SJAA Activities Calendar
Jim Van Nuland

January
4 Astronomy Class at Houge Park. 7:00 p.m.
4 Houge Park star party. Sunset 5:04 p.m, 50% moon rises 12:39 a.m. Star party hours: 7:00 until 9:00 p.m.
5 Dark-Sky weekend. Sunset 5:05 p.m, 36% moon rises 1:45 a.m.
6 Observing H-alpha flares and sunspots at Houge Park. Also our Telescope Tune-up Time. Sun party and tune-up hours: 2:00 until 4:00 p.m.
12 Dark-Sky weekend. Sunset 5:11 p.m, 3% moon sets 6:43 p.m. Henry Coe Park’s “Astronomy” lot has been reserved.
18 Houge Park star party. Sunset 5:18 p.m, 52% moon sets 1:00 a.m. Star party hours: 7:00 until 10:00 p.m.
26 General Meeting. Board meeting at 6:00; Social Time at 7:30; General Meeting at 8:00. Our speaker is Dr. Mark Showalter from the SETI Institute discussing the newly discovered moons of Pluto.

February
1 Astronomy Class at Houge Park. 7:00 p.m.
1 Houge Park star party. Sunset 5:33 p.m, 66% moon rises 11:36 p.m. Star party hours: 7:00 until 10:00 p.m.
2 Dark-Sky weekend. Sunset 5:34 p.m, 52% moon rises 12:42 a.m.
3 Observing H-alpha flares and sunspots at Houge Park. Also our Telescope Tune-up Time. Sun party and tune-up hours: 2:00 until 4:00 p.m.
9 Dark-Sky weekend. Sunset 5:41 p.m, No moon. Henry Coe Park’s “Astronomy” lot has been reserved.
15 Houge Park star party. Sunset 5:48 p.m, 34% moon sets 11:45 p.m. Star party hours: 7:00 until 10:00 p.m.
23 General Meeting. Board meeting at 6:00; Social Time at 7:30; General Meeting at 8:00. Our speaker is Dr. Thomas Zobrist, LLNL; his topic: The Future of Ground-based Astronomy.

Ah, C’mon Man!
Paul Kohlmiller

The photo below is the Carina Nebula (Image credit: ESO. Acknowledgement: VPHAS+ Consortium/Cambridge Astronomical Survey Unit). The file used for the color version of this photo was cut down from a version that was almost 1 Mb. You can easily get a version of this picture that is 3700 x 4000 pixels. But, hey, why stop there. You can get a version that is 17383 x 18656 pixels - 350 Mb if your Internet provider doesn’t shut you down for trying to download it. Ah, c’mon, Man! We aren’t even talking the full resolution yet. A new telescope, the VLT Survey Telescope is just getting started in Chile. The scope itself is 2.6 meters but the camera, called the OMEGACam has a 268 megapixel detector. When it is in full operation it will generate 30 terabytes of data per year. Oh, c’mon.

Board Elections February 23

24 hour news and information hotline:
(408) 559-1221
http://www.sjaa.net
Jupiter is high in the sky all night this month — and its storms offer lots of wonderful detail to see, if you’re lucky enough to get steady skies and avoid the storms down here on Earth.

The Great Red Spot (GRS) seems unusually complex this year. Some observers, or at least imagers, are seeing detail inside the spot. There’s a dark central core, and a small white oval farther out near the edge of the spot, on the side nearest Jupiter’s equator. Some of this should be visible visually with good optics and sufficiently steady skies. Even if you can’t see the interior detail, there’s the spot itself, and a wealth of turbulence in the South Equatorial Band (SEB) following in the wake of the GRS.

Leading the GRS, and a little farther south, is “Oval BA”, also known as “Red Junior”. First seen in 2000 when several white ovals collided, it’s now a small but fairly dark red spot.

And there’s a new spot — an even darker, smaller spot — between GRS Jr. and the GRS proper.

South of the GRS, toward the south polar region, look for a series of small but prominent white ovals in the South Temporal Band (STB).

There’s so much to see on this side of Jupiter that it’ll keep you busy all night.

When the GRS isn’t pointed toward us, there’s still plenty to look at. Jupiter’s North Equatorial Band (NEB) sports two elongated white ovals along the north side of the band. They’ve been drawing closer to each other over the last few months, and there’s some chance they might merge into one larger oval. You might also have a chance to catch a dark feature in another part of the NEB that’s shaped like a tadpole — Christopher Go caught it on CCD last month.

The South Equatorial Zone has some white ovals of its own, three of them, much smaller than their northern cousins. Plus there are lots of swirls and monster festoons in the equatorial zone, rifts in the NEB, and other assorted detail all over the planet.

And of course, there are the moons. Most of this month’s double transits (two moons, and/or their shadows transiting at the same time) take place during the day, where they’re a lot less spectacular to watch and more difficult to observe. But Jan 24 offers a twilight and early evening pass of Ganymede, Io, and Io’s shadow. The initial Io transit starts in broad daylight, around 2:30 pm, and by sunset, Io’s shadow is just exiting Jupiter’s disk. If you set up just after sunset, around 5 or 5:30 pm, you can catch Io’s shadow and Ganymede in transit.

It’s a good thing there’s so much to see on Jupiter, because none of the other planets are particularly well placed this month. Uranus and Neptune are high enough to catch in the evening — try as soon as it gets dark, since they only get lower from there. Mars rises at about 10 and doesn’t transit until the wee hours of the morning. Saturn, too, is best viewed as a morning object, rising several hours after Mars, and Mercury is just barely visible in the early morning dawn early in January. Pluto is too close to the sun all month.

And if it’s too cloudy to see Jupiter, you can always go to the web for the latest planetary spacecraft news. Last month was fun. NASA had a leak leading everybody to expect historic news from the Mars Curiosity rover — “one for the record books” — then had to backpedal and say well, it found some organic compounds — “organic” being defined as “containing carbon and hydrogen”.

Chlorinated methane, to be specific. Not exactly the big evidence-of-life news implied by the initial rumors — and it’s possible that the compounds are contamination from Curiosity itself, so further study is required.

But wait — what should hit the news only a few days later? NASA’s Messenger spacecraft, in orbit around Mercury, found evidence of water ice in some of the shadowed craters at "Mercury’s" north pole. Not only that, but it also found evidence of organic compounds.

Bet that’s not where you’d look first, for either water or organics.

But Mercury has very little axial tilt, so it doesn’t have seasons the way the Earth does. And that means that the interior of a crater at one of Mercury’s poles can stay in shadow indefinitely, never seeing sunlight. So water ice (or anything else) can potentially remain in there for a long time.

Of course, no one is suggesting evidence of past life on Mercury.

The organic compounds were likely deposited there by impacts from comets and meteorites. (All the news reports I’ve seen say “comets and meteorites.” Is a piece of a comet making impact on a planet not considered a meteorite?) Still, I love the irony. Organic compounds on Mercury! While we were all so busy looking at Mars!

 Ain’t science grand?
The Dreamtime Eclipse: Australia 2012
Paul Kohlmiller

My wife and I were fortunate to be able to view the November 2012 eclipse as the path of the moon’s shadow traversed across northeast Australia. The skies were partly cloudy but our view of the event was clear. We were part of a tour (MWT Associates) and we were on Green Island, a small island not far from Cairns. This was our second total eclipse so we had some idea of what to expect. First, although totality lasted for more than 2 minutes, we knew that it would feel like 30 seconds or less. Sure enough, after taking a few photos, badly focused, I just put the camera down and watched the spectacle. The most amazing thing is how fast things change. From first contact to second contact it feels like everything is in slow motion. Then between 2nd and 3rd contact things seem to be constantly in motion.

The remainder of the tour took us to Alice Springs, Ayers Rock, Melbourne and Sydney. It also let us rub elbows with Seth Shostak (SETI Institute), David Levy (co-discoverer of Shoemaker/Levy 9), Dava Sobel (author of “Galileo’s Daughter”), Dennis Mammana (nationally syndicated columnist and noted astrophotographer), Rich Talcott (Senior Editor at Astronomy magazine) and Dave Eicher (Editor-in-chief at Astronomy).

David Levy provided one of the non-astronomical highlights. We visited the headquarters of the Royal Flying Doctor Service and we were given a short talk about what they do. The presenter asked if anyone had any questions or comments. Immediately David Levy jumped up and talked about the night when the Shoemakers were in a terrible traffic accident in a rural area of Australia. Eugene Shoemaker died but Carolyn Shoemaker survived almost certainly only because of the Flying Doctors. Suddenly a little side trip took on a special meaning. Later David told me he is working on his autobiography, the 38th book he has written.

Seth Shostak gave a talk to the tour group that concentrated on Australia. Later Seth, Mary and I were walking back to our hotel in the outback. We realized that the sky was relatively dark and we weren’t sure if we were seeing the Magellanic Clouds or just clouds. Seth later verified that it was the LMC and SMC. That same night David Levy set up his Questar and we looked at the Orion Nebula. It felt upside down.

During one of the 9 airflight legs of the trip, Mary and Dennis Mammana discussed dozens of episodes of “The Big Bang Theory”. I was complimenting Dava Sobel on “Galileo’s Daughter” which I knew of only because of the PBS series based on the book. She deflected praise about that series because she didn’t work on it. Overly modest methinks.

The tour also included a number of things that won’t make any sense to those reading this article. Like the bleachers we sat on to watch penguins come ashore; the crocodile zoo on Green Island; kangaroo, emu, camel and crocodile on the menu - as an appetizer; going to the most interesting building in Australia, the Sydney Opera House, and not being able to take pictures; checking out a “chair” made of sandstone; and eating a gourmet lunch on a tram (what we call light rail in San Jose) served by a waiter who sang opera - a good way to get a look at Melbourne.

But the eclipse was still the highlight. The corona looked fairly well balanced and there was a prominent “diamond ring” at both 2nd and 3rd contact. I didn’t think the Baily Beads phenomenon was particularly noticeable. It was over far too soon.
The “Goldilocks Zone” describes the region of a solar system that is just the right distance from the star to make a cozy, comfy home for a life-supporting planet. It is a region that keeps the planet warm enough to have a liquid ocean, but not so warm that the ocean boils off into space. Obviously, Earth orbits the Sun in our solar system’s “Goldilocks Zone.”

But there are other conditions besides temperature that make our part of the solar system comfortable for life. Using infrared data from the Spitzer Space Telescope, along with theoretical models and archival observations, Rebecca Martin, a NASA Sagan Fellow from the University of Colorado in Boulder, and astronomer Mario Livio of the Space Telescope Science Institute in Baltimore, Maryland, have published a new study suggesting that our solar system and our place in it is special in at least one other way.

This fortunate “just right” condition involves Jupiter and its effect on the asteroid belt.

Many other solar systems discovered in the past decade have giant gas planets in very tight orbits around their stars. Only 19 out of 520 solar systems studied have Jupiter-like planets in orbits beyond what is known as the “snow line”—the distance from the star at which it is cool enough for water (and ammonia and methane) to condense into ice. Scientists believe our Jupiter formed a bit farther away from the Sun than it is now. Although the giant planet has moved a little closer to the Sun, it is still beyond the snow line.

So why do we care where Jupiter hangs out? Well, the gravity of Jupiter, with its mass of 318 Earths, has a profound effect on everything in its region, including the asteroid belt. The asteroid belt is a region between Mars and Jupiter where millions of mostly rocky objects (some water-bearing) orbit. They range in size from dwarf planet Ceres at more than 600 miles in diameter to grains of dust. In the early solar system, asteroids (along with comets) could have been partly responsible for delivering water to fill the ocean of a young Earth. They could have also brought organic molecules to Earth, from which life eventually evolved.

Jupiter’s gravity keeps the asteroids pretty much in their place in the asteroid belt, and doesn’t let them accrete to form another planet. If Jupiter had moved inward through the asteroid belt toward the Sun, it would have scattered the asteroids in all directions before Earth had time to form. And no asteroid belt means no impacts on Earth, no water delivery, and maybe no life-starting molecules either. Asteroids may have also delivered such useful metals as gold, platinum, and iron to Earth’s crust.

But, if Jupiter had not migrated inward at all since it formed farther away from the Sun, the asteroid belt would be totally undisturbed and would be a lot more dense with asteroids than it is now. In that case, Earth would have been blasted with a lot more asteroid impacts, and life may have never had a chance to take root.

The infrared data from the Spitzer Space Telescope contributes in unexpected ways in revealing and supporting new ideas and theories about our universe. Read more about this study and other Spitzer contributions at spitzer.caltech.edu. Kids can learn about infrared light and enjoy solving Spitzer image puzzles at spaceplace.nasa.gov/spitzer-slyder.

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.
Our solar system is represented by the middle scenario, where the gas giant planet has migrated inward, but still remains beyond the asteroid belt.
**The Last Month In Astronomy**

**DEC-19-2012   Tau Ceti Maybe**
Steve Vogt of UCSC is the co-author of a study showing evidence of 5 planets orbiting Tau Ceti. This is of interest for a few reasons. First, it might include a habitable planet. That planet is the 4th planet from the star with an orbital period of 168 days. It is more than 4 times more massive than the Earth and probably not a rocky planet but it might be in the “Goldilocks” zone. Second, Tau Ceti is less than 12 light years away, a neighbor really. Third, Tau Ceti is often mentioned in science fiction stories because of its proximity and also because it is a sun-like star. To be sure, these are planetary candidates, not yet confirmed. Given the proximity, why haven’t planets been detected here before. One reason is that the multiple planets make it difficult to separate the signal from the noise. The discovery was made by reanalyzing 6000 observation of Tau Ceti made by 3 different instruments: HARPS (High Accuracy Radial velocity Planet Searcher) in Chile, UCLES (University College London Echelle Spectrograph) in Australia and HIRES (High Resolution Echelle Spectrometer) attached to Keck telescope in Hawaii. [http://www.msnbc.msn.com/id/50245884/ns/technology_and_science-space/]

**DEC-14-2012   Totally Toutatis**
The 3 mile-long asteroid Toutatis came within 4.3 million miles of Earth on December 12. This is the closest this asteroid will come to Earth until 2069 and it is clear it won’t hit the Earth during the next 400 years, about as far as such predictions can be made accurately. [http://www.jpl.nasa.gov/news/news.php?release=2012-397&rn=news.xml&rst=3624]

**DEC-03-2012   Voyager hits new region**
The Voyager 1 spacecraft is leaving the solar system. It currently is in a region that has been previously unknown. This new region is sometimes called a magnetic highway. Edward Stone (Caltech) says “Although Voyager 1 still is inside the sun’s environment, we now can taste what it’s like on the outside because the particles are zipping in and out on this magnetic highway. We believe this is the last leg of our journey to interstellar space.” [http://www.jpl.nasa.gov/news/news.php?release=2012-381]

**NOV-28-2012   Titanic weather change**
The weather on Titan is changing. Air near the south pole is sinking whereas it was upwelling earlier in the Cassini mission. The difference is probably season-related. Studies of weather is somewhat restricted in the solar system because only 4 bodies have a solid surface and a substantial atmosphere: Earth, Mars, Venus and Titan. [http://www.jpl.nasa.gov/news/news.php?release=2012-374]

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**Imaging Special Interest Group**
Gautami Shirhatti

As a part of our collaborative learning meet ups at Houge Park, the SJAA Special Interest Group met on November 17, 2012 to learn more about Imaging Acquisition and specifically “Backyard EOS- BYE”, a very effective and popular image acquisition tool used these days in the Astronomy fraternity.

Why do I need Image Acquisition software?

Deep-sky astrophotography requires shooting many short exposures. This can be done manually, but it is a very tedious process. For example, faint deep-sky objects may require several hours worth of 5 minute exposures that are later stacked or combined in subsequent image processing. Image acquisition is a key step and a thorough understanding of this process early on surely helps to ease the learning curve in Astroimaging.

And we at the SIG are always looking out to ease your way.

Paul Mahany gave a very informative presentation and demo of the software. The highlight of the seminar was tips and tricks that Paul demoed to improve image acquisition process in general and shared his lessons learned when he built his own telescope. Well, who would imagine using a 4$ flashlight from Home Depot for your telescope? This just tells me that imaging or for that matter any hobby you pursue need not always be an expensive affair, you just need to put on your creative hats, invest your time and get going!! The key is not to settle until you get the results you deserve.

The good product is the one that gets rid of anything that isn’t absolutely essential; yet is comprehensive and caters to every need of the user. Ease and Simplicity being the defining qualities!

This particular tool provides 5 different tabs with multiple settings available to cater to user needs: Image Capture, Frame and Focus, Planetary, Drift Alignment and ASCOM.

Additional details of the tools can be found at [http://www.backyardeos.com/]

In conclusion, the image acquisition software is a great tool that helps you get the results you desire but like anything else, it takes passion, lots of trials and errors, persistence and patience to get those perfect shots! As Galileo right said, “You cannot teach a man anything; you can only help him discover it in himself.”
Upcoming Elections
The annual elections for the SJAA Board of Directors will take place at the February General meeting. It is not a requirement but those wishing to be nominated are recommended to contact Mark Wagner, head of the nominating committee. (see page 5 of the December issue)

“Only two things are infinite, the universe and human stupidity, and I’m not sure about the former.” - Albert Einstein

Loaners
The telescope loaner program has been revamped. The program now includes QuickSTARt, program geared to those new to astronomy. Please check it out at http://www.sjaa.net/loaners.shtml.

School Star Parties
Completed Events

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As of November 28, 2012

School Star Party Link
For information on school star parties including how to schedule one see http://www.sjaa.net/school.shtml.

SJAA Email Addresses

- Board of Directors sjaa-board@googlegroups.com
- School Star Parties schools@sjaa.net
- 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/
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San Jose Astronomical Association Membership Form
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☐ New  ☐ Renewal (Name only if no corrections)

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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.)

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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”.

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