SJAA EPHEMERIS

VOLUME 4 NUMBER 5 OFFICIAL PUBLICATION OF THE SAN JOSE ASTRONOMICAL ASSOCIATION MAY 1993

The Eye Piece
by Bob Madden

First I wish to say I am sorry I made so many mistakes last month. Did you catch them? I don't care how much the wife and I proof read and spell check there will be mistakes. I also had several mistakes in the Celestial Calendar. I hope they weren't too costly for you.

Did the months of February and March hold too much bad weather for observing? What do you do about astronomy during the winter months when the weather is inclement? This sounds as though it would make a nice article to write about. I know I hibernate and focus on other projects. Of course I always have the Ephemeris to publish. Making sure we have interesting articles to publish can keep one hopping. I always try to get the newsletter from the printer by the 15th of each month. Folding, labeling and zip sorting will take a day and then the next day it is off to the Post Office for mailing. You know, the general meeting, Observational Astronomy class, Houge Park and one other weekend of observing doesn't leave much time for other priorities.

As promised we have Bill Dellinges' article. We are loosing Bill as a member. He is moving to Phoenix, Az.

I received a call tonight (4/18/93) from Chuck Olsen with some feedback on the Ephemeris. It was some very constructive criticism. I have failed to state where the general meetings are and where Hogue park and Grant Ranch county park are located. We have published maps and directions to most of these locations in past Ephemeris issues. I will include in the monthly calendar that the general meeting is held at the Milpitas Library. Now! We have also published an introduction to the SJAA booklet for new members. This booklet has directions to our observing sites and the Milpitas Library. The booklet is mainly for new members, but to obtain your copy, call or write Jack Petersen and ask him for one. He will be happy to see you get a copy. For those of you who may not understand why we don't include the directions or maps in each issue, I may state that we try to keep each issue to eight pages. This is to keep the publication costs within reason. For information, the costs were running near $180 each month. The Association couldn't keep that up so I have found a printer that has reduced that significantly.

Don't let all this intimidate you as I need feedback. I feel Chuck's call was constructive. With out the call I wouldn't have known something needed improvement. To an editor, knowing how the reader is responding is important. I am embarrassed with all the mistakes which are made, therefore anyone who wishes to proof read just call. It would be convenient if you lived near Camden and Branham Avenues. Paul Barton does, but he already has enough to do for us careing for the loaner telescopes for us.

Does anyone who has a Macintosh wish to be a backup editor for the ***Ephemeris***? Call me and we can talk about it - (408) 264-4488.

May 1: SJAA Auction and Swap. Held at Houge Park - Swap 1:00 pm to 5:00 pm. Auction 6:00 until we're done (10:00 pm ?)

Due to the auction there is no general meeting this month

May8: Night off - too much Moon.
May 15: Star Party at Henry Coe Park. Sset 8:08, 26% moon up 3:01am. Also Public Star Party at Grant Ranch County Park.
May 22: Star Party at Fremont Peak. Sset 8:12 pm, 3% moon sets 8:36 pm.
May 28: Public star party at Houge Park. Sset 8:20 pm, 55% moon sets 1:41 am.
May 29: Fifth session of Astronomy Class, 8 pm at the Milpitas Library.
June 5: General Meeting 8:00 pm at the Milpitas Library. Board of Directors Meeting 6:15 pm. Edna Devore will discuss the FOSTER Program - teachers flying in the Kuiper Airborne Observatory.
June 12: No Activity
June 19: Star Party at Henry Coe SP or Grant Ranch. Moon 2%, Mset 20:24, Sset 20:32.
June 21: Summer begins at 2:01a
June 25: Star Party at Houge Park on Twilight Ave. 42% Moon, Mset never, Sset 20:33
June 26: Fifth session of Astronomy Class, 8 pm at the Milpitas Library.
July 3: No activity
July 10: General Meeting 8:00 pm at the Milpitas Library. Board of Directors Meeting 6:15 pm. Speaker to be announced.

THE STARGAZER'S NOTEBOOK

by Bill Dellinges

One of my favorite pastimes is loading a telescope into my van and heading out to a dark sky site for an evening of stargazing. On a few occasions however, I've discovered to my dismay that I've forgotten to bring a critical piece of equipment. This could be something minor like coffee, a step ladder, or a star chart. Or, it might be a fatal oversight: your optical tube assembly, mount, or maybe your eyepiece case.

Years ago, I decided that to prevent such problems, I'd make a checklist of everything I felt was required for a successful night of gazing. Its worked beautifully, and I strongly recommend this idea to association members who may not currently use one. Here is my list (based on using a C-8):

Tube assembly, tripod, wedge, inverter (DC to AC), catalog case (containing star charts and books), stool (for sitting comfortably at the scope), dew cap, lawn chair (for relaxing views of the night sky), binoculars and tripod, red flashlight, sleeping bag, parka, gloves, coffee, snacks, warm boots, hat, thermal underwear, eyepiece case (see, I almost forgot!), tool kit (allen wrenches, screwdrivers, screws, bolts, batteries, cords,etc.).

In addition, should I expect to meet the public, I also bring a step ladder for the kids and a briefcase loaded with teaching aids and reference sheets to hand out. As you can see by looking at the list, if I were to forget any one of those items, my night of observation would suffer to some degree, the severity of which would depend on what item was left home.

By the way, there is another list that may be desirable too. Have you ever found yourself wondering what to look at first after setting up your telescope? It's a big sky and it moves faster than you might think. I've found it very helpful to do a little homework and prepare a list of objects to view or things to do. It gives you a mission, a plan of attack, thereby saving time too. Consider starting in the west, as those objects will set first; for example:

1. Practice polar alignment.
2. Try various filters on Mars.
3. Ditto on Jupiter.
4. Attack the Virgo galaxies (good luck!).
5. Try for 3C 273 in Virgo, nearest and brightest quasar at 2 billion light years distance (finder chart in S/T March '88, p.294).
6. Trace constellation of Hydra.
7. Split Castor, Porrima, and Izar . . . and so forth

you get the idea.

I hope these suggestions prove to be helpful and add to the pleasure of your nightly observations.

Tip of the month: According to Terence Dickinson in ***The Backyard Astronomer's Guide***, a wonderful book by the way, a barlow lense placed ahead of a star diagonal adds about 50% more magnification to your optical system than its normally rated factor. That is, a 2X barlow would become a 3X barlow. It's still a 2X barlow when used behind your diagonal. Did you know that? (I checked it out, and it seems to be true!)

LOANER TELESCOPES

by Paul Barton

We now have 12 telescopes for loan to members. These came from various sources, mostly donated or loaned, but commonly with inadequate or no eyepieces, including finders. We need eyepieces with focal lengths of 20 - 30 mm or so, 1-1/4 or .96 inch diameter.

Donations of eyepieces or cash will be very welcome. It is planned to try to buy eyepieces at the May 1 auction, also plan to look into cosmetically defective eyepieces. We will contact Orion for help in this area. Exotic eyepieces are not required. Kelner's, et al, will do very nicely.

Richard Raw has started the ball rolling with a $10 donation and we will need perhaps $200. Please help if you can.

CORRECTION

We have incorrectly called the KAO, the Kuiper Solar Observatory. It is the Kuiper Airborne Observatory

The following letter is in response to Mr Chung-Lin's comments presented in the April Ephemeris. . . . . .Editor

Dear Mr. Madden,

I was pleased to read in the April issue of Ephemeris the letter by Mr. Chung-Lin regarding my talk on SETI to the Association in March, Naturally, I am glad to know that Mr. Chung-Lin found the talk interesting, but I'm afraid that I may have been less than clear in my comments regarding the suitability of radio vs light waves for sending messages across interstellar space.

As Mr. Chung-Lin rightly points out, the received flux of radio waves would be attenuated simply by the geometric effect of distance — the well-known inverse square law. Of course, this applies to any frequency: a laser broadcaster, although possibly starting with a narrow beam, will also find his signal reduced by this effect. My comments on attenuation were intended to point out that light, especially in the visible region of the spectrum, is subject to further interference because of the scattering by interstellar dust. Mr. Chung-Lin is undoubtedly aware of deep sky photos in the directions of dark clouds in which the latter can be seen to completely block the starlight from behind them. Microwaves are not so affected. He may also recall that mapping the Milky Way was not possible using visible light because we can see only about 10% of the way towards the galactic center due to this optical obscuration. The first global maps of the Galaxy were made in the 50's and 60's when microwaves could be employed to this end.

Regarding signal strengths, it may interest Mr. Chung-Lin to know that the NASA SETI experiment, when using the Arecibo antenna, will be sensitive to 1 Hz-wide signals having a flux of less than a millionth millionth microwatt.

Once again, I greatly enjoyed meeting with your group, and I look forward to being able to speak to you again.

Sincerely,
Seth Shostak

Observing
by Paul Barton

Beginning observers (star gazers) are often seen at a star party with a telescope that they do not know how to operate, a stock of good intentions, and little more. More experienced star gazers will always help the novice at setting up and operating the telescope.

But first you must be warm and comfortable. Even a warm summer night gets chilly at 3,000 feet, after midnight, when you are not active. You can not enjoy star gazing if you are uncomfortable. Wear warm clothes and pay particular attention to head and neck covering. Warm gloves and heavy socks are helpful. A light nylon golfer's wet suit over your regular clothes is great for moderate nights. A skier's suit or a snowmobile suit is great for really cold nights.

You must have star charts (maps) with proper detail. [Have a preplan developed for observing that night]. An experienced observer can find many objects without charts, but they require charts to find new objects or to refresh their memory on familiar objects. The star chart must have the proper detail for the job at hand. The monthly chart in Sky and Telescope is not in enough detail to actually find objects. This chart merely shows what part of the sky is visible that month.

The celestial sphere has 360° or 24 hours of sky (15 degrees per hour) east to west (Right Ascension). Approximately 90° or 6 hours of sky is readily visible at a given time. A star chart that covers roughly 6 hours (90°) RA, the visible sky, is fine for general observing. Orion Telescope Center's four seasons sky charts has this amount of definition of detail. Too much detail (to expanded) becomes more difficult to use — too many pages (maps) to follow thru — but is essential for locating small dim objects.

Uanometria 2000 covers the entire celestial sphere in 2 large heavy volumes, plus a third for index. There are approximately 500 charts and typically cover about 10° per page. This is great for serious advanced work but not very useable for a novice.

Then there are many fine publications in between these two. Sky and Telescope publishing, P.O. Box 9111, Belmont, MA 02178-9111 publishes many fine charts and books. Edmund Scientific's ***Mag 5 Star Atlas*** is excellent for a beginer. They also have many how-to publications. Willman Bell, P.O. Box 3125, Richmond, VA 23235 is another fine source of publications. These three sources are all excellent well established and reputable businesses, eager to supply your needs. [also try the library]

The amateur astronomer must have charts, the proper charts, and must be intimately familiar with the one he uses. Look around at a star party and see what others are using.

Of course, when you use charts you must have a light. One of the best is the full size (not miniature) GI flashlight. It has a right angle head, has various colored inter-changeable lenses, spare bulbs, uses "D" cell batteries, and is available at Cambrian Surplus store and others for about $10. Many of the miniature flashlights have very short battery life — like 1/2 hour. By and large I've not found rechargable flashlight batteries to be cost effective. A discussion of "why" is beyond the Ken of these pages. You will have to find out for your self!

STAR PARTIES
by Paul Barton

Saturday March 20 at Fremont Peak: There was some high thin "stuff" up there, so seeing was only fair, but after a long winter of poor seeing, this was pretty good. The temperature was a pleasant 50's most of the night while dropping to 44° at dawn. Some dew was noticed. A troop of girl scouts was camped at the east end of telescope row. Sounded like 100 girls, but may only have been 25

Due to flashlights, lanterns, camp fires, auto, motorcycles, etc, the star gazing didn't get under way till nearly midnight. (So what's new?)

As a measure of the visibility, Corvus, the Crow - mag 4, was just visible, but Crater, the Cup - mag 5, was nearly invisible. Hydra's head - mag 4 - was barely visible. We were able to pick out all the "easy" objects, like the Whirlpool (M51), the Owl (M97) - mag 12. M81 and M82, Ursa Major, stood out strongly at mag 8. We had loads of fun viewing the various objects in each other's telescopes.

There were about a dozen telescopes on Telescope Row. There were many more behind Ranger Rick Morales' house by the 30" Challenger having a Messier Marathon. It was a fine outing.

Let me remind you to pay the usual State Park fee. Rick Morales has been our good friend and supporter. He needs our support in these days of cost cutting. The Park fee is small compared to the total cost of an outing.

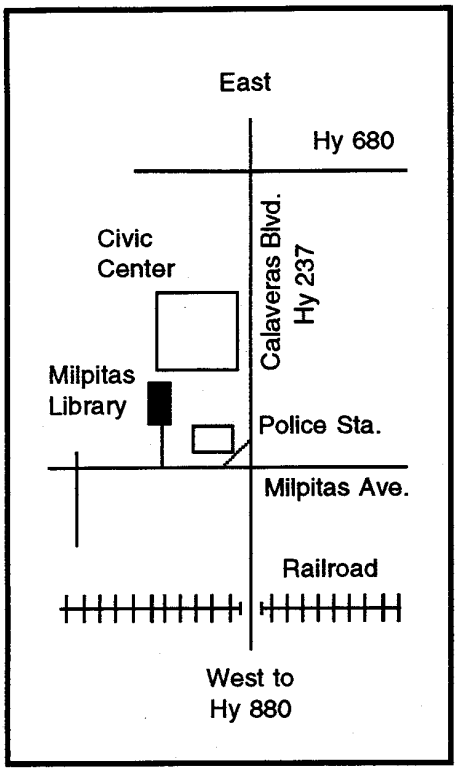
Present, in part, were:

Paul Barton	JMI-18
Jim Bartolini	Coulter 10"
Terry Skinner	10" Meade
Delories Skinner	
John Kuklewicz	Big Light Bucket
Ken Ward	
Virgina Ward	
Lew Kurtz	10" Meade
Bob Brauer	4" Refractor
David Guernsey	30"
Bill McClure	2-1/2" Tasco
Lana McClure	
Chung-Lin Lee	4-1/2" Newt
Albert Chen	8" Newt
Mark Chen	
Shou-Ho Chen	

AAVAO AND AAS HOLD CONSECUTIVE MEETINGS!

In June, the AAVSO and the American Astronomical Society (AAS) will once again hold consecutive meetings, this time in Berkeley, California. The 82nd Spring Meeting of the AAVSO will be held June 4-6, followed by the 182nd AAS Annual Meeting, June 6-10. On June 6th, the AAVSO, the AAS, and ***Sky & Telescope*** magazine will jointly host the 3rd CCD Workshop.

Call (617) 354-0484, or FAX (617) 354-0665 for registration form or write to AAVSO, 25 Birch Street, Cambridge, Massachusette 02138. Registration must be received before 7 May to receive the discounted fee.



REMEMBER THAT ENTERING GRANT RANCH AFTER 10:00 PM CAN BE DANGEROUS TO YOUR AUTOMOBILE TIRES. DO NOT ENTER THROUGH THE EXIT GATE WHEN THE ENTRANCE IS LOCKED!

Directions to our Favorite Places
by your Editor

To the left is a map showing directions to the Milpitas Library location for our Board of Directors, General Meeting and Beginning Astronomy Classes. This is the old Milpitas Police Station location. The public and members are welcome to these meetings. There are interesting talks given by professional and amateur astronomers along with lively discussions. Here is a chance to ask someone about your equipment or theory to work out a solution.

The map below shows directions to our public star party site at Houge Park. Star Parties begin at sundown and continue until around 11:00 P.M. As you know the public is invited and so is the membership. Come display your favorite telescope, help another who is less proficient, and get some one else interested in astronomy and the night sky.

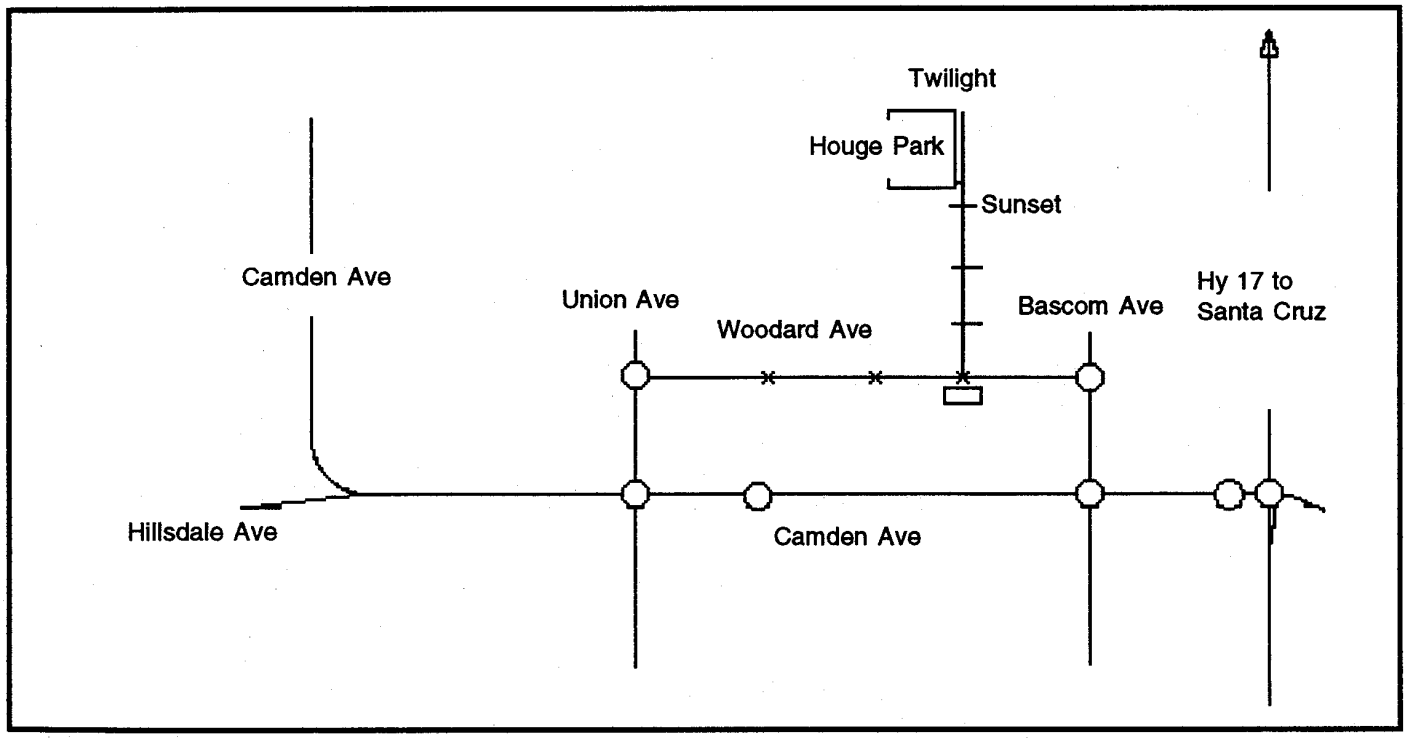
Henry Coe State Park is located east of Morgan Hill in the Hamilton mountain range. To get there go down Hy. 101, past San Jose toward Morgan Hill. Take East Dunne Ave. Follow it east, past Anderson Reservoir, up the mountain for 12 miles. At the overflow parking lot you'll see the sign identifing the Park. Then in a half a mile, you'll see the buildings of the old Coe ranch, now the park headquarters. On the left is a horse trough and a locked gate.

When star parties are scheduled you will pass through the gate and drive up the hill, about 100 yards and set-up on the right. Be extremely careful in the summer as the grass is dry and flamable. Smoking is allowed only inside your vehicle.

You should not let anyone else into the park who is not attending the star party. If you don't need your car at the site and are not hauling heavy astronomical equipment, consider parking near the camp grounds.

There are restrooms in the Museum building, down the stairs and to the rear.

To get to Grant Ranch take Alum Rock Ave. east to Hamilton Road. Turn right here and continue on until you arrive at the Grant Ranch gate. Enter, pay your fees, and continue to the first or second left where you will see Telescope row. There is no power here at the observing site, however there are restrooms. Please read the notification to the left of this page.



General Meeting
by Jim Van Nuland

Rick McWilliams, Tangent Instruments

Rick began observational astronomy with a Dobsonian and star charts, and managed, on his first night, to find a total of four objects! Of course, he looked at them many times. Since he designs electronic instrumentation professionally, he began thinking about how he could combine the two. He soon had the ear of Jack Marling, who started selling them at his store, Lumicon. The first model displayed only RA and Dec, which was not all that easy to use on an alt/az scope, watching the position change in both axes while trying to remember the co-ordinates of the desired object.

Later versions soon followed with the ability to guide independently on each axis, and by putting the catalog inside, they eliminated the need to hold the co-ordinates in mind during the process.

Present versions have some or all of the Messier, NGC, IC, and other catalogs of deep-sky objects; double and colored stars, planets, and a number of user-definable objects. As did the original, they have a list of named bright stars to be used during initial calibration, but in addition, one may calibrate on any object in the database, including the user-defined ones (this is how JVN can use the Sun and Moon to align during the day). The "identify" feature allows one to specify the class of the object and limiting magnitude, and the computer will try to tell you what you are looking at.

In addition to the guiding computers, Rick showed drawings of the (soon to be) largest production telescope, a 32 inch (!) portable (!!) scope. Alt/Az mounted with drives on each axis, and also on the film holder for photography! (Lots of !'s here.) The optics will be a folded Newtonian, so it will provide a relatively wide field while keeping the scope short enough for a six-footer to observe without a ladder. (JVN strenuously disagrees, and insists on a ladder in nearly all cases.) I didn't catch the focal ratio. It will be marketed by Jim's Moble, Inc. (JMI).

Rick does not market any of his devices directly — they are sold through Lumicon, Celestron, JMI, and most recently, Orion Telescope Stores.

Each of these differ, mostly in the size and selection of objects in the database, and whether planetary positions are calculated internally. Some models are available through the New York mail order places for a little less than at the named stores.

Ron Scheldrup — The Star Port

Ron began using the early digital setting circles that Rick McWilliams was selling through Lumicon. Independently of Rick, he began to think of a way to combine the catalog information with the dynamic position of the telescope. Rather than stop at the numerical information as is done by Rick's computers, Ron utilized a grid of tiny LEDs to display a star field, with a touch screen to control it all.

Ron had hacked one of Rick's computers to obtain the information he needed; that is, Rick's instrument was generating the RA and Dec position information as discussed above, and Ron used that to control a sky display. The current production uses a special version of Rick's computer, but is not directly compatible with the serial port on the regular ones.

After an initial alignment very similar to what is done with McCircles, the Star Port displays the sky, and moves the display to match the motion of the telescope. The display can cover several constellations, or can zoom down to a small scale. (I didn't catch the minimum field size or faintest star.) When guiding to an object, an arrow tells which way to move the scope, so it's quite easy to find. The database includes much of the same objects as do Rick's devices, but the star database is much larger, to display the constellations. All this is housed in a box about 8 by 10 by about 3 inches thick, the display about 5 by 8 or so. Asked about the durability, Ron tossed the box several feet onto the floor! Not to worry.

The Star Port may be used away from the telescope, as an electronic star chart, so it is useful indoors for planning, etc.

Comparisons, considerations

The two devices provide very similar functions, so far as alignment, finding objects, directing the scope, etc. Installation is identical, using the same encoders and connectors; in fact one can plug one or the other into the same telescope. The Star Port includes all the function of the McCircles. So why by McCircles?

The telescope computers sell from about $400 to about $800; the Star port, about $1200.

The internal battery in the Star Port is a rechargeable lead-acid, and lasts a night or two, or it can be run from one's car. The McCircles use a 9-volt that lasts 30 to 50 hours.

McCircles are compact! The largest measures 5-3/4 x 3-1/2 x 1-1/4 inches thick, and weights about 8 ounces, and can easily ride on a small scope. The Sky Port weighs several pounds, and must have its own table with a cable running to it.

The fact is, that one can learn the sky for free, and buy a superb set of star charts for under $100. And after learning the sky, one can use any scope, however equipped.

For gadget freaks, they are a whale of a lot of fun!

ASTRO AD

Continued from page 6

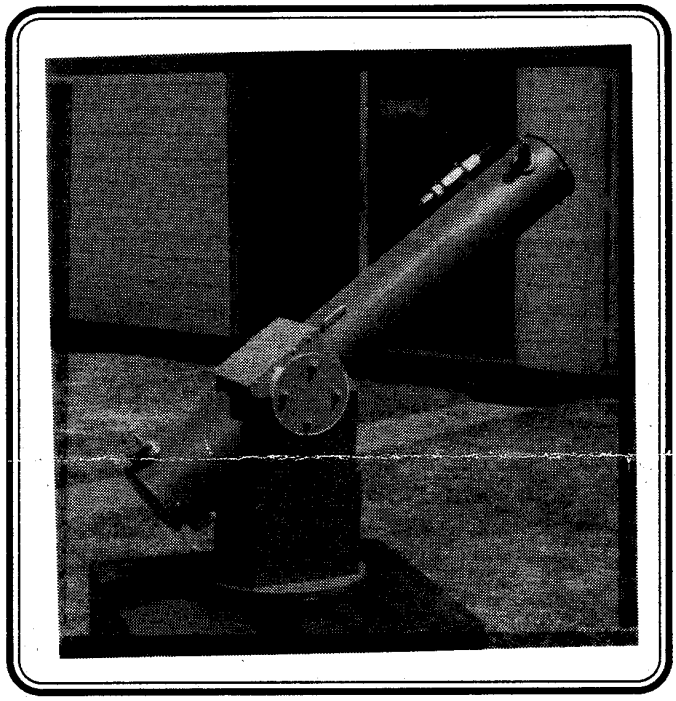
Celestron SPC 80 Refrector, Super Polaris Mount W/"Pole Finder", 26mm Plossl, 8mm RKE eyepieces, 3 years back issues ***"Astronomy"*** Mag. All equipment in new condition - $400. Contact John Felch (408) 741-0880 4/93

Newtonian 12-1/2", f/5.5 - $1000 obo or trade for 4-1/2" EQ Newtonian and a 80mm refractor. 12-1/2" is optically very good; 2"/1-1/4" focuser, 8X50 finder, Fbglass tube, GEM mount, drive corrector, (120V or 12VDC); solid mount, but easy to transport. Fairly good gondition. Call Edward Hillyer evenings 7pm-10pm at (209) 931-0486 or write to 4900 N. Hwy 99 #238, Stockton, Ca. 95212 4/93

1993 SJAA Calendar

General Meeting		Houge Park Star Party	Observational Astronomy Class
May	1 Auction	28	29
June	5	25	26
July	10	23	31
Aug	**14 Picnic**	20	28
Sept	4 Slide/Equip night	24	25
Oct	2	22	30 Last one
Nov	20	19	none
Dec	18	17	none

Please read your *Ephemeris* each month for changes



SJAA Loaner Status
by Paul Barton

			Due Date
4-1/2"	Newt/P mount	Bud Whitlin	5/23/93
6"	Dobson	Dave Simmons	5/14/93 *
4"	Quantum	Ken Ward	5/11/93
60mm	Cometron Ref.	J Schoenenberger	4/28/93
C-8	Celestron	T Kahl (J Schoenenberger)	5/14/93 *
12-1/2"	Dobson	L Courtney	4/23/93
14"	Dobson	Richard Raw	6/4/93
6"	Newt/P mount	D. Petri	5/24/93
8"	Dobson	Mark Wagner	6/4/93
8"	Newt/P Mount	Albert Chen	5/21/93
		(on waiting list)	
	(Magin Cox	Gabriel Stoll	Bob Dow)
	(Bill & Lana Mc Clure		Chung-Lin Lee)

If you want to borrow a telescope call Paul Barton (number is on the credit Marque) and get your name on a general list (any telescope) or on a specific telescope list. Lonars need to be returned promptly.

ASTRO ADS

ASTRO ADS are free to all noncommercial advertisers wishing to sell astronomically related products or services. Please send your ad directly to the Editor: Bob Madden
1616 Inglis Lane
San Jose, Ca. 95118-2825
NO LATER THAN THE 12th OF EACH MONTH! Your Astro Ad will run approximately 3-months.

Meade 8", W/Starbright coating, German Eq Mt. Metal accessory case, 26mm, 40mm, 13mm eyepieces. Piggie-back camera mount, T-ring camera adapter, and eyepiece projection system. Great telescope at $1200 for everything. Call Maria Petersen at (408) 263-2896. 3/93

Astro-Physics 6" Starfire, f/9, air spaced triplet APO refractor tube assembly. Only 21 lbs and 50" long (dew cap retracted). Beautifully made, great views, about 1 and 1/2 yrs old. All Astro-Physics parts: 2.7" focuser, 2" & 1.25 adapters, 2.5" extension, sliding dew shield, cover, case, plus mounting rings - $2550. Call Rich Neuschaefer WK (408) 285-6818 Hm (408) 446-0975 3/93

Meade 2080 LX-5 W/MCOG, field tripod and wedge. Inc 9X69 RA polar illumated finder, AC/DC adapter and cable, Quartz pulse drive, 2" star diagonal and 1.25 adap. Remote hand controller and Motodec, storage trunk, T-adapter for Yashika SLR, 1.25" 9mm, 26mm Meade eyepieces, 2" 18mm Or and 60mm Celestron Kellner eyepieces, small reference library - entire package only $1300. Call or write Steve DeMelo, P.O. Box 311 Shingle Springs, CA 95682 - (916) 677-9575 3/93

2 Tasco telescopes, both excellent condition. T-58 model $100 and T-48 model $75. Call Rebeca Newell (408) 259-8027 3/93

Celestron 8 S/C, Super Polaris, manual drive, 6X30 finder, stool, but no case, star diag, 2X Barlow, Ocualrs of 7.5, 15, 26 and 36mm - Illuminated reticle w/ battery Pack. Ask $1400/OBO. Call Carl Harris (408) 338-9580 3/93

Yeager 3-1/4" refractor on a super polaris Mount. Contact Phyllis Rose (408) 293-6611 3/93

Continued on page 5

CELESTIAL CALENDAR

May 1993

LunarPhases	Date	Rise	Trans	Set
FM 20:35hr	06-5	1955	0056	0558
LQ 05:20hr	13-5	0144	0721	1256
NM 07:08hr	21-5	0604	1314	2029
FQ 11:22hr	28-5	1304	1914	0125

Nearer Planets

Mercury	07-5	0543	1228	1914
1.32 AU	17-5	0601	1312	2025
Mag -2.4	27-5	0634	1403	2132
Venus	07-5	0418	1033	1647
0.50 AU	17-5	0400	1018	1636
Mag -5.4	27-5	0344	1008	1633
Mars	07-5	1124	1835	0148
1.64 AU	17-5	1110	1816	0125
Mag +0.8	27-5	1058	1758	0101
Jupiter	07-5	1626	2226	0431
4.76 AU	17-5	1544	2145	0350
Mag -2.3	27-5	1504	2105	0310
Saturn	07-5	0251	0814	1337
9.84 AU	17-5	0213	0736	1300
Mag +1.1	27-5	0134	0658	1222

SOL Star Type G2V Mag - 26.72

RA	DEC				
0255	1645	07-5	0605	1303	2004
0335	1916	17-5	0556	1304	2013
0415	2115	27-5	0550	1305	2020

Astronomical Twilight		Dawn		Dusk
JD 2,449,115.5	07-5	0425	-	2144
9,125.5	17-5	0412	-	2157
135.5	27-5	0402	-	2208

Sidereal Time

Transit Right	07-5	0000 PDT=1351
Ascention at	17-5	0000 PDT=1431
Local Midnight	27-5	0000 PDT=1511

Darkest	**Saturday Night May 22**
Sunset	2014
Twilight End	2206
Moon Set	2142

TIMES AND DATES ARE PACIFIC DAYLIGHT

by Richard Stanton

Times are Local Civial except Lunar Phase is in Universal Time

Derivation of these values are from

Astronomy with Your Personal Computer

by Peter Duffet-Smith

MacEphem

by Elwood Charles Downey

Comet Comments

by Don Machholtz

Although recent attention has been turned to the supernova in M81, our local community - our solar system - has had a few surprises of its own. While periodic Comet Schumasse fades in our evening sky, a strange, but faint, Comet Shoemaker-Levey has been discovered. To this we add two more comet announcements, and the discovery of a "cometoid".

1993FW: Do you remember Asteroid 1992QB(1), found last August 30? It is a large object, about 200 miles across, and 40 AU from the sun. We are still not sure if it is an asteroid or a comet, and it is not expected to get much closer to the sum. Now the same team (J. LUU and D. Jewitt), using the 2.2 meter telescope at Mauna Kea, has found a second object. Also at 23rd magnitude, but on the opposite side of the solar system (near RA 12h25m, Dec -3°), an early estimate places it at 38 to 56 AU from earth. We'll learn more as observations come in.

Comet Mueller (1993d): This comet was found on plates taken March 19 by Jean Meuller and J. Mendenhall during the course of the second Palomar Sky Survey. I was at magnitude 17 and north of the Big Dipper. We now know that it will reach perihelion this summer at a distant 6.1 AU. It will remain faint.

Comet Shoemaker-Levey (1993e): Caroline and Eugene Shoemaker and David Levey discovered this comet on plates exposed March 24 from Mt. Palomar. Only 4 degrees from Jupiter (and 1 degree from object 1993FW), the comet displayed a linear image about 1' long. Later observations showed multiple nuclear bright spots, with several tails. A close approach to Jupiter last summer may have broken it up. An early orbit suggests a 10 year period, and a (distant 3.9 AU) perihelion. I'm including positions below. The comet is roughly 14th magnitude. Those of you with large telescopes and/ or photo/CCD equipment might wish to give it a try.

Periodic comet Forbes (1993f): M. Candy of Perth Observatory recovered this comet on March 21 at magnitude 14. It has a 6.1-year orbital period, and is not expected to get much brighter.

EPHEMERIS

DATE(00UT)	R.A. (2000)	DEC.	ELONG	SKY	MAG
	PERIODIC COMET SCHAUMASSE (1992x)				
04-28	10h07.9m	+34°03'	103°	E	10.8
05-03	10h26.1m	+31°18'	103°	E	11.2
05-08	10h42.8m	+28°34'	103°	E	11.6
05-13	10h58.1m	+25°52'	103°	E	12.1
	COMET SHOEMAKER-LEVY (1993e)				
04-28	12h11.3m	-02°30'	146°	E	13.9
05-03	12h09.7m	-02°20'	141°	E	13.9
05-08	12h08.4m	-02°11'	135°	E	13.9
05-13	12h07.3m	-02°05'	130°	E	14.0
05-18	12h06.4m	-01°59'	125°	E	14.0
05-23	12h05.8m	-01°56'	120°	E	14.0
05-28	12h05.5m	-01°54'	115°	E	14.1
06-02	12h05.5m	-01°53'	110°	E	14.1
06-07	12h05.7m	-01°54'	106°	E	14.1

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