

SJAA EPHEMERIS

December General Meeting

Milky Way Yurt Exhibit and Holiday Celebration!

December 17, 2005 at 8 p.m.

Dave Smith

Our December 17 general meeting exhibitor is Dr. Irwin Sobel. If you have done digital image processing, you may be acquainted with the Sobel edge detection operator, which Irwin devised. Irwin was enthused when he first saw Axel Mellinger's Milky Way Panorama on the net. (See <http://home.arcor-online.de/axel.mellinger/>) Irwin thought that the panorama needed to be seen properly, in the round. So he contacted Axel, and received the whole unredacted data set,

with permission to make a large display. He printed it on one continuous transparency, 3 feet wide by 24 feet long, backed it with a white diffusing sheet, and built it into the wall of a yurt. (A yurt is a cylindrical tent used by Mongolian nomads.) The ceiling and skirt are fairly light tight. When you enter and close up the entrance slit with Velcro, you see the Milky Way glowing all around you. About five people at a time may enter the yurt.

Also on display will be Irwin's original prototype, a light box backlighting a 4.5 inch by three foot wide Milky Way transparency. Posters on easels describe how Axel produced the images and spliced them together. Irwin will also speak on how the yurt came to be.

Just this year, Axel Mellinger's photos have been published as a star atlas in English! The book is called the "New Atlas of the Stars" put out by Firefly press. The SJAA will be putting a group order in for the Atlas. If you are interested in purchasing a copy, please email Mike Koop (koopm@best.com) by December 5th with your order. The cost should be in the \$35 - \$40 range and will be available for pick up at the meeting.

As we are waiting our turn in the Milky Way Exhibit, we will be ringing in the holiday season with a Dessert Potluck. Bring your favorite dessert or appetizer to share. Last year we had many tasty "potluck" contributions. Contributions of food or drink are appreciated but not necessary. No alcohol, please.

We will again be running the "white elephant" gift drawing. To participate, please anonymously wrap (no name tag) an astronomical item of small value and/or large humor and bring it along. It can be a used item you no longer want, an inexpensive new item, and can be either useful or funny. We'll do the exchange as a "draw or steal" lottery, which is always great fun.

Happy Holidays to All!

SJAA Activities Calendar

Jim Van Nuland

December

- 3** Dark sky weekend. Sunset 4:50 p.m., 9% moon sets 6:49 p.m.
- 9** Houge Park star party. Sunset 4:50 p.m., 69% moon sets 2:00 a.m. Star party hours: 7:00 p.m. to 10:00 p.m.
- 10** ATM Class at Houge Park. 7:30 p.m.
- 17** **General meeting** at Houge Park. 8 p.m. Sobel's Milky Way Yurt and Holiday Party.
- 22** ATM Class at Houge Park. 7:30 p.m.
- 23** Houge Park star party. Sunset 4:55 p.m., 45% moon rises 0:38 a.m. Star party hours: 7:00 p.m. to 10:00 p.m.
- 24** Dark sky weekend. Sunset 4:56 p.m., 35% moon rises 1:39 a.m.
- 31** Dark sky weekend. Sunset 5:00 p.m., 2% moon sets 5:41 p.m.

January

- 6** Houge Park star party. Sunset 5:05 p.m., 56% moon sets 1:01 a.m. Star party hours: 7:00 to 10:00.
- 7** ATM class at Houge Park. 7:30 p.m.
- 14** **General meeting** at Houge Park.
- 19** ATM class at Houge Park. 7:30 p.m.
- 20** Houge Park star party. Sunset 5:19 p.m., 63% moon rise 11:27 p.m. Star party hours: 7:00 to 10:00
- 20** Astronomy Class at Houge Park. 7:30 p.m. Rob Hawley on Care and Feeding of Dobsonian Telescopes
- 21** Dark sky weekend. Sunset 5:20 p.m., 53% moon rises 0:27 a.m.
- 28** Dark sky weekend. Sunset 5:28 p.m., 0% moon rise 7:40 a.m.

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

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

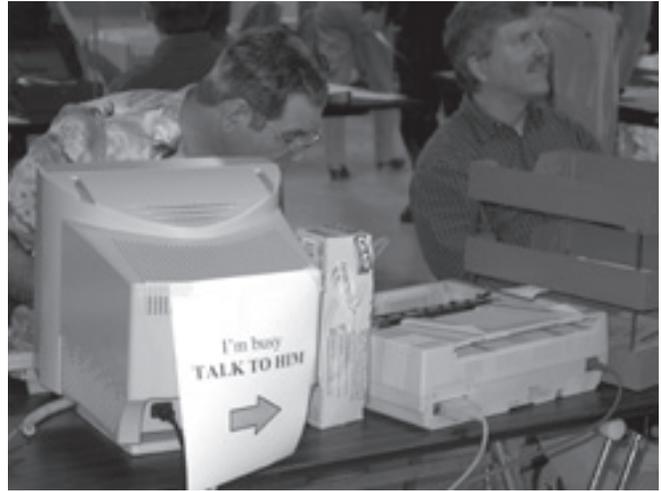
<http://www.sjaa.net>

2005 Speakers

We were fortunate to have had some excellent speakers at our 2005 general meetings. Here we show just a few that we enjoyed this past year.



Dale Cruikshank spoke to us in January about the Cassini mission. The Huygens probe had landed just days before this talk.



The auction was held in April and it was very popular again this year. In this photo we see Jim Van Nuland and Gary Mitchell bringing order to a wide-ranging and fast-moving event.



Dorothy Schaumberg discussed some of the history of the Lick Observatory when she was here in June.



Steve Gottlieb came to the March general meeting. He talked about his work on updating the NGC and IC catalogs. He even brought copies of some original catalog entries which he is showing to interested club members after his talk.



Scott Sanford discussed the Stardust mission when he was here in February. This represented a return visit for Dr. Sanford as he was also here in June of 2003. We hope to have him back again after the Stardust mission returns its precious cargo of comet stuff in January of 2006.

Share the Planets With Friends and Family

Akkana Peck

Mars continues to dominate the December night sky, high overhead as the evening begins and perfectly placed for observing. It's a great time to take a telescope and share views of the red planet with friends and family who may not have seen it before.

Show them the ringed planet, too. Saturn rises in early evening and is visible for most of the night, though it doesn't get very high in the sky until after midnight. It's always a treat when Saturn returns to the evening sky, and it's especially good when you can share

"The only thing cooler than Saturn is a kid looking at Saturn." - Ed Green

views of it with people who haven't seen it before. Remember the words of SJAA member Ed Greenberg at a Houge Park star party a few years ago: "The only thing cooler than Saturn is a kid looking at Saturn."

Mars is a month past opposition, but it's still fairly close and shows a nice big disk in a telescope, nearly 17 arc seconds at the beginning of December, though it will shrink noticeably by month's end.

It's been an excellent opposition so far -- subject to the usual fall weather considerations. Mars has had a lot of small dust storm activity, leading to some interesting and unusual patterns in some otherwise familiar areas of the planet. The great impact basin Hellas, in high summer and not collecting its usual hazes and frosts, has seemed much less pale than usual, with interesting dark streaks inside. More

surprisingly, both polar caps have been visible at times, which isn't something we can see during most Mars oppositions. Since the weather is chancy this time of year, keep a telescope handy and grab looks when you can!

On the night of December 11th, the moon makes a close pass by Mars, less than a degree away. If you're willing to take a trip to Siberia, you can see it as an occultation, but here in San Jose it's merely a pretty sight for the naked eye, binoculars or a low-powered telescope.

Venus continues its beautiful evening apparition, giving us a brilliant "evening star" in the western sky for most of the holiday season. As December progresses it expands to a large, slim crescent and sinks lower and closer to the sun.

You can still find Uranus in the early evening sky (in Aquarius) since it doesn't set until nearly midnight. Neptune, in Capricornus, is more difficult, setting around 9pm: catch it early if you want a look. Pluto is too close to the sun to be seen this month.

Mercury gives its best early morning show of the year in the middle of December, emerging as a dawn crescent during the first week of the month and

eventually reaching 21 degrees from the sun on the 12th. Jupiter, too, is visible in the morning, though it's still low when dawn breaks.

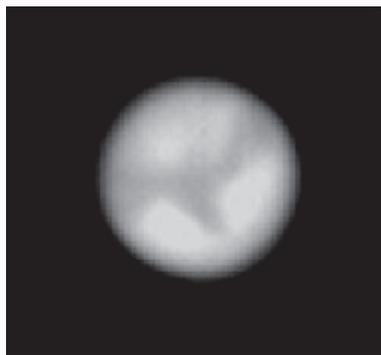
Early Christmas morning (around 5:30-6:30), the moon occults Spica as seen from most of North America, though not from San Jose. If you're visiting family and find yourself up early, it might be worth a glance. Check lunar-occultations.com for the exact times for your location, since they vary quite a bit.

RASC Handbooks and Calendars

Gary Mitchell

We had the RASC Observer's Handbook and Astronomy Calendars available at the November meeting and the swap. If you missed both, don't panic -- we still have some left. The Board decided to have this be more of a service than a fund raiser, so you probably will not find a cheaper price anywhere: \$17 for the Handbook and \$9 for the Calendar. (Retail is \$24.95 and \$13.95 respectively.) What little we do make goes to SJAA's telescope loaner program.

They'll be available again at the December meeting, and future meetings until they're gone. Pass the word. Tip: either or both would make a nice Christmas gift for your astronomically inclined friends and relatives. You don't have to tell them you got it at a big discount!



Mars as seen on November 5, 2005. Photo courtesy of Paul Kohlmeier.

Alnilam

Alnilam is the middle star in the belt of Orion. It is a bright star shining at magnitude 1.7. It appears to be as bright as the other stars in the belt but it is about 50% further away than the others. Its designation is Epsilon Orionis and it's a solid member of the B stellar spectral class. Much of its light is in the ultraviolet. It shines with the luminosity of 375,000 suns and contains 40 solar masses. Stars of this size are headed for a spectacular end - a supernova.

Alnilam is only 4 million years old but it is already running out of hydrogen and will start fusing larger atoms and then turn into a red supergiant more luminous than Betelgeuse. A star of this size sends out a large amount of material at speeds up to 2000 kilometers per second. The total amount of mass that it sends out is 20 million times what our sun does. Alnilam is a single star unlike the majority of the brightest stars in Orion

including the other belt stars.

When we look at the stars in Orion we are looking outward from the center of the galaxy, out along the (aptly named) Orion arm. Aldebaran is one of the two major stars easily found from the belt of Orion. If you follow the line formed by the belt to the right (or up if Orion is just rising) you get to Aldebaran, a bright red star sometimes called the eye of the bull (Taurus). To me it is more accurate to follow a line that runs parallel to the belt but actually starts at Bellatrix (the other shoulder of Orion besides Betelgeuse). If you follow the belt line to the left (or down), you get to the brightest star in the sky, Sirius.

Many of the stars in Orion, including Alnilam, are created from something called an OB association. The O and the B refer to the kinds of stars created in these associations, the kind that live fast and die young. This is an association

that, because of the strong stellar winds and large masses, breaks down into substructures with the stars in each structure sharing the same (relative) birthdate. The stars in the Belt of Orion are part of one such substructure. The sword in Orion is another substructure and there the Orion nebula is still producing stars. The stellar winds in the nebula can be seen evaporating the dust around newborn stars thus making planetary formation unlikely.

The other stars in the belt are called Alnitak (to the left of Alnilam) and Mintaka. All three stars incorporate the name of the whole asterism. Alnitak and Mintaka both mean something like "the belt of the Central One". Alnilam means "string of pearls". All three names are Arabic.

References for this article are in the online version.

AIC 2005

The Advanced Imaging Conference 2005 was held at the Doubletree Hotel in San Jose on November 11-13. This year's conference attracted 180 participants, a 33% increase from last year. This conference is for the very serious amateur astrophotographer.

If you are interested in the science of astronomy, this might not be for you. If you like massaging images using Photoshop, it might be the best thing you have even seen. Not a single presentation discussed astronomy to any significant degree. Note that the name of the conference doesn't even sound astronomical. Instead there were talks on:

- * detecting faint nebulas
- * understanding how seeing works
- * using the new larger format CCD cameras
- * narrow band imaging techniques

* Photoshop tricks and tips

This conference does a lot of things right. First of all, lunch and supper on Saturday are provided. Second, a CD-ROM of the presentations is sent to all attendees a few weeks after the conference.

I felt like a white-belt in a conference filled with black-belts. So what do I do? Well, for starters, I don't pick any fights. Although, I wanted to hear someone talk about the new Richey-Chretien telescopes from Meade. As I reported from last year's AIC, the RC scope is close to standard equipment among this crowd. But Meade wasn't a sponsor and they were rarely mentioned.

I talked to one vendor about what I thought was a high price for his narrow-band filters. He patiently

explained to me that for CCD imaging you need filters that block out the infrared and cheaper filters don't do that. OK, but still doesn't fit my budget.

Because of the highly technical and specific nature of the conference, most of the talks would not appeal to a general astronomy audience. But Lisa Frattore from the Hubble team gave a very accessible talk. She had several interesting facts to share - some of which you can read in Editor's Semi-Dark Matter on page 6.

There is no direct connection between this conference and the SJAA but the conference organizers noted the SJAA swap in their pre-conference e-mails and also made an announcement for it during the last day. We put a notice about the conference on our web page.

Voices from the Cacophony

Trudy E. Bell and Dr. Tony Phillips

Around 2015, NASA and the European Space Agency plan to launch one of the biggest and most exacting space experiments ever flown: LISA, the Laser Interferometer Space Antenna.

LISA will consist of three spacecraft flying in a triangular formation behind Earth. Each spacecraft will beam a laser at the other two, continuously measuring their mutual separation. The spacecraft will be a mind-boggling 5 million kilometers apart (12 times the Earth-Moon distance) yet they will monitor their mutual separation to one *billionth* of a centimeter, smaller than an atom's diameter.

LISA's mission is to detect gravitational waves—ripples in space-time caused by the Universe's most violent events: galaxies colliding with other galaxies,

supermassive black holes gobbling each other, and even echoes still ricocheting from the Big Bang that created the Universe. By studying the shape, frequency, and timing of gravitational waves, astronomers believe they can learn what's happening deep inside these acts of celestial violence.

The problem is, no one has ever directly detected gravitational waves: they're still a theoretical prediction. So no one truly knows what they "sound" like.

Furthermore, theorists expect the Universe to be booming with thousands of sources of gravitational waves. Unlike a regular telescope that can point to one part of the sky at a time, LISA receives gravitational waves from many directions at once. It's a cacophony. Astronomers must figure

how to distinguish one signal from another. An outburst is detected! Was it caused by two neutron stars colliding *over here* or a pair of supermassive black holes tearing each other apart in colliding galaxies *over there*?

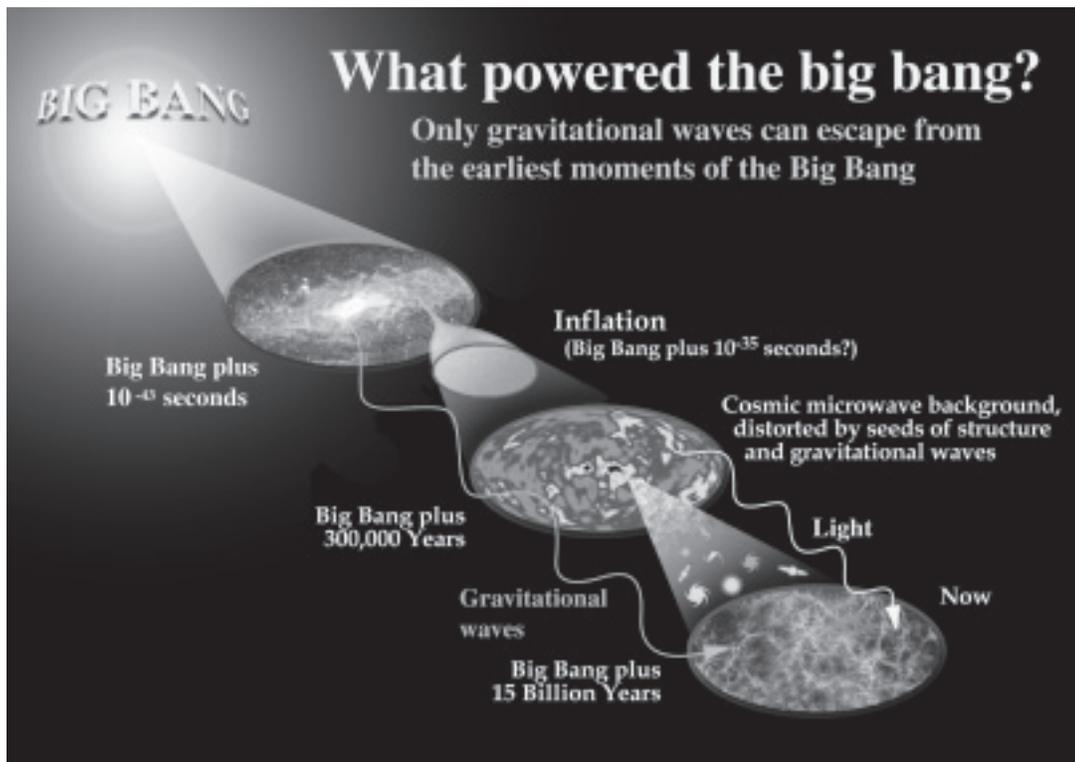
"It's a profound data-analysis problem that ground-based astronomers don't encounter," says E. Sterl Phinney, professor of theoretical physics at the California Institute of Technology in Pasadena.

Profound, but not hopeless: "We have lots of good ideas and plans that work—in theory," he says. "The goal now is to prove that they actually work under real conditions, and to make sure we haven't forgotten something."

To that end, theorists and instrument-designers have been spending time together brainstorming, testing ideas, scrutinizing plans, figuring out how they'll pluck individual voices from the cacophony. And they're making progress on computer codes to do the job.

Says Bonny Schumaker, a member of the LISA team at the Jet Propulsion Laboratory: "It's a challenge more than a problem, and in fact, when overcome, a gift of information from the universe."

For more info about LISA, see lisa.nasa.gov.



Editor's Dark Matter

* Dark Matter may not matter. An article is currently being peer-reviewed by the Astrophysical Journal that states that there may not be anything such as dark matter. The authors claim that other explanations can account for the large amount of gravity needed to keep a galaxy together. The theory is that relativity in a galaxy explains a kind of gravity that increases with mass in a manner greater than linear. However, they don't have an explanation for clusters of galaxies. Reported in space.com – see http://www.space.com/scienceastronomy/051010_dark_matter.html.

* In recent weeks a new Kuiper Belt Object has been found that is at least as large as Pluto. Also, two new moons have been found around Pluto. Question: if we keep finding new moons for Pluto can we still call it a planet?

* At the AIC2005 conference (pg. 4) Lisa Frattore gave us these facts:

- a) The Hubble is available for observing for 45 minutes out of each 97 minute orbit.
- b) Autoguiding on the Hubble can make corrections at the rate of 40 times per second.
- c) Hubble has taken 700,000 exposures.
- d) The total amount of data from Hubble is 23 terabytes, 15 gigabytes per day.
- e) 3900 astronomers have done research using the Hubble.
- f) The signal path for Hubble is (at least sometimes): Hubble, TDRSS - communications satellite, antenna at White Sands in New Mexico, back up to another geosynchronous satellite, back down to an antenna in Maryland and then by land line to the STSci.

Solar System Stats for December 2005

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

		Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Sun
RA	1	15 ^h 35 ^m	19 ^h 38 ^m	2 ^h 24 ^m	14 ^h 22 ^m	8 ^h 55 ^m	22 ^h 36 ^m	21 ^h 10 ^m	16 ^h 28 ^m
	11	15 ^h 46 ^m	20 ^h 02 ^m	2 ^h 22 ^m	14 ^h 30 ^m	8 ^h 54 ^m	22 ^h 36 ^m	21 ^h 11 ^m	17 ^h 12 ^m
	21	16 ^h 33 ^m	20 ^h 14 ^m	2 ^h 24 ^m	14 ^h 37 ^m	8 ^h 52 ^m	22 ^h 37 ^m	21 ^h 12 ^m	17 ^h 56 ^m
Dec.	1	-16°51'	-24°32'	15°07'	-13°02'	17°57'	-9°43'	-16°27'	-21°46'
	11	-17°23'	-22°25'	15°16'	-13°39'	18°03'	-9°38'	-16°24'	-22°59'
	21	-20°41'	-20°08'	15°45'	-14°13'	18°11'	-9°32'	-16°19'	-23°26'
Dist (AU)	1	0.75	0.46	0.55	6.26	8.60	20.08	30.44	0.986
	11	0.98	0.40	0.61	6.17	8.46	20.25	30.59	0.985
	21	1.18	0.34	0.69	6.05	8.34	20.42	30.73	0.984
Mag	1	1.4	-4.5	-1.6	-1.7	0.2	5.8	7.9	
	11	-0.5	-4.5	-1.3	-1.7	0.1	5.9	7.9	
	21	-0.4	-4.5	-1.0	-1.8	0.0	5.9	8.0	
Size	1	9.0"	35.9"	16.9"	31.4"	19.2"	3.5"	2.2"	32'26"
	11	6.9"	42.1"	15.2"	31.9"	19.5"	3.5"	2.2"	32'29"
	21	5.7"	49.5"	13.6"	32.5"	19.8"	3.4"	2.2"	32'31"

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Publication Statement

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Submit

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

SJAA loaner scope status

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

Available scopes

These are scopes that are available for immediate loan, stored at other SJAA members homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a scope pick up at any of the listed SJAA events.

# Scope	Description	Stored by
1	4.5" Newt/ P Mount	Annette Reyes
3	4" Quantum S/C	Hsin I. Huang
6	8" Celestron S/C	Karthik Ramamurthy
7	12.5" Dobson	Tom Fredrickson
8	14" Dobson	Colm McGinley
10	Star Spectroscope	Jim Albers
12	Orion XT8 Dob	Kevin Roberts
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
35	Meade 8" Equatorial	Ethan Romander
36	Celestron 8" f/6 Skyhopper	Mike Koop
37	4" Fluorite Refractor	Carl Ching
38	Meade 4.5" Digital Newt	Tej Kohli
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
13	Orion XT6 Dob	Rajiv Vora	01/20/06
16	Solar Scope	Ken Frank	02/13/06
40	Super C8+	Sander Pool	12/23/05
41	18" Sky Designs Dob	Martin J. Smallen	12/14/05

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
11	Orion XT6 Dob	Ravi Shankar Erram	12/10/05
21	10" Dobson	Michael Dajewski	Repair
39	17" Dobson	Steve Nelson	01/02/06

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
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Make your check payable to "SJAA"
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