



SJAA EPHEMERIS

Costa Rica Star Party

Rob Hawley

The southern sky is filled with many wonders. Our local horizon hides the bright Eta Carina nebula, Alpha Centauri the closest star, the Magellanic Clouds, and hundreds of galaxies and clusters. Omega Centauri, the largest Globular Cluster in the sky, passes tantalizing just above the southern horizon.

To view these objects from below the equator means committing to a long plane flight (18 hours to Chile or Australia, 24+ to Africa) and a great

deal of expense. Sky & Telescope working with TravelQuest International provided an alternative during February. Instead of traveling to the southern hemisphere they arranged to view from a dark sky site in Costa Rica. The site they selected was La Ensenada Lodge located at the northern part of the Gulf of Nicoya (10° 8' N 85° 2' E). The lodge is a part of a private nature reserve and is located in a dry part of Costa Rica far from any light sources. February is also the driest month of the year in Costa Rica. The photo (see page 2) shows the

almost flat southern horizon.

Costa Rica itself is a modern, largely middle class country (85% of the population is middle class or better). It is quite a change for those that have traveled in the 3rd world. The roads are in good condition, the electric power works and you can even drink the water.

This type of visit is quite a switch for those used to the more Spartan life of a typical dark sky party. TQ booked the entire lodge. The lodge agreed to replace all of its white lights with red bulbs and even disabled some local streetlights. This means that you could observe from near your room in complete darkness. When you were done a real bed awaited you with a shower and 3 good meals a day. The only downside was the daytime heat and humidity. After 9 PM the temperature was comfortable and there was no dew.

One of the most important aspects of the trip was that it was very spouse friendly. Since the lodge is a nature reserve they have many trips during the day. We arranged for a white light area so that non-observers could read and play cards. My wife went to Shingletown last year and has no interest in other star parties. Yet she felt this trip was one of our best vacations. As a bonus she could walk out and see what her husband was looking at.

The trip spent four nights at the lodge. The weather was generally good. The first two nights had good transparency, but really crummy seeing. We got clouded out early on the third night, but

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SJAA Activities Calendar

Jim Van Nuland

April

- 4** General meeting, SJAA/Bay Area Auction. Doors open at 12 p.m. See article in March issue for more details. No Board meeting this month.
- 8** ATM class at Houge Park. 7:30 p.m.
- 9** Astronomy class at Houge Park. 7:30 p.m. Jim Van Nuland on Telescopes and Eyepieces.
- 9** Houge Park star party. Sunset 7:38 p.m., 70% moon rise 1:10 a.m. Star party hours: 8:30 to 11:30 p.m.
- 10** Deep sky weekend. Sunset 7:39 p.m., 59% moon rise 2:15 a.m.
- 17** Deep sky weekend. Sunset 7:45 p.m., 1% moon rise 6:13 a.m.
- 23** Houge Park star party. Sunset 7:50 p.m., 20% moon sets 0:14 a.m. Star party hours: 9:00 to 11:00 p.m.
- 24** ATM Class at Houge Park. 7:30 p.m.

May

- 1** General meeting,
- 6** ATM class at Houge Park. 7:30 p.m.
- 7** Astronomy class at Houge Park. 7:30 p.m.
- 7** Houge Park star party. Sunset 8:03 p.m., 83% moon rise 0:04 a.m. Star party hours: 9:00 to 11:00 p.m.
- 8** Deep sky weekend. Sunset 8:04 p.m., 73% moon rise 1:04 a.m.
- 15** Deep sky weekend. Sunset 8:10 p.m., 7% moon rise 4:41 a.m.
- 22** ATM Class at Houge Park. 7:30 p.m.
- 28** Houge Park star party. Sunset 8:20 p.m., 71% moon sets 3:01 a.m. Star party hours: 9:30 to midnight.

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

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

<http://www.sjaa.net>

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resumed about 2 AM with average transparency and seeing. The final night was the best; excellent seeing and good transparency. We did not do a visual magnitude, but the S&T guide (Gary Seronik) measured the sky on a previous trip and this was the darkest site he had measured to date.

I had the opportunity to set up next to Steve Gottlieb, an active member of TAC and a frequent S&T contributor. He brought a 13" scope and was able to pull in some really good objects. Setting up next to him proved to be very educational. I brought my new 8" string scope. This size is more than adequate to provide four full nights of objects to view.

This time of year most of the major objects are visible. Only the Small Magellanic Cloud was not visible. The Large Magellanic Cloud was just above the hills across the Gulf at sunset. We could view it for about an hour each night. The other major objects were visible at reasonable elevations. For example Eta Carina was at about the same elevation as the lower parts of Canis Major in the bay area. Given the nearly flat, completely dark southern horizon it could be easily viewed. At about 2 AM the Milky Way ran almost parallel with the horizon. Near dawn

you can see where the southern Milky Way joins with the Scorpio and Sagittarius portions visible here during the summer.

My time in Costa Rica was some of the most productive I have ever had. Before leaving I made extensive notes on which objects to view (only those south of -40° dec were of interest) and prepared sky maps for each two-hour interval of the night. Over the four nights I logged the two major nebulas Eta Carina and Tarantella plus NGC 3199, 4 planetaries, 10 globs, 16 galaxies, and 16 open clusters. There were many other objects in Eta Carina and the LMC that I saw but did not log.

The most unique object we observed was the Homunculus that was a part of the star Eta Carina. Steve first pointed this out in the 13". On the final night the two major lobes of the outburst were easily visible as orange extensions to the star. Steve claimed he could also see the streamers, but I could not. The lobes were also visible in my 8", but the color was not nearly as intense.

This trip is probably the easiest and cheapest way to see the southern sky. If anyone is interested, TravelQuest is planning to repeat this trip next February. They are also considering a trip to Chile in July of 2005.

Foothill College Lecture Series

Andy Fraknoi

Wednesday, April 14 at 7p.m.

Dr. Claudia Alexander, of NASA's Jet Propulsion Laboratory, will give a non-technical, illustrated talk on: "A Galileo Wrap-up: What We Have Learned about Giant Jupiter and its Marvelous Moons." in the Smithwick Theater, Foothill College, El Monte Road and Freeway 280. Free and open to the public. Parking on campus costs \$2.

Dr. Alexander served as the Project Manager of the Galileo mission to explore the Jupiter system and supervised the final descent of the spacecraft into the clouds of Jupiter after its 14 year mission of exploration. She will review the many exciting discoveries from Galileo and show the best of the spectacular images of Jupiter's stormy clouds and puzzling moons.

Dr. Alexander currently serves as Project Manager and Project Scientist for the U.S. section of the Rosetta Project, launched this March and heading for a rendezvous with and landing on a comet in 2014. She has a PhD in space physics from the University of Michigan.

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.



This photo shows the almost flat southern horizon. Photo courtesy of Rob Hawley.

The Lunar Bush

Dave North

First, should you find yourself in South Africa or Antarctica April 19 you can catch a partial solar eclipse. I doubt it's worth a special trip though.

In other news, you've probably heard Bush has decided tentatively to announce a mission to Mars someday eventually.

You may also have heard as part of this proposal that a base should be built on the Moon to support the effort.

It's an interesting detail to ferret out of an otherwise extremely muzzy mission approach -- and one that started up an old controversy all over again.

Okay, I digress: politicians proposing a vague plan to do, oh, something ... is not necessarily a bad thing. Such people seldom actually know how to get anything done, so restraining themselves from actually interfering with people who do know is something we should encourage.

The controversy?

Whether a base should be constructed on the Moon or at the Lagrangian Point du Jour (any of five stable orbital points shared by the Moon and Earth. The most popular are L1 -- between the Earth and Moon -- and L5, which trails the Moon by 60 degrees).

Both plans have merit and for that reason I think we'll eventually do both (and much more). So I guess I see it as a "which one first" argument rather than a "which one" problem.

Of course "who" is another good question, since it increasingly looks like the United States hasn't the resolve to start into space in a big way.

Getting past all that, what are the advantages of Bush's base on the Moon? I won't speculate as to whether he actually knows -- maybe someone should forward this article to the White

House. I'll try not to use too many long words.

Gravity is a big plus. You can put stuff down and it will stay there. But of course there isn't quite so much on the Moon, meaning anything you need to lift from there would require much less thrust.

The bad news is, you still have to lift it. If you could build a transport vehicle at a Lagrangian point from materials at hand ... oh wait, there aren't any. Yet.

Which brings us to materials. Sure there's a lot of stuff on the Moon, but how useful is it? You can extract aluminum, lots of silica, and boatloads of iron in the right places. Good start, but you might also want some water.

Is there some? Don't know. Maybe.

None at L(1, 4 or 5) though. Yet.

On the Moon, you have shade. This can actually be pretty handy -- you can set up in a shady spot and stick out solar reflectors and collectors for power and temperature control. You can do that in orbit, too, but not so easily. Plus you get bonus radiation shielding on the cheap.

Since the Moon has no tectonic activity to speak of, you've got one heck of a steady platform for a really big telescope. That little hint of gravity (and the inertial mass) make aiming the telescope easier, but it also means a heavier structure and warping worries. Also, you need a (very slow) tracking mount.

Plenty of materials around for making glass, though.

Gravity is good for your bones, muscles and digestion. Etc.

But what it really comes down to is finding a way to make either place sustainable, and having enough

hardware and materials to construct a hop-off base.

There are materials on the Moon but it's not clear there are enough of the right materials. Anything you have to import is a big problem.

Everything would have to be imported to a Lagrangian Point, save for any junk you may find floating there. It would also have to be decelerated into a stable orbit (the Moon can decelerate most things by itself, as the various craters can attest).

But once you have the stuff there it can be launched away pretty easily.

So why do you suppose the Bush League chose the Moon base approach over a stable orbital base?

My guess is, surprise, politics. By now most people are catching on that the International Space Station is probably just stupid. Also, the glory days of NASA were the race to put Neil Armstrong on the Moon (though, eventually, putting Harrison Schmitt there was probably a better idea overall).

So another "space station" probably sounds like a questionable idea, but going back to the Moon might get folks excited.

Of course, I'm dubious of the whole rhetorical crock and don't necessarily think any of this will actually get done.

But it should. We should be back on the Moon, we should be at L1, and we should be at L5 and lots of other places by now.

But you knew that already.

The good news is, China and India and the European Union are starting to get their space legs, and it looks like there's hope some humans will finally get moving out into space.

Jupiter for Dummies (and Everybody Else, Too!)

Akkana Peck

Jupiter rides high in the sky all night throughout April. A month past opposition, now is the easiest time for evening observers to get a look at its intricate, ever-changing cloud bands, its moons, and their shadows.

Since some readers may still be shaking out a new Christmas scope, and others may have been too busy looking at the deep sky to pay much attention to Jupiter, this month I'll talk about how to see detail on Jupiter, what to look for, and some terminology so you can decipher what other Jovian observers write about.

("Jovian", if you're curious, comes from Jovis or Iovis, the Latin genitive form of the word Jupiter. The genitive, or possessive, form is the same form we use when we refer to a star like Theta Orionis or Alpha Lyrae.)

Getting started with Jupiter observing is easy. First, there's no trouble finding it – it's that extremely bright object to the east or nearly overhead in early evening. Point your telescope at it. What's the first thing you notice? Probably the Galilean moons – four of them, named Io, Europa, Ganymede, and Callisto. (Jupiter has many more moons, but these four are all we'll see in most amateur telescopes.) Of course, you may not see all four on any given night: some of them might be hiding behind the planet, or even passing in front of it (I'll talk about that shortly). The moons move fast: make a note of where they are, then watch, as you continue to observe Jupiter, how much change you can see in the moons even over periods of less than an hour.

You might notice that one moon is brighter than the others. That's Ganymede, the biggest of all the moons in the solar system. You can probably resolve it as a disk in your

telescope, which is quite a feat for a moon that's more than four hundred million miles away from us.

Besides the moons, what do you notice about the planet? No matter how small your scope, you'll probably notice two reddish bands ringing the planet. Those are Jupiter's Equatorial Bands, one just north and one just south of the Jovian equator, and designated the NEB and SEB (north equatorial band and ... you know).

The NEB and SEB are surprisingly different. Look carefully at them, and see if you can see differences in intensity, width, and color. They

vary from year to year, which is part of the fun of watching Jupiter, but they're always somewhat different from each other.

You've probably heard about Jupiter's "great red spot", and you'll want to see that, of course. You'll probably be disappointed the first time: for one thing, it's not very red. The GRS sits in the SEB, and most of the time, it's not really any redder than the SEB itself. If you haven't seen the GRS before, find out when it's supposed to be facing us – use software if you have it (check shallowsky.com for an online applet) or use the chart in one of the astronomy magazines – pay close attention to the SEB and look for a place where the band splits. It splits because the GRS, a huge, rotating storm like a cyclone three times the size of the Earth, sits right in the middle of the band, so the high-level winds that make up the SEB (think of it like our jet stream) skirt around the outside edges of the GRS, then rejoin on the other side. On a really steady night, with excellent optics, sometimes you can see turbulent swirls in the wake of the GRS where the two parts of the SEB rejoin.

Now that you know where the equator is, look near the poles. You'll probably be able to see darker areas near both poles – the polar regions, designated NPR and SPR. They're quite extensive, not little wimpy things like Mars' polar caps.

Finally, look over the planet's disk. When Jupiter's Galilean moons pass between the sun and the planet, the shadows they cast are visible on the planet as small, very sharp black spots. If you see a moon shadow, watch it as it crosses the disk. Did I mention the moons move fast? They take a few hours to cross Jupiter's disk, so you can watch their progress over the course of an observing session.

If you see a moon shadow, try to find the moon that's casting it. If you don't see a moon just off the edge of Jupiter's disk, then the moon is probably transiting the disk itself. It can be challenging to see Jupiter's moons in transit – sometimes they will stand out as a darker spot against a light area, or as a lighter spot against one of the equatorial bands. They're almost always easier to see when near the limb (the edge of the planet), and watching a moon enter or exit a transit is always a pretty sight.

Sometimes you can even see two moons and shadows transit at once. There are a couple of choice double shadow transits this month, of Io, Europa, and both of their shadows: the 5th starting at 9:54, and the morning of the 13 at a half hour after midnight. The one on the fifth also features the GRS, leading the moons by a couple of hours.

Once you're finished looking at Jupiter, there's plenty more to look at in the shallow sky this month. Saturn continues an excellent pass, reaching its most northern declination – 22 degrees 49 minutes – on April 2.

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Venus continues its brilliant evening apparition, shining at magnitude -4.5 high in the evening sky. On April 3, it passes only half a degree south of the Pleiades, close enough to see both in the same low-power telescope field – should be a beautiful sight! Much fainter Mars stands near it, setting at about 11pm.

Mercury is visible very low in the evening twilight during the first week of April, then disappears into the sun's glare as it speeds to inferior conjunction on the 16th.

Uranus, Neptune, and Pluto are observable in the morning sky.

Editor's Semi-Dark Matter

Ø If you are stumped by what NGC means, if your astro friends toss around IC and PK and Abell with numbers after them, try <http://home.earthlink.net/~mcgermano/Prefix.html>.

Ø NASA Ames has initiated a quarterly speaker series. The first one was Andrew Chaikin (the major source for Tom Hanks' HBO series *From the Earth to the Moon*) on March 11. For more information see: <http://www.arc.nasa.gov>.

Ø AstroCon 2004 will be a truly amazing event. It combines the national meetings of the ASP, the Astronomical League, the AAVSO and ALPO. The website is fully functional as of March 5. If you visited the website earlier, you should return. Go to <http://www.astrocon2004.org>.

Ø Don't forget the Auction – Houge Park on April 4. Doors open at noon.

Ø Lick Observatory is hiring an assistant to help with the summer programs. If I get contact information it will be in the web version of this article.

Out There

I occasionally like to change my observing program from catalogues like the Messiers or Herschels to double stars, red stars or dark nebulae, just to do something different. This month I'll look at that staple of great Hubble images – planetary nebulae. I'll provide a list of fifteen planetaries that will be in our skies over the new moon this month. Some are familiar, others somewhat obscure, some challenging, some easy. We'll begin in the west and work east in R.A.

The Eskimo Nebula in Gemini is still visible, but did you know about the Baby Eskimo?

08 54 12.0+08 55 00.0Cnc16.812.2

Start with one of the more challenging planetaries – Abell 31. It is described as a huge, faint, roundish glow visible easily with averted vision when using an Oxygen III (OIII) filter at lower power (try at 80x to 100x). Its edges are ragged, uneven, its surface brightness also uneven. Abell 31 is conveniently located between a good group of naked eye stars in Cancer at its border with Draco, near the Dragon's head. Find mag 3.3 Epsilon Hydrae, mag 3.1 Zeta Hydrae and mag 4.1 Alpha Cancri. Abell 31 (PK 219+31.1) sits almost equidistant from each star.

10 07 00.0-40 26 00.0Vel1.48.2

I remember years ago, Jack Zeiders, then president of the SJAA, coming down from the 30" Challenger at Fremont Peak, excited at seeing the Eight Burst Planetary NGC 3132. It is a challenge for us due to its declination. At -40.26 it requires a good southern horizon and steady skies. It is the premier deep sky object in Vela, the Sail. Located in a star poor area of the constellation, this planetary has an apparent central star shining at mag 10, but that is not the star that created

A Sampling of Planetaries

Mark Wagner

this object... its mag 16 dwarf companion is responsible. The object itself has an oblong shape but that does not explain why it is called "Eight Burst". This object is worth hunting down.

10 24 48.0-18 39 00.0Hya0.678.6

One of the brightest planetary nebulae I've viewed is NGC 3242, or the Ghost of Jupiter in Hydra. About half the size and brightness of the planet for which it is named, this target can be seen even in small telescopes. Glowing bluish-green (as do many compact planetaries), it is slightly

elliptical and of even brightness. Some report a dim haze exterior to the bright main disk. Can you see it? It has been reported in 6 inch telescopes. How about its central star? One report calls it easy at 300x. There are also some bright knots reported at higher powers and using a UHC filter.

11 14 48.0+55 01 00.0Uma3.3711

The Owl Nebula is among the most well known planetaries, being M97 of the famous Messier Catalog. I have seen it without a filter in my 10" scope on good nights at Houge Park. This is a bright planetary, and an interesting one. Two dark lobes inside the nearly round disc are obvious and enhanced by use of a UHC filter. It is large and has a wonderful neighbor, the galaxy M108 just outside most fields of view. It is easy to find in Ursa Major, just off the line between mag 2.3 Merak and mag 2.4 Phecda at the bottom of the Big Dipper's bowl.

11 26 42.0-34 22 00.0Hya3.1312.1

Returning to Hydra, there is a planetary known as The Southern Owl Nebula. It is also catalogued as PK 283+25.1 and K1-22. With a 13" telescope it is very faint, but using an OIII filter enhances the view to easy direct vision. At low powers, say 80x, it is nearly round, has

Continued on page 6

crisp edges and an even surface brightness. If you find an image of this target, you'll see that it is easy to tell why it is referred to as the Southern Owl Nebula.

12 33 06.0+82 34 00.0Cam0.311.6

Now that we've visited one object named after another, why not do it again. The Eskimo Nebula in Gemini is still visible, but did you know about the Baby Eskimo? IC 3568 is, well, is it a planetary, or not? It is a planetary, but it has been mistaken visually for a compact galaxy, even in some catalogues. This planetary has a high surface brightness, and is located in

Camelopardalis above the open bowl of the Little Dipper. It is a small planetary with little obvious color. 5 arc seconds away is a star that makes the planetary appear to be part of a tight double star. IC 3568 is a famous Hubble photo reminding me of the inside of a lemon cut between its ends. Gorgeous. It has been described as morphologically the simplest of planetaries but the Hubble photo tells the real story. A complex inner structure is obvious. It has a sharp edge, brighter middle, and easily visible central star.

Here is the list of 15 planetaries. I hope you enjoy them: the easy ones and the challenges.

ObjectID	R.A.(h m s)	Dec.(d m s)	Const	Size	Mag
PK 245+1.1	08 02 30.0	27 42 00.0	Pup	0.12	14.2
NGC 2610 (Turtle Planetary)	08 33 24.0	16 09 00.0	Hya	0.83	13
PK 254+ 5.1	08 40 42.0	32 23 00.0	Pyx	0.18	11
PK 261+ 2.1	08 53 30.0	40 04 00.0	Vel	0.33	13
Abell 31	08 54 12.0	08 55 00.0	Cnc	16.8	12.2
NGC 2818A	09 16 00.0	36 36 00.0	Pyx	0.6	11.9
PK 238+34.1	09 39 06.0	02 48 00.0	Hya	4.47	13.4
PK 248+29.1	09 45 36.0	13 10 00.0	Hya	4.68	12.9
NGC 3132	10 07 00.0	40 26 00.0	Vel	1.4	8.2
NGC 3242	10 24 48.0	18 39 00.0	Hya	0.67	8.6
NGC 3587	11 14 48.0	55 01 00.0	Uma	3.37	11
PK 283+25.1 (Southern Owl Nebula)	11 26 42.0	34 22 00.0	Hya	3.13	12.1
NGC 4361	12 24 30.0	18 47 00.0	Crv	1.33	10.9
IC 3568 (Baby Eskimo)	12 33 06.0	82 34 00.0	Cam	0.3	11.6
Abell 36	13 40 36.0	19 53 00.0	Vir	7.97	13

Celestial calendar

April 2004

Richard Stanton

Lunar phases:	Date	Rise	Trans	Set
FM	03:03 PST	05 19:11	00:08	06:04
LQ	19:46 PST	11 01:15	05:52	10:31
NM	05:21 PST	19 05:37	12:20	19:12
FQ	09:32 PST	27 11:18	18:47	01:35

Nearer planets:	R. A.	Dec.
Mercury, 0.57 A.U., Mag. +2.5		
07 06:09 13:00 19:50	01:54	+15:07
17 05:23 12:04 18:45	01:37	+12:06
27 04:42 11:08 17:34	01:20	+07:30

Venus, 0.56 A.U., Mag. -2.7		
07 07:42 15:08 22:33	04:02	+24:31
17 07:33 15:05 22:38	04:39	+26:28
27 07:20 14:57 22:35	05:10	+27:32

Mars, 2.06 A.U., Mag. +1.6		
07 08:22 15:42 23:02	04:36	+23:13
17 08:07 15:30 22:53	05:03	+24:00
27 07:54 15:19 22:43	05:31	+24:30

Jupiter, 4.71 A.U., Mag. -2.3		
07 15:23 21:54 04:25	10:48	+09:06
17 14:40 21:12 03:44	10:45	+09:20
27 13:59 20:31 03:03	10:44	+09:28

Saturn, 9.34A.U., Mag. +0.9		
07 10:18 17:36 00:54	06:30	+22:48
17 09:42 17:00 00:18	06:33	+22:48
27 09:06 16:24 23:41	06:36	+22:46

SOL Star Type G2V Intelligent Life in System ?	Hours of Darkness
08:04 07 05:45 12:11 18:37 01:05 +06:58	
07:34 17 05:31 12:09 18:46 01:42 +10:36	
07:05 27 05:19 12:07 18:55 02:19 +13:57	

Astronomical twilight:	Begin	End
JD 2,453,102	07 04:17	20:07
112	17 04:01	20:19
2,453,122	27 03:44	20:31

Sidereal time:	Transit Right Ascension at local midnight
07	00:00 = 12:56
17	00:00 = 13:35
27	00:00 = 14:14

Darkest Saturday Night: 17 Apr 2004	
Sunset	18:46
Twilight	20:19
Moon set	17:13
Dawn begin	04:01
Hours dark	07:34

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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
7	12.5" Dobson	Tom Fredrickson
8	14" Dobson	Craig Colvin
10	Star Spectroscope	Keng Teh
14	8" f/8.5 Dob	E. Clay Buchanan
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
28	13" Dobson	Jim Albers
33	10" Deep Space Explorer	Glen White
35	Meade 8" Equatorial	Patrick Lewis
38	Meade 4.5" Digital Newt	Tej Kohli

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
12	Orion XT8 Dob	Sean McCauliff	5/6/04
29	C8, Astrophotography	Joe Huber	6/6/04
36	Celestron 8" f/6 Skyhopper	Peter Young	5/12/04

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	?
6	8" Celestron S/C	Richard Savage	4/24/04
9	C-11 Compustar	Bill Maney	Indefinite
11	Orion XT6 Dob	Steve Codraro	4/4/04
13	Orion XT6 Dob	Michael Hewitt	4/2/04
15	8" Dobson	Mike Koop	Repair
21	10" Dobson	Michael Dajewski	Repair
32	6" f/7 Dobson	Sandy Mohan	4/28/04
34	Dynamax 8" S/C	Yuan-Tung Chin	4/24/04
37	4" Fluorite Refractor	Gary Hansen	4/15/04
39	17" Dobson	Ron Gross	4/3/04

Waiting list:

39	17" Dobsonian	Frank Williamson
	8" Dob	Vinod Nagarajan
	Any telescope	Mike Van Meter, Al Garcia

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