



SJAA EPHEMERIS

SJAA Activities Calendar

Jim Van Nuland

June

- 2 Houge Park star party. Sunset 8:23 p.m., 44% moon sets 1:30 a.m. Star party hours: 9:30 – midnight
- 3 ATM Workshop at Houge Park. 7:30 p.m.
- 3 Coyote Lake Star Party (see page 2). 9:00 - midnight.
- 10 **General meeting at Houge Park.** Dr. Peter Jenniskens on Meteor Showers and their Parent Comets. 8 p.m.
- 15 ATM Workshop at Houge Park. 7:30 p.m.
- 16 Astronomy Class at Houge Park. 7:30 p.m.
- 16 Houge Park star party. Sunset 8:30 p.m., 64% moon rises 0:43 a.m. Star party hours: 9:30 – midnight
- 17 Dark sky weekend. Sunset 8:30 p.m., 53% moon rises 1:10 a.m.
- 24 Dark sky weekend. Sunset 8:32 p.m., 0% moon rise 5:26 a.m.
- 30 Houge Park star party. Sunset 8:32 p.m., 28% moon sets 11:55 p.m. Star party hours: 9:30 – midnight

July

- 1 ATM Workshop at Houge Park. 7:30 p.m.
- 1 Coyote Lake Star Party (see page 2). 9:00 - midnight.
- 8 **General meeting at Houge Park.** Albert High on Design of Lightweight Telescopes. 8 p.m.
- 13 ATM Workshop at Houge Park. 7:30 p.m.
- 21 Astronomy Class at Houge Park. 7:30 p.m.
- 21 Houge Park star party. Sunset 8:24 p.m., 8% moon rise 3:18 a.m. Star party hours: 9:30 to 12:00
- 21-22 SJAA Weekend at Glacier Point, Yosemite National Park
- 22 Dark sky weekend. Sunset 8:24 p.m., 3% moon rise 4:17 a.m.
- 29 Coyote Lake Star Party (see page 2). 9:00 - midnight.

The Board of Directors meets at 6:00 p.m. preceding each general meeting. All are welcome.

Possible Land Donation to the Club

Rob Hawley and Craig Scull

The sky quality in the public parks near San Jose is degrading as the Bay Area continues to grow. For almost 20 years the club has been considering purchasing some land that can be used as a dark sky observing site. Until this year none of the leads have worked out.

In January one of the club members approached the board and suggested his property might be suitable. Both donor and the board of SJAA are waiting to see how much interest there is before proceeding with the donation.

The property is located south of Hollister about 90 mi from Houge Park (about a 2 hour drive). The area around the property is former ranch land. The site is in located in the beautiful rolling hills of Willow Springs around 3000' in elevation.

The site is nearly as dark as the site where the Texas Star Party is held. What's more, it is likely to stay dark because by chance it is located within a San Benito County Dark Sky Zone that was set up to protect both the Pinnacles and Fremont Peak. It is also located considerably south of Hollister (about 32 mi). There are virtually no light sources to the south.

Here is a sample of some of the things that can be seen from the site:

- Barnard's loop (6" RFT)

Continued on page 2



This map shows the light pollution comparing Fremont Peak with Willow Springs. Willow Springs is 2 zones darker, by about 0.5 Magnitude!

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

<http://www.sjaa.net>

- Gegenshein (naked eye on a good night)
- Horsehead (10" with filter)
- Omega Centauri - well resolved (in 16"). The southern sky is dark down to a wide low horizon.

The site is raw property. There are no services and it's accessed by 2.5 miles of dirt road that is generally in good condition. The site will be closed for use during the winter rainy season. Access will be restricted to observers and their guests.

The donor is hosting an open house star party on May 27 and we're hoping you will come join us for some of the darkest skies within a 2 hours drive of San Jose. It's a pleasant drive down to Willow Springs and the land itself is beautiful by day. We are very excited about the possibility of SJAA having a dedicated dark sky observing site and we hope you will be too! Contact the authors for more information.

We have been studying the site for the board since the offer was made. Our presentation during the May general meeting provided some additional information on our conclusions including estimates of the costs. At this point we are actively soliciting input. If the board and the donor do not feel there is sufficient interest then this offer will lapse.

Please contact the authors at membership@sjaa.net if you desire further information or wish to express interest.

Summer Volunteer Astronomy Opportunity

The National Park Service is seeking volunteers with a solid knowledge of the sky, telescope operation, and good communication skills to participate in a public astronomy program at Bryce Canyon. Stargazing and protection of dark skies has become an important theme at Bryce Canyon with over 27,000 visitors attending dark sky programs last summer.

Volunteers will get free park housing, dark 7+ skies, with a 4-week commitment between April-October 2006.

For further information:
http://www.nps.gov/brca/astro_volunteer.html

Volunteers Wanted

Bob Brauer

After more than a decade of monthly service to the club, Bob Brauer, Lew Kurtz and Dave North are running out of steam. We need to find the next generation of newsletter circulation staff.

Here's the deal:

The newsletters are picked up from the printer. Rob Hawley supplies the input to print the labels. Then you get to have a labeling and sorting party to put address labels on each newsletter and sort them into Postal Service trays. Next, you get to add up the numbers and fill out the paperwork for entering the Bulk Mail system.

After that, you will take the trays to the San Jose Main Post Office on Lundy Avenue between 9AM and 7PM, Monday through Friday, and submit the mailing to a postal clerk at the Business Mail entry office.

Finally you pick up empty trays and get ready to do it all again next month. The result of all this "fun" is that you will save the club over \$70 per month in mailing expenses.

We need to find replacements quickly as Dave, Lew and I have to exit from the process in July. We will be able to walk you through the system if you raise your hand quickly. Volunteers should live in, or commute through, San Jose near Lundy Ave and Brokow Rd. Send e-mail to "circulation@sjaa.net" and let us know when you can help.

Coyote Lake County Park Summer Star Party Series

Mike Koop

Saturday, June 3rd, between 9:00 and 12:00 p.m. the SJAA and The Astronomy Connection (TAC) will host the first of a series of public star parties at Coyote Lake County Park. Coyote park is the one of the most convenient summer observing sites in the area. It is a short 45 minute drive from Houge Park. Through the efforts of SJAA/TAC member Denny Woolaghan, astronomical use of Coyote is free during the year. The SJAA and TAC have agreed to provide Star Party support for the Ranger Program during the summer. The SJAA will support the Park Rangers in their public program efforts by setting up our telescopes to share views with all those present from the campgrounds or those who drive in just for the Star Party. Since last year's Star Parties were such a success drawing people, the viewing will be moved to the Boat Launch Ramp Parking Lot which is located about 2 miles from the Ranger Station/Visitor Center. Come on out and support the star party as your way of thanking the staff for making this great observing site available to us.

For Conditions, Directions, Maps, and More Visit:
<http://www.sjaa.net/CoyoteStarParties.html>

For Sale

LX-200, 10 inch, motorized GO-TO scope. Great condition, superb optics. \$1400.

Celestron C-5, excellent condition, great optics. Table plus tripod. 9-volt drive. \$650

Dan and Edie Stokes. Call 831-751-9704, in Salinas.

— — — — —
Celestron C-5 - Complete with fitted case, tripod, wedge, assorted eyepieces, misc. stuff. All in mint condition. \$350 obo.

Richard Beckert
408-395-2267

Broken Comets and Drifting Dunes

Akkana Peck

Jupiter is a month past opposition, which means it's perfectly placed for observing, rising before nightfall and reaching its maximum altitude well before midnight. Unfortunately, that maximum altitude is a hair under 40 degrees, so it never gets up into really steady air. Still, 40 degrees is enough that you'll be able to see quite a bit of detail if you look. See the May 2005 Ephemeris (still available on the web if you don't keep all your old copies) for a chart of some of Jupiter's prominent features and a guide to observing them.

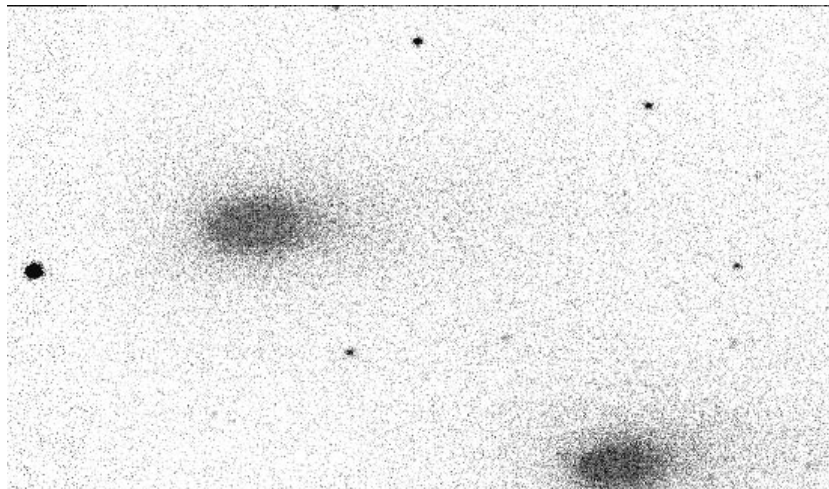
Neptune rises a bit before midnight, and Uranus a bit later; both are well placed for observing if you're staying up late.

Pluto reaches opposition on June 16, blazing at a magnitude 13.9, and is visible all night. Count this as the beginning of "Pluto season": grab yourself a good star chart (the chart in the RASC Observer's Handbook has proven to be very accurate for Pluto, while not all planetarium programs are) and your biggest scope, and head on out to your favorite dark-sky site!

How much aperture do you need for Pluto? Opinions vary. I recommend at least a 12.5", though I've heard occasional reports of experienced observers nailing the dim planet with 8" telescopes or even smaller). Some people say that going bigger than 12.5" is a waste of effort for Pluto: all the extra stars you see (too faint to show up on the charts) will just confuse you. I don't agree myself: I find Pluto easier to find

when I'm not straining to see it, so more aperture is helpful. Everyone is different: your mileage may vary, void where prohibited by law.

Last month, Comet 73P/Schwassmann-Wachmann 3, which broke into five large pieces back in 1995, made a fairly close flyby. In June, 73P/Schwassmann-Wachmann 3 is still visible, but it's moved into the morning sky, rising after 3 a.m., so you'll have to stay up late



This is a picture of Schwassmann-Wachmann 3 made in early May using a 10" SCT and a CCD camera. It is actually two 10-second exposures: one is taken at 2:39 a.m. on May 7, 2006 and the second was made 15 minutes later at 2:54. The two images were aligned in Photoshop so that the triangular asterism (imagine a nearly isosceles triangle with its apex in the upper right) lined up. The different exposures show how far the comet moved in 15 minutes. The first exposure shows the comet outside of the triangle and then later it is inside the triangle. According to www.heavens-above.com, the comet at this time was .09 AU from Earth and around 7th magnitude. It was traveling through the Lyra constellation and, as you can see, it was moving pretty fast as it neared perihelion. Photo by Paul Kohlmeier.

(or get up early) to catch it. The pieces should still be bright enough to see in most amateur telescopes.

Venus sits very low in the dawn sky, showing a slightly gibbous phase.

On the other side of the sun, Mercury is visible in evening twilight early in the month, but becomes lost in the sun's glare near month's end. Mars hovers a bit above Mercury in the evening sky, and Saturn is nearby. On the night of the 4th Saturn makes a very close pass by the Beehive cluster, M44, in Cancer.

Then on the 14th Mars joins the show: a fairly wide field should be able to show Saturn, Mars and the Beehive all together in one field. (If your telescope can't show a field that wide, binoculars should give a lovely view of this trio.)

Take a look at low power, then crank up the magnification a bit and zoom in on Saturn: it's not too late to get a good view of Saturn's rings and some of its brightest moons. In particular, Titan.

What's so interesting about Titan? Well, the latest research from the Cassini spacecraft includes some very interesting photos of Titan, showing what looks remarkably like dune fields. In other words, all those areas on Titan that everyone thought were vast methane seas now appear to be dry desert areas, blown by wind into dunes like the ones we can see in the Mojave or Death Valley, up to 500' high and extending for hundreds of miles. Pretty impressive considering

that one mile per hour counts as a high wind on Titan. But since Titan is so small (well, it's big for a moon, nearly twice as massive as ours, but small for a planet, only about 4/10 the mass of Mercury) it doesn't take much to build up big dunes.

What sort of sand makes up these dunes? Nobody knows yet. They might be sand, like dunes on Earth, or they might be tiny ice crystals or some other material. Stay tuned! I'm sure Cassini will have more surprises for us.

Eclipse over Egypt

Ernie Piini

On the morning of March 29, 2006, at 1:30 A.M., three busloads of eclipse chasers and spectators set off for a four-hour ride from the Charm Life hotel in El 'Alamein, Egypt, and headed West to our destination, El-Sallum Matrouh, a restricted area just 4 km east of the Libyan border. This area had been set up by the Egyptian authority especially for our safety and comfort. Security was tight and our bus had to be inside the restricted area by 6:00 A.M. or find some other place to set up our telescopes.

Fog covered most of the hills surrounding this vast campsite when we arrived. Flags flapping from the strong winds in the area forebode gloom. Worse yet, it had rained heavily the day before and several buses were stuck up to their axles in mud.

There must have been several hundred buses in the area

where the Egyptians had raised several large tents. Inside, many tables and red fabric draped chairs were set up on large rugs which covered the ground. Restrooms were conveniently near. Along with the estimated 17,000 viewers, Egyptian President Hosni Mubarak made an appearance. Two yellow helicopters circled overhead for his personal security.

Fortunately the fog cleared by 10 A.M., the wind died down, and only pure blue skies remained. My daughter Elaine and I selected a site behind a row of tents facing the southern hills and got busy setting up my 3-Way telescope. I filled the shipping crate with rocks from nearby piles, set the crate upright, and mounted the telescope on top. This then became a solid base from which to film and record the eclipse.

My primary experiment for this eclipse was to assess the results from my new Canon "Rebel" digital camera. I mounted

Continued on page 6

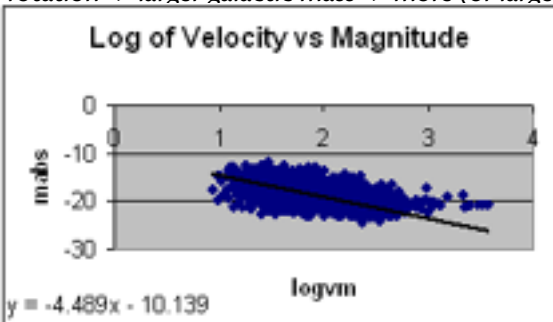


Astro Concepts

The Tully-Fisher Relation

Paul Kohlmler

Astronomers use many different techniques to determine the distance between the Earth and the stars. Many of these techniques rely on finding a "standard candle." This is the term for being able to determine the intrinsic brightness of an object. If that brightness is known and we compare it to the apparent brightness as seen on Earth, then we can determine how far away an object is. The Tully-Fisher relation is an attempt do this but this time for galaxies instead of stars. The problem is the same, determine how intrinsically bright the galaxy is and then measure how bright it appears on Earth. In this case, the intrinsic brightness is inferred from a measurement of the rotational speed of the galaxy. The logic goes something like this: faster galactic rotation -> larger galactic mass -> more (or larger) stars -> brighter galaxy.



I attempted to see how well this relationship held up by looking at a database of galactic statistics, the LEDA database. I plotted the measured rotation versus the absolute magnitude for those galaxies that have this information. The relation is apparent in the graph on the left. The line shows the general direction – down indicates brighter. The slope of the line is given by the number before the x variable and in this case is -4.49. We will see below that we can make the relation stronger, that is, we can get more steeply angled slopes. You will also notice considerable scatter in the data. The scatter is quantified by computing the standard deviation of this data. The lower the

standard deviation, the less scattering of the data and the more the data will resemble the line itself. The graph shows the data from more than 10,000 galaxies – the 1% of all galaxies in LEDA that have rotational measurements.

I looked at the galaxies by type. Spirals, ellipticals and irregular galaxies all fit the relation but not all in the same way. Spiral galaxies with well-defined arms fit the relation more strongly (-4.7) than spirals with hard to detect arms (-2.7). Ellipticals and irregulars fit the relation somewhere in the middle of this range. Galaxies that are "face-on" to us fit the relation more strongly (up to -5.63) but that's because it is easier to measure the rotation of these galaxies.

The LEDA database does not have absolute magnitudes in all parts of the spectrum. However, we found a journal article with a number (21) of galaxy magnitudes in the I (infrared), R (red), V (green) and B (blue) bands. The relation showed a clear preference toward the red band and the I band was strongest of all - increasing the strength of the relation to -7.1. A more detailed version of this article is available online.

Who Wants to be a Daredevil?

By Patrick L. Barry and Dr. Tony Phillips

When exploring space, NASA naturally wants to use all the newest and coolest technologies—artificial intelligence, solar sails, onboard supercomputers, exotic materials.

But “new” also means unproven and risky, and that could be a problem. Remember HAL in the movie “2001: A Space Odyssey”? The rebellious computer clearly needed some pre-flight testing.

Testing advanced technologies in space is the mission of the New Millennium Program (NMP), created by NASA’s Science Mission Directorate in 1995 and run by JPL. Like the daredevil test pilots of the 1950s who would fly the latest jet

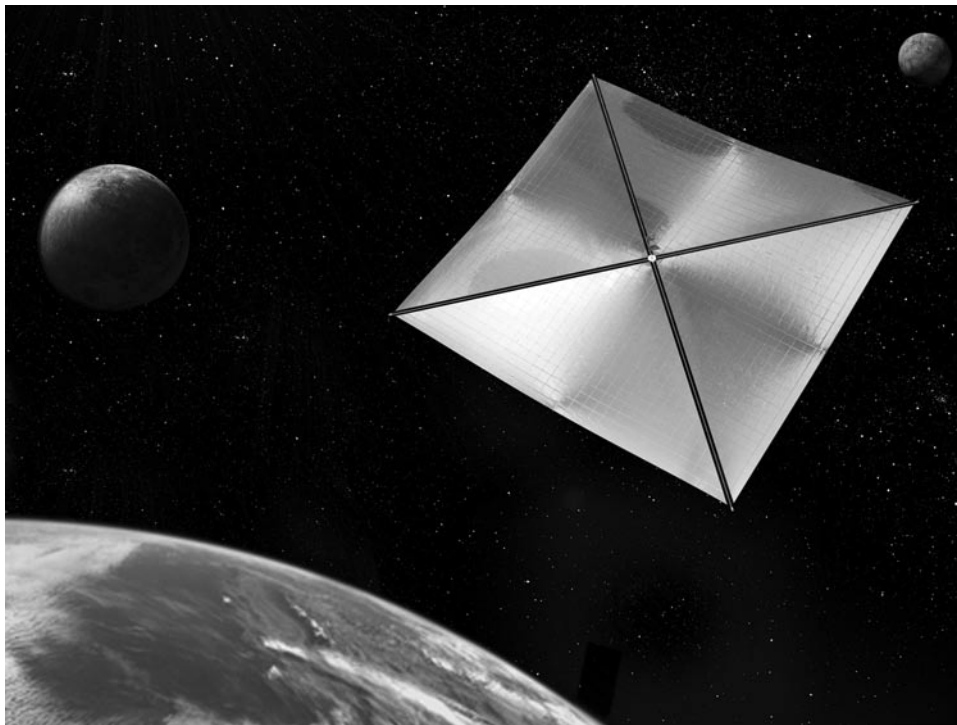
technology, NMP flies new technologies in space to see if they’re ready for prime time. That way, future missions can use the technologies with much less risk.

Example: In 1999, the program’s Deep Space 1 probe tested a system called “AutoNav,” short for Autonomous Navigation. AutoNav used artificial intelligence to steer the spacecraft without human intervention. It worked so well that elements of AutoNav were installed on a real mission, Deep

Impact, which famously blasted a crater in Comet Tempel 1 on July 4, 2005. Without AutoNav, the projectile would have completely missed the comet.

Some NMP technologies “allow us to do things that we literally could

proposed NASA missions would be possible only with dependable solar sails—L1 Diamond and Solar Polar Imager—both of which would use solar sails to fly spacecraft that would study the Sun.



Artist’s rendering of a four-quadrant solar sail propulsion system, with payload. NASA is designing and developing such concepts, a sub-scale model of which may be tested on a future NMP mission.

not do before,” says Jack Stocky, Chief Technologist for NMP. Dozens of innovative technologies tested by NMP will lead to satellites and space probes that are smaller, lighter, more capable and even cheaper than those of today.

Another example: An NMP test mission called Space Technology 9, which is still in the planning phase, may test-fly a solar sail. Solar sails use the slight pressure of sunlight itself, instead of heavy fuels, to propel a spacecraft. Two

“The technologies that we validate have future missions that need them,” Stocky says. “We try to target [missions] that are about 15 to 20 years out.”

A menagerie of other cool NMP technologies include ion thrusters, hyperspectral imagers, and miniaturized electronics for spacecraft navigation and control. NMP focuses on technologies that have been proven in the laboratory but must be tested in the extreme

cold, vacuum, and high radiation environment of space, which can’t be fully recreated in the lab.

New NMP missions fly every year and one-half to two years, taking tomorrow’s space technology for a daredevil test drive.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

it in series with new coronal streamer filters, which I had modified especially for this eclipse. The streamer filters act like darkroom dodging tools which help eliminate much of the strong inner corona and emphasize the outer streamers. Elaine operated my Canon GL-1 camcorder riding piggyback on the telescope.

When checking out the optical alignment of my telescope I realized it was badly disturbed, probably from the jostling of the morning's long bus ride. I adjusted it as best I could but it was still well out of alignment. After I had returned home I found the diagonal mirror mount had come loose—a delicate job to correct, and something which takes time to adjust—not something to be done in the field.

The moon began its first bite of the sun at 11:20:06 A.M. The excitement in our area increased, knowing that

this eclipse would occur unimpeded! Elaine recorded the temperature and humidity every 10 minutes and took 10-second videos. I had my Dry - Wet bulb thermometer mounted on the shady side of my crate, as I have for each of the 26 eclipse adventures I have attended since 1970. As the crescent shape of the sun became more and more prominent, I noticed that my digital screen was showing double images telling me my optical alignment was still bad, so I spent some time finding an area on my screen that would help correct some of this problem.

Screams from the huge crowd signaled the arrival of totality at 12:38:01 P.M. Camera shutters sounded like machine guns. People yelled out the names as they discovered the various planets and brighter stars shining in the dark skies above. The 360-degree horizon shone with a red-orangish hue as the dark moon above highlighted the eclipsed sun and its awesome corona. You had to

be there to fully appreciate this beautiful force of nature.

My initial photo exposures through the coronal streamer filters were mostly bad, so I removed them and settled for unfiltered exposures. The camcorder view screen provided a continuous and grand view of the eclipsed sun, its Bailey's Beads, rosy colored prominences, and that awesome corona. Elaine used a remote controlled zoom function to expand or decrease our view of the corona. Awed Egyptian security guards came over to watch with us and enjoy this rare sight.

Ed. Note: Ernie Piini, a frequent contributor to the Ephemeris, has an expanded version of this article including photos of the Eclipse and both commentary and photos from Egypt. See this expanded version on the Ephemeris website.

June General Meeting

Dr. Peter Jenniskens on Meteor Showers and their Parent Comets

June 10, 8 p.m. at Houge Park

Mike Koop and Peter Jenniskens

Dr. Peter Jenniskens of The SETI Institute will be our speaker for the June General Meeting. Dr. Jenniskens is well known to the Bay Area Meteor community, often leading coordinated meteor observing efforts at our local sites. He was the Principal Investigator on the Leonid Multi Aircraft Campaign missions and the recent successful Stardust SRC Entry Observing Campaign. Spectacular displays of 'shooting stars' are created when the Earth's orbit crosses a meteoroid stream, as each meteoroid causes a bright light when it enters our atmosphere at high speed. Hear how meteoroid streams originate from the decay of meteoroids, comets and asteroids, and how they cause meteor showers on Earth. The talk will include findings of recent space missions to comets and asteroids, the risk of meteor impacts on Earth, and how meteor

showers may have seeded the Earth with ingredients that made life possible. Join us in the hall at Houge Park starting at 8 PM.

Since 1994, SJAA members have been part of a great exploration of space, a quest to predict the return of meteor showers. The fabulous storms of history were long thought to be more elusive than the weather and more difficult to predict. Many professional astronomers would start their career during a Perseid shower, soon to turn attention to more profitable problems such as Black Holes and the Age of the Universe. Meteor showers were the realm of amateur astronomers. Among those sacrificing a night's sleep in the middle of the week and at awkward times in the year were members of SJAA. Our target: meteor outbursts, the unusual showers that

occur when Earth travels through one of the recent dust trails of comets. And we were successful. We observed the outbursts of the Perseid shower in 1994 and 1997, the Ursids in 2000, and the Leonids in many years. This culminated in the great expeditions that set out to observe the Leonid storms of 1998 - 2002.

Meteor astronomer Jenniskens will speak about his new book "Meteor showers and their parent comets" published by Cambridge University Press, due out in early July, which narrates these past observing campaigns and explains what we have learned from past meteor outbursts and what to expect from the showers yet to come.

This month's Solar Systems stats are available on the web version of this month's newsletter.

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Publication Statement

SJAA *Ephemeris*, newsletter of the San Jose Astronomical Association, is published monthly.

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P.O. Box 28243
San Jose, CA 95159-8243

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	Karthik Ramamurthy
7		12.5" Dobson	Tom Fredrickson
8		14" Dobson	Colm McGinley
10		Star Spectroscope	Jim Albers
11		Orion XT6 Dob	Ravi Shankar Erram
14		8" f/8.5 Dob	Colm McGinley
15		8" f/9 Dobson	Mike Koop
19		6" Newt/P Mount	Daryn Baker
23		6" Newt/P Mount	Wei Cheng
24		60mm Refractor	Al Kestler
26		11" Dobson	Vivek Kumar
27		13" Dobson	Steve Houlihan
28		13" Dobson	Anupam Dalal
29		C8, Astrophotography	Mark Ziebarth
32		6" f/7 Dobson	Sandy Mohan
33		10" Deep Space Explorer	Jack Zeiders
34		Dynamax 8" S/C	Yuan-Tung Chin
36		Celestron 8" f/6 Skyhopper	Charles Santori
38		Meade 4.5" Digital Newt	Tej Kohli
39		17" Dobson	Steve Nelson
41		18" Sky Designs Dob	Len Bradley
42		11x80 Binoculars	Ritesh Vishwakarma
43		Orion XT4.5 Dob	Gary Mitchell

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	Judy Arauz	3/17/06
35		Meade 8" Equatorial	Mike Horzewski	4/20/06
37		4" Fluorite Refractor	Peter Young	5/11/06
40		Super C8+	Bill Kerns	4/20/06
44		4.5" Skyview/ P Mount	Mantle Yu	5/03/06

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
13		Orion XT6 Dob	Rajiv Vora	04/20/06
16		Solar Scope	Ken Frank	05/13/06
21		10" Dobson	Michael Dajewski	Repair

Waiting list:

(lots of scopes available!!!)

San Jose Astronomical Association Membership Form

You can join or renew with the SJAA online at <http://www.sjaa.net/SJAAMembership.html>

New **Renewal** (Name only, plus corrections below)

Membership Type:

- Regular — \$20
- Regular with Sky & Telescope — \$53
- Junior (under 18) — \$10
- Junior with Sky & Telescope — \$43

Subscribing to Sky & Telescope magazine through the SJAA saves you \$10 off the regular rate. (S&T will not accept multi-year subscriptions through the club program. Allow 2 months lead time.)

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

**San Jose Astronomical Association
P.O. Box 28243
San Jose, CA 95159-8243**

Make your check payable to "SJAA"
(not Sky Publishing)

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