

EPHEMERIS

OF THE SAN JOSE ASTRONOMICAL ASSOCIATION.



MARCH 1987

 * MARCH 7TH 8 PM *
 * BERNIE HAISCH *
 * GRAND TOUR OF THE SOLAR SYSTEM *

- MARCH 7 GENERAL MEETING 8 PM, THE LOS GATOS RED CROSS BUILDING.
 BERNIE HAISCH, GRAND TOUR OF THE SOLAR SYSTEM.
- MARCH 14 INDOOR ASTRONOMY CLASS STARTS AT 8 PM, LOS GATOS RED
 CROSS BUILDING.
- 14 ASTROPHOTO VII SYMPOSIUM, MOORPARK COLLEGE, MOORPARK, CA.
- MARCH 21 BOARD MEETING AT 7 PM, FOLLOWED BY AN INDOOR STAR PARTY
 AT 8 PM, LOS GATOS RED CROSS BUILDING.
- MARCH 28 FIELD EXPEDITION FOR ASTRONOMICAL OBSERVATION TO HENRY
 COE STATE PARK. DUSK TILL DAWN MESSIER MARATHON.
- APRIL 4 GENERAL MEETING. PROGRAM TO BE ANNOUNCED
- APRIL 11 BOARD MEETING AT 7 PM, FOLLOWED BY THE INDOOR ASTRONOMY
 CLASS AT 8 PM, LOS GATOS RED CROSS BUILDING.

FIELD OF VIEW
 BY: JOHN GLEASON

MARCH 7TH GENERAL MEETING

Our guest this evening will be Bernie Haisch, who will conduct us on a tour of the solar system, bringing to light the current state of knowledge and photography of the planets. 8 PM Los Gatos Red Cross building.

SJAA BOARD ELECTIONS FEBRUARY 7TH

Five board positions were filled on February 7th. Congrats to Paul Mancuso, Tom Ahl, Duncan Monroe, Steve Greenberg, and Jim Van Nuland.

7th ANNUAL BAY AREA ASTRONOMICAL AUCTION

In this month's Ephemeris you will find specific instructions about how to enter your astronomical items into this year's Astronomical Auction. Please use the handy auction pre-registration form for all of your equipment. If you do not pre-register your equipment by auction day, you will need to come in early and register all items to be auctioned-off. The auction will start promptly at 6 PM.

7th ASTROPHOTOGRAPHY CONFERENCE IN MARCH

Held every two-years, the Astrophotography Conference is a symposium of astrophotography and techniques. There will be prominent speakers, an all day symposium on beginning and advanced astrophotography, latest information on films and techniques, amateur astrophoto exhibition and competition, commercial exhibits, door prizes and refreshments. For registration information, please contact UCAS/ASTROPHOTO VII, P.O. Box 982, Simi Valley, CA. 93062. The SJAA usually has a large contingent of members in attendance. I encourage anyone interested in astrophotography to attend this conference.

**THE CELESTIAL TOURIST SPEAKS
BY: JAY REYNOLDS FREEMAN**

DR. FREEMAN GOES TO SPACE CAMP, PART II

(Last month we learned how our own Jay Freeman gained access to a Houston Space Center simulation complex. This month continues Jay's story of how he single-handedly piloted the Space Shuttle into orbit!)

So there I was, Jay Freeman, lightplane pilot, science fiction fan and physics graduate student, Star Child in the Promised Land, sitting down to fly the simulator of the most advanced aerospace vehicle the world had yet conceived. And as I climbed the stair to the flight deck, the portable radio blared forth a familiar tune, exhilarating and appropriate even though distorted and amplified well past saturation by the public address system: it was the main title from Star Wars.

I had already watched the simulator fly itself many times. There was nothing to gain by leaving the autopilot on. Yet nothing in my observations had given me any clue to the forces required to operate the controls, or to the degree of response I might expect from a given amount of control motion. These matters are only learned from hands-on experience. But the first few tens of seconds after launch are a poor time to find them out: during the first few seconds the gantry is perilously close, and for the next minute or so the rising dynamic pressure -- called "Q" -- of the transsonic flight through the dense lower atmosphere creates almost as solid and uncompromising a hazard.

My plan was simple: Ride autopilot for a few seconds, to clear the tower, then push forward gently, taking a guess at what the right attitude might be and ignoring the trajectory display until past maximum aerodynamic pressure. No fancies like the "roll program" that we have all seen on television.

It worked. Control response was very predictable and linear. I had no real difficulty in keeping the attitude in bounds and varying smoothly. The Shuttle's control "feel" is all artificial anyway, generated by servos in the yoke rather than by feedback through (nonexistent) mechanical connections. I suspect that what was programmed into the simulator was identical to what was programmed into the real thing -- there would be no reason for it to be otherwise. I didn't look much of anywhere else but at the artificial horizon, and I didn't think about much of anything else but making smooth control motions and watching what was happening, and it was enough. I had all the habit patterns of controlling a much more skittish and unstable light aircraft by instrument reference in turbulence and bad weather. But this vehicle flew as if it were on rails. There were no surprises, and I could learn quickly. What a beautiful machine!

Past max Q I widened my instrument scan to include the navigation display. This was absolutely marvelous. At a glance I saw that I had lofted well above

the desired trajectory -- the cursor was much higher than the smooth curve of the nominal ascent. I had been too timid in my initial pitch adjustments.

Let's see if we can fix matters. I pitched the vehicle more toward the horizontal and watched the other cursor, the one that was tracking a predicted position, several tens of seconds ahead. Presently, it drifted toward the trajectory. As it crossed the line on the console, I began pitching up to hold it in the groove. It did not take too much fuss to keep the "future" cursor tracking smoothly. The actual position of the vehicle almost didn't matter, though naturally I watched it. The "now" cursor dipped below the ascent course, then corrected back smoothly and was soon following in trail, right behind its "future" companion.

What a magnificent job of display design, what a tribute to the science of human factors engineering, that a mere high-time lightplane pilot can operate a space ship. But it was a piece of cake. There was nothing to do but follow the green phosphor road, up from the pad and out to the stars.

Some eight minutes after liftoff, the main engines shut down. I was in the groove -- not in orbit yet -- it takes a burn of the orbital maneuvering unit to obtain the last few hundred feet per second of velocity -- but the hard part was over. The technicians and programmers were all a little surprised. And so, I guess, was I.

Would it have worked for real? If it has been an actual Shuttle ascent, would I have had any chance of pulling it off? I suspect not. The first two minutes, before the solid strap-ons are jettisoned, are reported to be a rather jiggly ride, and three G's acceleration plus moderate vibration will do a lot to mess up an instrument scan. My lofting above the trajectory and subsequent corrections undoubtedly would have eaten up lots of fuel -- even if I had known

how to perform the burn with the orbital maneuvering unit, it might not have been possible to achieve orbit. And at least some of this maneuvering was taking place when dynamic pressures were still pretty high; perhaps the vehicle would have been at risk thereby.

Notwithstanding, I do not expect to forget the experience.

COMET COMMENTS BY: DON MACHHOLZ

Several comets have been recovered or discovered recently. This includes three new comets visually found by amateur astronomers - the annual average is 3.3. Comet Wilson peeks into our morning sky while Halley continues to recede from both the earth and sun. Comet Sorrells is too close to the sun for observation; we'll see it again in April. A newly discovered comet (1987d) will be visible in the March evening sky.

Periodic Comet Du Toit-Hartley (1986q): J. V. Scotti of Kitt Peak recovered this comet on Dec. 28 when it was in Gemini at mag. 19. This comet, which probably split in 1976, has an orbital period of 5.21 years and is not expected to get brighter than mag. 13.

Comet Levey (1987a): We now know that this comet was closest the sun (0.92 AU) on Dec. 17. In the months prior to discovery (Jan. 5) it moved across the northern evening sky at mag. 10.5-11.0. It is presently fainter than mag. 12 and getting fainter.

Comet Wiseman-Skiff (1987b): Jennifer Wiseman discovered this comet on plates taken by Brian Skiff at Lowell Observatory on Dec. 28. Confirming plates were taken three weeks later. The orbit is of short period-6.5 years and the 14th magnitude comet will not be getting any brighter.

Comet Nishikawa-Takamizawa-Tago (1987c): The first comet to be visually discovered by anyone outside the U.S. in over two years was found by four Japanese observers on Jan. 19 and 20. This is N. Nishikawa's first comet discovery. He alone found it on Jan. 19; he was using a 6" refractor. This is K. Takamizawa's second find and A. Tago's third comet. Discovery magnitude was 8.4 and the comet was six degrees SSE of Comet Sorrells, south of the Square of Pegasus.

Comet 1987c is still approaching the sun, being closest (0.85 AU) on March 18. Its almost perfect retrograde orbit places it on the far side of the sun at that time, making observations difficult from mid-Feb. to late March. Northern Hemisphere observers will have to wait until mid-April, when it will appear in the morning sky at mag. 7. As the comet approaches the earth to 0.51 AU in late May, it should brighten slightly as it moves as far south as -45 degrees. It should be visible in binoculars through June.

Comet Terasako (1987d): M. Terasako of Japan discovered this, his first comet, on Jan. 24. Using 6" binoculars, he found it low in the SW evening sky at mag. 8. An early orbit suggest it was closest the sun at 0.38 AU on Christmas Day, 1986. Then at mag. 4 but in strong twilight, it was undiscoverable until it emerged into the evening sky shortly before discovery. It will dim rapidly over the next few months.

Periodic Comet Wild (1987e): T. Gehrels and J. Scotti recovered this 19th magnitude comet from Kitt Peak, Arizona on Jan. 29. The comet should be closest the sun on Sept. 1, but it is not expected to get brighter than mag. 15. Its orbital period is 6.9 years.

EPHEMERIDES

DATE	R.A. (1950)	DEC	ELONG	MAG.	NOTES
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Comet Terasako (1987d)

02-24	01h 50.7m	-12° 35'	51°	9.3	This comet dims rapidly as it moves
03-01	02h 06.3m	-10° 14'	50°	9.7	away from both the earth and sun.
03-06	02h 20.4m	-08° 07'	49°	10.1	This preliminary parabolic orbit is
03-11	02h 33.4m	-06° 11'	48°	10.4	subject to change, the comet may be
03-16	02h 45.3m	-04° 27'	47°	10.7	periodic. On Mar. 14 it will be 5
03-21	02h 56.5m	-02° 51'	45°	11.1	degrees south of M 77 and setting 90
03-26	03h 07.0m	-01° 25'	43°	11.3	minutes after astronomical twilight.
03-31	03h 17.0m	-00° 07'	41°	11.6	By late March we'll lose it in the
04-05	03h 26.4m	+01° 05'	39°	11.9	evening sky.

Comet Wilson (1986L)

02-24	20h 30.1m	-21° 33'	30"	8.0	Comet Wilson makes a short reappear-
03-01	20h 33.6m	-22° 44'	35"	7.7	ance in our morning sky, rising near
03-06	20h 37.2m	-24° 06'	39"	7.5	ast. twilight. Early in Mar., those
03-11	20h 41.1m	-25° 39'	44"	7.2	N. of 35° N. latitude are favored.
03-16	20h 45.3m	-27° 29'	49"	7.0	Late in Mar. those S. of 35° will see
03-21	20h 49.8m	-29° 40'	53"	6.6	it. Following this opportunity, the
03-26	20h 55.0m	-32° 19'	58"	6.4	comet heads so far south that it will
03-31	21h 01.1m	-35° 37'	63"	6.0	be hidden to mid-northern latitudes
04-05	21h 08.9m	-39° 48'	68"	5.7	until mid-May. Be rare, see it now!

Periodic Comet Halley (1982i)

02-24	10h 37.7m	-14° 09'	156"	12.4	Still moving at 10 miles per sec.,
03-01	10h 32.2m	-13° 37'	158"	12.5	Halley's Comet makes its way from
03-06	10h 26.7m	-13° 03'	159"	12.5	Hydra to Sextans. On Mar. 31 it'll
03-11	10h 21.5m	-12° 27'	158"	12.6	be 2 deg. south of galaxy 3115.
03-16	10h 16.5m	-11° 51'	155"	12.7	Some have reported the comet to be
03-21	10h 11.9m	-11° 14'	151"	12.7	brighter than listed here, a 10"
03-26	10h 07.5m	-10° 36'	147"	12.8	at 100 power should still show it.
03-31	10h 03.6m	-10° 00'	142"	12.9	For 2000 coords., add 2.8 minutes
04-05	10h 00.0m	-09° 24'	137"	12.9	to R.A., subtract 15' from Dec.

SEEKING COMETS

According to Dr. Brian Marsden of the Smithsonian Astrophysical Observatory, there are about three times as many moderately serious comets reports as there are comets. Add to this the non-serious reports, and nearly every weekend evening in the summertime tends to produce an amateur report. The professional astronomers are only slightly more cautious.

The mistaken reports, called "forgetables" since they are usually forgotten by the SAO, are caused by 1, ghost images of bright objects, 2, photographic flaws on a single exposure, and 3, known nebulae or asterisms fainter than those shown on the star charts. Galaxy NGC 404 is often reported as a comet (it's not on some charts), as are some galaxies near M 31.

1987 MESSIER MARATHON BY: DON MACHHOLZ

A new moon on Mar. 29 offers us a fine opportunity for this year's Messier Marathon. Observers in the southern United States may be able to observe all 110 of the Messier Objects in one night, those further north will be able to observe 109 objects.

The SJAA began the Marathon in March 1979, and we've been holding it every years since then. In some years the moon has given us trouble, while sometimes the weather fails us.

Because of the locations of the galaxies, clusters and nebulae in Charles Messier's catalog, mid-March through early April is the best time to hold the dusk-to-dawn observing session. Between March 5 and 20, 109 of the 110 objects can be seen, with only M 30 missing. From our locations we lose M 74 around March 21, meaning we'll see 108 objects until March 30. On March 31 we can pick up M 30 in the morning sky, this gives us 109 objects again. After April 3 we lose several objects in the evening sky, decreasing the count. Other factors include the moon phase, which can't be too bright, and picking a weekend, since we're usually awake all night long.

This year the weekend of March 28/29 is the most favorable of the Marathon. With good skies and low horizons M 30 will be observable, giving a count of 109 objects. I'm suggesting you try the Marathon from one of several sites. Henry Coe Park has dark skies with the NW horizon giving the greatest trouble. Grant Ranch Park has a bright western sky but low horizons. Saratoga Gap has almost all that's needed, but there is some busy traffic nearby. I'll be at Loma Preita, where a locked gate provides limited access. Marathoners interested in using that site should call me early as I'm limited as to the number of guests I can bring onto the property. Contact me for observing order sheets which can be used with almost any star chart. And after the marathon, please let me know how it went. (408) 448-7077

THE
SAN JOSE ASTRONOMICAL ASSOCIATION'S

7TH
ANNUAL
**BAY AREA
ASTRONOMICAL
AUCTION**

WILL BE:

SATURDAY MAY 2ND AT 6:00 PM
AT THE LOS GATOS RED CROSS
16011 LOS GATOS-SARATOGA RD.
DOORS WILL OPEN AT 2:00 PM

TELESOPES, EYEPIECES, MOUNTINGS, MIRRORS, LENSES, CLOCK DRIVES,
BOOKS, CAMERA GEAR, STAR CHARTS, FINDERS, TUBES, DIAGONALS, & PHOTOS
Everything you need to make your hobby more enjoyable. You name it -
it will likely be there. Check your garage and closets for anything
astronomical you would like to sell. Complete the pre-registration
information form on the back and save time and trouble. Anyone may
buy and sell! It's fun and easy! See you there.

PLEASE PRE-REGISTER ALL ITEMS

1987 SJAA AUCTION PRE-REGISTRATION FORM

BIDDER # _____	NAME: _____ CLUB: _____ ADDR: _____ CITY: _____ ZIP: _____			
ITEM #	QTY	MIN BID	SJAA %	DESCRIPTION (40-50 CHARACTERS...)

GENERAL MEETINGS

INDOOR STAR PARTIES

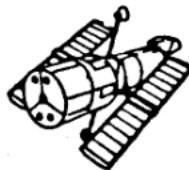
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SAN JOSE ASTRONOMICAL ASSOCIATION MEMBERSHIP APPLICATION

MEMBERSHIP ONLY: \$ 10

MEMBERSHIP/S&T: \$ 24.00

JUNIOR (UNDER 18): \$ 17.00

Name _____

Questionnaire (optional)

Address _____

What are your astronomical interests (e.g. astro-
photography, deep-sky observation, telescope making,
etc.)? _____

Telephone (____) _____

Please bring this form to any SJAA meeting, or send to:

Jack Peterson, Treas.
San Jose Astronomical Association
1840 Yosemite Dr.
Milpitas, CA. 95035

Do you own a telescope? _____ If so, what kind?

[Phone: (408) 262-1457]

Is there any specific area of astronomy that you feel
qualified to help others with? _____

Please check type of membership and if new
or renewal.

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