SAN FRANCISCO
Amateur Astronomers
SHARING THE WONDERS OF THE UNIVERSE

President	Bob Levenson	468-3592
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Bulletin Editor	Jim Shields	585-4088

BULLETIN FOR OCTOBER 1991
MORE ECLIPSE STORIES

Time: WEDNESDAY, OCTOBER 16, AT 8:00 PM

Place: THE RANDALL MUSEUM
199 Museum Way, San Francisco

Topic: IS PHYSICS A RELIGION?

Speaker: LEWIS CARROLL EPSTEIN
City College of San Francisco
San Francisco Amateur Astronomers

Lewis Epstein has been with the SFAA since its first meeting - then a student at Lowell High School. He studied physics at the University of California and went on to work for Ford Aerospace and the Chrysler Space Division on the Saturn (Moon) rocket.

Presently he teaches physics at San Francisco City College. He has published many technical papers and written two popular books: THINKING PHYSICS and RELATIVITY VISUALIZED.

Dr. Epstein will be discussing a question often contemplated in private but seldom discussed in public.

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THIRTY-NINE YEARS AGO THIS MONTH the San Francisco Amateur Astronomers held its very first meeting at The Randall Museum. At the October meeting we'll be celebrating the occasion with a birthday cake and honoring a speaker who's a charter member of the club!

JOHN DOBSON REPLACEMENT FUND

We recently learned with sorrow that John Dobson's Sidewalk Astronomy van had been burglarized. The culprits stole personal clothing as well as a slide projector and collection of slides on telescope-making.

The SFAA has started a special fund to help replace JD's lost gear. Please send your contributions to Chelle Beard, 32 Penhurst Avenue, Daly City 94015. Checks should be made payable to the John Dobson Replacement Fund.

NEXT STAR PARTY OCTOBER 12

The club's next star party at Rock Springs on Mount Tamalpais is Saturday evening, October 12, beginning at dusk. Plan to arrive by 7:30 to hear Dr. Frank Shu of UC Berkeley speaking on "Formation of the Solar System" at the nearby Mountain Theater.

The star party may be cancelled if there is bad weather. Save yourself a possibly wasted trip up the mountain by calling the star party hotline (468-3592) on Saturday before you leave home.

TELESCOPE CONTRIBUTED TO SFAA

We'd like to express our appreciation to Dr. Earl Miller of San Rafael, who recently contributed a Jason Model 313 Discoverer telescope to the club. The two-inch f/15 refractor is well-equipped with an equatorial mount and slow-motion controls, built-in finder scope, two eyepieces and a Barlow lens.

The new club telescope is available for rental on a monthly basis to SFAA members only. The monthly rental fee is $10, plus a refundable security deposit of $40. The SFAA also owns two reflecting telescopes of 6-8" aperture available for monthly hire on the same terms. For more information, call Bob Levenson at 468-3592.

SFAA BOARD MEETINGS

The Board of Directors of the San Francisco Amateur Astronomers meets the second Wednesday of each month at 8:00 p.m. at the Randall Museum. All SFAA members are invited to attend these meetings and bring along their ideas and suggestions for making the club even better.

THE GREAT SOLAR ECLIPSE OF JULY 11, 1991

Joel W. Goodman

Like many amateur astronomers around the globe, I had been making plans for several years to view the extremely favorable total solar eclipse on July 11, 1991. I was fortunate to have successfully seen two previous eclipses, the first at Great Slave Lake in northwestern Canada in 1963 and the second in the Oaxaca Valley of Mexico in 1970. They had been beautiful sights indeed, but totality had only lasted about 2.5 minutes in each instance, scarcely enough time to fully savor the splendor of the phenomenon. The July, 1991 eclipse had two important things in its favor: the path of totality crossed the southern tip of Baja California close to noon, where the weather outlook was favorable and the sun would be virtually overhead, and the duration of totality was almost 7 minutes at the center line (the diameter of the moon's shadow on the earth's surface was about 130 miles), which is close to the theoretical maximum. Thus, the prospects for this eclipse were particularly exciting.

After joining and dropping out of two tour groups, I finally settled in with a small group based in Bend, Oregon, which was led by Dick Norton, an old friend who had been Director of the Morrison Planetarium at the California Academy of Sciences in the early 1960's. We had accomodations at the Palmilla Hotel, which is located between San Jose Los Cabos and Cabo San Lucas on the Baja coast. Totality would last 6m24s at the Palmilla, about half a minute less than at the center line, but we decided that the convenience and comfort of viewing the eclipse at the hotel more than compensated for the shorter duration. Several telescopes were on hand, including two 8-inch Schmidt-Cassegrains, a 6-inch Newtonian and a 3.5-inch Questar, and we held star parties under clear skies the two evenings prior to the eclipse.

We arose the morning of July 11 to perfectly clear skies. A bank of clouds perched on the eastern horizon across the Sea of Cortez over mainland Mexico, but was unlikely to interfere with our view of the eclipse. The Palmilla had a festive atmosphere; the staff had decorated the hotel for this gala occasion and the stage was set for a gourmet buffet following the eclipse. Impressively, the president of Mexico and his family had chosen the Palmilla to view the eclipse, so the grounds abounded with security agents.

Like clockwork, first contact took place at 10:25 as the moon began its sojourn across the solar disk. We had been given mylar filters mounted in glass slide holders, so we could follow the progress of the partial phases of the eclipse. Five sunspot groups dotted the sun, but none of the spots approached the size of the giant seen several weeks earlier. Tension mounted as the sky darkened, birds nested, and totality approached. A few minutes before second contact some of us saw shadow bands race by on the ground, but I must confess that I did not. A bright surface (a white bed sheet, for example) was needed to see them distinctly, and, even then, awareness was essential because their presence was so fleeting.

Second contact occurred right on schedule at 11:50 to a chorus of cries of delight from the onlookers. A momentary diamond ring was followed by an awesome corona accompanied by the most spectacular orange-pink prominences I had ever seen. One prominence arched more than 50,000 miles above the sun's limb and was visible to the naked eye. It was a wonderful sight in binoculars, along with several smaller ones. The visible corona extended out about a solar diameter and was remarkably irregular in shape, with long, narrow "streamers" radiating from the blackened disk. The 6m24s of totality seemed no longer than 2.5m, so caught up was I with the majestic beauty of the scene. Third contact brought with it "Bailey's Beads" as the first sunlight shone between mountains

on the moon's limb. This was quickly followed by another diamond ring more spectacular than the first (or so it seemed to me), and totality was over. All that was left now was the moon's gradual passage off the sun's face, which would consume about another 90 minutes.

We adjourned to the buffet as the sky brightened, all eclipse veterans agreeing that this had been the most spectacular in memory, due largely to the near-zenith position of the sun, the complexity of the corona and the prominence activity. So enthralled were we with the success of this eclipse that we already began formulating plans for an expedition to the eclipse in 1994. It's never too soon to get started!

ECLIPSE TOTAL DE SOL - by Nancy Cox

As usual, I procrastinated and had not yet made arrangements to view the Great Total Solar Eclipse of July 1991 as of April. But I had always wanted to see Baja California and I jumped at the chance to go when I saw an ad for hotel space available in La Paz with a group from Lick Observatory. I also learned of an astronomy conference--Symposium for Research in Amateur Astronomy (SRAA)--being held there the same week as the eclipse. There was plenty of room on the conference's charter bus from Los Angeles all the way down Baja to La Paz, a thousand miles away and taking two days with no overnight stop. So, after a quick flight to LA, I was off! On Saturday morning, July 6, about 20 of us eager amateur astronomers boarded the bus in LA.

From the moment we crossed the border at Tijuana, with its "Bienvenidos Mexico" signs, we were in another country. It seemed as remote and foreign as India, where I saw my first solar eclipse in 1980. We changed dollars to pesos and had lunch in Ensenada. Communicating in fractured Spanish was becoming a necessity. South of El Rosario, where we had dinner at a dusty roadside diner, there were dramatic tall cacti for miles and miles, but most of this area was traversed in darkness. In one section it seemed there was no electricity for 50 miles and the sky was so dark that star clusters in the Milky Way were visible to the naked eye. We dozed through the night on the bus.

Dawn broke, beautifully, Sunday morning on the Sea of Cortez and the lovely beaches of Mulege. Breakfast--spicy huevos and refried beans--was in the historic town of Loreto, site of the first mission in the Californias. We reached La Paz in the afternoon and I checked into "Club El Moro", a Moorish-style resort hotel on the main marina. La Paz is on a bay, balmy and warm, and has a tropical flavor, with palm trees swaying in the breeze. Needless to say, all along the way, the shop signs were in Spanish and the people were invariably friendly.

The SRAA conference was very interesting--three days of papers by amateur astronomers from all over the world, covering everything from sunspots and eclipses to photographing planets and observing variable stars. I was the only SFAA member there; I thought of my compatriots--Bob Levenson, Carl Trost and Irving Hochman in Cabo San Lucas and Dennis Tye in Hawaii. In La Paz there was much excitement. Signs of the coming eclipse were everywhere--from eclipse banners, posters and pinatas, to T-shirts for sale and murals painted on school walls. We anxiously traded the latest news about the weather. (Baghdad could get CNN but not La Paz!)

Wednesday, July 10, was time for a decision--where to observe the eclipse? At the hotel in La Paz? At the centerline? (It looked hot and dusty.) I decided to go with the group from Lick Observatory to a private beach home in the small town of Pescadero on the west coast, right on the Pacific Ocean. On Wednesday afternoon, our bus took us there. The drive through the countryside and the town of Todos Santos was right out of National Geographic--small villages, mango trees, roadside shrines, sugar cane fields, still lots of cacti. I slept on the veranda in a sleeping bag that night, kept half-awake by the slapping of the waves. Here I was--on our little ball, a watery planet spinning in the blackness of space, awaiting a cosmic conjunction.

THURSDAY, JULY 11. At last the great moment had arrived--first contact, at 10:20 a.m., the moon just touching the sun's edge. It would take more than an hour for the moon to cover the sun's face, even though the moon was moving at several hundred miles per hour. The light took on a dim metallic quality when the sun was about half-covered. As the partial phase continued, small crescents could be seen on the ground through the palm fronds on the thatched roof, or you could make them by forming a small circle with your fingers. We noticed the shadow bands--very ephemeral bright and dark bands of light moving across the white sheets we had laid out. At 11:45 the moon's shadow swept over us from the ocean, the sun--a Cheshire Cat smile--winked out and TOTALITY had begun!

All I could say was, "Oh my God! Oh my God!", at the sight I saw--a huge solar corona, extending several solar diameters, with long coronal streamers (two especially long) and much fine structure; and two groups of prominences, one looping, orange-pink in color. To the naked eye (and through binocs) the sky and the moon's disc were blue-grey in color, like deep twilight, and the corona was yellow-white. No camera can compare with the naked eye for seeing; the fine structure of the inner corona, the long lobes of the outer corona, and the pink prominences were all visible at the same time!

With six minutes of totality there was ample time for observing with naked eye, binoculars and telescopes, and for a round of photos. (I had a 200mm lens on a tripod and Kodachrome 64 film.) In India in 1980 the eclipse was much briefer (it lasted 2 1/2 minutes) and not nearly as spectacular (a much smaller corona). Then I had concentrated on photography. This time I was going to do more looking, so I would remember it--and I will never forget the sight of that corona and those prominences.

I noticed many other effects during totality. There was a 360° twilight, with pinks at the horizon. I spotted Venus near the sun. The temperature had dropped 30°. A dog went to sleep. The sun stood nearly overhead, and it felt like an Aztec eclipse. (It was predicted by an Aztec priest 1,200 years ago!)

The next day featured a field trip retracing the steps of the Transit of Venus Expedition of 1769. The bus left Saturday morning for home. On the return trip we felt like Kurdish refugees, hot and tired, but our minds were filled with memories of an exciting adventure and a fantastic eclipse. My thanks to God for the good fortune to be two-for-two with eclipses, to the Mexican people for their hospitality, to our bus drivers for taking good care of us, and to the sun for a really good show, and a glimpse of you!

OCTOBER LIST OF MESSIER OBJECTS by Dennis Tye

Surprise, if you've made it this far, you're 80% of the way through the entire Messier list. Not too difficult was it? Fun too.

In this ninth installment I'm giving you a rest after September's marathon. Only five objects this month - three more globulars and a couple of fine planetary nebulae.

NGC#	MES	RA	DEC	Mag	TYP	SIZE	DIST	CON	DESCRIP
6720	057	18 51.7	+32 58	09.3	PLA	083"x059"	0660	LYR	Ring

This is the famous Ring Nebula in Lyra - also one of my favorites. Certain objects are so well known that they are instantly recognizable. M57 is one of those. M57 was the second object I looked for when I acquired my telescope, after M13. Galaxies can be disappointing after seeing photographs (where ARE those spiral arms?), but M57 looked just like its photos. To me it has almost a comical look - who would expect to see a giant smoke ring out there in space. It is not visible in the finder, but should be easily found, being in a compact constellation, Lyra, with good guide stars. Use as high magnification as you can here to catch all the details.

6779	056	19 14.6	+30 05	08.2	GCL	001.8'	014K	LYR	

M56 is a small globular also in Lyra. Couldn't resolve any stars myself.

6838	071	19 51.5	+18 39	09.0	GCL	006.1'	5.5K	SGE	

This globular is one of the closest to us in space, which makes its size large, but its total light is only 8-9th mag, so it appears fairly faint.

6853	027	19 57.4	+22 35	07.6	PLA	480"x240"	0300	VUL	Dumbbell

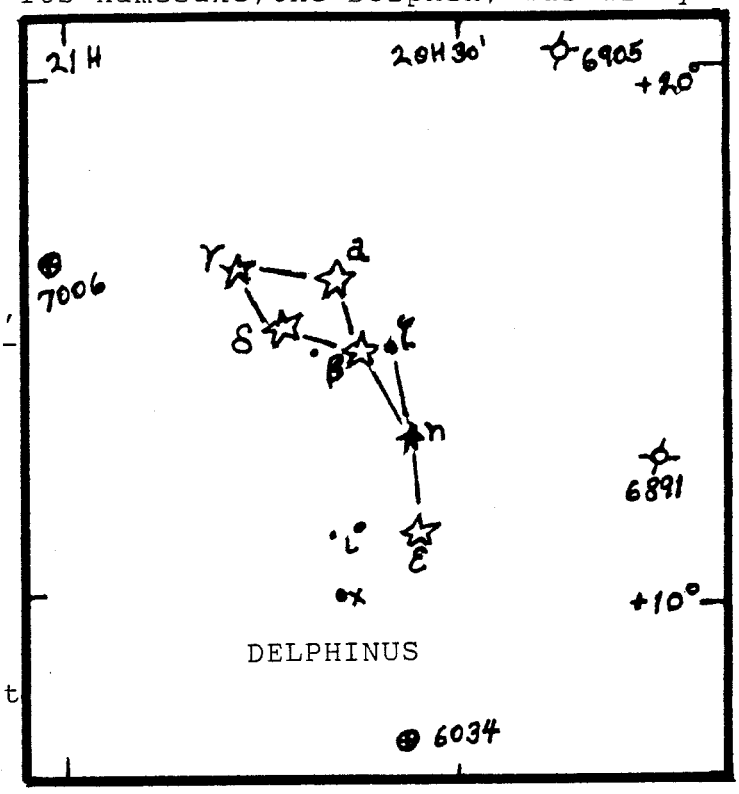
Although not as well known as M57, the Dumbbell nebula is actually bigger and brighter. I was even able to see it in my finder. One thing nice about planetaries is that they look like you expect them to. The Dumbbell sides are "clipped" so that it has a squarish appearance.

6864	075	20 03.2	-22 04	08.0	GCL	001.9'	024K	SGR	

A small globular estimated at over 100,000 light years from Earth, making it the most remote globular in the Messier list. Though only 8th mag its small size equates to a tighter concentration so that I was able to resolve a few stars.

DELPHINUS, THE DOLPHIN -- By Gordon Ridley

Now overhead in the evening sky is that small but interesting constellation Delphinus, the Dolphin. Delphinus itself is easy to identify as to the minds of the ancients it actually resembled a Dolphin. Looking south of Cygnus and east of Aquila, on the edge of the Milky Way we find it occupying, with the adjoining aqueous figures, that portion of the sky the ancients called "The Water". Delphinus originally also included the stars of Equuleus, which Hipparchos stole to form the adjacent constellation Equuleus. In astronomical literature Delphinus has borne its present title and shape, with many and varied stories attached, for its namesake,the Dolphin, was always regarded as the most remarkable of marine creatures. The early Christians, however, considered it as the "Cross of Jesus" transferred to the skies after his crucifixion. The stars Alpha and Beta are the brightest members of this little 2.7° long lozenge-shaped asterism, at mag. 3.77 and 3.78 respectively. Curiously the strange names Saulocin and Rotanev first appeared for these stars in the Palermo Catalogue of 1814, and long were a mystery to all, until Webb discovered their origin by reversing their component letters, revealing Nicolaus Venator, the name of the valued assistant to Piazzi at Palermo Observatory. Look also at Gamma Delphini, a beautiful double of 4th and 5th magnitudes, 11" apart, whose components are a golden and bluish green, a fine object for small telescopes.



Deep sky objects are few in Delphinus, and include only 2 planetary nebulas and 2 globular clusters. The planetaries are NGC 6891, mag 10, diam 15"X 7" at 20h15.2m+12°42', and NGC 6905, mag 12, diam 44"X 38", at 20h22.4'+20°07'. The globulars are NGC 6934, mag 9, diam 2', at 20h34.2'+7°24', and NGC 7006, mag 11.5, diam 1', at 21ho1.5'+16°11'. NGC 7006 is exceedingly remote, about 150,000 light years from the center of our galaxy, and 185,000 light years from our solar system, and is considered by many to be an extra-galactic object. Can you pick up any or all of these objects in your telescope? Sky Atlas 2000, Chart No. 16 shows them all. Try them!

COMET COMMENTS

09-07-91

One returning comet has been recovered recently. Three other comets are in our sky, now is a good time to get out to see them.

Periodic Comet Arend (1991u): T. Seki of Japan recovered this comet on Aug. 1 at magnitude seventeen. This comet has an orbital period of eight years and will be closest to the sun early next year. It will not get much brighter.

EPHEMERIDES

DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
PERIODIC COMET HARTLEY 2 (1991t)							
09-21	07h57.5m	+19°23'	08h00.4m	+19°15'	59°	M	10.1
09-26	08h16.9m	+17°20'	08h19.7m	+17°11'	59°	M	10.3
10-01	08h34.7m	+15°18'	08h37.5m	+15°08'	60°	M	10.5
10-06	08h51.2m	+13°19'	08h54.0m	+13°08'	60°	M	10.7
10-11	09h06.5m	+11°23'	09h09.2m	+11°11'	61°	M	10.9
10-16	09h20.6m	+09°10'	09h23.2m	+09°18'	62°	M	11.2
10-21	09h33.6m	+07°43'	09h36.2m	+07°30'	64°	M	11.4
10-26	09h45.2m	+06°00'	09h48.2m	+05°47'	65°	M	11.7
10-31	09h56.6m	+04°23'	09h59.2m	+04°08'	67°	M	12.0
11-05	10h06.6m	+02°49'	10h09.2m	+02°35'	69°	M	12.2
11-10	10h15.8m	+01°21'	10h18.4m	+01°06'	71°	M	12.5
PERIODIC COMET WIRTANEN (1991s)							
09-21	08h29.0m	+18°28'	08h31.8m	+18°18'	52°	M	10.2
09-26	08h50.7m	+18°02'	08h53.5m	+17°51'	52°	M	10.2
10-01	09h11.8m	+17°29'	09h14.6m	+17°16'	52°	M	10.3
10-06	09h32.2m	+16°49'	09h35.0m	+16°36'	52°	M	10.5
10-11	09h51.8m	+16°04'	09h54.7m	+15°50'	52°	M	10.5
10-16	10h10.7m	+15°14'	10h13.5m	+15°00'	52°	M	10.6
10-21	10h28.7m	+14°23'	10h31.5m	+14°06'	53°	M	10.7
10-26	10h45.9m	+13°30'	10h48.6m	+13°13'	54°	M	10.9
10-31	11h02.3m	+12°36'	11h05.0m	+12°19'	55°	M	11.0
11-05	11h17.9m	+11°42'	11h20.6m	+11°25'	56°	M	11.2
11-10	11h32.7m	+10°49'	11h35.4m	+10°33'	57°	M	11.4
PERIODIC COMET FAYE (1991n)							
09-21	01h35.7m	+13°30'	01h38.4m	+13°45'	150°	M	10.8
09-26	01h38.5m	+12°48'	01h41.2m	+13°04'	154°	M	10.7
10-01	01h40.7m	+11°58'	01h43.4m	+12°13'	159°	M	10.5
10-06	01h42.5m	+10°58'	01h45.2m	+11°13'	164°	M	10.4
10-11	01h43.8m	+09°52'	01h46.5m	+10°07'	169°	M	10.3
10-16	01h44.8m	+08°40'	01h47.5m	+08°55'	174°	M	10.2
10-21	01h45.6m	+07°25'	01h48.3m	+07°40'	177°	E	10.1
10-26	01h46.4m	+06°10'	01h49.0m	+06°25'	174°	E	10.0
10-31	01h47.2m	+04°58'	01h49.8m	+05°13'	169°	E	10.0
11-05	01h48.3m	+03°51'	01h50.9m	+04°06'	164°	E	10.0
11-10	01h49.8m	+02°52'	01h52.4m	+03°07'	159°	E	10.0

Don Machholz (916) 346-8963

A Grand Tour of the Solar System
With Astronomer Andrew Fraknoi

Santa Clara, CA —— In the last two decades, robot spacecraft from the U.S. and Soviet Union have explored eight of the nine worlds in our solar system in great detail, sending back fantastic views of the planets, moons, rings and their surface features. (Pluto is too distant and has too strange an orbit to be easily explored by spacecraft.)

Now that this initial exploration is done, it's a perfect time to look back and examine what we have learned. And who can better serve as our cosmic tour guide than astronomer and popular lecturer Andrew Fraknoi, Executive Director of the Astronomical Society of the Pacific?

On Saturday, November 2, 1991, Fraknoi will present a completely nontechnical program that will take participants on a full day's journey through the wondrous sights and discoveries made about our solar system in the last two decades.

Sponsored by University of California Extension, Santa Cruz, the program will take place at the Santa Clara Convention Center Theater, 5001 Great America Parkway, Santa Clara. Fee for this special event is $79.

His tour will be illustrated by a marvelous collection of color slides from U.S. and Soviet space probes and the world's largest telescopes, including the Hubble Space Telescope. Many of these images have been computer enhanced to bring out exquisite detail and many others have rarely, if ever, been seen before by the public.

Fraknoi has also made a list of "The Twelve Great Wonders of the Solar System," including the largest volcano on Mars, the red spot on Jupiter, the rings of Saturn, volcanoes on Triton, and the footprints of astronauts on the Moon.

For more information on this special program call University Extension, Santa Cruz, at (408) 427-6610.

BULLETIN CONTRIBUTIONS

The SFAA Bulletin is a forum in which club members may share their ideas and experiences in astronomy. We encourage you to participate and welcome your letters, sketches and articles on astronomical subjects. Please send your contributions to SFAA Bulletin, C/O Jim Shields, 190 Chilton Avenue, San Francisco 94131. Deadline is the 18th of the month.

SFAA MEMBERSHIP BENEFITS

The club offers three categories of membership, with annual dues as follows:

Regular Membership - $20
Family Membership - $25
Junior Membership - $ 5 (for astronomers under 18)

SFAA members receive the monthly Bulletin and admission to club activities including monthly lecture meetings and star parties, field trips and the annual picnic. In addition, they may subscribe to several astronomy magazines at greatly-reduced rates. For more information, contact Chelle Beard, 32 Penhurst Avenue, Daly City 94015. Telephone 878-4965 evenings.

San Francisco Amateur Astronomers
The Randall Museum
199 Museum Way, San Francisco 94114

TOTALITY - Drawn a few minutes after the eclipse. Orange prominences, large looping one at top, two smaller ones at bottom. Dramatic corona with streamers.
- Nancy Cox