

# ★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

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San Francisco  
Amateur Astronomers



Sharing the Wonders  
of the Universe



**Information Hotline**  
(415) 566-2357

**Web Page**  
<http://www.zennla.com/sfaa>

## **A Letter from the President Al Stern**

I would like to thank the 1999 Board for their outstanding contributions to the club. Each member played a necessary role in one or more events. I would like to welcome two new members to the Board of Directors, Lorrie Boen and Randy Taylor. I look forward to another good year of participation by the SFAA Board.

The total eclipse of the moon on January 20<sup>th</sup> provides at least two opportunities for participation by club members. One can join Jane Houston, near sea level, at St. Anselms School (60 Belle Avenue, San Anselmo, from 5:00 to 10:00 p.m.), or one can come up to Mt. Tam, at a much higher elevation, relatively speaking, for an evening of sharing the night sky and the lunar eclipse with the general public. Please bring, but not required, telescopes, binoculars, and a warm jacket. The first umbra contact (U1) is at 7:02 PST. See the chart inside for other times in UT format. Last umbra contact (U4) is at 10:25 PST.

Two days later, January 22, at 7:00 p.m., your attendance is requested at the SFAA Annual Awards Banquet. You can be sure the eclipse will be reviewed, the new Board members will be installed, and the SFAA awards will be announced. Please see the notice inside for necessary details.

We have updated and verified our 2000 calendar, particularly the Star Party dates and times.

I hope everyone had a good holiday season and I wish everyone a healthy and happy 2000 (sounds a bit awkward, compared to 1999, doesn't it? – a Y2K problem☺).

## SFAA Officers 2000

*President* Al Stern  
(510) 728-1851

*Vice-President* Bill Stepka  
(415) 928-2367

*Secretary* Renita Mock  
(415) 566-2357

*Treasurer* Chelle Owens  
(415) 479-5313

*Honorary Director* John Dobson

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### Bulletin Editor

Lorrie Boen (415) 921-1432

### Telescope Loans

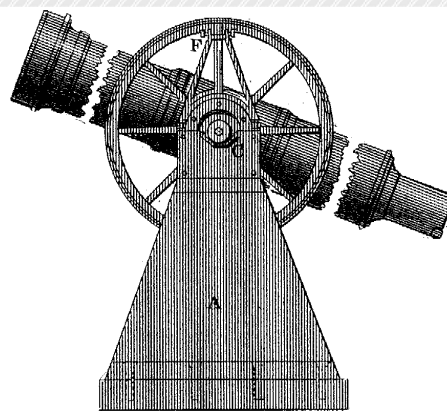
Ray Cash (415) 665-8666

## SFAA Website Update

For those of you with online access, don't forget to visit the club's website. The bulletin board area especially is a great place to post info and ask questions. Go to <http://www.zennla.com/sfaa>.

*Above the Fog* is the official bulletin of the SFAA. It is our forum in which club members may share their experiences, ideas, and observations. We encourage you to participate, to submit your letters, drawings, announcements, articles and photos. We would also like to hear from our new members, about what you have done in the past, what other clubs you may have been with and, while you are at it, tell us about yourself. The deadline for the next issue is the last day of the prior month. Send your articles to Lorrie Boen to 765 Geary Street #302, San Francisco, CA 94109 or at [LorrenLee@aol.com](mailto:LorrenLee@aol.com).

## Club Telescopes



Long time member Ray Cash-LePenne has 3 loaner telescopes for club member use and is in charge of loaning them out. If you are interested in borrowing a club telescope, give Ray a call. There are many new members in the SFAA and they ask what kind of telescope to buy or use and this is a good way to get to know the Dobsonian type of scope and learn the sky as well.

## CLUB DATES

### **Board Meeting**

February 9 – 7:00 p.m. Western Addition Library  
– corner of Scott & Geary Sts. SF

### **SFAA Club Meeting**

February 16 at 7:30 p.m.  
Morrison Planetarium, Golden Gate Park

### **City Star Party**

February 12 at 5:30 p.m. – first of the year

# SFAA Annual Awards Banquet

## 7:00 p.m. January 22, 2000

**Strawberry Joe's**  
320 Strawberry Village  
Mill Valley, CA  
(415) 383-1400

This year's menu choices are:

1. Veal Parmigiano	\$17.00
2. Prime Rib Au Jus	\$19.00
3. Broiled Breast of Chicken Sec with Mushrooms	\$16.00
4. Eggplant Parmigiano	\$14.00

All entrees are served with dinner salad, fresh vegetables, and a choice of risotto, mostaccioli, or baked potato, French Bread, butter, dessert and coffee or tea.

Prices include tax and gratuity. Strawberry Joe's is located in Mill Valley. Please arrive before 7:00 p.m. Please order in advance *no later than January 18* with Chelle (415-479-5313) and include what choice of side dish you want as well, i.e. risotto, mostaccioli or baked potato. Payment in advance would be appreciated as well. Seating is limited to 40 people, so please notify Chelle as soon as possible.

We will be presenting the Herman Fast Award, Observer Award, and Service Award. We will also present the awards for the Astrophotography Contest.

### The Silicon Valley Astronomy Lectures

Smithwick Theater, Foothill College  
Los Altos, California

**January 26, 2000**

Dr. Alexei Filippenko (U. of California, Berkeley)  
Einstein's Biggest Blunder: New Discoveries about "Antigravity"

Dr. Alex Filippenko is professor of astronomy at the University of California, Berkeley, and one of the world's authorities on exploding stars. Admission to this non-technical illustrated program is free (on a first-come, first-served basis) and the public is invited to attend. Dr. Filippenko's talk, entitled "Einstein's Biggest Blunder: New Discoveries about 'Cosmic Anti-gravity,'" will describe how recent observations of distant exploding stars -- which can be used as distance markers for the universe -- are showing that the expansion of the universe seems to be SPEEDING UP, not slowing down the way astronomers had expected. The Silicon Valley Astronomy Lectures, co-sponsored by NASA's Ames Research Center, the Astronomical Society of the Pacific, the SETI Institute, and Foothill College, are designed to explore exciting developments in our exploration of the universe in everyday language.

For telephone updates about the series, check our hot-line at 650-949-7888

## MERCURY CROSSING

11/15/99

by Renita Mock

It had been a hectic week -- going to and fro, from home to hospital, hospital to home. Relatives descending. Mother was not well.

Yet amid the muddle of doctors, nurses and medications, a Wee Voice somewhere in distant memory chirped, "21:15 UT." I scarcely heard.

It rained on Sunday, I think. I knew it only because my feet were wet. Still the Wee Voice warbled, though somewhat wistfully now, "Remember me . . . 21 UT . . . *tomorrow*."

By Monday morning, sometimes-gray-sometimes-white pillars of clouds lumbered across the sky. And in between, the Sun. The Wee Voice was more optimistic now. "21:15," it trilled.

Noon, PST. In a little more than an hour, a Tiny Planet would bravely cross the solar vastness. And I had found a few spare moments.

But who would have a telescope and where to go? Fort Miley? The Academy? Eenie, meenie, minie . . .the Academy was mo. Not much time. Gotta hurry.

I pulled up to the blue parking space and climbed the stairs. Nothing. Not one scope anywhere. Then a uniformed, Female Voice twittered, "There *was* someone here, but his telescope was upended by a dog." "Oh, you can't be serious," I muttered.

Very soon the Proprietor of the Scope and several of his followers returned. "Stand here! No, *there!* Shield the scope! Hold the paper steady!" the Proprietor fussed, no doubt wishing to banish *canis familiaris* to the heavens with all the others of its kind there. I found myself an unwitting volunteer. Doing, something.

It was almost 21 UT. From somewhere out of nowhere a voice called, "Hey, R. That you?" It was Mark just off from work, dropping by just by chance. He'd almost forgotten!

"D'ya think Toney's at Fort Miley?" I asked. "Maybe," Mark answered, "but my Dad might set up in the back yard." "Can I come along, too?" "Sure. Follow me."

Leaving the meandering Park behind, our little caravan of two whizzed down the boulevard. No traffic. That's good. 21:05. Left turn. Right turn. 21:10. Down the hill. Red light. Green light. GO!

We hurried down the avenue on foot. In the driveway, Toney's midnight Lincoln signaled at least two scopes. It was 21:13.

.....

Under the pergola in back, Bill smiled hello. The eight-inch balanced on a table. There, too, Edwina calmly weeded the comfortable grass. The sundial marked the hour. And the wind chime caroled its mellow alto in the soft wind. "I'm home free," I thought. "One minute to spare." (continued)

## ASTRONOMY in MARIN

### Winter Events Calendar

#### FEBRUARY

Saturday, February 5<sup>th</sup> Star Party in Lagunitas

Friday, February 11<sup>th</sup> Moon/planet viewing in Fairfax

Sunday, February 13<sup>th</sup> Moon/planet viewing at Book Passage

Saturday, February 26<sup>th</sup> Star Party in Lagunitas

(continued from previous page)

"So where's Mercury?" Toney challenged gently, his voice echoing the echo of the chimes. I stepped up smartly to the eyepiece. So many spots!! I was playing with the big boys now. No time for eenie meenies. "It's at four o'clock. It's almost cleared the limb," I barked. Toney smiled approvingly.

While I looked through the eyepiece some more the Wee Voice chortled now, "Look at me!" as the tiny speck crept across the solar disc. A small David to its Goliath.

Then things began to sizzle. Out came the valises chock-a-block full of eyepieces. "Let's try this one," Mark said. "No, it won't fit. Better make it that one," Toney thought. "I don't think that'll do either," Bill instructed. By now the pergola was abustle. First one eyepiece, then another. And

another. Higher, higher went the power. Up went another scope. "How much time we got?" someone queried. "About an hour," was the reply.

I glanced around the garden once again -- at Edwina calmly weeding the grass, oblivious to the fracas. At the sundial and the chimes. From scope to garden, from garden to scope.

"Gotta go," I said, finally, hating to rejoin my world. "See you Wednesday, guys."

As I left, I heard Edwina say over the chiming of the chimes, "You know, Bill, there aren't that many weeds. Just moss. Maybe you could mow the grass?"

Bill smiled.

Eenie, meenie, minie . . .

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**Stacy's Stargazing Getaways**  
(Or Sometimes the Best Laid  
Plans Get Depth Charged)

by Stacy Jo McDermott

Sometimes you see an area that holds great potential as a stargazing site. Maybe you even drive by it numerous times. Finally, you decide that you are going to go check it out only to find that while it has great potential, the night you chose was less than perfect.

This is what happened to me and a friend a few weeks ago when we decided to go visit a site we had both seen on our work commutes. While I do expect to go back to this particular site on a better night and scope it out as it were, my friend and I took a chance on another area on our way back to San Francisco.

You see, the problem was fog at the initial site. What's new! But that didn't stop us from at least trying to get to some viewing time in that night. Where we ended up at was an area that also has potential but what I would categorize as a little more than a pinch-hit.

On the back side of Pacifica, at the end of Sneath Lane off of Freeway 280 South is a small area that may be considered (in a pipe dream) a stargazing site.

After meandering through a residential area, up a hill, pass the San Francisco County Jail (looking like a bad rendition of something out of the *Metropolis*. Quite disturbing. And, what's this all about the SF County Jail being located in San Mateo County? Maybe it's me, I dunno, because I would think that the SF County Jail would be located in San Francisco County.) Anyway, passing aforementioned architectural enigma, we drove down the hill into a little canyon at the dead-end of Sneath Lane.

The potential here is the fact that there are steep, sloping hills on each side of the viewing area. This is good for blocking out the streetlights and keeping the fog at bay. However, there is one street light at the crest of the hill that really annoyed me. In fact, had I had a BB gun, I would have gladly shot it out. But, this being a family newsletter and all, a response like that often leads to more trouble than it is worth and not to mention, that being so close to the previously

referenced county jail, I thought I should just keep my desire to fantasy.

So after taking a look around, my friend and I decided we could live with the intrusive community safety device and also the house lights from the dwellings on the top of the east ridge. I had to keep telling myself that this was a residential area. The fog was abated for the time being and we proceeded to set up our telescopes. My friend had his set up in about three minutes while it took me a little longer. This area has a tad bit of a slope and for some reason I was all thumbs when it came to leveling my tripod, getting it pointed to north and generally trying to screw on the wing nuts to the telescope mount. Sometimes it's not just the fog that leads to a frustrating evening!

It was after we got the telescopes set up and our eyes had "dark adapted" (I use that term loosely here as in an urban area, your eyes never really get dark adapted), we noticed that there was tremendous sky glow. So much for the fog being our friend. Viewing objects at the zenith was fine but anything lower got progressively worse. At the time of night we were there, the Pleiades were up but looking kind of washed out as you might expect and I had a hard time discerning Orion. Cassiopeia looked a little better, except that the street light was right under it. Jupiter looked good and Saturn looked decent. In fact, my friend got a really good view of Saturn through his 10" Dob but then also, he was using his Nagler.

Fortunately, I had thought to bring my binoculars and was somewhat pleasantly surprised that I could get some decent views through the sky glow. For the rest of the time we were there, I used my binoculars to get my starfix. (You know, those binoculars are probably one of the best investments into anything that I've made in my lifetime. Got to give myself a pat on the back for that one. Pat, pat.)

After about an hour and a half, we noticed that the fog was beginning to creep up over the crest of the

west hill. As it was getting more damp and chilly we decided to pack it in. While not the stargazing night I had envisioned, it was none-the-less OK. (The companionship had saved it from being less than OK.)

All in all, this site is just this side of OK. My advice to you, dear reader, is to check it out only if you are semi-desperate. It's pretty quick to get to and not that hard to find. Who knows, one night I may go back and I'll love it, but I don't see that happening anytime soon.

Overall Rating:



Based on:

Ease of access:	4
Darkness of Urban Sky:	2
Sky Glow Annoyance:	1
Fog Factor:	2

Directions: I-280 South to Sneath Lane exit. Stay in right hand lane coming onto the off-ramp and come up to the signaled intersection. Take a left turn and follow Sneath Lane for about two miles through residential areas, pass the SF County Jail, up the hill and down into the small canyon where Sneath Lane dead-ends. There is a gate at the end and you can go no further.

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Opinions expressed by the author are solely her own and do not reflect those of her companion mentioned herein, the SFAA, its board or other members. The author takes no responsibility regarding the effects from gazing upon the architectural wonder known as the San Francisco County Jail. Comments, questions, clarifications, suggestions for other site reviews or feedback may be directed to Stacy Jo McDermott at [smcdermo@cmp.com](mailto:smcdermo@cmp.com) or [jostaznik@yahoo.com](mailto:jostaznik@yahoo.com). All rights reserved, © 1999.

### **Job Opportunity**

If you are interested in working at Scope City, they are offering full and part time positions, at their new San Francisco location. They will train you, but wish to hire an amateur astronomer. Please drop by at 350 Bay Street or give them a call at 415-421-8800.

## Leonid Storm 1999: Aboard the ARIA Part 2 of 4

By Jane Houston

The complete story & photos can be found at  
<http://morris.san-jose.psn.net/~mojo/jhmac/index.html>

Our first night over the Atlantic was a night of trial and error. And success! We wanted to prepare ourselves for the real mission. It turns out that many of the researchers accomplished many of their goals on that first night. The Japanese group from the television network NHK imaged sprites above the clouds and lightning in and below the clouds. The Utah group was successful capturing Airglow spectrums stereoscopically. And everyone got the auroral display they hoped for.

My part on the flux measurement team was to count meteors and estimate the magnitude. Any meteor not a Leonid was counted as a sporadic, even though it was clear we saw plenty of other meteors such as Taurids. On this mission, there were only two categories, Leonid and sporadic. We had plenty to do just worrying about the Leonids.

We planned three nights of Leonid Storm measurement. Both the nights before and after the expected storm were full-time observing sessions for the flux measurement group. Last year's peak came earlier than planned and we didn't want to be caught with our goggles off. We had two nights in England, and we practiced with our goggles and counters on the ground, in the aircraft both nights. A contingency plan was devised in case the counting software couldn't keep up with the shower. We developed a manual form to use just in case. And we copied enough of them to see us through the peak night.

We were also getting used to being on a Universal Time schedule, the time we would keep to for the duration of the mission. So we worked (well mostly worked) at night and observed crew rest during the day. We did have a couple hours for English beer and camaraderie before crew rest in England both days. Some of us enjoyed cream tea and visits to many Cambridge colleges and gardens and a walk along the Cam one afternoon.

One night Peter Jenniskens gave a school presentation, where he made a comet, and a dozen of us talked to the students, who afterwards wanted our autographs! Our visit inspired many students, and was one of my personal highlights of the trip. We poured liquid nitrogen (used on the other plane) on the school tables and explained meteors to a packed audience at a school on a nearby Air Force Base. The other night was, um ... ok it was a beer party in my room in the officer's quarters! But we worked on the aircraft 'till 1:30 AM that night (morning) before the party! For some, this was a highlight of the trip, and I have the pictures to prove it! And we all quit the party in time for scheduled crew rest. Barely!



Flux team members Michael (Smitty) Schmidhuber, Dave Holman, Jane Houston, Gary Kronk, Claas Jobse

The next days and nights blend together. It was the Leonid Storm, after all! The reason we were invited on this mission was to measure the flux of the Leonids. We traveled from England to Tel Aviv one night, to the Azores Archipelago of Portugal the next and then, on to Florida the next, and then home. Each crew rest period was barely enough time to take a quick look see of a new part of the world, followed by barely got enough sleep to be ready for mission night. Those of us who stay up all night as amateur astronomers had a distinct advantage. Both Gary Kronk and I mentioned we got more sleep than usual on this mission!! Now, it is my great pleasure to present the Leonid storm of 1999!

November 17th - Mildenhall AFB to Tel Aviv

21:15 on the 16th was the scheduled departure time from Mildenhall, but there were some delays - geo-political delays we with goggles had no idea about 'till afterwards. We were not allowed to fly

over several countries air space, which ruined some of the stereoscopic imaging opportunities between the two aircraft -- and delayed the take-off. We grumbled at the hurry up and wait scenario. We anxiously awaited reaching 10,000 feet altitude, which was the level where we could leave our seat belted seats and set up cameras, goggles and computer. The rush to set up and observe was thrilling to watch and thrilling to experience. Most stations took maybe 10 minutes and a little duct tape to accomplish. Immediately after turning on our goggles we were clicking away. We saw Leonids or sporadics immediately. We had our first ZHR for the night 10 minutes later. The ZHR reached 15 Leonids and 14 sporadics this night. Updated every 10 minutes, we were very happy to see results close to predicted numbers.

The flux measurement team was a cohesive and helpful and fun group, just what you would expect from a bunch of amateur astronomers who got a free trip to the greatest show on (above) earth! Morning was dawning after many airborne hours aloft, and we took advantage of it, snoozing for minutes or more after stowing the equipment. Our stay in Tel Aviv was short. I took a walk on the Mediterranean almost to the ancient port of Jaffa (in my case), and some shopping with one of the three women on the mission (yes, there are shopping malls in Tel Aviv). I slept 4 hours. We had a nice group dinner at a trendy restaurant in Tel Aviv, and awaited the trip to the aircraft. We were ready for Leonid Peak night!

November 18th Tel Aviv to Terceira, Azores

At 23:00 hours we departed Tel Aviv. We were itching to set up and count meteors. An Air Force Colonel, Col. Pete Worden, joined us. He was the driving force behind funding this mission, and an honestly fantastic man. He loaded luggage into the cargo bay, donned goggles (I gave him a look through mine during the peak), talked over the internet to thousands and basically was a part of our mission. He has a Ph.D. in Astronomy, and told us not to "BS" him too much! He observed the Leonids last year from Mongolia!

The moment we were set up we saw Leonids. Lots of Leonids! I clocked the time I began counting at 23:37, and the expected peak was at 2:00, a little more than two hours later. I was counting twenty to thirty Leonids every 10

minutes right away. It is a good thing there was not a bigger group on the flux measurement team, because not one of us wanted to relinquish our goggles! We didn't want to take any eye breaks and miss any of the action! At about 00:45 November 19th the rates began to rise dramatically. Last night's ZHR of 15 soon became 50. Our intensive image cameras allowed us to see meteors down to 7th or 8th magnitude, lower than a normal person in a dark sky could see with a naked eye, so our "clicks" on the mouse were statistically adjusted. Leonids increased ten-fold every 10 minutes. Soon we were seeing multiple meteors in our goggles. They appear to stream down in clumps. Some seconds there were none, other seconds there were 5 to 15 in our field of view at the same time. The pauses between the "clumps" was dramatic! There were more faint magnitude 5 thru 7 meteors during the peak of the storm.



Air Force crew

Everyone on the aircraft was energized. Whooping and hollering was heard in all quarters. The pilots had an awesome view! All the television monitors were showing the amazing images, a bank of 10 monitors held the media folks captive while they scribbled the times of the great fireballs for worldwide media distribution. Everyone without another duty was glued to window, monitor or goggle! I distinctly heard "wow" in Japanese, Dutch, German, English, American English, and Canadian English. I'm sure you all will understand that "wow" sounds the same in every language on earth! I felt part of a global light show that will never happen again in my lifetime. I savored every minute of it!

Now, I was clicking madly on my mouse, and could not keep up with the Leonids. The peak of the storm began promptly on schedule at about 2:00, rising to 2300 Leonids per hour. We



actually saw many more Leonids each, but the numbers were adjusted for ZHR. Each member of my team hollered that they could not keep up! Each massive fireball or mighty mass of faint meteors brought exclams of joy and wonder! We had a power outage during the peak, and some cameras needed film reloading just at the crucial moments. So I truly believe that once we go back to the tapes, and count every single meteor, and adjust for the ZHR, that the final peak of 2300 will go up quite a bit. I've seen other observers reports of 2,000 to 5,000 Leonids. I'll bet our number won't reach 5,000, but will be more than 2,300. The peak ebbed dramatically after about 10 minutes. We all knew when it was over, and in some ways we were glad, and some ways we were disappointed that the mighty show was over so soon. I heroically relinquished my goggles to Dr. Peter Jenniskens right during the peak. He was the driving force of the mission and the reason I was there to witness it, so I felt he had a right to see his dream come true ... to witness a Leonid Storm. I'll bet he didn't click the mouse every

time he saw a Leonid. He was saying "Oh" "Oh" "Oh" with each passing Leonid, and I'm sure the brain cannot process both visual and aural orders, and make the finger press the mouse button at the same time. But I don't question my choice to let him see the main show! Plus, I was sitting in the easiest seat to relinquish. Soon after Peter left, Col. Worden was wanting to don the goggles. Well, he was sort of hovering, and it wasn't hard to read his mind, even in the dark. I again relinquished my precious goggles, and let him have a look. I then watched the meteor storm of 1999 through the window, naked eye, just like observers throughout the world were attempting to do. Seeing Leonids rain down on Canis Major, mighty Orion, and other constellations through the scratched windows was exhilarating! I'm glad I got to see them first hand too!

High five's abounded! Air force personnel hugged their civilian counterparts! We were all in ecstasy! We had witnessed and videotaped the Leonid Storm of 1999!

Morrison Planetarium's  
**Benjamin Dean Lecture Series**  
*presents*

A forum for emerging theories with insights into the process of contemporary astronomical research.

**25 January**

***Small Comets and our Origins:***

***The Ecstasy and the Agony of the Scientific Debate***

Are dark spots detected by orbiting spacecraft a "cosmic rain" of small comets

Entering our atmosphere or instrument malfunctions?

Dr. Louis Frank, The University of Iowa

DEAN LECTURE INFORMATION LINE at (415) 750-7141



# COMET COMMENTS FOR JANUARY 2000

By Don Machholz

Periodic Comet Machholz 2 is fainter than expected, but might still be glimpsed in our evening sky. It will return every 5.2 years but will not be well-placed until the year 2015.

The Catalina Sky Survey found a faint comet on Nov. 5. It is now pulling away from the sun. Meanwhile, old data from the SOHO satellite was used to find a comet that appeared in May 1997.

**COMET HUNTING NOTES:** As we head into the new year the visual comet hunter faces competition from programs designed to find comets and asteroids that may hit us. Is there any need for the visual comet hunter? The consensus seems to be that amateurs will still find comets but at a much reduced rate. Searching for over 1,000 hours may become commonplace. Areas near the sun, especially in the morning sky, should yield the greatest number of visual discoveries.

## EPHEMERIS

141P/Machholz 2

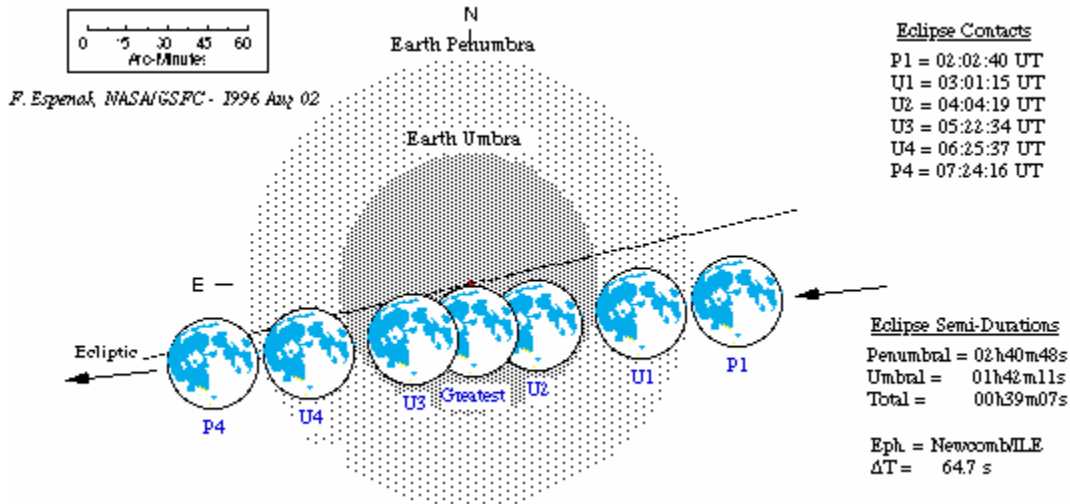
Date(00UT) R.A. (2000) Dec El Sky Mag

12-08 20h19.5m -11d29' 50d E 11  
 12-13 20h42.5m -11d41' 50d E 11  
 12-18 21h08.2m -12d04' 50d E 11  
 12-23 21h37.7m -12d38' 52d E 11  
 12-28 22h12.2m -13d21' 55d E 11  
 01-02 22h53.4m -14d07' 59d E 11  
 01-07 23h42.1m -14d41' 65d E 11  
 01-12 00h37.6m -14d41' 72d E 12  
 01-17 01h36.0m -13d52' 81d E 12  
 01-22 02h32.0m -12d15' 90d E 12  
 01-27 03h21.3m -10d11' 98d E 12  
 02-01 04h02.5m -08d11' 103d E 13  
 02-06 04h36.3m -06d00' 108d E 13  
 02-11 05h03.9m -04d12' 110d E 13

## ELEMENTS

Object: P/Machholz 2  
 Peri. Date: 1999 12 09.2752  
 Peri. Dist (AU): 0.748905 AU  
 Arg/Peri (2000): 149.2991 deg.  
 Asc. Node (2000): 246.1434 deg.  
 Incl (2000): 012.8116 deg.  
 Eccen: 0.751075  
 Orbital Period: 5.22 years  
 Ref: MPC 35815  
 Epoch: 1999 12 08  
 Absol. Mag/"n": ??/??

## Total Lunar Eclipse of January 20, 2000



**2000**

<i>Month</i>	<b>Board Meeting</b>	<b>General Meeting</b>	<b>City Star Party</b>	<b>Mt. Tam Star Party</b>	<b>Other</b>
<i>January</i>	Jan 12				SFAA Dinner Strawberry Joe's - Jan 22  Winter Star Party 1/31 - 2/5
<i>February</i>	Feb 9	Feb 16	Feb 12 - 5:30 pm		
<i>March</i>	Mar 8	Mar 15	Mar 11 - 6:00 pm		AANC workshop Mar 25
<i>April</i>	Apr 12	Apr 19	Apr 15 - 7:30 pm	Apr 1 - 7:00 pm	Astronomy Day Apr 8  Texas Star Party 4/30 - 5/7
<i>May</i>	May 10	May 17	May 13 - 7:45 pm	May 6 - 8:30 pm	Riverside Star Party 5/26 - 5/29
<i>June</i>	June 14	June 21	June 10 - 8:00 pm	June 3 - 8:30 pm	
<i>July</i>	July 12	July 19	July 8 - 8:00 pm	July 1 - 8:30 pm  July 29 - 8:30 pm	ASP Annual Meeting 7/13 - 7/18  Stellafane 7/28 - 7/29
<i>August</i>	Aug 9	Aug 16	Aug 5 - 8:00 pm	Aug 26 - 8:00 pm	Oregon Star Party 8/31 - 9/3
<i>September</i>	Sept 13	Sept 20	Sept 2 - 7:15 pm	Sept 30 - 7:30 pm	
<i>October</i>	Oct 11	Oct 18	Oct 7 - 6:30 pm	Oct 28 - 7:00 pm	
<i>November</i>	Nov 8	Nov 15			
<i>December</i>	Dec 13	Dec 20			

Founded in September 1952, the San Francisco Amateur Astronomers (SFAA) is an association of people who share a common interest in astronomy and other related sciences. Our membership consists of people from all walks of life, educational backgrounds and ages. Many SFAA members own their own telescopes; some have been made by hand in local telescope-making classes and vary in size from 6 to 25 inches.

**Treasurer, SFAA, 13 Mabry Way, San Rafael, CA 94903**

make checks payable to **San Francisco Amateur Astronomers** and mail to:

- \$25 enclosed, individual membership
- \$30 enclosed, foreign membership
- \$30 enclosed, family membership
- \$30 enclosed, institutional membership
- \$ 8 enclosed, youth membership (under 18)

**Select one category:**

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## **San Francisco Amateur Astronomers Membership Application**

### **San Francisco Amateur Astronomers**

c/o Morrison Planetarium  
California Academy of Sciences  
Golden Gate Park, San Francisco, CA 94118

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#### **In This Issue of SFAA's Above the Fog**

- **Election Results**
- **Mercury Crossing**
- **Stargazing Getaways**
- **Leonids, Part 2**
- **Comet Comments**
- **Lunar Eclipse**
- **Revised 2000 Dates**