

PRIMEFOCUS

Tri-Valley Stargazers

October 2009



Meeting Info:

What

Stellar Archaeology in the Magellanic Clouds

Who

Dr. Jason Harris

When

October 16, 2009

Doors open at 7:00 p.m.
Lecture at 7:30 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

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October Meeting

Stellar Archaeology in the Magellanic Clouds

Dr. Jason Harris

As we enter the Petabyte Age of science, novel statistical techniques and vast data sets are bringing new levels of understanding to some of the biggest questions in astronomy. Among these is the question: what are the agents which drive star formation in galaxies? Dr. Harris will present results from the Magellanic Clouds Photometric Survey, which has provided four-color photometry for tens of millions of stars in both the Large and Small Magellanic Clouds — the most complete census to date of a galaxy's stellar content. A data set like this enables statistical techniques which unlock the entire history of star formation in these galaxies, and provide exciting insights into the forces that have shaped the evolution of these nearby and yet enigmatic galaxies.

Jason Harris earned his Ph.D. at U.C. Santa Cruz in 2000. After a three-year postdoc at the Space Telescope Science Institute in Baltimore, he was awarded a Hubble Fellowship, which he took to the University of Arizona. He was then an assistant astronomer at the National Optical Astronomy Observatory, where he worked on the SAGE project, a Spitzer infrared survey of the Large Magellanic Cloud. He is now an engineer at Illumina, Inc. in Hayward, developing next-generation instruments for DNA sequencing.



The Large and Small Magellanic Clouds as seen from the Cerro Tololo Inter-American Observatory (CTIO) in Chile. The observatory in the foreground is the 4-meter Blanco Telescope. Photo: Roger Smith, AURA, NOAO, NSF

News & Notes

New Member

TVS welcomes our newest members, **Tony de la Cruz** and **Albert Forster**.

2009 TVS Meeting Dates

The following lists the TVS meeting dates for the rest of the year. 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 December 6th deadline is for the December issue).

| Lecture Meeting | Board Meeting | Prime Focus Deadline |
|-----------------|---------------|----------------------|
| Oct. 16 | Oct. 19 | Oct. 4 |
| Nov. 20 | Nov. 23 | Nov. 8 |
| Dec. 18 | Dec. 21 | Dec. 6 |

Money Matters

At the September Board Meeting, Treasurer David Feindel left word of the TVS account balances as of September 13th, 2009:

| | |
|----------|-----------------------------|
| Checking | \$3,809.66 |
| CD #1 | \$3,758.60 matures 11/17/09 |
| CD #2 | \$2,653.02 matures 11/27/09 |

LCROSS Mission Impact - October 9

On Friday, October 9th, 2009, at 4:30 a.m. (+/- 30 minutes), a part of the Centaur rocket that carried the Lunar Crater Observation and Sensing Satellite (LCROSS) to the Moon will impact the lunar surface, on purpose. The impact should be visible with telescopes 10-12" or larger.

The selected impact spot will be the crater Cabeus. Preliminary data from other spacecraft indicate that crater has the highest concentration of hydrogen in the lunar south pole, which bodes well for their search for water.

NASA will be broadcasting the event live starting at 3:15 a.m. on NASA TV and <http://www.nasa.gov/ntv>. The main NASA LCROSS page is at http://www.nasa.gov/mission_pages/LCROSS/main/index.html.

Amateur astronomers are encouraged to watch and record the impact, and report what they were able to see through their telescopes. If you would like to participate, visit <http://lcross.arc.nasa.gov/observation.htm> to get all the details. Another web site with information about the program is http://www.nasa.gov/mission_pages/LCROSS/main/observing_the_impacts.html. For still more info, see http://science.nasa.gov/headlines/y2009/05oct_lcrossvg.htm?list1055969.

If you are lucky enough to be able to see the debris cloud rise up from the Moon, please be sure to submit your observations to the team.

Astro Events

Jupiter Transits

The following are a few listings of transit times for various Jupiter related objects. The abbreviations are: G=Ganymede, C=Callisto, I=Io, E=Europa, GRS=Great Red Spot, and if you see a 's' next to one of the moons, it means its shadow (e.g., Is=Io's shadow); na means Jupiter is below the horizon or it is daylight at that time.

October

| | | | | |
|---------|-----|--------|--------|--------|
| Thur 8 | Gs | 7:51p | 9:20p | 11:25p |
| Fri 9 | GRS | 8:40p | 10:35p | 12:35a |
| Sat 10 | I | 9:25p | 10:35p | 11:40p |
| | Is | 10:34p | 11:34p | 12:48a |
| Sun 11 | E | 9:55p | 11:15p | 12:43a |
| | GRS | 10:30p | 12:21a | na |
| Mon 12 | Is | na | na | 7:17p |
| | GRS | 7:00p | 8:09p | 9:58p |
| Wed 14 | Cs | na | 7:15p | 9:55p |
| | GRS | 8:05p | 9:45p | 11:45p |
| Thur 15 | G | 7:00p | 8:43p | 10:35p |
| | Gs | 11:51p | 1:25a | na |
| Fri 16 | GRS | 9:40p | 11:23p | 1:26a |
| Sat 17 | GRS | na | 7:22p | 9:15p |
| | I | 11:17p | 12:15a | 1:30a |
| | Is | 12:30a | 1:30a | na |
| Mon 19 | I | na | 6:50p | 8:01p |
| | Is | 6:59p | 7:55p | 9:12p |
| | GRS | 7:10p | 8:58p | 10:55p |
| Wed 21 | GRS | 8:46p | 10:39p | 12:35a |
| Fri 23 | GRS | 10:27p | 12:23a | na |
| Sat 24 | GRS | na | 8:04p | 10:05p |
| Mon 26 | I | 7:38p | 8:42p | 9:54p |
| | GRS | 8:00p | 9:47p | 11:40p |
| | Is | 8:54p | 9:54p | 11:09p |
| Thur 29 | GRS | na | 7:12p | 9:05p |
| | Es | na | 7:49p | 9:30p |
| Fri 30 | C | 10:56p | na | na |
| | GRS | 11:19p | na | na |
| Sat 31 | GRS | 7:00p | 8:44p | 10:50p |

Newsletter header image: M17 / NGC 6618 - The Omega Nebula (aka the Swan Nebula)

M17 is located in the constellation Sagittarius, about 5,000 light years away. It is an emission nebula, with the stars that are forming inside causing the nebula to glow.

Image taken an ST10XME 1x1 -15C camera and a 5" f/6.3 APO. (HR)GB 90:30:30:50 min. Picture taken at the H2O Open House, August 2009. Photo: Gert Gottschalk

Calendar of Events

October 17, 11:00 a.m. - 12:00 p.m.

What: *Fascinating Objects in our Solar System*
Who: Imke de Pater (UC Berkeley)
Where: UC Berkeley, Genetics and Plant Biology Building, Room 100
Cost: Free

Our Solar System is comprised of bodies varying in size from the giant planet Jupiter, 12 times larger than our Earth, down to bodies less than a few kilometers in size, and further down to microscopically small dust grains. The planets and their satellites are now known to us as individual worlds, some of which show similarities to Earth (e.g., Titan, Mars), whereas others exhibit such extreme volcanism that even the largest volcanoes on Earth are dwarfed in comparison (Io, Enceladus). The giant planets are surrounded by rings, systems which are unique to each planet. In these systems we observe details that help us understand the physical processes in the early solar nebula that led to planet formation 4.5 billion years ago, which are still now operational in disks around other stars. Once in a while comets approach the Sun and exhibit fantastic displays. Remote observations and in situ analysis of cometary gases and dust grains help us understand the early epoch of planet formation in our Solar System.

In this talk Prof. de Pater will give you a tour through our Solar System. Using her team's observations from the 10-m Keck telescope, together with Hubble Space Telescope and spacecraft data, she will give you an up-to-date picture of several of the most fascinating objects therein.

Limited hourly pay parking is available on weekends on and nearby campus - please check the signs. For more info about the talks, please visit <http://astro.berkeley.edu/~scroft/iya/>.

October 19, 7:30 p.m.

What: *Exploring the Extreme Universe with Fermi*
Who: Prof. Lynn Cominsky (Dept of Physics and Astronomy, Sonoma State University)
Where: Cal Academy of Sciences, SF
Cost: Adults \$12, Seniors \$10, Academy members \$6
Seating is limited. To purchase tickets in advance, go online or call 800-794-7576.

NASA's Fermi Gamma-ray Space Telescope (formerly known as GLAST) mission was launched into orbit on June 11, 2008. Its mission is to explore the most energetic and exotic objects in the cosmos: blazing galaxies, intense stellar explosions and super-massive black holes. Using experimental technologies developed by high energy particle physicists, Fermi's astrophysical observations are being conducted by international and multi-agency teams including hundreds of scientists world-wide. Prof. Cominsky will explain how Fermi uses matter and anti-matter pair production to track gamma rays to their cosmic locations, and will showcase the first exciting results from the mission.

October 24, 7:30 p.m.

What: *The Dawn of the LHC Era: The Convergence of Particle Physics and Astrophysics*
Who: Professor Michael Dine (UC Santa Cruz)
Where: Mt. Tam
Cost: Free

Over the past year, the Large Hadron Collider, an extraordinary scientific instrument, has begun to operate in Geneva. It offers the possibility of answering some of the great questions we confront in understanding the universe, including the identity of the dark matter and the asymmetry between matter and antimatter.

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Lecture Meeting:
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1893 N. Vasco Road, Livermore

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1024 E. Stanley Blvd., Livermore

Web & E-mail

www.trivalleystargazers.org
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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 October times Pacific Daylight, all November times Pacific Standard, unless otherwise noted.

October

- 7 Wed The Moon is 5° north of the Pleiades. 10:00 p.m.
8 Thur Draconid meteor shower peaks. 12:00 a.m.
Mercury $26'$ below Saturn low in the east. Venus is $5^{\circ}47'$ above the pair. 7:00 a.m.
9 Fri Moon 1° north of M35 as they rise together. 11:00 p.m.
11 Sun **Last Quarter Moon.** 1:56 a.m.
1968 First manned Apollo flight launched.
12 Mon Columbus Day.
13 Tue Jupiter stationary. 2:00 a.m.
Moon at perigee (228,821 miles). 5:00 a.m.
Venus $31'$ south of Saturn. 6:00 a.m.
14 Wed Mercury at greatest heliocentric latitude north.
15 Thur During the next two weeks, look for the Zodiacal Light in the east before morning twilight.
16 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
17 Sat **New Moon.** 10:33 p.m.
19 Mon **Tri-Valley Stargazers Board meeting.** 7:30 p.m. at the Round Table Pizza on 1024
E. Stanley Blvd.
21 Wed Orionid meteor shower peak. 3:00 a.m.
22 Thur 4000 BC The world was created, according to James Ussher, archbishop of Ireland.
1975 Venera 9 becomes first spacecraft to return images of the surface of Venus.
24 Sat 3936 BC According to Johannes Hevelius, the world was created on this date at 6:00 p.m.
25 Sun Venus at greatest heliocentric latitude north.
Moon at apogee (250,582 miles). 4:00 p.m.
First Quarter Moon. 5:42 p.m.
26 Mon Jupiter $2^{\circ}48'$ south of the Moon. 9:00 p.m.
31 Sat **Halloween.**
1992 The Vatican absolves Galileo of all heresy charges.

November

- 1 Sun Mars in the Beehive Cluster (M44) as they rise in the east. 1:00 a.m. PDT
Daylight Saving Time ends. 2:00 a.m. PDT Yea!
2 Mon **Full Moon.** 11:14 a.m.
1885 Harlow Shapley born.
1917 First light for Mt. Wilson's 100-inch Hooker telescope.
3 Tue Moon $43'$ south of the Pleiades (M45). 8:00 p.m.
4 Wed Neptune stationary. 11:00 a.m.
5 Thur Mercury in superior conjunction. 12:00 a.m.
S. Taurid meteors peak. 2:00 a.m.
6 Fri Moon $50'$ north of M35. 5:00 a.m.
Moon at perigee (228,719 miles) 11:00 p.m.
7 Sat 1991 The 10-meter Keck Telescope dedicated on Mauna Kea, Hawai'i.
9 Mon **Last Quarter Moon.** 7:56 a.m.
1934 Carl Sagan born.

Sptizer, the Sequel

The Spitzer Space Telescope is getting a second chance at life.

The liquid helium “lifeblood” that flows through the telescope has finally run out, bringing Spitzer’s primary mission to an end. But a new phase of this infrared telescope’s exploration of the universe is just beginning.

Even without liquid helium, which cooled the telescope to about 2 degrees above absolute zero (-271°C), Spitzer will continue to do important research—some of which couldn’t easily be done during its primary mission. For example, scientists will use Spitzer’s “second life” to explore the rate of expansion of the universe, study variable stars, and search for near-Earth asteroids that could pose a threat to our planet.

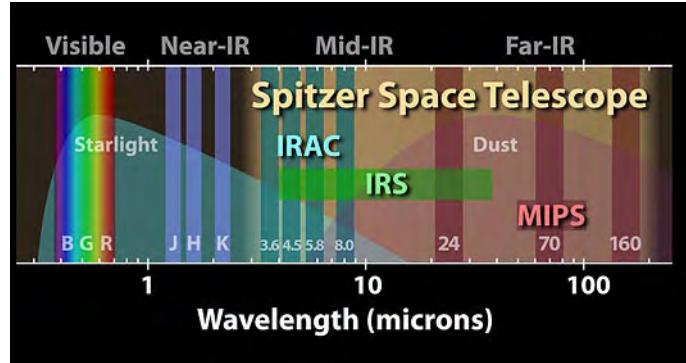
“We always knew that a ‘warm phase’ of the mission was a possibility, but it became ever more exciting scientifically as we started to plan for it seriously,” says JPL’s Michael Werner, Project Scientist for Spitzer. “Spitzer is just going on and on like the Energizer bunny.”

Launched in August 2003 as the last of NASA’s four Great Observatories, Spitzer specializes in observing infrared light, which is invisible to normal, optical telescopes.

That gives Spitzer the power to see relatively dark, cool objects such as planet-forming discs or nearby asteroids. These objects are too cold to emit light at visible wavelengths, but they’re still warm enough to emit infrared light.

In fact, all warm objects “glow” with infrared light—even telescopes. That’s why Spitzer had to be cooled with liquid helium to such a low temperature. Otherwise, it would be blinded by its own infrared glow.

As the helium expires, Spitzer will warm to about 30 degrees above absolute zero (-243°C). At that temperature, the telescope will begin emitting long-wavelength



The “warm mission” of the Spitzer Space Telescope will still be able to use two sensors in its Infrared Array Camera (IRAC) to continue its observations of the infrared universe.

infrared light, but two of its short-wavelength sensors will still work perfectly.

And with more telescope time available for the remaining sensors, mission managers can more easily schedule new research proposals designed for those sensors. For example, scientists have recently realized how to use infrared observations to improve our measurements of the rate of expansion of the universe. And interest in tracking near-Earth objects has grown in recent years—a task for which Spitzer is well suited.

“Science has progressed, and people always have new ideas,” Werner says. In its second life, Spitzer will help turn those ideas into new discoveries.

For kids, The Space Place Web site has a fun typing game using Spitzer and infrared astronomy words. Check it out 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*

October 30, 6:00 - 10:00 p.m.

What: *Things That Go Bump in the Night*

Who: You

Where: Chabot Space & Science Center

Cost: \$20 Adults, \$15 Students, \$8 Members

Box Office: (510) 336-7373

Let kids of all ages wear their costumes a day early and experience Chabot from a different vantage point. Featuring live music from BandWorks School of Rock, costume contest, spooky beverages, views of the cosmos (weather permitting), and a special haunt jaunt crawl of things that go bump in the night. Dinner available in the Starlight Bistro or Celestial Café.

October 31, 11:00 a.m. - 5:00 p.m.

What: *Sinister Science Saturday: Aliens, Asteroids, and Adventure, Oh My!*

Who: You

Where: Chabot Space & Science Center

Cost: FREE with General Admission except for missions.

Missions at 1 & 3 p.m. \$10 guests, \$5 members.

Advanced registration required for missions

Box Office: (510) 336-7373

Trick or treat at Chabot! Drink some spooky punch and participate in hands-on activities. Enjoy guest appearances by costumed friends. Discovery lab activities for tots with costumes, spooky read-alongs and much more. Plus, fly a simulated space flight and experience some spooky space encounters in our Challenger Learning Center.

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.