



SJAA EPHEMERIS

Observing Near Home

David Kingsley

[October 21, 2000] I was just reviewing my observing log last weekend. Of 364 observing sessions in the last 30 months, approximately 80% were around home. 9% were less than a half hour drive away (mostly Montebello), an additional 9% were about an hour's drive (Henry Coe, Pacheco, Fremont Peak, Lick observatory), and only 1 to 2% of sessions were at darker sites located a couple hours or more away (Lassen, Lake San Antonio, Fiddletown).

Although I prefer observing at a dark site, constraints of time, and work, and kids, and the moon and weather, limit the times that is possible to 2 or 3 sessions a month. Fortunately double stars, bright open clusters, planets, and the battered surface of the moon all make beautiful targets near home.

Here are a few of the resources I have found useful for planning observing projects in brighter skies.

Double stars look great anywhere.

1) The astronomical league has a 100 doubles list that's a reasonable place to start (<http://www.astroleague.org/al/obsclubs/dblstar/dblstar1.html>).

2) Sissy Haas periodically publishes double star hops for particular constellations in *Sky and Telescope*. Her enthusiasm for doubles shines through in her writing. I also enjoy the range of targets, colors, and brightness contrast that she usually includes in her lists. The constellation approach also means that each article could serve as the basis of observing sessions at a particular time of year. See:

"Double Stars off Mizar," May 00

"Double stars of Cepheus," Sep.

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- "Gems of the Desert," April 98
- "The Extraordinary Doubles of Bootes," June 96
- "Wide Doubles in Capricornus," Oct. 95
- "Double Jewels in Cancer," Mar. 95
- "Double Gems in Pisces," Nov. 94
- "Jewels in Lynx," April 1994

3) The "33 Doubles in Orion" project was an interesting constellation-based project I went through in a couple of sessions last January. Large range of star colors and distances, many of which took me to parts of the constellation I had never explored before. Most of the doubles were relatively easy. However 42 Orionis required attempts on a couple of different nights before seeing conditions

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SJAA Activities Calendar

Jim Van Nuland

April

- 1 DST start. Advance clock by 1 hour at 2 a.m. -> 3 a.m.
- 7 AANC Conference of Astronomy Clubs - Chabot Space and Science Center. Speaker John Dobson, and the Indoor Messier Marathon. Visit <http://www.aanc-astronomy.org>)
- 8 Auction and Swap meet (Sunday! See article inside)
- 13 Hough Park star party Sunset 7:41 p.m., 64% moon rises 1:39 a.m.
- 14 Fremont Peak star party Sunset 7:40 p.m., 55% moon rises 2:24 a.m.
- 15 Easter Sunday (school vacations before/after)
- 16 Tax Day
- 21 Coe and Peak star party Sunset 7:47 p.m., 3% moon rises 6:14 a.m.
- 27 Astronomy Class V, 7:30 p.m., hall, Hough Park, Types of Telescopes

April (Cont.)

- 27 Hough Park star party Sunset 7:54 p.m., 23% moon sets 0:27 a.m. (This is the SJAA official Astronomy Day event)
 - 28 Astronomy Day
-
- ### May
- 5 General Meeting: Speaker Seth Shostak from SETI
 - 12 Fremont Peak star party sunset 8:04 p.m., 71% moon rises 1:02 a.m.
 - 18 Astronomy Class VI, 7:30 p.m., hall, Hough Park
 - 18 Hough Park star party. Sunset 8:12 p.m., 17% moon rises 4:16 a.m.
 - 19 Fremont Peak star party. Sunset 8:10 p.m., 10% moon rises 4:43 a.m.
 - 25-28 Riverside Telescope Makers Conference, 1Q moon following Tuesday
 - 26 Coe and Peak star party sunset 8:17 p.m., 20% moon sets 0:13 a.m.

24 Hour News and Information Hotline: (408) 559-1221

www.sjaa.net

Observing Near Home

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were good enough to split the close dimmer secondary. This project was described in the February 2000 issue of *Sky and Tel* and maps and charts are also available online. (http://whuyss.tripod.com/Orion/33_orion_table.html)

4) Several star atlases include good lists of both double stars and brighter deep sky objects. I have used Astrocards for observing projects, and they work great for Messiers, brighter NGC objects, and many Herschel 400 targets (see <http://www.astronomymall.com/regular/products/astro-cards/>). I don't find the Astro card set for double stars to be as useful as the rest, however. (Unlike the other card

The large range of star colors and distances ... took me to parts of the constellation I had never explored before.

sets, there are no blow ups of target regions, and it can be hard to located the interesting doubles in a constellation-wide view.)

5) Jamie Dillon, has been working on his "Dickinsons", the list of objects included with good text descriptions in the Edmund Mag 6 Star atlas. Many of these are double stars and brighter deep sky objects that could be chased down from a near-town site.

6) The Orion Deep Map 600 has Steve Gottlieb's great list of the best deep sky objects, and descriptions of about 85 double and multiple stars (see Ray Cash's page for more information and on-line version of lists: <http://sites.netscape.net/raycash/dm600.htm>)

I like the whole sky map format, and the object selection and descriptions, even though there aren't enough stars on the map to star hop effectively to the dimmer objects. This is an excellent resource if your view is obstructed in particular directions

because of trees, lights, fences, etc. The large scale map format of Deep Map 600 makes it easy to find a particular slice of the sky, and points out lots of rewarding objects for whatever slice you've got.

7) My own recent favorite Atlas of relatively bright targets and double stars is the *Observer's Sky Atlas* by E. Karkoschka. This is a great compact atlas for near home viewing. It's small enough to fit in a coat pocket. It has both overview charts (mag. 6) and then higher density charts around regions of interest (mag. 9) on the same page. This combines both an overall view, and a useful blow up with lots of stars to help find the objects (sort of like having a combination of Bright Star Atlas and Sky Atlas 2000 resolution together for selected target regions).

The book includes a large amount of useful descriptive information about the objects on the page facing each chart. This includes both verbal descriptions of deep sky objects, and lots of interesting data on stars, star colors, variables, and interesting doubles to be seen on each chart. Lots of this information goes substantially beyond what you see in a usual list of objects in a beginner atlas, including distances to stars and objects, B-V color information, ratings for difficulty of viewing, orbit projections over the next 10 or 20 years for rapidly changing double stars, variable star predictions, and lists of furthest-closest, brightest-dimmest, largest-smallest, object sizes and intrinsic brightnesses that provide an interesting perspective on things amateurs look at in telescopes. Much of this information may be overkill for people just starting out, but I have found it to be very useful. The book charts 110 Messiers and 140 additional deep sky targets of similar brightness, plus 250 double and 80 variable stars that provide an instant list of near-town targets, complete with charts, in a book you can fit in a jacket pocket.

8) Alan MacRobert's *Star Hopping for Backyard Astronomers* is also an outstanding way to organize short observing sessions near home. I originally saw a recommendation for the book in an article by Alister Ling on

Ray Cash's web page, and finally got a copy this fall. MacRobert is a very interesting writer and an excellent tour guide who both picks very interesting objects, describes them well, and gives enough theoretical background to teach you something at the same time. He majored in physics and manages to slip in a surprising amount of information in the course of the star hops. Many of his targets are bright enough to chase down from near town with a 6-inch telescope. I've learned something every time I've gone through one of MacRobert's star hops, and seen many beautiful objects I have not found on any other observing lists. MacRobert has written up 28 different star hops, each of which could serve as the basis of a near-town observing session. Fourteen are collected in the book, and

Get a Rukl atlas and try crater hopping instead of star hopping ... any night the moon is up.

14 additional star hops have subsequently been published as occasional articles in *Sky and Telescope*. I am impressed enough by the book to be making copies of his other *Sky and Tel* articles from the library.

9). Planets also look great from anywhere. I'll look at Jupiter and Saturn any night they are up. I also enjoy shadow and moon transits on Jupiter, and keep a list of all the events for the year in an electronic file on the Palm Pilot (see <http://www.projectpluto.com/jevent.htm>). Month by month lists are also published each month in *Sky and Telescope*.

10) And of course the moon itself could provide a lifetime of observing projects. Dave North's regular column in *SJAA Ephemeris* helped stimulate my own interest in the giant ball in the sky (<http://ephemeris.sjaa.net/>). Get a Rukl atlas and try crater hopping instead of star hopping along the terminator any night the moon is up (even deep sky mavens have been

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known to try this on occasion, see <http://www.observers.org/reports/99.01.27.2.html>). Try finding all the objects in the 50 views of the moon series at the back of Rukl. Try looking at a region of the moon and working out the temporal order of events using the law of superposition. (The classic example is Imbrium then Archimedes, then basin filling, then Eratosthenes, then Copernicus.) Search for new sunset and sunrise rays (<http://www.shallowsky.com/moon/ruklindex.html#R>, <http://www.lunar-occultations.com/rlo/moon/lunarray.htm>, <http://www.observers.org/reports/2000.09.18.html>). Sketch the play of light and dark as the terminator advances during an observing session. Compare your observations with those of many other observers at Akkana's excellent website (<http://www.shallowsky.com/moon/hitchhiker.html>). Even on a full moon weekend with clouds in the sky, you can set up near home and spend a very enjoyable night pushing your telescope and observing skills. Last Saturday's session with Plato craters was a lot of fun, and didn't require a long drive or favorable weather forecast (<http://www.observers.org/reports/2000.10.14.4.html>).

Tonight the moon does not come up 'til late, the skies look clear, and I am looking forward to going to Henry Coe State Park to chase down more deep sky objects from the Herschel II list. I can't wait. It has been nearly a month since my last opportunity to travel to a reasonably dark sky site with a telescope. Since going last month, however, I have been able to set up a scope 14 times around home. The in-town sessions have provided great views of deep-sky objects, double stars, open clusters, planets, and the moon, and great practice for pulling out detail at the eyepiece. I love the dark sky stuff, but there is a whole solar system, galaxy, and universe of things to see in the sky. Observing near home lets me explore it on a regular basis, and keeps the rust and cobwebs out as well.

A Cup Of Wine And Thou

Dave North

Mentioning Omar Khayyam and libration in the same sentence is definitely an invitation to make the classic confusion of "libration" and "libation."

There's only one letter difference, and of course the line Omar is most famous for? "A loaf of bread, a jug of wine, and thou." One of the best-known libation phrases of all time.

But it's libration that concerns us here — in this case, the shifting view we get of the edges of the moon, sometimes revealing things that are otherwise impossible to see.

Just off the west edge of the Moon, in the northern quadrant, is the crater named for Omar Khayyam —

Why does an author of sappy love poems ... have a lunar crater named after him?

and though the strongest western exposure for the month doesn't happen until the 23rd, the northern libration is out of sync. As a result, we have a rare opportunity to see the finer details of OK on the first of the month.

But wait a minute! Why does an author of sappy love poems (much adored by parapostpubescent teenyboppers) have a lunar crater named after him? Is it because "crater" means "cup," and he did more to popularize wine cups than anyone else?

Nah.

It's because he was (get this) one of the foremost mathematicians of his time (which was 1048 to 1131, a remarkable old age for those times).

And, of course, mathematicians are well-represented on the Moon.

First, the crater itself: not all that special, but definitely challenging to locate in this light. When you see it, you'll be able to feast on a nearly edge-on plain old everyday 70Km crater with no discernible central peak and reason-

ably well-preserved walls.

The terminator position will be just about perfect, though, to inspire your imagination to reverie on the curious stories behind the man for whom the crater is named.

For example, the symmetry and clean shape of the crater bring to mind the orderly logic of Algebra, Omar's true devotion. We can only regret that there were no telescopes, and no way for Omar ...

...hold on a minute. Omar? His full name was Ghiyath al-Din Abu'l-Fath Umar ibn Ibrahim Al-Nisaburi al-Khayyami. I suppose the "Umar" is where "Omar" comes from, but I can't help but prefer OK to UK, so we'll call him "Omar" since I have it on excellent authority (Thomas Edward Lawrence) that arabic pronunciation is somewhat mercurial, and english transcriptions should reflect that happy approach...

...Omar had no way to observe his own crater, as telescopes were not yet popular. Nevertheless, he's also known as one of the premier astronomers of his age!

Not happy with that, he composed a groundbreaking proto Music Of The Spheres — *Problems of Arithmetic*, a book on music and algebra — before he was 25 years old. Later, he wrote what became a classic in the field: *Treatise on Demonstration of Problems of Algebra*.

During this time Khayyam led work on compiling astronomical tables, also contributing to calendar reform (a popular Arabic pastime) in 1079.

Astronomy was often his chosen venue to illustrate the uses of Algebra, and the precision possible with only crude tools.

For example, Khayyam measured the length of the year as 365.24219858156 days. For his time, it is outstandingly accurate, and was useful in all manner of computations (including discovering that the length of

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Mooning

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the year was changing!)

Cubic equations may be his greatest legacy.

Khayyam solved the cubic equation $x^3 + 200x = 20x^2 + 2000$ and found a positive root by considering the intersection of a rectangular hyperbola and a circle. An approximate numerical solution was then found by interpolation in trigonometric tables. Perhaps even more remarkable is the fact that Khayyam states that the solution of this cubic requires the use of conic sections and that it cannot be solved by ruler and compass methods, a result which would not be proved for another 750 years.

In the end, Khayyam himself seems to have been the first to conceive a general theory of cubic equations.

Okay, by now you've probably pointed your scope at the Moon and seen the curious problems inherent in such observations — a perfect example of how odd the moon itself is. And how you can see a crater in much the same way that Omar could see ideas: with the eye of your mind.

You start out with a Rubaiyat and end up with a guy who also extended several of Euclid's geometric principals.

But should he be so remembered for his poems? Probably not; versions of the forms and verses used in the Rubaiyat existed in Persian literature before Khayyam, and only about 120 of the verses can be attributed to him with certainty. But if I understand it correctly, he does own the patent to this:

The Moving Finger writes, and, having writ,

 Moves on: nor all thy Piety nor Wit

 Shall lure it back to cancel half a Line,

 Nor all thy Tears wash out a Word of it.

It's ironic to me that The Finger would have served Omar so well had it in fact recorded all that he did, but instead it inscribed most deeply perhaps his least important contributions.

Then again, consider it a marketing "loss leader." Enticed by the poems, we discover the substance of the man.

Enticed by a chance to see the crater, we come to understand the name. That both enticements are insubstantial is unimportant.

If nothing else, the next time someone quotes his poetry at you, it might serve you well to point out what he really was:

An astro nerd.

make them easily visible. But how many of us have seen comets which haven't been diverted from their usual abode? Why not try observing comets while they're still in the Oort cloud?

The Oort cloud is a spherical shell of proto-comets and debris encircling the solar system far beyond the orbit of Pluto, at a distance of about 50,000 astronomical units from the sun (for comparison, Pluto sits at about 30AU). It is thought to contain as many as a trillion comets — the ambitious planetary observer looking for challenges won't run out of targets here! Better still, since the

Oort cloud isn't restricted to the plane of the ecliptic, its objects are distributed about the sky — you don't have to worry about that pesky far

southern ecliptic, the way you do with most planets. If your skies are darker to the north, look for some Oort objects there!

If your skies aren't quite dark enough to catch any of these Oort cloud objects, try something a little easier: try for objects in the Kuiper belt, only 30 to 100 AU out from the sun, and the trans-Neptunian "Centaur" asteroids, ranging between the orbits of Jupiter and Neptune. These objects, also mostly comet-like collections of rock and ice, range in size up to Centaur 2060 Chiron, about 170km in diameter, unless (as some astronomers do) you count Pluto (diameter 2274 km) and its moon Charon (1172 km) as Kuiper belt objects rather than a major planet.

As the biggest Centaur object, Chiron makes a good starting point. It's big enough that upon discovery there was talk of whether it should be considered the tenth planet!

Chiron ranges about 11-13 AU from the sun, and ranges between magnitudes 16-18, so it should be a nice challenge for people with large



Ida and Dactyl. Sketch by the author.

The Shallow Sky

How About a Shallow Sky Challenge?

Akkana Peck

This month we'll talk about some unusual topics in shallow sky observing. Ever feel annoyed when your deep sky observer friends make fun of you because planets aren't challenging to locate or difficult to see? Well, that just shows how little they know about planetary observing. Our solar system is full of targets much more challenging than the Virgo cluster, so let's talk about some of them and how you can observe them this April.

Most of us who have been involved in astronomy for more than a few years have seen comets, thanks to

the excellent visitations a few years ago by Comets Hyakutake, Hale-Bopp, and the somewhat less bright but still good Linear S4. What we usually

observe are comets which leave their remote homes and venture into the solar system, where solar radiation sweeps their ice and dust into tails which



Sketch of Chiron by the author.

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The Shallow Sky

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telescopes or CCD imaging equipment. If you have steady seeing, try for the coma: it is a comet, and it does have an observable coma, which extends about 30".

If your skies aren't dark enough for these far-away objects, but you still want an observing challenge, try something closer to home: observing an asteroid's moon! Asteroid 243 Ida, orbiting in the asteroid belt between Mars and Jupiter, was the first asteroid found to have a moon, which has been named Dactyl. At least three other asteroids, 3671 Dionysius, 45 Eugenia, and 762 Pulcova, have since been found to have moons. The brightest of these, Eugenia, runs about magnitude 11.9, itself an easy target for a medium

sized telescope; give yourself a real challenge and try to see Eugenia's moon.

Don't forget to call your deep-sky friends over for a look at these challenging shallow sky targets. They

Eugenia and its moon. (Note that east-west are reversed in this refractor view.) Sketch by the author.

may be surprised to find that planetary observing isn't as easy as they had previously thought. And keep in mind, the best time to see these objects is near the very beginning of this month!



Evidence that aliens visited the moon might be found in this sketch by Jane Houston Jones.

Auction XXI

Jim Van Nuland

On Sunday, April 8, 2001, an astronomical auction and swap meet will be conducted at Hough (city) Park in San Jose. Sponsored by the San Jose Astronomical Association, this is our only fund raiser.

There are two changes this year.

First, we are doing the event on Sunday, to avoid the uncontrollable conflict with the child care program that can and has pre-empted our reservation for the hall at Hough Park.

Second, the auction will be conducted prior to the Swap Meet, instead of afterward. Any items that do not sell may be offered at Swap. More importantly, it is hoped that the delays will be shortened.

Doors open at 10:30 a.m. (or only slightly before) to register material for the auction, and view the auction material. Selling will begin at noon, and will run as long as needed. Settle-up is done afterward by one check to (or from) SJAA, then the items may be claimed. Seller pays 10% commission, with a cap of \$50 for any one item. Seller specifies minimum bid; if not met, it goes back to the seller with no commission applied.

We suggest pre-registering as much as possible; this will avoid a crush at the registration table. See our

web page at www.sjaa.net or e-mail Jim Van Nuland at JVN@sjaa.org.

After the auction, material for the Swap Meet will be allowed into the hall, about 2 p.m. or perhaps earlier. Each buyer pays the seller. Sellers are to keep track of their sales, and pay a 10% commission, as for the auction.

There are no table fees other than a \$1 requested donation for the auction bidder/seller number. We do not handle charge cards. The commissions are tax-deductible, as SJAA is a 501(c)(3) educational organization.

Directions:

From Hwy. 17, take the Camden Avenue exit. Go east 0.4 miles, and turn right at the light, onto Bascom Avenue. At the next light, turn left onto Woodard Road. At the first stop sign, turn right onto Twilight Drive. Go three blocks, cross Sunrise Drive, then turn left into the park.

From Hwy. 85, take the Bascom Avenue exit. Go north about 0.2 miles, and turn right at the first traffic light, onto White Oaks Road. At the first stop sign (another 0.2), turn left onto Twilight Drive. You will now be passing the park. Turn right at the first driveway, into the parking lot.

For more about SJAA, visit our web site at <http://www.sjaa.net>

Silicon Valley Astronomy Lecture Series

April 11, 2001 at 7 p.m.
Smithwick Theater, Foothill College,
Los Altos Hills, CA.

The Long-term Future of the Sun,
the Earth, and the Solar System

Speaker: Dr. Gregory Laughlin
NASA Ames Research Ctr.

This is a nontechnical program focusing on the ultimate fate of our planet over billions of years. Come and find out if a giant Sun will someday melt or even swallow the Earth, and

what nature has in store for the solar system.

Call 650-949-7888 for more information.

Sponsored by: NASA Ames Research Center, Foothill College, SETI Institute, and the Astronomical Society of the Pacific

Admission is free and open to the public. Please bring \$2 with you for the parking meters.

New Board of Directors and Officers

Jim Van Nuland

At the general meeting on February 10, the Board of Directors was elected, to serve 2-year terms. Four members are elected in even-numbered years; and 5 in odd-numbered years. Elected were:

Jim Bartolini (from 1999)
Jim Van Nuland (from 1976)
Bill O'Shaughnessy (from 1994)

Paul Mancuso

Bob Havner

Those having a year to go are:

Gary Mitchell (from 2000)

Bill Arnett (from 1998)

Mike Koop (from 1998)

Mark Taylor (from 1998)

Leaving the Board are Akkana

Peck and Dave North. We thank them for their efforts on behalf of SJAA. Paul

is not entirely new to the Board, having served from 1983-93, and probably also prior to my records. At the Board meeting on March 10, the newly-constituted Board elected its officers for one-year terms. They are:

Mike Koop, President

Bob Havner, Vice-President

Jim Van Nuland, Secretary (since 1979)

Gary Mitchell, Treasurer

A big Thank You to Mike, Gary, and Bob for picking up these important jobs. And thank you too, to Dave North and Mark Taylor for having done them 'til now. Dave will continue maintaining the membership roster and assisting in mailing of the Ephemeris. Thanks, Dave! [And thank you Jim! -Ed]

Project ASTRO

Be a Visiting Astronomer in Bay Area Schools

Project ASTRO is searching for amateur (or professional) astronomers who would like to work with teachers and students in 4th - 9th grade classrooms. This is a great opportunity to help kids learn science, while sharing the wonder of astronomy with the most enthusiastic audience you can find (and to sharpen your own teaching or communication skills in the process.)

Through Project ASTRO, you will be paired in a one-on-one partnership with a Bay Area teacher at a school near you. Together, astronomer and teacher partners attend a free two-day summer training workshop where they learn effective hands-on astronomy activities and receive a copy of Project ASTRO's 800-page curriculum resource book, "The Universe at Your Fingertips."

The project emphasizes ongoing partnerships, not just one-time class visits. During the school year, astronomers make at least four visits to their adopted classroom at mutually convenient times. The program has been operating for 7 years in the Bay Area, and previous participants often report that it has been one of the most

satisfying volunteer endeavors they have ever undertaken.

Astronomer applications are now being accepted for the 2001 - 2002 school year. The deadline is April 27 (but late applications are often accepted.) Space is limited to 20 - 25 partnerships. All participants are required to attend the training workshop, which will be held August 3 - 4, 2001, at the San Mateo County Office of Education in Redwood City.

(Project ASTRO, a program of the nonprofit Astronomical Society of the Pacific, began with support from the National Science Foundation and the NASA Office of Space Science. It has now expanded to 11 other sites around the country and has trained over 900 astronomer-teacher partnerships.)

Astronomer application forms are available from: Karin Avila, Project ASTRO, A.S.P. 390 Ashton Avenue, San Francisco, CA 94112; Tel. 415-337-1100 ext. 101; E-mail: astro@aspsky.org

Forms can also be downloaded from: www.aspsky.org/astro/volunteer.html.

Celestial Calendar

April 2001

Richard Stanton

Lunar Phases:	Date	Rise	Trans	Set
FQ 02:49 PDT	01	10:01	18:40	02:20
FM 19:22 PDT	07	18:04	00:13	05:48
LQ 07:31 PDT	15	02:20	06:08	09:58
NM 07:26 PDT	23	05:22	12:08	19:11

Nearer Planets:	R. A.	Dec.
Mercury, 1.33 A.U., Mag. -2.4		
07 06:16 12:16 18:19	00:10.2	-01:22
17 06:19 12:46 19:14	01:24.1	+07:29
27 06:29 13:25 20:23	02:36.4	+15:33

Venus, 0.33 A.U., Mag. -5.4		
07 05:41 12:09 18:37	00:06.6	+08:08
17 05:04 11:23 17:40	23:58.6	+04:40
27 04:37 10:50 17:03	00:05.0	+03:09

Mars, 0.75 A.U., Mag. -1.3		
07 00:45 05:33 10:20	17:28.8	-23:06
17 00:22 05:07 09:51	17:32.3	-23:34
27 23:51 04:36 09:19	17:50.5	-23:59

Jupiter, 5.77 A.U., Mag. -2.0		
07 09:17 16:31 23:46	04:28.4	+21:19
17 08:44 16:00 23:16	04:37.2	+21:38
27 08:13 15:30 22:47	04:45.2	+21:55

Saturn, 9.93 A.U., Mag. 0.9		
07 08:27 15:50 22:52	03:46.6	+18:04
17 08:11 15:15 22:18	03:51.5	+18:22

SOL Star Type G2V Intelligent Life in System ?		
Hours of Darkness		
08:04 07 06:42 13:10 19:38 01:04.7	+06:53	
07:35 17 06:28 13:07 19:47 01:44.4	+10:48	
07:05 27 06:15 13:05 19:56 02:18.9	+13:52	

Astronomical Twilight:

JD	Begin	End
2,452,006	07	05:12 21:08
	016	17 04:55 21:20
	026	27 04:38 21:33

Sidereal Time:

Transit Right Ascension at Local Midnight	
07 00:00 = 11:54	
17 00:00 = 12:34	
27 00:00 = 13:13	

Darkest Saturday Night: 21 April 2001

Sunset	19:51
Twilight End	21:25
Moon Rise	05:47
Dawn Begin	04:48
Hours Dark	08:44

Officers and Board of Directors

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Telescope Loaner Program

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Web Page

Bill Arnett	bill@nineplanets.org
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SJAA Loaner Scope Status

All scopes are available to any SJAA member; contact Mike Koop by email (loaner@sjaa.net) or by phone at work (408) 473-6315 or home (408) 446-0310 (Leave Message).

Available Scopes

These are scopes that are available for immediate loan, stored at other SJAA members homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a scope pick up at any of the listed SJAA events.

# Scope	Description	Stored by
1	4.5" Newt/ P Mount	Tim Roberts
3	4" Quantum S/C	Bob Havner
10	Star Spectroscope	Steven Nelson
15	8" Dobson	Daron Darr
16	Solar Scope	Jim Van Nuland
24	60mm Refractor	Al Kestler
30	7" f/9 Newt/Pipe Mount	Mike Koop
32	6" f/7 Dobson	Sandy Mohan
42	36" Crossley Refractor	Jay Reynolds Freeman

Scope Loans

These are scopes that have been recently loaned out. If you are interested in borrowing one of these scopes, you will be placed on the waiting list until the scope becomes available after the due date.

# Scope	Description	Borrower	Due Date
6	8" Celestron S/C	Al Kestler	4/19/01
7	12.5" Dobson	Bruce Horton	5/10/01
11	Orion XT6 Dob	David Findley	3/9/01
12	Orion XT8 Dob	Steve Sergeant	5/13/01
13	Orion XT6 Dob	Li Chung Ting	3/15/01
23	6" Newt/P Mount	Dennis Hong	4/28/01
26	11" Dobson	Robert Morgan	6/2/01
29	C8, Astrophotography	Doug Graham	3/18/01
31	8" f/8 Dobson	John Templeton	5/16/01
86	3M f/5.6 Shane Reflector	Geoff Marcy	4/30/01

Extended Scope Loans

These are scopes that have had their loan period extended. If you are interested in borrowing one of these scopes, we will contact the current borrower and try to work out a reasonable transfer time for both parties.

# Scope	Description	Borrower	Due Date
2	6" f/9 Dob	John Paul De Silva	?
8	14" Dobson	Andrew Pierce	4/6/01
9	C-11 Compustar	Paul Barton	Indefinite
19	6" Newt/P Mount	Illa Kallio	3/15/01
21	10" Dobson	Ralph Seguin	Repair
27	13" Dobson	Bill Maney	4/22/01
28	13" Dobson	Michael Dajewski	3/2/01
99	Vulcan Telescope	Peggy Barnard	4/30/01

Waiting List

Hsin Huang, 4" Quantum S/C; Jack D. Kellythore, 14" dobsonian; Gene Schmidt, 13" dobsonian; Raghu Srinivasan, XT6 dob; Gordan McClellan, 8" Sky Quest; Dennis Hong, 8" Sky Quest

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