

# SJAA EPHEMERIS

VOLUME 5 NUMBER 3 OFFICIAL PUBLICATION OF THE SAN JOSE ASTRONOMICAL ASSOCIATION March 1994



**The Eyepiece**  
By Bob Madden

I made a terrible mistake last month. After giving "Crazy Ed's" thoughts for designing up a collimating tool I proceeded to misplace a decimal place in the sighting hole diameter. You guessed it! the dimension should be 0.050 to 0.062 inches. Ed states even larger would be fine - more like 0.125 inches (that's 1/8 to you metric nuts).

With that out of the way, you will find a flyer about the AANC CCD Imaging and Image Processing Conference at the Lawrence Hall of Science, UC Berkeley. Berry's *Cook Book on CCD Devices* is due out in March and the chips referenced there are beginning to be hard to come by. It has been said for over five years that CCD imagery is the coming and there must be ways to get into the field without a lot of expense.

Next, one of our favorite events of the year, the auction is coming. Get ready! It will be held at Houge Park on the 23 of April from 1:00 to 8:00 pm. As you know the swap will be conducted from 1 to 5, we'll take a break for supper and begin the auction. Bring your stuff in to sell and money to purchase something you need.

We have been having some difficulty with the care of our loaner telescopes. As a result of some equipment

Mar 5: Star Party H. Coe SP. Sset 6:05, 34% Moon, Rise 2:46 am.  
Mar 18: Star Party at Houge Park. Sset 6:19 pm, 37% Mset 1:26 am.  
Mar 19: Third session of Observational Astronomy class at Houge Park.  
Mar 20: Spring begins 12:30 pm.  
Mar 26: General meeting at the Milpitas Library. Board of Directors meeting at 6:15.  
Apr 2: Star Party H. Coe SP. Sset 6:30 pm, 50% Moon Rise 1:29 am.  
Apr 3: Darkness squandering time begins at 2 - becomes 3 am.  
Apr 9: Star Party at Fremont Pk SP. Sset 7:35 pm. No Moon. Also: Public star party at Grant Ranch County Pk.  
Apr 15: Star party at Houge Pk. Sset 7:43 pm, 22% moon Mset 12:10 am.  
Apr 16: Observational Astronomy Class at Houge Pk 8:00 pm.  
Apr 16: Astronomy Day, daytime at Milpitas Library, evening at Houge Pk.  
Apr 23: 15th annual Astronomy Swap and Auction at Houge Pk, 1:00 - 8:00 pm. This activity replaces the General Meeting.  
Apr 30: No activity: Twilight 9:30 pm, Moon up about 1:30 am.

being lost or not returned the Board of Directors has decided to have every recipient of a loaner telescope sign a Borrowing Agreement to impress the importance of taking proper care of each telescope. It is a shame that we have to do it this way, but we need to keep the equipment in top notch condition for the next person. Paul Barton goes beyond the call of duty keeping these telescopes in top-notch condition and many times he will supplement deficiencies with his own equipment.

We have several school star parties in March. Try to attend. Call Jack

Peterson or Jim Van Nuland for details. Their telephone numbers are in the credit marquee, next to last page.

20 — Laurelwood Elementary School  
22 — Mayne School in Alviso  
25 — Norwood Creek Elementary School (900 pupils)

**Hey, people!** (from Jim Van Nuland)

When we have scheduled a Houge Park star party, and especially when we have a school star party, WE ARE GOING TO HAVE CUSTOMERS, even though the weather may be getting cloudy. I've had the only scope to show the moon to a hundred kids! All it takes is a sucker hole, and the show is ON!

At Houge Park in January, there was a large turnout from the public, over a hundred, and there were only "two" scopes. It looked lousy all day, I know, I was watching, but evening brought some breaks. This is not at all unusual-- when the Sun stops feeding the heat engine that we call our atmosphere, changes take place.

So, unless you would be driving a LONG way, make every effort to bring your scope to a scheduled event, as the probability is very high that you WILL be needed.

"CCD Imaging and Image Processing" conference, at the LHS, Berkeley, Saturday, March 26, 8 am to 5 pm. Vendors, demonstrations, lectures. Included: John Sanford, keynote speaker, overview of CCD imaging. Chris Tennant, Sirius Instruments, demo of new products at new price points. John Westfall of ALPO, presentation on his experiences with the LYNXX system. Cost: \$25 at door, \$20 pre-registered. Write Don Stone, CCD registrar, 731 Camino Ricardo, Moraga, CA 94556-3014. Include SASE if you need confirmation and map.

## Eye-piece Advice

I did some side-by-side tests of various Televue eyepieces before and after buying a set. My comments after that experience:

1) The Naglers have a nice wide field, which is really useful if you don't have a clock drive. However, they definitely transmit less light than Plossls. Dim objects can lose a lot because of this. For dim objects, consider getting a lower-power Plossl with an equivalent field of view instead. If you have a light bucket, however, the Nagler's slight dimness may not be a problem. (It's also less of a problem for bright objects like planets.) Naglers also cost a lot more so you can't buy a complete a set for the same bucks.

2) The Plossls don't have as wide a field of view, but they're relatively cheap and you can get a complete set of them without busting the bank (or being overly paranoid about leaving one on the roof of your car for a minute while you rearrange things). The plossls will display some distortion at the edge of the field of view at lower powers if your telescope has a short focal length. Keep in mind, though, that if you want to use your short focal length scope for higher powers you can just put a Barlow on the end of the scope and effectively double or triple the focal length. Then even the lower power Plossls will work fine. You may require a little practice before you're able to use plossls comfortably in the dark; if you don't get your eye in quite the right position you may see only blackness or a piece of the image may be missing. Televue plossls are better about this than their competition.

3) For really nice BRIGHT low powers the Panoptics are WONDERFUL. The 35mm Panoptic, though, only comes in the 2" barrel size, is expensive, and weighs a ton. It's one of those eyepieces that you will constantly fear dropping or having fall out of the end of the scope in an accident, say when someone loosens the screw that holds the eyepieces in thinking it's the focus knob. I've also found that the Panoptic won't focus within the range of focuser travel on some scopes. (You'll also have to do massive refocusing after switching

from the Panoptic to something else, say a Plossl.) Some Barlows won't work well with them, either. But for awesome views at the low-power limit of your scope I don't think you can beat the 35mm Panoptic! It's my favorite low-power eyepiece. (Just keep a close watch on it!)

4) Keep in mind eye relief and exit pupil size when looking at eyepieces. Ask yourself why Televue stops at the 7mm Plossl as the highest power... it's because the eye relief would be intolerable for anything shorter. The Naglers are somewhat better, but the 4.8mm requires that your eye be up pretty close (my eyelashes sometimes touch the lens and leave smudges on it, which is annoying). The Panoptics are the best for long eye relief. Also remember you can use Barlows to get higher powers with good eye relief.

Exit pupil size sets a lower limit on the overall power you can use your scope at. If the exit pupil size gets larger than your eye's pupil size, lower powers won't be any brighter.

5) Always remember you can put the Barlow on EITHER side of the eyepiece: between the eyepiece and your eye or between the eyepiece and the telescope. You may find that only one or the other is within the range of focus for your scope. You'll get a higher power multiplication if the barlow is between the eyepiece and the scope, so be sure to take that into account if you plan on using the barlow to fill the holes in your power selections.

6) If you can, find someone who has one of the eyepieces of the same type as what you're going to buy and try it with your scope. It may turn out that it just doesn't fit yours, for example the 'fits both 2-inch and 1 1/4-inch' Naglers don't work very well with my Traveler refractor at the 1 1/4-inch size. They assume the eyepiece mount is a thin cylinder projecting out from the scope, not a cylindrical hole going in. As a result I can only insert the eyepiece part ways. I can always use it fine in the 2" mode, but then I can't quickly switch to the 1 1/4 inch Plossls and it's also nowhere near parfocal with the others as it would be if I could stick it all the way in.

7) Beware cheap aluminum tightening screws threaded into aluminum

eyepiece bodies. They're very easy to crossthread and strip! Replace the cheap aluminum screw with a decent steel one, and be VERY CAREFUL with it so you don't damage the weak aluminum threads on the body.

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Honolulu  
Joe Dellinger  
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joe@montebello.soest.hawaii.edu

In article  
<1994Feb3.025708.14041@Princeton.EDU>,  
paullin@dae.Princeton.EDU (Paul  
Tinphone Lin) writes:

>> I was wondering why the first julian day was set to January 1, 4713. I haven't been able to find the reason why in any books I have looked at. several calendars all had 1-jan all on the same day of the year in 4713 B.C so 1JD was at noon on that date. reference: an astronomy class 10-15 years ago....<<

The Julian period is a period of 7980 years and is the least common multiple of three cycles that were used in Roman chronology. The period is 7980 years long and last had a common beginning in 4713 BC. This is the arbitrarily chosen date for Julian day 1. It was also thought in medieval times to be the time of creation of the Earth. Shades of Bishop Ussher. Look in old astronomy books like early editions of Abell, or John Duncan. or a very good disussion of the calendar is in the Explanatory Supplement to the Astronomical Almanac. [Bob Elliott Hobbs Observatory elliotb@uwec.edu]

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"Joseph Justus Scaliger tried to resolve the patchwork of historical eras by placing everything on a single system (Scaliger 1583). Instead of introducing negative year counts, he sought an initial epoch in advance of any historical record. His numerological approach utilized three calendrical cycles: the 28-year solar cycle, the nineteen-year cycle of Golden Numbers, and the fifteen-year indiction cycle. The solar cycle is the period after which weekdays and continued on next page column 1

calendar dates repeat in the Julian calendar. The cycle of Golden Numbers is the period [used for Easter calculations] after which moon phases repeat (approximately) on the same calendar dates. The indiction cycle was a Roman tax cycle [introduced by Diocletian, originally just in Egypt]. Scaliger could therefore characterize a year by the combination of numbers (S,G,I), where S runs from 1 through 28, G from 1 through 19, and I from 1 through 15. Scaliger noted that a given combination would recur after 7980 (= 28 x 19 x 15) years. He called this a Julian period, because it was based on the Julian calendar year."

[That last is false — he called it Julian after his father, Julius Caesar Scaliger, although it is reasonable to believe that this was done in part as a pun on the Julian calendar, so-called after the "original" Julius Caesar.]

"For his initial epoch Scaliger chose the year in which S, G and I were all equal to 1. He knew that the year 1 B.C. was characterized by the number 9 of the solar cycle, by the Golden Number 1, and by the number 3 of the indiction cycle, i.e., (9,1,3). He found that the combination (1,1,1) occurred in 4713 B.C. or, as astronomers now say, -4712. This serves as the year 1 of Scaliger's Julian Period."

A couple of other notes: this combination of cycles was \*not\* used before Scaliger, who did \*not\* have any bizarre idea of it being the date of Creation. Scaliger does \*not\* count as an Italian (though his father does; he, escaping from scandal at some Italian court fled to France, and JJ can be more justly taken as French than as Italian. He is one of the founders of the modern discipline of chronology. A \*lot\* of work had to be done, by JJ Scaliger first of many, to sort out the "patchwork" of eras which the Ex.Supp. notes as characterizing the period before Scaliger. You have no idea how lucky we are to have a single common and well-understood dating scheme — until this took hold in the 17th or 18th centuries, chronology was a total mess.

Michael L. Siemon

Bob Fingerhut suffering from two ruptured blood vessels in his head is now recuperating at home after surgery. At the January General Meeting Bob listened to Ernie Piini and Joe Shrock lying down on a table in the back. According to Bob, we heard they were pretty bad headaches. We hope he recovers soon and is back observing.

Dorothy Petri passed away on January 11 th. Dorothy was a close friend of Paul Barton who helped her satisfy a desire to observe the sky. We had seen Dorothy and her husband, Jack, at Houge Park several times last year. We hope that Jack will continue to observe with us. May Dorothy find the next universe.

[when members know of another member who is ill please drop me a note and when space permits we'll publish it here Eitor]

#### Book Report by Paul Barton

A Brief History of Time by Stephen W Hawking, Bantam Books, \$25, is just what we need to help understanding Einstein's Theory of Relativity and Astrophysics. If you have trouble with over three dimensions and curved space, as I do, even Stephen Hawkins admits to having difficulty also and he is considered to be in Einstein's class of "smartz".

The book covers the history of Astrophysics from Aristotle to present. It also discusses subjects such as the "Big Bang", Black Holes, Event Horizons and more in a very readable non math manner. The famous equation  $E=mc^2$  explains (in part) why mass can never exceed the speed of light. What is the future of the universe?

I know this book has been out for some time, but it is a must for the serious amateur astronomer.

What we have given is a "best estimate" based on what physical measurements were available and the type of anomalies that were observed and reported during the time of the ANIK failures.

The failure of the ANIK satellites is therefore not as exotic as Telesat Canada and the media would have the public believe. Some of the media have claimed that we may see a repeat of this activity over the next several months due to the 27-day recurrence tendency of coronal holes. This is highly speculative reasoning and is most likely incorrect. Although it cannot be dismissed, it must be remembered that over a 27-day interval, the characteristics, structure, and internal morphology of solar coronal disturbances can change very dramatically. During one solar rotation, we may see a very strong and geoeffective disturbance from a coronal hole, while on the next rotation, it may be completely absent or very much diminished even though the physical appearance of the coronal hole may not change. Stating that we may see this activity recur again between 08 and 17 February therefore cannot be estimated with very much reliability. Odds are against a recurrence of this nature.

We hope that this report will put some of the false statements and rumors to sleep and help satisfy those who required a more technical solution to the observed anomalies onboard the ANIK E1 and E2 satellites.

Comments or questions regarding this report may be directed to us at the following address. Inquiries may also be directed via e-mail to either: Oler@Rho.Uleth.CA, or to: COler@Solar.Stanford.Edu.

Solar Terrestrial Dispatch  
P.O. Box 357  
Stirling, Alberta T0K 2E0  
Canada

## Satellites and Large Solar Activity: What Happens

Condensed from the Internet: sci.astro

Anyone wonder what happens to a geosynchronous satellite during severe solar activity? This press release will describe how severe the environment can be.

On 20 January 1994, two major Canadian communications satellites ANIK E1 and ANIK E2 were damaged while in geosynchronous orbit, affecting nationwide television and news-gathering services. Statements and rumors made by officials and the media have resulted in some confusion regarding exactly what happened. To this end, we have developed a brief report concerning the suspected true source of the satellite failures.

Telesat Canada and/or the media claimed that the satellite failures were the result of a "massive solar flare". Some inadequately and incorrectly stated it was the result of a "tear in the Sun's surface". These statements are false and require clarification.

Solar activity on 20 January was quiet. There were no major or minor flares on this date. A major flare erupted very near the eastern limb of the Sun on 16 January, although it was very poorly located and incapable of producing the effects observed on 20 January. Likewise, there were no other significant eruptive solar disturbances which can be clearly blamed on the failure of the ANIK birds. By "eruptive", we mean events on the Sun which are related to flares (explosive releases of energy). This includes the eruption of solar filaments, which are "strings" of gas suspended by magnetic fields above the surface of the Sun. The claim that the ANIK failures were the result of major flares or other eruptive solar phenomena are therefore false.

One of two potentially influential solar coronal holes (or possibly a combination of both) are currently suspected of INDIRECTLY producing the conditions responsible for the ANIK satellite failures. Coronal holes are areas where the Sun's upper atmosphere is exceptionally low in density and where high-speed winds (known as the "solar wind") emanate in space. We are at that stage in the declining phase of the 11-year solar cycle where stable and influential coronal holes develop. These stable coronal holes can survive, remaining relatively unchanged for many solar rotations (a 27-day interval) and can therefore have potentially adverse effects on the near-Earth space environment.

Not all coronal holes are

geoeffective, or capable of producing noteworthy changes in the near-Earth space environment. There are many factors which can change the effect coronal holes have on the Earth. Most noteworthy are the changes in the Earth's magnetic field which envelops our planet and protects us from much of the harsh environment outside of our planet's magnetosphere. The high-speed streams of solar wind which emanate from coronal holes can perturb our geomagnetic field. Disturbances in our magnetic field are given several types of "ratings" or categories, depending on their magnitudes. The date in question, 20 January, was unsettled to active. That is, the geomagnetic field was fluctuating at levels indicative of an "unsettled to active" state. Compare this with the more severe ratings which can occur, where geomagnetic activity increases to "storm" levels. There are three divisions of storms: "minor", "major", and "severe". The activity on 20 January was well below even the "minor storm" category. The claim that the ANIK satellites failed due to a "massive", "large", or other geomagnetic "storm", are therefore also inaccurate and false.

All satellites in orbit are susceptible to particles having electrical charges - namely protons and electrons. It is therefore of interest to investigate the possible influences of these particles on the charging environment near these satellites. The GOES-7 geosynchronous environmental and meteorological satellite is equipped with sensors capable of measuring the density of protons and electrons in the vicinity of the satellite. Since this satellite is in the vicinity of the ANIK birds, it has been used to determine the state of the charging environment near the ANIK satellites.

There were no proton enhancements at geosynchronous altitudes on 20 January, or for any day prior to 20 January. Protons were at quiet background levels and have therefore been ruled out.

The GOES-7 spacecraft did, however, observe enhanced densities of high-energy electrons (at energy levels greater than 2 MeV, or 2 million electron volts) in the space environment for several days prior to 20 January. Electrons became elevated rather abruptly on 12 January. Gradual intensification took place over the next several days, beginning on about 15 January. Electrons at greater than 2 MeV peaked on 20 January at about the time of the reported ANIK failures at levels about 2 to 3 magnitudes higher than the quiet-time background levels. They then fairly abruptly returned to quieter levels late on 21 January. The observed failures of the ANIK satellites are therefore blamed on elevated levels of high-

energy electrons which resulted in deep-dielectric charging, which in simple terms, is the deep penetration and deposition of electron energy within the satellite.

Satellites are capable of "bleeding" (or gradually discharging) electrical charges. This can be accomplished in many different ways. Energetic electrons, of hundreds of keV to several MeV, can penetrate to considerable depth in a dielectric and deposit a charge deep within the bulk material of the satellite. Anomalies and damage to internal satellite circuits can occur if the rate of deposition of energy exceeds the rate at which the electrical charges bleed away. This may have been why the ANIK satellites were able to endure the enhanced electron densities for such a long period before failing on 20 January. It is also thought that this type of charging is relatively slow, requiring several hours or days before anomalies begin to be observed. These densities of high-energy electrons tend to occur more along the outer magnetosphere, where geosynchronous satellites pass on the day-side of the Earth. This is why lower Earth-orbiting satellites did not observe concurrent anomalies.

Numerous other satellites in geosynchronous orbit were also affected by this event, and have reported anomalies, although nothing quite as catastrophic was observed.

Enhanced densities of high-energy electrons of the magnitude observed near 20 January are not uncommon, and often occur as many as 4 or 5 times a year. Other factors may have also been involved or contributed to the failure of the ANIK satellites, such as the construction of the satellites, the shielding used, etc. There are still many things scientists don't understand well enough to quantitatively explain, and we still don't know enough to quantify exactly what densities of charging particles are necessary to produce anomalies in satellites. This is one of the many reasons why it is difficult to predict the influence these events might have on the satellite community. Effects will also vary widely from one satellite to another due to the varying construction and shielding techniques used.

The source of the high-energy electrons is not yet well understood. It is presently believed that disturbances from the Sun (in this case, an enhanced solar wind stream from a solar coronal hole) which perturb the Earth's magnetosphere result in the acceleration of electrons that can attain energies of between about 1 and 3 MeV. This is what is believed to have happened during the interval from 12 to 21 January, although it is possible that this event was completely unrelated to the coronal holes noted above. Continued on Page 3

# The 14th Annual Bay Area Astronomical Auction April 23rd, 1994

**Doors open at 1:00 PM**

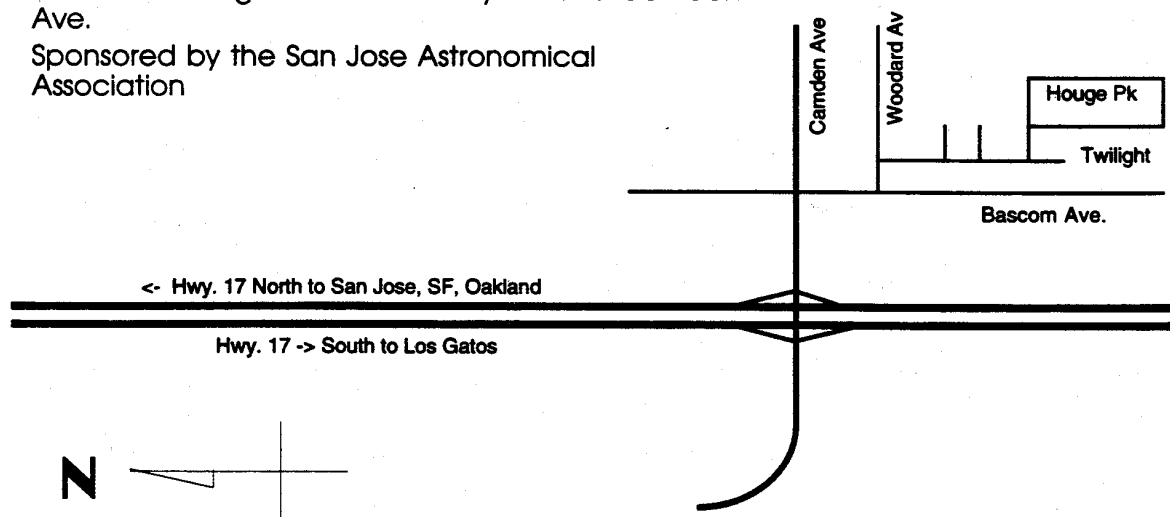
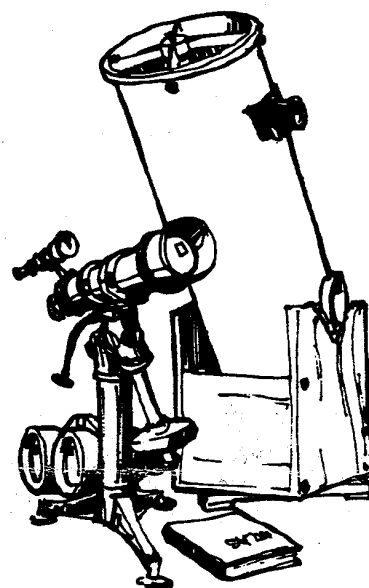
**Swap Meet 2:00 - 5:00 PM**

**Auction starts at 6:00 PM**

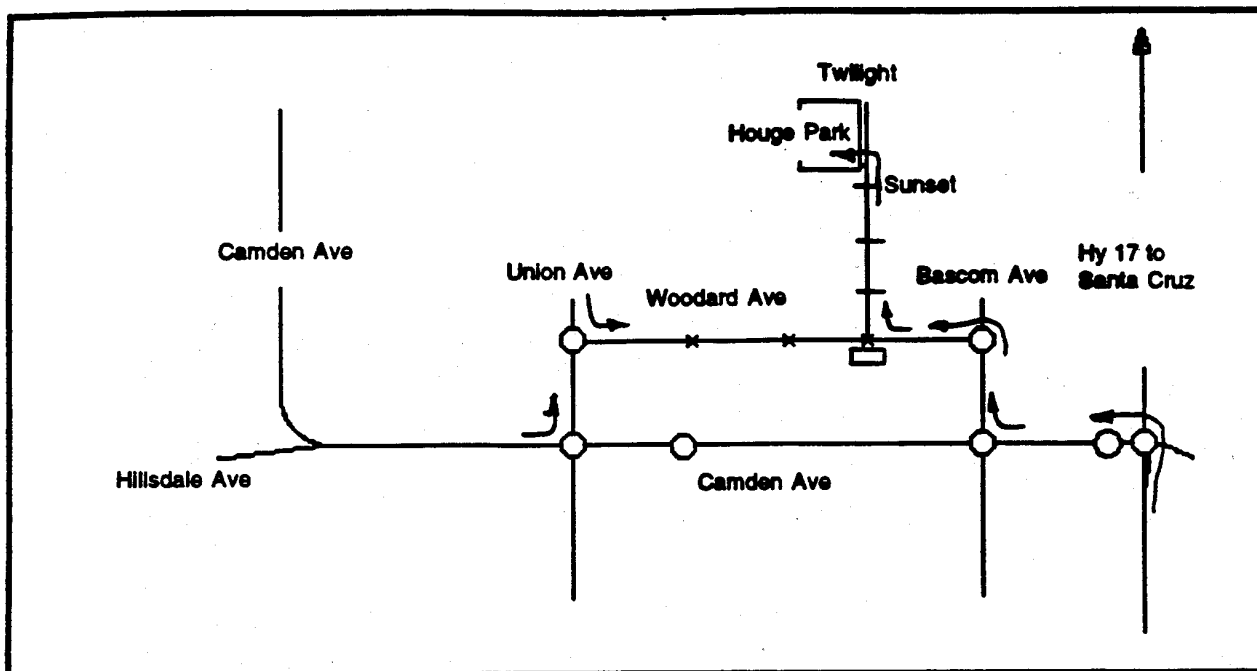
Bring those unused goodies and swap 'em for something new and different or turn the dust collectors in the garage and closet into cash.

Located at Hogue Park near Hwy. 17 and Camden Ave.

Sponsored by the San Jose Astronomical Association



Please post this flyer



## Directions to HOUGE PARK

1994 Bay Area Astronomical Auction Registration				
Bidder # from SJAA	Name			City
	Addr			Zip
Item # from SJAA	Qty	Min Bid	Donation 10% min	Description (40 - 50 Characters)

10% of all sales go to the SJAA - Please pre-register - fill this out and Mail to J Van Nuland, 3509 Calico Ave, SJ, CA 95124



THE AANC PROUDLY ANNOUNCES A ONE - DAY WORKSHOP:

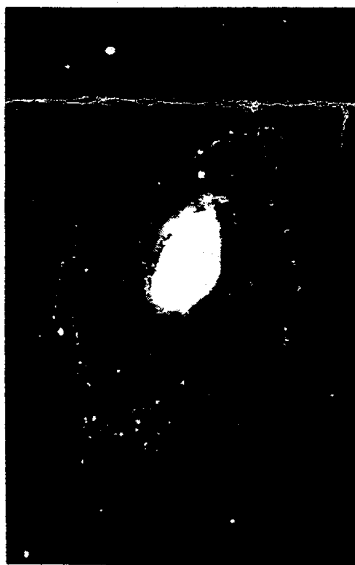
# CCD IMAGING AND IMAGE PROCESSING

SATURDAY 26 MARCH 1994

8: 00 A.M. - 5:00 P.M.

LAWRENCE HALL OF SCIENCE  
UNIVERSITY OF CALIFORNIA, BERKELEY

- Hear what the Vendors say about their latest products!
- See the latest in CCD cameras and equipment, and software!
- Learn the techniques of the emerging field of CCD astrophotography!
- Ask the Questions, Compare the Products, Try them out!
- Learn hidden secrets that can save you money!



M81 (from Tri-Valley Eye's on the Sky BBS)

It wasn't so long ago that charged coupled devices (CCDs) had low resolution and VERY high prices, using very slow computers. Well all that's changed! In the last few years CCDs are performing with dazzling speed, ever increasing imaging resolutions, at prices within reach of amateurs.

To help you learn about this exciting new field, the AANC presents its first one-day workshop dedicated to a specific topic:

#### CCD Imaging and Image Processing with

- Keynote Speaker, **John Sanford** of Starlight Xpress and editor of the Orange County Astronomers, "Sirius Astronomer." John will give an overview of CCD imaging, a technology that may some day replace silver halide as the way we take pictures.
- **Chris Tennant** of Sirius Instruments, from Villa Park, Illinois will show a new product that features high resolution at a very affordable prices. He is bringing three units to demonstrate and a video that we will project on a large screen.
- **John Westfall** of ALPO will make a presentation on his experience with his LYNXX system from SpectraSource Instruments. CompuScope will show its amazing new 32 bit Image Processing software.

Circle that date, 26 March 1994, because that's when you will have the opportunity to learn about a whole new way of capturing starlight!

Cost: \$25 at the door; \$20 if preregistered.

For more info, call Don Stone 510-376-3007.

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#### Preregistration:

Send \$20 by March 15, 1994 to

Don Stone, CCD Workshop Registrar  
731 Camino Ricardo  
Moraga, CA 94556-3014

If you want confirmation and a map to  
Lawrence Hall of Science, include SASE.

Your Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

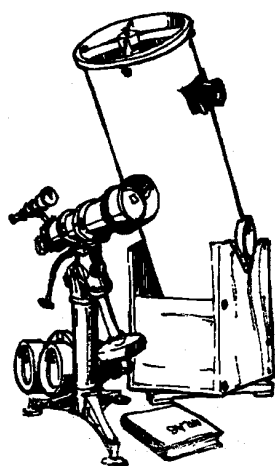
Club (if applicable): \_\_\_\_\_

Amount Enclosed: \_\_\_\_\_

# 1994 SJAA Calendar

General Meeting		Houge Park Star Party	Observational Astronomy Class
Mar	26	18	19
Apr	23 Auction and Swap	15	16
May	May be the 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	Ken St. George	3/15/94
3	4" Quantum	----->	available
6	C-8 Celestron	Jim Ricks	3/22/94
7	12-1/2" Dobson	----->	available
8	14" Dobson	Lee Courtney	2/15/94
9	C-11 Celestron	Paul Barton	*****
14	6" Newt/P mount	Sridhar Lakshmikanthan	3/29/94
15	8" Dobson	Jim Marquis	2/26/94
18	8" Newt/P Mount	John DaSilva	4/4/94
19	6" Newt/P Mount	Chung-Lin Lee	4/6/94
20	4-1/4" Dobson	John Bettencourt	3/1/94

Solar telescope (#16). 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

#15	Richard Raw	#6	Ben Lee
#15	John Schoenenberger		

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.

**Roll-off Roof Observatory** - 6-1/2 X 6-1/2 X 6-1/2 feet semi-moveable, new condition, worth \$2000 - sell for \$700 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. **Minolta Zoom Binoculars**, 7-21 X 50, exceptional quality, mint condition, \$200 or more when new. sell \$150. **4-inch LCD Color TV/Monitor**, Casio, world's smallest, great for CCD use or TV alone. Mint. Sacrifice at \$150. Call Edward Hyeler (209) 931-0486 6:30 to 9:30pm or leave message. 2/94

**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. 2/94

**Celestron Sp-C8**. (Black tube), Star Bright coating, 3yrs old, gives nice images. Super Polaris Mount (GEM) improved, motor drives - RA and Dec, Celestron 8X50 convertible finder (illuminated). Also comes with 1.25 and 2 inch visual backs, Celestron 26 mm plossl eyepiece, star diag, mounting bracket, hand controls and foot locker case. \$925

Like new **Teleview Wide field** eyepieces

1 Teleview 19 mm wf

1 Teleview 15 mm wf

best reasonable offer. Call:

Rich Neuschaefer

work) (408)-285-6818

home (408)-285-0730

2/94



# CELESTIAL CALENDAR

March 1994

Lunar Phases	Date	Rise	Trans	Set
LQ 08:54hr	04-3	0059	0603	1107
NM 23:05hr	11-3	0548	1151	1802
FQ 04:15hr	20-3	1142	1845	0116
FM 03:10hr	27-3	1912	----	0552

## Nearer Planets

Mercury	07-3	0523	1046	1610
0.90 AU	17-3	0509	1034	1559
Mag -1.6	27-3	0505	1040	1615

Venus	07-3	0706	1305	1905
1.64 AU	17-3	0656	1311	1926
Mag -4.0	27-3	0647	1317	1948

Mars	07-3	0553	1118	1643
2.28 AU	17-3	0534	1108	1642
Mag +1.0	27-3	0515	1058	1641

Jupiter	07-3	2238	0358	0914
4.70 AU	17-3	2156	0317	0834
Mag -2.4	27-3	2114	0235	0752

Saturn	07-3	0606	1134	1703
10.67 AU	17-3	0530	1059	1629
Mag +1.20	27-3	0454	1024	1555

SOL	Star	Type	G2	V	Mag	-	26.72
RA	DEC						
23:14	-0456	07-3	0630	1219	1808		
23:51	-01:00	17-3	0615	1216	1818		
00:27	+02:56	27-3	0600	1213	1827		

Astronomical Twilight	Dawn	Dusk
JD 2,449,419.5	07-3	0504 - 1934
,429.5	17-3	0449 - 1944
,439.5	27-3	0433 - 1954

## Sidereal Time

Transit Right	07-3	0000	PDT=1055
Ascension at	17-3	0000	PDT=1134
Local Midnight	27-3	0000	PDT=1214

Darkest	Saturday Night	Mar. 12
Sunset		1813
Twilight End		1939
Moon Set		1858
Dawn next morning		0455

## 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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## Distribution

Bob Madden and Paul Barton

## Comet Comments

by Don Machholtz

The first comet of the year is a photographic find by an amateur. Meanwhile, several comets remain visible in our skies. Periodic Comet Schwassman-Wachmann 2 is in our sky for nearly the whole night. Periodic Comet Tempel 1 is brightening near opposition. The newly-discovered Comet McNaught Russel is rapidly moving north, it will pass 0.46 AU from the earth in April. It may become brighter than predicted here. Finally, Periodic Comet Shoemaker-Levy 9, expected to hit Jupiter this July, is faint but visible for most of the night.

Periodic Comet Kushida (1994a): This comet, the second found by Yoshio Kushida in five weeks, was a photographic discovery on Jan. 8 at magnitude 11. At discovery the comet was near opposition, not far from the star Regulus. He used a 4", f/4 patrol camera and Technical Pan 6415 film. It is now known that this is a periodic comet. It was closest to the sun on Dec. 12 at 1.36 AU and takes 7.2 years to complete each orbit. It is now dimming.

Kushida seems to be conducting the type of search program carried on by the Shoemakers at Mt. Palomar. The Shoemakers have recently retired their Palomar program in favor of one from Arizona where they will pick up fainter objects. This leaves the potential of undiscovered comets of magnitude 11 - 14 in the region of the ecliptic near opposition.

This issue of Comet Comments is now available via electronic mail. You can download it by calling Kingmont Observatory BBS at (916) 652-5920 and requesting file cc187.txt.

## EPHEMERIDES

### PERIODIC COMET SCHWASSMANN-WACHMANN 2

DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG
02-22	08h14.7m	+20d58'	148d	E	11.1
02-27	08h14.2m	+21d11'	143d	E	11.2
03-04	08h14.4m	+21d21'	138d	E	11.3
03-09	08h15.5m	+21d27'	133d	E	11.4
03-14	08h17.4m	+21d29'	128d	E	11.5
03-19	08h20.1m	+21d28'	124d	E	11.5
03-24	08h23.5m	+21d24'	120d	E	11.6
03-29	08h27.6m	+21d16'	116d	E	11.7
04-03	08h32.3m	+21d05'	112d	E	11.8
04-08	08h37.6m	+20d50'	108d	E	11.9

### PERIODIC COMET TEMPEL 1

DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG
02-22	13h29.4m	+09d32'	134d	M	12.6
02-27	13h31.6m	+09d52'	138d	M	12.3
03-04	13h33.2m	+10d16'	141d	M	12.0
03-09	13h33.9m	+10d42'	146d	M	11.7
03-14	13h33.9m	+11d08'	149d	M	11.5
03-19	13h33.0m	+11d35'	153d	M	11.2
03-24	13h31.2m	+12d00'	156d	M	11.0
03-29	13h28.7m	+12d21'	159d	M	10.7
04-03	13h25.5m	+12d37'	160d	M	10.5
04-08	13h21.8m	+12d45'	160d	E	10.3

CC187.TXT

### PERIODIC COMET SHOEMAKER-LEVY (1993e)

DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG
02-22	14h40.8m	-16d23'	110d	M	13.8
02-27	14h41.1m	-16d23'	115d	M	13.8
03-04	14h41.1m	-16d24'	120d	M	13.7
03-09	14h40.8m	-16d20'	125d	M	13.7
03-14	14h40.2m	-16d15'	131d	M	13.7
03-19	14h39.3m	-16d10'	136d	M	13.6
03-24	14h38.1m	-16d02'	141d	M	13.6
03-29	14h36.7m	-15d54'	146d	M	13.6
04-03	14h35.0m	-15d44'	152d	M	13.6
04-08	14h33.2m	-15d33'	157d	M	13.5

### COMET MCNAUGHT-RUSSELL (1993V)

DATE (00UT)	R.A. (2000)	DEC	EL	SKY	MAG
02-22	03h06.5m	-38d31'	69d	E	13.8
02-27	03h15.7m	-35d13'	68d	E	13.4
03-04	03h25.9m	-31d16'	67d	E	13.0
03-09	03h37.2m	-26d27'	66d	E	12.6
03-14	03h49.4m	-20d29'	64d	E	12.2
03-19	04h02.7m	-13d00'	63d	E	11.9
03-24	04h17.0m	-03d43'	62d	E	11.5
03-29	04h32.4m	+07d30'	60d	E	11.3
04-03	04h49.2m	+20d11'	60d	E	11.2
04-08	05h07.9m	+33d15'	62d	M	11.3

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