

SJAA *EPHEMERIS*

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OCT, 1991

OCTOBER MEETING

Please note that the October General Meeting is on the 3rd Saturday so as to keep the new moon weekend clear for star parties. As of this writing, no speaker or program has been selected for the October 19th meeting.

SOME DATES TO REMEMBER

There will be a star party at Henry Coe State Park on October 5th. If you have never been to Coe park, please give Jim Van Nuland a call (number elsewhere in the Ephemeris). On the 12th there is another star party scheduled with the Halls Valley Astronomy Group at Grant Ranch Park. Apparently Jack Peterson will do a star talk for the public that evening. Friday public observing sessions continue to be favorite with south bay residents. The SJAA has scheduled the 18th for an evening public star party at Branham Lane Park. This location was very popular during the July 11th eclipse. There is a Board meeting slated to begin at 6:30 on the 19th, just before the General Meeting. Interested members and visitors are encouraged to attend and to get involved in club activities. New blood is always needed. The October 26 astronomy class session has been cancelled. Jack told me that only 1 person showed up for the August session. The class is over until further notice. There is an indoor star party slated for that same evening. Doors open at 8 pm.

NEW DIRECTOR/EDITOR

Due to time constraints, Wolfgang Harnisch has resigned from the Board of Directors. Long-time SJAA member Bob Madden has replaced him for the remaining five months of his term. We thank Wolf for his contributions, and look forward to his presence at other

OCTOBER 19 GENERAL MEETING SURPRISE PROGRAM 8 PM

October 5: Star Party at Henry Coe State Park. Dusk till Frozen.

October 12: Star Party at Grant Ranch. Hosted by the Halls Valley Group. Evening public program planned with observing till dawn.

October 18: (Friday) Public star party at Branham lane park. Starts at dusk.

October 19: Board meeting at 6:30 pm, with General meeting to follow. Surprise speaker and program at 8 PM.

October 26: Indoor star party at the Los Gatos Red Cross. 8 PM.

November 2: Star Party at Fremont Peak State Park.

November 9: Star party at Grant Ranch with Halls Valley Group.

November 15: (Friday) Public star party at Branham lane park. Sun setting early now, come early!

November 16: Board meeting at 6:30 PM with General Meeting to follow at 8 PM. Patrick Donnelly featured speaker on Double, Triple, and Multiple Stars.

November 23: Indoor star party, 8 PM at Red Cross. Come down for an informal evening of discussion and socializing.

SJAA HOTLINE

24 HOUR INFORMATION
408-997-3347

SJAA functions. Welcome, to Bob. Bob has also volunteered to edit the Ephemeris along with help from Paul Barton.

TELESCOPE MAKING & ASTRONOMY MAGAZINES

Renewals have been coming in very slowly! You have received a postcard reminder from Kalmbach Publications; please call Jim Van Nuland and let him know if you want to continue, or if you wish to drop your subscription. Save his having to make multitudinous phone calls. Or send a check to Jim at 3509 Calico Ave., San Jose, CA 95124 (payable to Jim Van Nuland). If you have your own subscription, and it expires in 1992, you may extend by pro-rating the price. In this case, a mailing label or renewal notice is needed. The bad news is that both have gone up: \$10 for Telescope Making and \$16 for Astronomy.

GRAND TOUR OF THE SOLAR SYSTEM

In the last two decades, robot spacecraft from the U.S. and Soviet Union have explored eight of the nine worlds in our solar system in great detail, sending back fantastic views of the planets, moons, rings and their surface features. (Pluto is too distant and has too strange an orbit to be easily explored by spacecraft.)

Now that this initial exploration is done, it's a perfect time to look back and examine what we have learned. And who can better serve as our cosmic tour guide than astronomer and popular lecturer Andrew Fraknoi, Executive Director of the Astronomical Society of the Pacific?

On Saturday, November 2, 1991, An-

OFFICERS * PRES. Jack Zelders * VICE PRES. Paul Mancuso * TRES. Jack Peterson * SEC. Jim Van Nuland * EDITOR John Gleason

drew Fraknoi will present a completely nontechnical program that will take participants on a fully day's journey through the wondrous sights and discoveries made about our solar system in the last two decades.

Sponsored by the University of California Extension, Santa Cruz, the program will take place at the Santa Clara Convention Center Theater, 5001 Great America Parkway, Santa Clara. Fee for this special event is \$79.

His tour will be illustrated by a marvelous collection of color slides from U.S. and Soviet space probes and the world's largest telescopes, including the Hubble Space Telescope. Many of these images have been computer enhanced to bring out exquisite detail and many others have rarely, if ever, been seen before by the public.

Fraknoi has also made a list of "The Twelve Great Wonders of the Solar System," including the largest volcano on Mars, the red spot on Jupiter, the rings of Saturn, volcanoes on Triton, and the footprints of astronauts on the Moon.

"I'd like to invite everyone to be part of a celebration of this great human achievement," Fraknoi says. "The sum total of what we have learned about the solar system is one of the most exciting parts of the heritage of the 20th century."

This program assumes no background in science or math, and is designed for the travel buff, space enthusiast, science fiction fan, or anyone who loves tales of exploration and magnificent images of alien vistas. It is especially appropriate for teachers in grades 3-12 who want to cover more astronomy under the new California science framework. For more information on this special program call University Extension at 408-427-6610.

CATCHING SOME RAYS IN THE SJAA

- Jack Zeiders

Recently I have acquired a pair of 6 inch f/10 mirrors that will be the objec-

SJAA EPHEMERIS

tives for a pair of sun telescopes. One could make a nice addition to the SJAA public presentations and observing sessions. By expanding our capability to include solar astronomy we present a more complete view of amateur astronomy to the public. I plan to build 2 sun scopes, one for the SJAA and one for use at the Fremont Peak Observatory.

Many of you are familiar with John Dobson's sun telescope. For those that are not, it is a Newtonian layout with the front of the tube cut off at a 45 degree angle. A partially aluminized glass plate covers the full front of the tube diverting the majority of the Sun's light and heat before it enters the system. What passes through is further reduced by the unaluminized primary. The front element serves as a diagonal, but introduces no obstruction. The final reduction to a comfortable, safe viewing level is through a welders class filter permanently mounted at the base of the focuser. The tube assembly rides on a typical Dobson mounting with 2 sets of altitude rings to allow 2 eyepiece positions, one on top for big folks and one at the side for shorter individuals. This telescope design can give wonderful white light views.

While at the Riverside Telescope Makers Conference this year, I had an opportunity to view the Sun in Hydrogen Alpha light with several "T-Scanners". One was attached to a Solaris telescope from Televue Co. It gave a superb view of prominences and granulation across the entire solar disc. It even showed a prominence on the front surface of the Sun. This was with a .7 angstrom filter. Another view was through a Takahashi 4 inch refractor with a large heat sink and 2 small fans for cooling attached to his T-Scanner. The view through this setup was excellent. All the solar viewing has started me think that it would be a great addition for the SJAA to be able to show the public the Sun in Hydrogen Alpha light as well as white light.

I began asking several people I know about various filters and their experiences with them. The Daystar filters are very expensive, ~\$2.5 0- 3k, and somewhat difficult to get stabilized. They require 110V AC power. The T-

Scanners are somewhat less expensive ~ \$1 - 1.5k and do not require power, relying on tilting of a component to tune the filter. Both take approximately a half hour to heat up to operation temperature. Both good high contrast views of prominences and surface detail. The Solaris telescope is designed to work with a T-Scanner and the one I had the opportunity to use at RTMC was superb! It is very expensive however, ~ 3K with the T-Scanner filter. It is small and compact, I estimate it would easily fit into a package about the size of a trumpet case. Tom Ahl set up an opportunity for me to go to Lumicon and use their prominence viewer. It is much lower cost than any or the other Hydrogen Alpha viewers I know of and requires no power to operate. It also tilts the optical element to tune the filter. It does show the prominences well around the limb. There was little to no surface granulation similar to what one seen through a white light filter. It is also a much wider band pass: 1.5 angstroms than the Daystar filters.

Well, I don't know what would be best yet, but I propose we start a fund for a SJAA hydrogen alpha filter. Perhaps some of those members with filters can shed some light on what may be the best alternative. Please contact either a board member or myself with your thoughts. I am donating \$100 to this fund as seed money. Anyone willing to match me? 408-281-0220

LETTERS TO THE EDITOR

- John Gleason

I have just returned from a visit to the mailbox where I found it loaded with letters from enthusiastic readers of the Ephemeris. As most of you have read by now, I am leaving the editorship of your monthly newsletter. This month's Ephemeris marks my 85th and last issue. I cannot say that it's always been fun but it has certainly been a nice way to keep in touch with club activities as well as with a number of talented and interesting people - my contributors. I am not leaving out of dissatisfaction or disinterest in amateur astronomy as some have speculated. In some ways

its hard to giveup something like this, but it is important to move on to new challenges. In the last 7 years the Ephemeris has seen a number of dramatic changes. Everything has been accomplished that I originally set out to do with the club's newsletter. Funny however, I never did figure out how to use the spell checker after all those issues!

To all members I want to wish you the very best. And to the next generation, Bob Madden and Paul Barton - Well you guys wanted it, it's all yours!

Dear Editor,

"Just wanted to say how much I enjoyed the the solar eclipse issue. One of your best. Next time you are in Cabo, look me up." - Tiffany Blue

"Hate to see you go. The Ephemeris kept me awake during star "Party" meetings." - Gorbi

"Great story about human bones found on the Moon. I've started a NASA investigation as a result of your article." - D. Quayle

"Your invited to a star party at the Palm Springs compound. Bring all your Ephemeris back issues and the majic crystal refractor." - E. Kennedy

"Now you're going to have to become a member of the SJAA in order to get a copy of the Ephemeris" - R. Walton

PERSEID METEORS AND A FIREBALL

- Jeff Horne

Observation planning for the Perseid meteor shower began in earnest in early July. I had noted earlier in the year that the Perseids this year might be especially good since the Moon would be only a few days old. It was not until I received the August Sky & Telescope that my plans included several nights of observing and photographing the shower. The article in Sky & Tele indicated the meteor shower could have a rather broad maximum with two distinct peaks of activity on 12 and 13 August universal time. The times of maximum indi-

cated that morning of 12 August just before dawn and midnight to 2:00 AM on 13 August were best locally.

Bill Cooke and I made plans to go to Fremont Peak on Friday night August 9th to try out his new Naglers brought in the buy two get one free deal. The Naglers worked great in both his 100mm refractor and my 10 inch dobson. We saw a few meteors that night but took no pictures. Saturday night for me was lost to a previous engagement.

Bill and I had decided that together we would try to catch the shower Monday night August 12.

On Sunday the 11th I found myself really wanting to try out my second hand Parks mount on which I had put my 4.25 inch reflector and room for at least two cameras. The addition of Bill's unused clock drive from a Meade DS-16 mount tracked beautifully in a few tests, but the mount had not been used for photography. So with some encouragement from my wife Valerie, I made plans to go to Fremont Peak early on the 12th.

At 1:40 AM on Monday morning I packed the whole family in the car and headed south to see the Perseids. My sons Jeremy and Michael had already spotted two Perseids from my front yard while waiting for the car to be loaded. One hour after leaving the house we arrived at the top of Fremont Peak in what must have been record time. Reassembly of the telescope and alignment proceeded smoothly even though this was the first field attempt at the process with this telescope and mount.

The meteors seemed to be coming about once a minute while I set up and aligned the telescope. I placed a camera with a 28mm lens on a tripod and ran exposures for about 7-10 minutes each for three hours until dawn. Two additional cameras were placed on the sides of the 4.25" reflector and guided exposures were timed at 5 minutes each. The cameras were pointed at random points in the sky in the hopes of picking up a meteor or two. The sky was quite dark, although a few clouds drifted across the sky just prior to dawn.

Several meteors exceeded first magnitude in brightness although many were magnitude three or less. It often seemed like the cameras were always pointed in the wrong area of the sky when a Perseid would appear. As luck would have it only two frames out of 72 attempts showed a Perseid from this or subsequent photography sessions. Close to dawn my wife and I shared a fine view of the rising Orion nebula.

After some sleep Monday morning I awoke to find the sky getting more and more cloudy. After the excitement of the Perseids that morning I was even more eager to photograph them Monday night. By 5:00 PM it was obvious that we were going to be clouded out that night. It might have been clear way to the north, but anything south of San Jose was a washout. By 9:00 PM it had even began to rain! Tuesday morning came with with some clouds, but as the day progressed the sky became clearer. A call to Bill Cooke confirmed that he was also thinking of heading to Fremont Peak that night. The Perseids would be 24 hours past maximum, but we still should see something.

Because of the rain the night before, no fog came into the valleys on the night of 13 August. Fremont Peak wasn't very dark. I rated the limiting visual magnitude to 5.2 - 5.5 at best. There were a few other folks at the Peak who came to see the meteors as well. The usual setup and alignment was completed and picture taking began. Since the sky wasn't the best, any deep sky work was pretty much a bust. The only thing that was of much interest was the Perseids, and even that was only half of what I saw Monday morning, at most about 30 per hour.

A little after midnight both Bill and I decided we had had enough and began packing up the equipment. At 12:20 AM, just as I was removing the film from the camera facing west, I heard Bill shout "Look at that!" I looked up to see Bill bathed in this pale green light. At the same time out of the corner of my eye I saw a brilliant green fireball proceeding approximately south to north in the sky above Watsonville. The fireball lasted about two seconds

changing to orange and white at burn-out while breaking up into four different paths. It changed in intensity several times during its descent as more and more of the meteoritic material was consumed by the atmosphere. Since the event lasted so long, it was almost as if you could see the surface being burned away. The entire landscape at Fremont Peak remained lit up in green until almost the end. The ending was at 10 degrees high, with its length about 20 degrees. The vaporization trail only lasted a few seconds. Bill and I estimated the magnitude at minus eight (Somewhere less than the Moon and far, far brighter than Venus ever gets).

The 1991 Observers Guide says the green color probably comes from magnesium in the meteor. Since it was traveling in the opposite direction, it is unlikely that the meteor was a Perseid. But it was the most brilliant meteor either of us had ever seen. Both of us were stunned by its brilliance. Neither of us got to see the total eclipse this year, but this was a rare event as well. It made a great finish to the 1991 Perseids.

DOUBLE, TRIPLE, AND MULTIPLE STARS

- Patrick M. Donnelly

Well, it's Autumn again. The time of the year when the heavens are not dominated by one type of astronomical object. In the Spring we have the season of the galaxies. In the Summer globular clusters dominate, and the Winter is full of open clusters outlining the Orion spiral arm of the Milky Way. But what about the Fall? doesn't it have some type of astronomical object, that is more permanent than the other seasons? In fact, the Fall is blessed with two types of objects - planetary nebulae and variable stars. Led by M27 and M57 Fall has much more to offer than all the other seasons combined. The same is true for variable stars.

Fall is the season of the variable stars. In fact, the brightest and best known member of each major type of variable star can be found during the Fall sea-

son. Moreover, each of these prototype variables is also a component of a true multiple star system.

Our first type is the Beta Lyrae variable.

Beta Lyrae is an eclipsing variable star. By definition it is a binary star system consisting of two unequally bright supergiants. The two components revolve about their common center of gravity every 12.9 days and Beta varies in magnitude from 3.4 to 4.1 as each component eclipses the other. Because of the closeness of the components (22 million miles), the stars are distorted in shape towards each other, and their outer atmospheres overlap. Visually Beta has four (4) companions visible through a telescope at varying distances from 47 arcseconds to 86 arcseconds and magnitudes 7 to 13. The 7th magnitude companion at 47" and the 9th magnitude companion at 86" are also part of the same system. The 7th mag. companion is also a spectroscopic binary of period 4.348 days. This means that the Beta Lyrae system has five components in it.

Near Beta Lyrae in the sky is Delta Cephei. Delta is the prototype of the Cepheid variables. It is one of the pulsating giants in the sky with the amazing property that the period of pulsation is related to the absolute luminosity of the star. Moreover, Delta changes both radius and spectral type as it pulsates. Delta has a period of about 5.37 days and varies in magnitude from 3.6 to 4.3. Delta has two visual companions in a small telescope - a 6.5 mag. component at 41 arcseconds and a 13 mag. component at 21 arcseconds. The brighter component is physically related Delta. So Delta Cephei is also a multiple star system.

Farther to the east in Cetus is Omicron Ceti (Mira) called "the wonderful". Omicron was the first of the long period variables to be discovered, varying from 3rd magnitude to 9th magnitude and back again every 331 days. As Mira varies in brightness it also changes diameter, spectral type, and temperature. At minimum brightness its surface temperature is only about 199 degrees Kelvin. Mira is about 220 light years distant from the Earth. Visually Mira has 2 companions, a 10th mag.

companion about 1" from Mira and a 9th mag. companion at 118". The closer companion is physically related to Mira, and it too is a variable star. As it has turned out, many Mira variables consist of a double star system with secondaries at approximately the same distance and same spectral type as found in the Mira system. The distant companion is only an optical component.

The final variable star is Beta Persei, also known as Algol. Algol is the prototype eclipsing binary star known since ancient times as varying in brightness. Algol varies from magnitudes 2.1 to 3.4 every 2.87 days, due to mutual eclipses of a large dim companion and a bright companion. The system actually consists of three stars with the third having an orbital period of 1.87 years. The system is a spectroscopic system with none of the companions visible in the largest scopes on Earth. Algol has three visual companions all about 12th magnitude and about 1 arcminute from Algol. However, these stars are all optical companions.

As can be seen, all of the most famous of the variable stars are in the Autumn sky and all are members of multiple star systems.

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COMET COMMENTS - DON MACHHOLZ

One returning comet has been recov-
ered recently. Three other comets are
in our sky, now is a good time to get
out to see them.

Periodic comet Arend (1991u): T. Seki
of Japan recovered this comet on Au-
gust 1st at magnitude seventeen. This
comet has an orbital period of eight
years and will be closest to the Sun
early next year. It will not get much
brighter.

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EPHEMERIDES							
DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
PERIODIC COMET HARTLEY 2 (1991t)							
09-21	07h57.5m	+19°23'	08h00.4m	+19°15'	59°	M	10.1
09-26	08h16.9m	+17°20'	08h19.7m	+17°11'	59°	M	10.3
10-01	08h34.7m	+15°18'	08h37.5m	+15°08'	60°	M	10.5
10-06	08h51.2m	+13°19'	08h54.0m	+13°08'	60°	M	10.7
10-11	09h06.5m	+11°23'	09h09.2m	+11°11'	61°	M	10.9
10-16	09h20.6m	+09°10'	09h23.2m	+09°18'	62°	M	11.2
10-21	09h33.6m	+07°43'	09h36.2m	+07°30'	64°	M	11.4
10-26	09h45.2m	+06°00'	09h48.2m	+05°47'	65°	M	11.7
10-31	09h56.6m	+04°23'	09h59.2m	+04°08'	67°	M	12.0
11-05	10h06.6m	+02°49'	10h09.2m	+02°35'	69°	M	12.2
11-10	10h15.8m	+01°21'	10h18.4m	+01°06'	71°	M	12.5
PERIODIC COMET WIRTANEN (1991s)							
09-21	08h29.0m	+18°28'	08h31.8m	+18°18'	52°	M	10.2
09-26	08h50.7m	+18°02'	08h53.5m	+17°51'	52°	M	10.2
10-01	09h11.8m	+17°29'	09h14.6m	+17°16'	52°	M	10.3
10-06	09h32.2m	+16°49'	09h35.0m	+16°36'	52°	M	10.5
10-11	09h51.8m	+16°04'	09h54.7m	+15°50'	52°	M	10.5
10-16	10h10.7m	+15°14'	10h13.5m	+15°00'	52°	M	10.6
10-21	10h28.7m	+14°23'	10h31.5m	+14°06'	53°	M	10.7
10-26	10h45.9m	+13°30'	10h48.6m	+13°13'	54°	M	10.9
10-31	11h02.3m	+12°36'	11h05.0m	+12°19'	55°	M	11.0
11-05	11h17.9m	+11°42'	11h20.6m	+11°25'	56°	M	11.2
11-10	11h32.7m	+10°49'	11h35.4m	+10°33'	57°	M	11.4

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