

SJAA EPHEMERIS

Observing Markarian's Chain — A One-Night Project

Michael Dajewski

One evening last winter I took my telescope to Henry Coe State Park, my favorite site.

There was only one other gentleman there. He was busy with his projects. It was a quiet, chilly night. I did not have any observing plan, so I just visited old places. At some point, the gentleman started a conversation and showed me a nice edge-on galaxy in Coma Berenices.

I looked up the galaxy on my laptop, and few minutes later I had it in my eyepiece. I got excited — a new adventure was about to begin. I moved the scope to Virgo, and a few galaxies popped into the view. I must have said something, because the gentleman commented. "There are thousands of them there." He was not at all talkative.

For the rest of the night I stayed glued to my eyepiece, just slewing the telescope from one galaxy to another. Later, I shared my observation with colleagues during one of the meetings of the SJAA. Mike Koop suggested I had observed Markarian's chain.

I went home, logged on to the Internet and started to read about Markarian's Chain of Galaxies so I would be prepared for the next observing night. This time I would not just wander around. I prepared a list of the objects, found them on my laptop, and rehearsed it all. This was how my little adventure started.

The following weekend was dark, so I rushed to Henry Coe. The same gentleman was there, quietly working on his projects. I started working on Markarian's chain. What is Markarian's chain? It is a group of eight galaxies located in Virgo. That was all I knew back then.

The object list, according to my February 2001 research included:

NGC 4374, NGC 4406, NGC 4435, NGC 4438, NGC 4458, NGC 4461, NGC 4473, NGC 4477. Where are they? If you connect the left arm of Virgo with the rear of Leo, the group starts slightly below middle point of the line. The chart on the next page shows Telrad (4 degree) circles.

What does the group of galaxies look like? The eight NGC objects are marked. It is up to you to identify the rest of them. The magnitude ranges from 9.2 to 13.0, surface brightness from 12.53 to 14.73. I would suggest

Continued on next page

SJAA Activities Calendar

Jim Van Nuland

May

- 2** ATM Class VII — Hough Park, 8 p.m.
3 Astronomy Class V — *Observing Galaxies*, Morris "Mojo" Jones — Hough Park, 7:30 p.m.
3 Hough Park star party. Sunset 7:59 p.m., 51% moon rises 2:40 a.m.
4 Deep-Sky weekend. Sunset 7:58 p.m., 42% moon rises 3:12 a.m.
9 ATM Class VIII — Hough Park, 8:00 p.m.
11 Deep-Sky weekend. Sunset 8:04 p.m. No visible moon tonight.
17 Hough Park star party. Sunset 8:11 p.m., 32% moon sets 1:22 a.m.
18 **General Meeting:** Tim Castellano, Planet Transit Search Project
18 AANC Conference, College of San Mateo, 9:00 a.m. — 5:00 p.m., followed by spaghetti feed and star party
24 RTMC to May 27. Full Moon on Sunday
30 ATM Class IX. Hough Park, 8:00 p.m.

May (Continued)

- 31** Astronomy Class VI — Hough Park, 7:30 p.m.
31 Hough Park star party. Sunset 8:22 p.m., 68% moon rises 1:13 a.m.

June

- 1** Deep-Sky weekend. Sunset 8:19 p.m., 58% moon rises 1:42 a.m.
8 Deep-Sky weekend. Sunset 8:25 p.m., 4% moon rises 4:52 a.m.
14 Hough Park star party. Sunset 8:29 p.m., 20% moon rises 0:05 a.m.
15 ATM Class X — Hough Park, 7:30 p.m.
11 Deep-Sky weekend. Sunset 8:04 p.m. No visible moon tonight.
22 **General Meeting:** Robert Naeye, The Great Pluto Debate
28 Astronomy Class VII — Hough Park, 7:30 p.m.
28 Hough Park star party. Sunset 8:32 p.m., 82% moon rises 11:44 a.m.

Upcoming Speakers:

July 27, Ken Lum, Bernhard V. Schmidt talk

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

www.sjaa.net



Markarian's Chain of galaxies in Virgo. Chart from Cartes du Ciel.

A One-Night Project

Continued from previous page

taking a 12.5" or a bigger telescope. Remember, the galaxies will appear more detailed at higher magnification. The galaxy group is a very nice sight. All the galaxies in the group span only 1.5 degrees. Why only eight galaxies? I have counted more than twelve in the group. The questions started to pile up. Then, as usual, something else took my attention.

Virgo is back in the sky and so are my questions about Markarian. Once more, I queried Markarian's name on the Internet, and have found more that I could wish to find.

So, here is what I discovered: Markarian's chain is just eight of some 1500 peculiar galaxies, that were catalogued by Russian astrophysicist B.E. Markarian. In May 1966, Markarian published "The galaxies with UV Continua." Around that time, he started the First Byurakan Spectral Sky Survey (FBS) — now completed. In 1975,

Markarian initiated a Second Survey (SBS). The SBS was continued by his collaborators after his death.

In other words, Markarian was looking for galaxies that would emit unusually strong UV radiation. Well, as it turns out, these are galaxies that have Active Galactic Nuclei (AGN), which emit lots of energy, not only in UV but also in a very wide range, from gamma and x-rays, through UV and

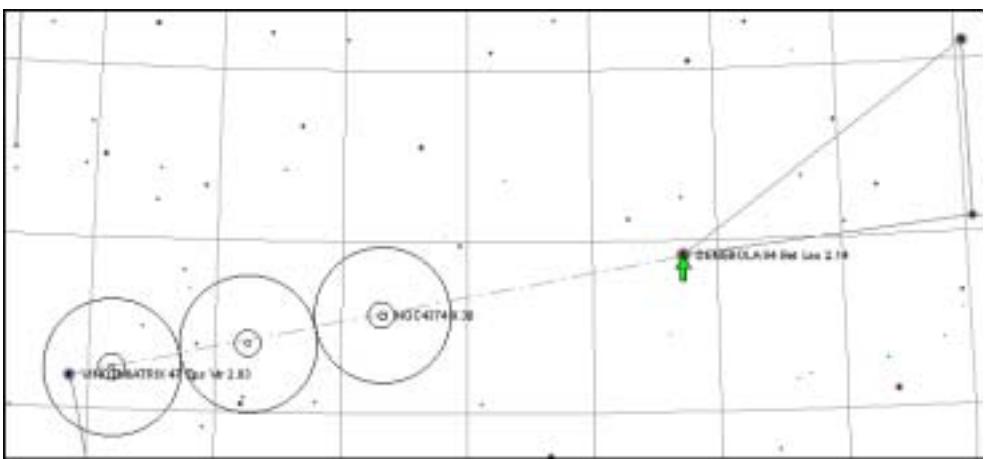
visible light to infrared and radio waves.

That is enough; you can find more information by yourself. Try *Active Galactic Nuclei*, by D. E. Osterbrock, http://nedwww.ipac.caltech.edu/level5/Osterbrock3/Oster_contents.html and NASA Astrophysics Data System (ADS), <http://www.harvard.edu> — search for Markarian.

You will read about quasars, black holes, and many other interesting things. When you look at a Markarian galaxy, pause and give it some thought. These galaxies are very bright, but we cannot see them. Would the UV radiation stop

nature in its creation process? What would our world look like, if our galaxy hosts a monster in the center? Well, I think that nature always finds its way. This is a time for a little meditation, so stop chasing galaxies for the moment and stop logging them by the hundreds. Relax and have some coffee. This is how I observe.

— Michael Dajewski,
michaeld@worldnet.att.net



Telrad circles (4-degrees) on the boundary between Leo and Virgo.

One of the coolest — and most exclusive — clubs in the world is the People Who Have Something On The Moon Named After Them Society.

By far, most are dead men, and the further back you go in the naming lists, the dumber it gets (there are various people Liked By Old Popes, for example, who are better forgotten).

But features named more recently do not follow the same pattern. Most of them are named for people who actually earned the distinction, and many of them are women.

I'm not sure how many, exactly, so this isn't a compendious discussion of the subject. Rather, I'm going to try to have some fun with it.

And if you want, you can get out a scope and see many of them, without any clothes on! Lunar pornography...

Oddly, one of the most distinguished is also one of the oldest, by in how long it's been named and how long ago she lived. It's should be pretty easily seen on May 17. But what's the name?

Announcing the Inaugural 2002 Shingletown Star Party

For the past eight years the San Francisco Bay Area internet observers group The Astronomy Connection (TAC) has been hosting star parties at Mount Lassen Volcanic National Park. The location's outstanding dark skies and wonderful daytime sights have made for an annual gathering that continues to increase in popularity and attendance.

This year, in conjunction with TAC, TAC-SAC (Sacramento) and Shasta County, the Shingletown Activities Council is proud to host the inaugural Shingletown Star Party for 5 days and nights at the Shingletown Airport, which is located approximately 40 miles east of Redding off of Hwy 44 in Shingletown, CA. The dates are from noon on Wednesday, July 10th

Scoping Out Women

Dave North

Hypatia. You'll find her guarding the gates between Serenity and Nectaris, on a promontory just south of the first Apollo landing.

So why is she on the Moon? Partly because of her accomplishments: she was an astronomical scholar of the first rank, author of The Astronomical Canon and a developer of the Ptolemaic school of astronomy. She was perhaps more famous as a mathematician, in particular concentrating conic sections.

... She was cut to pieces with pottery shards and fragments of her body spread throughout Alexandria.

But she was also a well-respected general philosopher, very popular with the people of Alexandria and recognized throughout the known world at that time.

It may also be a matter of some importance that she was reputed to be extremely beautiful, and of the highest

moral character. It was definitely an issue that she was not Christian.

The story has it she was murdered by a gang of monks at the orders of St. Cyril (one of the idiots who has a crater named after him. In some small justice, it's a wrecked old mess). Apparently Cyril not only couldn't stand so much fame and respect aimed at someone not of his faith, but was miffed that she rejected his affections as well.

This was no sudden event. She was a subject of controversy for years before her death, and knew what she was risking in sticking by her convictions, both intellectual and spiritual.

In the end, she was cut to pieces with pottery shards and fragments of her body spread throughout Alexandria.

It is perhaps not a coincidence that the crater Hypatia has one of the more unique shapes: it resembles a heart.

Few scientists or mathematicians have accomplished the level of fame and respect she earned, and very few indeed paid such a price for it.

A little later in the month, on the 21st, we get something of a treat: the terminator will be passing through Sinus Iridum and giving that amazing view you can only get when it is "hanging off" into the dark side. The play of the Bay Of Rainbows.

More topically, though, a bit south of it you'll see a smallish crater right on the terminator. That's named for Carolyn Herschel, comet hunter extraordinaire. She was the first woman ever to discover a comet and ended up with eight "kills" to her name.

Born in 1750 and described as the "first famous woman in astronomy since Hypatia" (fitting we're going in this order, no?) she personally favored music over astronomy.

In fact, she got involved because

Continued on next page

Scoping out Women

Continued from previous page

of her singing: her brother William (maybe you've heard of him?) imported her to England to sing soprano in his compositions.

She only helped out at first, grinding mirrors and taking notes while William pursued his sky survey.

After he discovered Uranus, William gave up music altogether and pretty much ended Carolyn's career as a result. At first she was not very happy about this, but soon found it freed up her time to engage in astronomy, which she took up with a passion.

Aside from her comets, she also found something I think we all have enjoyed: NGC 253 is one of her finds.

She was never much impressed by her own accomplishments, but subsequent generations have improved on her thinking.

Almost a week later, on the 27th, a very hard target will present itself way out on the limb. Fortunately, we'll have a favorable libration to help us out, but it might actually be fitting that Cannon is hard to find: the things Annie Jump Cannon found were also difficult, and it took someone of her singular nature to find them.

Annie studied astronomy at Wellesly, specializing in spectroscopy. After working as an astronomy professor for some time (and various other tasks in life) she secured a job working for Edward Pickering at Harvard in 1894, reducing observations and calculating results.

This meant she spent an enormous amount of time looking over spectral data, hands-on.

She was the woman who finally settled the star classification scheme on the OBAFGKM system we still largely use today. Others had pressed in this direction, but it was left to her (and her phenomenal eye for spectra) to settle the issue once and for all.

Even more important, she was able to categorize enough stars (in the end, something over 450,000) to establish that there really weren't all

that many spectral categories, and that color and temperature were related in intimate ways.

She had to work very hard to find what she did, so you shouldn't complain if you have to work a bit to see her crater.

The First Binary Star

Bob Brauer

This month, the constellation Gemini is well positioned in the evening sky. Castor and Pollux, the Gemini twins of mythology, are represented by the two brightest stars on this constellation with Castor shining to the north of Pollux. Castor, also known as Alpha Geminorum, may be considered it's first star since alpha is the first letter of the greek alphabet.

Castor has been designated Alpha Gemonorum since the star maps of Bayer's *Uranometria* in 1603.

... Castor may deserve its Alpha designation for other reasons.

Bayer's system ranks the brighter stars in each constellation in order of brightness, hence Alpha Geminorum is the brightest star in Gemini.

Except it isn't.

The other twin of Gemini, Pollux, is designated Beta Geminorum, but Pollux is the 17th brightest star in the sky (magnitude 1.16) while Castor is the 23rd brightest (magnitude 1.59). As noted in Burnham's *Celestial Handbook*: "The star, although designated Beta, is actually brighter than Alpha Geminorum and it has been suggested that one of these stars has changed in luminosity in the last few centuries."

Regardless of its brightness, Castor may deserve its alpha designation for other reasons. It may be considered the finest double star to view in the northern skies. The two stars visible in amateur telescopes, Castor A and B, are magnitude 2.0 and

2.8. Their visual separation has been increasing since periastron in 1968 and 1969 of 1.8 arcseconds, and currently appears to be about 4 arcseconds.

These two stars orbit each other with an average physical separation of 90 astronomical units (AUs) which is also the approximate diameter of our solar system. I'm always delighted to realise that our entire solar system could fit neatly between Castor A & B.

A lot of motion has been recorded since these stars positions were first measured in 1718. We have not yet observed one complete revolution of these stars, but one estimate of the period of revolution is around 400 years. From Burnham's *Celestial Handbook*: "In 1803, Sir William Herschel announced that the components form a system in which the two stars are gravitationally connected and revolve about each other in space. Castor was the first true physical binary to be recognized, and the first object beyond our own Solar System in which the force of gravitation was shown to be operating, as it does in the planetary system."

So Castor may be considered the first binary star due to it's historical significance, it's pleasing visual appearance in small telescopes, and it's unusual Bayer's designation.

— Bob Brauer,
Robert_N_Brauer@compuserve.com

Annual SJAA Yosemite Trip

Jim Van Nuland

The annual SJAA Yosemite star party will be held on July 5 and 6, at Glacier Point. Up to 30 people will be given free admission and camping, in exchange for two public events on Friday and Saturday evenings. We are expected to have at least 1 scope per 2 people.

This year we will share the space with the Central Valley Astronomers, from Fresno.

Various information may be found on my Yosemite Page, <http://www.svpal.org/~jvn/yosemite.htm>

May Planets

Akkana Peck

All the easily visible naked-eye planets make a fine cluster in the May evening sky. Why not take a tour of them?

We begin our tour just past sunset with Mercury, low in the twilight sky and showing near half phase as the month begins, and rapidly growing in size and shrinking in phase until its crescent disappears for inferior conjunction — when the planet passes closest to being directly between us and the sun — on the 27th.

Not far above Mercury is Saturn, which is ending a fine season of ring observing. This low in the sky, it'll be hard to see details in its ring system, but we'll still be able to catch a glimpse of the ringed planet for most of the month.

Venus and Mars make a fairly close pair in the early parts of the month, passing by Saturn for a nice triple on May 6. The actual conjunction of Venus and Mars happens on the 10th, when they will be only 3 degrees apart, bright Venus, showing roughly half its disk, greatly outshining the smaller and more distant red planet.

A slim crescent moon makes close passes with all three of these planets on May 14th — from other parts of the world it will actually occult them, but here in San Jose we'll only see close passes. It will be less than a degree from Venus and Mercury at around 1 p.m., so if you're willing to hunt the moon in the daytime you might be able to fit all three in the same low-power eyepiece field.

Higher up above Venus and Mars is brilliant Jupiter, putting on a great show for observers, with wonderful detail still visible in its cloud bands, and lots of storm activity still taking place, white ovals forming and disappearing and gaps in the bands constantly changing. It's not too late to get some good views before it disappears!

The fainter outer planets — Uranus, Neptune, and Pluto — are all in the morning sky now, Neptune in Capricornus and Uranus having moved into nearby Aquarius, and Pluto leading them in Ophiuchus, visible to motivated searchers who stay up late to catch our distant neighbor.

In addition, there are lots of occultations and eclipses this month — but sadly, none of them are visible from San Jose, with the exception of the penumbral lunar eclipse in the wee hours of May 25-26, when the moon sets shortly after first contact.

Getting Started

Constellation Tips

Morris Jones

Question: I would like to learn many of the constellations. Do you have any tips or recommended books that would help me learn?

The biggest help for me in learning the constellations was a computer planetarium program, such as SkyMap, Distant Suns, or many others. It's invaluable to be able to see a rendition of the sky that matches your time, orientation, and location, and without too much projection distortion.

There is one book I recommend, too, *Turn Left at Orion* by Consolmagno and Davis.

The key is to start with a few bright, recognizable constellations, and use them as guideposts to fill in the rest of the sky gradually. It's a year-long process to watch the sky go through all of the seasons.

Another tip is to set up at star parties next to experienced astronomers and pick up on their tips, tricks, and mnemonics for constellations and asterisms. What is listed as Sagittarius in the books will be known at any (northern hemisphere) star party as only "the teapot." Or "arc to Arcturus,"

then follow the line from Arcturus to Vega to see Corona Borealis and Hercules.

Then speak to your travel agent about extended visits to the opposite hemisphere from the one you live in, at different times of the year. [:])

On the contraindicated side, I suggest that commonly available planispheres are useful only if you already know the constellations fairly well. The projection distortions around the edge of a planisphere render the constellations almost unrecognizable. ("What teapot?")

Another factor that inhibits the learning of constellations is the treatment of constellations individually. To me it's much easier to understand and recognize constellations in the context of their neighbors and place in the sky. I find this to be a problem with many of the books and catalogs, and an otherwise excellent ASP constellation slide set. Once again, such things are useful if you're already familiar with the constellations, but are difficult in the context of trying to learn them.

One last tip: Most of the constellations are either totally faint, or unrecognizable when their fainter members can't be seen. Get away from town to see, for instance, the girl in the sky in Virgo, the arrow in Sagitta, or the dolphin in Delphinus.

— Morris Jones,
mojo@whiteoaks.com

Jack Zeiders Donates Telescope and Big Binocular

Jim Van Nuland

Jack Zeiders has donated his 17-inch dobsonian telescope to SJAA. Many of you have admired this scope and its remarkable design and workmanship, which compares very favorably to such makers as Obsession.

In addition, he donated a 1940's Japanese battleship binocular with 6-inch objectives. This is interesting for its history, as well as its superb optics.

We thank Jack for this latest generosity.

— Jim Van Nuland, jvn@svpal.org

SJAA Board of Directors

Jim Van Nuland

The February meeting is designated as the Corporate Annual Meeting, whose main business is the election of the Board of Directors.

Directors serve two-year terms, with four directors elected in even-numbered years, and five elected in odd years. Candidates must be SJAA members for at least one year.

Bill Arnett and Mark Taylor declined to stand for re-election. We thank them for their years of service.

Replacing them are David Smith and Steve Nelson, for their first time on the board. Re-elected were Gary Mitchell and Mike Koop.

In addition, Jim Bartolini, Jim Van Nuland, Paul Mancuso, Bill O'Shaughnessy, and Bob Havner all have an additional year to go.

Board meetings are held at 6:30 preceding each general meeting. They are open to all.

AANC Conference

May 18, 2002

Jane Houston Jones

The AANC Conference will be held at and co-sponsored by the College of San Mateo this year. Registration, agenda, box lunch selection forms and directions can be found on the AANC website, www.aanc-astronomy.org.

Talks will range from the Kepler Mission, to study terrestrial planets orbiting stars, to a talk on the black hole in our own galaxy, to the DART membrane telescope to a presentation featuring a representative from Coronado Filters.

At lunch view the sun through various solar filters, while enjoying your selection of box lunches.

After the day of talks, stick around for a social hour and planetarium shows (also at lunchtime) followed by an old fashioned spaghetti feed brought to you by the San Mateo County Astronomical Society, followed by a star party.

Wanted

Needed: One old small-size suitcase. This is to hold together some small items for small kids at star parties. Things like hand stamps, star stickers, blow-up planet balls etc. Contact Steven Nelson (wsnelson@concentric.net) or bring to a monthly meeting. Thanks.

Loaner Notes

Mike Koop

Thanks to Jack Kellythorne for fixing up Scope #8, the 14" truss dobsonian. Jack reduced the size of the mirror box and reworked the truss poles. Our backs thank you!

Directions to Houce Park

Houce (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.

Between the parking lot and tennis courts is a strip of grass where public star parties are held. The meeting hall is directly ahead (south) of the parking lot. There are restrooms on the other side of the hall.

For directions to observing sites commonly used by SJAA members, visit the SJAA web site: <http://www.sjaa.net/directions.html>.

Celestial Calendar

May 2002

Richard Stanton

Lunar Phases:	Date	Rise	Trans	Set
LQ 00:15 PDT	04	02:41	07:44	12:51
NM 03:44 PDT	12	06:18	13:25	20:41
FQ 12:41 PDT	19	12:34	19:44	02:07
FM 04:51 PDT	26	20:56	00:57	06:02

Nearer Planets: R. A. Dec.

Mercury, 0.61 A.U., Mag. 4.0		
07 06:49 14:26 21:52	04:18.5	+23:58
17 06:38 13:58 21:18	04:32.2	+22:55
27 05:56 13:03 20:09	04:17.0	+19:31

Venus, 1.38 A.U., Mag. -4.3		
07 07:34 14:59 22:24	04:50.0	+23:30
17 07:42 15:12 22:42	05:42.6	+24:48
27 07:55 15:25 22:55	06:35.4	+24:55

Mars, 2.43 A. U., Mag. 1.5		
07 07:42 15:06 22:30	04:58.3	+23:33
17 07:29 14:55 22:22	05:27.4	+24:09
27 07:17 14:45 22:12	05:56.4	+24:24

Jupiter, 5.85 A. U., Mag. -1.9		
07 09:36 16:58 00:23	06:52.0	+23:07
17 09:05 16:26 23:47	06:59.6	+22:58
27 08:35 15:55 23:15	07:07.9	+22:46

Saturn, 9.99 A.U., Mag. 0.9		
07 07:44 14:58 22:12	04:52.2	+21:10
17 07:09 14:24 21:39	04:57.4	+21:20

07 06:35 13:50 21:05	05:02.9	+21:29
Sol Star Type G2V Intelligent Life in System ?		
Hours of Darkness		
06:37 07 06:04 13:04 20:05 02:56.2	+16:47	
06:10 17 05:54 13:04 20:14 03:35.4	+19:18	
05:47 27 05:48 13:05 20:22 04:15.6	+21:16	

Astronomical Twilight:	Begin	End
JD 2,452,401	07	04:23 21:46
411	17	04:10 21:59
421	27	03:59 22:12

Sidereal Time:	
Transit Right Ascension at local midnight	
07 00:00 = 13:52	
17 00:00 = 14:31	
27 00:00 = 15:10	

Darkest Saturday Night: 11 May 2002	
Sunset	20:09
Twilight	21:51
Moon Set	19:39
Dawn Begin	04:18
Hours Dark	06:26

Officers and Board of Directors

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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
7	12.5" Dobson	Bruce Horton
15	8" Dobson	Daron Darr
19	6" Newt/P Mount	Iikka Kallio
24	60mm Refractor	Al Kestler
26	11" Dobson	Tajinder Singh
27	13" Dobson	Gene Schmidt
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
3	4" Quantum S/C	Hsin I Huang	7/8/02
6	8" Celestron S/C	Carl Ching	6/23/02
8	14" Dobson	Dana Crom	7/4/02
10	Star Spectroscope	Lew Kurtz	5/23/02
12	Orion XT8 Dob	Mike Macedo	4/23/02
13	Orion XT6 Dob	Dennis Hong	7/5/02
14	8" f/8.5 Dob	John Templeton	7/5/02
16	Solar Scope	Tobias Giles	6/30/02
29	C8, Astrophotography	Kevin Roberts	4/18/02
33	10" Deep Space Explorer	Sandy Mohan	4/18/02
34	Dynamax 8" S/C	George Wang	6/30/02

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
1	4.5" Newt/ P Mount	Annette Reyes	7/18/02
2	6" f/9 Dob	John Paul De Silva	?
9	C-11 Compustar	Paul Barton	Indefinite
11	Orion XT6 Dob	Wai Tuck-Low	4/27/02
21	10" Dobson	Ralph Seguin	Repair
23	6" Newt/P Mount	Wensheng Hua	4/27/02
28	13" Dobson	Michael Dajewski	6/31/02
31	8" f/8 Dobson	Jan Lynch	4/27/02

Waiting List: #12, Tajinder Singh; #3, Eric Anderson

Submit

Submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to ephemeris@sjaa.net.

To subscribe to or unsubscribe from the SJAA Mailing List, visit <http://www.sjaa.net/mailman/listinfo/sjaa-announce>

San Jose Astronomical Association Membership Form

New Renewal
Membership - \$15

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

Sky and Telescope - add \$30 to membership
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