

# SJAA EPHEMERIS

Volume 7 Number 2 Official Publication of the SAN JOSE ASTRONOMICAL ASSOCIATION February 1996

## Eye on the Universe

by Lew Kurtz

The annual election for Board of Directors seats will be held at the start of this month's general meeting. There are four seats to be voted on this year, currently held by Bob Brauer, Jack Petersen, Rich Neuschaefer, and Bob Madden (the other five seats will be voted on next year). On pages two and three of the newsletter you will find vita's from five people running for the four Board seats. This gives you a chance to learn a little about these people and where they wish to take the club.

Ed Erbec, Jim Van Nuland, and Bill O'Shaughnessy are this year's nominating committee. If you would like to run for a seat on the Board, contact Jim, Ed, or Bill (phone numbers are on page 7).

The election will be conducted during the general meeting as follows: First the nominees will be presented. Nominations for Board seats will then be accepted from the floor. Each SJAA member will be given a ballot and will vote for up to four people. Ballots with more than four votes will be declared void and will not be counted. The results of the election will be announced at the end of the general meeting.

SJAA's 1996 budget was set at the January Board of Directors meeting. It took all of 20 minutes. See page 7 for some detail.

Shiloh Unruh called (Jim Van Nuland) Monday morning to apologize for missing the Jan. 6 meeting. He had laryngitis so bad that he was not able to phone to tell us that he was ill. We'll reschedule this summer or fall.

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## SJAA Hotline: 24 hour News and Information 408-559-1221

**Feb 3:** General meeting 8:00 pm at Hough Park. Brian Drummond and Beholt Shillings, on CCD Cookbook camera construction and results. Also, Board of Directors' elections. Board meeting at 6:30 pm is open to all members.

**Feb 10:** No activity, too much Moon.

**Feb 17:** Star party at Henry Coe and Fremont Peak state parks. Sunsets 5:48 pm, 1% Moon rises 6:25 am.

**Feb 23:** Hough park star party, 7:00 pm. Sun sets 5:55 pm, 30% Moon sets 11:20 pm.

**Feb 24:** Beginner's All-Purpose Astronomy Class, Hough Park, 7:00 pm. Open to all.

**Mar 2:** General meeting 8:00 pm at Hough Park. Ernie Pini and the October '95 Eclipse over India. Board meeting at 6:30 pm is open to all members.

**Mar 9:** No activity, too much Moon.

**Mar 16:** Star party at Henry Coe and Fremont Peak state parks. Sunsets 6:15 pm, 5% Moon rises 4:58 am. Messier Marathon anyone?

**Mar 22:** Hough park star party, 7:00 pm. Sun sets 6:22 pm, 15% Moon sets 10:04 pm.

**Mar 23:** Beginner's All-Purpose Astronomy Class, Hough Park, 7:00 pm. Open to all.

## Periodical Publication Statement

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

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San Jose, CA 95111-1846

## Eyepiece Types

by Jay Freeman

(posted on sci.astro.amateur)

There has been some discussion of eyepiece types of late. I thought I would put in my two cents' worth for the iconoclastic viewpoint that fancy eyepieces are overrated. I am not trying to make you feel bad if you like whizzy technology, or if you already have a complete set of Naglers. Rather, I hope to encourage beginners and low-budget astronomers who are wondering if they really need to spend one or two thousand dollars on eyepieces to obtain satisfactory performance from a five-hundred-dollar Dobson-mounted Newtonian, or if their two-thousand dollar Schmidt-Cassegrain is going to get lonely if it is not equipped with comparably pricey oculars.

The answer to both of those, for me at least, is "no", and I have owned and observed with many Newtonians, several Schmidt-Cassegrains, and several refractors. Let me explain what magnifications I routinely use, and for what purpose. I will then discuss what eyepiece types suit my intentions.

Most of my observing (some 5000 observations logged over a total of more than a dozen telescopes) has been done with either fairly low magnification, or else medium or medium-high magnification. By "fairly low", I mean an exit pupil of 4 or 5 mm, corresponding to a magnification equal to five or six times the objective diameter in inches. By medium or medium-high, I mean an exit pupil of roughly 1 mm, giving magnification of about 25 times the objective diameter in inches.

Thus on my C-14, the two eye-

continued on page 4, see eyepieces

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**Vita**  
**Bob Madden**

A graduate Aeronautical Engineer and retired Group engineer from Lockheed after 34 years.

I was elected to the Board of Directors in September of 1991. I became the editor of The Ephemeris shortly thereafter, and until recently when I passed the baton to Lew Kurtz. I remain the publication manager, printing and mailing each issue. I am also a charter member of Group 70 making the 1.8 meter L.A.T. and also a past editor of the Group 70 newsletter, Reflections.

My reason to be on the Board of Directors is to maintain the purpose, direction and tradition of the SJAA. I personally feel each Board Member should meet as many members as possible and learn their desires and interests. I am a supporter of our President, Vice President, Secretary and Treasurer. I also am interested in the activities of School Star parties, and special interests such as CCD imagery and mirror making.

Please vote for me and let me know you did.

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**Vita**  
**Bob Brauer**

Those of you who have been to our meetings in the past year will recognize me as the guy standing in the front of the room. I've been your president for the last two years and I must say that it is wonderful to see other club members at meetings and star parties. Talking and observing with you is the real reward of the job.

As a member of the board of directors, I can assure you that we are actively seeking ways to bring more fun services to you. We already have a tradition of finding exciting, interesting speakers for the general meetings and we have a broad range of loaner equipment for you to use. I'm sure that we will find even more ways to enjoy our astronomical experiences and provide a public service in the next year. How about some refreshments at general meetings and star parties? Would you like to have a club meeting at a plan-

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**Vita**  
**Mark Wagner**

**GOALS:**

1. Expand the SJAA according to its purpose of education.
2. Foster older "cognizant" children and young adults' interest in astronomy.
3. Use TV & Internet to increase interest in astronomy and SJAA membership.
4. Will work to initiate a mentor program for newcomers to using telescopes.
5. Work for more effective / cohesive SJAA board of directors meetings.

**SJAA ACTIVITIES:**

1. Developed and coordinate the annual Mt. Lassen Dark Sky Star Party.
2. Built, donated and maintain the SJAA World Wide Web Internet site.
3. Regular attendee and participant at SJAA board of directors meetings.
4. Contribute articles regularly to the SJAA Ephemeris.
5. Team member on SJAA school star party committee.
6. Research alternate viewing sites for club members.
7. Regular participation at Hough Park public star parties.
8. Currently developing a new program to expand SJAA school star parties.

**RELATED NON-SJAA ACTIVITIES:**

1. Teach six week astronomy seminars for Los Gatos Union School District.
2. Publish AstroNet Astronomy Digest on Internet to large subscriber base.
3. Regular observer at Fremont Peak.
4. Volunteer running 30" telescope for Fremont Peak public observing program.
5. Member of FPOA, Halls Valley Astronomical Group and PAS.
6. Build, donate and maintain FPOA Internet web-page, developing one for PAS.
7. Amateur telescope maker (build my own).

etarium? Let me know if you like these ideas, or if you have any other suggestions. You can reach me by phone or by e-mail at

[Robert\\_N\\_Brauer@cup.portal.com](mailto:Robert_N_Brauer@cup.portal.com).

My personal astronomy interests are astrophotography and planetary observing.

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**Vita**  
**Dean Linebarger**

My primary interests are broadening public participation in the SJAA observing program and the school star parties. In particular, I want to see SJAA reach out to larger numbers of older children and young adults. I am also interested in establishing a club presence on public television, supporting the club's Web page, and participating in a mentor program for new SJAA members. Finally, I would like to start a new program to research and identify alternative observing sites in our part of North-

ern California and make information about those sites available to SJAA members.

I am a regular attendee of the SJAA Board of Directors meetings. I was secretary of the SJAA school star party committee and assisted in developing an SJAA Fact Sheet to use as a handout at school star parties. I am also a regular observer at Fremont Peak and club events with either my 20" Dob or 130mm APO refractor.

By profession I am a technical manager in computing and networking and I will bring to the SJAA Board of Directors extensive project and financial management experience. I know how to start a program or project and see it through to a successful outcome. I also know how to actively listen and incorporate ideas that I may not always agree with personally. It is management experience, consensus building skills, and commitment that I hope to bring to the SJAA Board of Directors.

**Vita**  
**Rich Neuschaefer**

**GOALS:**

- \* Improve our club's educational activities in the community.
- \* Expand the use of public service announcements on local television stations to promote our club's activities.
- \* Expand our Slide & Equipment nights to highlight the wide range of amateur astronomy activities enjoyed by our members.
- \* Make our public star parties even more interesting and educational.
- \* Expand our telescope loaner program.
- \* Make sure our club stays on sound financial footing.
- \* Increase the SJAA membership.

**SJAA ACTIVITIES:**

- \* Active SJAA board member.
- \* Instrumental in obtaining club insurance for the first time.
- \* Worked on the school star party committee to make them better organized, improve their educational content, and keep them fun.
- \* Have written a number of educational handouts that are given out at our public star parties.
- \* Have worked with Ch 54 KTEH to run PSAs about SJAA activities.
- \* Organized a second Slide & Equipment night in 1995.
- \* Working on, and promoting at least two S&E nights for 1996.
- \* Make and supply several hundred flyers per year to Orion Telescope Center promoting SJAA activities.
- \* I bring my telescope to almost all of our Hoge Park and Fremont Peak public star parties.

**OTHER:**

- \* Frequently observe at Fremont Peak in addition to the SJAA hosted Fremont Peak star parties.
- \* Take my turn running the 30" Challenger (FPOA) telescope on public viewing nights.
- \* Member of the FPOA and Halls Valley Astronomical Group.

Universe, continued from page 1

We have several good talks lined up for the next few months: CCD techniques (this month); slides of the October 1995 total solar eclipse over India (March); Craig Wadnke on Moon (April).

**SJAA's 1996 Swap Meet and Auction** will be on May 4th. If you have something you wish to put in the auction, send me a description (see bottom of column three on page 7). I will publish all reasonable descriptions in the April and May newsletters (maybe March too, haven't decided).



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**Mt. Lassen Star Party, 1996**  
by Mark Wagner

Announcing the 3rd Annual Mount Lassen Star Party, August 14 through 17. See a spectacular Milky Way steam from Lassen Peak volcano.

Lost Creek is our group campground (tent only, the only reservable site in the park, small additional fee). Other campsites are first come-first serve. Amenities available at all campgrounds (vary in quality).

Lost Creek is 5 minutes drive from Devastated Area, and 20 minutes from Bumpass Hell, which are the two observing areas. Devastated Area is at 6200 ft, Bumpass is over 8,000 feet. Both have very good horizons, bathrooms, but no drinking water. Attendees to last year's event have first right of refusal for Lost Creek campground and Devastated Area.

All campgrounds are within 20 minutes drive of our observing areas. Sun and Moon times are:

8/14 8/15 8/16 8/17

Moon Set: 20:04 20:36 21:08 21:40

Sunset: 19:58 19:57 19:55 19:54

Twilite ends: 21:33 21:31 21:30 21:28

We will allow 25 vehicles in the Devastated area parking lot. Additional star party attendees have access to Bumpass Hell, which can easily accommodate 30 to 50 vehicles.

Our Thursday feast will be held at the group campsite. All attendees will be contacted about bringing something to contribute to the meal.

Just north of Mt. Lassen is Hat Creek Radio Observatory, a possible day trip.

Our public night at Lassen will be Saturday this year. Last year we had an amazing turnout for this event.

Reservations for Lost Creek Campground close April 30, 1996 and are confirmed only upon receipt of payment. Last year's fees came to \$12 per person and can be used as a rough price for 1996. Children under 18 are no cost.

Solo amateurs or members of other clubs are welcome to participate, but reservations are required.

Contact Mark Wagner at (408) 356-1125 days, (408) 356-1072 eves, or by e-mail at mgw@resource-intl.com.

## Eyepieces, continued from page 1

pieces I use most often are 71x and 315x (exit pupils 5.0 and 1.1 mm). On my 8-inch Dobson, I most often use 51x and 254x (exit pupils 4.0 and 0.8 mm). On my 90 mm fluorite refractor, I use 40x and 116x (2.2 and 0.8 mm, and we'll see in a minute what happened to the 4 or 5 mm exit pupil for that one).

Why these magnifications? The low power has two purposes: First, no matter what I look at, I want a wide field of view to help find it and get it centered in the field of view, and low-power eyepieces have wider fields of view by nature. Second, for looking at diffuse objects of low intrinsic surface brightness, I want a low power to obtain as great an apparent surface brightness as possible -- at low power, the light is concentrated into a small area on my retina instead of a large one. As most of you know, too low a magnification results in not all of the light that leaves the eyepiece making it through the pupil of the eye, and as some of you may have experienced, depending on the darkness of your favorite observing sites, at too low a power the brightness of the background sky may become objectionable. I find that an exit pupil of 4 or 5 mm works for me, at my sites.

In good seeing, the medium or medium-high power begins to allow my eyes access to most of the detail in the telescope's image. Sometimes more power is useful, but not often. I have eyepieces that give 559x and 978x on the C-14, and they are rarely used -- the latter just once -- notwithstanding that one site I like occasionally has seeing for the C-14 with rock-steady diffraction rings, for hours at a time.

It is interesting that I also find little use for exit pupils interim between 4 mm and 1 mm (and we will get back to that refractor soon). I do have suitable eyepieces, but my experience seems to be that the loss in apparent image brightness in going to a somewhat higher magnification of extended objects, is not compensated for adequately by the increase in visible detail. Furthermore, if I am looking for detail in a bright object, why not use a high enough magnification to let me see it well? Thus my

eyepieces for 122x and 196x on the C-14 are also rarely used.

Now consider eyepiece types. In broad terms, what makes an eyepiece designer sweat blood is any of the following: (1) Eyepiece to be constructed with a short focal length (say, much below 12 mm); (2) Eyepiece to have a wide apparent field of view (say, much above 45 or 50 degrees); (3) Eyepiece to be used with a fast objective (say, f number much below eight). These conditions are even more difficult when they occur in combination; thus, the fact that a 4.8mm Nagler can deliver reasonable images over an 82-degree apparent field of view with an f/6 Dobson or an f/5 or f/6 fast refractor, is astonishing and well worthy of applause.

However, what eyepiece types are suited to my purposes? At f/10 or f/11 (the C-14), a 5mm exit pupil will require a 50 or 55 mm eyepiece focal length, and the field of view will be restricted to about 50 mm linear diameter by the inside of the eyepiece's two-inch barrel -- that's only about a 50 degree apparent field of view, at 55 mm focal length. So, we have need of a long-focal-length eyepiece, to be used at a slow f number, with a field of view that is not too wide, and there is no need for a whizzy design. My 55 mm eyepiece is a Plossl; I also have a 60 mm Kellner that works about as well. (The unavoidable disadvantage of the Kellner design is that bits of dust on the front lens are in focus when you look through it, and are very distracting.)

For my f/5.1 Dobson, my low-power eyepiece has 20 mm focal length. It's an Erfle, with a 68-degree apparent field of view, a moderately sophisticated design well capable of delivering reasonable images at this fast f number and wide field (at least, the off-axis eyepiece aberrations seem no greater than those of the paraboloid itself). I have thought about getting a 20 mm Nagler instead: The Dobson has a two-inch focuser and a diagonal mirror large enough to illuminate the Nagler's field of view. But the big Naglers cost three to five times as much as the Erfles and their cousins -- a matter of an extra two hundred dollars or more -- and I am not sure that the extra twenty-one percent of field width is worth

it. Even if it were, another matter would be vexing. My Dobson is lightly built, with bearing geometry carefully optimized for low-effort tracking, so that I can operate it at high magnification. A 20 mm Nagler weighs so much that it makes the tube rotate forward. (Yes, I tried one.) I would have to add a counterweight whenever I switched to the Nagler from a smaller eyepiece, and that's too much trouble.

My 90 mm refractor only has a 1.25-inch focuser, so the 36 or 45 mm eyepiece that would give a 4 or 5 mm exit pupil would have its apparent field of view greatly constrained by the focuser itself, and would provide no advantage of wide field for finding things. I do have a 40 mm eyepiece I use occasionally with this telescope for looking at extended objects -- it's a Kellner, and works fine at this narrow field, long focal length, and reasonable f number (f/9). However, I use the 90 mm refractor mostly as a star-party telescope, for what I might call general viewing, rarely for demanding observations of extended objects. My 20 mm Erfle provides a reasonable "gee, whiz" look for newcomers and gives an entirely adequate 1.7-degree field of view to help find things. If the refractor had a two-inch focuser I would want a 40 mm wide-field eyepiece for low power work.

So: Notwithstanding that my favorite kind of observing is looking at extended faint fuzzies, and despite the manifest virtues of 80-degree-plus field of view eyepieces for low-power observations, I have had no cause to want any such eyepieces. But what about higher magnifications?

The point here is that when I add magnification, I am rarely interested in looking at more than a small fraction of the field of view. Even at a thousand diameters magnification (well, 978 on the C-14), a planet or a demanding double star does not nearly fill the field of view (and if the double star were wide and undemanding I wouldn't be using a high magnification anyway). High magnifications generally require short focal length eyepieces, which do indeed require some effort from the eyepiece de-

continued on page 5, see eyepieces 

## Eyepieces, continued from page 4

signer, but I do not require wide fields of view. Even for centering the object, I don't need them; I can center something in a low-power eyepiece well enough to swap in one that gives a 1 mm field of view with no problem. There is no reason to bother with wide fields of view at exit pupils of about 1 mm and smaller.

Thus my medium and high-power eyepieces are generally no fancier than Orthoscopics, typically with 45 degree apparent field of view, and they work fine even down to f/5. On the C-14, I use a 12.4 mm Erfle for 315x, just because I happen to have one. On the Dobson, my 4 mm Orthoscopic gives me 254x, and on the 90 mm refractor, a 7 mm Orthoscopic gives 116x. I have occasionally played with a 12 mm Ramsden eyepiece as a medium-high power eyepiece on the likes of Schmidt-Cassegrains and long-focus refractors; a Ramsden is a centuries-old design with about a 35 degree apparent field of view, containing only two pieces of glass, both simple plano-convex lenses. Mine cost ten dollars in about 1980. And it works superbly. The images on and near axis are indistinguishable from those in the other 12 mm eyepieces I have compared it to, including Kellner, Orthoscopic, Erfle, Plossl and Nagler, and the narrow field of view is irrelevant.

If anyone is curious, my eyepiece box contains the following items that I actually use regularly (plus lots that merely gather dust): In two-inch barrels -- 55 mm Plossl and 32 mm Erfle. In 1.25-inch barrels -- 40 mm Kellner, 20 mm and 12.4 mm Erfles, 7 and 4 mm Orthoscopics. If I had to throw them all away and start anew I would very likely end up with a nearly identical set, possibly replacing the Kellner with a newer design of comparable simplicity, and possibly substituting some more recent reoptimizations of Erfle-class designs for the Erfles themselves. I might not bother with a wide-field design at 12 mm, though -- an Orthoscopic would be fine.

And my personal recommendations for filling your own eyepiece box would be generally the same. If you have an f/10 instrument which can use

two-inch-diameter eyepieces without the instrument's mechanical parts artificially restricting their field of view you might start with approximately a 50 mm Plossl, Erfle, or other design with a front lens that fills the barrel, and a 9 mm or 10 mm Orthoscopic or Plossl. If your f/10 instrument cannot use two-inch diameter eyepieces effectively, then you should whine a lot, and you might want a low-power eyepiece of perhaps 30 to 35 mm focal length, again of a design whose front lens also fills the barrel. For a Dobson or a refractor at f/5, I'd start with a 20 mm low-power eyepiece, again with a wide field but considering the Nagler and its cousins as excessive, and a 4 or 5 mm Orthoscopic for medium-high power. Where you go from then depends on you, and by all means go to a star party and try things out before you buy.

### Excerpts from Galileo Amazing Facts

from the Galileo home page  
<http://www.jpl.nasa.gov/galileo/>  
provided by Ron Baalke

Galileo passed about 100 km closer to Io than planned. This meant that the gravity assist from Io slowed Galileo's speed more than was planned, putting the spacecraft into a shorter orbit around Jupiter than expected. Rather than use up over 10 kilograms of propellant to "fix" this, Galileo's navigators realized that they could just let the spacecraft continue on its way...where it would arrive at its first encounter with the moon Ganymede a week early! Amazingly, going slower means we're getting where we're going sooner! (The Ganymede flyby was originally scheduled to occur on July 4, 1996. Since it takes a little over one week for Ganymede to go around its orbit, it would be in about the same location one week earlier on June 27. Since Galileo's orbit was one week shorter than originally planned, the first satellite encounter could simply be moved earlier by one week).

Galileo's cameras will capture pictures that can detect objects as small as 12 meters (39 feet). That's an improvement on Galileo Galilei's original telescopic observations by a factor of 1,000,000.

## A New Spacecraft Comes to Life

Public Information Office  
Jet Propulsion Laboratory  
California Institute of Technology  
NASA Pasadena, Calif. 91109.  
Telephone (818) 354-5011  
Contact: Mary Beth Murrill  
December 18, 1995

In the midst of the excitement surrounding the arrival of the Galileo spacecraft at Jupiter, technicians and engineers presided over the birth of a new spacecraft, in a white-walled clean room at NASA's Jet Propulsion Laboratory, Pasadena, CA.

The Cassini spacecraft was successfully "powered on" for the first time last week as its cousin spacecraft Galileo began its historic mission at Jupiter. Cassini is scheduled for launch from Cape Canaveral, FL, on October 6, 1997 and will reach Saturn in July 2004.

"This is the first time the major elements of the spacecraft have been electrically linked together, and it all worked," said Richard J. Spehalski, Cassini program manager at JPL.

Support equipment supplied the 30 volts of electricity on which the spacecraft and its science instruments will operate. No problems were found as the power flowed through the seven miles of cabling that will link Cassini's computers, science instruments and mechanical and propulsion systems.

Cassini, a joint mission of NASA, the European Space Agency (ESA) and the Italian Space Agency (ASI), is similar in concept to the Galileo mission. Cassini will send a parachuted probe, called Huygens, into the atmosphere and to the surface of Saturn's large moon Titan. The main Cassini spacecraft will orbit Saturn to provide four years of close-up data on the moons, rings, planet and Saturn's magnetic environment. Huygens is provided by ESA, and Cassini's sophisticated radio antenna is provided by ASI. The Cassini program is managed by JPL.

Assembly and testing of the spacecraft will continue at JPL through mid-1997 when the spacecraft will be shipped to Cape Canaveral, FL, for launch preparations.

**COMET COMMENTS**  
by Don Machholz

A new comet was discovered on Christmas Day, it is in our morning sky and should reach eighth magnitude next month. Also in our morning sky is Periodic Comet Honda-Mrkos-Pajdusakova, it will approach to within 16 million miles of us in early February. Meanwhile, Periodic Comet Schwassmann-Wachmann 3 fades in our evening sky; one indication (observatory photograph) shows it has split into four parts, and that this is the cause for its recent outburst in brightness. Positions for Comet Hale-Bopp are not included this month, it is still behind the sun. Next month it will enter our morning sky.

Comet activity increased during the second half of 1995. The year produced three visual discoveries by amateur astronomers while only two new comets were found by professional astronomers. The decrease in professional discoveries is due in part to the discontinuation of the earth-crossing search programs. This is still a great time for amateurs to search for new comets. This last year we also saw the return of old friends: Periodic Comets Borrelly and d'Arrest, and Periodic Comet de Vico- a *real* old friend!

C/1995 Y1 (Hyakutake): This new comet was discovered by Yuji Hyakutake of Japan on Dec 25 in the morning sky at magnitude 10.5. He was using 25x150 binoculars. It will be in our sky through May.

**EPHEMERIDES**

**73P/Schwassman-Wachmann 3**

| DATE<br>00 UT<br>2000 | R.A.<br>23h40.1m | Dec<br>-10°11' | EL<br>45° | Sky Mag<br>11.2 | DATE<br>00 UT<br>2000 | R.A.<br>17h51.7m | Dec<br>-09°36' | EL<br>42° | Sky Mag<br>8.5 |
|-----------------------|------------------|----------------|-----------|-----------------|-----------------------|------------------|----------------|-----------|----------------|
| 01-28                 | 23h40.1m         | -10°11'        | 45°       | E 11.2          | 01-28                 | 17h51.7m         | -09°36'        | 42°       | M 8.5          |
| 02-02                 | 23h51.1m         | -08°47'        | 43°       | E 11.6          | 02-02                 | 16h44.1m         | -03°50'        | 64°       | M 8.9          |
| 02-07                 | 00h01.6m         | -07°25'        | 40°       | E 12.1          | 02-07                 | 15h32.1m         | +02°46'        | 88°       | M 9.6          |
| 02-12                 | 00h12.5m         | -06°01'        | 38°       | E 12.4          | 02-12                 | 14h25.7m         | +08°35'        | 110°      | M 10.5         |
| 02-17                 | 00h22.3m         | -04°45'        | 36°       | E 12.6          | 02-17                 | 13h31.0m         | +12°42'        | 128°      | M 11.3         |
| 02-22                 | 00h31.9m         | -03°31'        | 34°       | E 12.7          | 02-22                 | 12h48.7m         | +15°16'        | 143°      | M 12.2         |
| 02-27                 | 00h41.3m         | -02°20'        | 31°       | E 12.9          | 02-27                 | 12h16.6m         | +16°44'        | 155°      | M 13.1         |
| 03-03                 | 00h50.4m         | -01°12'        | 29°       | E 13.0          | 03-03                 | 11h52.5m         | +17°31'        | 163°      | M 13.5         |
| 03-08                 | 00h59.3m         | -00°05'        | 26°       | E 13.2          | 03-08                 | 11h34.4m         | +17°51'        | 166°      | M 14.7         |

**45P/Honda-Mrkos-Pajdusakova**

| DATE<br>00 UT<br>2000 | R.A.<br>17h51.7m | Dec<br>-09°36' | EL<br>42° | Sky Mag<br>8.5 | DATE<br>00 UT<br>2000 | R.A.<br>16h44.1m | Dec<br>-03°50' | EL<br>64° | Sky Mag<br>8.9 |
|-----------------------|------------------|----------------|-----------|----------------|-----------------------|------------------|----------------|-----------|----------------|
| 01-28                 | 17h51.7m         | -09°36'        | 42°       | M 8.5          | 02-02                 | 16h44.1m         | -03°50'        | 64°       | M 8.9          |
| 02-02                 | 16h44.1m         | -03°50'        | 64°       | M 8.9          | 02-07                 | 15h32.1m         | +02°46'        | 88°       | M 9.6          |
| 02-07                 | 15h32.1m         | +02°46'        | 88°       | M 9.6          | 02-12                 | 14h25.7m         | +08°35'        | 110°      | M 10.5         |
| 02-12                 | 14h25.7m         | +08°35'        | 110°      | M 10.5         | 02-17                 | 13h31.0m         | +12°42'        | 128°      | M 11.3         |
| 02-17                 | 13h31.0m         | +12°42'        | 128°      | M 11.3         | 02-22                 | 12h48.7m         | +15°16'        | 143°      | M 12.2         |
| 02-22                 | 12h48.7m         | +15°16'        | 143°      | M 12.2         | 02-27                 | 12h16.6m         | +16°44'        | 155°      | M 13.1         |
| 02-27                 | 12h16.6m         | +16°44'        | 155°      | M 13.1         | 03-03                 | 11h52.5m         | +17°31'        | 163°      | M 13.5         |
| 03-03                 | 11h52.5m         | +17°31'        | 163°      | M 13.5         | 03-08                 | 11h34.4m         | +17°51'        | 166°      | M 14.7         |
| 03-08                 | 11h34.4m         | +17°51'        | 166°      | M 14.7         |                       |                  |                |           |                |

**1995 Y1 (Hyakutake)**

**1995 Y1 (Hyakutake)**

| DATE<br>00 UT<br>2000 | R.A.<br>16h45.3m | Dec<br>-12°19' | EL<br>56° | Sky Mag<br>M 8.7 | DATE<br>00 UT<br>2000 | R.A.<br>18h52.0m | Dec<br>+06°03' | EL<br>55° | Sky Mag<br>M 8.2 |
|-----------------------|------------------|----------------|-----------|------------------|-----------------------|------------------|----------------|-----------|------------------|
| 01-28                 | 16h45.3m         | -12°19'        | 56°       | M 8.7            | 02-22                 | 18h52.0m         | +06°03'        | 55°       | M 8.2            |
| 02-02                 | 17h10.2m         | -09°02'        | 57°       | M 8.5            | 02-27                 | 19h16.8m         | +09°43'        | 54°       | M 8.3            |
| 02-07                 | 17h35.6m         | -05°27'        | 57°       | M 8.4            | 03-03                 | 19h40.8m         | +13°09'        | 53°       | M 8.4            |
| 02-12                 | 18h01.7m         | -01°40'        | 56°       | M 8.3            | 03-08                 | 20h03.9m         | +16°16'        | 52°       | M 8.5            |
| 02-17                 | 18h26.7m         | +02°13'        | 55°       | M 8.2            | 03-13                 | 20h26.0m         | +19°04'        | 52°       | M 8.6            |

**ORBITAL ELEMENTS**

| Object              | Schwassmann-Wachmann 3 | Honda-Mrkos-Pajdusakova | Hyakutake    |
|---------------------|------------------------|-------------------------|--------------|
| Peri. Date          | 1995 09 22.76          | 1995 12.25.93           | 196 02 24.33 |
| Peri. Dist.(AU)     | 0.9328                 | 0.5319                  | 1.0536       |
| Arg/Peri.(2000)     | 198.776°               | 326.061°                | 046.440°     |
| Asc. Node(2000)     | 069.947°               | 089.167°                | 195.749°     |
| Inclination (2000)  | 011.423°               | 004.250°                | 054.495°     |
| Eccentricity        | 0.694799               | 0.824302                | 1.0          |
| Orbital Period(yrs) | 5.34                   | 5.27                    | Long Period  |
| Source              | IAU Catalog            | MPC 20124               | MPC 26374    |

**Celestial Calendar - Feb 1996**

by Richard Stanton

| Lunar Phase | time     | date | rise  | trans | set   |
|-------------|----------|------|-------|-------|-------|
| FM          | 07:58pst | 04   | 17:06 | 00:01 | 06:51 |
| LQ          | 00:38pst | 12   | 00:56 | 06:18 | 11:36 |
| NM          | 15:32pst | 18   | 06:26 | 12:08 | 17:57 |
| FQ          | 21:51pst | 25   | 11:38 | 18:49 | 02:02 |

| Mercury | Dist: | 1.06AU | Mag:  | -1.4           |
|---------|-------|--------|-------|----------------|
| date    | rise  | trans  | set   | RA Dec         |
| 07      | 05:38 | 10:36  | 15:33 | 19:36.3 -20:16 |
| 17      | 05:42 | 10:41  | 15:41 | 20:20.1 -19:55 |
| 27      | 05:50 | 10:58  | 16:06 | 21:15.8 -17:31 |

| Venus | Dist: | 1.03AU | Mag:  | -4.8           |
|-------|-------|--------|-------|----------------|
| 07    | 08:54 | 14.54  | 10:54 | 23:53.5 -01:25 |
| 17    | 08:41 | 14:56  | 21:12 | 00:35.8 +03:49 |
| 27    | 08:28 | 14:59  | 21:31 | 01:17.7 +08:55 |

| Mars | Dist: | 2.36AU | Mag:  | +1.1           |
|------|-------|--------|-------|----------------|
| 07   | 07:28 | 12:45  | 18:02 | 21:45.2 -14:40 |
| 17   | 07:10 | 12:36  | 18:02 | 22:15.6 -11:55 |
| 27   | 06:51 | 12:26  | 18:02 | 22:45.5 -08:58 |

| Jupiter | Dist: | 5.85AU | Mag:  | -2.0           |
|---------|-------|--------|-------|----------------|
| 07      | 04:45 | 09:32  | 14:19 | 18:33.1 -23:01 |
| 17      | 04:13 | 09:01  | 13:48 | 18:41.5 -22:55 |
| 27      | 03:41 | 08:29  | 13:17 | 18:49.3 -22:47 |

| Saturn | Dist: | 10.4AU | Mag:  | +1.1           |
|--------|-------|--------|-------|----------------|
| 07     | 08:47 | 14:35  | 20:22 | 23:36.9 -04:43 |
| 17     | 08:10 | 13:59  | 19:48 | 23:41.0 -04:16 |
| 27     | 07:34 | 13:24  | 19:15 | 23:45.4 -03:47 |

| SOL Star Type G2V Intelligent Life in System ? | Begin | End            |
|--|-------|----------------|
| 07 07:05 12:21                                 | 17:38 | 19:06          |
| 17 06:56 12:22                                 | 17:48 | 22:0.7 -12:10  |
| 27 06:43 12:21                                 | 17:59 | 20:38.9 -08:33 |

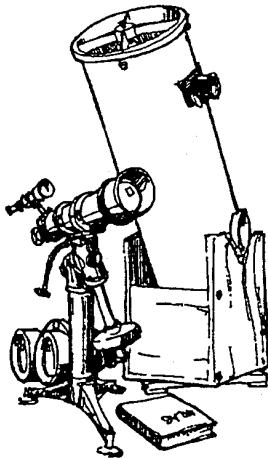
| Sidreal Time   | Transit Right | 00:00 | = | 08:59 |
|----------------|---------------|-------|---|-------|
| Ascension at   | 17            | 00:00 | = | 09:38 |
| Local Midnight | 27            | 00:00 | = | 10:18 |

| Darkest Saturday | Night: | 17-Feb-1996 |
|------------------|--------|-------------|
| Sunset           |        | 17:38       |
| Twilight End     |        | 19:06       |
| Moon Set         |        | 16:46       |
| Dawn Begin       |        | 05:29       |

Home, Home on the Web...Where the Spiders & the Mice are at play...

<http://got.net/~lionhert/homeport.htm>

## ASTRO ADS



### Telescope Loaner Status by Paul Barton

| No. | Name              | Borrower             | Due Date  |
|-----|-------------------|----------------------|-----------|
| 1   | 4.5" Newt/P Mount |                      | available |
| 2   | 6" Dobson         | John Paul Da Silvia* | over due  |
| 3   | 4" Quantum        | Bob Madden           | -----     |
| 6   | C-8 Celestron     | Steve Wincor         | 2/9/96    |
| 7   | 12.5" Dobson      |                      | available |
| 8   | 14" Dobson        |                      | available |
| 9   | C-11 Celestron    | Paul Barton          | -----     |
| 15  | 8" Dobson         | Bob Elsberry         | 2/9/96    |
| 16  | solar scope       | Bob Madden           | -----     |
| 18  | 8" Newt/P Mount   | Jerry Lovelace       | 1/6/96    |
| 19  | 6" Newt/P Mount   |                      | available |
| 21  | 10" Dobson        | Timothy Sandstrom    | 1/15/96   |
| 23  | 6" Newt/P mount   | Bob Ashford          | 2/6/96    |

Bob Ashford wants an 8" Dob when available.

There are several small refractors and two 13.1" Dobs available - call (408-377-0148). There are so many telescopes available that storage space has become a problem and some have to be stored at other member's places.

### 1996 Budget

Here is the condensed budget:

#### Income:

|                 |        |                          |        |
|-----------------|--------|--------------------------|--------|
| Membership dues | \$3195 | Ephemeris                | 1540   |
| auction         | 300    | Miscellaneous            | 355    |
| books           | 220    | Insurance                | 327    |
| total income    | \$3715 | Astronomical League Dues | 420    |
|                 |        | total expenses           | \$3878 |

#### Expenses:

|                      |       |         |       |
|----------------------|-------|---------|-------|
| Speakers             | \$250 | deficit | \$163 |
| Houge Park           | 100   |         |       |
| Phone                | 216   |         |       |
| Loaner Scope Program | 450   |         |       |
| Books                | 220   |         |       |

For the 1995 fiscal year we had a projected surplus of \$28 and an actual surplus of \$467.

**Odyssey 10.1 inch with Telrad, Tele-View 1.8x Barlow, T-V Plossl 32mm ocular, Lumilite K-2AA, and Tiron Sky Atlas.** Hardly used. \$450.

Contact Robert Szabo:  
(408)353-4352 (home, fax);  
(408) 924-4682 (work);  
(408) 697-6281 (page).

**Wanted:** Left over cabinet grade plywood for use in homemade dobsonian. What I don't use will be donated to the Chabot Telescope Maker's workshop. Call Doug (415)961-2826 email dferrell@adoc.xerox.com

**ASTRO ADS** are free to all noncommercial advertisers wishing to sell astronomically related products or services. Please send your ad directly to the Editor, (my address is in the header on the last page).

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| Jay Freeman     |              |

### Editor

Lew Kurtz 739-7106

Members are encouraged to submit articles for publication in The Ephemeris. Articles received by the 10th will be put in the following month's newsletter. Send articles to me, Lew Kurtz, (e-mail to lewkurtz@aol.com, a text file on a 3-1/2" IBM or MAC diskette, or written on old fashioned paper). My home address is 1336 Bobolink Circle, Sunnyvale, California, 94087. Please include your name and phone number.

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