



SJAA EPHEMERIS

SJAA Activities Calendar

Jim Van Nuland

(late July)

- 21 Coyote Lake Park star party. Sunset 8:23 p.m., 49% moon sets 12:04 a.m. Star party starts at 9:30.
- 28 **General meeting at Houge Park.** 8 p.m. Bryant Grigsby, staff astronomer at Lick Observatory, will tell of Developing Adaptive Optics for Lick Observatory.

August

- 2 Mirror-making workshop at Houge Park. 7:30 p.m. (Final session for 2007)
- 3 Astronomy Class at Houge Park. Rob Hawley will discuss types of telescopes with examples. 7:30 p.m.
- 3 Houge Park star party. Sunset 8:13 p.m., 69% moon rise 10:52 p.m. Star party hours: 9:00 to midnight.
- 11 Dark sky weekend. Sunset 8:05 p.m., 1% moon rises 5:57 a.m.
- 17 Houge Park star party. Sunset 7:57 p.m., 25% moon sets 10:07 p.m. Star party hours: 9:00 to midnight.
- 18 Coyote Lake Park star party. Sunset 5:55 p.m., 33% moon sets 10:32 p.m. Star party starts at 9:00.
- 25 **General meeting at Houge Park.** 8 p.m. Dr. Graeme Smith, UC Professor of Astronomy will tell us of his research on globular Clusters.
- 28 Houge Park lunar eclipse party. Roughly 2-5 a.m.

September

- 7 Astronomy Class at Houge Park. 7:30 p.m.
- 7 Houge Park star party. Sunset 7:28 p.m., 9% moon rise 3:45 a.m. Star party hours: 8:30 to 11:30 p.m.
- 8 Coyote Lake Park star party. Sunset 7:26 p.m., 4% moon rise 4:51 p.m. Star party starts at 8:30.
- 15 Dark sky weekend. Sunset 7:16 p.m., 19% moon sets 9:02 p.m.
- 21 Houge Park star party. Sunset 7:07 p.m., 75% moon sets 2:01 a.m. Star party hours: 8:00 to 11 p.m.
- 22 **General meeting at Houge Park.** 8 p.m. Slide and Equipment night.

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

Upcoming Speakers

David Smith

July 28 General Meeting speaker

Bryant Grigsby presents New Technologies for Lick Observatory

The nature of what and how we observe is rapidly changing, and UCO Lick Observatory is embracing and contributing to these changes. Bryant Grigsby will present two technologies that he has been developing for the Nickel Telescope: remote observing, and MEMS-based visible light adaptive optics (VILLAGES). A support astronomer at UCO Lick since 2005, Bryant has previously been a specialist in microfluidics for biotech, fuel injectors, and other applications; and has taught computer science at Brown College.

August 25 General Meeting

Dr. Graeme Smith presents Globular Clusters

The main area of Dr. Smith's research has been the properties of the oldest populations of stars within our Galaxy, with regard to both their physical evolution and what they can tell us about the chemical enrichment history of the Milky Way. Much of his work has been directed towards the study of abundance differences among stars within globular clusters. These clusters are amongst the oldest stellar systems within the Galaxy, having formed at a time when the process of galactic chemical enrichment was just commencing. Striking differences in the abundances of the elements carbon, nitrogen, oxygen, sodium, magnesium, and aluminum typically exist among stars within the same globular cluster. Understanding the origin of these differences can potentially provide information about the early environment in the halo of our Galaxy, within which the globular clusters formed, as well as about processes, such as mixing, occurring within the interiors of their stars.

Dr. Smith also conducts research into chromospheric activity among evolved red giants, the spectroscopy of comets in our Solar System, and the chemical composition of red giants in Galactic open clusters. He holds B.S. and Ph.D. degrees from the Australian National University.

24 hour news and information hotline:

(408) 559-1221

DEEP SKY OBSERVING

by Mark Wagner

August 2007 third quarter to new moon observing list The list begins in the north and moves southward. Objects are within roughly a two hour section of right ascension that is at a comfortable elevation to the east at astronomical dark. This list is just a sampling of the full list which is at <http://www.resource-intl.com/Deep.Sky.Aug.07.html>.

Object	Const.	Type	Size	Mag	R.A.	Dec.
N7023	Cep.	BN	14.0'		21 01 36	68 10 00
With an Ultrablock filter, this appeared as a star with a glowing circle around it.						
NGC 7142	Cep.	OC	4.3'	9.3	21 45 12	66 46 23
A faint grouping of 50+ stars approx 15'x15'						
N7129	Cep.	OC/BN	8.0'	11.5	21 42 00	66 05 00
A faint grouping of 50+ stars approx 15'x15'						
N7139	Cep.	PN	77.0"	13.3	21 46 08	63 47 31
A small cluster of stars with a diffuse glow around 3 of them						
NGC 6939	Cep.	OC	7.0'	7.8	20 31 31	60 39 14
Nice target and in same wide field view as NGC 6946						
NGC 6946	Cep.	GX	11.6'x9.8'	9.6	20 34 52	60 09 15
Nice large galaxy same low power field of view as NGC 6939						
NGC 7008	Cyg	PN	86"	13.3	21 00 33	54 32 32
Excellent showpiece, with a surface brightness of 11.8						
NGC 7086	Cyg	OC	9.0'	8.4	21 30 30	51 35 00
Stands out well against the Milky Way.						
M39	Cyg	OC	31.0'	4.6	21 32 12	48 27 00
70x is a great magnification for this bright but sparse large open cluster. About 20 bright stars comprise the group.						
N7067	Cyg	OC	3.0'	9.7	21 24 12	48 01 00
Tiny open cluster only a few degrees from M39.						
N6991	Cyg	OC	25.0'		20 54 54	47 25 00
Just a hazy area with many dim stars						
N7082	Cyg	OC	24.0'	7.2	21 29 24	47 05 00
Fairly bright, large, 15' diameter, scattered, no distinct borders, in very rich field.						
NGC 7062	Cyg	OC	6.0'	8.3	21 23 28	46 23 03
About 30 stars mag 10 and fainter in a 5' diameter at 220x.						
N6997	Cyg	OC	8.0'	10	20 56 30	44 39 00
About 50 stars in a 10' diameter. Located in the eastern U.S. portion of the North American Nebula.						
NGC 7000	Cyg	BN	120.0'		20 58 00	44 20 00
100x and OIII filter appears very bright, extremely large						
NGC 6866	Cyg	OC	10.0'	7.6	20 03 55	44 09 36
About 100 stars in a 20'x10' region are visible at 100x. Appears rich and very appealing.						
NGC 7044	Cyg	OC	5.0'	12	21 13 09	42 29 44
Large, sparse cluster with no central concentration.						

Note: Source catalogs are Messier, Arp, Abell Planetary, Abell Galaxy Cluster (AGC), Hickson Compact Galaxy (HCG), Herschel 400-I, Herschel 400-II. Herschel 400-I are identified as NGCXXXX, Herschel 400-II as NXXXX.

Lunar Eclipse in the Wee Hours

Akkana Peck

There will be a total lunar eclipse in the wee hours of August 27-28. That's a Monday night, so it may be tough staying up until 2:52am when totality begins. The early parts of the eclipse are more civilized: the moon enters the Earth's penumbra (outer shadow) at 12:53am, but that may be subtle and difficult to see. The real eclipse, the umbral portion, begins an hour later at 1:51.

Early risers who can't stay up that late can catch it from the other end. This eclipse brings the moon unusually deep into the Earth's shadow, which also means that totality lasts longer than usual for a lunar eclipse: about 90 minutes, until 4:22 am. The partial umbral eclipse continues for another hour beyond that.

Meanwhile, every night in August Jupiter rules the early evening skies, perched above the head of the Scorpion. It's not very high, and never will be this year, but don't let that stop you from looking at its bands, ovals, moons, and moon shadows. If you can get to high mountaintop sites with steady air, that's ideal, but even looking through city smog there should be plenty to see.

The Southern Equatorial Band, or SEB, has mysteriously faded this year, to the point where it sometimes isn't easy to find at all. This is unusual for Jupiter: usually even in the smallest telescope you can be confident of seeing at

least the two equatorial bands. It's not invisible, and as the planet rotates you'll see that parts of it are much easier to see, but novice Jupiter watchers shouldn't be discouraged this year if they don't immediately notice the SEB. On the bright side, this might make it easier to spot the great red spot (GRS), which may look much redder and show more contrast against a pale background.

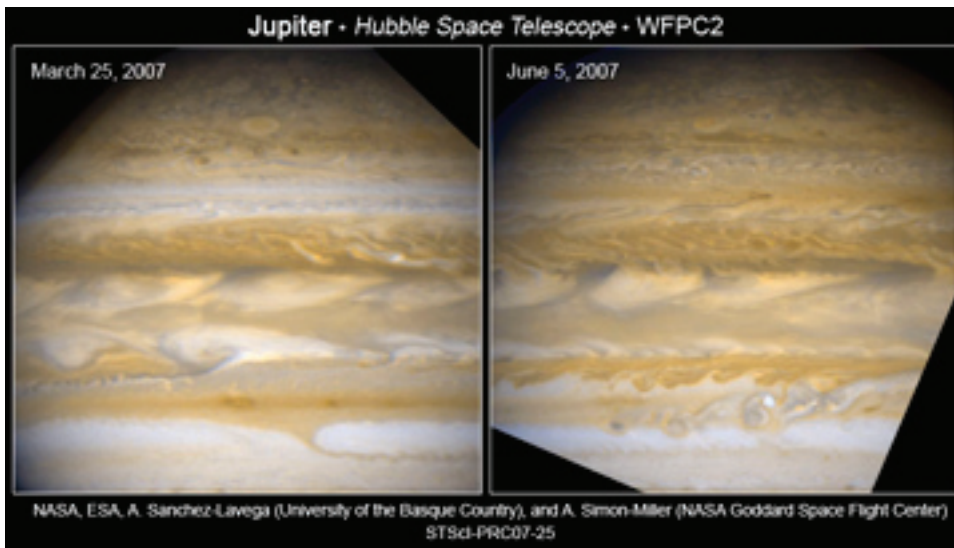
In contrast, the NEB (its counterpart in the north) is quite dark and should be no problem to spot with any telescope.

Meanwhile, the equatorial zone is darker

Mars rises around midnight. It's still far away and quite small, 7 arcseconds (only about twice the as big as Uranus) so it will still be quite difficult to see much detail on it.

Neptune, in Capricornus, reaches opposition on August 13. Uranus trails a bit behind it in Aquarius (it won't get to opposition until next month). Pluto, too is well placed for observation. It transits shortly after nightfall, though it never gets high up (about 36 degrees) so it's not quite as easy as it would be some years.

Saturn and Venus have promenaded together down into the sun's glare, and won't be visible until the end of August when they begin to peek out into the dawn sky. Mercury also stays close to the sun this month: you can catch it low in the morning sky at the beginning of August, and very low in the evening sky at the final days of the month, but you're best off waiting until September and October, when it should present a nice early evening view.



than usual; normally this is an area where it's difficult to see any detail, but you might see more than usual there this year. In particular, look for large white ovals right on the equator.

More advanced observers have plenty of targets to keep them busy. Remember Red Spot Junior, the white oval designated BA which last year suddenly turned red? It's still there and still red. It has its own web site, so you can find out when it will be visible: redspotjr.com. It's pretty close to the GRS, but farther from the equator.



Chew on This

Diane K. Fisher

The Mars robotic rovers, Spirit and Opportunity, are equipped with RATs, or Rock Abrasion Tools. Their purpose is to abrade the surface patina off the Mars rocks so that the alpha x-ray spectrometer can analyze the minerals inside the rocks, rather than just on the surface.

But future robotic missions to Mars will be asked to go even further below the surface. Scrapers and corers will gather rock samples of substantial size, that, in order to be analyzed by a spectrometer, will need to be crushed into a fine powder.

Crushing rocks on Mars? Now there's a problem that brings to mind a multitude of possible approaches: Whack them with a large hammer? Squeeze them until they explode? How about just chewing them up? It was with this latter metaphor that the planetary instrument engineers struck pay dirt—so to speak.

Thanks to NASA's Planetary Instrument Definition and Development Program, a small group of NASA engineers came up with the Mars Rock Crusher. Only six inches tall, it can chew the hardest rocks into a powder.

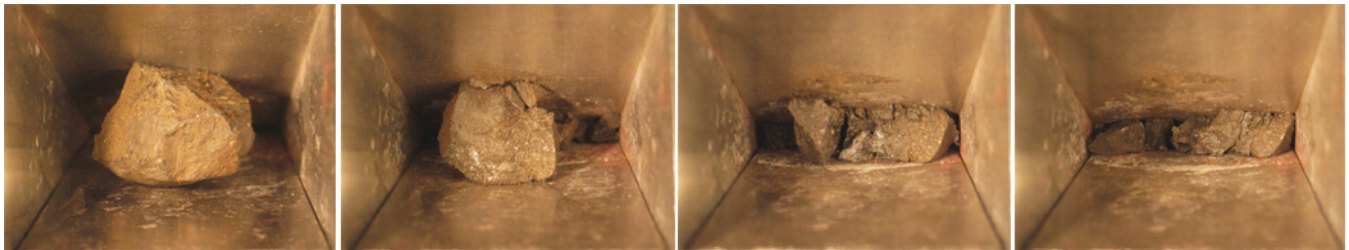
The Mars Rock Crusher has two metal plates that work sort of like our jaws. One plate stays still, while the other plate moves. Rocks are dropped into the jaw between the two plates. As one plate moves in and out (like a lower jaw), rocks are crushed between the two plates. The jaw opening is larger toward the top and smaller towards the bottom. So when larger rocks are crushed near the top, the pieces fall down into the narrower part of the jaw, where they are crushed again. This process repeats until the rock particles are small enough to fall through a slit where the two plates are closest.

Engineers have tested the Mars Rock Crusher with Earth rocks similar to those

expected to be found on Mars. One kind of rock is hematite. The rusted iron in hematite and other rocks help give Mars its nickname "The Red Planet." Another kind of rock is magnetite, so-called because it is magnetic. Rocks made by volcanoes are called basalts. Some of the volcanoes on Mars may have produced basalts with a lot of a mineral called olivine. We call those olivine basalts, and the Rock Crusher chews them up nicely too.

Visit www.jpl.nasa.gov/technology to read the latest about other NASA technologies for exploring other planets and improving life on this one.

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



Looking down on the jaws of the Mars Rock Crusher, we see a magnetite rock get crushed into smaller and smaller particles.



Photos from past General Meetings. In December, someone gave soon-to-be club president Rob Hawley the bird as part of the white elephant gift exchange. In February, Doug Brown from the Fremont Peak Observatory Association talked about the history of the exploration of Mars. In April, Karrie Gilbert discussed halo objects around the galaxy Andromeda and the implications for determining the accurate size of that galaxy.

CalStar's New Approach

Rob Hawley

SJAA will hold the Fall CalStar Star Party this year on the nights of October 11 - 13 at Lake San Antonio.

This year SJAA is teamed with GSSP. GSSP put on the Lassen party this year and have been responsible for Shingletown in the past. Together we came up with a new approach how to layout and sign the CalStar site.

The new layout recognizes there is a need to support those that do not wish to camp or arrive too late. The new Late Arrival/ Early Departure area uses a part of the park we have not previously used. It is different entrance that is easy to find at night, easy to drive into and out of after darkness, has good horizons, and is only a short walk from the food and other observers. It is a much better site than we previously used for Early Departers. Finally, it will reduce the impact of arrivals and departures on the more controlled areas.

The two resident areas are the Dark Enforced Area (where all white light is banned) and a Casual Area (for people that want a more relaxed experience). They will be signed this year to make them easier to find. Signage and volunteers will also make it clear when these areas close to all traffic. Every vehicle in these areas must remain off from 8 PM to morning twilight. These are the same rules we have had for 7 years. Attendees using the DEA or CA must register every vehicle in these areas by car TAG ID.

Since 90+% of the people attending CalStar camp in the dark or casual areas the only change they should notice is their night vision being preserved for the entire evening. Time is precious in a star party like this. One mistake (or inconsiderate action) can prevent someone from finding that elusive glob for 30 minutes or more.

Registration begins Sept 1. To register, for more information, or to get a tour of the new layout visit our website at www.sjaa.net/calstar.

The Last 30 Days In Astronomy

The news seen between June 11 and July 11, 2007.

JUN-16-2007 ***Suni Williams sets the record*** Sunita Williams broke the record for the longest single flight duration for a woman. http://www.nasa.gov/mission_pages/station/expeditions/expedition15/s_williams_record.html

JUN-22-2007 ***Atlantis completes mission*** Atlantis completed its STS-117 mission. It landed at Edwards AFB in California after weather scrubbed landing attempts at Cape Canaveral. The shuttle would not return to Florida until July 3. http://www.nasa.gov/mission_pages/shuttle/behindscenes/sts117_overview.html

JUL-01-2007 ***More arms for the Milky Way*** A recent study looking at open clusters has uncovered some interesting statistics regarding the Milky Way's spiral arms. In particular, some of the spiral arms appear to actually be 2 or more arms. The differences are apparent when looking at the speed of the stars as they move in orbit the galactic nucleus. <http://adsabs.harvard.edu/abs/2007NewA...12..410N>

JUL-03-2007 ***Plan B for Spacecrafts*** A pair of NASA missions that you might have thought were completed are now moving into new assignments. The Deep Impact spacecraft will fly by the short-period comet Boethin on December 5, 2008. Along the way it will also look at extrasolar planets in the mid-infrared range. The Deep Impact mission encountered comet Tempel 1 on July 4, 2005 and the Stardust spacecraft will fly by it again on Feb. 14, 2011. Stardust's first mission was completed when samples from the Comet Wild were recovered from a canister that returned to earth in January of 2006. http://www.nasa.gov/home/hqnews/2007/jul/HQ_07147_Discovery_missions.html

JUL-07-2007 ***Dawn will rise late*** The oft-delayed Dawn mission to explore the asteroids Ceres and Vesta has now been postponed until September. A number of problems caused small delays and eventually NASA decided the Dawn mission was endangering the Phoenix mission to Mars. Phoenix only has a 3 week window or else it has to wait for two years. Dawn will be able to perform all of its scientific goals even with the delayed launch. But August will be a busy time at Cape Canaveral. Phoenix is scheduled to launch on August 3, the STS-118 mission onboard the Endeavor shuttle is scheduled on August 7, and a military satellite has an August 11 launch date. http://www.space.com/missionlaunches/070708_dawn_update.html

A Master's Degree in Astronomy

Paul Kohlmler

Perhaps you have seen the advertisements in Sky and Telescope. The offer is for an academic program leading to a Masters of Science degree in Astronomy. The advertiser is Swinburne University of Technology. In 2005, I started taking courses from Swinburne and I'm on schedule for getting my Masters degree in 2009. Here is how it works.

Swinburne University is in Australia in the greater Melbourne area. The Masters program is part of Swinburne Astronomy Online (SAO). SAO has been around since 1998. All of the course work is done remotely. And it is a lot of work. Each of the normal classes lasts 14 weeks and consists of these parts.

E-mail - really a newsgroup. Every two weeks of the course you have to ask at least one question and answer one question in the newsgroup. Obviously, your grade will be better if you do more than the minimum. In addition, during the class you pick 3 of your answers to be graded in detail. This e-mail portion of the class is probably the most like a real classroom because of the give-and-take among your classmates and the teacher. To keep up with this e-mail requires reading 50-150 e-mails per week.

Text - most classes have a textbook which is highly recommended. It might be possible to pass the class without the textbook but I doubt that I could. For each two week segment of the class there are readings. Many of the questions in the newsgroup will be generated from the text but answers are supposed to involve more research.

Essay - early in the class, you have to submit a 2000 word essay on a topic chosen from a list of 5 subjects relevant to the particular class. This essay is expected to be somewhat like a professional astronomical article. References are required and you lose points if they are all Wikipedia pages.

One very nice thing about being a student at Swinburne is that you have access to the full articles of many journals including Science, Nature and the Astrophysical Journal.

Tests - since the students and the teacher are remote, all tests are open book. Twice during the class a test will be open for one week. A typical test will consist of 10 questions and each answer must be less than a specified word count – say 20-60 words in most cases. The questions might be from the PowerPoint slides or the text. or it might require some research.

PowerPoint presentations - the replacement for course lectures is a set of PowerPoint slides. In each two week segment of the course, you will view 5-6 presentations averaging 40-50 slides each. Some presentations include short animations, optional background information and several Internet links.

Project - 30% of your final grade is the last assessable item in the class. The project is a 10-12 page paper that is similar to the essay in terms of tone and references. The project can be one chosen from a list or you can pick your own project if it gets approved. You actually choose this project just a couple of weeks into the class so that you have about 3 months to work on it – at least in theory. You are assigned an advisor for the project and they are supposed to help you complete the project and they will grade it when you are done.

What does it cost? Each class currently costs 1100 Australian dollars. The U.S. dollar's recent slide has raised the actual cost to about \$950. Add the cost of the textbook and it's about \$1000 per class. You will receive the PowerPoint presentations on a CD-ROM once your fee is paid. The Masters program requires 12 classes. I have completed 8 classes but I will probably take only one class per semester from now on. Most of the people reading this article will find the early classes fairly easy but they will

get harder.

How much math? Some college level math is assumed. You don't have to do a lot of calculus but you should at least know what differentiation means. Some classes involve almost nothing but math in the tests but that's just about the only place will you have to use it.

What are the other requirements?

To start the Masters program, you will have to show that you completed your bachelor's degree. Hopefully your transcript includes some Math (see above).

What classes are available? The first three classes you take will probably be a sequence that discusses the Solar System, Stars and the Milky Way, and Galaxies and the Cosmos. These classes are the prerequisites for many of the other courses. Other early classes are on Relativity and Astronomical Tools. Certainly relativity is a mind-(and space-) bending subject so it's kind of nice to pretty much have one whole unit on that. The unit on tools was a lot more difficult then it sounds and it one of the first units that had a lot of math. The History of Astronomy course was great. Stellar Astrophysics was a ton of math. Next up for me is Radio Astronomy and SETI. Other units are on astrophotography, space exploration (easier if you lived during Project Mercury), astrobiology and particle physics. A few other units are "major projects" which means the class is mostly the project itself. Currently there are 17 possible units.

So how does it work? This seems to be as effective a method of learning as traditional classes. I wish the class included a few lectures. Most of the learning is in writing the essay and project. You can decide on your own way to tackle the course.

Drawbacks? All of that e-mail checking, text reading, and PowerPoint

Continued on page 7

Officers and Board of Directors

Pres Rob Hawley (408) 997-6526
VP Rich Neuschaefer
Sec Craig Scull (408) 292-9317
Tres Gary Mitchell (408) 265-2336
Dir David Smith (408) 978-5503
Dir Lee Hoglan
Dir Gordon Reade
Dir Steven Nelson (650) 968-4733

Ephemeris Staff

Editors Paul & Mary Kohlmitter
(408) 848-9701

Circulation

Gordon Reade

Printing Accuprint (408) 287-7200

School Star Party Chairman

Jim Van Nuland (408) 371-1307

Telescope Loaner Program

(temporarily suspended)

Web Page

Paul Kohlmitter pkohlmit@best.com

SJAA Email Addresses

Board of Directors board@sjaa.net
Membership ?'s membership@sjaa.net
Chat List chat@sjaa.net
Ephemeris ephemeris@sjaa.net
Circulation circulation@sjaa.net
Telescope Loaners loaner@sjaa.net
Members Email Lists:
<http://www.sjaa.net/mailman/listinfo>

From The Editors

Please note that the submission deadline for the September 2007 issue will be August 8th instead of the 10th.

Publication Statement

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

San Jose Astronomical Association,
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.**

From the President of the club

Changes to the Telescope Loaner Program

Mike Koop, who has run the loaner program for over 10 years, has resigned. The loaner program has been one of the club's great assets. We will miss Mike.

The board has decided not to immediately appoint a replacement. Instead, the board wants to take this time to understand the program and its inventory. From that we will determine where to make future investments.

We have already embarked on this improvement program. One of the leading telescope designers, Albert Highe, agreed to rebuild one of the large Coulter scopes into a modern, lightweight design. The club greatly appreciates his donation.

If you currently have a scope on loan I should have already contacted you. If you have loaned scopes or equipment and I have not contacted you then please let me know. Please continue to keep (and hopefully use) the scope for now. The program depends on club members providing distributed storage for the scopes in the program. At the moment we have no ability to receive returned scopes.

For the moment we are also unable to make new scope loans. We will let the members of the club know when we are ready to resume making loans and/or when we will be prepared to accept returns.

If you have any questions (or are willing to provide storage or assistance running the program) please contact loaner@sjaa.net.

Rob Hawley
President, SJAA

Master's Degree

Continued from page 6

presentation viewing is a lot to complete in each two week segment. You have to work on the tests, essay and project at the same time. If you take more than one course at a time then you have to multiply accordingly. There is a lot of variation among the instructors and project advisors. Some are very helpful while others actually worry about helping too much. Although each of the assessable items contributes a specific amount to the final grade, Swinburne recently added an additional requirement that every major item has to have a certain minimum value. As a result, your project advisor (not your instructor) can flunk you out of the course.

Is it worth it? What you really want to know is, does a Masters degree from Swinburne have the same weight as a masters degree from a normal, accredited, American University? I don't know. I have no illusions that I'm going to start a new career as a college professor in my late 50's. There aren't a lot of programs like this. There is another university in Australia offering a Masters degree but the course options are more limited (<http://www.jcu.edu.au/school/mathphys/astronomy/paged.shtml>). The only American program that I found offers a Masters degree through remote learning but it is oriented toward space policy rather than astronomy (<http://www.space.edu/distance.asp>). It appears that one program at the University of Western Sydney has become defunct (a cautionary tale, perhaps?) or it may have moved to James Cook University.

For more information about Swinburne see <http://astronomy.swin.edu.au/sao/>

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

Nonprofit Organization
U.S. Postage Paid
San Jose, California
Permit No. 5381

San Jose Astronomical Association Membership Form

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

New **Renewal** (Name only if no corrections)

I'll get the Ephemeris newsletter online

<http://ephemeris.sjaa.net> Questions?

Send e-mail to membership@sjaa.net

Membership Type:

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

Bring this form to any SJAA Meeting
or send to the club address (above).

Please make checks payable to "SJAA".

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.)

You can join or renew online:

<http://www.sjaa.net/SJAAmembership.html>

Name: _____

Address: _____

City/ST/Zip: _____

Phone: _____

E-mail address: _____