November 2010

# EPHEMERIS

## SJAA Activities Calendar

Jim Van Nuland

***October (late)***

29 Astronomy Class at Houge Park. 7:30 p.m. Topic is "What You Can See In The Sky - Part 1".

29 Houge Park star party. Sunset 6:13 p.m., 53% moon rises 12:02 a.m. Star party hours: 7:15 until 10:15.

30 Dark Sky weekend. Sunset 6:12 p.m., 42% moon rises 1:12 a.m.

***November***

6 Dark Sky weekend. Sunset 6:05 p.m., no moon. Henry Coe Park's "Astronomy" lot has been reserved.

7 Daylight Savings Time Ends. 2:00 a.m. Set your clock to 1 a.m.

12 Houge Park star party. Sunset 5:00 p.m., 46% moon sets 11:10 p.m. Star party hours: 7:00 until 10:00.

20 **General Meeting** at 8 p.m. Our speaker TBA.

21 **Fall Swap.** Open at noon, selling 1:00 to about 4:00 p.m. In the hall at Houge Park.

26 Astronomy Class at Houge Park. 7:30 p.m. Topic is "What You Can See In The Sky - Part 2".

26 Houge Park star party. Sunset 4:52 p.m., 68% moon rises 10:04 p.m. Star party hours: 7:00 until 10:00.

27 Dark Sky weekend. Sunset 4:51 p.m., 57% moon rises 11:13 p.m.

***December***

4 Dark Sky weekend. Sunset 4:50 p.m., no moon. Henry Coe Park's "Astronomy" lot has been reserved.

10 Astronomy Class at Houge Park. 7:30 p.m. Topic is TBD.

10 Houge Park star party. Sunset 4:50 p.m., 29% moon sets 9:56 p.m. Star party hours: 7:00 until 10:00.

18 **General Meeting** at 8 p.m. Holiday Party.

*The Board of Directors meets before each general meeting at 6:30 p.m. All are welcome to attend.*

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

## Mars Landing Sites

Paul Kohlmiller

The fourth Mars Science Laboratory Landing Site Workshop was held in Monrovia, CA Sept. 27-29. More than 150 people attended the workshop where discussions were held for deciding the landing site candidates for the next Mars Rover mission. The new rover is called "Curiosity" and it is scheduled for a late 2011 launch with landing in August 2012. According to a press release last October 8th, the sample analysis hardware is in "flight configuration", that means it is all set to go. It is undergoing environmental testing (heat, vibration, etc.).

But the workshop is still working on the landing area. There are 4 candidates:

1. Gale Crater (4.5°S, 137.4°E). This crater includes a mound of stratified rock. It might be the thickest and most diversified rock segment of this type that can be accessed with current technology. One picture of this shows erosion features but the lines seemed just a bit like Europa. The various strata show that there were differences over time but without sampling the material it is difficult to associate strata with specific times. 2. Mawrth Vallis (24°N, 341°E) - This is an area that gives access to many kinds of rocks ranging from the early Noachian period (4.5 billion years ago) to the end of the Hesperian period (3 billion years ago). 3. Holden crater (26°S, 325°E) - The landing area at this crater is near the location where there is a lot of evidence of flooding and weathering. A lot of the material is phyllosilicates (you

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*Mars Landing Sites*
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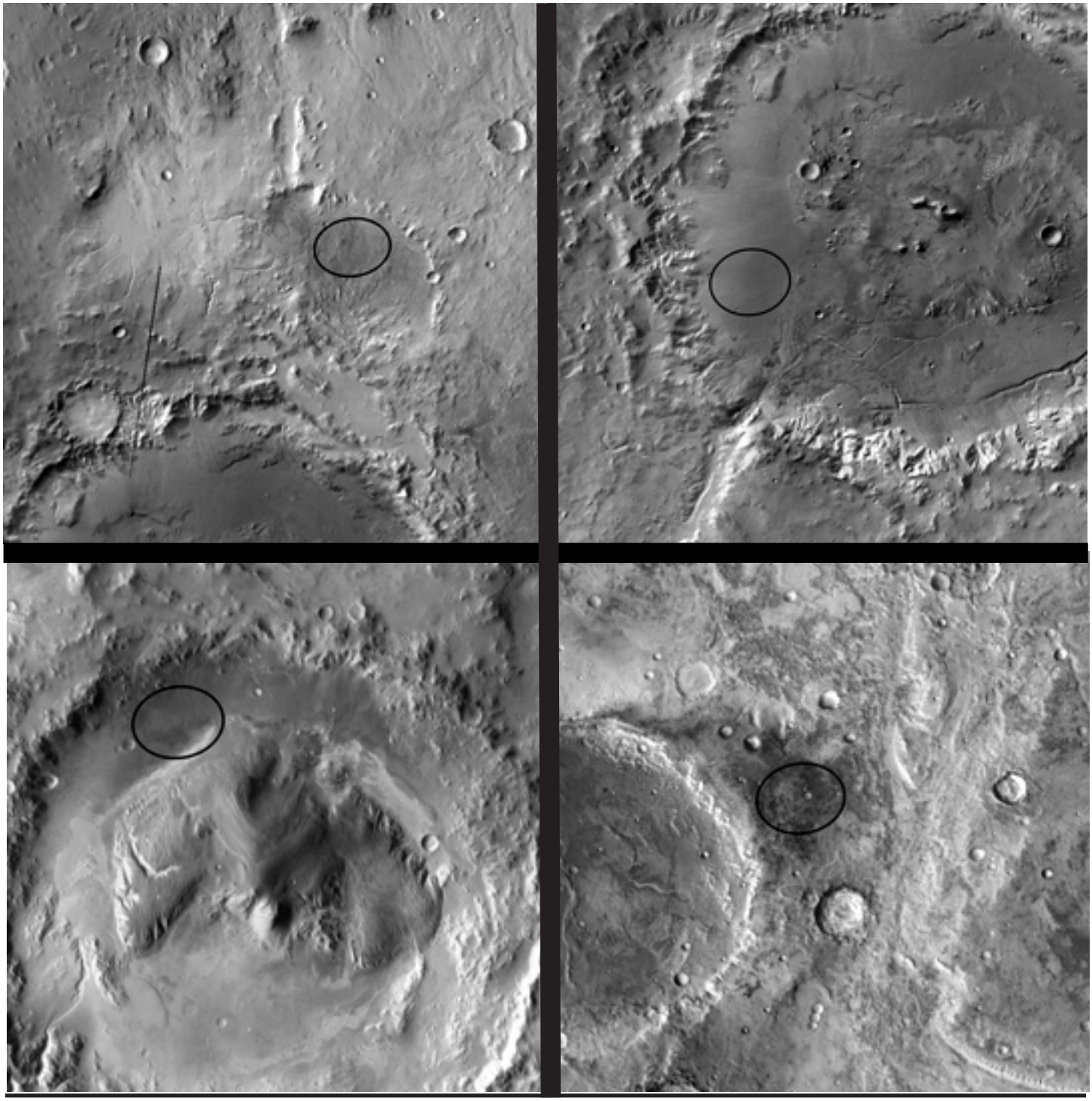
can imagine what this word means by breaking it down: silicates are mineral made largely of silicon, phyllo is that thin dough used to make baklava and other gastronomical delights). 4. Eberswalde crater - This crater is just north of Holden and it has a more teardrop shape rather than the typical crater circle. Eberswalde predates Holden and contains Holden ejecta. A key test here would be the old river delta to see how deep it is and the size of the particles. (23.9°S, 327°E).

A letter summarizing the results of this workshop says that all 4 sites have merit, seem to be safe landing sites, and should remain under consideration. There will be one more workshop in the Spring of 2011. Previously, the sites NE Syrtis and Margaritifer were rejected for landing hazard reasons. That fifth and last workshop will probably be in the L.A. area as all of the previous were. My uninformed opinion is that Holden is the leading candidate because it may have the best evidence of an ancient but habitable past.

In the NASA photos below the sites and the landing ellipses are in clockwise order from the upper left: Eberswalde, Holden, Mawrth Vallis, Gale Crater. More information at: http://marsoweb.nas.nasa.gov/landingsites/index.html




The August General Meeting was a special one for the SJAA. The Gregory Award was given to Gary Mitchell for the many things he has done for the club and the community. Of particular note is the many hours Gary has spent at the school star parties.

At the same meeting, one of most popular astronomers stopped by to give us a talk on innovative ways to search for extraterrestrial intelligence. Seth Shostak was our speaker. Seth is a senior astronomer at the SETI Institute, the author of several books and articles about SETI and he has his own radio show/podcast called "Are We Alone".

Photos in clockwise order from upper left: The Gregory Award plaque (photo courtesy of Gary Mitchell), Gary Mitchell receiving the award from Greg Claytor, Seth Shostak answering a question about possible alien communications, Seth - an accomplished photographer - wondering who is taking his picture now (your editor).

*The Shallow Sky*

## Jupiter is high

Akkana Peck

Jupiter is high (well, relatively — a little under 50 degrees) in the sky at nightfall and remains the undisputed ruler of our fall sky. The South Equatorial Belt remains very faint, making for an interesting and unusual view, in addition to all the usual storms, festoons, moons and moon and shadow transits that make the giant planet so interesting.

Uranus, too, is well placed for observing, still only a few degrees away from Jupiter. That makes it much easier than usual to find, so don't forget to take a look at the dim green world when you're done studying Jupiter.

Neptune is a little tougher — it's transiting around nightfall in eastern Capricornus, only 40 degrees up at its highest and sinking fast as the evening progresses, so catch it while you still can.

Mercury is back in the evening sky, along with Mars, which sits near its rival Antares. The two planets pass within a couple of degrees of each other on the 21st — not close enough for a telescope field, but they should make a nice naked-eye or binocular view early on a full moon evening. Pluto, too, is in the evening twilight sky, but you aren't likely to catch it there; better to wait a few months.

Venus and Saturn both move into the morning sky this month.

Daylight Savings Time ends on November 7. Remember to set your clocks back an hour!

NASA Space Place

## Close Encounters with Jupiter

Dr. Tony Phillips

Jupiter and Earth just had a close encounter—and it was a good one. In late September 2010, the two worlds were 31 million km (about 19 million miles) closer than at any time in the past 11 years. Soaring high in the midnight sky, Jupiter shone six times brighter than Sirius and looked absolutely dynamite through a backyard telescope.

Planetary scientist Scott Bolton of the Southwest Research Institute isn't satisfied. "I'd like to get even closer," he says.

Bolton will get his wish in July 2016. That's when a NASA spacecraft named "Juno" arrives at Jupiter for a truly close-up look at the giant planet. Swooping as low as 5,000 km (about 3,000 miles) above the cloud tops, Juno will spend a full year orbiting nearer to Jupiter than any previous spacecraft.

The goal of the mission is to learn what lies inside the planet.

Astronomers have been studying Jupiter since the invention of the telescope 400 years ago, but in all that time the planet's vast interior has remained hidden from view. Even the Galileo probe, which dived into the clouds in 1995, penetrated no more than about 0.1% of Jupiter's radius.

"Our knowledge of Jupiter is truly skin deep," says Bolton, Juno's principal investigator. "There are many basic things we just don't know—like how far down does the Great Red Spot go? And does Jupiter have a heavy core?"

Juno will improve the situation without actually diving into the clouds. Bolton explains how. "Juno will spend a full year in close polar orbit around Jupiter, flying over all latitudes and longitudes. We will thus be able to fully map Jupiter's gravitational field and figure out how the interior is structured."

But that's not all. Researchers have good reason to believe that much of Jupiter's interior is filled with liquid metallic hydrogen, an exotic metal that could form only in the high-pressure, hydrogen-rich core of a giant planet. Jupiter's powerful magnetic field almost certainly springs from dynamo action inside this vast realm of electrically conducting metal.

"Juno's magnetometers will precisely map Jupiter's magnetic field," says Bolton. "This map will tell us a great deal about planet's inner magnetic dynamo—what it's made of and how it works."

Finally, Juno will probe Jupiter's atmosphere using a set of microwave radiometers. "Our sensors can measure the temperature 50 times deeper than ever before," says Bolton. Researchers will use that information to figure out how much water is underneath Jupiter's clouds. "Microwave measurements of Jupiter's water content are particularly exciting because they will help discriminate among competing theories of the planet's origin."

Now that's a close encounter. Stay tuned for Juno.

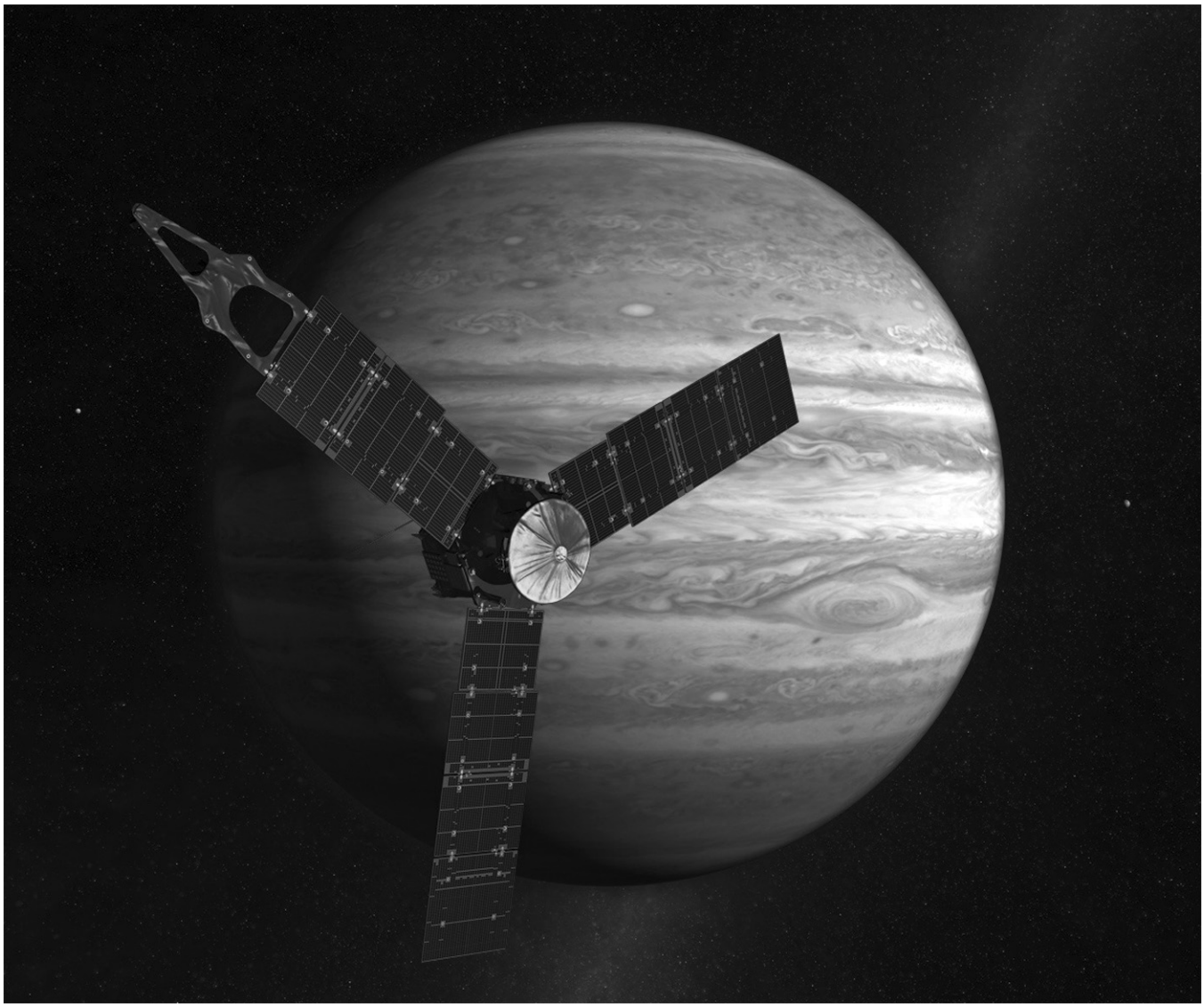
Find out more about the Juno mission at http://www.nasa.gov/mission_pages/juno. Play the new Solar System Explorer super game, which includes the Juno Recall mini-game at http://spaceplace.nasa.gov/en/kids/solar-system. It's not just for kids!

*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.



*The Juno mission, arriving at Jupiter in July 2016, will help to solve the mystery of what's inside the giant planet's core. Projected launch date is August 5, 2011.*

# The Last Month In Astronomy

12-OCT-2010 ***Smothered Supernova*** A supernova has been discovered by Ohio State researchers that is covered by dust. The supernova was first seen in 2007 using the Spitzer Space Telescope. They weren't looking for supernovae at the time. They were trying to detect hot spots that occur near black holes that are actively sucking up material. But the signature they found in this case was not what they expected when they looked at a galaxy that is 3 billion light years distant. This has been confirmed with more recent research using the Keck Telescope in Hawaii. Supernovae of this type may have occurred fairly often in the past and Eta Carinae might do something similar. The last eruption of Eta Carinae was seen in 1840. It is covered with a dust shell that is called Homunculus Nebula. http://researchnews.osu.edu/archive/dustynova.htm

12-OCT-2010 ***Fire down below Mars*** It has often been noted that life could exist below the surface of Mars. That possibility sounds greater now based on data that came from the Mars Reconnaissance Orbiter (MRO). A deposit of carbonate rocks that were originally 6 meters deep was exposed by an ancient meteorite. These rocks show evidence of having been altered by heat. According to Joseph Michalsky "... such deposits could indicate past seas that were once present on Mars." http://www.astronomy.com/asy/default.aspx?c=a&id=10309

07-OCT-2010 ***Saturnian Moons Share*** Paul Schenk from Lunar and Planetary Institute in Houston is the lead author for an article describing how the Saturnian Moons share. He says "The beauty of it all is how the satellites behave as a family, recording similar processes and event on their surfaces ... we see it on several moons, including Mimas, which was once thought to be rather bland." For example, Enceladus sprays icy material which makes up the E ring and the blowback gives Enceladus a blue tinge. But it also paints the surface of Tethys, Dione and Rhea. Amanda Hendrix of JPL says "Analyzing the image color ratios is a great way to really enhance the otherwise subtle color variations." This in turn allows the study of processes within the Saturnian system. http://www.jpl.nasa.gov/news/news.cfm?release=2010-328

05-OCT-2010 ***Astronomy buys Discover*** The owner of Astronomy and other magazines, the Kalmbach Publishing Company, has purchased Discover magazine, aka Discover Media LLC. Both magazines will continue. http://www.astronomy.com/asy/default.aspx?c=a&id=10104

04-OCT-2010 ***Europa Fast Reactions*** Europa is apparently covered with tens of meters of ice. The temperatures are so cold that it is assumed any chemical reactions within that ice would be slow. But apparently, with ice and sulfur dioxide as reactants, the reactions can be rather quick. This reaction does not need a lot of radiation to speed up these reactions so these reactions might happen deep into the ice blanket. The reactions at 130 Kelvin occur almost instantaneously. http://www.jpl.nasa.gov/news/news.cfm?release=2010-319

23-SEP-2010 ***NGC 1365*** The galaxy NGC 1365 has a new picture (seen here, Image Credit: ESO) to add to its modeling portfolio. It was taken in the infrared using the HAWK-I camera at the VLT (Very Large Telescope) at the Paranal Observatory in Chile. This galaxy is 60 million light years away in the Fornax galaxy cluster. It is one of the clearest examples of a barred spiral galaxy. Perhaps 2/3 of all spiral galaxies are barred spirals including the Milky Way. http://www.astronomy.com/asy/default.aspx?c=a&id=10258

# It Must Be Astronomical ...

## 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

## Dues Change

Effective January 1, 2011, the SJAA membership dues will be changed. The regular dues will remain at $20 but only for members choosing the electronic version of this newsletter. Those who want to continue with the print version will find that their dues are $30.

## Kids Links

"Power Up!" is the new game on NASA's Climate Kids web site. In this game you have just two minutes to capture enough wind and solar energy to light up all the windows in all the houses of the town. If you succeed, you win the Platinum Award for clean energy. Gold, Silver and Bronze Awards are good, but you'll learn to do even better. See http://climate.nasa.gov/kids/powerupcleanly

## School Star Parties

| **Completed Events** | | | | | |
|---|---|---|---|---|---|
| | Total Sched. | Good Sky | Partial Success | Cloudy Fail | Cancel at noon |
| Jul | 1 | 1 | | | |
| Aug | 4 | 4 | | | |
| Sep | 0 | | | | |
| Oct | 5 | 5 | | | |
| *Total* | *10* | *10* | *0* | *0* | *0* |
| **Scheduled Events** | | | | | |
| | Total | Firm | Workin' | | |
| Oct | 2 | 2 | 0 | | |
| Nov | 14 | 12 | 2 | | |
| Dec | 7 | 5 | 2 | | |
| Jan | 2 | 1 | 1 | | |
| Feb | 2 | 2 | 0 | | |
| Mar | 5 | 3 | 2 | | |
| *Total* | *32* | *25* | *7* | | |

***As of mid-October***

*"For small creatures such as we the vastness is bearable only through love." - Carl Sagan*

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# 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. The newsletter is always available online at** http://ephemeris.sjaa.net
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