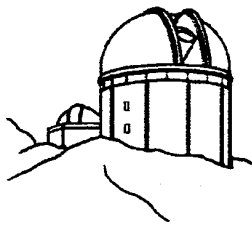

SJAA EPHEMERIS

The Best Three Hours of My Astronomical Life

Bill Arnett

Wednesday, 1997 September 17 was a very indecisive day. A grazing occultation of Saturn by the Moon was scheduled for 3:30am Thursday but the weather was not cooperating.

The forecasts (I checked dozens of them) were ambiguous as usual. The sky out my window kept changing from just OK to very much not OK. My astro friends on the Net were doing the same thing; much ambiguous email was exchanged. At 10pm the others gave up but I held out for a final decision at midnight.

As Thursday approached, one last peek outside showed the Moon and Saturn as clearly as can be expected in the middle of a sea-level city but low clouds were closing in fast. The weather satellite images showed a hole in the upper level clouds over us. I decided to go for it. I sure wasn't going to see anything if I went to bed.

It was probably the best decision I've made since I bought my first telescope.

So into my Mitsubishi 3000GT went my 12" LX200, tripod and accessories (that such a thing is possible is another story). My destination was Henry Coe State Park. At that location, Saturn was predicted to just graze the edge of the Moon's limb;

See **The Best**, p. 2

DECEMBER

5 Houge park star party. Sunset 4:50 pm, 38% moonset 10:49 pm.

13 General meeting 8 pm, Speaker Bob Garfinkle will discuss what are and how to observe the dark haloed craters on the Moon.. Open board meeting 6:30 pm.

20 Star party at Fremont Peak. Sunset 4:53 pm, 57% moon sets 11:32 pm.

26 Houge star party cancelled for Holiday.

27 Star parties at Fremont Peak, Coe. Sunset 4:56 pm, 3% moonrise 6:07 am.

JANUARY

9 Houge park star party. Sunset 5:08 pm, 93% moonset 5:19 am.

8 General meeting Houge Park 8pm; Al Stern of ASP will discuss and show recent discoveries by the Hubble Space Telescope. Open board meeting 6:30 pm.

17 Beginning astronomy class at Houge Park, 8 pm.

23 Houge park star party. Sunset 5:23 pm, 19% moonrise 3:53 am.

24 Star party at Fremont Peak, Coe. Sunset 5:22 pm, 12% moon rise 4:48 am.

Please note that SJAA insurance only covers SJAA members at SJAA sponsored events.

24 hour News and Information:
SJAA Hotline: (408) 559-1221
Web Address: http://
www.seds.org/billa/sjaa/sjaa.html

The Celestial Tourist Speaks

Jay Freeman

Editor's Note: Jay prefers I assemble this collection of his comments under the same title as his old column in the Ephemeris, so that's how it will be. Hopefully these notes (assembled by the editor; blame me for the choice, not Jay) will help you enjoy your tours as much as they add to mine...

On Astro Bumper Stickers . . .

I have one that reads "When you've seen one universe, you've seen 'em all."

On Binoviewers . . .

I think that all the current commercial units have the same fault: None of them allow any fine adjustment for different degrees of near-sightedness in the user's eyes. That lack not only makes set-up time-consuming and jiggly, but also means that it is very difficult to share views with friends whose glasses prescriptions are different from yours. I am left with the sense that none of these products — binoviewers — are really ready for the market. After all, when was the last time you saw a Zeiss binocular — or a Tasco binocular, for that matter — that did not allow some means of varying the focus from one eye to the other?

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VOLUME 8 NUMBER 12 OFFICIAL PUBLICATION OF THE SAN JOSE ASTRONOMICAL ASSOCIATION, DECEMBER 1997

The Best, from p. 1

at home in San Jose it was to be a near miss while at our usual spot at Fremont Peak a little farther south a total occultation was expected.

And, unlike the weather forecasts, astronomical predictions are extremely trustworthy. Coe was the place to be.

Fortunately, there wasn't much traffic since I was looking at the sky half the time instead of the road. Curiously, I wasn't too anxious. I figured the worst that could happen was that I would have a nice moonlight drive up the mountain and back down. In the valley there were low broken clouds illuminated from below by the orange city lights and from above by the blue moonlight.

I thought it was actually kind of pretty, especially since I expected to leave them behind as I got up the mountain. That turned out to be correct but the hole in the upper level clouds turned out to be smaller than I expected. By the time I was out from under the low crud the Moon was playing hide and seek with the high clouds.

That, too, made for a pretty but somewhat more worrisome sight. Driving up the winding mountain road with my eyes on the sky most of the time was not an example for the driving schools. The 3000GT was bored. But the sky was improving! By the time I arrived at the top there were BIG holes.

As I drove into the campground with only my parking lights on, I was greeted by a small red light waving around. That could only be another astronomer. Had my last email gotten through in time? No, the owner of the red light was William Phelps who also turned out to own a 7 inch f/9 Astrophysics refractor. I was glad to have some company since the main event was still two and a half hours away. As it turned out, I was to be VERY glad...

William was encouraging about the weather. His opinion was that the edge of the cloud band was approaching and that we had a good chance of clear weather for the graze. So we both set up our scopes to let them get cooled down well in advance. (Fortunately, it was a pretty warm night, anyway. I made do with only a sweatshirt.)

The Moon was still going in and out of the holes. But it and Saturn were visible even through the clouds. Maybe we need not worry so much about them after all?

Then as we were just waiting around, casual glances at Saturn looked pretty sharp, Cassini's division was easy even with all the bad weather. That got our attention. In fact the seeing was excellent, one of the best nights all year! Of course, the transparency was horrible; but this was of no consequence for viewing the Moon and Saturn.

The Moon was almost two days past full so there were lots of features visible along the terminator on the (selenographic) eastern limb. I was able to use 350x with no problems. My eye was first drawn to a broad linear feature which may have been Vallis Snellius. The rimae and central mountains in Petavius were excellent. But this was just foreplay...

Soon after William and I set up Paul Mortfield showed up. He and William were planning to make a video of the graze. They had an expensive "prosumer" video camera whose lens was removable and could be attached directly to the big refractor. They also had a small color monitor on which to watch the show.

After what I thought was an amazingly small amount of fussing they had it up and running. Wow! Live video of the Moon! And Saturn. We could see Cassini's division and banding in the southern hemisphere on the monitor! The resulting tape will be pretty interesting.

It turned out that William not only owns a top of the line AP refractor but also a Zeiss/AP binoviewer. I had had poor experiences with similar units before; I was never able to get the images to fuse. Seeing double is no fun at all, it gives me a headache in just a few seconds. So I was eager to try another example of this reputedly fabulous (and fabulously expensive) gadget.

A quick peek through William's refractor showed that I really could fuse the images. And it looked pretty nice on Saturn. Damned nice in fact. I hesitantly asked if I could try it on my LX200 so I could relax and take my time to evaluate it on my own scope.

William generously agreed. In a few seconds I had my diagonal off and the binoviewer installed (along with a pair of 19mm Televue Panoptics). Looking at the Moon my eyes fused the image instantly. Wow! WOW!! OH WOWIE ZOWIE!!! Eyegasm! At last I knew what it's all about.

All the things you've heard about these things is absolutely true. The view IS 3-D; it IS easier on the eye, much better than an eyepatch, MUCH better than squinting; the loss of light through all the extra optics IS NOT a problem (at

See **The Best**, p.3

The Best, from p. 2

least with as 12" scope looking at the Moon or planets). Slewing the scope around the Moon was like flying, an unbelievable experience.

The usually boring bright areas away from the terminator were full of interesting albedo features and wonderful details. Amazing! I later tried Paul's identical and equally excellent unit. I am totally sold. Unfortunately, I understand that this particular unit is no longer in production and that the cheaper ones are not as good. I not so briefly considered grand larceny. Wow!

What's better than an eyegasm? A second eyegasm! The night's main event was now quickly approaching... At first it was merely odd to see Saturn and the Moon in the same low power field. I had expected the contrast difference to be a major problem with the Moon's brilliance blowing away Saturn's delicate form.

I had variously heard that Saturn would be 8 f/stops or 72 times dimmer; either way it's a lot. And so it was with Paul's video.

When the exposure was set correctly for the Moon Saturn was a pale ghost of itself; when set for Saturn the Moon was a bright featureless disk. But the human eye is a wonderful device. Direct viewing showed both objects with no problems.

I had also expected that the glare from the Moon would be a problem. But the extremely poor transparency conditions made for very poor contrast between Saturn and the sky anyway. So we were not bothered by the Moon's glare.

In my 12" I was able to see Rhea, Titan and Tethys, too; though only Titan was visible in the big refractors. In fact, I was able to see Titan when it appeared equally distant from both Saturn and the Moon (roughly an arcminute). I certainly did not expect that.

We must have been living right, the sky gods were smiling on us that night.

As the Moon approached Saturn their relative motion became quite evident. With the binoviewer and the 19mm Panoptics I could see only a small portion of the Moon's limb along with Saturn. And then my brain flipped so that it seemed that it was Saturn that was moving against the stationary Moon.

Of course, in reality the Moon's motion is far faster. But Saturn looks very small beside the huge Moon; one's brain expects the small thing to be the one in motion.

As Saturn dropped down onto the Moon's bright limb it was a surreal scene. Of course, both objects are very familiar but none of us had ever seen them together. Saturn looked so tiny and fragile against the looming edge of the Moon. And Saturn's pale yellow color was in marked contrast the the Moon's harsh bluish gray.

The seeing was still holding up. We could still see Cassini's division as it slipped behind the Moon's limb.

As this was a grazing occultation, Saturn slipped along the limb of the Moon; it never disappeared entirely. It was easy to see it move against the lunar features. As it crossed the pole over to the dark limb a bit of blackness intruded between the terminator and Saturn.

Then as Saturn rose again we first saw the whole of Saturn's disk, then the inner part of the occulted half of the ring, then Cassini's division and then it was over.

What a trip! Of course, we had all seen simulations and knew pretty much what to expect. But to actually witness it was awesome. We were all so excited that we were laughing and yelling at each other like a bunch of school kids. I had thought this would be interesting. But I had no idea what an emotional impact it would have! I will remember this night as long as I live.

Fog started to roll in shortly after the event. We all tore down quickly. As I was driving home (slowly, at 4am) I couldn't help thinking how close I had come to missing this wonderful night. Many is the time I've decided to stay home for fear of going to a lot of bother for nothing. And I thought too, of my friends and all those millions of ordinary folks asleep in their beds while this marvelous spectacle went on over their heads.

How fortunate I was to be one of the lucky few to witness it. This was definitely the best three hours of my astronomical life.

Celestrial Tourist, from p. 1

On The Occultation Of Aldebaran . .

When the occultation came, I was watching through the 127 ED at 228x. In an occultation last Spring, Aldebaran had seemed to take a substantial fraction of a second to disappear, but this time the vanish was as near to instantaneous as I could tell. The Moon slowly glided up over the star, and then alpha Tauri winked out.

On Thing That Go Bump . . .

One of the interesting things about being around a state park on a lonely night is the number of thumps and crackles that come out of the underbrush. I generally lift my red flashlight to head level and sweep it horizontally, looking for reflections of eyes in the night. Usually there aren't any, but some times there are, and the deep red LED reflections look rather spooky. I was wondering what might be hiding behind a nearby fence post, as I shined my light at it, when the fencepost suddenly opened its low-set eyes and stared at me. Then it lifted its head to rather more than the fencepost's height, and stared some more. "Oh, look at the deer," I said. "Or maybe they're Velociraptors."

On The 90mm Vixen Refractor . . .

My 90 mm is the only refractor I have that I would not for a moment consider selling. The original owner moved out of the Bay Area shortly after he sold it to me, and I did not see him again for some eight years. When we encountered one another the next time, I shook his hand delightedly and said, "Hi! You can't have your telescope back!"

On telescope weight . . .

Many people say Vixens are too lightly constructed. I say that Takahashis and Astro-Physicses are overbuilt ... excess weight in a telescope is a serious flaw, for it either requires vastly more weight in the mounting to make the whole thing steady, or else increases problems with vibration: "Wunga-wunga-wunga" is usually perceived as much more objectionable than "boinggg".

School Star Parties

Jim Van Nuland

The SJAA's school star party program got off to a rough start on Sept.14, when the clouds eliminated the entire sky at Overfelt Gardens. Even some daytime events were affected by a cold wind.

The Ice Cream Social on Sept.19 at Taylor School was a success! After putting down great dishes of ice cream with numerous chocolate toppings, Mark Stalions and I showed off Venus, Jupiter, some fine open clusters, and for those that hung around just a little late, also Saturn and the past-full moon.

There were a couple hundred kids — we sure could have used more telescopes! Our next events will be on Oct.23 and Nov.4. Contact Jim Van Nuland at 408.371.1307 (10 am to 10 pm), or e-mail to jim.van.nuland@sjpc.org (24 hours) to volunteer. You need not be an expert. We're usually back home by 10 pm or so. Thanks much!

Activities Through Other Clubs

TAC has reserved the Montebello site for every Wednesday, more or less indefinitely (weather permitting). To get there, take Page Mill Road off 280 (or get to it via El Monte Road) until you're near the top. Montebello's sign will be visible on the left.

December

6 **TAC** FP or Henry Coe lunar observing.

12 **PAS** Annual Meeting when board elections are held. The speaker will be Stanford professor Dr. Simon Clemett speaking on "Laboratory Measurements of E.T. Objects including the "martian meteorite".

27 **HVAG** Starparty at Grant Ranch.

January

24 **HVAG** Starparty at Grant Ranch.

Astro Ads

Encoder and hardware package for G-11 mount, hardly used $200; Edmund Astroscan (plus totebag) $200. Call **Dave, 650-858-0327** (evenings).

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The Shallow Sky

David North

This month, the moon starts its climb toward good conditions for first quarter viewing -- that phase will be considerably higher in the sky than previous months. December is the beginning of "moon season" for those of us who don't like to stay up too late, or get up in the early morning.

Aside from improving general views there are a lot of lunar activities this month. First, this is a pretty good month for looking at the full moon, or at least nearly full -- if for no other reason than it will be at its maximum elevation.

The day before full (the 13th) will be the maximum northern libration, so for a few days there will be excellent edge-on crater hunting. And as a bonus, the day after is the maximum eastern libration, which means the full and near-full moon will let us get very good looks at the maria "outside" of Mare Crisium, and they show very well under high illumination due to increased contrast. This is a great opportunity!

Saturn, which will show well all month, will be occulted almost dead on by the moon about 11pm December 8, if I have the calcs right. Further, Aldebaran will be occulted at about 9pm on the 12th. This is near full, but should still show well.

Venus will be at its brightest for this conjunction on the 11th.

Jupiter will still be up for a double daytime shadow transit shortly after noon on the 14th. Daytime views are possible, but not easy. Mars is just about gone.

Akkana Peck has started a new mailing list for lunar and planetary observers, called *The Shallow Sky* (great name!), to give solar system observers (as opposed to "deep sky" observers) a place to discuss their observations and techniques. (Discussion of other solar system objects, such as comets or asteroids, is also welcomed.)

A web page describing the list in more detail, at http://www.best.com/~akkana/shallow-sky.html. To subscribe to *The Shallow Sky* mailing list, send mail to shallow-sky-request@lists.best.com with the word **subsingle** in the message body.

There will be two meteor showers in December, The Geminids and the Ursids.

The Geminids are usually the strongest shower of the year, producing nearly 100 meteors per hour at peak. They are visible for one week prior to maximum, but most activity is December 12/13 and 13/14.

Expect many bright meteors, but persistent trains are rare. Near maximum there are many fireballs with vivid colors, making this a definite photo opportunity.

The parent object of the Geminids were unknown until recently. However, the Asteroid 3200 Phaethon is now known to be the source, and is also the only non-cometary object associated with a major annual stream.

The Ursids are visible for one week prior to Christmas. A great majority of the activity occurs on the morning of December 21/22. The parent comet of this shower is Comet Tuttle, which last reached perihelion in 1994.

Prism vs. Mirror Diagonals

Jay Freeman

A surface irregularity on a refracting surface produces a much smaller wavefront error than on a reflecting surface, by something like a factor of six. Unless reflecting surfaces are extremely well polished, and have coatings that are extremely regular, they will scatter more light than refracting surfaces. Note that prism internal reflections are subject to this factor-of-six problem, too, after the wavefront has made it back out of the prism, but at least they do not have coatings to mess things up further.

All set to go out and buy a prism star diagonal? Well, wait just a minute, because:

Prisms introduce both spherical and chromatic aberration into the convergent beam of light. The amount increases as prism size increases, and also as f-number decreases. At f/7 or so, even a prism diagonal for just 1.25-inch eyepieces may introduce enough of these aberrations to take the system outside the Rayleigh limit.

I think the current recommendation is that for long-focus systems — f/9 or more — buy a prism, or else one of the new high-tech multicoated mirror diagonals such as Astro-Physics is selling. For fast refractors, if you plan on extracting the most detail from a good objective, get a mirror diago

Daytime Shadow Transits

Bill Arnett

I just saw a shadow in the daytime. Why is this a big deal, you ask?

Because the shadow was on Jupiter and the Sun was shining on me. (OK, actually I was in the shade of my house, you'll give me that much literary license, right?)

Dave North, Akkana and I had been discussion whether it would be possible to see a moon shadow in the daytime sky. I thought it was worth a try; Akkana thought it should be possible.

Starry Night said that a perfect event was going to happen this afternoon.

So at 4:30pm PST today (Oct 27), as the shadow of Io crossed Jupiter's meridian I was watching. Using my 12" LX200 and my new binoviewer and 19mm Panoptics I just couldn't see it. But with my 12mm Nagler and no binoviewer it was there! Not easy, mind you, but definitely there.

I could also see it in most of my other eyepieces (including the 19mm Pans). I finally saw it with the binoviewer, too, but it was MUCH more difficult. I guess that extra bit of light really matters sometimes.

The north and south equatorial bands were very distinct, even in daytime. They were much easier than the shadow. I was having considerable difficulty focusing as the seeing was predictably horrible from my driveway in the middle of San Jose. The belts are so large that they're easy to see even when a little out of focus. Not so the tiny shadow.

As the Sun set, I was taking my scope back inside (just to be perverse).

Editor's Notes

David North

As many of you know, elections for the Board of Directors will be held in February, and nominations are proceeding for the four openings.

Of the nine members, four terms end: Paul Mancuso, Terry Kahl, Jack Zieders and Bob Brauer. Terry will be running, Paul and Bob will not due to heavy "real life" commitments. Jack Zeiders, the current president, has also indicated he may not run for his seat.

There are currently three distinguished active members who are on the nominating list for these seats: Bill Arnett (who administers our web page and mailing list), Rich Neuschaeffer (director *emeritus*), and Mike Koop (who currently runs the **Scope Loaner Program**). There may be more nominations before the election meeting. If anyone else is interested in running, please contact any member of the nominating committee: VP Ed Erbeck, Director Bill O'Shaugnessy, or myself.

Nominations will also be open on the night of the election, when the membership at large can vote for the new board.

The January SJAA speaker will be Al Stern, discussing recent discoveries by the Hubble Space Telescope. He was to give this illustrated talk some months ago, but was injured in an auto accident. By now, the talk will be mostly new material, as discoveries continue to pour in.

Our March speaker will be club member Don Machholtz, who will explain the Messier Marathon (and have discount copies of his excellent book on the subject). This is particularly timely as the best opportunities for the marathon in 1998 will be a couple of weeks later.

Richard Navarette came up with an excellent Astro Bumper Sticker: "Objects in eyepiece are father away than they appear."

Members looking for equipment (or wanting to sell some) should check out the Bay Area Astronomy Classifieds. This is a free service, and is just for our very active local astronomy community, avoiding shipping and other long distance problems. You can check it out at http://www.rahul.net/resource/TAC/baac.

Many folks refer to the double arcs in Capricornus as "the bikini bottom," but for some reason this is more obvious to male astronomers at The Peak. "The smile" seemed more intuitive to the ladies, from an informal poll. Curiously, nobody seems to see a "sea goat."

Celestial Calendar December 1997

Richard Stanton

Lunar *(all times PST)*

Phases	Time	Date	Rise	Trans	Set
FQ	23:09	07	13:49	19:52	00:56
FM	19:37	13	17:04	00:17	06:31
LQ	14:43	21	00:29	05:56	12:10
NM	09:57	29	07:05	12:17	17:29

Mercury .067 A.U. Mag. .20

Date	Rise	Trans	Set	R.A.	Dec.
07	08:35	13:16	17:57	18:14.9	-24:32
17	07:08	11:59	16:51	17:40.4	-21:26
27	05:49	10:48	15:46	17:05.1	-19:51

Venus 0.37 A.U. Mag. -5.3

Date	Rise	Trans	Set	R.A.	Dec.
07	10:15	15:02	19:49	19:59.4	-23:04
17	09:45	14:41	19:37	20:19.0	-20:41
27	09:02	14:06	19:10	20:24.2	-18:22

Mars 1.08 A.U. Mag. +0.9

Date	Rise	Trans	Set	R.A.	Dec.
07	09:49	14:36	19:24	19:33.7	-22:57
17	09:37	14:30	19:23	20:06.9	-21:30
27	09:23	14:23	19:23	20:39.4	-19:38

Jupiter 5.54 A.U. Mag. -2.1

Date	Rise	Trans	Set	R.A.	Dec.
07	11:12	16:22	21:33	21:21.3	-16:24
17	10:37	15:50	21:02	21:28.3	-15:50
27	10:04	15:18	20:23	21:36.0	-15:13

Saturn 9.01 A.U. Mag. +0.8

Date	Rise	Trans	Set	R.A.	Dec.
07	13:42	19:54	02:10	00:54.3	+02:58
17	13:02	19:14	01:31	00:53.9	+02:59
27	12:23	18:35	00:52	00:54.3	+03:04

SOL Star Type G2V Intelligent Life in System?
(HOD = Hours of Darkness)

HOD	Dt	Rise	Trans	Set	R.A.	Dec.
11:15	07	07:09	11:59	16:49	16:55.9	-22:37
11:19	17	07:17	12:04	16:51	17:40.1	-23:22
11:18	27	07:21	12:09	16:57	18:24.5	-23:19

Astronomical Twilight		Begin	End
JD 2,450,789	07	05:37	18:22
799	17	05:43	18:25
809	27	05:48	18:30

Siderealtime

Transit Right	07	00:00 = 04:56
Ascension at	17	00:00 = 05:36
Local Midnit	27	00:00 = 06:15

Darkest Saturday Night	27 Dec 97
Sunset	16:57
Twilight End	18:30
Moon Set	05:11
Dawn Begin	05:48

Directions to SJAA Places

Houge Park is in San Jose, near Campbell and Los Gatos.

From Hwy.17, take the Camden Avenue exit. Go east 0.4 miles, and turn right at the light, onto Bascom Avenue. At the next light, turn left onto Woodard Road. At the first stop sign, turn right onto Twilight Drive. Go three blocks, cross Sunrise Drive, then turn left into the park.

From Hwy.85, take the Bascom Avenue exit. Go north, and turn right at the first traffic light, onto White Oaks Road. At the first stop sign, turn left onto Twilight Drive. You will now be passing the park. Turn right at the first driveway, into the parking lot.

Henry Coe State Park is east of Morgan Hill.

From Hwy.101, exit onto East Dunne Avenue. Continue for 12 miles, far past Andersen Reservoir, to the park, atop the ridge. The current SJAA site is the parking lot on the right about 1/2 mile before the main entrance. There is now a fee for use.

Fremont Peak State Park is south of the village of San Juan Bautista.

From Hwy.101, about 11 miles south of Gilroy, take the eastbound Hwy.156 exit. Run for 3.0 miles, to a traffic light, and turn right onto county Hwy.G-1. Follow G-1 for 12 miles into the park. Be careful to note the sudden "left/right jog" soon after the turn; signs are posted. There is a $3 entrance fee.

Bob Garfinkle On Moon Observation

Jim Van Nuland

SJAA member Bob Garfinkle will be our speaker for the December meeting. Bob will discuss what are and how to observe the dark haloed craters on the Moon.

He is in the process of writing a lunar observers' handbook to be published by Willmann-Bell. He will discuss where they are located on the Moon and give some history to the ALPO dark haloed crater survey.

Bob's great book "Star-Hopping: Your Visa to Viewing the Universe" (Cambridge University Press) has recently been reprinted in hardback for the 2nd time and is now available in paperback, too.

Bob will have copies of this book with him at the talk. Be sure to bring your own copy for him to sign. Bob has recently co-authored a book "Skywatching II" for the Nature Company.

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Comet Comments

Don Machholz

One faint comet has recently been discovered; it was found by Jeff Larson using the Spacewatch equipment at Kitt Peak. It is not expected to become bright. Meanwhile the SOHO satellite picked up two more sungrazer comets falling into the sun.

Several comets are visible to us these nights. Comet Hale-Bopp is quite far south; many Northern Hemisphere observers have had their last view of this great comet. Comet Meunier-Dupouy remains in the north. Periodic Comet Hartley 2 crosses the Milky Way in the evening sky while the beautiful Comet Utsunomiya passes further north. Periodic Comet Temple-Tuttle, responsible for the Leonids Meteor Shower each November, returns after a 33-year absence. Its brightness curve may not be as steep as shown in the ephemeris below

COMET HUNTING NOTES: Since January 1975, 48 different individuals have visually discovered comets that now carry their names. What countries do they live in? Twenty-three are in Japan, nine reside in the USA, with four in Australia. Other countries represented are the old USSR, Canada, England, South Africa, Philippines, Italy, New Zealand and Norway. The most discovery events occurred in Japan (33), followed by the USA (30) and Australia (19).

Ephemerides 2000.0, 0h UTC

C/1995 O1 (Hale-Bopp)

Date	R.A.	Dec	El	Sky	Mag
11-08	08h01.2m	-53°00'	84°	M	6.8
11-13	07h56.4m	-54°48'	86°	M	6.9
11-18	07h50.5m	-56°29'	87°	M	7.0
11-23	07h43.4m	-58°04'	89°	M	7.1
11-28	07h35.1m	-59°29'	90°	M	7.2
12-03	07h25.5m	-60°46'	91°	M	7.3
12-08	07h14.9m	-61°52'	91°	M	7.4
12-13	07h03.3m	-62°46'	92°	M	7.5
12-18	06h50.9m	-63°29'	92°	M	7.6
12-23	06h38.1m	-64°00'	92°	M	7.6
12-28	06h25.1m	-64°19'	92°	E	7.7
01-02	06h12.3m	-64°26'	92°	E	7.8
01-07	06h00.1m	-64°23'	92°	E	7.9

C/1997 J2 (Meunier-Dupouy)

Date	R.A.	Dec	El	Sky	Mag
11-08	16h57.2m	+53°17'	75°	E	11.8
11-13	17h12.2m	+52°08'	75°	E	11.8
11-18	17h27.0m	+50°57'	74°	E	11.7
11-23	17h41.5m	+49°46'	74°	E	11.7
11-28	17h55.6m	+48°34'	73°	E	11.7
12-03	18h09.4m	+47°22'	73°	E	11.7
12-08	18h22.8m	+46°11'	71°	E	11.7
12-13	18h35.9m	+45°01'	70°	E	11.6
12-18	18h48.6m	+43°53'	69°	E	11.6
12-23	19h00.9m	+42°47'	67°	E	11.6
12-28	19h12.9m	+41°43'	66°	E	11.6
01-02	19h24.4m	+40°42'	64°	E	11.6
01-07	19h35.6m	+39°45'	62°	E	11.6

C/1997 T1 (Utsunomiya)

Date	R.A.	Dec	El	Sky	Mag
11-08	18h55.8m	+29°30'	75°	E	10.0
11-13	18h52.0m	+25°12'	69°	E	10.1
11-18	18h49.6m	+21°32'	63°	E	10.2
11-23	18h48.0m	+18°24'	58°	E	10.4
11-28	18h47.1m	+15°42'	52°	E	10.3
12-03	18h46.7m	+13°22'	48°	E	10.5
12-08	18h46.6m	+11°19'	43°	E	10.6
12-13	18h46.8m	+09°30'	39°	E	10.6
12-18	18h47.1m	+07°54'	35°	E	10.7
12-23	18h47.5m	+06°27'	32°	E	10.8
12-28	18h48.0m	+05°09'	29°	E	10.9
01-02	18h48.5m	+03°58'	27°	M	11.0
01-07	18h49.0m	+02°52'	26°	M	11.1

103P/Hartley 2

Date	R.A.	Dec	El	Sky	Mag
11-08	19h55.5m	-08°29'	74°	E	9.2
11-13	20h09.7m	-08°51'	72°	E	9.0
11-18	20h25.0m	-09°08'	71°	E	8.8
11-23	20h41.5m	-09°20'	70°	E	8.6
11-28	20h59.2m	-09°27'	69°	E	8.4
12-03	21h18.1m	-09°29'	68°	E	8.2
12-08	21h38.2m	-09°25'	68°	E	8.1
12-13	21h59.4m	-09°14'	68°	E	8.0
12-18	22h21.7m	-08°56'	68°	E	7.9
12-23	22h45.1m	-08°31'	68°	E	7.8
12-28	23h09.4m	-07°58'	69°	E	7.8
01-02	23h34.5m	-07°17'	70°	E	7.9
01-07	00h00.2m	-06°29'	71°	E	7.9

55P/Tempel-Tuttle

Date	R.A.	Dec	El	Sky	Mag
11-08	12h18.0m	+12°50'	48°	M	19.2
11-13	12h20.9m	+13°03'	53°	M	18.8
11-18	12h23.7m	+13°22'	57°	M	18.3
11-23	12h26.4m	+13°49'	62°	M	17.8
11-28	12h29.0m	+14°26'	66°	M	17.3
12-03	12h31.4m	+15°16'	71°	M	16.7
12-08	12h33.6m	+16°23'	76°	M	16.1
12-13	12h35.6m	+17°53'	81°	M	15.5
12-18	12h37.1m	+19°57'	86°	M	14.8
12-23	12h38.0m	+22°51'	92°	M	14.0
12-28	12h37.9m	+27°03'	98°	M	13.2
01-02	12h35.9m	+33°30'	105°	M	12.3
01-07	12h29.5m	+43°59'	113°	M	11.4

Orbital Elements

Object:	Hale-Bopp	Meunier-Dupouy	Hartley 2	Tempel-Tuttle	Utsunomiya
Peri.Date:	1997 04 01.1370	1998 03 10.4365	1997 1222.0242	1998 02 28.1034	1997 12 10.0570
Peri.Dist:	0.914008 AU	3.051015 AU	1.031725 AU	0.976639 AU	1.359850 AU
Arg/Peri:	130.5787°	122.6755°	180.7240°	172.4930°	095.8952°
Asc. Node:	282.4653°	148.8429°	219.9547°	235.2568°	053.7059°
Incl:	089.4268°	091.2731°	013.6191v	162.4861°	127.9898°
Eccen:	0.995085	1.000760	0.700391	0.905507	1.0
Orb.Period:	~2500 years	Long Period	6.39 years	33.23 years	Long Period
Ref:	MPC 30738	MPC 30738	MPC 29880	MPC 30244	MPC 30738
Epoch:	1997 12018	1998 03 08	1997 12 18	1997 12 18	1997 10 10
Abs. Mag/"n":	-1.0/4.0	4.0/4.0	8.0/6.0	10.0/10.0	7.8/4.0

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TELESCOPE LOANER PROGRAM STATUS

Mike Koop

No.	Scope Description	Borrower	Due Date
1	4.5" Newt/ P Mount	Mark Cousins	11/24/97
2	6" f9 Dob	John Paul De Silva	?
3	4" Quantum S/C	David Manley	12/1/97
4	60mm Refractor	Del Johnson	Indefinite
6	8" Celestron S/C	Bob Bootz	11/13/97
7	12.5" Dobson	Nick Tucci	11/11/97
8	14" Dobson	Bryan Zaring	10/1/97 Note 1
9	C-11 Compustar	Paul Barton	Indefinite
15	8" Dobson	Available	
16	Solar Scope	Jack Peterson	Indefinite
18	8" Newt/ P Mount	Cecelia Yarnell	11/18/97
19	6" Newt/P Mount	Madhava Kidambi	10/15/97
21	10" Dobson	Nathan Hill	11/9/97
23	6" Newt/ P Mount	Bob Hess	10/31/97
24	60mm Refractor	Ravi Tembhekar	11/31/97
26	11" Dobson	Steve Sergeant	12/4/97
27	13" Dobson	Dean Sala	12/1/97
28	13" Dobson	Ramin Ghafouri	10/9/97
29	C8, Astrophotography	Scott Wade	8/28/97 Note 1
30	7" f/9 Newt/Pipe Mount	Available	

Note 1: Please call us and tell us how it's going.

Waiting List:

No. 6	8" Celestron S/C	Ravi Tembhekar
No. 8	14" Dobson	Steve Sergeant
No. 29	C8, Astrophotography	Dean Sala

All scopes are available to any SJAA member. To reserve a scope, please contact Mike Koop at (408) 473-6315 or email at koopm@best.com.

PERIODICAL PUBLICATION STATEMENT

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Members are encouraged to submit articles for publication in the *SJAA Ephemeris*. Send articles to Dave North via e-mail to Timocharis@aol.com. Articles received by the tenth will be put in the following month's newsletter. Please include your name and phone number.

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