

SJAA EPHEMERIS

VOLUME 5 NUMBER 5 OFFICIAL PUBLICATION OF THE SAN JOSE ASTRONOMICAL ASSOCIATION May 1994



The Eye Piece.
by Bob Madden

I am writing this before The April auction, but I'll bet it was great! It seems each year there are bargains I can't resist. I never guess why someone is offering it for sale, only it is a bargain. I've listened to many old timers stating that the same item re-appears after about five years. I'm beginning to believe that old saw too. What little does it matter, it is a great event and brings us together for the great spectacle. Only one is better and that is the "Feeding Frenzy" at the Riverside Telescope Makers Conference. It has to be experienced to be believed.

Sorry about Abain! I thought most amateurs would realize he is a big mouth. Jim Van Nuland got the "pukes" so bad he wouldn't read the rest of the Ephemeris. Most of the folks who frequent sci.astro on usenet have read Abain and have laughed at his antics. Just remember, "time has inertia".

This month we have a letter from a long time member and friend, Bill Dellenges, from Phoenix. The letter is posted further on, read it. Bill is planning to do what most of us would like to do, build an observatory. It sounds as though he has an ideal location for one. Go for it Bill!

Also we have another article on

May 7: Star party at Fremont Peak or H. Coe State Park. Your choice

May 13: Star Party at Houge Park

May 14: General Meeting 8:00 pm at the Milpitas Library. Board of Dir. Mtg. at 6:15pm. Speaker will be Jeff Buell talking about Archeo-Astronomy in SW Colorado and the Four Corners area.

May 21: Observational Astronomy class at Houge Park 8:00pm

May 28: Riverside Telescope Makers Conference. No other activity planned.

Jun 4: Star Party at H. Coe. Sset 8:23. 15% moon, rises 3:24 am.

Jun 11: Star Party at Fremont Peak. Sset 8:25, 8% moon. Mset 10:17 pm (= ast. twilight). Also Pub star Party at Grant Ranch county Park.

Jun 17: Star Party at Houge Park. Sset 8:30, 65% moon, Mset 1:51 am

Jun 18: Observational Astronomy Class at Houge Park, 8:00 pm.

Jun 21: Summer begins at 7:50 am

Jun 25: General Meeting 8:00 pm at the Milpitas Library. Board of Dir. Mtg. at 6:15pm. Speaker will be Mike Rushford speaking about his remote solar telescope and "Eye on the Sky" Bulletin Board System.

collimation given to us by Dave Smith. This is reprinted with permission and will be a series ending with taking apart and cleaning, a Schmidt-Cassegrain. This should be interesting reading; scary, but maybe it can save you some money.

The speaker at the May 14th general meeting will be Jeff Buell of the Peninsula Astronomical Society. Jeff will be speaking on Archeo-astronomy in South West Colorado and the Four Corners region.

Last month we heard Denni Medlock, President of Group 70, talk about the status, plans and future of the

1.8 meter Large Amateur Telescope project. The location of the shop has changed, work on polishing the glass has started and a large amount of planning has begun. What the group needs most is financing and how to use the instrument when it, the observatory and the project are completed. Any one who has a proposal on this subject write to Denni or Group 70. Jim Van Nuland can give you the correct address.

Next month, June 25th, We have Mike Rushford from Livermore coming to talk about his remote solar telescope and "Eye on the Sky" Bulletin Board which has a ton of graphics, plus several conference rooms - including Group 70. I've heard Mike talk at the CCD Symposium given by the AANC about this subject. It is very interesting. Come hear him.

There continues to be discussions where the SJAA annual picnic should be held. If you have any ideas please contact your SJAA President. The picnic will be held either in July or August.

Group 70 1.8 Meter Large Amateur Telescope Project

Speaker: Denni Medlock
member, SJAA and Group 70

Denni reviewed the history of Group 70, starting with the advertisement of a 70 inch mirror blank in Sky & Telescope magazine in August, 1988. Fund-raising for the initial purchase, \$25,000, took only a week! Paperwork was filed to incorporate as a non-profit organization with the name "Group 70" prior to actual examination of the glass, which turned out to be 72 inches in diameter.

Continued on Page 2 - Column 3

Double, Triple, and Multiple Stars

by Patrick M. Donnelly

This is the time of year, when most amateur astronomers are spending their time observing the ultimate multiple stars, the galaxies. I must admit that I have been overcome with "galaxy fever" on a few occasions; pondering who could be looking back at me across the depths of inter-galactic space. Then I realize that I won't be born for millions of years yet for an observer on M65 or M86. However, galaxies in general are dim, and it takes a moonless night to see them. What do you do when the moon is out?

Fortunately, there are in the springtime skies plenty of bright double and multiple stars to explore until the moon sets. Here are just a few to examine. Begin with Castor in Gemini. Castor has been described before in detail. However, it is so pretty that one should examine it about once a month. Next to Gemini is Cancer and it contains two very nice doubles. Zeta Canceri is a pair of 5.5 magnitude stars separated by about 6". If you have a large telescope and good seeing, the A - component is a very close 0.9" pair of magnitude 5.6 and 6.0. However, for fun and visual satisfaction try Iota Canceri. It consists of a magnitude 4.5 and magnitude 6.5 pair separated by about 30". The intense yellow and blue color to the pair would make it all but an identical twin to Alberio.

Above Iota Canceri in Lynx is 38-Lynx. This star is a fine triple with the A and B components of magnitudes 4 and 6.5, respectively, separated by a close 3". There is also a magnitude 11 C component about 88" from the others. It's a fine sight. If the moon is too bright for 38-Lynx, go over to 12-Lynx. It is a true triple system. The magnitudes are 5.5, 6 and 7.5. The first two are separated by a very close 1.8", and the first and third by 8.5". It is a very pretty trio under high power. I've observed this trio many times. Just east of Lynx is Ursa Major. It has many remarkable double stars, but three of them stand out. Check out Mizar (Zeta Ursa Majoris) first. It's a 2.5 and 4.0 magnitude pair separated by 15". It's easy to

resolve in almost any telescope and along with nearby Alcor the sight of the trio is made. Besides Mizar there are two other notable bright doubles Xi and Nu Ursa Majoris. They are located down around +30° declination. Nu is a rather easy double consisting of a magnitude 4.0 primary and a magnitude 10 secondary separated by about 7". Just below Nu is the more difficult, Xi Ursa Majoris. Xi is a true binary system with a period of 60 years. It is fun to watch because the position angle and separation change quickly from year to year. Right now the magnitude 4.5 and 5 pair is separated by about 1.3" and the P.A. is about 60°. A good project would be to continue to observe Xi each year. One only needs one good night a year to note the separation and position angle. Xi is closing right now, so one would be smart to observe it before its components are too close to observe.

After Ursa Major observe Gamma Leonis. It is one of the finest doubles in the sky. It consists of a magnitude 2.5 and 3.5 pair separated by about 5". It makes a very pretty sight in any telescope, and to me it seems like my idea of how a double star would appear. Move down now to Virgo. In Virgo there are two splendid doubles, Gamma Virginis and Theta Virginis. Gamma Virginis, like Gamma Leonis, is a true double system with a period of 171 years. The system consists of a pair of 3.5 magnitude stars separated by about 5". Observe this pair now, because by the year 2008 the separation will be under 1" and impossible to resolve. The other star in Virgo is Theta Virginis. It is a triple star with a 4.5 magnitude primary. The other components are magnitudes 9 and 10 and separated by 7" and 71", respectively. This triple is fairly easy to resolve.

The final double to observe is the double that I show to people, who want to see a double star. I show them Cor Caroli, Alpha Canes Venatici. Cor Caroli consists of a magnitude 3 primary and a magnitude 5.5 secondary separated by 20". Just about any telescope under almost all seeing conditions will resolve this pair. Even three year old children can see this pair. That's why I pick it.

Group 70

Continued from page 1

She recounted the trials and tribulations of getting the blank back into the USA after 50 years in Tasmania.

The surface was molded with an f/2 curve, as the mirror was originally a backup for the 72 inch primary of the great 48 inch Schmidt at Palomar Mountain. It was made by Corning in 1938.

A shop was rented, a grinding machine designed and built, and a lifting system designed and tested. Soon the back of the blank was ground flat, the sides were smoothed to remove the mold marks and make it circular. The face has been flattened to f/3.8, and is now ready for polishing. This should begin within a few weeks.

Group 70 has about 120 members all over the USA, with an unexplained 10% of them in Massachusetts! A recent anonymous donation from the east coast will cover the cost of fabricating the tube assembly. Happily, one of the members owns a steel fabricating company, and is donating use of his shop. This is the same shop that repaired the Bay Bridge after the 1989 earthquake, over which the blank had passed only six days before!

Group-70 is open to the eventual location of the scope, but very serious consideration is being given to Lick Observatory. Lick would get a fraction of the telescope time, but will have the complete infrastructure already in place. The scope will be capable of remote control and down-link of the images.

Collimation

Continued from Page 3

primary mirror appears to be darkening first. With experience you will learn how to rake in or out your focuser to cause your primary mirror to darken as uniformly as it can. Once you have accomplished this, leave the focuser alone and adjust, instead, the alignment of your primary mirror or secondary mirror until this Foucault test gives a uniformly darkened image of your primary. By the way, this is an excellent test for the quality of your optics as well.

Optics Collimation by Craig Willford

The collimation of the optics of your telescope is as important to its enjoyment as any other factor. We will discuss three different types of telescopes in this article on collimation of alignment of the optics.

1. Refractors: The first is the refractor. This scope will give the worst images of the three scopes if not aligned because the color aberrations will be noticeable even to the untrained eye. Luckily, the lens is usually mounted in a cell which does not need to float as do the reflective mirrors in their supports and thus it is very unlikely to fall out of alignment.

How do you tell if yours is out? Generally the center of the field should be the least "colorful" area of the field with the "prism" effect becoming more pronounced near the edges. If the least colorful is not in the center, then your lense is "out". In order to perform this test, look at a fairly bright star nearly overhead (this will eliminate color refraction from the earth's atmosphere which might deceive you into thinking that your optics are "out".) then shift the star around in the field of your eyepiece. If you have different quality eyepieces, use the best so that you won't wrongfully attribute the color to the objective rather than the eyepiece where the blame may lie. By shifting the image from the center radially to the edges you ought to be able to determine where the color is least offensive. Unfortunately this article is in black and white so no illustrations are useful. If the objective is out of alignment, make very minor adjustments in the screws on the cell (if any) until the image is best. Another method would be a prime focus Foucault knife test as described below.

2. Catadioptrics: The second system to be discussed is the catadioptric system, ie. one which uses both mirror and transmission lens. These come in so many types that to list them alone would be beyond the scope of this article. The most commonly owned system is the Schmidt-Cassegrain. Here a spherical mirror works in conjunction with an aspheric transmission lens and a convex hyperbolic secondary mirror. The

first, being spherical, is relatively forgiving on alignment (and is usually not adjustable by the user anyway). The second is usually mounted in a cell as was the lens in the refractor and so usually doesn't fall out of alignment (and again usually isn't user serviceable). The last is highly sensitive to misalignment and is user serviceable.

The following directions and illustrations are those of Celestron International:

After your scope achieves thermal equilibrium, aim at a bright star near the Zenith and defocus your 25 mm eyepiece so that the light source blurs to about 1/3 of the field of view. If the shadow of the secondary mirror is not perfectly in the center of the star's blur of light then your scope is out. To adjust your collimation, use the edge of field in the direction that the shadow is off center. Then using the three Allen screws at the edge of the secondary housing, bring the blur circle back to the center. Tighten the screw(s) in the direction that the shadow is off center and loosen the other(s).

Tighten finger tight only! Repeat this process until the blur circle is again at the center of the field and center of the light source. Then repeat the process using high power in focus using the Airy Disk (fine concentric circles) with its first diffraction ring instead of the shadow of the secondary.

3. Newtonian: The last system to be discussed is that of the Newtonian. This system goes out of alignment so easily that it ought to be checked after each drive to a star party. The reason for this is that the mirror floats on a support to minimize or eliminate the flexion that the larger refractors suffer. There are two mirrors which require alignment: The parabolic and the secondary flat. In order to check general alignment, remove the eyepiece holder and view down the holder into the secondary mirror. If this secondary mirror is not properly aligned, you will see more of one side of your tube than the other and your primary mirror will not be centered in the field. (see Figure 4.4). To correct this, simply adjust the set screws on the secondary mirror until that view is a view of your primary mirror. (see Figure 4.5).

Now, while still viewing down the eyepiece holder, see whether the reflected image in the primary gives a centered view back up the tube showing the secondary and its spider and beyond. If your view does not look like Figure 4.6, then adjust the set screws on the back of the primary mirror cell until the view looks extremely centered.

Depending on the focal ratio of your Newtonian, you will have different quantities of coma when viewing the stars with a wide field eyepiece at low power. The Richest Field telescopes are notorious for this and it is one of the detriments that one must suffer for the advantages provided by a Richest Field. If your telescope is relatively aligned, the image you see should have any coma that is detectable at the edges while stars are pinpoints at the center. If your image at low power looks like pinpoint images on one edge or non existent and extreme coma appears to be centered around some location not at the center of the field, then your optics need alignment.

Perhaps the most effective test for optical alignment would be the Foucault test. Although this test requires a small piece of equipment, you can manufacture it. It requires some experience in interpretation of the results you get. Basically construct a sharp edge which is straight and opaque and mount the edge across a piece of tubing which can be slid into your eyepiece holder so that it blocks off the light from one half of the tubing allowing light to flow through the other half. Your edge should cut the exact center of this tubing. Now slide your tester into the eyepiece holder and point the scope at a bright star overhead (what better source of parallel light could there be). With your eye close to the edge, move the telescope back and forth through one axis only (declination or right ascension) so that the star's light is exposed, then blocked, and then exposed. Rotate the knife edge so that it is perpendicular to the direction of motion of the star's light. Then repeat the motion of your scope with your slow motion controls and with your eye close to the edge, determine which side of your

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A Note from Bill Dellenges

Hil Thought I'd drop a note to let you know how I'm doing down here in Phoenix.

I've been here since last April, so I've seen a summer and winter go by. The summer here was like living in a 350°F oven. There were 74 consecutive days when the temperature was over 100°F: The winter saw the days cool off to 60°F or so, but the nights were just as cold as the bay area. Somehow I saw myself observing the winter sky here in a bathing suit.

There are several astronomy clubs here (as Phoenix has a population of 2 million). I've joined the "East Valley Astronomy Club". They number about 50. Enclosed is one of their newsletter [given to Jim Van Nuland].

Laura and I are having a house built in Apache Junction, a town of 18 thousand, about 35 miles east of downtown Phoenix. The sky is fairly dark overhead and to the east. The house is framed and the roof is on as of this date. It should be done in another two months, we hope, then I can start figuring out where to build my observatory! We have 1-1/4 acres and I'd like to build a roll-off roof setup for my old C-14. There are no street lights in our area and this arrangement would fulfill a life long dream to observe from the comfort of my backyard.

I miss the "old gang" at the SJAA, family and other friends. But Laura and I want to give Arizona and the desert life a chance to work its magic on us after 50 years in the bay area.

I'll send our new home address to you when they finish the house, at which time we would welcome a visit from you all (not all at once!!!).

Best regards,

Bill and Laura Dellenges

School Star Party by David R. Smith

To:
Jim.Van.Nuland@f11.n143z1.FIDONET.ORG
Date: Fri, 18 Mar 1994 14:42:14 -0800

Jim,

I thought you (and maybe Bob Madden) would like to know that I made a presentation on astronomy in the combined third grade classes at Challenger School yesterday morning, 3/17. I first talked about the size of the solar system and the universe, then narrated a slide show which toured the Earth, Moon, Sun, and all the other planets, as well as Comets West and Halley, and asteroid Gaspra. I ended with some deep space objects including star birth nebulae (Orion, Trifid), other diffuse nebulae (North American, Horsehead), star death nebulae (Ring, Dumbbell, and Crab); the Double Cluster, Omega Centauri, the Milky Way, Andromeda Galaxy, and M101. The kids are really jazzed about the Hogue Park Star Party tonight.

In the scale-of-space part, I started with the Sun 8 ft. in diameter, which is as high as I can reach with my fingertips. Jupiter is a basketball, Saturn is a soccer ball, Uranus and Neptune are grapefruits, and the other planets are appropriately sized marbles and balls of clay. At that scale, the inner three planets are one, two, and three football fields away. The other planets were at various street intersections, relative to the school's position. Pluto was almost to the San Jose airport.

Shrinking down Pluto's orbit to match the mouth of a teacup I brought (95mm), the Milky Way spans from here almost to Tokyo. Some of the kids have travelled that far, and know how big that is. Finally, I shrunk the Milky Way into the teacup and placed some of the farthest known galaxies at the distance of K-Mart.

Donations by Paul Barton

Loaner Program:
25 mm Kellner eyepiece
Jack Petersen
1-1/4" Nebula filter
Stan Webster
1-1/4" 4 mm Ortho eyepiece
Stan Webster
1-1/4" 12-1/2 mm Ortho eyepiece
Stan Webster
Polished mirror and tool
John Hata
(plan to make a solar telescope from this mirror)

There have been many other donations in the past 2 years or so and they have helped tremendously. Typically a telescope is received (perhaps from an estate), in various stages of disrepair or construction. Usually eyepieces and/or finders are needed.

SJAA now has 14 useable telescopes to loan to members. We still are looking for a qualified and experienced operator for the C-11, now in my (Paul Barton) possession.

It is planned to purchase more eyepieces at the Auction/Swap.

Del Johnson came through San Jose on his way to South Africa with the Peace Corps. He would have taken his 8" newtonian which is in the loan pool, but it was "out" and could not be recovered soon enough.

The C-11 has had difficulty "stuttering" without moving, there by losing its Polar calibration/alignment. It now seems to be "ok". The RA motor is hung between two pivots, which had become loose.

The 12-1/2" Dobson is expected to be on long term loan to Tom Rice at the end of April. Number 8, a 14" Dobson requires a procedure sheet for set-up. So Lee Courtney made a beautiful procedure sheet and even supplied a disk for it. Thanks Lee.

From: Jim.Van.Nuland@f11.n143z1.FIDONET.ORG
(Jim Van Nuland)
Subject: Astrology / Astronomy
To: bob_-_madden@cup.portal.com

Bob, here's a cute article that was posted on FidoNet's Astronomy echo. You might put it away for a partly-blank page some time.

BBS: Data Port BBS
Date: 02-25-94 (08:10) Number: 278
From: TOM EZELL Refer#: 238
To: JEAN PIGNAL Recvd: NO
Subj: Re: ASTROLOGY
Conf: (3) Astronomy

I thought the USENET's Oracle had a pretty good handle on things:

"Oh Mighty Oracle, at whose footsteps the Woodchucks do tremble; please tell us, when we joined the Astronomy Club we thought we were joining the Astrology Club. What's the difference?"

Thus spake the Oracle:

Your confusion is shared by a great many other people, and I wish I knew where it started. The fact is that, contrary to popular myth, there is absolutely no difference: astronomy and astrology are the same thing. Essentially these are variant spellings for the same science.

Oh, there are a few minor differences in terminology, emphasis, and in the lifestyles of the devotees of these two branches of astro-science, but these are completely insignificant compared with the wide-spread theoretical agreement on all major questions concerning astrophysics, celestial mechanics, and propitious influences. Sure, professional astronomers sometimes tease their astrological brethren (in good humor, of course) in popular magazines, but this is an in-joke. I can assure you that astronomers really respect their astrological colleagues, and when they're up for tenure they consult their horoscopes just as avidly as anyone else.

Still, the following may help you tell them apart at scientific meetings.

First, though the ASTRO in both astrology and astronomy comes from the Greek word for the stars, astronomers study the stars, while astrologers are studied by the stars (Shirley McClaine, Nancy Reagan, etc).

Second, astronomy is actually a pseudo-science: the NOM in astroNOMy comes from the city in northern Alaska that astronomers love for its long, cold, nights. These brainy nerds go to lush, tropical Hawaii to huddle on frigid mountaintops, bags under their eyes, gasping for air, and squint through telescopes. The LOGY in astroLOGY, on the other hand, tells you astrologers are logy-cal. While the astronomers shiver on mountaintops, down below the astrologers are on the beach at Waikiki, slathered with sun screen, downing Singapore Slings and purple chicken poo-poo, and calling their brokers on cellular phones. So which group do you think has the brains of a higher mammal?

Astrologers tell you how to attain wealth, power, and the sexual favours of "that special person". Astronomers think it's a big deal if they can tell you when the moon will rise. Half of the time they're lucky to defrost, while the astrologers are cuddled by a warm modem with "that special person", monitoring their real estate investments.

Finally, astrologers reach the public through the newspapers and mass circulation magazines; astronomers get an hour a year on "Nova" to explain their crazy theories.

I hope this enables you to tell them apart, and I think you can see that astrology is just indoor astronomy without all the hassle and frozen extremities, and with a more practical bent, just like cosmology and cosmetology are essentially the same thing, though the one focuses more on where we've been, and the other on where we're going Saturday night."

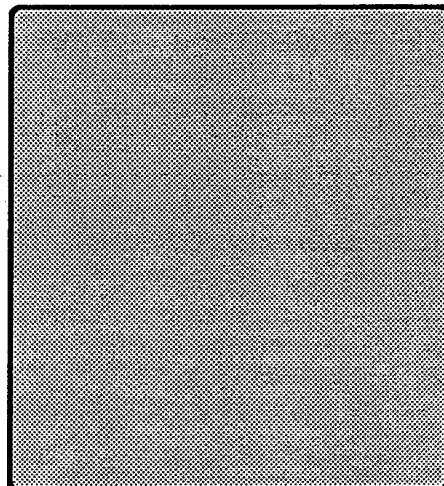
Shoemaker-Levy Predictions by Rich Neuschaefer

Here is a list of the SL9/Jupiter times, from a posting by Jerry Groninger (Anaheim) on the RIME astronomy echo. His list had an incorrect adjustment for PDT, which I've fixed here. Happily for our Arizona member, the same time zone applies. (Hi, Pete)

Nucleus	Universal day	local time PDT
21	16	12:26 pm
20	16	07:38 pm
19	16	11:29 pm
18	17	04:31 am
17	17	07:38 am
16	17	05:29 pm
15	18	12:12 am
14	18	11:43 am
12	19	03:05 am
11	19	02:22 pm
09	20	02:50 am
08	20	07:38 am
07	21	12:12 pm
06	20	11:43 pm
05	21	07:38 am
04	21	11:00 am
03	21	02:07 pm
02	21	09:19 pm
01	22	12:41 pm

The 1-sigma uncertainty is 0.03 days, approximately 43 minutes.

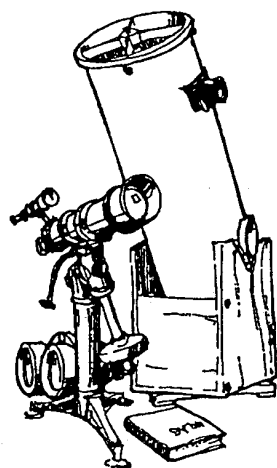
[this table has been condensed - universal time has been deleted. By the way Rich, what has happened to number 10? - Ed.]



1994 SJAA Calendar

General Meeting		Houge Park Star Party	Observational Astronomy Class
May	14	13	21
June	25	17	18
July	23	15	16
Aug	13?	Picnic at FP SP	

Please read your *Ephemeris* each month for changes



Telescope Loaner Status by Paul Barton

SJAA no.	Name	User	Due
1	4-1/2" Newt/P mou	----->	available
2	6" Dobson	Rick Raw	5/22/94
3	4" Quantum	Bill Cook	5/30/94
5	60mm Refractor	Jim Marquis	3/26/94
6	C-8 Celestron	Ben Lee	5/24/94
7	12-1/2" Dobson	John Schoenenberger	4/22/94
8	14" Dobson	David Smith	5/29/94
9	C-11 Celestron	Paul Barton	*****
14	6" Newt/P mount	Sridhar Lakshmikanthan	3/29/94
15	8" Dobson	Lee Courtney	5/27/94
18	8" Newt/P Mount	Ken St George	5/20/94
19	6" Newt/P Mount	Chung-Lin Lee	4/6/94
20	4-1/4" Dobson	Kristen Smith	5/29/94
21	10" Dobson	Jim Marquis	5/15/94

Solar telescope (#16). Available only to experienced members for special occasions such as day time public star parties, etc. Call.
(on waiting list)

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

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CELESTIAL CALENDAR

May 1994

Lunar Phases	Date	Rise	Tran	Set
LQ 07:33hr	02-5	0148	0718	1253
NM 10:08hr	10-5	0559	1309	2024
FQ 05:49hr	18-5	1310	1942	0132
FM 20:39hr	25-5	2114	0117	0623

Nearer Planets

Mercury	07-5	0628	1339	2050
-2.1 AU	17-5	0653	1420	2149
Mag -1.8	27-5	0713	1443	2214

Venus	07-5	0734	1456	2219
-4.2 AU	17-5	0742	1510	2237
Mag -4.1	27-5	0755	1523	2251

Mars	07-5	0451	1113	1736
0.90 AU	17-5	0431	1102	1734
Mag 0.9	27-5	0411	1051	1731

Jupiter	07-5	1909	0036	0558
4.46 AU	17-5	1824	2347	0515
Mag -2.5	27-5	1740	2304	0432

Saturn	07-5	0323	0858	1433
9.94 AU	17-5	0245	0821	1357
Mag 1.10	27-5	0207	0743	1320

SOL	Star	Type	G2	V	Mag	-	26.72
RA	DEC						
0300	1703	07-5	0605	1304	2004		
0339	1931	17-5	0556	1304	2012		
0419	2126	27-5	0550	1305	2020		

Astronomical Twilight	Dawn	Dusk
JD 2,449,480.5	07-5	0426 - 2143
,490.5	17-5	0413 - 2156
,500.5	27-5	0402 - 2208

Sidereal Time

Transit Right	07-5	0000	PDT=1355
Ascension at	17-5	0000	PDT=1434
Local Midnight	27-5	0000	PDT=1513

Darkest	Saturday Night	May 7
Sunset		2004
Twilight End		2143
Moon Set		1738
Dawn next morning		0450

TIMES AND DATES ARE PACIFIC DAYLIGHT

Times are Local Civil
Planet distance and Magnitude
for 17th of month
Derivation of these values are from
*Astronomy with Your Personal
Computer*
by Peter Duffet-Smith
MacEphem
by Elwood Charles Downey

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Dir: Gene Cisneros-	408-923-6800
Dir: Paul Barton-	408-377-0148
Dir: Bob Madden-	408-264-4488
Dir. Bill O' Shaughnessy	408-984-3985
Dir: Jack Zeiders -	408-281-0220

Ephemeris Contributors

Don Machholtz -	916-346-8963
Paul Barton -	408-377-0148
Pat Donnelly -	408-778-2741
Jim Van Vulaud -	408-371-1307
David Smith -	408-978-5503

Editor

Bob Madden -	408-264-4488
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Distribution

Bob Madden and Paul Barton

Comet Comments

by Don Machholtz

Several comets remain visible in our skies. Meanwhile, a new Comet Mueller and a new Comet Shoemaker-Levy has been discovered.

Comet Mueller (1994c): Jean Mueller discovered this comet on plates exposer during the course of the Second Palomar survey. Found on March 10 at magnitude 17, the comet was closest to the sun at 1.8 AU in early December 1993. It is getting dimmer.

Comet Shoemaker-Levy (1994d): On March 23, Carolyn Shoemaker reported her discovery of a new comet on plates exposed on March 14 by herself, David Levy and D. Williams. A preliminary orbit suggests that the comet will be closest to the sun at 1.16 AU in late May, but it is pulling away from the earth and getting fainter. It is now at magnitude 14.

This issue of Comet Comments is available via electronic mail. You can download it by calling Kingmont Observatory BBS at (916) 652-5920. Request file cc189.TXT. It is in Section 1.

EPHEMERIDES

PERIODIC COMET TEMPEL 2

DATE (00UT)	R.A. (2000) DEC	EL	SKY	MAG
04-23	00h03.6m -05d13'	34d	M	11.4
04-28	00h17.7m -04d06'	36d	M	11.5
05-03	00h31.6m -03d02'	37d	M	11.6
05-08	00h45.2m -01d58'	38d	M	11.7
05-13	00h58.5m -00d57'	40d	M	11.8
05-18	01h11.6m +00d02'	41d	M	11.9
05-23	01h24.4m +00d58'	42d	M	12.0
05-28	01h37.0m +01d52'	44d	M	12.2
06-02	01h49.2m +02d42'	46d	M	12.3
06-07	02h01.2m +03d29'	47d	M	12.5

PERIODIC COMET TEMPEL 1

DATE (00UT)	R.A. (2000) DEC	EL	SKY	MAG
04-23	13h09.2m +12d10'	152d	E	9.7
04-28	13h05.3m +11d34'	148d	E	9.5
05-03	13h02.0m +10d46'	144d	E	9.4
05-08	12h59.5m +09d45'	140d	E	9.3
05-13	12h57.8m +08d33'	136d	E	9.2
05-18	12h57.2m +07d11'	132d	E	9.1
05-23	12h57.6m +05d40'	128d	E	9.0
05-28	12h59.0m +04d00'	125d	E	8.9
06-02	13h01.7m +02d15'	122d	E	8.9
06-07	13h05.3m +00d23'	119d	E	8.9

COMET MUELLER (1993a)

DATE (00UT)	R.A. (2000) DEC	EL	SKY	MAG
04-23	23h03.0m -03d49'	47d	M	10.4
04-28	23h05.2m -04d52'	52d	M	10.4
05-03	23h07.1m -05d59'	57d	M	10.4
05-08	23h08.6m -07d12'	62d	M	10.4
05-13	23h09.8m -08d31'	67d	M	10.4
05-18	23h10.5m -09d57'	72d	M	10.5
05-23	23h10.7m -11d31'	78d	M	10.5
05-28	23h10.3m -13d14'	83d	M	10.5
06-02	23h09.3m -15d06'	89d	M	10.5
06-07	23h07.6m -17d09'	95d	M	10.5

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PERIODIC COMET SHOEMAKER-LEVY (1993e)

DATE (00UT)	R.A. (2000) DEC	EL	SKY	MAG
04-23	14h26.9m -14d54'	174d	M	13.5
04-28	14h24.6m -14d40'	179d	M	13.5
05-03	14h22.4m -14d26'	176d	E	13.5
05-08	14h20.2m -14d12'	170d	E	13.5
05-13	14h18.1m -13d58'	165d	E	13.5
05-18	14h16.2m -13d44'	160d	E	13.5
05-23	14h14.4m -13d31'	154d	E	13.6
05-28	14h12.8m -13d19'	149d	E	13.6
06-02	14h11.4m -13d08'	144d	E	13.6
06-07	14h10.3m -12d57'	139d	E	13.6

COMET McNAUGHT-RUSSELL (1993V)

DATE (00UT)	R.A. (2000) DEC	EL	SKY	MAG
04-23	06h29.9m +63d43'	69d	E	7.2
04-28	07h14.1m +69d44'	71d	E	7.6
05-03	08h11.5m +73d49'	73d	E	8.0
05-08	09h22.5m +76d06'	75d	E	8.4
05-13	09h36.4m +76d43'	77d	E	8.8
05-18	11h41.2m +76d04'	78d	E	9.2
05-23	12h31.6m +74d37'	79d	E	9.5
05-28	13h09.0m +72d43'	81d	E	9.9
06-02	13h37.0m +70d36'	82d	E	10.2
06-07	13h58.6m +68d22'	83d	E	10.5

COMET MUELLER (1993p)

DATE (00UT)	R.A. (2000) DEC	EL	SKY	MAG
04-23	03h31.0m -49d01'	65d	E	6.9
04-28	04h27.0m -49d42'	70d	E	6.9
05-03	05h29.4m -48d33'	74d	E	7.0
05-08	06h30.7m -45d17'	79d	E	7.1
05-13	07h24.5m -40d19'	82d	E	7.3
05-18	08h08.4m -34d32'	84d	E	7.6
05-23	08h43.2m -28d46'	85d	E	7.9
05-28	09h10.8m -23d31'	84d	E	8.3
06-02	09h33.1m -18d58'	82d	E	8.7
06-07	09h51.5m -15d09'	81d	E	9.0

Don Machholz (916) 346-8963

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