

# SJAA EPHEMERIS

## The shallow sky

The 2004 transit of Venus is behind us. I wasn't able to see it in person, but I watched it on the web, and I know some SJAA members travelled for it and got some good looks and photos.

The best photo I've seen so far of the transit was an exceedingly sharp close-up from the Royal Swedish Academy of Sciences, showing sunlight off the sun's

limb refracting through Venus' atmosphere. It was the Astronomy Picture of the Day for June 10: <http://antwrp.gsfc.nasa.gov/apod/ap040610.html>

There are lots of other amazing transit images in the photo gallery at [spaceweather.com](http://spaceweather.com).

I haven't heard yet whether any

interesting science has come of the transit, but it did get a few of us talking about the "black drop effect". This is the effect seen in Mercury and Venus transits where, near the points of second and third contact when the planet's silhouette is just barely entirely inside the sun's disc, the edge of the silhouette seems to "smear out" and make the planet take on the shape of a water drop, rather than a perfect circle. I'd always thought this was an optical illusion, but quite a few of the images of the Venus transit show the effect, so it's obviously not something the brain is doing. A web search for "black drop

## SJAA Activities Calendar

Jim Van Nuland

### July

- 8** ATM class at Hoge Park. 7:30 p.m.
- 9** Astronomy class at Hoge Park. 7:30 p.m. Rob Hawley speaks on weather's impact on observing.
- 9** Hoge Park star party. Sunset 8:30 p.m., 40% moon rise 1:14 a.m. Star party hours: 9:30 to midnight.
- 10** Deep sky weekend. Sunset 8:30 p.m., 30% moon rise 1:40 a.m.
- 16-17** Yosemite Public Star Party
- 17** Deep sky weekend. Sunset 8:26 p.m., 0% moon sets 9:11 a.m.
- 20-24** Astrocon 2004 – see page 2
- 23** Hoge Park star party. Sunset 8:22 p.m., 31% moon sets 11:56 p.m. Star party hours: 9:00 to midnight.
- 24** ATM Class at Hoge Park. 7:30 p.m.
- 31** **General meeting**, What's Up at Lick – The State of the Observatory Address by Tony Misch 8 p.m.

### August

- 5** ATM class at Hoge Park. 7:30 p.m.
- 6** Astronomy class at Hoge Park. 7:30 p.m.
- 6** Hoge Park star party. Sunset 8:09 p.m., 65% moon rise 11:41 p.m. Star party hours: 9:00 p.m. to midnight.
- 7** Deep sky weekend. Sunset 8:08 p.m., 46% moon rise 00:09 a.m.
- 14** Deep sky weekend. Sunset 8:00 p.m., 1% moon rise 5:50 a.m.
- 20** Hoge Park star party. Sunset 7:52 p.m., 19% moon sets 10:26 p.m. Star party hours: 9:00 p.m. to midnight.
- 21** ATM Class at Hoge Park. 7:30 p.m.
- 28** **General meeting**, The Magnetic Weather and Climate of the Sun and its Environment by Karel Schrijver from Lockheed 8 p.m.

The Board of Directors meets at 6:30 p.m. preceding each general meeting. All are welcome.

***"I'd always thought (the black drop effect) was an optical illusion but ... it's obviously not something the brain is doing."***

effect" revealed that there's lots of disagreement about what actually causes it. I found a few pages stating that it's due to Venus' atmosphere, which sounds plausible until you start wondering how, then, this effect became so well known based on Mercury transits. Hmm!

It turns out that you can demonstrate the effect yourself without needing to wait for the next Venus transit (good thing! since that won't be until 2012). Hold your thumb and forefinger nearly touching, at arm's length, against a

**24 hour news and information hotline: (408) 559-1221**

<http://www.sjaa.net>

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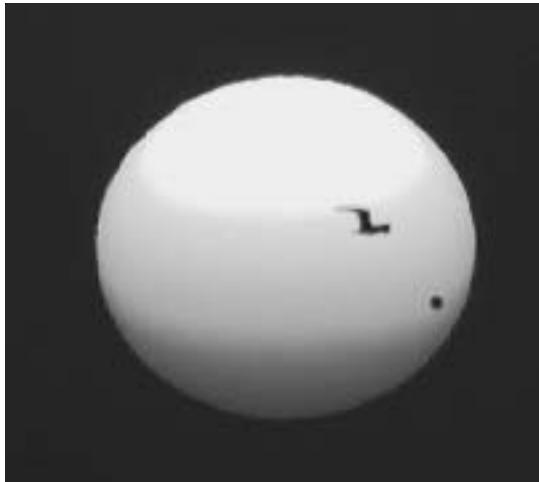
bright background. An open window works nicely. As you slowly move your fingers together, you'll see a point just before they touch where there seems to be a bit of extra flesh stretching between them. Puzzling, isn't it?

If you get more curious, though, you can learn a lot by pointing a

digital camera at your fingers while this is happening. For one thing, you'll learn how much chromatic aberration your camera lens has, since this sort of bright/dark boundary shows color fringing more than anything else (just like Jupiter, Mars and the full moon show violet fringing in an achromatic refractor more than other targets do). Zooming in makes the effect even more pronounced; and if you can get your camera to defocus just a little bit, the effect changes a little.

Looking at the digital camera images, we convinced ourselves that the reason for the effect is diffraction: light bends around a sharp edge, the same effect the folks in the SJAA telescope building class use when they test a mirror using a Ronchi grating or Foucault tester. I haven't actually been able to show interference bands yet doing this test: perhaps an enterprising reader will try it, using a dark room and a directional light source.

It's something to do when you're not looking at planets, anyway. But there are



*Sunrise over Lake Michigan, June 8, 2004. This picture was taken in Chicago without a solar filter. The object that does not appear to be a planet is a bird. Photo courtesy of Bill Arnett ([www.nineplanets.org](http://www.nineplanets.org)).*

some planets to look at this month as well. Jupiter is still in the sky, low in the west during early evening. It's joined by Mercury during the latter half of the month, showing a slightly gibbous phase now, though in August it will dwindle to a crescent. Venus, having passed across the sun, moves into the morning sky, also showing a crescent.

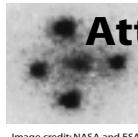
Uranus, in Aquarius, and Neptune, in Capricornus, both transit a bit after midnight and so are available to the late-night observer.

Saturn and Mars are too close to the sun to be visible during July.

Finally, Pluto, in Ophiuchus, is ideally placed for observing; only a month past opposition, it transits a few hours before midnight, though it never gets very high in the sky, less than 40 degrees.



*Venus in its crescent phase on May 22, 2004. Non-uniformity caused by atmospheric perturbations. —PK*



## Attend A Conjunction!

**AstroCon 2004**

**July 20-24, 2004**

**San Francisco Bay Area**

**H**ere's a conjunction you can actually attend—not just observe: a truly once-in-a-lifetime conjunction of the Astronomical League, the American Association of Variable Star Observers, the Association of Lunar and Planetary Observers, and the Astronomical Society of the Pacific.

### Highlights :

- AAVSO and ALPO member sessions open to all attendees
- Top professional astronomers
- Great new public outreach tips and techniques
- Field trip to the world-famous Lick Observatory

AstroCon 2004—the Astronomical League's annual convention—is co-hosted by the Astronomical Association of Northern California, the Eastbay Astronomical Society, and the San Jose Astronomical Association.

**www.astrocon2004.org**  
visit the website for complete details, including secure online registration and payment

**1-415-337-1100 x 109**  
leave us a message to request a printed registration form, or to ask a question

## On the Fourth of July

The supernova that is now known as M1 or The Crab Nebula started shining in 1054.

NASA's Pathfinder landed on Mars in 1997. The next day it would be renamed Sagan Memorial Station. The rover Sojourner would travel a distance of 171 feet during its mission. The current Mars rovers have traveled 4.5 kilometers as of June 15, 2004.

## Words of Galileo Galilei

*In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual.*

*Measure what is measurable and make measurable what is not so.*

*Infinities and indivisibles transcend our finite understanding, the former on account of their magnitude, the latter because of their smallness; imagine what they are when combined.*

*The laws of Nature are written in the language of mathematics ... the symbols are triangles, circles and other geometrical figures, without whose help it is impossible to comprehend a single word.*

## Orbital Dynamics

Dave North

Our first point about orbits? There will be two full Moons this month. Doubtless this will bring up the term "Blue Moon" being the second full Moon in a month, but as best I have been able to determine, that's hogwash.

But it's also becoming common usage, which is how "hogwash" becomes "English." And considering how much of said wash is going around, it's a miracle there's a dirty pig in the US.

I kind of enjoy double-full-moon months. It's fun to hear twice the whining from the (often imaginary) smudgie crowd!

Last month's little notes about the inconstant lunar orbit did provoke a seemingly straightforward question: how long would it take before it was necessary to recenter the Moon in an eyepiece if one were using sidereal rates?

We'll skip right past the "what eyepiece" part and assume we have a fairly typical 1-degree field of view.

Let's see. The Moon completes a sidereal orbit (that's the one we're interested in – not the 29.5-day synodic month) in roughly 27.3 days. That means it will (on average) traverse 13.2 degrees per day, or .55 degrees per hour. Or, if you prefer, 33 minutes per hour.

So, in just under half an hour we're at the edge right?

Wrong!

On average, the Moon takes up a hair over half a degree of the sky. If you've got a 1 degree field of view, when you center up the Moon you've only got .25 degree to spare on each side (about 15 minutes of arc).

If you want to keep the whole enchilada (okay, the whole tostada at full, and maybe the whole taco at quarter)

you've only got the time that it takes to travel 15 minutes of arc, which just happens to be about 27.3 minutes.

That sounds awfully familiar. Where have we seen that number before?

It's the sidereal period in days! How did that happen?

It's a coincidence. Really. This is decidedly not a Face On Mars thang. For example, you might consider what the result would be if we used a  $\frac{3}{4}$ -degree field of view instead.

Cheap magician's trick. Nothing to see here ...

Okay, so we don't exactly have to be correcting our view very often. But what happens when we're not at an 'average' point in the orbit, but rather when the Moon is close and zooming by?

Ah, an interesting problem for someone who took orbital dynamics in college, then forgot it completely!

We recall from our fuzzy Keplerian memories that the Moon will sweep out an equal area in any given equal amount of time (barring other influences).

Without getting too hairy, we can approximate this by noting then that the radius times arc should be equal in all cases, and that over a short period of time the arc very closely approaches a line.

Let's see. The Moon's orbit varies by about 14 percent from apogee to perigee, an ellipse with each axis offset by 7 percent from center. (The rough numbers are 356,400 Km and 406,700 Km respectively).

If the average angular travel is given as 33 minutes per hour (coincidentally, that's the rough angular size of the

Moon at perigee – another Woo!) we can choose an arbitrary radius (or use the real radius) and vary it by 7 percent each way, run the simple calculation and roughly arrive at a perigee angular velocity of 35.5 minutes of arc per hour and about 30.8 at apogee.

Aha! So we just plug these numbers in and see how much the time varies, right?

Wrong again! Nothing about the Moon is simple!

We also have to account for the enlarged Moon at perigee (33.5 minutes of arc approximately) and the shrunken orb at apogee (about 29.4 minutes).

This shrinks the 'available white space' from 15 to 13 arcminutes at perigee and eats them up in a mere 22 minutes!

That, by the way, will be our definitive answer to the 1-degree eyepiece field question.

Should you observe at apogee, you can correct at the lazy rate of about once every half hour.

Now that wasn't such a tough question, was it?

It does illustrate something about lunar rates on telescopes, however. Though they cannot actually keep the Moon centered (except near the "middle" of the orbit) they can certainly slow down the need to correct the eyepiece. Quite a bit, actually.

You might say, gee Dave, then why do you sniff at them as relatively silly?

Same old same old. You'd better have Really Good Alignment (be it equatorial or star alignment of a goto) before that slight difference will work in your favor.

Small errors add up fast.

## From The Board

### Wanted: Laptop

Do you have an old but perfectly good laptop running Windows 98 (or later) that you don't want anymore? The SJAA could use a couple. If at all possible, it should have a color monitor, VGA output, 3.5" floppy and/or CD (preferably both). A USB port would be nice too.

See Mike Koop, Jim Van Nuland, or Gary Mitchell at any meeting. The SJAA is a 501(c)3 nonprofit, donations are tax deductible.

### New SJAA Logo?

Take a look at the top of the first page. See that graphic? That's been the default SJAA logo for a while now. It's OK, but the SJAA doesn't have an observatory like that. The board was thinking it'd be nice if the logo were more representative of the club.

Most of what we do is have star parties with amateur telescopes. Gary Mitchell suggested our logo could be a silhouette of several people with various amateur telescopes, all looking in different directions at the sky; perhaps with one or two of the people pointing sky-ward. (Imagine what one would see from a small distance looking at our Houge park public star party.)

Some board members suggested making a contest out of it. No prize was mentioned... yet. Of course, there's always bragging rights. If there's enough interest, we can have a contest.

In any case, if you're interested in working on a new club logo, contact Gary Mitchell at [wb6yru@ix.netcom.com](mailto:wb6yru@ix.netcom.com).

## Top 10 Ways to do Astrophotography

Ten ways to do amateur astrophotography plus one more for the non-amateur.

**1. High-end CCDs.** Companies like Santa Barbara Instrument Group (SBIG), Apogee and others offer serious CCD cameras. They include features such as the ability to cool the camera 30 C degrees below the ambient temperature. This reduces noise in the picture. Other features make these CCD cameras scientific grade cameras. These cameras tend to start around \$2,000 and that's just black and white.

**2. Piggy Back Camera.** Traditional film cameras still have some advantages over CCD: less noise, finer grain, and color without compromise. However, the piggy back camera needs its own lens. A serious telephoto lens can easily cost more than the telescope it's attached to.

**3. Telescope as Lens.** You can connect a camera to the telescope itself, effectively using the telescope as the lens. Since you don't use the eyepiece, you don't get the magnification you might expect. The only expense besides the camera and the scope is a T-mount which costs about \$50.

**4. Projection Eyepiece.** In the category of eating your cake and having it, too; consider taking a picture of the image that your eyepiece creates. Many people simply put their camera up to the eyepiece. Fancier eyepiece and camera holders cost about \$200.

**5. WebCam.** The January 2004 issue of Sky&Telescope showed how easy it is to get good results from a webcam that has been modified (either a lot or a little) for astronomical use. Costs vary but it will probably be around \$150 for both web cam and adaptor or just \$30 if you have a webcam already. Scopetronix is a vendor for both webcam adaptors and projection eyepieces.

**6. Schmitt Camera.** Some telescope cameras are built just for that purpose. The Schmitt Camera is an example. You can see a nice one at <http://www.psiaz.com/schur/astro/schmidt.html>. When you see a Schmidt camera it tends to have a very low f-stop number like 1.5 or 2. The cost will be north of \$20K.

**7. LowCost CCD, Planetary and Lunar Imager.** LowCost astronomical CCD cameras are available. The Meade Pictor series is a good example. The latest Meade telescopes come with a camera called the lunar and planetary imager(LPI). The name tells you what it is best suited for. The LPI can be purchased separately for \$150. An entry level CCD is available for \$539 from SAC Imaging. A variation on this is to substitute your eyepiece with a video cam that sends images to your television. With other hardware/software you can capture video frames and use them as photographic images. Orion sells a color video cam for \$120.

**8. Internet Astronomy.** Astronomy sites on the internet have lots of pictures but you can also make your

*Continued on page 5*

## Directions to Houge Park

Houge (rhymes with "Yogi") Park is in San Jose, near Campbell and Los Gatos. 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, and turn right at the first traffic light, onto White Oaks Road. At the first stop sign, turn left onto Twilight Drive. You will now be passing the park. Turn right at the first driveway, into the parking lot.

*Continued from page 4*

own pictures via the Internet. One such site is maintained by the people who run the New Mexico Skies astronomy resort. The cost is as low as \$17/hour assuming you are willing to buy a few thousand hours up front. More information is at <http://www.nmskies.com/ITEquipment.html>.

**9. Sketching.** It has been said (I think by John Dobson) that if you get tired of a particular astronomical view in your scope, try sketching it. This isn't photography but it often works better because of the sensitivity of the human eye and the "photoshop" in the brain. Cost is virtually nothing.

**10. Photography already done.** You can get a copy of the Digitized Sky Survey made at Palomar (for Northern skies) and the UK Schmidt Telescope in Siding Spring, Australia (for Southern skies). Cost is \$100 from Software Bisque with occasional discounts offered with other Software Bisque products.

**11. Launch a satellite.** If you read the list down to here and are still not satisfied with the results, you may need to launch an observatory satellite like Hubble. Costs are high – Chandra cost about \$3 billion dollars including development, launch and operations. <http://chandra.harvard.edu/resources/faq/chandra/chandra-8.html>

-PK

## Cassini Timeline

All times PDT

June 30 19:36 – Start Orbital Insertion Burn  
June 30 21:31 – Complete Orbital Insertion Burn  
July 1 00:00 – Spacecraft returns to Earth-point  
(Data playback begins)  
July 2 03:54 – Closest approach to Titan  
July 2 12:15 – Titan playback  
July 3 14:30 – Cleanup maneuver burn  
July 4 22:44 – Solar conjunction begins  
July 12 07:15 – Solar conjunction ends  
July 17 07:45 – Post-conjunction cleanup maneuver  
July 30 15:55 – End of background sequence

## Reflections on Winning the 2004 W. Bruce Blair Medal

Jane Houston Jones

Dr. Gilbert Bruce Blair was born September 13, 1879 in Blairsburg, Iowa and studied at both Tabor and Washburn Colleges in Kansas. He continued his graduate work at University of California, Chicago and Kansas majoring in Physics. He held a fellowship at Lick Observatory too. Dr. Blair taught astronomy at Washburn from 1907 to 1919, and then moved westward, where he taught at the University of Nevada in Reno until his death in 1949. In 1936, Dr. Blair organized the Astronomical Society of the University of Nevada. He is the founder of the Western Amateur Astronomers.<http://www.waa.av.org/>

Dr. Blair envisioned a grand meeting, to be held once a year, which would bring western amateur astronomers together to exchange ideas and to meet each other. The first Western Amateur Astronomers conference was held at USC in August 1949. 200 delegates from 23 organization attended. It rained! A month later Dr. Blair died of a heart ailment. Dr. Blair's obituary ran in the October 1949 Sky & Telescope magazine.

The sixth WAA Convention was held in August 1954 at the Josephine Randall Junior Museum in San Francisco and was hosted by the San Francisco Amateur Astronomers, who hold their meetings at the Randall Museum today. The WAA presented the first G. Bruce Blair Medal to Albert G. Ingalls, editor of the Amateur Telescope Making books. The G. Bruce Blair medal was designed by Eastbay Astronomical Society member Frank Kettewell, who was a cartoonist for the Oakland Tribune. The seventh convention was held in 1955 at Yosemite National Park. A.L.P.O founder Walter E. Haas received the second WAA G. Bruce Blair Medal.

Fast forward to the 2004 Riverside Telescope Makers Conference and

Astronomy Expo. Imagine my thrill as I walked to the stage and received the 2004 WAA G. Bruce Blair medal! I was surrounded by many past winners as I received this years award.

When I went through the award winners list from the past 50 years [http://www.waa.av.org/Blair\\_recip\\_99.html](http://www.waa.av.org/Blair_recip_99.html), I discovered that I knew over half of the awardees personally and admired or was inspired by all of them. Dr Haas inspired me to not just look at the planets but to study and sketch their features when observing through my telescope.

Clifford Holmes inspired me by his infectious joy of amateur astronomy. Paul Zurakowski inspires me every day to help others build telescopes the best they can. Betty Neall and Denni Medlock, the only other two women Blair medal winners set a high bar for me and remind me that it is important for women amateur astronomers to encourage the stars of tomorrow. I could go on and on...

Current WAA president Jack Borde, received the G. Bruce Blair medal in 1987, the year I discovered amateur astronomy. 1987 was the year I became an amateur astronomer, first by learning about different types of telescopes then by joining an astronomy club. The following year, I took a deep breath and signed up for John Dobson's telescope making class in San Francisco. A few months later, I was spending all my free time looking through f/7.3 10-inch Stardust, which I still use today. Like countless thousands who preceeded me, I got my start as an amateur astronomer at the hands of John Dobson, so I dedicate this award to John for the years of wonder that he has brought into my life. Every day he inspires me to ask a question, answer a question, or take my telescope out on a local sidewalk and share the wonder of the universe with others. Thanks, John!

## July General Meeting

### **State of the Lick Observatory**

Bob Havner

Tony Misch, support astronomer at Lick Observatory, will be the guest speaker at the July general meeting. You may remember that Tony spoke to the SJAA on the Lick Solar Eclipse expeditions. Tony will be giving an informal talk on the latest research going on at Lick Observatory, the new Automatic Planet Finder (APF) telescope; scheduled to be operational sometime next

***Make note of the date, July  
31 8:00 p.m. at Hogue Park***

year, and, time permitting, he will talk about the 1882 Transit of Venus animation. Read Tony's article "Reanimating the 1882 Transit of Venus" and see the animation at: [http://skyandtelescope.com/observing/objects/sun/article\\_1187\\_1.asp](http://skyandtelescope.com/observing/objects/sun/article_1187_1.asp)

### **Solar System Stats for July 2004**

Adapted from the Observer's Handbook published by The Royal Astronomical Society of Canada which in turns gets this data from the U.S. Naval Observatory's Nautical Almanac Office and Her Majesty's Nautical Almanac Office and contributions by David Lane, St. Mary's University, Halifax NS.

		<b>Mercury</b>	<b>Venus</b>	<b>Mars</b>	<b>Jupiter</b>	<b>Saturn</b>	<b>Uranus</b>	<b>Neptune</b>	<b>Sun</b>
<b>RA</b>	1	7 <sup>h</sup> 42 <sup>m</sup>	4 <sup>h</sup> 34 <sup>m</sup>	8 <sup>h</sup> 28 <sup>m</sup>	11 <sup>h</sup> 00 <sup>m</sup>	7 <sup>h</sup> 08 <sup>m</sup>	22 <sup>h</sup> 34 <sup>m</sup>	21 <sup>h</sup> 09 <sup>m</sup>	6 <sup>h</sup> 41 <sup>m</sup>
	11	8 <sup>h</sup> 54 <sup>m</sup>	4 <sup>h</sup> 44 <sup>m</sup>	8 <sup>h</sup> 54 <sup>m</sup>	11 <sup>h</sup> 06 <sup>m</sup>	7 <sup>h</sup> 14 <sup>m</sup>	22 <sup>h</sup> 34 <sup>m</sup>	21 <sup>h</sup> 08 <sup>m</sup>	7 <sup>h</sup> 22 <sup>m</sup>
	21	9 <sup>h</sup> 48 <sup>m</sup>	5 <sup>h</sup> 04 <sup>m</sup>	9 <sup>h</sup> 19 <sup>m</sup>	11 <sup>h</sup> 12 <sup>m</sup>	7 <sup>h</sup> 19 <sup>m</sup>	22 <sup>h</sup> 33 <sup>m</sup>	21 <sup>h</sup> 07 <sup>m</sup>	8 <sup>h</sup> 03 <sup>m</sup>
<b>Dec.</b>	1	+23°19'	+17°48'	+20°20'	+7°38'	+22°14'	-9°50'	-16°27'	+23°06'
	11	+18°51'	+17°34'	+18°42'	+7°02'	+22°05'	-9°54'	-16°31'	+22°06'
	21	+13°14'	+18°08'	+16°51'	+6°22'	+21°56'	-10°00'	-16°35'	+20°27'
<b>Dist (AU)</b>	1	1.25	0.36	2.52	5.81	10.05	19.48	29.24	1.017
	11	1.11	0.42	2.56	5.94	10.06	19.35	29.15	1.017
	21	0.96	0.49	2.60	6.07	10.04	19.23	29.09	1.016
<b>Mag</b>	1	-0.9	-4.4	1.8	-1.9	0.1	5.8	7.9	
	11	-0.2	-4.5	1.8	-1.8	0.1	5.8	7.8	
	21	0.2	-4.5	1.8	-1.8	0.1	5.7	7.8	
<b>Size</b>	1	5.4"	46.3"	3.7"	33.9"	16.5"	3.6"	2.3"	31'28"
	11	6.1"	39.5"	3.7"	33.1"	16.4"	3.6"	2.3"	31'28"
	21	7.0"	33.8"	3.6"	32.5"	16.5"	3.6"	2.3"	31'29"

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## Publication Statement

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## Submit

Submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to ephemeris@sjaa.net. **Deadline, 10th of previous month.**

## SJAA loaner scope status

All scopes are available to any SJAA member; contact Mike Koop by email (koopm@best.com) or by phone at work (408) 473-6315 or home (408) 446-0310 (Please leave message, phone screened).

### 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	Annette Reyes
3	4" Quantum S/C	Hsin I. Huang
6	8" Celestron S/C	Richard Savage
7	12.5" Dobson	Tom Fredrickson
8	14" Dobson	Craig Colvin
16	Solar Scope	Bob Havner
19	6" Newt/P Mount	Daryn Baker
23	6" Newt/P Mount	Wei Cheng
24	60mm Refractor	Al Kestler
26	11" Dobson	John Bunyan
27	13" Dobson	Steve Houlihan
32	6" f/7 Dobson	Sandy Mohan
33	10" Deep Space Explorer	Glen White
34	Dynamax 8" S/C	Yuan-Tung Chin
35	Meade 8" Equatorial	Patrick Lewis
37	4" Fluorite Refractor	Gary Hansen
38	Meade 4.5" Digital Newt	Tej Kohli
39	17" Dobson	Ron Gross

### 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
10	Star Spectroscope	Bill O'Shaughnessy	9/11/04
11	Orion XT6 Dob	Lia Klofas	8/6/04
12	Orion XT8 Dob	Christopher Salander	7/23/04
13	Orion XT6 Dob	Steve Van Lare	7/28/04
14	8" f/8.5 Dob	Colm McGinley	6/19/04
28	13" Dobson	Anupam Dalal	8/1/04
29	C8, Astrophotography	Joe Huber	6/6/04
36	Celestron 8" f/6 Skyhopper	Grant Webb	7/28/04
40	Super C8+	Mike Macedo	9/11/04

### 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	?
9	C-11 Compustar	Bill Maney	Indefinite
15	8" Dobson	Mike Koop	Repair
21	10" Dobson	Michael Dajewski	Repair

### Waiting list:

8	14" Dobson	Jim Song
10	Star Spectroscope	Jim Albers
	Large Dob	Ken Frank

# San Jose Astronomical Association Membership Form

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