



EPHEMERIS

May 2012

SJAA Activities Calendar

Jim Van Nuland

- May**
- 5 General Meeting. Board meeting (*) at 6:00; Social Time at 7:30; General Meeting at 8:00. Our speaker is Marita Beard, a San Jose high-school teacher, who is a participant in NASA/SOFIA "Partners in Science Education" program.
 - 6 SJAA Auction XXXII - starting at noon at Houge Park.
 - 6 Solar Program: Sun-spotting at Houge Park. Sun party hours: 2:00 until 4:00 p.m.
 - 11 Astronomy Class at Houge Park. 8:15 p.m. The topic: Star Parties — where are they, how to prepare for and enjoy them.
 - 11 Houge Park star party. Sunset 8:07 p.m, 58% moon rises 1:27 a.m. Star party hours: 9:15 until midnight.
 - 12 Solar Program: Sun-spotting at the South Bay Birdfest, 10:30 am. See Edwards S.F. Bay National Wildlife Refuge.
 - 12 Dark-Sky weekend. Sunset 8:07 p.m, 47% moon rises 1:59 a.m.
 - 19 Dark-Sky weekend. Sunset 8:13 p.m, No moon. Henry Coe Park's "Astronomy" lot has been reserved.
 - 20 Partial Eclipse of the Sun, visible in San Jose. The moon can be seen covering part of the sun. Do NOT try this yourself; you will risk your eyesight! See "Ring of Fire" on page 2.
 - 25 Houge Park star party. Sunset 8:18 p.m, 23% moon sets 11:59 p.m. Star party hours: 9:30 until midnight. Includes "Introduction to Observational Astronomy" class for SJAA members.
- June**
- 2 General Meeting. Board meeting (*) at 6:00; Social Time at 7:30; General Meeting at 8:00. Our speaker is Dr. Peter Nugent, speaking on supernova 2011fe.
 - 3 Solar Program: H-alpha observing at Houge Park. Also, Telescope tune-up time (see page 5). Sun party hours: 2:00 until 4:00 p.m.
 - 5 Transit of Venus — the planet can be seen crossing the face of the sun. Do NOT try this yourself; you will risk your eyesight! Sun&Venus Party at Houge Park, 2:30 p.m. to 6:00 p.m.
- July**
- 1 Solar Program: H-alpha observing at Houge Park. Also, Telescope tune-up time. Sun party hours: 2:00 until 4:00 p.m.

(*) *The Board of Directors meets before each general meeting at 6:00 p.m. All are welcome to attend. A social time is observed from 7:30 to 8:00. Our speaker will start at 8:00.*

24 hour news and information hotline:
 (408) 559-1221
<http://www.sjaa.net>

Ring of Fire

Akkana Peck

Saturn is just past opposition and perfectly placed for viewing in May. It never gets all that high — 45 degrees at transit — but we'll still get a good look at the ring system, tilted about 13 degrees to us. Don't forget to watch for storm activity in Saturn's cloud belts.

Mercury is visible early in the month, but disappears in front of the sun by mid-month.

Venus, too, is visible as May begins, but later disappears in the sun's glare. But that's okay — because early next month, on June 5, is the last Venus transit until 2117. Some of you may have seen the last transit, in 2004, though it wasn't visible from San Jose since it happened in the middle of the night. This year we will get to see the transit — at sunset — so get ready for it!

I'll have more information about the Venus transit in next month's column, but for now, be sure you line up a solar filter if you don't already have one. You don't need a big telescope — even a 60mm should be plenty to see the transit — and you don't need a fancy H-alpha filter. Any safe white-light filter will do. But I expect there may be a run on solar filters as we get close to this once (or twice) in a lifetime event, so don't wait too long!

Mars has shrunk to under 10 arcseconds and zeroth magnitude as it recedes from us. It'll be tough to see much detail, but I hope you got a chance to look at it when it was closer.

As an example of the sort of detail you can see (at least photographically) in even a distant Mars opposition, consider this news item from last month. An amateur

astronomer, Wayne Jaeschke, imaging from Pennsylvania with a 14" SCT, captured what appeared to be clouds on Mars' limb, towering well up above the terminator. This sort of thing has been seen before on Mars, but usually with much bigger scopes and not so near opposition. There was much speculation on what might cause such a cloud — perhaps a dust storm, or maybe dust kicked up by a meteor impact? Or clouds lit up by a localized aurora?

Professionals jumped in to analyze the formation before it disappeared, and spectroscopy suggested it was probably a water cloud condensing near Mars' morning terminator. NASA's Mars Reconnaissance Orbiter showed no unusual dust activity in that region.

So probably just unusual morning clouds — but it's pretty cool that something like that could be discovered by an amateur.

“But here's the big news for the month: On May 20th, we'll be treated — well, almost — to an annular solar eclipse.”

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But here's the big news for the month: On May 20th, we'll be treated — well,

almost — to an annular solar eclipse.

Annular means that the moon is a bit farther away than usual, so it won't completely cover the sun even if you travel to the eclipse centerline. Since the sun will never be totally covered, make sure you have a safe solar filter for this one — don't look with your naked eyes! Think of it as a good excuse to try out that new filter you ordered for next month's Venus transit.

I mentioned that we'll "almost" see it. Here in San Jose, we're just a bit south of the southern limit of the annular path, which passes just south of the town of Redway, through Covelo, just south of Willows, then just misses Yuba City and Auburn. If you want to be closer to the centerline, go camping at Lassen National Park or Lake Shasta, or head

to Reno or Tahoe.

Here at home, we still get a darn good dinner show. The partial eclipse starts at 5:17 pm PDT, with maximum eclipse at 6:33. It's 18 degrees above the horizon at that point, and the sun will be 89% eclipsed. Compare that with 97% for



The 2012 annular eclipse will look a little like this from San Jose. Although almost 90% of the sun will be covered, the remaining portion of the sun is not filtered out and staring at the sun will cause eye damage. Use glasses that are intended for solar viewing. This image was taken during the 2005 annular eclipse. It was captured in Portugal by Paula Santos and rotated 180 degrees by the editor. The picture was taken with a Nikon D70 and a 400 mm lens (compares to 600 mm with 35 mm film). Exposure was 1/250th of a second. License for this image is via the Creative Commons Attribution License and found on Wikimedia Commons.

Jupiter is in conjunction with the sun this month. Uranus, Neptune and Pluto are all morning sky objects this

Golden State Star Party

GSSP is July 18-22. For more info:
<http://www.goldenstatestarparty.org>

a site right on the centerline — remember, since this is an annular eclipse, no place sees 100% coverage. The partial eclipse ends at 7:40 — still well before sunset, which isn't until 8:11.

It's been a long time since we had a solar eclipse anywhere near this good visible from home.

Photographers, if you want a shot of an annular eclipse as the sun sets, head east, to Albuquerque, NM or Lubbock, TX. Though it might be tough to balance an exposure that will show the annular ring while still showing the surrounding landscape. The centerline also crosses near a lot of great vacation spots like Bryce, Zion and Canyon de Chelly.

For calculating places and times, NASA has a great interactive page here you can click on a map and get times and coverage for any location: <http://eclipse.gsfc.nasa.gov/SEgoogle/SEgoogle2001/SE2012May20Agoogle.html>

I just went to put the event on my calendar, and discovered it already had an entry for May 20. It's the start of Bear Awareness Week.

So if you head up to Lassen or Shasta to watch the eclipse, be sure to be aware of the bears! (Also, maybe I should get a calendar that's a little more in tune with the sky.)



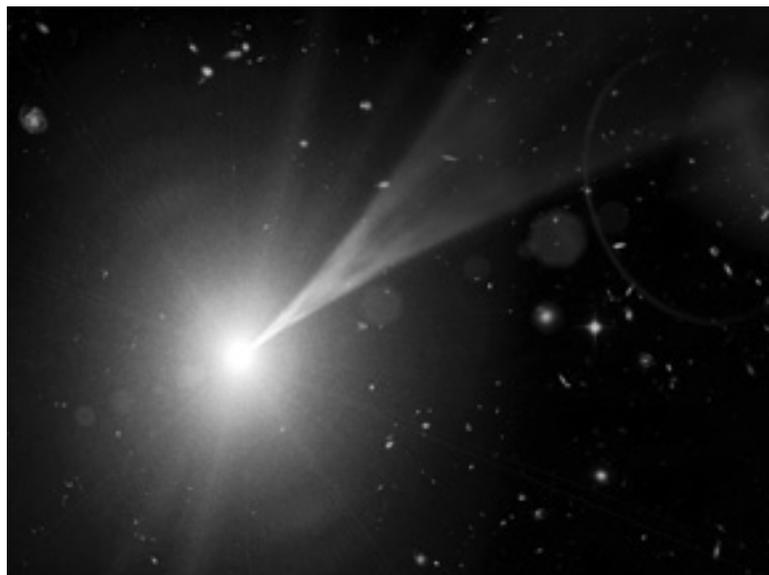
Magnetars

Paul Kohlmler

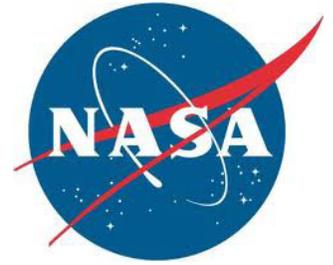
It has happened before in astronomy and it appears that it has happened again. Two distinct phenomena will originally suggest completely distinct origins but they both later are found to be the same thing, just seen in a different way. In this case we are talking about magnetars, rapidly spinning neutron stars with strong magnetic fields. They appear to be bright in X-rays and dark in radiowaves. Thus they were thought to be quite different from radio bright pulsars, neutron stars with high rotation rates but weak magnetic fields. But more recently a few magnetars have been seen to have pulses of radiowave emissions. The radio energy emitted is similar between the two types of stars. The different types of radio energy might be related to the rotational speed and the amount of x-ray luminosity.

So when has this kind of thing happened before? One great example is with quasars, and blazars. These are all very different manifestations of active galactic nuclei. If the energetic jets emitted by these AGN is coming right at us, we call it a blazar. If the torus of material around the AGN block visible light but lets us "see" the radio waves, we call it a quasar - a quasi-stellar radio source. Other AGNs are Seyfert galaxies, distant galaxies that emit low-energy gamma rays, lower than quasars. Blazars are actually less luminous than quasars because we see the jet of energy coming from the AGN and not the AGN itself.

New information indicates that blazars may be much more numerous than previously thought. NASA's Wide-field Infrared Survey Explorer has found 200 blazars and more discoveries are likely. "Blazars are extremely rare because it's not too often that a supermassive black hole's jet happens to point toward Earth" said Francesco Massaro of the Kavli Institute for Particle Astrophysics and Cosmology near Palo Alto. "We came up with a crazy idea to use WISE's infrared observations, which are typically associated with lower-energy phenomena, to spot high-energy blazars, and it worked better than we hoped." This research should yield insights into the evolution of super massive black holes. NASA's Fermi mission has identified hundreds of gamma ray sources and many are suspected blazars. WISE data so far indicates that just over half of the gamma ray sources are indeed blazars. "WISE's infrared vision is actually helping us understand what's happening in the gamma-ray sky" according to Raffaele D'Abrusco, a co-author of the papers describing the blazar detections.



This image is an artist's conception of a blazar. These are typically found at the core of galaxies. They emit light throughout the EMR spectrum but very heavy in gamma-rays. The energy from the gamma-rays accelerates particles to near light speed and these accelerated particles emit infrared radiation. Image credit: NASA/JPL-Caltech



NASA Helps Europe Study a Comet— Up Close and Personal

Dr. Tony Phillips

Europe's Rosetta spacecraft is on its way to intercept comet 67P/Churyumov-Gerasimenko. Comets have been intercepted before, but this mission is different. Rosetta aims to make history by landing a probe on the comet's surface while the mother ship orbits overhead.

"Rosetta is the European equivalent of a NASA flagship mission," explains Claudia Alexander, project scientist for the U.S. Rosetta Project at NASA's Jet Propulsion Laboratory. "It will conduct the most comprehensive study of a comet ever performed."

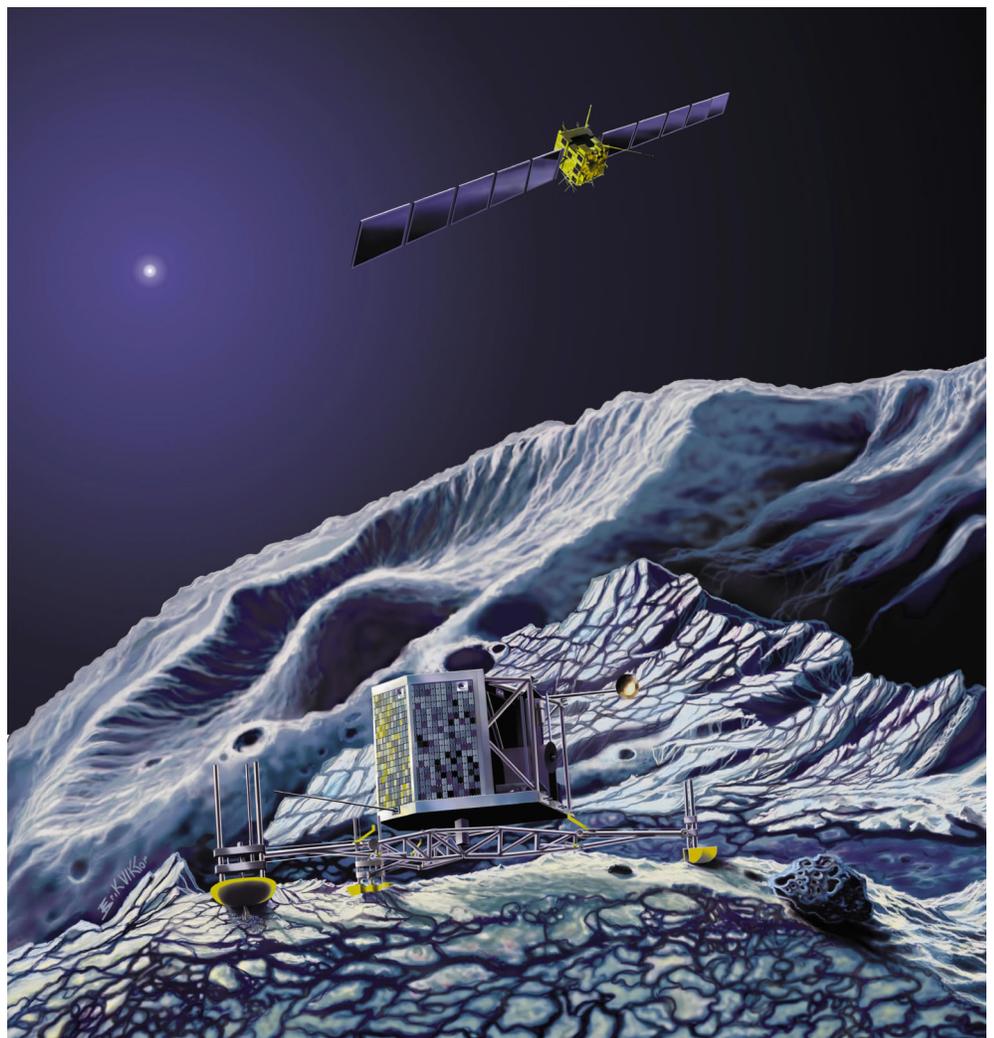
Rosetta's payload contains 21 instruments (11 on the orbiter, 10 on the lander) designed to study almost every aspect of the comet's chemistry, structure, and dynamics. Three of the sensors were contributed by the U.S.: Alice (an ultraviolet spectrometer), IES (an ion and electron sensor), and MIRO (a microwave sounder).

The main event of the mission will likely be the landing. The 100-kg lander, which looks a bit like a cross between NASA's old Viking Mars landers and a modern microsatellite, will spend two weeks fastened to the comet's icy surface. The European-built probe will collect samples for analysis by onboard microscopes and take stunning panoramic images from ground level.

"First the lander will study the surface from close range to establish a baseline before the comet becomes active,"

explains Alexander. "Then the orbiter will investigate the flow of gas and dust around the comet's active, venting nucleus."

Rosetta's sensors will perform the experiments that reveal how the chemicals present interact with one another and with the solar wind. Alice and MIRO detect uncharged atoms and



Rosetta's lander Philae will eject from the spacecraft, touch down on the comet's nucleus, and immediately fire a harpoon into the surface to anchor itself so it won't drift off in the weak gravity.

molecules, while IES detects the ions and electrons as the solar wind buffets the nucleus.

One problem that often vexes astronomers when they try to study comets is visibility. It's hard to see through the dusty veil of gas billowing away from the heated nucleus. The microwaves MIRO detects can penetrate the dust, so MIRO can see and measure its target molecules even when other instruments can't.

MIRO is one of several experiments focused on the comet's structural properties. It will determine the comet's dielectric constant, emissivity, and thermal conductivity to determine whether it is made of a powdery loose material, has a detectable layer of loose material, or is hard as rock.

"We want to find out whether comets have retained material from when the solar system formed," says Alexander. "If the ancient materials are still there, we can get an idea of what conditions were like at the dawn of the solar system."

Rosetta enters orbit in 2014. Stay tuned for updates!

Check out "Comet Quest," the new, free iPhone/iPad game that has you operating the Rosetta spacecraft yourself. Get the link at <http://spaceplace.nasa.gov/comet-quest>.

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

SJAA Yosemite Public Star Party 2012

Jim Van Nuland

The annual SJAA Yosemite star party will be held on August 10 and 11, at Glacier Point in Yosemite National Park. Up to 30 people will be given free admission and camping, in exchange for two public events on Friday and Saturday evenings. In what time is left, we can be tourists.

We are expected to have at least one scope per two people, and to attend both star parties, not just Friday or Saturday. For these reasons, this is probably not suitable for a family camping trip.

The camping is rough by modern standards: no dining room, no showers, no hot water. Read about it on the SJAA Yosemite page <<http://www.sjaa.net/yosemite.shtml>> and the FAQ page at <<http://www.sjaa.net/yosefaq.shtml>>. Then contact me with remaining questions. That first page also has sun and moon rise and set times.

If you can tolerate the limitations, tell me the number of people you'll have, and the number of scopes that will be set up for the public. E-mail me at jvn@sjpc.org, or phone 408-371-1307 11 a.m. to 11 p.m. Priority is given to SJAA members.

Telescope Tune-ups

Do you have telescope problems, boo boo? Is your right ascension dropping to the left? Can't stop the declination from rising? Did your last attempt at collimation feel like a visit to the optometrist? Or are you sure your telescope is fine but your personal software needs a serious upgrade? Is that what's got you down, bunky? Well, help is here (here = Houge Park). Take your scope to one of the SJAA's new Fixit sessions. The Telescope tune-up sessions are generally on the same day as the solar observing sessions except the day of the SJAA Auction. So the next Telescope Tune-up time is 2 - 4 p.m. on June 3. If you are looking for a later session, find the schedule at <http://www.sjaa.net/year2012.shtml>.

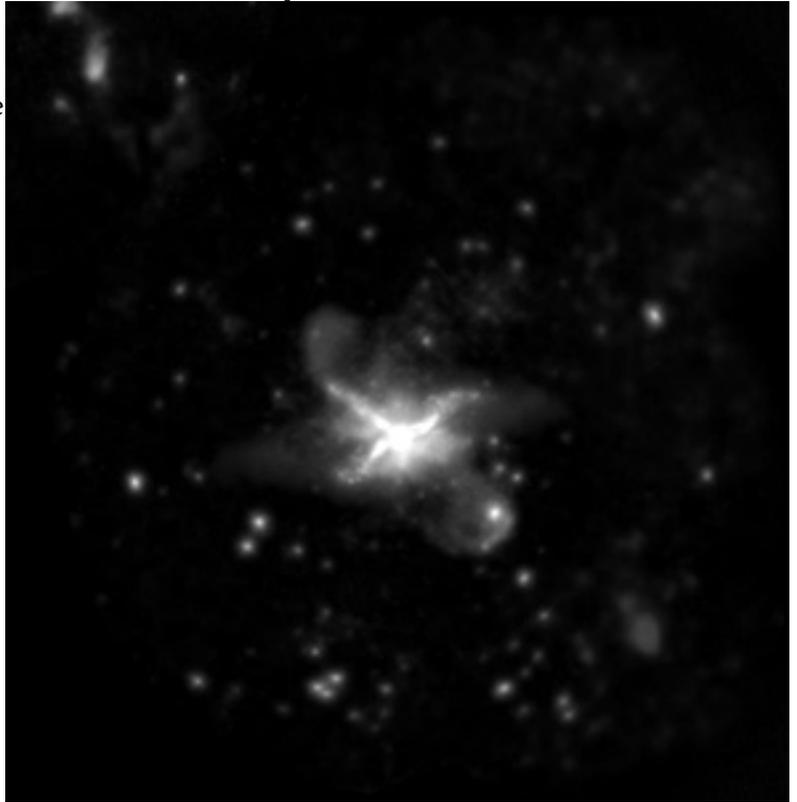
Directions to Houge Park

Houge (rhymes with "Yogi") Park is in San Jose, near Campbell and Los Gatos. From Hwy. 17, take the Camden Avenue exit. Go east 0.4 miles, and turn right at the light, onto Bascom Avenue. At the next light, turn left onto Woodard Road. At the first stop sign, turn right onto Twilight Drive. Go three blocks, cross Sunrise Drive, then turn left into the park.

From Hwy. 85, take the Bascom Avenue exit. Go north, and turn right at the first traffic light, onto White Oaks Road. At the first stop sign, turn left onto Twilight Drive. You will now be passing the park. Turn right at the first driveway, into the parking lot.

The Last Month In Astronomy

APR-4-2012 **Centaurus A** The closest giant elliptical galaxy is Centaurus A, a mere 12 million light-years from Earth. It has a massive black hole at its core and emits blasts of radio waves. A new image combining infrared and x-ray data adds credence to the idea that this galaxy is the result of the collision of two older galaxies. The infrared image came from the ESA's Herschel Space Observatory and the X-ray observations are from the ESA's XMM-Newton space telescope. The data also show intense star creation activity near the center of the galaxy and two jets coming from the core. The jets suggest a black hole with the mass of 10 million suns. Credits for the image are: Far-infrared: ESA/Herschel/PACS/SPIRE/C.D. Wilson, MacMaster University, Canada; X-ray: ESA/XMM-Newton/EPIC. <http://www.jpl.nasa.gov/news/news.cfm?release=2012-096>



APR-1-2012 **No foolin' - Asteroids!** A number of asteroids have been buzzing overhead. Two small asteroids came close on March 26. Asteroid 2012 EG5 passed by on April 1. It came within 143,000 miles. The moon is twice as far away. Asteroid 2012 FA57 was just discovered March 28 and it got about as close as the moon on April 4. These asteroids range in size from a car to a Boeing 727. These asteroids passes are not the result of a new assault on our planet. Scientists are just getting better at detecting them. http://www.msnbc.msn.com/id/46914188/ns/technology_and_science-space/

MAR-31-2012 **Mystery Mars Cloud** A cloud on Mars was noticed by amateur astronomers. This was unusual because the cloud appeared to be very large and very high considering the thin Martian atmosphere. Instruments onboard the Mars Reconnaissance Orbiter could not find the cloud suggesting that it was very transient and very thin. The amateur images showed the cloud near the edge of Mars so the view is edge-on. The MRO is looking straight down on the cloud and not seeing it. Most likely it is a high-altitude cloud of water vapor that often appears in the Martian morning and quickly dissipates. <http://cosmiclog.msnbc.msn.com/news/2012/03/30/10945735-mars-mystery-cloud-explained>

MAR-30-2012 **New naked eye comet** It is possible that a comet discovered last year will be visible to the naked eye in 2013. It is far from certain that comet C/2011 L4(PANSTARRS) will be that bright but astronomers are hopeful. PANSTARRS stands for Panoramic Survey Telescope and Rapid Response System. It is a 1.8 meter telescope in Hawaii that is a prototype for the military. Perihelion for the comet will occur around spring equinox next year, give or take a month. When discovered the comet was about 19 magnitude and now it is at 14.5. It may get as high as magnitude 0, the brightness of Vega. <http://www.space.com/15108-comet-panstarrs-skywatching-countdown-2013.html>

MAR-20-2012 **RSCC Satellite Deorbits** The Russian Satellite Communications Company is deorbiting a satellite called Expres-AM4. Several salvage plans were considered since the partial failure of the Proton rocket. The satellite went into an eccentric orbit from 600 to 12,000 miles. This took it through the Van Allen belts and the radiation damaged components in the satellite. <http://www.space.com/14935-falling-russian-satellite-controlled-reentry.html>

MAR-14-2012 **A WISE catalog** NASA has released the full catalog of images from the WISE infrared space observatory. Launched December 14, 2009 the spacecraft took 2.7 million images taken in 4 different sections of the infrared spectrum. From these an atlas of 18,000 images has been created. The catalog lists infrared properties of 560 million individual objects. Many of these objects, mostly stars and galaxies, have never been seen before. It also looks at asteroids and helps NASA determine that 90% of the largest near-Earth asteroids have already been found. Roc Cutri, leader of WISE data processing says "It will be exciting and rewarding to see the innovative ways the science and educational communities will use WISE in their studies now that they have the data at their fingertips." For information on how to access the archive go to <http://wise2.ipac.caltech.edu/docs/release/allsky/>. The press release with other useful links can be found at <http://www.jpl.nasa.gov/news/news.cfm?release=2012-072>

It Must Be Astronomical ...

Board Elections

At the March General meeting the board selected officers. The result is that all officers are keeping their current positions.

Note: New Date for Auction

The annual SJAA auction has been rescheduled to May 6, 2012. The auction starts at noon and goes into the late afternoon. The auction takes place at Hogue Park.

“Man must rise above the Earth—to the top of the atmosphere and beyond—for only thus will he fully understand the world in which he lives.”
— Socrates

Loaners

The telescope loaner program is currently suspended while the inventory is being evaluated and repaired as necessary.

School Star Parties

Completed Events					
	Total Sched.	Good Sky	Partial Success	Cloudy Fail	Cancel at noon
Jul	0				
Aug	1	1			
Sep	1	1			
Oct	6	3			3
Nov	13	9		1	3
Dec	4	4			
Jan	4	0	1		3
Feb	10	6		1	3
Mar	9	1	2		6
Total	48	25	3	2	18
Scheduled					
Apr	6				
May	1				
Jun	1				
Jul/Aug	2				
Total	10				

As of March 31, 2012

School Star Party Link

For information on school star parties including how to schedule one see <http://www.sjaa.net/school.shtml>.

Officers and Board of Directors

- Pres** Mark Wagner
- VP** Greg Claytor
- Sec** Rob Jaworski
- Tres** Robert Armstrong
- Dir** Lee Hoglan
- Dir** Rich Neuschaefer
- Dir** Rod Norden
- Dir** Kevin Roberts
- Dir** Michael Packer

Ephemeris Staff

- Editors** Paul & Mary Kohlmler
- Circulation** Mina Reyes-Wagner
- Printing** Accuprint (408) 287-7200

School Star Party Chairman

Jim Van Nuland (408) 371-1307

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 Ephemeris ephemeris@sjaa.net

Other e-mail contacts are available at <http://www.sjaa.net/contacts.html>

Members Email Lists:
<http://www.sjaa.net/majordomo.html>

<http://sanjoseastronomy.blogspot.com/>
 twitter: [sj_astronomy](#)
<http://www.meetup.com/A-A-N-C/>

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 San Jose, CA 95159-8243

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Articles for publication should be submitted by the 10th of the previous month. The PDF version is generally available by the 24th of the previous month and the HTML version by the last day of the previous month.

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

ADDRESS SERVICE REQUESTED

San Jose Astronomical Association Membership Form

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

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

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 \$5 off the regular rate. (S&T will not accept multi-year subscriptions through the club program. Allow 2 months lead time.)

I prefer to get the Ephemeris newsletter in print form (Add \$10 to the dues listed on the left). The newsletter is always available online at <http://ephemeris.sjaa.net>
Questions?

Send e-mail to membership@sjaa.net

Bring this form to any SJAA Meeting or send to the club address (above). Please make checks payable to "SJAA".

You can join or renew online:

<http://www.sjaa.net/membership.shtml>

Name: _____

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