

# EPHEMERIS

April 2012

## SJAA Activities Calendar

Jim Van Nuland

### April

- 1 Solar Program: H-alpha observing at Houge Park. Sun party hours: 2:00 until 4:00 p.m.
- 7 Board meeting at 6:00.
- 13 Astronomy Class at Houge Park. 8:30 p.m. The topic: Spring Constellations / Highlight Objects. (outdoors)
- 13 Houge Park star party. Sunset 7:42 p.m, 42% moon rises 2:52 a.m. Star party hours: 8:45 until 11:45 p.m.
- 14 Dark-Sky weekend. Sunset 7:42 p.m, 30% moon rises 3:26 a.m.
- 21 Dark-Sky weekend. Sunset 7:49 p.m, No moon. Henry Coe Park's "Astronomy" lot has been reserved.
- 27 Houge Park star party. Sunset 7:54 p.m, 38% moon sets 1:22 a.m. Star party hours: 9:00 until midnight. Includes "Introduction to Observational Astronomy" class for SJAA members.
- 6 Solar Program: Sun-spotting at Houge Park. Sun party hours: 2:00 until 4:00 p.m.
- 6 SJAA Auction XXXII - starting at noon at Houge Park.
- 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 7:42 p.m, 30% moon rises 3:26 a.m.
- 19 Dark-Sky weekend. Sunset 7:49 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!.

### May

- 5 General Meeting. Board meeting (\*) at 6:00; 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.
- 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.

## Upcoming Events

There are many astronomical events coming up this year.

Annular Solar Eclipse - There is an eclipse on Sunday May 20. Don't be confused by those who say May 21. They are going by Universal Time. In San Jose the moon will cover 83% of the sun. For an animation of what you will see from San Jose, go to [http://astro.ukho.gov.uk/eclipse/0132012/San\\_Jose\\_CA\\_United\\_States\\_2012May20\\_anim.gif](http://astro.ukho.gov.uk/eclipse/0132012/San_Jose_CA_United_States_2012May20_anim.gif)

Venus Transit - You may recall that a transit of Venus occurred 8 years ago but it was not visible from San Jose. This transit is visible from here and it won't be visible anywhere on the planet again for 112 years. It will occur on June 5. Don't be confused by those who say it happens on June 6. That's also using Universal Time. Do not look at the sun during either of these events without proper eye protection.

SETIcon II - Two years ago, the SETI Institute held their first conference dedicated to all things SETI. This year, SETIcon II will be held the weekend of June 22-24. For more information see their website at <http://seticon.com/>.

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

## Slim and bright

Akkana Peck

Venus continues its spectacular evening show, growing ever brighter toward its peak brightness of  $-4.7$  around the end of the month. By then it has waned to a crescent. That's a bit non-obvious: when the moon is a crescent, it's a lot fainter than a full moon. So why is Venus brightest in its crescent phase?

It has to do with their orbits. The moon is always about the same distance away, about 385,000 km or 239,000 miles (I've owned cars with more miles than that!), though it varies a little, from 362,600 km at perigee to 405,400 km at apogee.

When we look at the full moon, not only are we seeing the whole Earth-facing surface illuminated, but the central part of that light is reflecting straight up off the moon's surface. When we look at a crescent moon, we're seeing light that's near the moon's sunrise or sunset point — dimmer and more spread out than the concentrated light of noon — and in addition we're seeing less of it.

Venus, in contrast, varies its distance from us immensely. We can't see Venus when it's "full", because it's on the other side of the sun from us and lost in the sun's glow. It'll be more than a year before it's full next, in April of 2013. But if we could see it when it's full, Venus would be a distant 1.7 AU from us — about 170 million miles — and its disk is a tiny 9.9 arcseconds — about the size of Mars this month.

In contrast, when we look at the crescent Venus around the end of this month, although we're only seeing about 28% of its surface illuminated, and that only with glancing twilight rays, it's

much closer to us — less than half an AU, or about 45 million miles. So its disk extends a huge 37 arcseconds, bigger than Jupiter this month.

Of course, eventually, as Venus pulls between us and the sun, its crescent gets so slim that even expanding size can't compensate. So peak brightness happens when those two curves cross, when the disk is somewhere around 27% illuminated, as happens at the

end of this month and the beginning of May. (Exactly when? Good question. The RASC handbook lists "greatest illuminated extent" on April 30, but PyEphem and XEphem say Venus is actually brighter from May 3-8 ... and when it emerges from the sun's glare and moves into the morning sky in June,

it'll be slightly brighter still, peaking at magnitude  $-4.8$  in the first week of July.)

Mars is also visible in April evening skies, but it's past its opposition and already shrinking. As I write this, in March, I haven't heard many reports of good Mars observations — the weather hasn't been cooperative in giving us those steady skies we need to see detail during such a distant opposition. But keep trying — you never know when you're going to get lucky with the weather.

During the first week of the month, at around 9pm, you'll be looking at Mare Acidalium, Sinus Sabaeus and Sinus Meridiani. By the middle of the month, Syrtis Major dominates the center part of the disk, with Hellas looking like a polar cap in the south, and more subtle features like Nilosyrtris and Utopia ringing the north pole. A week later, you'll be looking at Cimmerium and Tyrrhenum in the south, Mare Boreum ringing the north pole, and

very subtle features like Cerberus and Trivium challenging you to pick them out of the washed-out center of the disk. Then it gets even more subtle for the last weekend of the month, with Sirenum rotating in far to the southwest, Boreum on the northeast, and very few discernible features at all in the center of the disk.

If you keep watch on Mars regularly during the month, pay attention to its phase over the course of the month: it'll go from nearly full to noticeably gibbous.

Saturn is high in the sky and hits opposition on April 15, with rings tilted at 13 degrees to us. On the other end of the sky, Jupiter disappears into the sun's evening glow during April.

Mercury is in the dawn sky. Early rising Mercury watchers might be particularly interested in it around April 22, when it acts as a nice pointer to Uranus, two degrees above and to the left of Mercury.

Uranus probably wouldn't be bright enough to see in the twilight, but with Mercury to point the way, it might be an unusual morning sight.

Neptune, too, is in the morning sky, but it doesn't have anything nearby to point the way, so you're better off waiting a few months.

Pluto rises around midnight, so if you want to catch it you'll have to stay up late — or get up very early.

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**The moon is dimmer when it is a crescent but Venus gets brighter in a similar phase. Why is that? Read Akkana's explanation here.**

### Golden State Star Party

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

## Mentoring Pays

Harsh Kaushikkar

This is my first post to this list and of course my first OR. First of all thanks to Dave Ittner and the mentoring program at SJAA. I am a complete newcomer to this hobby, case in point that in December of 2011 I did not know that any thing such as the Orion Nebula existed. Ranch Canada del Oro OSP is a great (dark) site for South Bay residents and thanks to Christopher Kelly for organizing the star party at this location. I was observing with an Orion 10" Dob that is part of the loaner program at SJAA. It's a wonderful instrument easy to setup and point to objects in the sky. It shows enough detail that makes the observer spend enough time on a single DSO (Deep Sky Object) to actually study it. Before the star party I had decided to spend the evening locating and observing some DSOs in the Canis Major and adjacent constellations. I used a combination of the Tirion and Skiff's Bright Star Atlas and the basic

Sky Safari App on my iPad. The goal was to try simple star hops so I figured why not pick the brightest star in the sky first? 1. M41: I started with Open cluster M41 which is a straight hop towards the horizon from Sirius. It's an attractive open cluster with a few visible red stars. 2. M50: Star hopped from Sirius to Cma which is 5° N-E, then continued same direction 1 finder field to get M50 in the view. 3. NGC 2360: I saw this cluster on the map on Sky Safari and hence decided to find it. From Sirius went towards North (left) to a star named Muliphiem and then a bit more left and down towards the horizon one finder field to get NGC 2360. Again another pleasing open cluster. I am beginning to be a fan of star clusters! 4. M47 and M46: Open Cluster M47 was visible to the naked eye and is very close to NGC 2360, it was just another hop to the left. If M47 is on the cross hairs in the finder then M46 is visible in the finder

scope as a very dim patch. M46 was a true discovery! As I was observing it with Dave he pointed out the visible planetary nebula NGC 2438 that is towards the center of this cluster. At first I almost did not see it, but slowly the ring like shape became apparent. After that I decided to spend some time looking for my current favorite galaxy pair M81 and M82. I star hopped to the pair using the 1st and 3rd star of the big dipper. I could almost see the two galaxies in the finder itself! But the view in the main scope almost blew me away! Although M81 is the brighter one, it was M82 with its cigar shape that truly was dazzling. I bumped up the magnification and spent some time just gazing at it. I am definitely looking forward to more observing sessions at RCDO and hope to improve my skills and hunt for more DSOs!

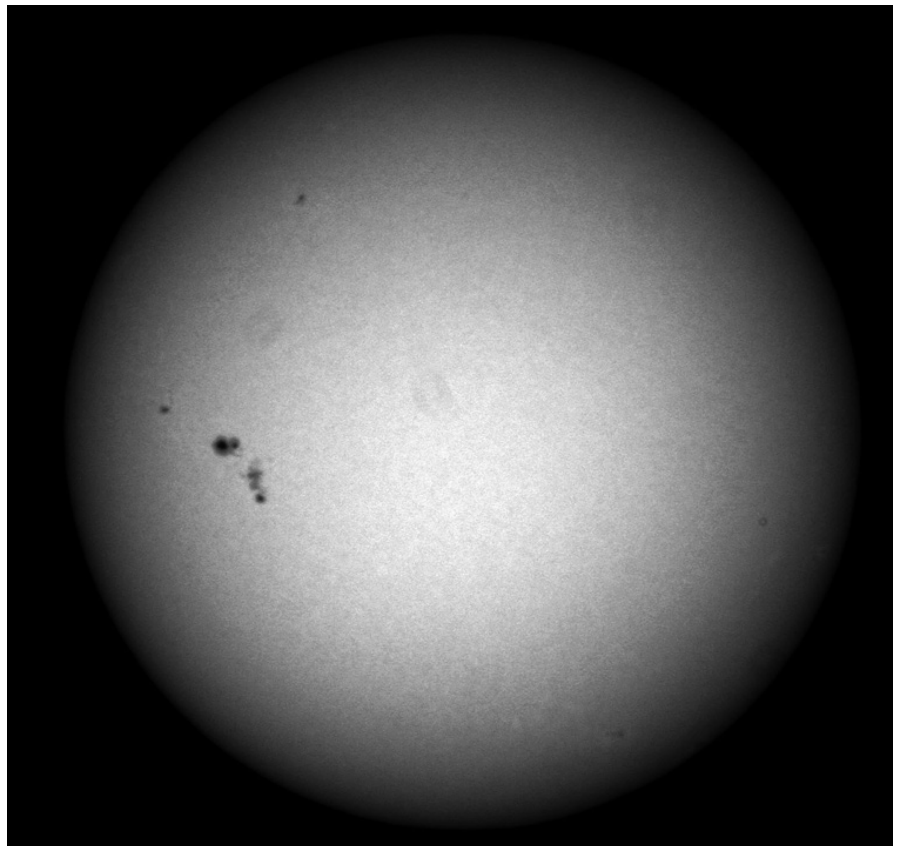
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## Solar View

Attached is a photo I took on Saturday, March 10, 2012 around 2:30 P.M.

It was taken in my front yard using my homebuilt 8-inch Newtonian telescope, I used a Canon Rebel SLR camera, Density 5 solar filter, 1/2000 second exposure

Ernie Piini





## The Planet in the Machine

Diane K. Fisher and Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is

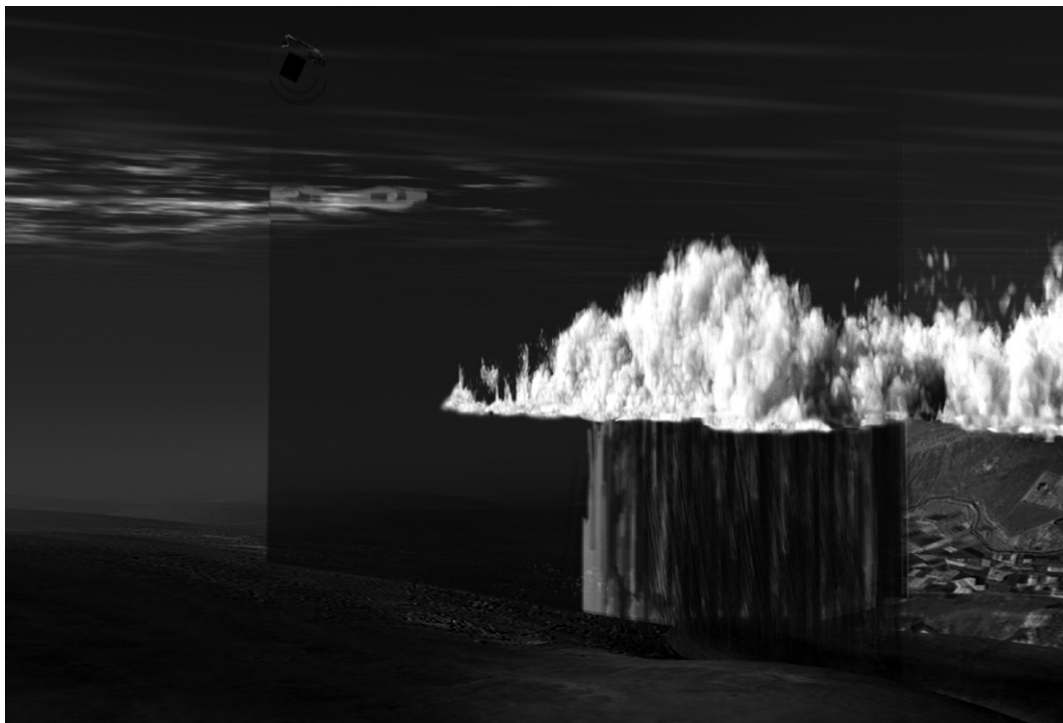
driven by, for example, global winds and ocean currents, polar ice (melting and freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there’s the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical

models (computer programs) that describe the complex inter-relationships of Earth’s carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA’s Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by



*CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat’s unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun’s energy in the atmosphere. See animation of this data simulation at [http://www.nasa.gov/mission\\_pages/calipso/multimedia/cloud\\_calip\\_mm.html](http://www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html).*

names like Terra and Aqua, keep an eye on Earth's land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit <http://science.nasa.gov/missions/earth.html>. Kids can get an easy introduction to Earth system science and play Earthy word games at <http://spaceplace.nasa.gov/ecosphere>.

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

### 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.

## 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](mailto:jvn@sjpc.org), or phone 408-371-1307 11 a.m. to 11 p.m. Priority is given to SJAA members.

### March 10 Talk

Dr. Graeme Smith from the Lick Observatory gave a talk on "Two Views of the Moon". He showed many pictures from the Apollo program but they were different from the ones we usually see. He also covered many geological features of the moon.



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## The Last Month In Astronomy

MAR-12-2012 **New Jupiter Movies** Scientists including amateur astronomers have made some new movies of Jupiter. The movies are taken from images captured by the Cassini spacecraft which flew by Jupiter on the way to Saturn in 2000. These movies capture a wave perturbing one of the jet streams. "This is the first time anyone has actually seen direct wave motion in one of Jupiter's jet streams" according to Simon Miller, lead author of an article on these movies published in the April 2012 issue of *Icarus*. Amateur astronomer Gianluigi Adamoli is a co-author of the paper. He said "Understanding the emerging analogies between Earth and Jupiter, as well as the obviously profound differences, helps us learn fundamentally what an atmosphere is and how it can behave." <http://www.jpl.nasa.gov/news/news.cfm?release=2012-070>

MAR-07-2012 **Bubbles in the MW** A team of volunteers, citizen scientists if you will, have found 5,000 star blown bubbles in the Milky Way. These volunteers, 35,000 of them, found these bubbles as of the online Milky Way project. According to Robert Simpson, a postdoc at Oxford, "The Milky Way Project is an attempt to take the vast and beautiful data from Spitzer and make extracting the information a fun, online, public endeavor". <http://www.jpl.nasa.gov/news/news.cfm?release=2012-062>

MAR-02-2012 **Dark Matter Slippery** Images from Hubble as well as the Canada-France-Hawaii telescope have found something interesting in the colliding galaxies called Abell 520. The problem? The colliding galaxies have moved on but the dark matter appears to have become detached from the galaxies. The dark matter location is inferred from gravitational lensing. <http://chandra.harvard.edu/photo/2012/a520/>

MAR-02-2012 **Breathe Deep at Dione** The Cassini spacecraft has detected a very thin atmosphere at the Saturnian moon Dione. When we say thin, we mean thin. Imagine 2 cubic inches and place 3 whole oxygen molecules inside. The Earth atmosphere has 15 trillion molecules in the same space. But Dione has company, Cassini has detected about the same atmosphere at the moon Rhea. Thin as that is, scientists are looking for some way to explain why even that much oxygen is present. <http://www.jpl.nasa.gov/news/news.cfm?release=2012-056&rn=news.xml&rst=3294>

MAR-01-2012 **Twinkling Stars of Orion** Scientists using the Herschel space observatory have noticed that some stars currently forming in the Orion nebula are twinkling, that is, their brightness varies over the course of a few weeks. That's much faster than previously thought likely. "Yet again, Herschel observations surprise us and provide more interesting insights into what happens during the very earliest phases of stars and planet formation" according to Goran Pilbratt of the ESA. <http://www.astronomy.com/en/News-Observing/News/2012/03/Fledgling%20stars%20flicker%20in%20the%20heart%20of%20Orion.aspx>

FEB-28-2012 **Asteroid 2011 AG5** There are 8,744 near-Earth objects (NEOs). One of them has gotten some press recently as representing a real threat for the morning of February 5, 2040. Actually, not much of a threat. The odds as of now are 1 in 625. It will pass close in 2023 and 2028 and the probability will be recalculated many times before then. It's 460 feet long. Currently the size and the probability give it a "1" on the 10 point Torino Hazard Scale. <http://www.jpl.nasa.gov/news/news.cfm?release=2012-051&rn=news.xml&rst=3290>

FEB-23-2012 **Higgs Can't Hide** The search for the Higgs boson has narrowed the range of possible masses for the particle. The Fermi National Accelerator has announced the most precise measurement of a related particle, the W boson. This raises confidence that the Large Hadron Collider (LHC) will find the Higgs particle later this year. [http://www.sciencenews.org/view/generic/id/338729/title/Deleted\\_Scenes\\_Higgs\\_running\\_out\\_of\\_hiding\\_places](http://www.sciencenews.org/view/generic/id/338729/title/Deleted_Scenes_Higgs_running_out_of_hiding_places)

FEB-21-2012 **Geologic Activity on the Moon** 50 million years might sound like a long time ago but in the total lunar history it is recent times indeed. It is the time some geologic activity clearly occurred on the moon. The Lunar Reconnaissance Orbiter has taken pictures of scarps that appear to be the result of that activity. According to Richard Vondrak from NASA "This pulling apart tells us the Moon is still active". <http://www.astronomy.com/News-Observing/News/2012/02/Spacecraft%20reveals%20recent%20geological%20activity%20on%20the%20Moon.aspx>

FEB-21-2012 **New class of planets** Hubble has discovered a new class of exoplanet. GJ1214b, discovered by the MEarth project in 2009, is a watery world with a thick, steamy atmosphere. It is 2.7 times the size of Earth and orbits a red-dwarf star every 38 hours. During a transit of the planet in front of its star. The spectroscopic study yielded results that suggests a steamy atmosphere with more water than Earth. <http://hubblesite.org/newscenter/archive/releases/2012/13/full/>

FEB-13-2012 **ESA's 3 Launchers** The Europeans have rounded out their launch capabilities with the Vega light launch rocket. Vega can put 1500 kg into a sun-synchronous orbit. The Vega joins the Soyuz medium lift and the Ariane heavy lift rockets. The Vega qualification launch was conducted from French Guiana. [http://www.esa.int/esaCP/SEMJ8LYXHYG\\_index\\_0.html](http://www.esa.int/esaCP/SEMJ8LYXHYG_index_0.html)

# 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.

## Auction Rescheduled

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.

*“And I’ll leave you with this question: when the Moon passes between the Earth and the Sun, it’s a solar eclipse, and when the Earth passes between the Sun and the Moon, it’s a lunar eclipse. So what do we call it when, for us on the surface, the Earth gets in between us and the Sun?”*

*Answer: night. — Phil Plait, the “Bad” Astronomer*

## Loaners

The loaner program offers members a means to try scopes of various sizes and technologies before you buy. For more information please see the loaner program web page: <http://www.sjaa.net/loaners.shtml>

## 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
<b>Total</b>	<b>39</b>	<b>24</b>	<b>1</b>	<b>2</b>	<b>12</b>
Scheduled					
Mar	9				
Apr	4				
May	1				
Jun	1				
<b>Total</b>	<b>15</b>				

As of March 1, 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](mailto: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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Articles for publication should be submitted by the 10<sup>th</sup> of the previous month. The PDF version is generally available by the 24<sup>th</sup> 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](mailto: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:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City/ST/Zip:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

**E-mail address:** \_\_\_\_\_