PRIMEFOCUS
Tri-Valley Stargazers

July 2009

Meeting Info:

What
LCROSS Mission

Who
Brian Day

When
July 17, 2009
Doors open at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

July Meeting

LCROSS Mission
Brian Day

On June 18, 2009, NASA launched the Lunar CRater Observation and Sensing Satellite (LCROSS). This lunar impactor mission is designed to determine whether or not deposits of water ice have accumulated in permanently-shadowed craters at the Moon's south pole. LCROSS will attempt to determine this by crashing the Centaur upper stage of its Atlas V launch vehicle into one of these craters. The resulting plume of debris will be analyzed from both ground and space for evidence of water ice. Researchers believe that the impact plume may also be visible in amateur telescopes and amateurs are being asked to participate directly in the science of the mission by imaging the impact plume and sharing their observations. Now is the time to start preparing for the October 9 impact. On July 17, Brian Day, LCROSS Education and Public Outreach Lead, will present an overview of this exciting mission to the Tri-Valley Stargazers. Come learn about LCROSS and join in a discussion of how you can participate.

Artist's conception of the LCROSS satellite deploying its Atlas V vehicle on a collision course wtih the Moon.

News & Notes

New Member

TVS welcomes our newest member, **Hanbum Cho**.

2009 TVS Meeting Dates

The following lists the TVS meeting dates for the next few months. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the July 5th deadline is for the July issue).

Lecture Meeting	Board Meeting	*Prime Focus* Deadline
July 17	July 20	July 5
Aug 21	Aug 24	Aug 9
Sept 18	Sept 21	Sept 6

Money Matters

The June Board Meeting actually took place. However, Treasurer David Feindel was out of the country yet again and had to submit his report of the TVS account balances as of June 19, 2009, via e-mail.

Checking	$3.918.20	
CD #1	$3,757.66	matures 5/17/09
CD #2	$2,652.35	matures 8/27/09

We've paid our PO Box rental ($116) and our Astronomical League dues of $325.00.

Yosemite Star Party

TVS' star party at Glacier Point is coming up at the end of this month—July 31-August 1. Don't let the Waxing Gibbous Moon deter you from a great time on the Point.

TVS will be hosting the public star party at the amphitheater at Glacier Point. In exchange for giving the public a peek through our telescopes, we get free camping at the Bridalveil Campgrounds.

Saturday evening will be a potluck BBQ dinner. Dave Rodrigues is the trip coordinator, so let him know if you will be attending (or if you have questions regarding the trip). Dave can be reached at 510-410-6047.

White Mountain Star Party

This year our dates for the White Mountain trip will be Saturday, September 12 (last quarter Moon) through Sunday, September 20 (two days past new Moon). You do not have to stay for the entire week. However, Barcroft is pretty empty at that time, and if you'd like to extend your stay a bit more, they probably wouldn't mind (as long as they are told in advance).

The cost is $65/night. That will get you a bed in a dorm-style room, three meals a day (plus snacks), and indoor plumbing, all at an altitude of 12,400'. Oh, and, very dark skies. There's even an oxygen tank in the dining hall for your breathing pleasure.

Deadline for sign up is August 15. Due to the high altitude, you have to be 16 years or older to attend. Dave Rodrigues is the coordinator for the trip—510-410-6047.

NASA Lunar Party

On Saturday, August 1st, the LCROSS lunar impactor mission and the NASA Lunar Science Institute will host a public lunar observation star party at NASA Ames in conjunction with the International Year of Astronomy. They are asking members of local amateur astronomy organizations to join us them at Ames and give the public an opportunity to meet amateur astronomers, learn about local astronomy clubs, and enjoy first-hand observations of the Moon's surface through amateur telescopes. The event begins at 8:30 p.m. and will go until 11:00 p.m. Please contact Brian Day at brian.h.day <at> nasa.gov to RSVP if you can bring a telescope or if you would like more information.

Calendar of Events

July 15, 9:30 a.m. - 4:00 p.m.
What: *California Academy of Sciences Free Day!*
Who: Everyone
Where: California Academy of Sciences
Cost: Free

Free admission is available to visitors on the third Wednesday of every month. Admission is on a first come, first served basis, and early arrival is recommended due to the likelihood of high demand. Final entry to the museum on free days is 4 p.m. and there will be no members-only entrance on free days. INSIDER TIP: Crowds tend to be a little lighter in the afternoon.

July 18, 11:00 a.m. - 12:00 p.m.
What: *A Troublesome Pioneer: Galileo Galilei*
Who: Roger Hahn
Where: UC Berkeley, Genetics and Plant Biology Building, Room 100
Cost: Free

Galileo revolutionized astronomy by turning his telescope to the heavens in 1609. The full story of his achievements is replete with complications that make it difficult for modern man to realize how troublesome his discoveries

Newsletter header image: Rho Ophiuchus Nebula Region
The Rho Ophiuchus region is in the constellation of Ophiuchus. Image taken with a Canon 20Da DSLR and 300mm telephoto lens. The total exposure time was 114 minutes (19 x 6 minute exposures). Picture taken at the Golden State Star Party near Adin, CA. *Photo: Conrad Jung*

were in his own times. Many of them stem from Galileo's personality which was calculated to upset the established order; others from the changes his pioneering work forced upon traditional astronomers, and more especially upon the Catholic Church. 400 years later we picture him as a critical link in the progress of our understanding; but in his own times he was soundly criticized and properly condemned.

Limited hourly pay parking is available on weekends on and nearby campus - please check the signs. You are encouraged to take public transport—BART and bus lines are within walking distance. For more info about the talks, please visit http://astro.berkeley.edu/~scroft/iya/ .

July 18, 11:00 a.m. - 5:00 p.m.
What: *40th Anniversary Celebration of our Moon Landing Missions*
Who: Everyone
Where: Chabot Space & Science Center
Cost: General Admission ($14.95 adults; $10.95 kids)

Activities free with general admission except for *Challenger Missions.

In celebration of the 40th Anniversary of the first moon landing, Chabot will have hands-on space activities and demonstrations, special Challenger Learning Center® missions*, Discovery Lab activities for tots with astronaut costumes, starry time read-alongs and space crafts. Come hear about our own telescope Rachel's special connection to Apollo 13 along with solar viewing and activities on the observatory deck, weather permitting of course.

***Challenger Missions** - 1:00 p.m. and 3:00 p.m.
Call the Box Office at 510-336-7373 to register. Cost per mission is $5 for Members; $10 for Guests.

Challenger Learning Center offers an 60 minute opportunity to simulate a flight to the Moon. Work as on-board astronauts and mission control specialists. Build a satellite, navigate the spacecraft, test hazardous materials via robotic arm or monitor on-board life support systems. If an emergency occurs, you and your team will solve them in order to successfully complete the mission.

Kids 8 years and up accompanied by an adult throughout the entire mission. Advanced registration required.

July 24-26, 8:30 p.m.
What: *Splashdown 2009*
Who: Everyone
Where: USS Hornet Museum
Cost: Before July 17: $17
After July 17: $25

The USS Hornet Museum in Alameda will be hosting their Splashdown 2009 event to celebrate the 40th Anniversary of Apollo 11 reaching the moon. One of the Apollo 11 astronauts, Buzz Aldrin, will be the featured guest and will be present to sign his new book, *Magnificent Desolation,* on July 25th. For more information, please visit their website at http://www.uss-hornet.org or call 510-521-8448.

July 25, 8:30 p.m.
What: *Kepler's Hunt for Habitable Planets*
Who: Dr. Natalie Batalha (San Jose State University)
Where: Mt. Tam
Cost: Free

NASA's Kepler Mission has begun its 3.5-year quest for habitable planets like Earth in our galaxy. Dr. Batalha will

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Eyes on the Skies

Eyes on the Skies is a robotic solar telescope run by Mike Rushford (rushford@eyes-on-the-skies.org). You may access it by visiting www.eyes-on-the-skies.org.

TVS E-Group

So how do you join the TVS e-group, you ask? Just send an e-mail message to the TVS e-mail address (trivalleystargazers@gmail.com asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

What's Up *by Debbie Dyke*

All times Pacific Daylight unless otherwise noted.

July

10	Fri	Jupiter 34' from Neptune and 5°10' south of the Moon. 4:00 a.m.
11	Sat	Mars 4°34' south of the Pleiades. 4:00 a.m. Jupiter and Neptune continue to hang out close together in the sky. 11:00 p.m. 1979 Skylab re-enters the Earth's atmosphere.
13	Mon	The Moon is 4° from Antares. 10:00 p.m. Mercury in superior conjunction. 7:00 p.m.
15	Wed	**Last Quarter Moon**. 2:53 a.m.
16	Thur	1994 Comet Shoemaker-Levy 9 begins plunging into Jupiter. The plunging continues through the 20th.
17	Fri	**Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore. 1850 First photo of a star (Vega).
18	Sat	Mercury at greatest heliocentric latitude north. Moon 5°38' north of the Pleiades (M45). 4:00 a.m. 1921 John Glenn born.
19	Sun	Venus 6°48' south of the Moon. 4:00 a.m.
20	Mon	**Tri-Valley Stargazers Board meeting**. 7:30 p.m. at the Round Table Pizza in Livermore. 1969 Apollo 11 lands at Tranquillity, placing the first men on the Moon. 1976 Viking 1 makes first robotic landing at Chryse Planitia on Mars.
21	Tue	**New Moon**. 7:35 p.m. Moon at perigee (221,627 miles). Expect large tides. **Total Solar eclipse** visible in India, China, a few Japanese and South Pacific islands. Maximum duration is over 6 minutes. 1925 John Scopes convicted for teaching evolution.
23	Thur	1995 Alan Hale discovers his half of Comet Hale-Bopp.
26	Sun	Moon 1° from M104 Sombrero Galaxy. 10:00 p.m.
27	Mon	Mars 5° north of Aldebaran. 4:00 a.m.
28	Tue	**First Quarter Moon**. 3:00 p.m. S. Delta-Aquarid meteor shower peaks. 8:00 p.m. 1851 First photo taken of a solar eclipse—the corona is discovered.
30	Thur	1971 Apollo 15 lands on the Moon.
31	Fri	Antares 0.5° south of the Moon. 9:00 a.m. TVS Yosemite Star Party tonight and tomorrow night. 1774 Oxygen is discovered. Everyone takes a deep breath of relief.

August

1	Sat	1818 Maria Mitchell born. She receives a gold medal from the king of Denmark who had offered the medal to a person who discovered a comet seen only through a telescope.
3	Mon	Moon at apogee (251,737 miles). 6:00 p.m.
5	Wed	**Full Moon**. 5:55 p.m. 1930 Neil Armstrong born.
11	Tue	1877 Asaph Hall Sr. discovers Mars' moon Deimos.

The Cool Chemistry of Alien Life

Alien life on distant worlds. What would it be like? For millennia people could only wonder, but now NASA's Spitzer Space Telescope is producing some hard data. It turns out that life around certain kinds of stars would likely be very different from life as we know it.

Using Spitzer, astronomers have discovered the organic chemical acetylene in the planet-forming discs surrounding 17 M-dwarf stars. It's the first time any chemical has been detected around one of these small, cool stars. However, scientists are more intrigued by what was not there: a chemical called hydrogen cyanide (HCN), an important building block for life as we know it.

"The fact that we do not detect hydrogen cyanide around cool stars suggests that that prebiotic chemistry may unfold differently on planets orbiting cool stars," says Ilaria Pascucci, lead scientist for the Spitzer observations and an astrophysicist at Johns Hopkins University in Baltimore, Maryland.

That's because HCN is the basic component for making adenine, one of the four information-carrying chemicals in DNA. All known life on Earth is based on DNA, but without adenine available, life in a dwarf-star solar system would have to make do without it. "You cannot make adenine in another way," Pascucci explains. "You need hydrogen cyanide."

M-dwarf and brown dwarf stars emit far less ultraviolet light than larger, hotter stars such as our sun. Pascucci thinks this difference could explain the lack of HCN around dwarf stars. For HCN to form, molecules of nitrogen must first be split into individual nitrogen atoms. But the triple bond holding molecular nitrogen together is very strong. High-energy ultraviolet photons can break this bond, but the lower-energy photons from M-dwarf stars cannot.

Do alien planets around other stars have the right ingredients for a pre-biotic soup?

"Other nitrogen-bearing molecules are going to be affected by this same chemistry," Pascucci says, possibly including the precursors to amino acids and thus proteins.

To search for HCN, Pascucci's team looked at data from Spitzer, which observes the universe at infrared wavelengths. Planet-forming discs around M-dwarf stars have very faint infrared emissions, but Spitzer is sensitive enough to detect them.

HCN's distinctive 14-micron emission band was absent in the infrared spectra of the M-dwarf stars, but Spitzer did detect HCN in the spectra of 44 hotter, sun-like stars.

Infrared astronomy will be a powerful tool for studying other prebiotic chemicals in planet-forming discs, says Pascucci, and the Spitzer Space Telescope is at the forefront of the field. Spitzer can't yet draw us a picture of alien life forms, but it's beginning to tell us what they could—and could not—be made of. "That's pretty wonderful, too," says Pascucci.

For news of other discoveries based on Spitzer data, visit www.spitzer.caltech.edu. Kids can learn Spitzer astronomy words and concepts by playing the Spitzer "Sign Here!" game at spaceplace.nasa.gov/en/kids/spitzer/signs.

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

Calendar of Events *continued*

describe how and where the spacecraft will look for planets we might call home and what to expect in the coming years as we work to understand whether Earth-like planets in our galaxy are common or rare.

August 3, 7:30 p.m. - 9:00 p.m.
What: *Astrobiology, Planetary Protection, and Hitchikers in the Solar System*
Who: Margaret Race (SETI Institute)
Where: California Academy of Sciences
Cost: Adults $10, Seniors $8, Members $5

This talk will provide a behind-the-scene view of how experts from many different disciplines contribute to searches for extraterrestrial life—and also explain how the Outer Space Treaty and planetary protection policies urge "responsible exploration" when visiting other planets. The breadth and depth of pre-planning may surprise you.

Advance tickets are recommended. Buy tickets online or call 800-794-7576 for reservations. Tickets may be purchased at the door, but there's no guarantee of availability.

Tri-Valley Stargazers
P.O. Box 2476
Livermore, CA 94551

PRIMEFOCUS

Tri-Valley Stargazers Membership Application

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function.

Name _____ Phone _____ e-mail _____

Address _____

Do not release my: _____ address, _____ phone, or _____ e-mail information to other TVS members.

Membership category: _____ $5 Student.
_____ $30 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.
_____ $40 Regular. You will receive a paper version of *Prime Focus* in the mail.
_____ $10 Hidden Hill Observatory (H2O) yearly access fee. You need to be a key holder to access the site.
_____ $20 H2O key holder fee. (A refundable key *deposit*—key property of TVS).
_____ $40 Patron Membership. Must be a member for at least a year and a key holder.
_____ $34 One year subscription to *Astronomy* magazine.
_____ $60 Two year subscription to *Astronomy* magazine.
_____ $32.95 One year subscription to *Sky & Telescope* magazine. **Note**: Subscription to *S&T* is for new subscribers only. Existing subscribers please renew directly through *S&T*.
$_____ Tax deductible contribution to Tri-Valley Stargazers.

$_____ TOTAL – Return to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551

Membership information: Term is one calendar year, January through December. Student members must be less than 18 years old or still in high school.