SJAA EPHEMERIS

VOLUME 5 NUMBER 2 OFFICIAL PUBLICATION OF THE SAN JOSE ASTRONOMICAL ASSOCIATION FEB. 1994

The Eyepiece
by Bob Madden

Last month we heard Bruce Weaver from MIRA. It was very interesting hearing about and seeing photographs of the MIRA observatory. What a beautiful facility. There is serious work being performed there.

This months speaker, as can be seen on the monthly calender, will be Paul Graves. Paul teaches at Dartmouth Middle School on Blossom Hill Road. Paul, for extra credit, asks his students to go to our monthly star party at Houge Park. Paul has been doing this for many years. In fact Paul taught two of my boys (ahem, who are 33 and 34 years old). His talk will be interesting.

JULIAN DAY REMINDER For those of you who dance to the beat of a different drummer, New Years Day is also reckoned as Julian Day 2,449,353. It's been that many days since January 1st, 4713 BC, which is the basis for the calendar system often used by astronomers.

There is a sad announcement about the death of Walter Scott Houston, whom many of you have read in Sky and Telescope, further on in the newsletter. Please remember him when you are looking for the next universe.

I've been a little short this month getting articles, as you can tell by the size of this, therefore much of the information is obtained from sci.astro (internet). We don't generally run commercial advertisement in these pages unless we think it will benefit our members. This month you will see an announcement from Orion Telescope Center. Further, it is my personal feeling that the board will also allow commercial advertisement and hopefully the advertiser will give a generous donation to our Eye piece, telescope loaner program or observatory fund.

Who is planning to go view the annular eclipse in May? Drop me a note of your plans.

Feb 5: Star Party at H. Coe Sp. Sset 5:36, 21% Moon, Mrise 4:03 am.
Feb 12: Star Party at Fremont Pk. Also Grant Ranch. Sset 5:44, 7% Moon, Mset 8:10 pm.
Feb 18: Star Party at Houge Park. Sset 5:52 pm, 54% moon set 1:43 am.
Feb 19: Second session of Observational Astronomy class at Houge Park - 8:00 pm.
Feb 26: General meeting at the Milpitas Library - 8:00 pm. Board of Directors meeting at 6:15. The speaker is Paul Graves, science teacher at Dartmouth School and SJAA Member.
Mar 5: Star Party H. Coe Sp. Sset 6:05, 34% Moon, Mrise 2:46 am.
Mar 12: Star Party at Fremont Pk. Sset 6:12, no Moon.
Mar 18: Star Party at Houge Pk. Sset 6:18, 37% Moon, Mset 1:26 am.
Mar 19: Observational Astronomy Class, Houge Pk 8:00 pm.
Mar 20: Spring begins 12:30 pm.
Mar 26: General Meeting 8:00 pm. Board of Directors Meeting 6:15 pm. Speaker needed.

Here's something for the PC owner

We are pleased to announce the immediate availability of version 2 of the popular Windows 3.1 shareware astronomy program "SkyMap" for the PC. SkyMap is available for download by anonymous FTP from "oak.oakland.edu", directory "/pub/msdos/astronomy". The program is in twofiles, "skymp20a.zip" and "skymp20b.zip". SkyMap can draw an accurate map of the sky, as seen from anywhere on Earth, for any date between 4000BC and 8000AD. Two types of map can be drawn - a "horizon" map showing a view of the sky as seen by the observer; and an "area" map, intended as a detailed finder chart for a small region of the sky. Each type of map can display stars, planets, comets, deep sky objects, constellation names, figures, and official IAU boundaries, etc.

SkyMap can print high-quality charts on any type of printer supported by Windows. Detailed information can be obtained for any object shown on a map simply by clicking on it with the mouse. Pictures can be associated with objects, and displayed either manually or automatically. The program supports GIF, BMP and NASA PDS file formats.

SkyMap is highly accurate - for example, planetary and lunar positions differ from those published in the "Astronomical Almanac" by less than half a second of arc!

New features of this release include:
- A total rewrite resulting in up to 5x speed increase in map drawing.
- A comet catalog in which the user can add, edit, or delete entries. Any number of comets from the catalog can be selected for display.
- Addition of the planet Pluto.

Continued on page 2

Walter Scott Huston

I am forwarding the following sad announcement from CompuServe:

I have the sad duty to report that our longtime columnist, Walter Scott Houston, died yesterday while on an extended trip in Mexico with his wife. "Scotty" influenced generations of amatuers and will be immensely missed. He was a fixture at the annual Stellafane convention for decades, and undoubtedly many of you had the pleasure to meet him. We at ST would be grateful to hear of "Scotty" anecdotes you might have. Please post them here under this thread. In the meantime, you'll find a short bio in this week's posting of news in the GO SKYTEL section.
Kelly Beatty

Walter Scott Houston, who authored S&T's Deep Sky Wonders column since September 1946, died on December 23rd at the age of 81 following a brief bout with pneumonia. He was in Cancun, Mexico, as part of an extended road trip with his wife, Miriam. Together with their daughter Margaret, they were planning to explore archaeological sites in the eastern Yucatan by day, and the southern sky by night. Born in Tippecanoe, Wisconsin, on May 30, 1912, Scotty had a life long interest in astronomy. While still in grade school he viewed all the Messier objects with a 1-inch refractor he constructed from eyeglass lenses. He was an extraordinary observer. Although his column made him internationally recognized as a deep sky expert, he was also a skilled solar observer and active as a variable star observer, contributing more than 12,000 magnitude estimates to the American Association of Variable Star Observers. An interview with Scotty, which describes some of his career, appears in the May 1987 issue of S&T.
Jim Van Nuland

I remember Water Scott Huston from my first Stellafane convention. My parents brought me there camping, I was 14 yrs old, I think. We were camped accross from Scotti's camp. I remember comenting about his, or it was a friend of his, telescope which looked at the sun. Being new to this stuff I commented to him, that his device looked like a solar warmer for his morning coffee. He was amused and we chatted. Later he signed my Sky And Tel with comments, "good luck finding neptune", I was searching for it in a 6" F#10. I was proud to have meet him. We crossed paths many more times as I grew up and frequented Stellafane. We cut trees and cleared brush and used the Porter Turret telesope together at Stellafane. We would sleep over in the club house later as years went by. I remember Scotti from his pipe smoking, it was a pleasant oder. He would stay up reading the many books in the Stellafane club house while we slept upstairs. I remember spending some nights watching the fire place smoldering as we talked and busseled about waiting for viewing conditions to improve. I remember being moved by the talks Scotti would give at Stellafane Conventions, I have not seen him for many years but I will always remember him..... Bye Scotti..... Hope they have internet where you are..!
Leonard B. Abbey Georgia Tech Research Institute labbey@gitvm1.gatech.edu

More IBM Shareware available

STARPLOT V2.0 A drawing package optimised for star charts.

Now uploaded to the SimTel Software Repository (available by anonymous ftp from the primary mirror site OAK.Oakland.Edu and its mirrors): pub/msdos/astrnomy/starpl20.zip Star chart drawing package & Hubble GSC viewer

Starplot v2.0 is a star chart drawing package. It allows the user to plot stars, symbols, text and curves against a sky projection using RA and Declination coordinates. Finder charts once drawn can be saved to disc, and then later reloaded for further editing. Several charts, including the whole sky to magnitude 5 are included. Charts can be printed or saved to .PCX format for importing to other graphics or desk top publishing programs. Starplot can import areas of sky from the Hubble GSC CD ROM's if you have them, giving access to 18,000,000 stars. This allows finder charts with immense detail to be created.

Also included is Makeplan.exe which creates charts of planet, minor planet and comet positions which can be imported into starplot and then plotted against background stars.

— Bernard Czenkusz

Sky Map (Continued from page 1)

- Comprehensive search facilities allowing any object to be easily located. Objects can be searched for by either popular name (eg "Ring Nebula"), or catalog number (eg "NGC 1976").
- Maps can be reflected both horizontally and vertically, allowing the chart to match the sky orientation shown by the optical system of your telescope.
- The observer's location can either be entered manually, or selected from a comprehensive list of more than 400 places, world wide.
- Complete "context sensitive" help.
- and much more!

This evaluation version of the program contains the complete RNGC non-stellar object catalog, and 15,000 stars to magnitude 7.0. Registered users receive a much larger star database, up to and including the entire SAO catalog of 259,000 stars to magnitude 9.5.

SkyMap is intended for use by both novices and serious amateur astronomers.
Chris Marriott, Warrington, UK
Author of SkyMap v2 shareware
Internet: chris@chrism.demon.co.uk
astronomy program for Windows.
CompuServe: 100113,1140
Mail me for details! Author member of Association of Shareware Professionals (ASP) Windows, C/C++ consultancy undertaken, anywhere in the world.

Shuttle Launch and Paload schedule

Mission	Launch Date	Inclination of orbit (deg.)	Prime Payload
STS-60	01/27/94	57.0	WSF-01,Spacehab 2
STS-62	03/03/94	39.0	USMP-2, OAST2
STS-59	04/07/94	57.0	Space Radar Lab-01
STS-65	07/08/94	28.5	IML-2
STS-68	08/18/94	57.0	Space Radar Lab -02
STS-64	09/09/94	57.0	Lite-1, SPTN-201
STS-66	10/27/94	57.0	ATLAS-03, CRISTA-SPAS-01
STS-67	12/01/94	28.5	ASTRO-02
STS-63	01/26/95	51.6	Spacehab-03,SPTN-204
STS-69	02/16/95	51.6	SPAS-III, OAST-FLYER
STS-71	05/30/95	51.6	SL-M SPACELAB -MIR

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! NOTICE !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Electronic still camera images of the Hubble telescope from STS-61 are now available. You may access the files by establishing an FTP session with sseop.jsc.nasa.gov, logging in as user ANONYMOUS, using your real identity as the password, and issuing a change directiory command to DUA2:[HUBBLE] (e.g. cd dua2:[hubble]). The ESC files all have the extension .GIF.
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! NOTICE !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

Moon Calculations

In article LJp@ucc.su.OZ.AU, bretta@extro.ucc.su.OZ.AU (bretta) writes:

>Dear anyone,
> What I would like to do is calculate the position of the moon as seen from earth from a particular position at any given time. I consulted the FAQ list, section 4, on "Computing Planetary Positions". Unfortunately, all it gave was a list of reference books. The ftp site at explorer.arc.nasa.gov did not appear to have any salient online information. What I am really looking for is a simple program which meets the specification below:
>INPUT: longitude/latitude, date/time
>OUTPUT: angular position of the moon, preferably as a bearing and an elevation.

>If anyone has a program to do this, I would appreciate assistance: source code (in any language), pointer to an archive site, etc. I am after an algorithm, so please nobody plug your favorite commercial software package!

(response)

There are two ways to do it: either integrate the equations of motion or use a table of interpolation coefficients derived from someone else's integration. In either case, the algorithms are FAR too complicated to post to a newsgroup. This is why the FAQ merely points you to the references, and why good ephemeris programs sell for real money.

If you want reliable PD software, I recommend the lunar code from "xephem" which is in /Mirror/X/contrib/xephem/xephem_2.4e.tar.Z on ftp.x.com (or sequoia.ccsd.uts.edu.au.) The code in "moon.c" should give you the center-of-earth to center-of-moon vector accurate to a few tens of minutes of arc over the next few decades. You must then correct for your earth site location and for abberation and, if you are interested in a particular location on the moon, you must add a libration model. I think that all of this, except for the libration, is done correctly within xephem, although it will take work to dig it out.

If, on the other hand, you want a professional job, e.g. to fit to lunar laser ranging or lunar radar echoes, you should apply to the US Naval Observatory (USNO) for a copy of their "N-body" ephemeris data set and interpolate it yourself. I did this several years ago while making some lunar radar images and it took several weeks to code and debug. The most accurate models require careful corrections for both special and general relativity, along with tabulated predictions of earth polar wobble and rotation period, also available from USNO or from BIH in Paris.

Hope this helps you, Peter G. Ford

Bolide Meteor

[information received fron the usenet]

I have received reports of a bright bolide which was observed on Saturday, January 8, 1994, at 5:34 local time, observed from Selkir and Clandeboye, Manitoba, Canada.

If anyone has further posts, please post.

Thx.
—
Chris Rutkowski -
rutkows@cc.umanitoba.ca
University of Manitoba - Winnipeg, Canada

Here is a quick, easy and CHEAP focusing aid:

(The directions that follow are for a SCT, modify as needed)

Get a 12"x12" piece of 1/8" aircraft modeling plywood from a local hobby shop. Place it over the end of your SCT, and trace the apeture on one side of the wood.

Find and mark the EXACT center of the the circle you drew. Draw a line across the circle, intersecting the center point. Measure the diameter of your center obstruction, and draw a corresponding circle on the wood.

Measure 1/2 the distance from the outer circle to the inner circle and mark the line on both sides. N.B.: BOTH POINTS MUST BE EQUIDISTANT FROM THE CENTER POINT.

Cut a circular hole in the wood 1.5 to 2.0 inches in diameter centered on each of the points described the the paragraph above. Try to make the cuts as "clean" as possible. (If your 'scope is less than 8", try holes 1.0 to 1.25 inches in diameter.)

Glue four small pieces of wood around the circumference of the outer circle. These will hold the focuser in place. Spray-paint the entire device FLAT BLACK (both sides). Allow to dry.

DIRECTIONS FOR USE:

1. Place the device over the end of your 'scope.
2. The image (look at a star or planet) will be "double".
3. Turn your focus knob until the images merge into one.
4. REMOVE THE FOCUSER! (Leave it in place to increase the f-ratio!)
5. Take your (superbly-focused) exposure.

I made this focuser after seeing an ad in Sky & Telescope— I refused to pay $40+ for such a simple device.

Clear Skies!

Dennis Ward
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Observatory Director,
ZU02308@UABDPO.DPO.UAB.EDU
Birmingham Astronomical Society

More Astro Ad(s)

Meade 8" f/6 Newtonian w/7" Mathias RA drive, 2" focuser, Leveling screws, Vib dampened Mt - $599 **Accutrack Speed control** - $80. **Lumicon Newt. "easy-Guider"** - $120. **Lumicon 2" Deep Sky Filter** (Prem + grade) - $80. **Meade Eyepieces** 1-1/4" MA 9mm, 25mm, 40mm - $17 ea. Meade1-1/4" Ortho 7" - $20. **Meade 1-1/4" Illuminated Reticle** - $35. **Meade 1-1/4" 2X Telenegative** Barlow - $25. **Meade Camera Adapter** - $20. Total $1030 - Package $900. **Celestron C90** Spotting Scope w/case - $250. **Hybrid Diagional Prisim** (.965/1-1/4) - $20. Trace Boyd (eve) 408-268-3120 (days) (415)-424-5535 2/94

Here is another CHEAP Telescope Tool

suggested by 'CRAZY Ed' Erbeck

Ed was visiting me one day showing some of his products, remember his nifty red led light key Chain, and he was talking about a Newtonian collimation tool he also had. Ed mentioned that it would be easy to reproduce and as he described the tool, I remembered a Coulter collimation device I had and what it looked like and I decided 'Crazy' ain't so crazy.

What you'll need is a Kodak 35mm film container which is about 1 - 1/4 inches in diameter and will fit nicely into your focuser, a small piece of adhesive backed aluminum duct tape - available at OSH or any hardware store, and an indelible marking pen. Tools that come in handy are a screw driver to remove the mirror, a framing square, masking tape, string and scissors.

Lets begin by removing the mirror and using the framing square locate tangent points 90° apart on the mirror edges. Using the masking tape, attach pieces of string with ends at opposite tangent points. Where they cross will be the center of the mirror. Here we will mark a small black dot 1/8-1/4 inch in diameter. Don't worry about telescope performance as this dot will be hidden from incoming light by the secondary mirror. The dot should be large enough to be seen through the collimation device we will build. Removing the string replace the mirror and using the same string method at the OTA inlet adjust the mirror and center the dot on the mirror where the strings cross.

Now we are ready to make the sighting tool. Take the film canister and apply the aluminum tape to the bottom such that the reflective side is outward and facing the secondary mirror. Next we will perforate the bottom of the canister and aluminum with a 0.50-0.62 inch diameter hole exactly in the center of the diameter. It is important the bottom of the canister is perpendicular to the center axis of the focuser. Any out of alignment here will affect the final adjustment.

To collimate your instrument, insert the device and adjust the mirror so that the dot seen on the mirror is centered in the hole of the device. This procedure assumes that you have properly adjusted your secondary mirror. This collimating should be done in daylight or a light background on a star. Bob M

NOTICE

This month is election of Board of Director members. Four are to be elected. Members who terms are expiring, but have agreed to run again are:

Gene Cisneros

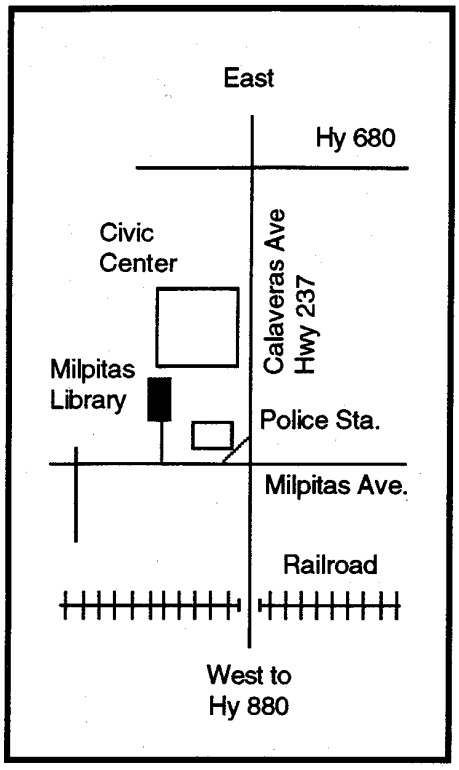
Jack Petersen

Robert Brauer

Bob Madden

If you have a friend you wish to nominate, Please be sure they are agreeable. Nominations can be made in advance by contacting Jack Zeiders or Jim Van Nuland or from the floor at the February general meeting.

NOTICE



REMEMBER THAT ENTERING GRANT RANCH AFTER 10:00 PM CAN BE DANGEROUS TO YOUR AUTOMOBILE TIRES. DO NOT GO 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. 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 Observational Astronomy class and public star party site at Houge Park. Observational Astronomy class is at 8:00P.M. and 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.

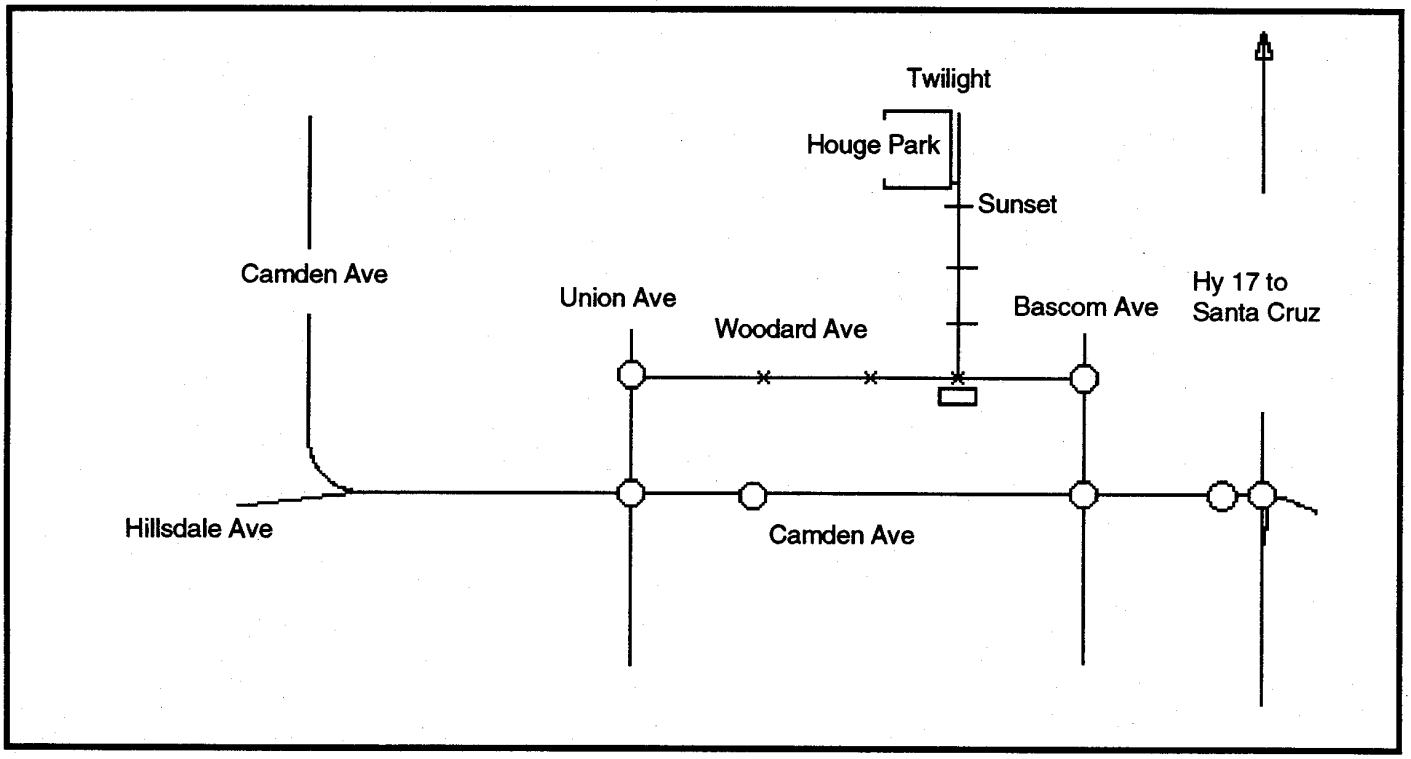
Henry Coe State Park is located east of Morgan Hill in the Hamilton mountain range. To get there go down Hy. 101, past San Jose toward Morgan Hill. Take East Dunne Ave. Follow it east, past Anderson Reservoir, up the mountain for 12 miles. At the overflow parking lot you'll see the sign identifing the 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 carefull 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.

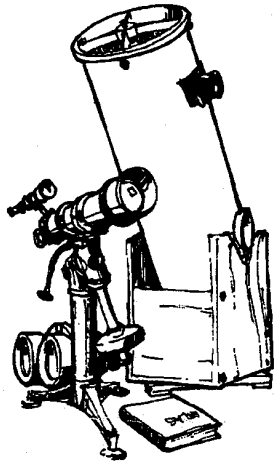
To get to Grant Ranch take Alum Rock Ave. east to Hamilton Road. Turn right here and continue on untilyou arrive at the Grant Ranch gate. Enter, Pay your fees, and continue to the first or second left where you will see Telescope row. There is no power here at the observing site, however there are restrooms.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



1994 SJAA Calendar

General Meeting		Houge Park Star Party	Observational Astronomy Class
Feb	26	18	19
Mar	26	18	19
Apr	23	15	16
May	May be the 14?	17	21
June	25	17	18
July	23	15	16

Please read your *Ephemeris* each month for changes



Telescope Loaner Status

by Paul Barton*

	Name	User	Due Date
4-1/2"	Newt/P mount	---------->	available
6"	Dobson	---------->	available
4"	Quantum	Chung-Lin Lee	2/06/94
60mm	Cometron Ref.	Jim Marquis, Jr.	2/26/94
C-8	Celestron	John Schoenenberger	1/19/94
12-1/2"	Dobson	---------->	available
14"	Dobson	Lee Courtney	2/05/94
C-11	Celestron	Call Paul Barton	********
6"	Newt/P mount	---------->	available
8"	Dobson	Jim Marquis	02/26/94
8"	Newt/P Mount	John DaSilva	01/9/93
6"	Newt/P Mount	---------->	available
4-1/4"	Dobson	John Bettencourt	03/01/94

Solar telescope. Available only to experienced members for special occasions such as day time public star parties, etc. Call.

(on waiting list)

Get on the the waiting list - please call . Thanks - Paul

If you want to borrow a telescope call Paul Barton (number is on the credit Marquee) and get your name on a general list (any telescope) or on a specific telescope list.

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.

Celestron C-11 many accessories $1750. Mike Ryan (408) 241-4508 11/93

6" Rich-field telescope - Coulter optics, rack and pinnion focusing w/eyepiece - $80. **Edmund Sci** med to heavy duty GEM - short wooden legs for reflector - $75. **Edmund Sci** light duty GEM - long legs for refractor - $50. **Edmond Sci** w/ aluminum setting circles - $75. **Pantax ME Super** 35 mm SLR camera - 50mm f/2.0 lense - through the lense metering - perfect astro-camera. MINT! $150. Call Ben Blake (408) 3795276 Leave message if answering machine. 11/93

C-6 Tube Assy - $200, **German Equqtorial pier Mount** - heavy duty - $500. **14-inch Mirror** - Cassegrain, hole in center, chip on edge - best offer. Call Ted Blanchard (408) 2655683 12/93

Roll-off Roof Observatory - 6-1/2 X 6-1/2 X 6-1/2 feet semi-moveable, new condition, worth $2000 - sell for $500 or make offer. **Deep Sky Nebula Filter** - 1-1/4-inch size, brand new - $40. **Olympus OM-1** w/Tokina Zoom 28-85mm lens - good condition, $160 or make offer. **Wanted** 4-inch (100mm) Binoculars. Call Edward Hyeler (209) 931-0486 6:30 to 9:30pm or leave message. 1/94

Sky and Telescope 1954 to 1982 (missing 14 issues) and **Aug 1984 to Dec 1992**. $300 takes all. Quality eyepieces may be considered in trade. Call John Brookman (408) 374-0594 (before 7pm) 1/94

Celestron Ultima 8 w/hand control. Mint condition. Great Gift. $1750. call Patrice (408) 736-2153. 1/94

* Stan Stanly lost the eyepiece - promise to return. C-11 needs a qualified operator to take to scheduled star parties. Newton co-invented Calculas over 200 years ago.

CELESTIAL CALENDAR

February 1994

LunarPhases	Date	Rise	Trans	Set
LQ 01:07hr	03-2	0058	0614	1126
NM 07:31hr	10-2	0645	1222	1743
FQ 10:48hr	18-2	1102	1821	------
FM 18:16hr	25-2	1802	------	------

Nearer Planets

Mercury	07-2	0749	1328	1907
0.67 AU	17-2	0654	1236	1817
Mag 0.00	27-2	0551	1121	1650
Venus	07-2	0727	1244	1802
1.69 AU	17-2	0722	1253	1825
Mag -3.9	27-2	0714	1300	1847
Mars	07-2	0639	1141	1643
2.34 AU	17-2	0624	1133	1643
Mag +1.1	27-2	0607	1125	1643
Jupiter	07-2	0029	0545	1102
5.12 AU	17-2	2348	0508	1024
Mag -2.2	27-2	2310	0430	0945
Saturn	07-2	0747	1311	1836
10.75 AU	17-2	0711	1337	1803
Mag +1.2	27-2	0635	1302	1729

SOL Star Type G2 V Mag - 26.72

RA	DEC				
21:22	-15:21	07-2	0704	1222	1740
22:02	-12:02	17-2	0654	1222	1750
23:17	-04:33	27-2	0641	1220	1700

Astronomical Twilight		Dawn	Dusk
JD 2,449,390.5	07-2	0549 -	1844
,400.5	17-2	0527 -	1917
,410.5	27-2	0515 -	1926

Sidereal Time

Transit Right	07-2	0000	PST=0705
Ascention at	17-2	0000	PST=0744
Local Midnight	27-2	0000	PST=0824

Darkest	Saturday Night Feb 5
Sunset	1737
Twilight End	1905
Moon Set	1310
Moon rise next morning	0401

TIMES AND DATES ARE PACIFIC DAYLIGHT

Times are Local Civil
Planet distance and Magnitude
for 17th of the month
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

Periodic Comet Encke has left our sky, while both Comets Mueller are exiting. Mean while, you might like to look for periodic Comet Shoemaker-Levy 9, it is expected to hit Jupiter beginning July 17. Three new comets have been discovered, one may be visible to us soon.

The year 1993 yielded no visual comet discoveries, this is only the second time since since 1975 that this has happened. In addition to the amateur Photographic find listed below, there were eight new comets found by professionals and thirteen returning comets recovered.

Periodic Comet Kushida-Muramatsu (1993t): This is a photographic discovery by two Japanese amateurs. The comet was near M 1 at magnitude 15. It will not be getting brighter. It is in an elliptical orbit of 6.9 years with a 2.34 AU perihelion distance.

Periodic Comet Wiseman-Skiff (1993u): This comet was recovered nearly a year ago, but confirmation images were recorded only recently. The comet will remain faint.

Comet McNaught-Russel (1993v): Robert McNaught found this comet on plates exposed by Kenneth Russel in Australia. Then at magnitude 17, the comet will be closest to the sun on April 1 at 0.86 AU. If it behaves normally, it will attain magnitude 11.5 in early April as it streaks 0.47 AU from the earth. If it brightens rapidly or outbursts, as such comets do, then it will be even brighter.

EPHEMERIDES

DATE(00UT)	R.A. (2000)	DEC.	ELONG	SKY	MAG
COMET MUELLER (1993p)					
01-28	23h16.3m	-15°36'	37°	E	9.4
02-02	23h21.4m	-17°09'	33°	E	9.2
02-07	23h26.8m	-18°42'	30°	E	9.0
PERIODIC COMET SCHWASSMANN-WACHMANN 2					
01-28	08h26.8m	+19°09'	177°	E	10.9
02-02	08h23.5m	+19°35'	171°	E	11.0
02-07	08h20.5m	+20°00'	165°	E	11.0
02-12	08h18.0m	+20°22'	159°	E	11.0
02-17	08h16.0m	+20°42'	153°	E	11.1
02-22	08h14.7m	+20°58'	148°	E	11.1
02-27	08h14.2m	+21°11'	143°	E	11.2
03-04	08h14.4m	+21°21'	138°	E	11.3
03-09	08h15.5m	+21°27'	133°	E	11.4
PERIODIC COMET SHOEMAKER-LEVY 9					
01-28	14h34.9m	-16°00'	87°	M	14.0
02-02	14h36.7m	-16°07'	91°	M	13.9
02-07	14h38.2m	-16°14'	96°	M	13.9
02-12	14h39.3m	-16°18'	101°	M	13.9
02-17	14h40.2m	-16°22'	105°	M	13.8
02-22	14h40.8m	-16°23'	110°	M	13.8
02-27	14h41.1m	-16°24'	115°	M	13.8
03-04	14h41.1m	-16°22'	120°	M	13.7
03-09	14h40.8m	-16°20'	125°	M	13.7

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