SJAA EPHEMERIS

Vol 3 No. 3 Official Publication of the San Jose Astronomical Association March, 1991

CALENDAR NOTES

Jim Richardson, our resident meteor observer will speak on meteors and meteor observations at this month's General Meeting. Jim has been responsible for the monthly Meteor Notes that appear in the Ephemeris and is very knowledgeable about this subject. Program starts at 8pm.

The Indroductory Observational Astronomy class is underway again. An outdoor session is planned for March 9th at Grant Ranch.

Also, don't forget that there is a public star party scheduled on March 22 (Friday) at Branham Lane Park.

1991 BOARD ELECTIONS

At the February 2 meeting, five members were re-elected to the Board of Directors, to serve two-year terms. They are: Steve Greenberg, Jim Van Nuland, Tom Ahl, Paul Mancuso, and Paul Barton. The Board will elect its officers at the March 2 meeting, and the new officers will be installed at the General Meeting that same evening.

NEW TV SERIES ON PBS

KTEH (Channel 54) has announced a new series called "the Astronomers". The series is expected to begin some time in April. The March issue of Sky & Telescope has an article on the series (page 239). The new six-part series will review some different branches of astronomy and will focus on the people who are involved. The series is funded by the W.M. Keck Foundation and is to be part of an educational outreach program. Instructors may obtain curriculum guides and information from Judy Ravitz, KCET Community Outreach, 4401 Sunset Blvd, Los Angeles, CA 90027. Or by calling (213) 392-2798. Locally, the series can be shown on PBS channels 54 (KTEH), 60 (KCSM).

MARCH 2ND OBSERVING METEORS 8 PM

MARCH 2: General Meeting at the Red Cross. Jim Richardson speaks on meteors and meteor obervations. 8 pm. Board of Directors meets at 6:30 pm.

MARCH 9: Halls Valley Group public star party at Grant Ranch. SJAA invited. This is also the outdoor session of the Introductory Observational Astronomy Class (weather permitting).

MARCH 16: Star Party at Henry Coe State Park. Sunset till frozen.

MARCH 22: (Friday) Public star party at Branham Lane Park.

MARCH 23: Introductory Obsrevational Astronomy Class. Red Cross building. 8 pm.

MARCH 30: No SJAA activity, full moon. Astrophoto IX conference in Thousand Oaks.

APRIL 6: General Meeting at the Red Cross. Speaker to be announced. 8 pm. Board of Directors meeting at 6:30 pm.

APRIL 7: Darkness Squandering Time begins. Advance your clocks one hours and apologize to your honest sundial.

April 13: Halls Valley Group public star party at Grant Ranch. SJAA invited. This is also the Outdoor session of the Introductory Observational Astronomy class.

SJAA HOTLINE
24 HOUR INFORMATION
408-997-3347

ASTROPHOTO IX

Astrophoto IX conference, sponsored by the Ventura County Astronomical and Orange County Astronomers will be held this year on March 30. Held in Thousand Oaks, the day long seminar will cover all aspects of celestial photography. There will be information for beginners and advanced astrophotographers, lectures on astronomy and astrophotography, photo exhibits, information on new equipment and techniques, vendor booths, door prizes, refreshments. This is usually a very well attended seminar, attracting several hundred amateur astrophotographers from around the country. Attendees can expect a full day of lectures and workshops lead by the countries leading astrophotograpers. The photo exhibit is very extensive, presenting images that are truly professional. If you have any interest in astrophotography, you should consider attending this important conference. For more information contact: Ventura County Astronomical Society, P.O. Box 982 SIMI, CA 93060. Preregistration, including proceedings is $20.

APPLE TALK

How many members noticed the missing observatory from the Ephemeris masthead? SJAA members may also notice more than just a few subtle changes in the form and format of this months issue. That's because your editor has abandoned MS-DOS and PageMaker and has gone over to a Macintosh for the monthly production of your newsletter. Your Editor is encouraging SJAA members to participate by submitting their ideas in the form of drawings for a new icon to be placed in the upper left hand corner of the masthead. It would be nice to see a good collection of images submitted! The best selected will be imortalaized on the cover of your favorite

newsletter!

Anyway, I hope all members enjoy this improved format. It is certainly much easier on the eye, as I have gone to a different font for all of the text. The Mac also processes this document about 1000% faster then the club's old XT clone. Anyone out there need a boat anchor?

COMET COMMENTS

- Don Machholz

Two new comets have been found recently, with one more recovered.

Comet Metcalf-Brewington (1991a): Howard Brewington of New Mexico discovered this comet on Jan. 6 with a 16" reflector. This find, occurring on the last sweep of a cold three-hour session, came 165 hours after Howard's previous find some fourteen months ago.

As the orbit was determined, it was realized that this is Periodic Comet Metcalf, discovered in 1906 and not seen since. Its orbital period is 7.76 years, and, although three out of every four passages is favorably placed, it had not been observed since 1906. Apparently it flared shortly before Brewington picked it up, pre-discovery photographs taken Jan. 5.5 UT show it at magnitude 15. In the hours after Brewington spotted it, T. Kiuchi of Japan and William Bradfield of Australia picked it up.

The discovery position was within three degrees of the position predicted by John Rogers and Charles Townsend in their booklet "Predictive Ephemerides for Selected One-Appartion Periodic Comets". The predicted magnitude was 17, which is probably near where the comet generally resides. The comet reached perihelion and Jan. 5 at 1.59 AU and is now pulling away from both the Sun and Earth.

Comet Arai (1991b): Masaru Arai of Japan photographically discovered this comet on Jan 5 at magnitude 10.5, a few degrees SE of M44 and Jupiter. It was closest the Sun on December 10 at 1.4 AU, it is now dimming as it heads into the N. Polar region.

Periodic Comet Swift-Gehrels (1991c): T. Seki of Japan recovered this comet on Jan. 7 at magnitude 17. It will not get much brighter.

METEOR NOTES

- Jim Richardson

Meteors are a relatively new addition to the field of astronomy and for many centuries were through merely to be an unusual atmospheric phenomena, similar to lightning. This thinking prevailed up into the late 18th century, and the study of the atmosphere (weather) was even named for the phenomena, Meteorology. Such a view increasingly came under question in the 1700's especially when bright fireballs, witnessed by many people, resulted in meteorite falls. Generally, these events were dismissed by the scientific community as hoaxes or as some other natural phenomena. However, over the years the evidenced mounted, and the official view as slowly changed. Finally, in 1803, the Paris academy officially recognized the extraterrestrial origin of meteors and meteorites, and Meteor Science was accepted as a separate branch of Astronomy. A diary of the events leading up to this acceptance follows:

September 13, 1768
Luce meteorite
Sarthe, France

A stone of 3.5 kg fell at 1630 hours; olivine-hypersthene chondrite. Discredited as "a stone struck by lighting," little has been preserved; 166 g in Vienna.

June 16, 1794
Siena meteorites
Tuscany, Italy

A shower of stones, up to 3.5 kg in size, fell at 1900 hours; olivine-hypersthene chondrite. This fall stimulated interest in the problem of "stones from the sky." Widely distributed.

October 13, 1795
Wold Cottage Meteorite
Yorkshire, Great Britian

A stone of about 25 kg fell at 1530 hours; olivine-hypersthene chondrite. This fall rallied English opinion to the reality of meteoritic falls. Main mass 21 kg, in London (British Museum Natural History).

1798
Germany

Two German students, Brandes and Benzenburg, conducted visual triangulations, and concluded for the first time that meteors occur about sixty miles above the surface of the Earth, have velocities a few tens of kilometers per second, and are due to objects entering the atmosphere from space.

April 26, 1803
L'Aigle meteorites
Orne, France

A shower of stones, estimated to number 2000-3000 with an aggregate weight of about 37 kg, fell at 1300 hours; olivine-hypersthene chondrite. This widely witnessed fall finally convinced the Paris Academy of the true nature of meteors and meteorites.

INDIVIDUAL SHOWER NOTES - MARCH 1991

Delta Pavonids - Associated with Comet Grigg-Mellish and tends to be rich in bright meteors. March 11 - April 16. Maximum on April 6th.

Record Your Observations

- Steve Gottlieb

Instead of simply "oohing" and "aahing" at bright deep sky objects and quickly passing over the multitude of faint blurs, I'd encourage everyone to record descriptive notes of your observations. At first, this may seem time consuming for the brighter detailed objects and difficult to do for the "faint fuzzies" but the final results will certainly justify the effort. I've been recording my observations since the mid 1970's when I was simply observing with a C-8 from my front lawn in the light polluted skies over El Cerrito but I feel those meager efforts paved the way to being an astute observer in dark skies with

larger scopes.

First of all, taking notes will help you focus on what details are visible in each object. By concentrating on specific components of each deep sky object, you will find you are noticing many structural details which you would easily pass over in a cursory glance. Secondly, you will find that concentrating on specific individual features, such as the brightness of the nucleus of a galaxy, will train your eye and sharpen your observing skills, allowing you to detect more subtle variations between similar deep sky objects. You will quickly realize that not all faint galaxies look identical in the eyepiece. Thirdly, you will be able to compare your observations with previous notes you've taken during different observing conditions or else with different scopes. I find it very interesting to compare the visual appearance of a globular cluster with my 8", 13" and 17.5" scopes. Also enjoyable is to compare your observations with other experienced observers. Magazines such as DEEP SKY and The Observer's Guide are filled with deep sky observations and you can read about details you may have missed and want to look for the next time out. I particularly enjoy comparing my notes with a 17.5" with those of the great visual observers of the 19th century such as the 72" of Lord Rosse. In many cases I'm quite pleased to obtain comparable results, once I'm aware of a certain feature. Taking notes on a regular basis has increased my enjoyment of the hobby.

If each observer used their own idiosyncratic system of notes it would be very difficult to compare observations. In the 18th and 19th century, William Herschel and his son John set the standards for visual descriptions of deep sky objects. Their codes were used by John Louis Emil Dreyer in the NGC, published in 1888 and are found today in Jack Sulentic and William Tifft's RNGC. For nebulous objects, the descriptive codes include brightness, size, shape, radial brightness variation, and comments referring to nearby field objects. In describing galactic and globular clusters, comments included size, richness, compression, and magnitudes of the stars.

As an example, let's examine in detail what to look for in the case of galaxies.

Brightness - The NGC used a scale of 10 different brightnesses ranging from eF (extremely faint) to eB (extremely bright). I've slightly modified the categories for my own observations. The descriptions which follow are only approximations and of course, are relative to the size of the aperture used (currently 17.5"), quality of the optics, sky conditions, and experience of the observer.

a) eF: Visible with averted vision only.

b) vF: Just visible with direct vision but little or no structural details.

c) fF (fairly faint): Easily visible with direct vision but not prominent. Often only a small range in brightness from the core to the outer edge.

d) mB (moderately bright): Stands out in field. Generally displays a range of brightness levels and possibly structural details.

e) fB (fairly bright): Prominent object worthy of close scrutiny for structural details such as knots or spiral structure.

f) B (bright): Showpiece galaxy, often with an intense core and structure such as dust, mottling or spiral arms.

g) vB (very bright): Takes your breath away! Often these are the larger Messier objects with prominent cores, very bright nuclei and extensive halos which often contain H11 regions, spiral arms and/or dust lanes.

Size - The Herschels adopted a similar 10 point scale for size, ranging from eS (extremely small) which they quantified as 3"-4" diameter up to eL (extremely large) which translates to 20' or larger in diameter. Although the larger galaxy diameters can be estimated fairly reasonably using the apparent field of the eyepiece, typical galaxies visible in the 17.5" fall in the 10" to 60" range, are more difficult to estimate but have no less than 4 categories in the NGC: vS, S, cS (considerably small), pS (pretty small) and pL. I use 8 different descriptions with similar categories as brightness. These can roughly be translated into the following galaxy diameters:

a) eS:under 10"	**b)** vS:10"-20"
c) S:20"-30"	**d)** fS:30"-60"
e) mL:1'-3'	**f)** fL:3'-5'
g) L:5'-8'	**h)** vL:over 8'

Shape - The NGC uses 8 codes from round to extremely extended to measure the degree of elongation. Unfortunately, these codes are not quantified and generally do not indicate the direction of elongation. Although I use a similar system, I also estimate the ratio of the major to minor axis as well as the direction of the major axis. So, a galaxy might be described as being very elongated in a 3:1 ratio NW-SE. By simply letting your scope drift for 30 seconds, the direction of west is easily ascertained. With a Newtonian, north is then 90° counterclockwise and with a Schmidt-Cassegrain or refractor using a standard star diagonal, north is 90° clockwise.

Brightness Variations - Galaxies exhibit a wide range of radial brightness differences. On one hand you will find some galaxies with a smooth surface brightness but generally the middle core will gradually increase in brightness. Note whether this increase is gradual or sudden. Often the core contains a compact nucleus which is sharply brighter and in some cases may be stellar. The outer halo may fade away into the background sky or have a sharply delineated border. Look for brighter features in the halo which may indicate huge H11 regions in the outer arms. Darker patches or an irregular patchy appearance are probably caused by dust. In more dramatic cases, actual dust lanes and spiral features may be visible.

Nearby Field Objects - Search the surrounding star field carefully for the following objects:

a) Companion galaxies: Look for nearby companions and estimate their separation and direction from the principal galaxy, such as 4' north. If you are observing in a group or cluster only the closest galaxies should be described as above. Often while I'm observing

with my 17.5", I'll run across an unexpected anonymous galaxy not listed in the NGC or IC. In this case I also make a careful field sketch so I can identify the galaxy later on the POSS or in an extensive galaxy catalogue such as the CGCG.

b) Nearby stars: Record any stars, however bright, which are either superimposed on the galaxy or lie just outside. In addition, I record any interesting field stars such as striking double stars or bright fields indicated on the Uranometria 2000.0 star atlas. As before, estimate the separation of the stars and their direction from the galaxy. If possible, give a rough estimate of their magnitudes.

c) Other Deep Sky Objects: Although uncommon, there are several cases of a field containing two different types of deep sky objects, such as an emission nebula and a star cluster or more rarely, an open cluster and a planetary nebula. Since these are fairly unusual, I go out of my way to observe incongruent pairs.

As an example, here are a couple of galaxies (15.6pg and 12.7pg) observed in July in the Sierras near Lake Tahoe with my 17.5":

NGC 7505: F, S, elongated 2:1 N-S, even surface brightness, *15 at south end, distinctive line of 5 stars mag 12 and 13 following.

NGC 7798: mB, fS, R, gradually increases to a small bright core, faint

COMET EPHEMERIS

EPHEMERIDES

DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
			Comet Levy (1990c)				
02-23	09h35.6m	-14°15'	09h38.0m	-14°29'	153°	M	8.4
02-28	09h18.3m	-09°58'	09h20.8m	-10°10'	153°	E	8.6
03-05	09h03.7m	-06°00'	09h06.2m	-06°12'	149°	E	8.9
03-10	08h51.6m	-02°27'	08h54.1m	-02°38'	143°	E	9.1
03-15	08h41.7m	+00°40'	08h44.3m	+00°29'	137°	E	9.3
03-20	08h33.8m	+03°22'	08h36.4m	+03°11'	130°	E	9.6
03-25	08h27.7m	+05°41'	08h30.3m	+05°31'	124°	E	9.8
03-30	08h23.0m	+07°40'	08h25.7m	+07°30'	117°	E	10.1
04-04	08h19.6m	+09°21'	08h22.3m	+09°11'	112°	E	10.3
04-09	08h17.2m	+10°48'	08h19.9m	+10°39'	106°	E	10.5
			Comet Metcalf-Brewington	(1991a)			
02-23	02h13.4m	+03°27'	02h16.0m	+03°41'	60°	E	9.2
02-28	02h27.0m	+04°29'	02h29.6m	+04°42'	58°	E	9.3
03-05	02h40.6m	+05°29'	02h43.2m	+05°41'	57°	E	9.4
03-10	02h54.1m	+06°26'	02h56.8m	+06°39'	55°	E	9.5
03-15	03h07.6m	+07°21'	03h10.3m	+07°33'	54°	E	9.6
03-20	03h21.1m	+08°14'	03h23.8m	+08°24'	52°	E	9.7
03-25	03h34.4m	+09°03'	03h37.1m	+09°13'	51°	E	9.8
03-30	03h47.7m	+09°48'	03h50.4m	+09°58'	49°	E	9.9
04-04	04h00.9m	+10°31'	04h03.6m	+10°39'	48°	E	10.0
04-09	04h14.0m	+11°09'	04h16.7m	+11°17'	46°	E	10.1

THIS MONTH'S METEORS

SHOWER NAME	DATES	DATE OF MAXIMUM	MAXIMUM VISUAL ZENITHAL RATE (per Hr.)	RADIANT POINT (ON MAX DATE) R. A.	DEC	VELOCITY km/sec.	NOTES
Delta Leonids	Feb 5 - Mar 19	Feb 26	<1	10h 36m	+ 19	23	slow, bright meteors
Virginids	Feb 3 - Apr 15	Mar 13?	<1	12h 24m	+ 0	35	very broad stream complex radiant
Delta Normids	Feb 25 - Mar 22	Mar 14	<1	16h 20m	- 49	??	sharp maximum
Camelopardalids	Mar 14 - Apr 7	(broad)	<1	7h 55m	+ 68	6.8	very slow meteors
Delta Pavonids	Mar 11 - Apr 16	Apr 6	<1	20h 20m	- 63	??	rich in bright meteors

stellar nucleus, *11 2'SW

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.

TELEVUE 15mm wide-field eyepiece. $60. Contact: Rick McWilliams, 415-969-3296. 3/91

Pair of 2-inch eyepieces - 50mm and 32mm Plossl's in good condition. Manufactured by a eastern opitcal firm in black anodized machined aluminum parrels. $50 each. Call Mike Schartman, 209-544-8828. 3/91

10-INCH f/6.5 full thickness mirror by Tom Scott of Fresno. Tom's work, which includes the mirrors for the Astromak, is becoming fairly well known and is considered excellent. This mirror has enhanced coatings and includes a E & W 1.5" quartz diagonal and Novak secondary holder, all for $350. By July, I am hoping and working to make a much shorter focal length telescope to take to Baja for the eclipse. If someone is really interested in only a complete 10" Dobsonian, I'd be willing to discuss selling the entire scope. All of the components are optimized first class items with quality work throughout. Anyone interested is encouraged arrange to view through this scope-the views are excellent. I live near Eureka and at our nearby observing site at 2500', the 10" has reached verifiable 15.9 mv stars using S & T charts (A 12.5" also by Tom Scott, reached 16.6 mv on the same night!). The 10" is a good mirror and a good deal. If any of the SJAA members would like to come up north to some fairly dark skies, let me know. We have two local observing sites, one at 2500' and the other just shy of 5000'. Jon Hafstrom, 450 Redmond Road, Eureka, CA 95501 707-442-7569 (weekends) 3/91

QUESTAR 3.5" with standard accessories ,Bogen tripod, Powerstar drive corrector. Original wide-field eyepieces, 1957 vintage in near mint condition. Asking $2000. Also...HP 41CV calculator w/hardcase and time module, survey pac, card reader, 30 cards, 2 rechargeable battery packs. 82143A printer also with charger and battery packs. Additional miscellaneous items and more. Asking $250. Contact Ed Stokke, 408-448-2181. 1/91

OLYMPUS binocular viewer, attaches to 1 1/4" telescope focuser. High Quality. INcludes 2 pairs eyepieces. $350. Celestron nebula filter, new type, 1 1/4", perfect, $49. Call after 7 pm. Edward Hillyer, 209-463-1817. 2/91

VISION Technologies (Everex) Video Digitizer board for IBM PC?XT?AT. 512 X 484 X 8 bits, 24 bit LUT. Real time (1/30 sec) frame grab from any RS170A or NTSC video source. Includes software developer tool kit. Never used, $850/obo. Also, National Instruments IEEE-488 controller for IBM PC?XT?AT. Half slot card w/ software. $40/obo. Contact Paul Keller, 408-227-5454.

SPACE PROGRAM UPDATE

- Bob Fingerhut

Discovery Scheduled for Lauch March 7 - The STS-37 mission is planned for eight days of dual-shift, around the clock operations by seven astronauts. Though it is a defense mission, the experiments are unclassified. The experiments include several investigations of the infrared environment around the shuttle. In one test, a SPAS platform will be set free to orbit at a distance from the shuttle while instruments on the SPAS record the firing of Discovery's orbit maneuvering engines. This will be with a new IBM general purpose computer (GPC) system. Each of the new computers has all of the hardware integrated into a singel package that is smaller and lighter with less electrical power requirements than the old configuration. The new GPC's also each have a larger memory that runs software faster than the old system.

Problem causes NAVSTAR/GPS Delay - Another GPS satellite was launched Jan 7 on a Delta 2 rocket. Meanwhile, managers are trying to determine the cause of a blown fuze in the control panel of the circuitry that controls the solar panels on another orbiting GPS satellite. The satellite's panels can be controlled from the ground, but this is not considered as acceptable over the long term. The Air Force has delayed the launch of additional GPS satellites until June because of a fear that the solar array pointing system in the first Block 2 satellite may be generic. There are currently 15 GPS satellites in orbit of the 21 planned.

Salyut 7 Returns to Earth - The Salyut 7 space station re-entered and burned up over Argentina on Feb 7. About 3000-4000 lbs. of debris was expected to reach the gournd but no damage or casualties have been reported.

Ariane 5 Engine Reaches Full Thrust - The VULCAN main engine for the Ariane 5 reached full thrust for the first time during test firings in November and December. Full duration (600 sec.) full thrust (183,210 lb at sea-level) test runs are expected later this year.

NASA's $15.7 billion fiscal year 1992 budget proposal call for a 13.6% increase to initiate work on a new heavy-lift booster and a new Lifesat spacecraft to carry animal payloads for detailed life science research. The new budget request was guided by recommendations made last year by Congress and findings from the Augustine committee on the future of the U.S. space program. Some the budget request includes: $175 million - heavy lift propulsion and materials of the capablility to lift up to 150,000 into low Earth orbit. $15 million - Lifesat new start. $2.02 billion - Space Station Freedom. $94 million - Lunar/Mars exploration technology. $72 million - National Aero-Space Plane. $211 million - Advanced X-ray Astrophysics Facility. $336 million - Mission to Planet Earth. $20 million - COMET commerical experiment transport spacecraft/booster system. $591 million - Aeronautical research including $76.4 million for high speed research. How much Congress will appropriate still remains to be seen.

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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Jack Peterson, Treasurer

San Jose Astronomical Association
1840 Yosemite Dr.
Milpitas, CA 95035
Telephone: (408) 262-1457

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