



EPHEMERIS

SJAA Activities Calendar

Jim Van Nuland

September (late)

- 25 **General Meeting** at 8 p.m. Slide and Equipment night (aka "Show and Tell").
- 30 Dark Sky weekend. Sunset 6:12 p.m., 42% moon rises 1:12 a.m.

October

- 1 Astronomy Class at Houge Park. 7:30 p.m. Topic is "Fall Constellations".
- 1 Houge Park star party. Sunset 6:51 p.m., 38% moon rises 1:03 a.m. Star party hours: 7:45 until 10:45.
- 2 Dark Sky weekend. Sunset 6:49 p.m., 23% moon rises 2:14 a.m.
- 9 Dark Sky weekend. Sunset 6:39 p.m., 9% moon sets 7:45 p.m. Henry Coe Park's "Astronomy" lot has been reserved.
- 15 Houge Park star party. Sunset 6:31 p.m., 63% moon sets 1:22 a.m. Star party hours: 7:30 until 10:30.
- 23 **General Meeting** at 8 p.m. Our speaker is Dr. Daniel Usikov. The topic is "Current Hypotheses on Dark Energy".
- 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

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 m.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.

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>

Silicon Valley Astronomy Lecture Series

For the past decade, Andy Fraknoi, the (and I do mean "the") astronomy teacher at Foothill College has gracefully conducted the Silicon Valley Astronomy Lecture Series. Every academic year Andy hosts about 6 lectures. For anyone wanting an ever-so-gentle expansion of their astronomy knowledge, this is it.

If you have never attended one of these lectures, here is what you need to know.

Cost: Free. Absolutely free. Not even a donation bucket at the door but I don't want Foothill College to get any ideas. Actually, there is one minor cost (see "parking" below).

College: Foothill College is one of most beautiful community college campuses. Take I-280 to the El Monte exit in Los Altos Hills. Follow the signs but, if you miss the sign, head toward the hills.

Parking: \$2. Parking at Foothill College is something that you should be prepared for. First, they really do enforce it. Second, generally you pay for parking at a small kiosk where you get a ticket to put on your dashboard. Third, the parking kiosk may or may not accept dollar bills. I try to always remember to have 8 quarters in

Continued on page 2

my pocket when I go to any community college in California. Fourth, the specific parking lot makes a difference. As you enter the campus, you may find yourself in a slow moving lane of cars waiting to get into Lot#1. At this lot, there may be a person who can give you a parking stub and who can actually make change. Therefore, stay in this slow moving lane if the smallest monetary unit you have is a \$5 bill. Others, can go around this lane, beware of pedestrians crossing the road, and circle almost all the way around the campus and go into a parking lot that I think is labeled #7. You will exit the campus circle road to the right and enter this mostly empty parking lot. Because you have completely circled the campus, you are almost as close to the lecture hall as those who are still in line for parking lot #1.

Location: The talks are held at Smithwick Auditorium. For these talks you can mostly follow the crowd but there are enough signs to guide you if necessary. The walk is steep because this place is not called "Foothill" for nothing. There is a parking lot, I think it is #5, that is almost at the same level as the Smithwick but some nights you have to be there early to find a spot there.

Bathrooms: We know you are embarrassed to ask so we will tell you anyway. There are bathrooms at the theater but you have to ingress from outside of the theater itself. When I lived in Minnesota, I don't think there were any theaters that asked you to go outside to find the little boy's room.

Time: The lectures are always held on a Wednesday at 7 p.m. and there is never more than one within one calendar month. I think there has only been one exception to that rule in the last 10 years. Here's a little secret: the talks almost always start a few minutes late because "there is a slow moving lane of

cars waiting to park" and now you know why.

Leader: If you don't know anything about Andy Fraknoi, where have you been? He is often on the radio or quoted in the press. He has won awards for his teaching. He has written astronomy texts including a recent collaboration with the Disney people. He has a great sense of humor although you only get a small sample at each lecture.

Lecturers: The lectures are almost always great and the one exception that I can think of was one of the best attended lectures because the speaker was so famous, a Nobel prize winner. So I

recommend every lecture without reservation.

For anyone wanting an ever-so-gentle expansion of their astronomy knowledge, consider the Silicon Valley Astronomy Lecture Series.

Credit: One unit of astronomy course credit at Foothill is available to those who attend all six of the Silicon Valley

Astronomy Lectures in 2010-2011 (you may watch one on the Web) and write a short paper. Lectures are always on Wednesday evenings, and there are two each quarter, from October through May. To register for the course, Astronomy 36, go to: <http://www.foothill.edu/admissions.php>

Schedule: Here is the schedule for the first two talks of 2010-11 academic year.

Wed., Oct. 20, 2010, 7 p.m.:

"The Ultimate Fate of the Solar System and the Music of the Spheres"

Dr. Gregory Laughlin, University of California, Santa Cruz

(On how the long term orbits of the planets might change over many eons of cosmic time and how the regularities of planet motions can form patterns like music.)

Wed. Nov. 17th, 2010, 7 p.m.:

An Update from the Kepler Mission: The Search for Other Earths

Dr. Natalie Batalha, San Jose State University and NASA Ames

(The Kepler telescope in space is searching for planets around other stars. It has already found a few and there are traces of many others in the data. By the time of this talk, Dr. Batalha, one of the mission scientists, hopes to be able to tell us about a number of other candidates.)

Can't Make It:

Past Silicon Valley Astronomy Lectures are now available in MP3 format at:

<http://www.astrosociety.org/education/podcast/index.html>

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Andrew Fraknoi, photo courtesy of Foothill College

Jup-shooting

Akkana Peck

In fall, some people go hunting for ducks in the bay, or go farther afield to hunt larger animals. But you can hunt much larger game — Jupiter — from your own backyard.

Jupiter is just past its opposition on September 21st, and it's perfectly placed for observing. This year is an unusually close opposition, because Jupiter is approaching the perihelion of its nearly 12-year orbit, its closest point to the sun. That means that Jupiter is a little bigger, as seen from Earth, than it is at most oppositions.

It won't actually reach perihelion until early next year, in March 2011. That's roughly midway between this year's opposition and next year's; this year's is the closer of the two, but not by much, so we'll get very good Jupiter views both this year and next year.

At this year's opposition (late September), Jupiter's disk measured 49.8"; by October 1 it shrinks a little to 49.5". At next year's opposition at the end of October 2011, it will measure 49.6". In a really small opposition, like in 2004, its disk extended only 44.6".

Of course, these differences aren't much. For comparison, the Galilean moons range between one and two arcseconds in size. Let's use Ganymede as a unit of measure, since it's fairly easy to resolve as a disk in our amateur telescopes. The difference in Jupiter's size between this year's opposition and one where Jupiter is at its farthest point from the Sun is about three Ganymedes. The difference between this year's opposition and next year's is less than 1/20th of a Ganymede.

So enjoy this year's big Jupiter! But look forward to next year's opposition as well, when it will be almost as large and quite a bit higher in the sky, transiting at 64 degrees versus 49 this month.

There will be plenty to see on this big Jupiter. Part of what makes this planet so interesting is the ever-changing weather patterns. You'll never get bored looking at the same thing with Jupiter! And it's mind-blowing to think that most of these changes are a lot bigger than our whole planet.

As I write this, Jupiter's South Equatorial Belt (SEB) is still nearly invisible — it faded mysteriously a few months ago while Jupiter was hidden behind the sun — but there are faint outlines showing where it ought to be. Maybe that's a sign that it's darkening again. Should be fascinating to watch and see how long it takes to get back to normal.

The faded SEB should make the Great Red Spot (GRS) look redder and easier to spot (ahem) than it has been in past years. Meanwhile, there's plenty of detail visible in the North Equatorial Belt (NEB) and Jupiter's other belts and polar regions.

Double shadow transits have been rare beasts lately. But there's a nice Ganymede/Europa dual shadow transit the night before Halloween, starting a bit after 9 p.m. on Oct. 30. Too bad it's not ON Halloween so you could show it to the kids — but the early evening hours of Halloween do offer a nice transit of Io and its shadow. So if you've been thinking about setting up a telescope and showing "eye candy" to the ghosts and goblins, this is a great year for it!

Uranus, too, is well placed for observing. It was at opposition on September 21 — the same day as Jupiter — and is still quite close to its giant neighbor. Look about three degrees up and to the left of Jupiter; there aren't any bright stars nearby, but you should be able to find it by sweeping with binoculars or a low-power eyepiece. As always, look for a greenish color and that steady, non-twinkling appearance that tells you

you're seeing the disk of a planet, not a point source like a star.

Don't forget to swing over to Neptune, hanging out off the left tip of Capricornus a bit west of the Jupiter/Uranus pair, pretty much the same place it's spent most of this summer.

The inner planets — all those lovelies that have graced our early evening skies for the last several months — are disappearing in the twilight. Venus and Mars are together sinking lower in the western sky: start early if you want to catch them. It's too late for Saturn, which dives past the Sun at the beginning of October and will appear in the morning sky next month. Pluto is also too low to be very rewarding this month. Mercury makes a brief appearance in the morning sky early on, then disappears into the Sun's glare by mid-month.

So the show this month is all gas giants. If you want to look at one of those rocky, dense inner planets, look at the moon — or get out and enjoy the nice fall weather on our own world!

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.

NASA Space Place

The Hunt is On!

Carolyn Brinkworth

The world of astronomy was given new direction on August 13, 2010, with the publication of the Astro2010 Decadal Survey. Astro2010 is the latest in a series of surveys produced every 10 years by the National Research

Council (NRC) of the National Academy of Sciences. This council is a team of senior astronomers who recommend priorities for the most important topics

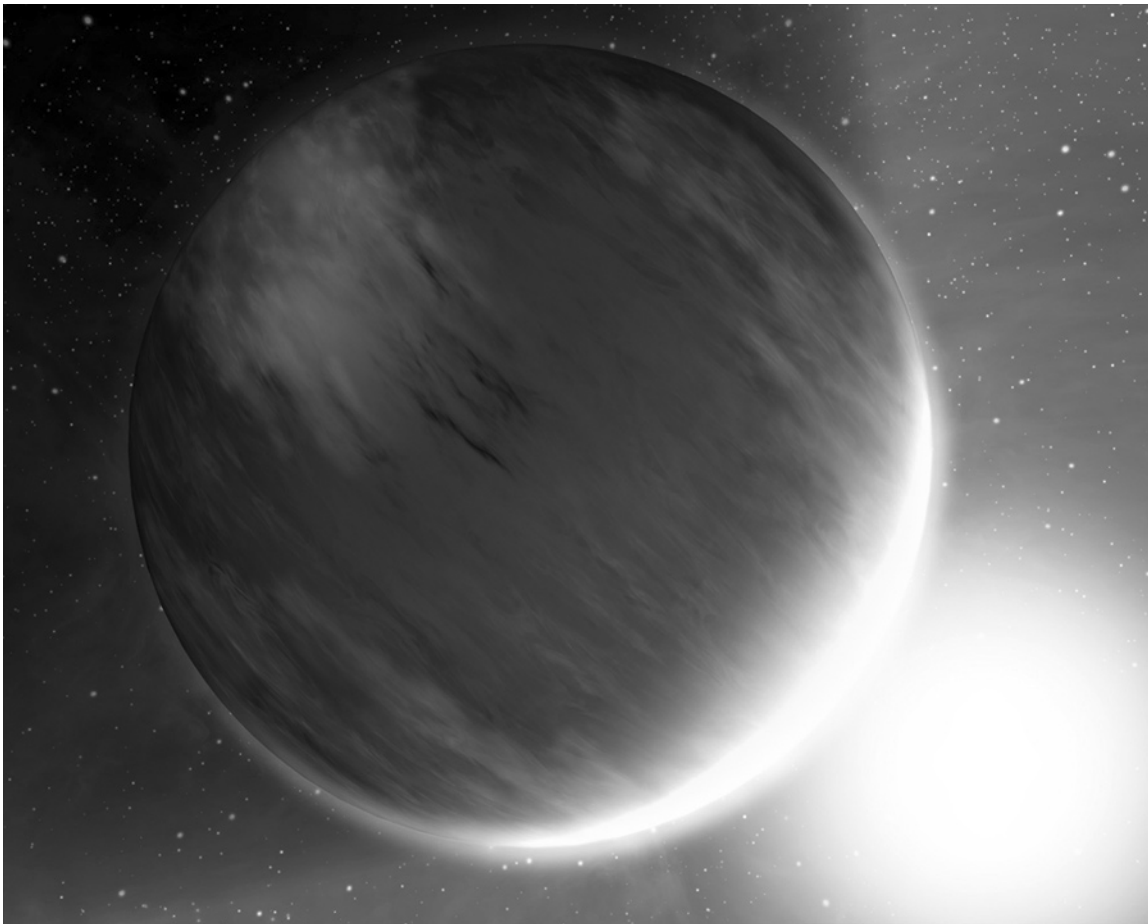
and missions for the next decade.

“in the last 20 years, the number of known planets in our Universe has gone from the 8 in our own Solar System to almost 500”

Up near the top of their list this decade is the search for Earth-like planets around other stars—called “extrasolar planets” or “exoplanets”—which has

become one of the hottest topics in astronomy.

The first planet to be found orbiting a star like our Sun was discovered in 1995. The planet, called “51 Peg b,” is a “Hot Jupiter.” It is about 160 times the mass of Earth and orbits so close to its parent star that its gaseous “surface” is seared by its blazing sun. With no solid surface, and temperatures of about 1000 degrees Celsius (1700 Fahrenheit), there was no chance of finding life on this distant



Artist's rendering of hot gas planet HD209458b. Both the Hubble and Spitzer Space Telescopes have detected carbon dioxide, methane, and water vapor—in other words, the basic chemistry for life—in the atmosphere of this planet, although since it is a hot ball of gas, it would be unlikely to harbor life.

world. Since that discovery, astronomers have been on the hunt for smaller and more Earth-like planets, and today we know of around 470 extrasolar planets, ranging from about 4 times to 8000 times the mass of Earth.

This explosion in extrasolar planet discoveries is only set to get bigger, with a NASA mission called Kepler that was launched last year. After staring at a single small patch of sky for 43 days, Kepler has detected the definite signatures of seven new exoplanets, plus 706 “planetary candidates” that are unconfirmed and in need of further investigation. Kepler is likely to revolutionize our understanding of Earth’s place in the Universe.

We don’t yet have the technology to search for life on exoplanets. However, the infrared Spitzer Space Telescope has detected molecules that are the basic building blocks of life in two exoplanet atmospheres. Most extrasolar planets appear unsuitable for supporting life, but at least two lie within the “habitable zone” of their stars, where conditions are theoretically right for life to gain a foothold.

We are still a long way from detecting life on other worlds, but in the last 20 years, the number of known planets in our Universe has gone from the 8 in our own Solar System to almost 500. It’s clear to everyone, including the Astro2010 decadal survey team, that the hunt for exoplanets is only just beginning, and the search for life is finally underway in earnest.

Explore Spitzer’s latest findings at <http://www.spitzer.caltech.edu>. Kids can dream about finding other Earths as they read “Lucy’s Planet Hunt” at <http://spaceplace.nasa.gov/en/kids/storybooks/#lucy>.

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

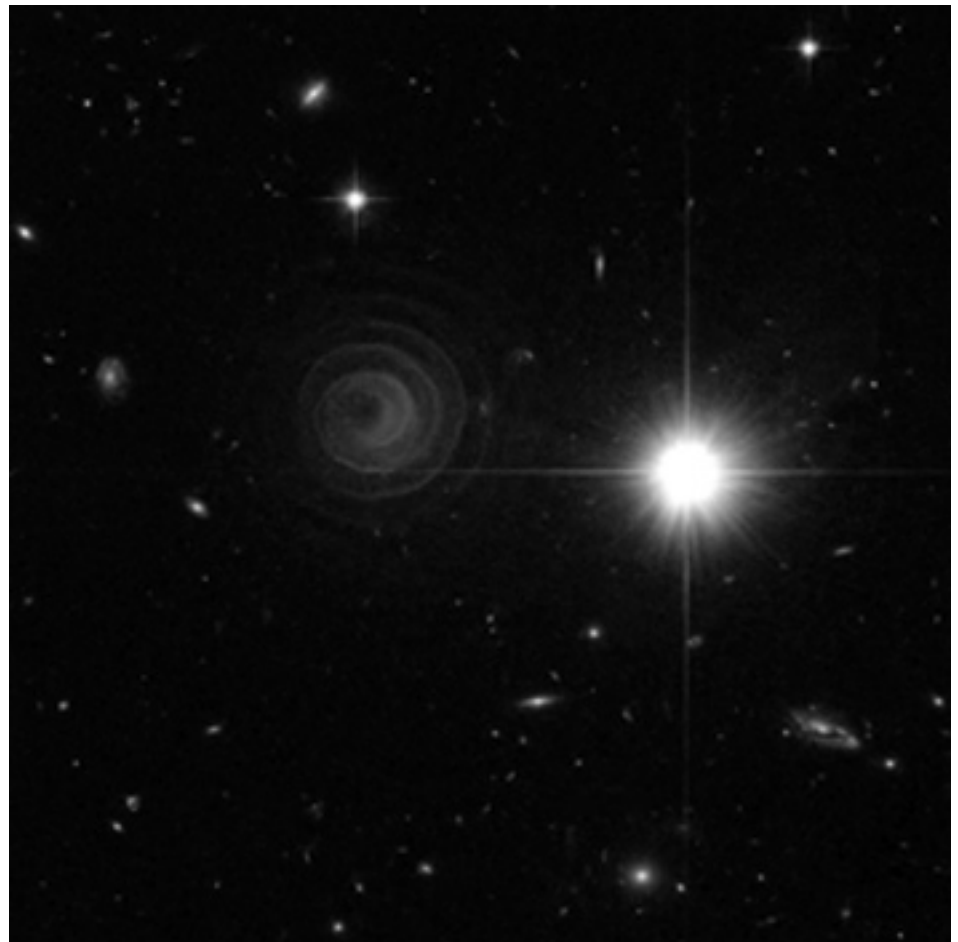
Weird Star

Paul Kohlmler

A very unusual binary star has been caught in the act of creating a spiral shape. It’s a dim object, it took 33 minutes on a Hubble camera to create the picture seen here. But why is it even that bright? There is so much material, the material creating the spiral shape, that the binary stars cannot light it up. Astronomers think that the object, called AFGL 3068, is actually lit up by galactic starlight. What? One reason to believe that is true is that the object is slightly brighter on the side closest to the plane of our galaxy. But what about the bright star in the picture? Its distance is not known while the dying binary is about 3000 lightyears away. <http://blogs.discovermagazine.com/badastronomy/2010/09/06/awesome-death-spiral-of-a-bizarre-star/>

We became aware of this story via Dr. Phil Plait, the originator of the Bad Astronomy website. This gives us a chance to mention Phil’s latest venture, a TV series named Bad Universe. The first episode was “previewed” on August 29 on the Discovery Channel but if you are like us, you missed it. At SETIcon I was within 5 feet of Dr. Plait and still didn’t find out the air date until it had passed. What to do? Well, the next showing has apparently not been scheduled as of mid-September. But you can catch video snippets at: <http://dsc.discovery.com/search/results.html?focus=video&query=bad+universe>.

You may know that Phil Plait resigned as president of the James Randi Educational Foundation to work on this series and we hope to see many more installments in the near future.



The Last Month In Astronomy

16-SEP-2016 **LRO turns to Science** The exploration phase of the Lunar Reconnaissance Orbiter has completed. It will now turn to scientific research and continue mapping the moon from its polar orbit 31 miles above the surface. Program management moves from NASA's Exploration Systems Mission Directorate to the Science Mission Directorate. LRO was launched on June 18, 2009 and began its detailed survey in September of 2009. The findings from the mission include permanently shadowed regions that may harbor water and be colder than Pluto. It made observations of Apollo landing sites and found the lost Russian rover Lunokhod which had one of those retroreflectors which can be used to bounce laser signals. Any viewer of the TV show "The Big Bang Theory" already knows this. After getting an accurate position on the Lunokhod a laser signal bounce was successful, 40 years after the rover was lost. <http://www.astronomy.com/asy/default.aspx?c=a&id=10229>

09-SEP-2010 **Fireballs on Jupiter** In a paper published in the Astrophysical Journal Letters, a group of professional and amateur astronomers pointed out that Jupiter is getting hit by asteroids at a surprisingly high rate. It has only been in the last two years that amateurs have shown they can detect these strikes. The most recent hit occurred August 20th. Earth gets hit with a 10-meter object once a decade. But it looks like Jupiter gets a similar hit a few times each month. A 10-meter object passed close to Earth on September 8th. A slightly smaller rock, 2008 TC3, burned up in the atmosphere above Sudan 2 years ago. http://science.nasa.gov/science-news/science-at-nasa/2010/09sep_jovianfireballs/

01-SEP-2010 **Windy Galaxy** The galaxy NGC 4666 is a starburst galaxy, a location of heavy star formation, that is estimated to be 80 million light-years from Earth. The star making activity is probably caused by interaction with NGC 4668. This activity leads to the formation of large stars and those stars die young and create supernovae. The result is a lot of gas, a "superwind", that flows out of the galaxy. This image was taken with the Wide Field Imager on the MPG/ESO 2.2 meter telescope at the La Silla Observation in Chile. It was used as a follow up on an X-ray image taken by the XMM-Newton space telescope. http://www.eso.org/public/news/eso1036/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+EsoTopNews+%28ESO+Top+News%29



01-SEP-2010 **Making Water** Quick, what do you need to create water? Best guess, cosmically speaking, is ultraviolet light. That is what some recent evidence from the Herschel spacecraft suggests. Paul Goldsmith from NASA says "These Herschel observations confirm the surprising presence of water vapor in what we thought was an astronomical desert." Herschel is a European Space Agency mission but NASA is a major participant via JPL. <http://www.jpl.nasa.gov/news/news.cfm?release=2010-281&rn=news.xml&rst=2716>

01-SEP-2010 **Magnesium at Mercury** The MESSENGER spacecraft has detected magnesium in the exosphere of Mercury. It was expected to be most highly concentrated at the surface and then tail off exponentially. Instead, the concentration over the north pole "was hanging there at a constant density, and then all of a sudden, it dropped like a rock" according to Rosemary Killen (Goddard). The temperature in this area is many times higher than the highest surface temperature. This requires some high-energy process that is completely unknown at this time. http://www.nasa.gov/mission_pages/messenger/media/seven-things.html

20-AUG-2010 **Confirmation Cosmological** Some observations of the gravitational lensing seen in Abell 1689 have increased confidence in the cosmological model most astronomers accept. That model says that dark energy makes up about 72% of the universe, dark matter about 23% and normal (baryonic) matter only 5%. http://www.spacetelescope.org/static/archives/releases/science_papers/heic1014.pdf

19-AUG-2010 **Moon shrinking** The moon has been shrinking recently. Note that in this case "recent" means sometime in the last 1 billion years. That's important because it was thought that small bodies like the moon would completely cool and stop shrinking within 1, 2 or 3 billion years after they were formed. It is not known if the moon will shrink more but it will stop eventually. <http://lunarscience.arc.nasa.gov/articles/moon-may-still-be-contracting>

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.

Hot Dates

CalStar - Oct. 7-10. <http://www.observers.org/CalStar/>

Silicon Valley Astronomy Lecture Series, Oct. 20 at 7 p.m., Greg Laughlin on "The Ultimate Fate of the Solar System and the Music of the Spheres."

Advanced Imaging Conference, October 22-24, Santa Clara. <http://www.aicccd.com/2010/website/index.html>

Silicon Valley Astronomy Lecture Series, Nov. 17 at 7 p.m., Natalie Batalha on "An Update from the Kepler Mission: The Search for Other Earths."

Q & A

Q: What is the ranking of the following in terms of their collective weight on Earth: bacteria, humans, and ants?

A: The sum total weight of all humans now living on Earth is about the same as the total weight of ants. Bacteria, when counting all subterranean bacteria, probably has a total weight that is 10 times the weight of all humans. In fact, humans may carry nearly 10 pounds of bacteria inside of themselves. If you make that 40 pounds it would account for the anomalous gravitational readings made on my bathroom scale.

"Skeptical scrutiny is the means, in both science and religion, by which deep thoughts can be winnowed from deep nonsense." - Carl Sagan

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I prefer to get the Ephemeris newsletter in print form. 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".

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

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