

# SJAA EPHEMERIS

## *The Celestial Tourist Speaks*

### Observing from Mauna Kea

Jay Reynolds Freeman

[In the previous issue of the SJAA Ephemeris, Jay Freeman describes a very portable 10-inch Dobson telescope (see photos inside.) built for a week-long observing session on the side of Mauna Kea on the big island of Hawaii. The expedition was a success. Here we have excerpted his report of his last two evenings on the island, June 1 through 3, 2000. The full report is available at [www.observers.org](http://www.observers.org) in the Observing Reports section. -ed]

#### The Penultimate Session

I slept as late as I could. After I got going, I bought dinner for the friends who had done the same for me earlier in the week. My list of early-evening objects was cleaned out, so we had time for a leisurely meal. I arrived at the Onizuka Visitor Center late in twilight. For a few hours, I had nothing much to do but chat and look at the sky. Several staff members expressed opinions about the most impressive and spectacular celestial sight visible from Mauna Kea. There was general consensus what that was, and I agreed. The most spectacular cosmic view from Mauna Kea, and the finest deep-sky target I have ever looked at, is our own galaxy, not piecemeal, through telescopes, but as a single object, seen with the naked eye.

I was primed to ponder the view of the Milky Way from southern locations, by the experience of a fellow graduate student years ago. He came home from an observing run on a Chilean mountaintop, where Sagittarius culminates straight up, and couldn't rave enough about the spectacle. I could see what he was talking about from central California, knowing

where to look and what to expect. Yet the view from far enough south to see well beyond Scorpius is unmatched: The Milky Way is a classic edge-on spiral, with central bulge and dark lane. In visible wavelengths, it looks rather like M104, but from our close-up, insider's viewpoint here on Earth, it spans the sky, horizon to horizon, and then some.

There are many decent photographs, montages, or synthesized

*Continued on following page*



*The author poses with his 10-inch Dobson telescope at the Onizuka Center for International Astronomy Visitor Information Station. Note the plastic lei ("Made in China"), and in the background, garbage cans that Jay used as observing tables during his nightly sessions.*

## SJAA Activities Calendar

Jim Van Nuland

### August

- 4** Houge Park star party. Sunset 8:12 p.m., 31% moon sets 11:29 p.m.
- 4-5** Astronomy Magazine "Sky Show," Davis, CA (see July Ephemeris)
- 12** Observational Astronomy class, Houge Park, 8 p.m.
- 19** General Meeting — Program: "Jay Freeman Stargazes the Frozen Arctic Wastes of Hawaii"
- 25** Houge Park star party. Sunset 7:46 p.m., 15% moon rises 3:14 a.m.
- 26** Fremont Peak star party. Sunset 7:42 p.m., 7% moon rises 4:22 a.m.

### September

- 2** Fremont Peak star party. Sunset 7:33 p.m., 26% moon sets 10:28 p.m.
- 8** Houge Park star party. Sunset 7:25 p.m., 81% moon sets 2:42 a.m.
- 9** Observational Astronomy class, Houge Park, 8 p.m.
- 16** General Meeting: Slide & Equipment night. Houge Park, 8 p.m.
- 22** Houge Park star party. Sunset 7:04 p.m., 27% moon rises 2:06 a.m.
- 23** Fremont Peak star party. Sunset 7:01 p.m., 17% moon rises 3:14 a.m.
- 30** Fremont Peak star party. Sunset 6:50 p.m., 13% moon sets 8:58 p.m.

**24 Hour News and Information Hotline: (408) 559-1221**

**[www.sjaa.net](http://www.sjaa.net)**

## *The Celestial Tourist in Hawaii*

*Continued from Front Page*

images that show the entire Milky Way, or at least the central portions. My web search turned up several nice ones, including

[http://www.astropix.com/HTML/D\\_SUM\\_S/MILKYWAY.HTM](http://www.astropix.com/HTML/D_SUM_S/MILKYWAY.HTM)

<http://www.nofs.navy.mil/projects/pmm/universe.html>

<http://adc.gsfc.nasa.gov/mw/milkyway.html>.

There are lots more. Look at one to understand what I saw.

The vast star clouds that obscure the heart of the galaxy are bisected by a straight dark lane, that passes north of the teapot and north of the Greater Sagittarius Star Cloud, then crosses the southern portion of the fishhook of Scorpius. That dark lane bifurcates on both sides of the galactic center; offshoots extend north of the plane. They begin far to either side, and widen out as they get closer to Scorpius and Ophiuchus. Thus the star clouds there appear framed by two long, moderately narrow "V"s of darkness, whose points lie in northern Aquila and in eastern Centaurus.

Stardust is visible on the galactic north side of the offshoots for much of their length. It defines their northerly boundaries. The northern dark offshoot, the Cygnus Rift, is well-known to northern amateurs. Some of us are

car-crazed California kooks disguised as amateur astronomers: We refer to the long, curved streak of Milky Way at its northern boundary as the "Off Ramp." The wide end of the southern offshoot is visible from mid-northern latitudes, west of Scorpius, enough so that some native Americans described the combined complex of all these bright and dark areas as "the hands of Father Sky", but the full symmetry of the pattern is not apparent unless you can see all the way to alpha and beta Centauri.

From a site as dark as Mauna Kea, the vast amounts of dark matter in or near the galactic plane stand out readily against the glow of stars beyond. Most of the naked-eye star clouds located close to the line of sight to the center of the galaxy are rela-

---

### *The vast amounts of dark matter ... stand out readily against the glow of stars beyond.*

---

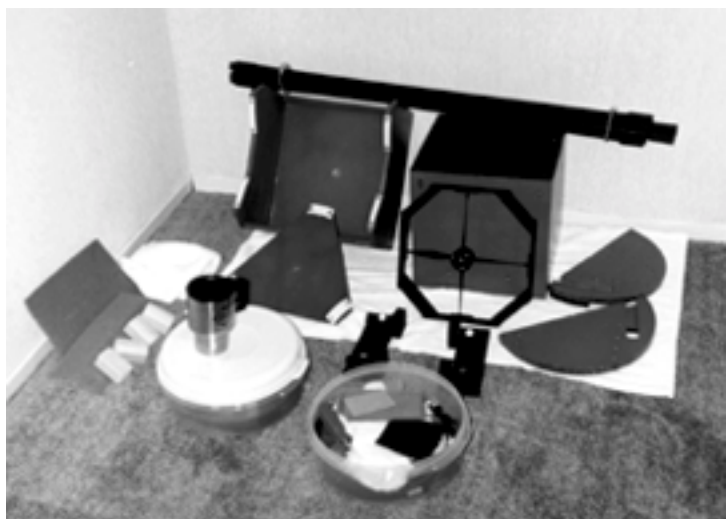
tively nearby. The actual galactic center is highly obscured. One web page I cited shows views in several wavelengths, including some that make it past the dust: They give an entirely different picture, one that is in some sense more realistic. Yet it is dark clouds that provide the specific

character of the naked-eye view of our galaxy. The dark lanes themselves are the largest such areas that are clearly defined. The Coal Sack, a big blot at the southeast border of Crux, is probably the most famous cloud, but northern observers should not miss the Pipe Nebula, in

southern Ophiuchus. It resembles a conventional smoker's pipe, with the bowl at the east and the stem running east-west. This nebula is about as long as the lid of the teapot of Sagittarius is wide, and is clearly visible to the naked eye from a dark site.

Bright star clouds that lie at least a little away from the direction to the center, are related to the large-scale structure of the galaxy. Most of these clouds appear where our line of sight passes along the axis of a major spiral arm, so that we see many of the bright stars within it. Stand close to a curving hedge row and you can understand this phenomenon. When you look at right angles to the shrubbery, you can perhaps see through it, but the view along the row, looking into it as it bends, is dense with leaves. So it is with stars in the arms. The eye of the knowing observer can ferret out the spiral structure of our home galaxy, even from deep within it.

Other physical features of the galaxy are detectable in the sky, if you know what to look for. The area from Scorpius through Centaurus contains many blazing suns of early spectral type. These young blue-white giants comprise one, or perhaps several, physically associated groups, located in places where substantial star formation has taken place in relatively recent times. My doctoral thesis research obtained a point measurement of the temperature, density, and velocity vector of the interstellar gas, close to the solar system, but before beginning to experience the local effects of the Sun. When I corrected the observed velocity vector for the motion of the Sun through the local group of stars, the interstellar gas appeared to be flowing outward from that vast collection of young giants. Perhaps past supernovae among them had caused the gas to expand outward, as within a swelling balloon or a growing bubble. How strange to find the placid tidewaters of the solar system subtly lapped by long swells from distant, powerful disturbances, hundreds of light years away, storms



*Jay Freeman's 10-inch Dobson telescope unpacked.*

*Continued on following page*

*Continued from previous page*

beyond the far horizon of the outstretched sea of space. As a kid, I dreamed of travel to the stars, yet it seemed perhaps that they had come to me, instead.

Presently alpha Indi rose, and then the Peacock Star, so I placed my telescope for a good view of the southeast horizon and picked up the last few objects on my primary lists. Yet these were generally nondescript. I logged them all, double-checked and re-checked that I hadn't forgotten any, then drove down the mountain. It had been a rather light session — only 58 objects viewed — but I was glad for the chance to relax under the night sky. Back in Hilo, I moved the telescope inside. On the next afternoon, I disassembled and packed it for return to the mainland, and mailed myself a box of dirty laundry and heavy telescope hardware, to lighten my baggage for the trip home. Yet there was one night's observing yet to come: I had planned to spend the final evening of my vacation with my 14x70 binocular.

### **A Night With Binoculars**

For me, astronomical binoculars are special-purpose instruments, for quick and easy wide-field views, so I almost always use them hand-held. My Orion "Giant" 14x70 — one of the last before the current, lighter, 15x70 was introduced — is perhaps the best of the half-dozen or so that I have owned. It is almost too large and too powerful to hold, which means it has almost exactly as much performance as I can handle. (By the way, be warned: The edge at which a hand-held binocular becomes unwieldy is sometimes very sharp, and varies from person to person.) I know several tricks for holding it unbraced, but when circumstances permit, I like to lean either myself or the binocular against something solid when I am using it, or prop my arms on a rigid surface, or something like that.

My rented Isuzu Rodeo had a two-piece back door. The rear window tilted up, and the lower door panel was hinged at the side. I parked it facing

north — toward the summit of Mauna Kea — and sat on the rear threshold with the door pulled toward me, half closed. Thus I could brace arms and binocular on the top of the door for observing, and also get some shelter from the wind. From this position, I surveyed the part of the heavens that I had swept with the 10-inch. Sometimes I would look to see how a specific object appeared in the binocular. Sometimes I would notice something, and have to check my charts to see what it was. I also paid attention to large features, like star clouds, rifts, and dark nebulae, that were too big for

---

### ***The prime object for binocular astronomy was the galaxy itself, as a whole.***

---

the field of the Dobson.

I have been mentioning binocular observations of southern objects along with descriptions of them in the larger telescope, so I don't have a great deal to add that is new. Yet there is certainly plenty to do with a binocular in these skies. I logged more than fifty observations of southern objects with the 14x70, plenty to warrant having it along. The large, bright, and famous stuff — the eta Carina complex, omega Centauri, the Jewel Box, and numerous of the open clusters that I have already mentioned — all showed interesting detail. Alpha

Centauri was resolved. And the prime object for binocular astronomy was the galaxy itself, as a whole.

If I had had no telescope, I would have been disappointed, but a night or two with a large binocular would have been very satisfying. You northerners who have an opportunity to travel south, but who do not have a portable large telescope, or are limited in budget or baggage allowance, by all means bring a binocular, and be prepared to enjoy yourself. A smaller one would do. For real saving in space and weight, consider a large-aperture monocular, if you can find one, and if you can't, you might get a suitably sized binocular with individually focusing eyepieces, and take it apart at the hinge. One of the popular small f/5 refractors, which come in 80, 90, and 100 mm aperture, might make an even more versatile package, but I suspect you would need a tripod for it. A monopod with a simple tilt head might

*Continued on following page*



*Jay Freeman's 10-inch packed for travel in the airline checked baggage.*

---

## *The Celestial Tourist Visits Hawaii*

*Continued from previous page*

make a good, compact support, for a binocular or for a low-magnification telescope.

Again wishing to use a familiar yardstick to evaluate both site and southern celestial wonders, I decided to review some Messier objects. I got carried away. In an hour or so cumulatively, spaced over the night, I went through eighty-three of them, from the Beehive and M67 all the way around to M2, M15, M30, and M39. That was easier than it sounds—I have been through the Messier catalog more than twenty times, and can find most of them without charts, and a 70 mm binocular of modest magnification is probably the easiest instrument for a Messier survey: It is capable enough to show them all without difficulty, and has a wide enough field to make finding them a cinch.

The southern objects fared very well in comparison. Except for the Beehive, and for the Messier objects in the Scorpius, Sagittarius, and Scutum Milky Way, the patch of heavens that was new to me had more stuff with interesting detail for the binocular, than that part of the Messier catalog that I could see.

The Messier objects also fared very well. As I cross-indexed my observations onto file cards, back at home, I noted that the cryptic notes I append to each such reference often indicated less detail seen in previous views of these objects with the 14x70, when I was doing a Messier survey with it not long after I bought it, than I could see from the Visitor Center. What's more, many of the observations for the 14x70 Messier survey were made from very dark sites in the southern Cascade Mountains, near Lassen Peak, at altitudes of 1.5 to 2.5 Km. I may have said it before, but let me say it again: The Onizuka Visitor Center on the side of Mauna Kea is a wonderful place for visual amateur astronomy.

Two hints of detail were particu-

larly interesting. Both M83 and M51 showed what I would call anisotropic structure, whose nature I could not quite determine. That is, in binoculars of similar size, I regularly see these objects as diffuse patches whose brightness varies radially, and I can routinely see the companion to M51, NGC 5195, as well. But on this night, both galaxies showed hints of structure—something like filaments in the fuzz—that I had not noticed before with similar instruments. Clearly, the spiral arms were on the verge of resolution. Yet even knowing that these galaxies are spirals, I could not say that I saw spiral structure with the 14x70, only that there was structure present, just

---

***I logged 155 observations  
with the 14x70, more than on  
all previous sessions with it  
put together.***

---

beyond my ability to detect precisely what it was.

I also used the binocular to push on the southerly limits of my main survey. As I said before, the Southern Pleiades, surrounding theta Carinae, was blocked from my big telescope by the wall of the Visitor Center observing patio. I had a nice view of it in the 14x70. I also saw a few other, more difficult, southerly objects. Peering south of Crux, I found several stars in Musca, and then noticed that alpha Musca, at beyond 69 degrees south declination, was visible to the naked eye—did I say that Mauna Kea was a good site? A bit more than half a degree north of alpha, I detected the barest hint of open cluster Harvard 6 in the binocular's field. I think that was the most southerly deep-sky object I observed during the entire trip.

I usually have a binocular handy when I observe, but only rarely use one much. This night was an exception. I logged 155 observations with the 14x70, more than on all the previous ones with it, put together.

As I drove down the access road

from the Visitor Center, I noticed Alpha Centauri setting toward the summit of Mauna Loa. Shortly before I reached the Saddle Road, it winked out, and I knew that my astronomical vacation had truly ended. But the next day had one more pleasant surprise. As I staggered to the departure gate at Hilo's airport, wondering why I had made a reservation for the absurdly early hour of 9:28 in the morning, two of the friends I had met on the island stepped forward to greet me. They presented me with a lei—a real one, made with real flowers, in the finest Hawaiian tradition! How wonderful!

They say *aloha* can mean both "farewell" and "greetings." As my flight winged across the broad Pacific, away from Hawaii's frigid temperatures, thin air, and inky darkness, home to the soft sunshine and warm breezes of central California, that seemed appropriate. For I was already planning to return.

[Ed. Note—Be sure to attend the general meeting of the SJAA in August for Jay's presentation, "Jay Freeman Stargazes the Frozen Arctic Wastes of Hawaii."]

---

## **Meteor? Fireworks? Space Junk?**

*Dave North from Grant Ranch:*

About 10:30 (okay, I didn't look at my watch) something started burning across the horizon, starting in the vicinity of Scorpius from our point of view. It was lowish, and incredibly slow ... much slower than the typical meteor.

There were two obvious sections—a brighter leading flare with a somewhat dimmer piece maybe 10 degrees behind it. About halfway across the sky, the dimmer object seemed to crap out.

We thought the main section looked like it might be calving slightly, in fact it was blowing chunks all the way out...

*Continued on next page*



## Space Junk

Continued from previous page

I thought "it has to blow any time now" and maybe give the best Fourth Of July fireworks show ever, but it turned out to be a classic Roman Candle ... just sputtering and flaring until it disappeared over the Diablo Range, leaving a crowd of muttering amateurs, until one person said, "well, maybe the sky is a little bright tonight, but we really got our money's worth there."

Indeed!

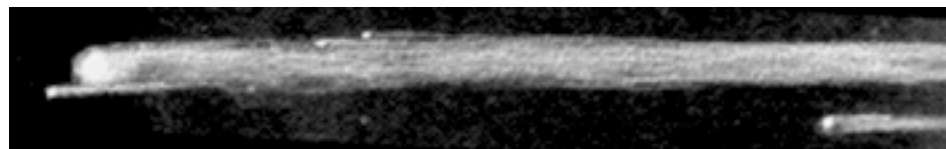
*Akkana Peck from Grant Ranch:*

It was amazing! Since it took so long to cross the sky, I was able to run to my 13.1" dob (fortunately I had a low-power eyepiece in it) and track it most of the way across the sky. Tiny pieces were breaking off the whole way (leaving trains of their own, but always parallel to the main object's train) and there was a tiny piece just ahead of the main object which remained there the whole time I tracked it.

The weirdest thing about it was the little fragments travelling with it. If this was a meteor gradually splitting up, I'd expect to see smaller bits separating and then following slightly different trajectories. But this followed a very straight line, and so did the tiny pieces splitting off of it every few seconds, and the bigger piece that had split off early and was trailing it by several degrees. Each of these small pieces left a trail of its own, which looked extremely parallel to the trail of the main piece. There was even a small piece preceding the main chunk, which had its own trail which blended in to the main trail.

*Paul Mancuso from Glacier Point:*

The sky was standard Glacier Point superb. But what happened Saturday night was a once in a lifetime event. We had just settled in for the public event. The slide show was over and the ranger had given his talk. We were welcoming our guests to our telescopes when someone shouted out "meteor", "in the south". Now normally when that happens by the time I look up its over but I looked up



*Akkana Peck sketched the glowing fireball after viewing it in her 13.1" reflector.*

any way. It came in about as bright as Vega and stayed that bright until it burned up. It was bright yellow and left a great long trail dropping bits as it went from a little west of south to about east. I kept waiting for it to burn up and go out but it didn't. It went just about from horizon to horizon. It burned up just south of Half Dome and almost to it. I don't know how long it lasted. It seemed like forever but

---

***It was bright yellow and left  
a great long trail dropping  
bits ...***

---

couldn't have been more than a minute. At the end the trail seemed to go farther than the bits. When it lit up all activity at our site stopped. There was hardly a sound from anyone, until it went out. Then everyone burst into applause. We must have had a hundred or more people visiting with us when it happened. Sunday, people who weren't with us Saturday but saw the event wanted to talk about it. It was a Glacier Point trip I won't soon forget.

*Morris Jones from Yosemite:*

Of course the Raduga 26 aux motor burn-in was a major crowd pleaser on Saturday night. Toward the end of the burn, I counted eight pieces in my 9x63 binoculars.

Nick and Craig Barth from Fremont Peak:

We were having a grand time in teaching mode, visitor on the eyepiece absorbing M 8, when someone shouted, "hey look!" and pointed into the Southeast sky. Blazing out of the microwave station, the large yellow fireball streaked north just below the arc of the Milky Way in the Eastern skies. Before it reached apogee in the Teapot, just as it approached Antares, it turned light green and started showering multi-colored flames

earthward. Expecting it to snuff out, we stood transfixed, struck dumb & breathless, as it proceeded slowly but steadily northward. It continued to burn as it streaked behind the trees and hills on the Northern horizon to the east of Altair. Someone checked the time: 10:20 p.m. Wild applause and huzzahs from the mountaintop.

*Christopher Angelos from Bonny Doon:*

Saturday, 1 July 2000 at 22:20 hours PDT an object appeared to the right of the constellation Scorpius, azimuth 190 degrees, at about 20 degrees above the horizon. It moved across the sky at about the same altitude all the way to the eastern horizon, azimuth 90 degrees, for almost a minute. It's initial brightness was -6 or -7 magnitude, red in color, and shed small fragments like a roman candle. It also shed three larger fragments the second half of its flight accross the sky. In addition it was followed by a less bright, 1 or 0 magnitude object with the same color, and character, about 10 degrees behind. The follower appeared to be on the same trajectory as the brighter piece, but expired before reaching the eastern horizon. They might be pieces of an artificial satellite falling out of orbit because their velocity was much slower than the meteors I have seen in meteor showers.

*Jane Houston Jones from Glacier Point:*

We were at Yosemite with the San Francisco Amateur Astronomers and got to watch the horizon to horizon "fire-works" with a large crowd of stargazers at Glacier Point. We were of the opinion at the time that it was a re-entry of some man-made object. It was way cool, that's for sure! The Yosemite visitors were awestruck that we astronomers could order such brilliant fireworks at will! Mir, then Iridium satellites, and then the roman candle for a finale!

## Line Up for LINEAR

Akkana Peck

Comet C/1999 LINEAR, a first-time visitor to the inner solar system, has been brightening nicely, and should be an easy target for binoculars and telescopes (and, barely, for the naked eye) through its closest approach to the earth, on July 23rd, at which point it may be as bright as fifth magnitude (though comet brightnesses are difficult to estimate), after which it will fade again, but should continue to be observable through August and into September.

At its brightest point in late July, the comet is low in the northwestern sky, just under the bowl of the Big Dipper, and heading further westward and southward each day. There's a good finder chart and more information online at Sky Publishing's site, <http://www.skypub.com/sights/comets/0007linearS4.html>.

Jupiter and Saturn rise almost together, around midnight by month's end. An unsubstantiated rumor on the Shallow Sky list suggests that Jupiter's Great Red spot may be darker than last year. Is it darkening again, so those of us who have seen only the Great Pale Spot will get a chance at to see why it earned its name? Will the white ovals preceding and following the spot have merged since last year? Stay tuned for these and other adventures, as the gas giants move back into our evening sky.

Uranus and Neptune continue to swim with the sea-goat, Capricornus, and are well placed (though low due to their far-southerly declination this year) for observation. Neptune is just past its opposition at the end of July; Uranus reaches opposition on August 11. Both should easily show small blue/green discs to telescopic observers. Pluto, in Ophiuchus, is also still observable this month.

Mercury is observable in the morning sky for the first few weeks of August. Venus remains too close to the sun all month for those of us in the northern hemisphere.

## Mooning

## Late Breaking News: Venus Disappears!

Dave North

I don't know if a July 31 event is appropriate for the August mooning column, but I didn't really think to put it in last month, what with the Wandke Moonwriting Marathon in full tilt... but we have a nonOccultation of Venus happening under nearly impossible conditions on the last day of July.

The moon will be very near the sun, and it will be just barely sunset when the semi-occultation takes place.

From here, we'll get a partial, which means we'll see Venus go a bit dim, and if we get impossibly good seeing, catch the change in shape.

However, Sacramento should be in the path the full occultation of the planet. If you think it's worth the drive to get there before sunset, head east and north a bit (anywhere on the Sacra-

*Continued on next page*

## Meteors

## Perseids of August

Jane Houston Jones

August Perseids! Here are the active dates and peak dates:

Activity from this meteor shower is visible from about July 23 until August 22. At the time of maximum on August 12/13 (J2000 solar longitude=139.7 deg), the radiant is located at R.A. 47 deg, Decl. +57 deg. The hourly rate typically reaches 80, although some years have been as low as 4 and as high as 200. The meteors tend to be very fast, with an average magnitude of 2.3, and about 45% leave persistent trains. The radiant advances by a rate of 1.40 deg/day in right ascension and 0.25 deg/day in declination.

To best observe the Perseids wear appropriate clothing for the weather. Lay outside in a reclining lawn chair with your feet pointing southward and look straight up. Do not look directly at the radiant, because meteors directly in front of you will not move much and fainter ones might be missed. Decent numbers of Perseids can be seen beginning around 10 p.m. local time, but the best show picks up after midnight and continues until dawn. When you see a meteor mentally trace it backwards and if you arrive at Perseus it is probably a Perseid.

In addition to the main radiant near Eta Persei, there are 4 minor ones. The radiants of these for minor

showers are near Chi and Gamma Persei, and Alpha and Beta Persei. These meteor showers are generally short-lived and possess radiants that move nearly parallel to the main radiant. The following are summaries of the most consistent of the secondary Perseid radiants.

The Gamma Perseids mainly occur during August 11 to 16 from an average radiant of R.A. 41 deg, Decl. +55 deg. The radiant diameter averages about 2 deg. Rates rise and decline with those of main radiant.

The Chi Perseids occur during August 7 to 16 from an average radiant of R.A. 35 deg, Decl. +56 deg. The radiant diameter is about 2 deg. Maximum seems to occur between the 9th and 11th.

The Alpha Perseids occur during August 7 to 24 from an average radiant of R.A. 51 deg, Decl. +50 deg. The radiant diameter averages about 1.5 deg. Maximum seems to occur somewhere between the 12th and 17th.

The Beta Perseids occur during August 12 to 18 from an average radiant of R.A. 47 deg, Decl. +40 deg. The radiant diameter averages about 1 deg. Rates are irregular. Weakest branch of the Perseid cluster.

If you need a chart to find Perseus, refer to last month's meteor column, or look at any star chart.

## ***Mooning***

*Continued from previous page*

mento line should do it).

The moon will be only a few degrees from the sun, though, so this will be both very hard to see (perhaps out of the question) and very, very dangerous (because telescopic observation means creeping so close to the sun).

If you're not an ace solar observer, and familiar with all the techniques and safety drill, I wouldn't try until the sun is below the horizon. This gives you almost no time to line up and watch, but better to miss this difficult shot than cause eye damage — keep your eyes and you'll be able to see Venus transit the sun before too terribly long...

I'm sure by the time July 31 rolls around, there will be plenty of "event noise" and advice floating around, for those who want a more thorough picture of what to expect.

August is traditionally a good time

to start the hunt for Orientale, but we're moving out of the cycle of best presentations. Still, the theoretical best presentation is often not the one that produces the best image.

On the evening of August 14, from sunset to midnight, there might be a good view of the terminator opening up Orientale. The shadowline will be moving to within a few degrees of the limb as the night progresses, and there is a moderate libration of Orientale

---

### ***So, as usual, that dang ecliptic gyps us again.***

---

toward us.

Actually, that's a pretty good terminator position, but a pretty poor libration. How those two will combine in the eyepiece is never obvious ahead of time (at least to me) so I'd suggest looking.

If you don't follow what I'm up to here, it's actually pretty simple.

The idea is to catch Mare

Orientale while the moon is tilted to show it best; turned toward us ... at the same time the terminator is crossing it. This really only happens once a month, just before full moon.

I got started on this annual chase some years back as an experiment to determine whether or not the moon was in fact a dull object near the full phase (or at it).

The lesson I learned from my experiment? Nope. There are tons of things to look for near full — just different things and different challenges.

Lately, the challenge has been the seeing, and that's not likely to get better any time soon.

Why not?

This is the season of the Low Moon. It appears highest in the sky when it's new (when we can't see it). From there, it declines each night, and by sunset is pretty low up until first quarter because it has been setting with the sun.

Then, by the time it starts to be near the meridian at sunset, it has gone lower in the sky due to the ecliptic inclination.

The weird effect is best seen in late June, July and early August new moons (which we have sort of this month): it will seem as if the moon always starts the evening at about the same elevation, and that won't be very high in the sky.

So, as usual, that dang ecliptic gyps us again. Low in summer, and high in winter when we can't see through the clouds!

Whoever designed this system didn't have astronomers in mind.

## **Minuteman Launch from Vandenburg, July 7, 9:17 p.m.**



*Many SJAA members observed the launch of the rocket from various locations. Dean Sala, at the Houge Park Star Party took some incredible pictures with his Olympus 2020Z digital camera. The bright spot in the upper right is the first quarter moon.*

## Fun Club Stuff To Do

Dave North

I would really like to put members who think a club project would be fun in contact with others who think the same way, and supply club resources to make all sorts of things happen.

Right now, there are plenty of ways anyone could help out with SJAA tasks, should the desire be there.

We are currently understaffed in:

1. Treasurer
2. Postal list maintenance
3. Event research and coordination (speakers, etc)
4. Mirror making
5. Telescope making
6. Club loaner scope maintenance and rebuilding
7. Special event coordination

8. Some aspects of Ephemeris mailing/production

9. Other good ideas.

I suspect quite a number of folks out there might like to become a bit more involved in the club, but it sometimes seems a little hard to figure out how...?

It's easy.

Just email me (north@znet.com) or any other board member with your idea, or let us know what you want to do. Or talk to any board member at a meeting, or give a phone call (the last is the least reliable method).

There are no strict procedural rules for anything in SJAA, unless it's a board matter (spending money, basically — and even those matters

need not trouble anyone who is not on the board. We have to deal with it; you don't).

That means if you want to take on a piece of anything listed above, or have your own idea for how to do something neat in the club setting, start making some noise.

I think you'll find we're more than happy for the help.

Just one personal note: I'm not trying to "hustle" anyone into a job. Mostly, I've found folks who think something might be fun stick with things longer, and get more out of them.

Don't volunteer because you think you "should" — but absolutely get cracking if you **want** to do something.

That will work best for everyone!

## Fremont Peak Notes

Dave North



*Sketch by Akkana Peck of ray-like illumination on the floor of crater Faye. Not a true ray, since they were not directly perpendicular to the terminator. No large angry gorillas were noted.*

I've been up to the Peak fairly regularly lately, and would like to take a moment to give a little advice to SJAA members (and anyone else who reads this) about how to get the most out of a trip there on a dark sky night.

There are three major use areas for astronomers at Fremont Peak: the Observatory, Coulter Row, and the Southwest Lot.

In previous years, Coulter was the heart and soul of "show up" astronomy in the SF Bay Area, but that situation has been deteriorating. I would not recommend setting up there any more — the last dark sky night I saw there was truly awful, with loud music, cars cruising, bonfires and artificial lighting throughout the area.

It was actually nicer (and darker) in my yard in downtown San Jose after we got back that night. El Camino Real is usually more peaceful.

For a few years, only FPOA members have been allowed to set up in the near the 30-inch. If you are an FPOA member, you're probably already familiar with the procedure to go there (call ahead, notify the Ranger, etc).

That leaves only the Southwest Lot for the "casual" astronomer.

The surface is good, and the western horizon excellent. A new real flush toilet is in the works.

But south, north and east are all extremely limited, up to 30-degrees and more. This has always been a problem there, and the surrounding trees are growing notably higher each year.

Conditions at the Southwest Lot in early July were very good, given those constraints.

For now, I would suggest anyone going up there stay away from the other sites.

I hate to give up on Coulter, as it is practically world-famous. And the Southwest Lot is not easy for visitors to find, so there are very few "publics" who get a chance to look through the scopes.

We'll try to keep you updated, and hope for a renaissance of Coulter Row sometime in the near future.

For now, though, a word to the wise: use Coulter at the risk of eye and ear!



## Ptolemy's Cafe

Bill Arnett

Like so many amateur astronomers, I've always wanted to have my own permanent observatory. Of course, we would all like to have one on top of Mauna Kea but the real world intervenes and we make compromises. So mine is in my backyard in the middle of the San Francisco Bay Area's huge light dome. Well, actually, at the edge of it; I'm located in the hills above Redwood City so there's no city to the west of me and little to the south.

Thus I have a pretty decent sky to the west and south and at the zenith but the east and north are pretty much lost. Fortunately (OK, it wasn't exactly an accident), my backyard is west of my house. My southern horizon isn't great but it is good enough to see Scorpius in the summer. I can usually see the Milky Way and on a good night I can see M31 without optical aid. Not bad for suburbia.

I knew from the beginning that I wanted a roll-off design, not a dome. I like the feeling of the open sky above me and the climate here is mild enough that a dome is not a requirement. But more importantly, I wanted it to be aesthetically pleasing. After all, it dominates my backyard. So I decided on a "Japanese tea house" look and designed the rest of my landscaping to match.

There were two major tradeoffs I had to make. First, having the roll-off support structure on the north side as is traditional was out of the question. It would have been in the middle of my lawn. So it is on the west side where it is least visible from my house (and fortunately, not too bad for my neighbors, either). That compromises my view of the sky low in the west but while that is the darkest part of my sky



*Bill Arnett's "tea house" style home observatory in Redwood City.*

it is rarely worth observing due to the seeing.

Second, between the "tea house" design, the building codes, and a pretty conservative structural engineer the structure got more massive than I would have liked. The engineer insisted on making it out of steel which greatly increased the cost (but at least I can use it as a shelter in an earthquake). It wasn't possible to have the whole south wall fold down (as is also commonly done) so I have to make do with looking through fold-down windows. This means that the posts and tops of the walls are pretty thick and obstruct more sky than I would have liked (I did a lot of trigonometric calculations about what part of the sky would be blocked, all of which turned out wrong since the obstructions got much thicker during construction). I partially compensated for this by designing a ridiculously complicated

pier which allows me to move the telescope up and down to get different angles thru the windows and over the walls.

Building the observatory was part of a larger project to landscape the entire yard. Getting architects and plans and permits and contractors all arranged took over a year before we started work. So in the meanwhile, I made a temporary wooden pier for my LX200 in the spot destined to be the observatory. Of course, since there was a lot of grading and digging to be done the very first thing we did when construction began was to remove the temporary pier. It was a good thing I had the 10" f/6 Dob I built in Jane Houston's SJAA mirror making class last year to use while the LX200 was off line.

Much more information and pictures are available at <http://www.seds.org/billa/obs/obs.html>

## Paul Graves, 1939-2000

Paul Graves died Wednesday June 29, after a year of fighting pancreatic cancer.

In lieu of flowers, donations may be made to the Boy Scouts of America, another of Paul's activities.

Paul taught science at Dartmouth Middle school for some 34 years, his entire career. He left only when he was too ill to keep a regular schedule, and even then came in from time to time.

He was a long-time active member of the San Jose Astronomical Association. In addition to conducting star parties at Dartmouth School, he often brought his class to SJAA public nights. He was an avid solar eclipse chaser, and spoke to SJAA and other groups about his travels and observations.

Dave Smith recalls his friend Paul this way: I shall certainly miss him. We had some great times observing together, and just sitting around talking. I will never forget the night we observed from his back yard as Saturn and its rings occulted 28 Sagittarii — eleven years ago this weekend. That was before I had a scope, and we used his C-8 and C-90. He insisted I use the C-8 (the better scope), because, he said, my eyes were better than his. The way the starlight kept winking on and off while coming through the structure of the rings was just amazing.

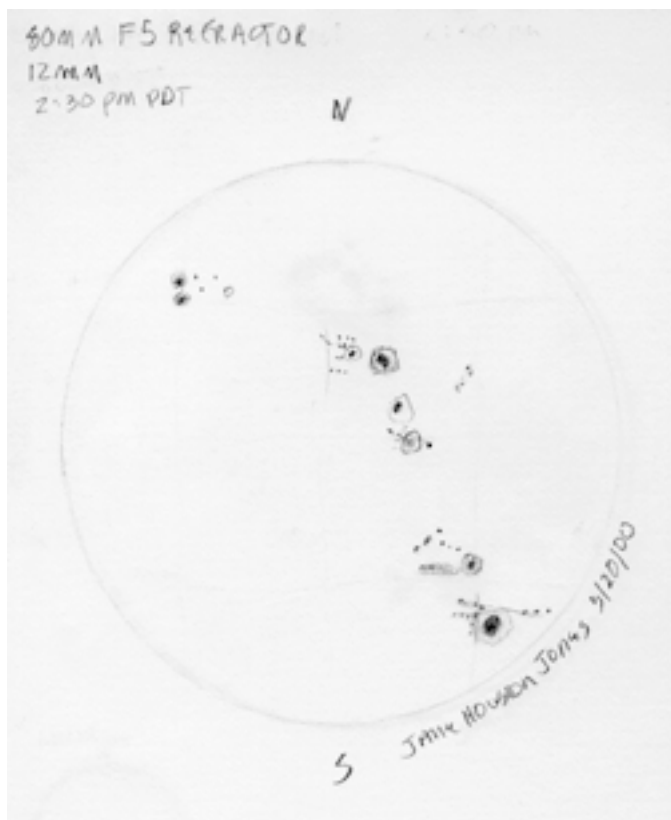
In early July last year, he was given four months to live. He stretched that out to almost twelve. He and his wife Ellen went to Europe in August last year for the solar eclipse, a

thrilling experience which he recounted with slides in the September SJAA meeting.

Before Paul went back to college to train as a teacher, he had been a forest ranger, and a fire lookout before that. He and Ellen liked to just drive out of town and hike in the mountains, or go down to Death Valley to see the wildflowers, or to go bird watching. His love of astronomy was a part of his general fascination with the wonders of creation. I think this enthusiasm shows in the words he wrote in the article he coauthored with me for the Ephemeris for April 1999, which can be found at <http://ephemeris.sjaa.net/9904/b.html>.

Ellen believes Paul willed himself to hold out until the Dartmouth awards assembly on June 13th, as he had been notified that the yearbook would be dedicated to him. The students showed him a great deal of love and respect that day. After that, he rapidly lost strength.

Farewell, Paul



Sunspot sketch by Jane Houston Jones, May 20, 2000. Orion "Short Tube" 80mm f/5 refractor.

## Celestial Calendar

### August 2000

Richard Stanton

| Lunar Phases: | Date      | Rise | Trans | Set         |
|---------------|-----------|------|-------|-------------|
| FQ            | 18:02 PDT | 06   | 12:25 | 18:02 23:33 |
| FM            | 22:13 PDT | 14   | 19:04 | 00:22 04:47 |
| LQ            | 11:51 PDT | 22   | 23:30 | 05:47 12:52 |
| NM            | 03:19 PDT | 29   | 05:47 | 12:37 19:18 |

| Nearer Planets:               | R. A.   | Dec.   |
|-------------------------------|---------|--------|
| Mercury, 1.31 A.U., Mag. -1.8 |         |        |
| 07 05:01 12:15 19:28          | 08:09.5 | +20:34 |
| 17 05:58 12:57 19:54          | 09:30.5 | +16:30 |
| 27 06:58 13:33 20:05          | 10:46.4 | +09:30 |

|                             |         |        |
|-----------------------------|---------|--------|
| Venus, 1.60 A.U., Mag. -4.1 |         |        |
| 07 07:33 14:17 21:00        | 10:13.1 | +12:37 |
| 17 07:55 14:24 20:52        | 10:59.4 | +07:59 |
| 27 08:16 14:29 20:41        | 11:44.5 | +03:00 |

|                            |         |        |
|----------------------------|---------|--------|
| Mars, 2.59 A.U., Mag. +1.6 |         |        |
| 07 05:18 12:29 19:40       | 08:26.5 | +20:17 |
| 17 05:11 12:16 19:21       | 08:52.9 | +18:41 |
| 27 05:04 12:02 19:01       | 09:18.6 | +16:53 |

|                               |         |        |
|-------------------------------|---------|--------|
| Jupiter, 5.14 A.U., Mag. -2.4 |         |        |
| 07 01:11 08:23 15:35          | 04:21.0 | +20:37 |
| 17 00:37 07:50 15:02          | 04:26.8 | +20:50 |
| 27 23:58 07:15 14:28          | 04:31.7 | +21:00 |

|                              |         |        |
|------------------------------|---------|--------|
| Saturn, 9.18 A.U., Mag. +0.7 |         |        |
| 07 00:52 07:55 14:57         | 03:52.6 | +18:04 |
| 17 00:15 07:18 14:20         | 03:54.8 | +18:09 |
| 27 23:33 06:40 13:43         | 03:56.4 | +18:12 |

| SOL Star Type G2V                  | Intelligent Life in System ? |
|------------------------------------|------------------------------|
| Hours of Darkness                  |                              |
| 06:45 07 06:15 13:13 20:11 09:10.1 | +16:19                       |
| 07:14 17 06:24 13:12 19:59 09:47.8 | +13:18                       |
| 07:43 27 06:32 13:09 19:45 10:24.7 | +09:56                       |

| Astronomical Twilight: | Begin | End   |
|------------------------|-------|-------|
| JD 2,451,763 07        | 04:35 | 21:50 |
| 773 17                 | 04:48 | 21:34 |
| 783 27                 | 05:00 | 21:17 |

| Sidereal Time:                            |  |
|---|--|
| Transit Right Ascension at Local Midnight |  |
| 07 00:00 = 19:56                          |  |
| 17 00:00 = 20:36                          |  |
| 27 00:00 = 21:15                          |  |

| Darkest Saturday Night: 26-Aug-2000 |       |
|-------------------------------------|-------|
| Sunset                              | 19:46 |
| Twilight End                        | 21:19 |
| Moon Rise                           | 03:11 |
| Dawn Begin                          | 04:59 |
| Hours Dark                          | 07:40 |

### Officers and Board of Directors

**Pres** David North (408) 297-5257  
**VP** Mike Koop (408) 446-0310  
**Sec** Jim Van Nuland (408) 371-1307  
**Tres** Mark Taylor (408) 972-2719  
**Dir** Bill Arnett (650) 780-9645  
**Dir** Bill O'Shaughnessy (408) 984-3985  
**Dir** Jim Bartolini (831) 394-7795  
**Dir** Akkana Peck (408) 297-5257  
**Dir** Gary Mitchell

### Ephemeris Staff

**Editor** Jane Houston Jones (415) 453-2885  
**Editor** Morris Jones (415) 453-2885  
**Circulation**  
Bob Brauer (408) 292-7695  
Lew Kurtz (408) 739-7106  
**Printing** Accuprint (408) 287-7200

### Observational Astronomy Teacher

Doug Davis

### School Star Party Chairman

Jim Van Nuland (408) 371-1307

### Telescope Loaner Program

Mike Koop (408) 446-0310

### Web Page

Bill Arnett billa@znet.com

### Publication Statement

**SJAA Ephemeris**, newsletter of the San Jose Astronomical Association, is published monthly, 12 times a year, January through December.

San Jose Astronomical Association,  
P.O. Box 28243  
San Jose, CA 95159-8243

## SJAA Loaner Scope Status

All scopes are available to any SJAA member; contact Mike Koop by email (loaner@sjaa.net) or by phone at work (408) 473-6315 or home (408) 446-0310 (Leave Message).

### Available Scopes

These are scopes that are available for immediate loan, stored at other SJAA members homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a scope pick up at any of the listed SJAA events.

| # Scope | Description            | Stored by   |
|---------|------------------------|-------------|
| 7       | 12.5" Dobson           | Jeff Crilly |
| 30      | 7" f/9 Newt/Pipe Mount | Mike Koop   |

### Scope Loans

These are scopes that have been recently loaned out. If you are interested in borrowing one of these scopes, you will be placed on the waiting list until the scope becomes available after the due date.

| # Scope | Description          | Borrower            | Due Date |
|---------|----------------------|---------------------|----------|
| 1       | 4.5" Newt/ P Mount   | Tim Roberts         | 9/9/00   |
| 3       | 4" Quantum S/C       | Hsin I Huang        | 9/5/00   |
| 6       | 8" Celestron S/C     | Lee Barford         | 10/7/00  |
| 8       | 14" Dobson           | Bob Havner          | 9/28/00  |
| 10      | Star Spectroscope    | David Kingsley      | 7/20/00  |
| 15      | 8" Dobson            | Mike Rupe           | 7/28/00  |
| 16      | Solar Scope          | Steven Nelson       | 8/20/00  |
| 19      | 6" Newt/P Mount      | Kannan Subbiah      | 9/17/00  |
| 23      | 6" Newt/P Mount      | Raghu Srinivasan    | 8/12/00  |
| 24      | 60mm Refractor       | Al Kestler          | 10/7/00  |
| 28      | 13" Dobson           | Paul Lawrence       | 8/26/00  |
| 29      | C8, Astrophotography | Bruce Horton        | 9/29/00  |
| 31      | 8" f/8 Dobson        | Robert Morgan       | 9/17/00  |
| 32      | 6" f/7 Dobson        | Gordon A. McClellan | 8/12/00  |

### Extended Scope Loans

These are scopes that have had their loan period extended. If you are interested in borrowing one of these scopes, we will contact the current borrower and try to work out a reasonable transfer time for both parties.

| # Scope | Description      | Borrower           | Due Date   |
|---------|------------------|--------------------|------------|
| 2       | 6" f/9 Dob       | John Paul De Silva | ?          |
| 9       | C-11 Compustar   | Paul Barton        | Indefinite |
| 18      | 8" Newt/ P Mount | Paul Barton        | Storage    |
| 21      | 10" Dobson       | Ralph Seguin       | Repair     |
| 26      | 11" Dobson       | John Templeton     | 7/14/00    |
| 27      | 13" Dobson       | Steve Sergeant     | 8/12/00    |

### Waiting List

|    |                 |                  |
|----|-----------------|------------------|
| 7  | 12.5" Dobson    | Doug Hendricks   |
| 16 | Solar Scope     | Gary Mitchell    |
| 18 | 8" Newt/P Mount | Nick DeMonner    |
| 27 | 13" Dobson      | Jeff Crilly      |
| 32 | 6" f/7 Dobson   | Daron Darr       |
|    | 8" Dob          | Srinath          |
|    | A Dob           | Satish K. Pagare |

### Submit

Members are encouraged to submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to [ephemeris@sjaa.net](mailto:ephemeris@sjaa.net).

To subscribe to or unsubscribe from the SJAA Mailing List send email to [sjaa-request@sjaa.net](mailto:sjaa-request@sjaa.net) with a blank subject line followed by a single text line that says "subscribe" or "unsubscribe"

## San Jose Astronomical Association Membership Form

New \_\_\_ Renewal \_\_\_

Membership - \$15

Junior (younger than 18 years old) - \$6

Sky and Telescope - add \$30 to membership

(Sky & Tel will not accept multiyear subscriptions)

Make checks payable to "SJAA"

Bring this form to any SJAA Meeting  
or send (along with your check) to

San Jose Astronomical Association

P.O. Box 28243

San Jose, CA 95159-8243

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

e-mail address: \_\_\_\_\_

SAN JOSE ASTRONOMICAL ASSOCIATION

P.O. BOX 28243

SAN JOSE, CA 95159-8243

NON-PROFIT ORGANIZATION

U.S. POSTAGE PAID

PERMIT NO. 5381

SAN JOSE, CALIFORNIA