

SJAA EPHEMERIS

A month of sun days — observing and sketching the Sun

Jane Houston Jones

I love observing the Sun and sketching sunspots but have never really tracked the rotation over an extended period of time. I started Googling and soon I found several excellent resources on the web to help me with my solar education. First, I ordered the Astronomical League's booklet *Observe and Understand the Sun* by ALPO solar coordinator Richard E. Hill. I used the forms in the booklet for my sketches. These forms are also available free of charge on the Astronomical League's Sunspotter Club website. <http://www.astroleague.org/al/obsclubs/sunspot/sunspcl.html>.

On a sunny sun day in October, I set up my homemade f/9 6-inch

dobsonian solar scope on the back deck and had a 54 power look at the Sun. I saw nine active regions — regions with more than one sunspot (there were actually 12 but I didn't see some of them) and I counted 26 spots (actually 51) for a Wolf sunspot number of 171. My count using this method was 116. Wolf chose to compute his sunspot number by adding 10 times the number of groups to the total count of individual spots, because neither quantity alone completely captured the level of activity. <http://www.ngdc.noaa.gov/stp/SOLAR/SSN/ssn.html>

Each day I sketched the Sun's disk and some days I also sketched the large active regions. Afterwards, I used Hill's booklet to classify the spots. The most interesting regions (to me) were the D, E and F classes of sunspots because they produce flares. On days when there were flare-producing spots visible, I also set up our f/6.8 70mm Televue Ranger fitted with a Coronado SolarMax60 H-alpha filter, to see the action.

New spots rotated on to the eastern limb and others rotated off the western limb. One particularly active region, AR0177, a DKI flare-producing region, first showed its spots on October 31. "D" stands for a bipolar group with penumbra on both ends and a length of less than 10 degrees. "K" means the largest spot in the region is an asymmetric spot with a diameter greater than 2.5 degrees. And the "I" means numerous umbral spots lie

Continued on following page



Jane at the eyepiece of her homemade solar dobsonian. An H-alpha sun scope is on the equatorial mount.

SJAA Activities Calendar

Jim Van Nuland

December

- 5 ATM class. Houge Park, 7:30 p.m.
- 7 Deep sky weekend. Sunset 4:49 p.m., 18% moon sets 8:20 p.m.
- 13 Houge Park star party. Sunset 4:51 p.m., 73% moon sets 2:20 a.m.
- 14 **General Meeting**, Houge Park. 8:00 p.m. Geoffrey Briggs, *Plans for Mars Exploration*
- 21 ATM class. Houge Park, 7:30 p.m.
- 28 Deep sky weekend. Sunset 4:58 p.m., 26% moon rises 2:20 a.m.

January

- 4 Deep sky weekend. Sunset 5:02 p.m., 6% moon sets 7:05 p.m.
- 10 Houge Park star party. Sunset 5:09 p.m., 56% moon sets 1:06 a.m.
- 11 ATM class. Houge Park, 7:30 p.m.
- 18 **General Meeting**, Houge Park. 8:00 p.m. Dr. Nick Kanas, *Of Epicycles and Unicorns: Celestial Mapping in the Golden Age*
- 23 ATM class. Houge Park, 7:30 p.m.
- 24 Astronomy class. Houge Park, 7:30 p.m.
- 24 Houge Park star party. Sunset 5:23 p.m., 52% moon rises 0:39 a.m.
- 25 Deep sky weekend. Sunset 5:24 p.m., 41% moon rises 1:47 a.m.

February speaker: Jane Houston Jones "Observing with Caroline (Herschel) and friends"

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<http://www.sjaa.net>

A month of Sun days

Continued from previous page

between leader and follower spots. To put this big "K" spot in perspective, 2.5 degrees spans 12,000 miles and the diameter of earth is 7,900 miles. This means the big spot was 1 1/2 times the diameter of the earth ... and growing! On November 6 it split in two! Of course that was the first day of our first winter storm, and it rained all day. :-(This sunspot group is still visible today, November 10th, as I write this article. The accompanying sketch was made on November 5th.

On October 19, two other amazing active regions caught my eye — AR0162 and 0165. These regions were visible to the naked eye! AR162 spanned 22 degrees — which is over 13 earth diameters. A few days later it was even bigger, at 27 degrees or 16 earth diameters — comprised of over 60 sunspots before it started to decay. Classified FKC — "F" for bipolar group greater than 15 degrees in length, "K" for the humongous spot larger than 2.5 degrees, and "C" for compact distribution of spots containing many spots with some having their own penumbra.



Flare-producing sunspot group 162 sketched 10/21/02 by the author.

It was visible until November 1st. The sketch of this sunspot group, made on October 21st, includes these features:

Faculae: relatively large (greater than an arc minute) irregularly shaped light area; sometimes serpentine in shape. Sunspots are usually located in faculae.

Granulation: fine grain structure of the solar photosphere. Grains appear to be one to two arc-seconds in diameter.

Light bridge: a bright ribbon or

band that may appear to connect two sunspots.

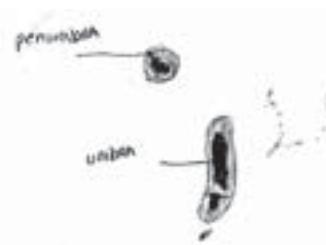
Penumbra: a gray area which frequently, but not always, appears around an individual sunspot or group of sunspots.

Penumbral fibril: fiber like lines that may appear to radiate out from an umbra into the surrounding penumbra.

Penumbral grain: granular or small patchy structure that may be visible in the penumbra.

Umbra: The dark black area of a sunspot.

I hope this gives you an appreciation for observing the Sun. It's astronomy we can do in the daytime with the right equipment. There are two websites I look at on a daily basis to verify my observations, or in the case of a cloud-out, to get my solar fix. I think



Sunspot group 177's biggest spot split in half two days after the sketch was made on Nov. 5.

you'll enjoy them as much as I do.

The NOAA Active Regions, including a solar activity report http://www.bbso.njit.edu/arm/20021107/wl_fd.html

Latest Solar Images <http://sprg.ssl.berkeley.edu/shine/suntoday.html>

— Jane Houston Jones,
jane@whiteoaks.com

December speaker Geoffrey Briggs

Geoffrey Briggs, scientific director of the Center for Mars Exploration at NASA Ames Research Center, will be speaking at the Dec. 14th meeting. His talk, *Plans for Mars Exploration for the Coming Decade* is an overview of what NASA has planned for Mars in the coming years.

The exploration of Mars by NASA and other space agencies will continue in high gear with launches planned for every opportunity (i.e. every 26 months). The focus of the exploration is the systematic search for evidence of past or even present life on Mars; this astrobiological effort is highly interdisciplinary involving an understanding of the geologic and climate history of Mars as well as calling for a direct search for biomarkers.

Two Mars Exploration Rovers (big brothers of Sojourner) are being readied at JPL for launch in 2003, as is a major mission by the European Space Agency — the Mars Express Orbiter carrying the UK's Beagle 2 Lander.

Toward the end of this decade a large Mars Surface Laboratory (MSL) mission is being planned to carry out key surface science experiments and

to demonstrate technologies (such as terminal landing hazard avoidance) that will be needed for a Mars sample return mission in the following years.

Please join us on Dec. 14th.

— Bob Havner,
bhavner@earthlink.net

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.

Saturn nearby in December, Mercury on Christmas Eve

Akkana Peck

December should be a lovely month for shallow sky observing, with all the gas giants in the sky at once, Mercury back in the early evening sky, plus a nice close dance between Venus and Mars in the morning sky — assuming the weather permits, of course.

Saturn reaches opposition on the night of December 16-17; that means it will be well placed all night. In addition, it's about as far north as it ever gets, which means it'll be high in the sky most of the night, up where the seeing is steady. It should be an excellent year to carry a small scope to any holiday gatherings you might be attending, and share the sight of this

"It should be an excellent year to carry a small scope to any holiday gatherings ..."

lovely planet, with its ring system tilted at a generous angle (my satmoons program says about 26 degrees), the gaps in the rings showing nicely (see last month's column), and nice subtle color on the planet's disk. Both photographers and visual observers take note: on January 4-5, Saturn will pass in front of the Crab nebula, a very rare event. Let's hope for clear skies that night!

Trailing Saturn by a few hours is mammoth Jupiter, not yet at opposition but close enough and high enough to show tremendous detail through a telescope. In addition, there's always plenty to watch in the motion of Jupiter's moons and the shadows they cast on their parent planet's disk, and it's a particularly good time right now, because the plane of Jupiter's equator is nearly edge-on to us, which means that we can see the unusual spectacle of mutual satellite events (eclipses and occultations). A Sky & Telescope article this month has more detail on this sort of phenomenon. On the night of December 19th, look for an annular

eclipse of Io by Europa starting at about 8:48pm. I've never seen an annular eclipse of a Jovian moon, where one moon casts a shadow on the middle of another. Will we be able to see Io as a ring? How big a telescope will it take to see the ring? If you have clear skies, take a look, and let me know! Keep watching after the occultation, and almost exactly two hours later Europa will occult Io, passing in front of

it. Will we be able to separate the two by color, brightness, or size, even when there's no dark space between them? I have no idea, and I can't wait to find out!

There are lots more mutual events mentioned in the Sky & Tel article. Check my site, shallowsky.com — I'll

Continued on following page

Fun trip to Lick Observatory

Hsin I Huang

Driving up the 20+ twisting miles on Highway 130, I kept telling myself that it would be a big challenge to bike all the way. October 1, 2002, incidentally on the 126th anniversary of James Lick's death, we took 32 students from Peterson Middle School, Sunnyvale, who were members of the Project Astro Astronomy Club up to the Lick Observatory on Mt. Hamilton.

The place is usually not open to students. But one of the astronomers in our Project Astro club is Dr. Elinor Gates who happens to be working there. She made a special arrangement and was our tour guide throughout.

Of the 9 telescopes, Ellie chose to show us the Shane 120-inch and the good old 36-inch refractor. The students were intrigued and asked many interesting questions. The 120-inch, built in 1950's, is where Ellie does her adaptive optics study and where our VP Bob Havner plays his role as a night owl (October issue of SJAA Ephemeris). One of highlights of this trip was riding

the dome in one revolution. It was just like being on a giant merry-go-round. Wait, are we moving or is Ellie spinning in the middle? It's all relative.



The Peterson Middle School Project Astro Astronomy Club visit Mt. Hamilton.

At the 36-inch, built in 1880's, Ellie told a story that James' ghost came out at night and scared a new astronomer such that he finally gave up his precious time working alone in that observatory.

Who says working for Project Astro is a tough job and no fun?

Oh, coming down the hills by bike would also be a challenge, but a much easier one.

— Hsin I. Huang

Shallow Sky

Continued from previous page

work up a table of those events that should be visible from here, and make them available there. Or check [skypub.com](http://www.bdl.fr/Phemu03/phemu03_eng.html) for the scoop from Jean Meeus, the Belgian astronomer who's famous for calculating these things (and for writing books showing other people how to calculate them). If you're interested in contributing to science, here's an area where an amateur can help out by timing the events : check http://www.bdl.fr/Phemu03/phemu03_eng.html for details on how to contribute. They also have software for predicting the events. I'd love to hear what local observers saw — post a note to sjaa-chat or the shallow-sky list, or (I'm sure our esteemed editors won't mind my suggesting this) write something up for next month's Ephemeris!

Farther out,, Uranus and Neptune are still within our reach, a few hours behind the sun. Pluto is in conjunction on the 9th, so it's not visible to us this month.

In inner solar system news: Mercury is back in our evening skies, in Sagittarius, going from near-full to third quarter over the course of the month. It reaches maximum elongation on Christmas Eve (perhaps another fun thing you can show your friends and relatives). Venus and Mars make a close pass in our skies, remaining less than five degrees apart all month, with the party getting started on the first when the slim crescent moon joins them to make a trio. Venus is showing a nice crescent through the first half of the month; it should be a lovely sight, especially if you have a telescope with a field wide enough to show both planets while still showing Venus' phase. Poor Mars really looks dim with Venus outshining it, magnitudes +1.5 and -4.7 respectively. But the color contrast is great when you can see them together like that. Take a look, in binoculars or whatever you have available.

— Akkana Peck,
observer@shallowsky.com

Out There

Galaxies and nebulae in the wee sky hours

Mark Wagner

Deep sky observers in the bay area are truly fortunate. Compared to other urban locations around the country, we have a great number of observing sites to choose from within a short drive. South of San Jose is an example, Henry Coe State Park. Just nine miles up East Dunne Road in Morgan Hill, Coe has wonderful horizons and skies are quite satisfying to the south, east and northeast. When fog shrouds the valleys it is an island of dark 2600 feet high.

Coe is an excellent choice to enjoy this month's objects. Here are a few objects placed within a two hour window rising in the east beginning at astronomical dark (R.A. 01:18 - 03:18).

Begin in the south on a nice chain of galaxies in Cetus. Move just over 2 degrees east-northeast of Theta Ceti to find NGC584. At mag 10.5 this elongated galaxy is the brightest in a chain including NGCs 596, 615 and 636. This is a fun group, including many dimmer galaxies beyond the mag 12.5 limit of this writing.

From there move east-northeast and find the star Menkar (Alpha Ceti). Use this as a guidepost to Gamma and then Delta Ceti, to enjoy views of M77. M77 is an active galaxy and shows its very bright core with tight spiral arms well with enough magnification. Try to get NGC1055 into the same low power field of view - there is a nice contrast

between the brightness and shape of these two galaxies. On nearly the opposite side of M77 are two more galaxies under mag 12.5 limit NGC1087 and 1090.

Move northwest to M33 in Triangulum. It is easy to locate and visible in a binocular or magnifying finder from a dark site. This large pinwheel galaxy has a thick core and two major arms extending from it, looking to me almost a barred spiral. In a dark sky with good transparency this object is spectacular. See how many HII regions you can pick out. A few are



NGC1023 (Per) at 205x, sketched by Andreas Domenico.

bright enough to make you think they are small satellite galaxies.

Pick up your binoculars again and swing them a bit over eight and one half degrees north-northeast, two-thirds the way from Alpha Trianguli to Gamma Andromedae to find the big open cluster NGC752. Local observer Albert Highe described this as an easy naked eye object, during an observing trip to Arizona. Jamie Dillon saw it naked eye too at Fremont Peak.

From here move eight and one half degrees east-northeast toward Algol to find the bright galaxy,



Messier 77 (Cetus) at 222x, sketched by Andreas Domenico

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December Deep Sky

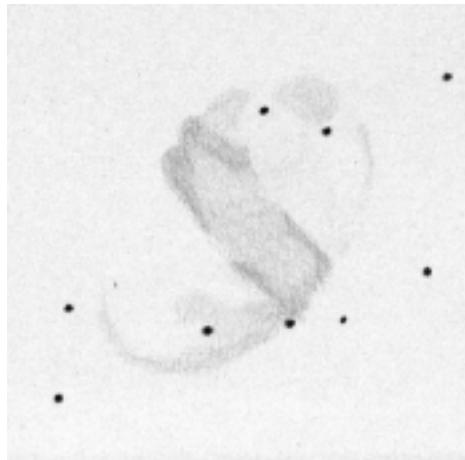
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NGC1023. Jamie Dillon described it "with a complex core full of dust lanes, big arms spreading out at least 8' across the field." At visual mag 9.4 and a size of 8.7 x 3.0, this one is a can't miss. Jane Houston Jones noted "a little spur on the tip" — a satellite galaxy.

Move your scope just over three and one-half degrees north and find M34 (NGC1039), one of several outstanding Messier "30's" open clusters that decorate the winter Milky Way. Its large size (35') and numerous bright components make this another binocular object.

Move another three and one-half degrees, but west, to find the outstanding edge-on galaxy NGC891. Looking like a faint twin to NGC4565, this galaxy is a challenge in all but dark skies but rewards the keen-eyed observer with an obvious dust lane bisecting its major axis. Oh, how I wish this was a brighter object!

Continue west another three and one-half degrees to Gamma Andromedae. This is a beautiful double (actually spectrographic quadruple)



Messier 76 (Perseus) at 154x with a UHC filter, sketched by Andreas Domenico.

star, appearing like a closer Albiero.

From there, go nine degrees north-northwest to the mag 4 star Phi-Persei, then just under one degree further north to find M76 The Little Dumbbell. Jay Freeman can detect this planetary nebula in instruments as small as a 7x50 binocular. But in an 8" scope even from a moderately light-polluted backyard, this object can contain wealth of interesting detail. Try it with a UHC filter.

Sitting equidistant seven and a half degrees from naked eye stars Phi Persei, Delta Cassiopeiae and Gamma Persei, is the naked eye Double Cluster (NGC869 and 884). It is hard to

go wrong with this object — it sparkles in a binocular or rich field telescope. I won't provide a description, if you've never seen it take a look, even if it is the only one you have time for.

Finish up the December tour with some more open clusters. While not as flashy as the Double Cluster, just under seven degrees northwest, toward Delta Cass, is M103. Matt Tarlach described M103 as "beautifully situated in the winter Milky Way and contains a pretty pair of contrasting orange and blue stars." This diminutive gem is a great jumping off point toward a series of fun opens in Cassiopeia. From there try for NGC659, 663, 654 and 637. These all lay near the five degree line between Delta and Epsilon Cassiopeiae, each having a unique and interesting personality. If you find you like these opens, try for NGC609, 559 and IC 166 in the neighborhood.

Next month we look forward to more wonderful winter objects, famous old friends, and some little, relatively unknown nuggets. My favorites are the wispy reflection nebulae in Orion, Gemini and Monoceros. Get your scopes out, and enjoy those clear dark skies so close by!

— Mark Wagner, mgw@resource-intl.com



NGC891 (And) at 205x, sketched by Andreas Domenico.

Mooning

Brow Furrows

Dave North

What are rilles? My only question this month (one I've answered before, here and there, but never straight up).

The simple answer is: probably the most interesting observational feature on the Moon. Challenging, fun, and thoroughly cool. But that's not quite what you expected, is it? How about this:

If you spoonerize this month's title, you get "Frau Burroughs," which is not an unreasonable leadin: the word "rille" has a Germanic origin, and means "furrow."

Of course, Burroughs wrote all kinds of stories about the Moon, Mars, whatever, and all of them were just as

silly as they could be. So (it turns out) were most of the original scientific ideas about formations on the Moon. And, just for fun, some are still pretty much a complete mystery.

Such as straight rilles. Basically, there are three kinds of rille: arcuate, sinuous, and straight. They may look in some ways similar, but as far as anyone knows, they're essentially unrelated.

Though the first two do share basaltic lavas as an ingredient. About the third, who knows?

Arcuate rilles are normally found

Continued on next page

Mooning

Continued from previous page

around the edges of maria, the large dark plains that are the most distinctive markings on the Moon.

It's generally accepted that they form as a result of the contraction and/or sinking of the basalts that formed the Maria ... perhaps as part of the long-term cooling process, or maybe just from the slow crushing of the crust under the weight of the lavas.

Maybe that's even right.

Such rilles will form arcs, and are usually pretty easy to spot. Rima Hypatia is a good example, almost letter-perfect. A complex like Rima Hyginus, an extremely weird formation, is probably of the same origin.

Sinuous rilles are almost certainly the best understood. They often begin at what is obviously a volcano, and proceed in a snaky line to their terminus. Sometimes they branch, but they almost always meander.

They are lava tubes on a massive scale.

Lava likes to travel in tubes. This isn't hard to understand: as lavas move away from their source, they cool — from the outside in. So their natural behavior is to form a skin like a sausage, then travel further using this "strategy."

Often, lava stops flowing abruptly. When that flow has been feeding a tube, the lava will simply pour most (or all) of the way out the far end, leaving an empty sausage skin.

A fragile skin. Eventually, most tubes simply collapse. On the Moon, the result is a sinuous rille. Here on Earth, where erosion happens much faster, they are often lost — though some can be seen here and there.

But what of the mysterious straight rille? What is its nature and how does it form?

The easiest one to see is Rima Ariadaeus, right smack in the middle of the Moon — long and wide. But my favorite is Rima Sirsalis, banished to the western edge of the Moon and not often observed since it shows up not long before the full Moon.

After pondering how run-of-the-mill rilles are made, sooner or later the

Moon observer simply has to notice there are examples that just don't seem to fit in.

Sirsalis qualifies in spades. It starts at the edge of Oceanus Procellarum near a modest crater of the same name and proceeds to directly away from the mare, eventually ending up among the cracks in the floor of — appropriately — Darwin, named for a man who pondered natural mysteries.

In the process it runs through craters, ranges of hills, other small rilles ... in fact, almost every kind of geology on the Moon except mare. Its origin makes it seem as if it were literally shunning maria!

This is particularly strange when you consider that most rilles are actually in maria.

Consider this: if you see a rille running across craters and mountains, the rille must be newer than those features. But it's a depression! So whatever it is, it's something that can cause slumping under all such features, in more or less a straight, smooth line.

Some guesses? One popular theory is "tectonic activity." And indeed that shows promise, since faults are often pretty straight and do cause slumping. There are problems, here: the faulting would have to be newer than most other features, for one thing, and there really doesn't seem to be much tectonic activity happening in recent eons.

Yet another idea is that they are collapsed dikes of some sort. Dikes are igneous intrusions into weak rock — sort of like lava that squirts into a weak seam.

Then, of course, to form a depression it would first have squirted in (raising the rock?), then squirted back out, then the crust above would collapse. And all this would happen in pretty much a straight line.

Does my skepticism show?

The point is, nobody seems to have a handle on this.

And for any observer, that just has to make them even more fun to hunt down and ponder!

So, what are rilles? In the end, they're a mystery.

— Dave North, north@znet.com

Celestial Calendar

December 2002

Richard Stanton

Lunar Phases:	Date	Rise	Trans	Set
NM 23:34 PST	03	06:19	11:29	16:32
FQ 07:48 PST	11	12:49	18:34	00:27
FM 11:09 PST	19	16:55	00:34	07:16
LQ 16:30 PST	26	00:28	05:52	12:13

Nearer Planets:	R. A.	Dec.
Mercury, 1.19 A.U., Mag. -2.2		
07 08:15 12:55 17:36	17:51.9	-25:35
17 08:42 13:22 18:02	18:55.8	-25:04
27 08:44 13:34 18:251	19:49.2	-22:20

Venus, 0.48 A.U., Mag. -5.4		
07 03:47 09:16 14:46	14:13.2	-11.11
17 03:39 09:03 14:27	14:38.7	-12:20
27 03:38 08:57 14:15	15:11.5	-14:14

Mars, 2.16 A.U., Mag. +1.2		
07 03:44 09:10 14:36	14:07.7	-12:00
17 03:37 08:56 14:14	14:31.7	-14:05
27 03:30 08:42 13:53	14:57.1	-16:05

Jupiter, 4.64 A.U., Mag. -2.5		
07 21:31 04:26 11:17	09:22.8	+16:04
17 20:46 03:46 10:41	09:21.9	+16:11
27 20:04 03:04 10:01	09:19.6	+16:24

Saturn, 8.05 A.U., Mag. +0.4		
07 17:32 00:48 08:00	05:44.3	+22:04
17 16:44 00:06 07:23	05:40.9	+22:03
27 16:02 23:19 06:40	05:37.4	+22:02

SOL Star Type G2V Intelligent Life in System ?		
Hours of Darkness		
11:14 07 07:07 11:59	16:52	16:56.4
11:19 17 07:16 12:04	16:51	17:38.9
11:18 27 07:21 12:09	16:57	18:23.3

Astronomical Twilight:	Begin	End
JD 2,452,615 07	05:36	18:22
625 17	05:43	18:25
635 27	05:48	18:30

Sidereal Time:

Transit Right Ascension at Local Midnight

07 00:00 = 04:56	
17 00:00 = 05:35	
27 00:00 = 06:14	

Darkest Saturday Night: 28 Dec 2002

Sunset	16:57
Twilight	18:30
Moon Rise	01:36
Dawn Begin	05:48
Hours Dark	11:18

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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.

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	Annette Reyes
3	4" Quantum S/C	Hsin I Huang
7	12.5" Dobson	Michael Lagae
10	Star Spectroscope	Lew Kurtz
24	60mm Refractor	Al Kestler
32	6" f/7 Dobson	Sandy Mohan

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	David Findley	2/1/03
8	14" Dobson	Ron Gross	1/19/03
11	Orion XT6 Dob	Krishna Seshan	11/16/02
12	Orion XT8 Dob	George Gadd	1/19/03
13	Orion XT6 Dob	Vinod Nagarajan	1/18/03
14	8" f/8.5 Dob	Tom Frerickson	1/19/03
15	8" Dobson	Vikram Keshavamurthy	12/13/02
16	Solar Scope	Suzanne Patrick	1/24/03
19	6" Newt/P Mount	Daryn Baker	12/27/02
23	6" Newt/P Mount	John Bunyan	11/30/02
26	11" Dobson	Jan Lynch	1/19/03
27	13" Dobson	Richard Savage	12/21/02
29	C8, Astrophotography	Murali Balasubramaniam	12/27/02
33	10" Deep Space Explorer	Tod Irwin	11/28/02
34	Dynamax 8" S/C	Lee Barford	11/16/02
35	Meade 8" Equatorial	Carl Ching	12/13/02
37	4" Fluorite Refractor	Steve Sergeant	11/16/02
38	Meade 4.5" Digital Newt	Tej Kohli	1/12/03

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	Paul Barton	Indefinite
21	10" Dobson	Ralph Seguin	Repair
28	13" Dobson	Michael Dajewski	1/31/02
36	Celestron 8" f/6 Skyhopper	Tajinder Singh	12/27/02
39	17" Dobson	Patrick Lewis	Repair

Waiting List:

3	4" Quantum S/C	Eric Anderson
8	14" Dobson	Doug Hendrix
10	Star Spectroscope	David Kingsley
13	Orion XT6 Dob	Adam Clark
16	Solar Scope	Jim Turley
36	Celestron 8" f/6 Skyhopper	Mik Macedo

San Jose Astronomical Association Membership Form

New Renewal

Membership - \$15

Junior (younger than 18 years old) - \$6

Sky and Telescope - add \$30 to membership

(Sky & Tel will not accept multiyear subscriptions)

Please write one check for the total payable to "SJAA"

Bring this form to any SJAA Meeting
or send (along with your check) to

San Jose Astronomical Association
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San Jose, CA 95159-8243

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