratus") probably mean that the bad weather hasn't gone through yet, but small puffy clouds ("cumulus") usually come when the system has passed and conditions are improving.

Higher clouds are also a valuable indicator. An approaching weather system will be heralded by high cirrus, which will drop and thicken as the storm nears. Large cumulus may develop to bring rain showers, and some of these may become thunderstorms. After the system moves through, the upper clouds will clear rapidly. Small quantities of cirrus often tend to dissipate at the end of the day or in the early evening, in any case (though don't count on it when storms are near).

Both low and high clouds are useful for what they tell about the winds aloft. After a front has gone through, winds generally blow from west through northwest. Winds from any direction within 90 degrees of south usually mean there is a weather system approaching. Surface winds are affected by topography, so ignore them and use middle-and high-level clouds as weather vanes. Strong winds are usually associated with strong storms, but strong winds also mean that things are moving fast and will change soon. Strong winds also move coastal fog and low clouds upslope, to ruin observing.

With these notions in mind, you can see how to think about the problem. Too much rain, particularly with any wind, and forget it - the remote sites will be wet, and fog and clouds may move upslope. Otherwise, watch carefully for signs of frontal passage, double check the upper clouds and winds to be sure that there isn't an-

other storm immediately following, and think carefully about the prospects of fog and dew. A clearing trend aloft, with upper winds from the west or northwest, with low clouds or fog, and not too much wind, often indicates that evening conditions at (say) Fremont Peak will be outstanding. The fog will turn off the city lights and the clear air behind the front will be very transparent. The only catch is weather there will be enough wind to bring the fog upslope, and this one is hard to call.

Meteorology is not an exact science, so even with the best of judgment you will encounter poor conditions occasionally. However, with a little weather sense, you can probably guess right on post-frontal observing conditions half the time.

"When the Universe was less than a trillionth of a second old, its radius was just over 3 feet, the size of a big beach ball you could hold in your arms."

GREAT RED SPOT

- JIM VAN NULAND

Jupiter is larger than it has appeared since last year, over 47 arc-seconds, due to the Earth's playing catch-up in its orbital motion. It's fun to see it so large in the eyepiece! With long nights and Jupiter near opposition it is practical to observe the Great Red Spot twice in the same night, on successive rotations of Jupiter. Search the table for an early evening time followed by morning on the following date.

The Great Red Spot is now redder than in a dozen years, though it lacks any dark outline and therefore needs cautious searching to make an initial sighting. On Oct. 27, I noticed a large dark lump embedded in the North Equatorial Belt, following the Spot by perhaps 30 minutes (clouds prevented a timing). Pay attention to whether the lump will catch up or fall behind the Spot, or simply fade out.

Times given in Sky & Telescope are later than given below, by several minutes. ALPO seems to be preparing their predictions without estimating the Spot's own movement in longitude. Over the last few months the latitude has been slowly decreasing; my table assumes that motion will continue. We'll see.

At the predicted times, the Spot will be facing nearest the Earth, and so will appear on the central meridian of the apparent disk of the planet. The Spot moves its own length in about 40-50 minutes.

Good seeing and a power of about 200-300 are needed. Begin half an hour before the given time. Focus carefully, then scan the southeast quadrant of Jupiter. Watch carefully for those moments when the air is especially stable, and the Spot will show itself in all its glory. Let me know of your results, especially if you are using an instrument smaller than 8-inches, or if you try various filters.

COMET COMMENTS

- DON MACHHOLZ

Comet Okazaki-Levey-Rudenko (1989r) is moving rapidly southward in the morning sky. Meanwhile, a fainter new comet is visible to us these evenings.

Periodic Comet Kerns-Kwee (1989u): J. Gibson of Palomar recovered this comet more than a year before perihelion. Found on Sept. 10 at magnitude 20, this comet will be magnitude 13 by next year at this time.

Comet Helin-Roman-Alu (1989v): This comet was discovered on Oct. 1 by Eleanor Helin, Brian Roman, Jeff Alu and R. Bambery with the 18" Schmidt at Palomar. The comet was magnitude 14.5 at discovery; it will be closest the sun (at a distant 3.67 AU) two years ago and is presently magnitude 17.

Comet SMM 10 (1989x): This Sungrazing comet was discovered by the Solar Maximum Mission Satellite. It was closest the sun on Sept. 28.8 and brighter than magnitude -4. It was not seen to reappear, this may have been due to a momentary data loss by the satellite.

Periodic Comet Helin-Roman-Alu 2 (1989y): This comet, the third found by this team in a month, was fifteenth magnitude upon discovery. It has an orbital period of 9.1 years and was closest the sun on Oct. 31. It is getting fainter.

SEEKING COMETS

Last month we learned that the average comet is visually discovered 62 degrees from the sun. This is the comet's discovery elongation. I also mentioned that those found in the evening sky are generally decreasing in elongation, while those in the morning are increasing. At what rate does this take place? Here we study that factor.

I Plotted the elongation changes for 19 comets visually found in the evening sky and 28 comets found in the morning sky between 1975 and the middle of 1989. Those comets found in the evening sky were approaching the sun at a average of 0.38 degrees per day (+/- 0.8) while the morning comets were receding from the sun at 0.31 degrees per day (+/- 1.1).

This means that if you cover a certain area tonight, then an average evening comet will be three or four degrees closer to the sun in ten days, while the average morning comet will be the same distance further from the sun. Comet hunters must remember this when covering consecutive sections of sky- you don't want a comet to slip through your overlapping sections.

Those comets showing no change in elongation were still moving in relation to the stars, however. They may be moving one degree east per day, keeping up with the sun. Also, most comets are moving north of south at discovery too, not just east or west.

Those few comets found approaching the sun in the morning sky were often pre-perihelion with a small perihelion distance. Additionally, those found receding from the sun in the evening sky were often post-perihelion. Don Machholoz 408-448-7077.

FROM THE COSMIC MIND-BOGGLING BOOK

- NEIL MACLEER

THE LONGEST TAIL

The great comet of 1843 was deserving of its greatness: Its tail stretched halfway across the Earth's sky, and astronomers estimated it to be about 500 million miles (800 million kilometers) long -- just over Jupiter's distance from the Sun. If this cosmic tail were wrapped around the Earth, there would be enough of it to circle the equator 20,000 times.

LUCKY COMETS

Comets were regarded with superstitious awe and were thought to signify impending disaster before the eighteenth century, when Edumund Halley discovered that they revolve around the Sun in large orbits. Pope Calixtus III asked everyone to pray for the deliverance in 1456 -- "from the devil, the Turk, and the comet." The devil, of course, was always at large; the Turks were threatening to invade Europe; and the comet appearing at the time, later named Halley's proved to those of the Middle Ages that evil was near. Today most people consider the sight of a comet good luck, and well they should. Dutch comet authority Jan Oort estimates that only 1 in 100,000 can be observed. Even so, the chance of every living person seeing at least one large and bright comet during his or her lifetime is good. So . . . good luck on this chance of a lifetime.

TOO FAR TO DRIVE

Alpha Centauri is the nearest star system to our Sun -- 4.3 light-years away. It is really a triple star system, and the dimmest companion, Proxima Centauri, is slightly nearer to the Sun than the two brighter stars. An Apollo spacecraft would take 850,000 years to reach the stars of Alpha Centauri if its average speed were the same as a 6-day 500,000-mile round trip to the Moon. It would take a VW Rabbit 52 million years to take the same trip at 55 miles per hour, which is equal to 722,000 average lifetimes.

"If you could fit the solar system into a coffee cup, the Milky Way galaxy would be as large as the United States."

COMET EPHEMERIS

Comet Helin-Roman-Alu (1989v)

DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
11-25	20h10.3m	+36°11'	20h12.2m	+36°20'	82°	E	10.5
11-30	19h56.7m	+38°29'	19h58.5m	+38°37'	78°	E	10.5
12-05	19h44.1m	+40°35'	19h45.8m	+40°43'	76°	E	10.6
12-10	19h32.1m	+42°33'	19h33.8m	+42°39'	74°	E	10.6
12-15	19h21.0m	+44°24'	19h22.1m	+44°29'	72°	E	10.6
12-20	19h09.2m	+46°09'	19h10.7m	+46°14'	72°	E	10.7
12-25	18h57.9m	+47°51'	18h59.2m	+47°55'	72°	E	10.8
12-30	18h46.3m	+49°31'	18h47.6m	+49°34'	73°	E	10.9
01-04	18h34.2m	+51°11'	18h35.4m	+51°14'	74°	E	11.0
01-09	18h21.4m	+52°54'	18h22.5m	+54°56'	76°	E	11.1

JUPITER'S RED SPOT

Great Red Spot on Meridian PST

da	mo	d	h	m		da	mo	d	h	m		da	mo	d	h	m	
F	12	1	5	13	am	Th	12	14	0	54	am	Th	12	28	2	25	am
Sa	12	2	1	1	am	Th	12	14	8	46	pm	Th	12	28	10	16	pm
Sa	12	2	8	54	pm	Sa	12	16	2	35	am	F	12	29	6	5	pm
Su	12	3	6	53	am	Sa	12	16	10	22	pm	Sa	12	30	4	4	am
M	12	4	2	38	am	M	12	18	4	9	am	Sa	12	30	11	51	pm
M	12	4	10	31	pm	M	12	18	11	58	pm	Su	12	31	7	45	pm
W	12	6	4	18	am	Tu	12	19	7	48	pm	Tu	1	2	1	26	am
Th	12	7	0	4	am	W	12	20	5	48	am	Tu	1	2	9	19	pm
Th	12	7	8	4	pm	Th	12	21	1	38	am	Th	1	4	3	9	am
F	12	8	5	59	am	Th	12	21	9	26	pm	Th	1	4	11	1	pm
Sa	12	9	1	49	am	Sa	12	23	3	15	am	F	1	5	6	53	pm
Sa	12	9	9	34	pm	Sa	12	23	11	3	pm	Sa	1	6	4	49	am
M	12	11	3	21	am	Su	12	24	6	53	pm	Su	1	7	0	35	am
M	12	11	11	17	pm	M	12	25	4	55	am	Su	1	7	8	27	pm
Tu	12	12	7	7	pm	Tu	12	26	0	44	am	Tu	1	9	2	11	am
W	12	13	5	1	am	Tu	12	26	8	35	pm	Tu	1	9	10	1	pm

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