SJAA EPHEMERIS

VOLUME 6 NUMBER 9 OFFICIAL PUBLICATION OF THE SAN JOSE ASTRONOMICAL ASSOCIATION September 1995

The Eyepiece
by Bob Madden

All is quite on the Western Front. Reports from Rich Neuschaefer about Fremont Peak were sketchy. Some nice telescopes mentioned. The fog did not come in so the viewing was less than excellent. Paul Barton was there and mentioned the "no see-ums" eating him up. That is a hazard at the Peak in the summer; the deer flies. A solution is the use of some "bug-off" (Skin so Soft, DEET, Cutters, etc), but allows the opportunity of some of it getting onto your optics. Here is another thing to try (if you can stand it) reported from Alaska on the internet; pin a sheet of Bounce (the smelly kind) to your shirt collar. I haven't tried it yet, but intend to on my fishing trip to Canada. If anyone tries this suggestion please let me know the results. Skin so Soft is reported to be excellent also. It is distributed through Avon.

We are working diligently this month to publish the Ephemeris early because of vacation plans. Everything is falling into place and it should be finished before vacation time.

The US Postal Service is implementing new rules governing non-profit organizations beginning in October. Actually they were postponed from September of last year, We have submitted a copy of our newsletter for review and beginning in October I have been advised we will not be allowed to have an Astro Ad column. As I understand it announcements for the benefit of all the members will be allowed and not sale items (for example, individual sale of equipment benefits the buyer and seller only). I will continue to question this ruling for a re-reading up until its implementation. Every thing else generally passed muster.

There is quite a lot of activity going on within our association these days; tepescope making, CCD, public star parties, internet and much more. Come to our General meetings and find out. You may meet someone who can help you in your endevor.

Sept 1: Houge Park Public Star Party, Sset 7:37 pm, 48% moon, Mset 11:53 pm.
Sept 2: No activity, 1st Qtr moon
Sept 9: General Meeting 8:00 pm, preceeded by Board Mtg at 6:00 pssm. This is our annual Slide/Equipment night. Bring your favorite project and show it to the group.
Sept 16: Observational Astronomy Class at Houge Park, 8:00 pm.
Sept 23: 3 Star parties: H Coe, Fremont Peak. Sset 7:02 pm, No moon, also, Halls Valley's public star party at Grant Ranch County Park.
Sept 29: Star Party, Houge Park, second this month, Sset 6:54 pm, 34% moon, Mset 10:44 pm.
Oct 7: No activity, full moon.
Oct14: General Meeting 8:00 pm, preceeded by Board Mtg at 6:15 pm.
Oct 21: Observational astronomy class will meet at Fremont Peak, at the 30 inch telescope.
Oct 21: Star parties at Coe and the Peak, also HVAG's at Ranch,Sset 6:22 pm, 5% moon rises 5:42 am.
Oct 27: Houge park star party, Sset 6:16 pm, 21% moon sets 9:36 pm.
Oct 28: 32% moon, too much for a star party.
October General Meeting will be a dinner at the King's Table (Hamilton/Bascom) to celebrate the SJAA's 40th year. Call Bob Madden 264-4488.
If there isn't an active response, this activity will be cancelled

The Ephemeris is published by
The San Jose Astronomical Association
5380 Pebbletree Way
San Jose, Ca 95111-1846

Forty Years Ago this month
by Jim Van Nuland

The September meeting at San Jose State was called to order by President Walt Krumm. Leading off was Steve Bieda, with a short review of the more interesting papers from the recent convention at Yosemite. He was followed by Bob Cunningham, Miss Margaret Krumm, and Walt.

Dr. Geisler presented the constellations of the month, Pegasus and Andromeda. He pointed out many features, including the mythology, location, nebulae, clusters, etc. His discourse on Andromeda was particularly interesting.

Walt Krumm completed his series of talks on telescope mountings, giving us specific details on the best ways to make a tripod. These talks have been very informative, and are greatly appreciated by all members.

The meeting adjourned at 9:45 pm. Most met in Columbus Park afterward and enjoyed an hour of good seeing through the three scopes present.

Tom Nelson, Secretary

MOONWATCH
by Don Watson

The article on Tracking Mir/ Atlantis in the August SJAA Ephemeris got me to reminiscing about the early days of Satellite tracking.

Back before 1960 I was living in Cincinnati, Ohio and was member of the Cincinnati Astronomical Society. I was working in the "Investigations" department of GE at the time for astronomer Dr. Herb Grosch. This department was the computer programming department for GE's Jet Engine division. They had started out with an IBM 701, and had progressed through the 704 and 709 to the 7090/94.

When we had all been caught flat-footed by the launch of the first Russian satellite, the amateur astronomers were asked to form teams to monitor the skies and keep track of the satellites that were up there. These teams were called "Moonwatch" teams presumably because we were tracking the artificial moons that were being put up. The basic equipment consisted of a wide field telescope roughly the equivalent of half of a 7x50 binocular which was mounted on a small table. Several of these tables were lined up in a row so they would stand a good chance of catching the satellites as they went overhead. (Hopefully, you would have WWV on a radio near by to give accurate times for the transits.) The observations were then turned into a central collection point for processing.

Fortunately for our Moonwatch team there was in one of the local high schools a very bright student, Tom van Flandern, that was really "into" celestial mechanics. (He later got his PhD in Astronomy.) He wrote a Fortran program to track satellites and we managed to get him on board at GE as a summer student. I helped him with his Fortran programming and got him a few hours a week to run off prediction for our observing site. (Tracksat runs off the equivalent predictions in a minute or so on my PC.)

The Cincinnati Astronomical Society had a site out in the country with a 16 or 18 in. Newtonian, a clark refractor (think), and some others. With the aid of the program, we could st up the Newtonian and catch the smaller satellites as they went over.

There was considerable competition with a group in Southern California that had a similar program running on computers at one of the aerospace companies. They often beat us out for the highest number of observations turned in, mainly, I think because they had better weather.

On one of my more interesting evenings at the Newtonian I managed to get two passages of a small satellite that had been classified as lost. However when I got back with my prize catch I had to admit that I had somehow managed to miss a good passage of the brightest satellite up at the time.

My memory is a bit fuzzy about the timing, but I think it was when this operation was wrapped up that we received a very detailed small silver pin showing a row of observers setting at their tables.

Henry Coe State Park
by Jim Van Nuland

The July 22 star party at Henry Coe State Park was a success. The grader and back-hoe have been removed, but the water tanks remain. The flip side is that they block some of the stray light.

We had a good turnout, about 10 people, I think, with my 8 inch and Bill O'Shaughnessy's 8 inch the largest apertures. Ken Miura brought the longest scope, his 6 inch f/15 refractor, giving good views of Jupiter. There were a few campers that joined us at dusk, having come by earlier in the day. Jay Freeman came up for a little while. It has been some time since he's been at Coe.

By dark, the temp was down to 56 degrees, but a nasty wind made it seem much colder! Quite a change from 95 when I arrived. I switched to my heavy coat, the one that I bought for Decembers at Coe. With the wind shaking the scopes, it was hard to use high power. But the air was clear, and most of the show objects, M4, M22, M24, M11 were excellent in the moments of stability. Jupiter and Saturn showed only moderately well, the air having gone soft, even when the wind let up for a moment.

Early on, I noted that the south-east quadrant of Jupiter seemed rather dark, but this was not pursued, unfortunately. It may have been residue of Comet Shoemaker-Levy 9 from a year ago. Perhaps others observed it too?

The highlight of the night was the search and finding of Comet 6P/ d'Arrest, predicted at magnitude 9 but seemingly much fainter. After some running back and forth between the two 8 inch scopes, we decided that we were looking at the same stars, and that there was a faint, faint fuzzy there, adjacent to a small "keystone" of faint stars. Watching for motion can fool the eye, so I went off and looked at other things for a while. Bill had already left when I returned to the keystone 1.5 hours later — and the fuzzy was now inside the keystone! The next day, calculations verified the motion at 2.3 arc-minutes per hour, to the south-east, just as seen in the scope.

The wind eventually stopped, and I sought meteors for a little while. There were a few nice ones, but my eyes were tired, and I sacked out about 2 a.m. All in all, a good outing! I hope the Peak was not so windy.

Astronomical Humour
by Bob Brauer

Here's a couple of lightly humorous quotes from Isaac Asimov.

What with one thing and another, I've gotten used to explaining various subtle puzzles that arise in connection with the scientific view of the universe. For instance, I have disposed of the matter in which electrons and photons can be waves part of the time and particles the rest of the time in a dozen different ways and by use of a dozen different analogies.

I've gotten so good at it, in fact, that at dinner parties the word nervously goes about, "For heaven's sake, don't ask Asimov anything about wave-particle duality."

And no one ever does. I sit there all primed and aching to explain, and no

Continued on Page five-see Laughter

Heartbreak of Optics
by Bill Marriott

Well, you'd think that after 15 yrs, I'd know what I was doing, but.....

I'm constantly reminding my employees at the optic shop, "When working with Bk-7, be careful using heat, it is thermal sensitive...."

So, I decided to heat up my 14 lb slab of Bk-7 to mount on a aluminum tooling to slice down the middle, so I could end up with two plates, as opposed to milling down a 1.5" thick slab to make a 1/4 or 1/2 inch corrector or window.

Heated both slab and tooling on the same stove, to the same temperature, picked up the tooling to apply mounting wax, must of cooled just enough, so when I attached it to the big slab, It instantly CRACKED in half....like a knife plunged deep into my soul!!

Suddenly a picture comes to mind: Elihu Thompson had poured the big 60" fused silica blank, working with George Hale on trying to figure out how to make a 200" mirror. Someone opened the annealing oven to soon, and when they examined the disc, it was cracked!!

Supposedly, Elihu turned to A.L. Ellis and all he said was "Better Lay down another 60" disc: We have proved we could do it"

Not quite the same analogy, but I pulled myself out of the deep pit of despair, got on the phone to Glass Fab in N.Y., got our salesman on the line and asked if he had anything close to a 9" dia plate of BK-7.(I rather use fused silica, but at 6x the price, can't rationalize it.)

Low and behold, turns out they had a 11" dia x 1/2" thick plate, and a 15" dia x 1/4" thick plate, both for not much more than I paid Ohara for the big slab. So, the cracked slab goes back on the inventory shelf, where it'll become thousands of dollars worth of small optical parts, and the two plates are on there way from Glass Fab....

So, what to do now...

1) Have a 8" f5 primary ready for polishing
2) Have a 11"X1/2" blank, perfect for a optical window for a 10" mirror (I do have a 10" mirror blank sitting around"
3) Have a 15"x1/4" blank Bk-7

Obviously, the 11" could be trimed to 9", but I think that's a waste, and I should use that with the 10" mirror.

The 15" plate has some defects on the edge, but could be trimmed to 13" for use with a 12.5, but by the time its ground and polished, it'll probably be more like .200", which maybe to thin for a schmidt corrector. Besides, I promised the wife to not build anything that size till we're settled down permanently.

Would .200" be two thin for an 9" optical window (plano/plano), I know it doesn't meet the 1/20 ratio, but what would the effects be??

I'll come to some decision at some point, I'm still educating myself in design mathematics, polishing the 8' primary to perfection (hopefully), building a much more accurate knife edge tester, etc, so no hurry...

Comments welcome as always...

Bill Marriott
Forest Knolls, Ca. USA
btk@ix.netcom.com

METEOR SCATTER - the FAQs
Rev. 1, Jul 25, 1995.

0. About these FAQs

These FAQs are the result of your various questions and remarks to the monthly RMOB (Radio Meteor Observation Bulletin). Constantly amateur astronomers, radio amateurs and schools looking for new projects, get involved in observing meteors by radio methods, and need the same basic information.

0.1. Revision / posting frequency

I am sure there will be many questions and remarks to this first issue. The section with references has to be expanded considerably. And undoubtly, we will hear from existing radio setups for the first time. Rev. 2 can be expected at the end of August.

0.2. Distribution

These FAQs are posted on:
sci.astro.amateur
rec.radio.amateur.space
Compuserve's Astronomy Forum, Section 11, Radio Astronomy.

Please let me know if you feel that other newsgroup are interesting too or more appropriate.

0.3. Acknowledgement

Many thanks to Tom Ashcraft (72632.1427@compuserve.com) and other participants to Compuserve's Astronomy Forum.

1. What is meteor scatter (MS) ?

Meteor scatter is a form of electromagnetic wave propagation. The ionized trail of meteors (typically appearing between 100 km and 80 km high) acts temporarily as a reflector for radio waves. A meteor does NOT generate detectable radio emission itself!

In the case of forward scatter, the transmitter and receiver are at different locations. Backscatter can be seen as a special case, whereby the sender and receiver coincide (typically the case of radar).

Meteor scatter can be used day and night, allowing daylight meteors streams to be studied. Meteor scatter can also be used for secure communication.

Historically, meteor streams were conclusively detected by means of radar at the end of World War II.

2. How to observe MS ?

Tune to an "empty" frequency in the VHF band, and wait until a suitable oriented meteor trail reflects a distant broadcasting station. You hear a more or less short (a fraction of a second to tens of seconds) fragment of the remote broadcast. Occasionally, more than one station (together or one after the other) can be heard. Routinely, stations of 300 km to 1000 km away can be observed. The problem however in densely populated

Continued on page four - see Meteors

Meteors - continued from page three

areas can be to find a non-locally used frequency.

2.1. Which frequencies to use ?

The lower the frequency, the better... but at too low frequencies, the radio-waves bend and follow the curvature of the Earth. A lower practical limit is 40 MHz. More commonly, the VHF is suitable. VHF Band I ranges from 41 to 68 MHz, and is used for TV. The FM band (88 MHz - 108 MHz) is also used frequently. Try as low as possible in the band, and avoid free radio's in the upper band (104-108 MHz). Not to forget are beacons at e.g. 75 MHz. Radio hams listen also to MS in the 2 m (144 MHz) band. The reflections are shorter and weaker than at the lower frequencies. There is little use in trying MS at still higher frequencies.

2.2. Which equipment to use ?

A regular FM receiver is sufficient. An all-band receiver is of course better in terms of sensitivity and features such as bandwidth selection. Connect a horizontally polarized Yagi antenna with 4 to 6 elements (not too directive) to your receiver. The antenna can be pointed horizontally, or at a certain angle (the latter avoids direct reception from nearby stations). Keep the antenna feed cable short to minimize losses, or add an antenna amplifier. With a good setup, it should be easy to obtain 10 to 20 meteor reflections per hour when no stream is active (the sporadic background). During streams, this number can get as high as several hundreds. Due to the daily variation in meteor activity, more reflections are received during the morning hours (5h to 6h local time) than in the evening (18h). This can serve as a proof that you are actually observing meteors!

2.3. Always possible to observe ?

Unfortunately, other forms of propagation interfere with MS. The worst one is sporadic-E or Es, consisting of conduction clouds in the high atmosphere that make permanent reception of remote stations possible during minutes to tens of minutes. The sporadic-E season is from May to July in large parts of the northern hemisphere. In some regions however, sporadic-E is unknown!

There are also tropospheric influences. A temperature inversion can also cause reception over wider ranges than normal.

Thunderstorms cause very sharp peaks. On FM, most of these (amplitude modulated) spikes are suppressed. However, DO NOT connect your antenna to your receiver during thunderstorms or when you are absent for longer time. Lightning strikes have ruined several radio shacks.

2.4. One step further: recording meteor reflections

Meteor reflections can easily be recognized by listening. But a better measure of the shape of the reflection can be obtained in accessing the signal strength and recording it, either on a pen recorder, either feeding it into a computer via an analog/digital (A/D) convertor. Special care has to be taken to shield well the computer, power supplies etc., or the computer signal will be more or less noticed in the receiver.

Meteor reflections can broadly be divided in two classes - underdense and overdense - with different reflection profiles. These profiles can be related to the physical characteristics of the meteors.

3. Who else is observing ?

During recent years, amateurs in following countries have been recording meteor reflections: Austria, Belgium, Denmark, Germany, Finland, the Netherlands, the UK, the USA.

Some of them observe only during the periods of the great streams, others run continuous automated stations.

Only a few radars are still used for monitoring streams. One is run by O. Belkovitch (oleg@astro.kazan.su), at Kazan University.

4. How to relate radio- to visual observations ?

Hearing and seeing a meteor is a unique experience. There is a fairly simple relation between the visual magnitude of a meteor and the duration of the reflection. At 70 MHz, a zero magnitude meteor gives typically rise to a 1 second reflection.

5. How to correct MS counts to standard conditions ?

The number of meteor reflections that will be observed from a certain stream is not a simple function of radiant height, as is the case with visual counts (cfr. the zenithal hourly rate). Conversely, deriving the true number of meteors from the observed number of meteors is not a trivial matter, certainly not when more than one transmitter is involved. Certainly, a stream does not necessarily peak when the observed number of meteors is highest!

The various parameters, such as antenna characteristics, position of transmitter and receiver, radiant position and other stream characteristics, power of the transmitter etc. can be fed into a simulation program, such as FORWARD (by the undersigned). Although the general activity pattern can be reconstructed, one has to be careful.

For visual meteors, the observed number is highest when the radiant is in the zenith (all other remaining the same). This is not so for the number of meteor reflections: the maximum number is observed for a radiant elevation of 45 to 50 degr. When the radiant is too high (say more than 80 degr), very few reflections are received!

6. Where to find meteor stream data ?

The International Meteor Organization (IMO), specializing in visual meteor observations, issues a yearly meteor stream calendar, which can be found on several places on the net. Contact otherwise Juergen Rendtel (jrendtel@aip.de)

Continued on page five - see Meteors

Meteors - Continued from page four

or Peter Brown
(peter@canlon.physics.uwo.ca).

Gary Kronk's home page [http://wums.wustl.edu/~kronk/index.html] gives also a good overview of the various streams.

7. Where to find observational data and reduction software ?
Ilkka Yrjola,OH51Y
(ILKKA.YRJOLA
@915000.KY.KYMMENE.MEMONET.mailnet.fi)
makes his data available on ftp server FTP.FUNET.FI in directory pub/ham/vhf-work/mssoft42.zip. The software for viewing is available too, as well as stream data.

The author edits the monthly RMOB, which gives summaries of recent observations from all over the world. Included are the setup characteristics. Just contact me for putting you on the distribution list.

8. References

8.1. Books

THE reference is still "Meteor Science and Engineering" by D.W.R. McKinley, McGrawHill 1961. A fantastic book, giving the theory and practical results of the heydays of the radio meteor science.

A recent, less astronomical and more communication oriented work is: Meteor Burst Communications (Theory and Practice) Ed. Donald L. Schilling, Wiley Series in Communications, 1993, ISBN 0-471-52212-0.

8.2. Periodicals

The regular astronomy magazines, such as Sky & Telescope, Astronomy, or Astronomy Now! run occasionally contributions about forward scatter experiments (due to lack of time: complete list in Rev. 2 of these FAQs).

WGN, the Journal of IMO, contain sometimes contributions and letters about radio observations of meteors.

Chris Steyaert Tel : +32 (14) 31 51 04
V.V.S. Astronomical Association
Fax : +32 (14) 22 13 73
Belgium e-mail: steyaert@vvs.innet.be
Kruisven 66
Compuserve: 72650,3513
B 2400 Mol, Belgium 51 d N, 5 d E

Laughter - continued from page two

one ever asks. It kills the party for me.
—The Magazine of Fantasy and Science Fiction, May 1966

I suppose many of you are familiar with the comic strip "Peanuts." My daughter Robyn (now in the fourth grade) is very fond of it, as I am myself.

She came to me one day, delighted with a particular sequence in which one of the little characters in "Peanuts" asks his bad-tempered older sister, "Why is the sky blue?" and she snaps back, "Because it isn't green!"

When Robyn was all through laughing, I thought I would seize the occasion to maneuver the conversation in the direction of a deep and subtle scientific discussion (entirely for Robyn's own good, you understand), So I said, "Well, tell me Robyn, why is the night sky black?"

And she answered at once (I suppose I ought to have foreseen it), "Because it isn't purple!"
—The Magazine of Fantasy and Science Fiction, November 1964

Submitted for your amusement and in memory of Dr. Asimov.
Bob Brauer

Periodical Publication Statement

The **SJAA Ephemeris,** newsletter of the San Jose Astronomical Association, is published monthly, 12 times a year, Janurary through December, by the:

San Jose Astronomical Association
5380 Pebbletree Way
San Jose, CA 95111-1846

The **SJAA Ephemeris** is included as a service included in the price of membership. The **Ephemeris** is also mailed to other participating astronomy clubs, publishers and selected individuals.

My new 1.16" f/34 Schiefspiegler

by BOB ROGERs
(rogers@comp.tamu.edu)

Hi there y'all,

Frustration can sometimes lead to desperate measures. The frustration in this case was trying to wade through humid Texas' skies and get a decent look at Jupiter. With my Meade 2045D SC (4", f/10), I could see one dark zone on Jupiter except on the best of nights when there was an inkling of the Southern zone present.

After reading about all the benefits attributable to Schiefspiegler designs, I determined that I might be able to improve the image contrast with a simple disk with a hole in it. I measured the appropriate diameters on the corrector plate and secondary mirror mount and then cut a suitable disc of card stock with a 1.16" hole located on one side. The hole just grazed the outside edge of the corrector plate and the near edge of the secondary mount. To my way of thinking, this is the equivalent of a 1.16" f/34 Schiefspiegler.

Anyway, with the collimator in place I enjoyed seeing both the Northern and Southern dark zones. Necessarily the image wasn't bright but with a 12.5 mm SP (80X) it looked very reminiscent of the photograph that appeared in the June issue of Astronomy on the page where they gave the transit times for the red spot. With just a little better sky and some luck I may get to see that red spot.

It was simple to make, it seemed to work, and it must set some sort of record for a small aperture Schiefspiegler.

To those who may quibble that this isn't a Schiefspiegler at all but simply a stopped down aperture, I shall quibble only after receiving a box of homemade chocolate chip cookies from you.

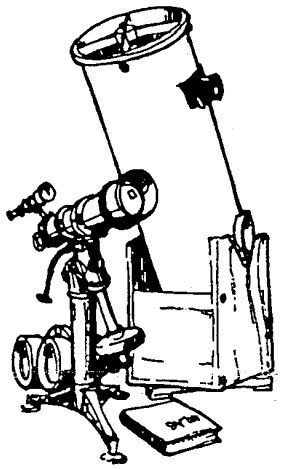
Best regards and clear skies.

Bob

1995 SJAA Calendar

General Meeting		Houge Park Star Party	Observational Astronomy Class
Sept	9	1 and 29	16
Oct	14	27	7 (Last -one Fremont Peak)
Nov	-	-	None
Dec	-	-	None
			Begin 1/1996

Please read your *Ephemeris* each month for changes



Telescope Loaner Status

by Paul Barton

NO.	Name	User	Due Date
1	4-1/2" Newt/P Mount	---------->	available
2	6" Dobson	John Paul Dasilvia	10/3/95
3	4" Quantum	Albert Chen	9/18/95
6	C-8 Celestron	Bob Maillot	9/22/95
7	12-1/2" Dobson	Tom Rice	indefinite
8	14" Dobson	Lee Courtney	9/8/95
15	8" Dobson	Bob Elsberry	9/8/95
18	8" Newt/P Mount	Jerry Lovelace	10/10/95
19	6" Newt/P Mount	---------->	Avaliable
21	10" Dobson	Richard Lee	9/5/95
23	6" Newt/P mount	Jim Marquis	9/8/95

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

Wait List

Steve Wincor C-8

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.

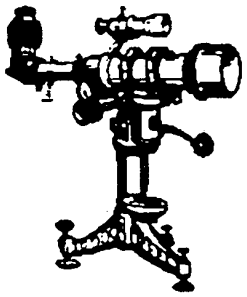
ASTRO ADS

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

Lost: Battery .... Left at Fremont Peak, Coulter Camp, Saturday, June 17 or 24 Deep Cycle, Trojan Marine, Red Top, White Case, Call Paul Krukar at:
(h) 286-5728
(w) 277-4638
or Paul Barton at:
377-0148
or any board member. The battery is SJAA property, part of the C-11.

Star Instruments 12-1/2 inch, f/9, Ritchy Chretien, GEM - stepper driven, 2-inch star diag. and 3 - 2-inch EP. Complete w/ battery and drive. Chip on primary; doesn't hurt image. Newly recoted primary. All overhauled and working. Exceptionally easy to collimate. Very compact for a large scope (like a Cassegrain). Designed for photography. $2,000 or $1500 w/out EPs. Call Paul Barton (408) 377-0148 8/95

8" f8 Neutonian on a Mead mount with a clock drive. It has a cave mirror. $500 Call Paul Mancuso (408) 946-0738 8/95



Notice

During the month of September John Dobson will be having his 80 th birthday. come to the September 1 Star Party at Houge Park to dedicate this activity in honor of John. John has given so much to amateur astronomy and astronomy education.

Celestial Calendar - Sept 1995

by Richard Stanton

Lunar Phase		Date	Rise	Trans	Set
FQ	02:04	02	14:27	19:38	00:53
FM	20:36	08	19:05	00:18	06:15
LQ	14:26	16	23:46	06:45	14:02
NM	09:54	24	06:56	13:02	19:02
Nearer Planets					
Mercury		07	08:58	14:41	20:23
0.82 A.U.		17	08:58	14:28	19:57
Mag. -1.2		27	08:17	13:45	19:14
Venus		07	07:04	13:26	19:47
1.70 A.U.		17	07:26	13:32	19:37
Mag. -4.0		27	07:48	13:38	19:27
Mars		07	10:28	15:55	21:21
2.09 A.U.		17	10:22	15:41	20:59
Mag. +11		27	10:17	15:28	20:39
Jupiter		07	13:30	18:24	23:18
5.48 A.U.		17	12:57	17:50	22:43
Mag. -2.0		27	12:24	17:16	22:08
Saturn		07	19:47	01:38	07:24
8.60 A.U.		17	19:06	00:56	06:41
Mag. +0.7		27	18:25	00:14	05:58

SOL Star Type G2V

RA	Dec				
11:02	+06:12	07	06:41	13:06	19:30
11:37	+02:23	17	06:50	13:02	19:14
12:13	-01:30	27	06:58	12:59	18:58

Astronomical Twilight

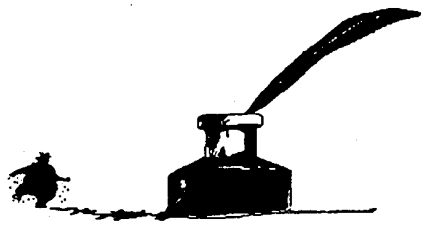
		Begin		End
JD 2,449,967	07	05:12		20:59
977	17	05:22		20:42
987	27	05:32		20:25

Sidreal Time

Transit Right	07	00:00	=	21:55
Ascension at	17	00:00	=	22:35
Local Midnight	27	00:00	=	23:14

Darkest Saturday Night: 23-Sep-1995

Sunset	19:05
Twilight End	20:31
Moon Set	18:27
Dawn Begin	05:29



COMET COMMENTS

by Don Machholz

Periodic Comet d'Arrest dims while Periodic Comet Jackson-Neujmin brightens slightly. Meanwhile, a new comet has been visually found. Comet 1995 01 (Hale-Bopp): Alan Hale of Cloudcroft, New Mexico and Thomas Bopp of Glendale, Arizona discovered this comet while observing M 70 on July 23. Hale is a well-known comet observer who has done some comet hunting but was not actually searching for comets when he found this. At that same hour Bopp was observing M 70 through his friend's (Jim Stevens) 17" telescope when he noticed the comet nearby. He promptly drove home (90 miles) to report it. Bopp doesn't own anything bigger than a spotting scope, but has been involved in astronomy for some 25 years, mostly in Ohio. Two days later Gerry Rattley of Gilbert, Arizona also discovered it. The orbit of this new object is difficult to determine, but the positions below should help you follow it through September. Early indications are that the comet is distant and will be around for a long time.

EPHEMERIS

6P/d'ARREST						58P/JACKSON-NEUJMIN					
DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG	DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG
08-06	23h46.6m	-08d23m	139d	M	9.1	08-06	21h28.7m	+0ld09m	161d	M	12.7
08-11	23h58.8m	-11d58m	142d	M	9.1	08-11	21h30.7m	-00d05m	165d	M	12.4
08-16	00h09.8m	-15d35m	144d	M	9.2	08-16	21h32.8m	-0id38m	168d	M	12.2
08-21	00h19.5m	-19d06m	146d	M	9.3	08-21	21h35.2m	-03d28m	169d	M	12.0
08-26	00h27.7m	-22d24m	147d	M	9.5	08-26	21h38.2m	-05d34m	169d	E	11.9
08-31	00h34.4m	-25d24m	147d	M	9.7	08-31	21h41.8m	-07d53m	167d	E	11.7
09-05	00h39.6m	-28d0lm	147d	M	9.9	09-05	21h46.2m	-10d21m	163d	E	11.5
09-10	00h43.5m	-30d13m	147d	M	10.2	09-10	21h51.7m	-12d52m	159d	E	11.4
09-15	00h46.1m	-32d00m	146d	E	10.5	09-15	21h58.2m	-15d20m	154d	E	11.4
09-20	00h47.8m	-33d21m	145d	E	10.7	09-20	22h05.8m	-17d40m	150d	E	11.3
09-25	00h48.6m	-34d18m	144d	E	11.0	09-25	22h14.6m	-19d48m	146d	E	11.3
09-30	00h49.0m	-34d52m	142d	E	11.3	09-30	22h24.4m	-21d37m	142d	E	11.4
10-05	00h49.0m	-35d06m	140d	E	11,6	10-05	22h35.1m	-23d06m	139d	E	11.4
10-10	00h49.0m	-35d00m	139d	E	11.9	10-10	22h46.6m	-24d13m	135d	E	11.5

1994 01 (HALE-BOPP)

DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG	DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG
07-27	18h40.6m	-32d02m	153d	E	10.6	09-05	18h20.3m	-30d26m	llld	E	10.4
08-01	18h37.2m	-31d53m	147d	E	10.5	09-10	18h19.1m	-30dllm	106d	E	10.3
08-06	18h34.0m	-31d43m	142d	E	10.5	09-15	18h18.2m	-29d57m	101d	E	10.3
08-11	18h31.0m	-31d31m	137d	E	10.5	09-20	18h17.6m	-29d42m	96d	E	10.3
08-16	18h28.3m	-31d19m	132d	E	10.4	09-25	18h17.4m	-29d28m	91d	E	10.3
08-21	18h25.8m	-31d07m	127d	E	10.4	09-30	18h17.5m	-29d14m	86d	E	10.3
08-26	18h23.7m	-30d53m	121d	E	10.4	10-05	18h17.9m	-28d59m	81d	E	10.3
08-31	18h21.8m	-30d40m	116d	E	10.4	10-10	18h18.6m	-28d45m	77d	E	10.3

Object	P/d'ARREST	P/Jackson-Neujmin	199501 HALE-BOPP
Peri. Date	1995 07 27.36197	1995 10 06.61876	The orbital elements
Peri. Dist.(AU)	1.34587 AU	1.381125 AU	for this comet are
Arg of Prei.(2000)	178 .0504 deg	200.3470 deg.	not known well enough
Ascend. Node (2000)	138.9874 deg	160.7177 deg.	for publication or
Inclination (2000)	019.5232 deg	013.4779 deg.	long-term prediction.
Eccentricity	0.6140404	0.6614285	The positions and
Orbital Period	6.51 yrs.	8.24 yrs.	magnitudes given above
Source	MPC 20122	MPC 20123	are approximate.

Don Machholz (916) 346-8963

EPHEMERIS is published monthly by the San Jose Astronomical Assocition - 3509 Calico Ave., San Jose California 95124, Members are encouraged to submit articles for publication. These should be typed and submitted no later than the 12th of the previous month. All submissions should be sent to the editor, Bob Madden, 1616 Inglis Lane, San Jose, California 95118. A text file on a 3-1/2" IBM or MAC diskette is preferred, but written is accepted.

SAN JOSE ASTRONOMICAL ASSOCIATION MEMBERSHIP

Membership only: $15 Membership / S&T: $35 Junior (under 18): $25

Name: _____

Address: _____

_____

Telephone: _____

Please bring this form to any SJAA Meeting or send to
Bob Elsberry, Treasurer
San Jose Astronomical Assoc.
5380 PEBBLETREE WAY
San Jose, CA 95111-1846
Telephone: (408) 281-3559

MAKE CHECKS PAYABLE TO "SJAA"
Please check **type** of membership and if **New** or **Renewal**

Membership Only ___ Membership/S&T ___ Junior (under 18) ___
New ___ Renewal ___

SAN JOSE ASTRONOMICAL ASSOCIATION
5380 PEBBLETREE WAY
SAN JOSE, CA 95111-1846

NON-PROFIT ORGANIZATION

U.S. POSTAGE PAID

PERMIT NO. 5381

SAN JOSE, CALIFORNIA

SJAA HOTLINE
24 HOUR INFORMATION
408-559-1221