

PRIME FOCUS

Tri-Valley Stargazers

June 2007



Meeting Info:

What

Summer BBQ

Who

You

When

June 15, 2007

Set up at 6:30 p.m.

Dinner at 7:00 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

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June Meeting

TVSers and Friends
Summer BBQ

The Summer Solstice is fast approaching (June 21st, 11:06 a.m.), so it must be time for our annual Summer BBQ.

We'll be starting a little earlier—set up will be at 6:30, eating at 7:00 p.m. TVS will provide the usual: hamburgers, veggie burgers, soft drinks, condiments, and plasticware. We ask members to bring in a side dish or dessert.

General rule of thumb is bring enough to feed eight people. As to what to bring, check the chart below. Use the first letter of your last name to determine which type of side dish to bring.

A-F	Green or Fruit Salad
G-L	Macaroni or Potato Salad
M-R	Appetizers
S-Z	Dessert

After dinner, if the skies are clear and the ever increasing light pollution manageable, we'll pull out our loaner scopes and do a little stargazing.



Science Night

TVS members **Chuck Grant** and **Dave Woolsey** were on hand at the Croce Elementary School's Science Night to show 200-300 students views through their telescopes. Chuck had his PST for an hour of solar flare observing, and Dave had two scopes, an 8" and a 4.5", for lunar and Saturnian viewing. Despite the fact that most of the Science Night took place during daylight, kids and their parents were still able to see astronomical objects through telescopes.



Dave Woolsey proves to hundreds of kids that yes indeed, you can see the Moon during the day.



News & Notes

2007 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 June 3rd deadline is for the June issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
June 15	June 18	June 3
July 20	July 23	July 8
Aug. 17	Aug. 20	Aug. 5

Money Matters

Our May board meeting was cancelled due to a lack of a quorum. However, our Treasurer, **David Feindel**, reports the TVS account balances (as of May 19 2007):

Checking	\$4,011.77	
CD #1	\$3,629.19	matures 08/17/07
CD #2	\$2,548.14	matures 05/27/07



Dave Rodrigues (the Astro Wizard!), Carter Roberts, Steve Edberg

Local Boys Make Good

As mentioned in the April issue of *Prime Focus*, TVS member and EAS President **Carter Roberts** was awarded the WAA's G. Bruce Blair award at this year's RTMC (Riverside Telescope Makers Conference). Another TVS and EAS member, **Dave Rodrigues**, also received an award—the Clifford Holmes Award—for being a major contributor to popularizing astronomy. Congratulations to both for receiving such well-deserved awards.

Club Star Party Trips

The H2O Open House nights are on Saturday, June 9th and Saturday, July 7. We'll meet at the corner of Mines and Tesla to caravan down to the site (an hour's drive away). Check the TVS web site for meeting times.

The Yosemite Star Party takes place during the Labor Day weekend (August 31st through September 2nd).

The White Mountain/Barcroft high altitude trip is from September 4th through the 15th, with a final departure date of the 16th. The cost is \$63 per person per day, which includes room and board. Attendees can choose how many days they would like to stay.

If you need more information, or want to sign up for either trip, contact **Dave Rodrigues** at 510-483-9191.

Jupiter Transits

The following are a few listings of transit times for various Jupiter related objects. The abbreviations are fairly straight forward: 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., Cs=Callisto's shadow); na means Jupiter is below the horizon or it is daylight at that time.

June

Fri 8	GRS	11:35p	1:30a	3:40a
Sat 9	G	12:30a	1:30a	2:43a
	Gs	12:48a	1:45a	3:09a
	I	2:12a	3:08a	4:23a
	Is	2:16a	3:14a	4:28a
	GRS	na	9:26p	11:25p
Sun 10	I	8:40p	9:40p	10:50p
	Is	8:46p	9:52p	10:57p
Mon 11	GRS	9:10p	11:08p	1:00a
Tue 12	E	12:08a	1:22a	2:41a
	Es	12:27p	1:38a	3:00a
Thur 14	GRS	na	8:30p	10:30p
Sat 16	GRS	12:14a	2:20a	4:20a
	G	3:54a	4:50a	na
	I	3:57a	na	na
	Is	4:12a	na	na
	Gs	4:50a	na	na
Sun 17	GRS	8:50p	10:11p	12:08a
	I	10:24p	11:29p	12:34a
	Is	10:40p	11:44p	12:51a

For more Jupiter transits, visit the TVS web site and click on the Calendar link.

Newsletter header image: NGC 4565, the Needle Galaxy
NGC 4565 is a spiral galaxy located in the constellation of Coma Berenices. It is about 30 million light-years away and is about 100,000 light years in diameter.

The image of NGC4565 was taken 15 April 2007 with a ST-2000XM, Takahashi FS-102 at f/6; L(24x5min), RGB(8x5min, 2x2 bin), and Lucy-Richardson deconvolution was applied.
Photo: Ken Sperber

Calendar of Events

June 17, 1:30 - 3:30 p.m.

What: *Father's Day Mission to Mars*
Who: You
Where: Chabot Space & Science Center, Oakland
Cost: \$30 Regular, \$25 Member
 Call 510-336-7311 for reservations or e-mail
groupsales@chabot.space.org.

Register now for your space on a simulated space mission to the Red Planet. Your adventure includes edible outer space treats, General Admission to Chabot and a souvenir of your trip!

June 22, 8:00 - 11:00 p.m.

What: *Lunar Lounge Express*
Who: You
Where: Chabot Space & Science Center, Oakland
Cost: Lunar Lounge: \$15 Adult, \$10 Student, \$8 Member
 Lunar Lounge + Mission: \$23 Adult, \$18 Student, \$16 Member.
 Space is limited! Call the Box Office at 510-336-7373 for reservations.

Bring your friends and come party under the stars at Chabot's monthly nocturnal celebration—The Lunar Lounge Express!

The Lunar Lounge Express

Featuring live music, refreshments, activities and fun! The Lunar Lounge Express gives you full access to the Chabot Space & Science Center's interactive exhibits and includes the Planetarium program SonicVision (a new alternative music show), as well as telescope viewing at the Observatory Complex.

There will be two musical acts for the evening:

Terrance Brewer is a jazz guitarist performing classic jazz, swing, blues and Latin standards. He's on from 8:00 to 9:30 p.m.

The Variable Stars are like Belle & Sebastian meet The Smiths. Poppy and catchy indie rock. They're on from 9:30 to 11:00 p.m.

You can purchase food from the Celestial Café, and enjoy \$3 micro-brews from Buffalo Bill's Brewery and \$3 wine from the cash bar.

For an additional \$8 you can add a Space Mission!

Comet Collision

Don't miss your chance to embark on a daring exploration of comets aboard the C.L.C. Spacecraft! The mission's objective is to plot a course to rendezvous with a comet and launch a probe to collect scientific data. Drinks will be served during the mission briefing. To complete your mission, your team of astronauts must overcome any unforeseen challenges and unexpected emergencies. The Mission lasts for one hour.

June 23, 8:30 p.m.

What: *The Birth of the Universe*
Who: Dr. Alex Fillipenko (UC Berkeley)
Where: Mt. Tam Mountain Theatre
Cost: Free

Prof. Alex Fillipenko of UC Berkeley will discuss *The Birth of the Universe*. He will present evidence in favor of a Big Bang origin for the cosmos—a hot, dense beginning with an inflationary expansion. He will also discuss recent theories suggesting that our universe may be only one of

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Lecture Meeting:
 Unitarian Universalist Church
 1893 N. Vasco Road, Livermore

Board & Discussion Meetings:
 Round Table Pizza
 1024 E. Stanley Blvd., Livermore

Web & E-mail

www.trivalleystargazers.org
tvst@trivalleystargazers.org

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 (tvst@trivalleystargazers.org) 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 Time.

June

- 8 Fri **Last Quarter Moon.** 4:43 p.m.
Uranus 1.5° south from the Moon. 4:00 a.m.
- 10 Sun The crescent Moon is 5° from Mars. 5:00 a.m.
- 12 Tue Moon at perigee (225,543 mi.) 10:00 a.m.
Venus just 1° from the Beehive Cluster (M44) in the evening sky.
- 13 Wed **The waning crescent Moon passes through the Pleiades in the early morning sky.**
1944 JPL was formed, originally called Air Corps Jet Propulsion Research Project.
- 14 Thur **New Moon.** 8:13 p.m.
- 15 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
- 16 Sat 1963 Valentina Tereshkova becomes the first woman in orbit.
- 17 Sun **Tri-Valley Stargazers discussion meeting.** 2:00 p.m. at the Round Table Pizza on 1024
E. Stanley Blvd., Livermore. Discuss astro stuff with your fellow members.
The Moon is just 2° from the Beehive Cluster (M44). 10:00 p.m.
Father's Day.
- 18 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.
The waxing crescent Moon is sandwiched in between Venus and Saturn. 9:00 p.m.
1983 Sally Ride becomes the first U.S. woman in space, 20 years after USSR sent Valentina up for a spin.
- 19 Tues The Moon occults Regulus (1.3 mag). Regulus disappears at 4:40 p.m., then reappears at 6:03 p.m.
- 21 Thur **Summer Solstice.** 11:06 a.m.
- 22 Fri **First Quarter Moon.** 6:15 a.m.
1675 Royal Greenwich Observatory founded.
1978 James Christy discovers Pluto's satellite Charon.
- 23 Sat The Moon 4° from the bright star Spica. 10:00 p.m.
- 24 Sun Moon at apogee (250,814 mi.) 7:00 a.m.
- 25 Mon 1178 Five British monks observe an impact on the crescent Moon. Theory has it that the resulting
crater is the one we know as Giordano Bruno.
- 26 Tue 1730 Charles Messier born.
- 29 Fri Venus and Saturn slowly pass by each other in the next few nights. They are closest together on the 30th.
- 30 Sat **Full Moon.** 6:49 a.m.
1905 Einstein submits his new theory of special relativity.
1908 After a flash of light, a loud boom and many flattened trees, it was determined that an asteroid
broke up and exploded over Siberia near Tunguska with the force of a hydrogen bomb.

July

- 4 Wed Independence Day.
1054 Chinese astronomers, and possibly Native Americans, observe the Crab Nebula supernova.
1868 Henrietta Swan Leavitt born. Henrietta discovered over 2,400 variable stars and the relationship
between period and luminosity in Cepheid variables.
1997 Mars Pathfinder lands on Mars.
- 7 Sat **Last Quarter Moon.** 9:54 a.m.
- 9 Mon The crescent Moon 5.5° from Mars. 5:00 a.m.
- 10 Tue The crescent Moon 5° from the Pleiades (M45). 4:00 a.m.
- 16 Mon The waxing crescent Moon is sandwiched in between Venus and Saturn. 9:00 p.m.

The Ions of Dawn

by Patrick L. Barry

This summer, NASA will launch a probe bound for two unexplored worlds in our solar system's asteroid belt—giant asteroids Ceres and Vesta. The probe, called Dawn, will orbit first one body and then the other in a never-before-attempted maneuver.

It has never been attempted, in part, because this mission would be virtually impossible with conventional propulsion. “Even if we were just going to go to Vesta, we would need one of the largest rockets that the U.S. has to carry all that propellant,” says Marc Rayman, Project System Engineer for Dawn at JPL. Traveling to both worlds in one mission would require an even bigger rocket.

This is a trip that calls for the unconventional. “We’re using ion propulsion,” says Rayman.

The ion engines for the Dawn spacecraft proved themselves aboard an earlier, experimental mission known as Deep Space 1 (DS1). Because ion propulsion is a relatively new technology that’s very different from conventional rockets, it was a perfect candidate for DS1, a part of NASA’s New Millennium Program, which flight-tests new technologies so that missions such as Dawn can use those technologies reliably.

“The fact that those same engines are now making the Dawn mission possible shows that New Millennium accomplished what it set out to,” Rayman says.

Ion engines work on a principle different from conventional rockets. A normal rocket engine burns a chemical fuel to produce thrust. An ion engine doesn’t burn anything; a strong electric field in the engine propels charged

atoms such as xenon to very high speed. The thrust produced is tiny—roughly equivalent to the weight of a piece of paper—but over time, it can generate as much speed as a conventional rocket while using only about 1/10 as much propellant.

And Dawn will need lots of propulsion. It must first climb into Vesta’s orbit, which is tilted about 7 degrees from the plane of the solar system. After studying Vesta, it will have to escape its gravity and maneuver to insert itself in an orbit around Ceres—the first spacecraft to orbit two distant bodies. Dawn’s up-close views of these worlds will help scientists understand the early solar system.

“They’re remnants from the time the planets were being formed,” Rayman says. “They have preserved a record of the conditions at the dawn of the solar system.”

Find out about other New Millennium Program validated technologies and how they are being used in science missions at <http://nmp/TECHNOLOGY/infusion.html>. While you’re there, you can also download “Professor Starr’s Dream Trip,” a storybook for grown-ups about how ion propulsion enabled a scientist’s dream of visiting the asteroids come true. A simpler children’s version is available at <http://spaceplace.nasa.gov/en/kids/nmp/starr>.

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*

many. Prof. Fillipenko is a favorite repeat speaker on the mountain, and his talks always entertain and elucidate.

Carpool with your friends, bring flashlights and dress warmly. It can be cold sitting on rocks! All programs are free, and we encourage you to bring students and family members of all ages. Telescope viewing will follow the program, weather permitting, until about 11:00 p.m. in the Rock Springs Parking Lot.

If the weather is questionable on the day of the program, call the SFAA hotline at 289-6636 (the Astronomy hotline will not be changed on this program). Usually the program goes even if the sky is not inviting for observing. And remember that when the fog comes in we are usually above it and welcome it to block out the lights of San Francisco.

Programs sponsored by your State Park, organized by the Mount Tamalpais Interpretive Association with viewing conducted by the San Francisco Amateurs.

More information and directions are at www.mttam.net.



Artist’s rendering of Dawn spacecraft, with asteroids. Largest are Vesta and Ceres. Credits: Dawn spacecraft—Orbital Sciences Corporation; background art—William K. Hartmann, courtesy UCLA.

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.
_____ \$32.95 One year subscription to *Sky & Telescope* magazine.
_____ \$34 One year subscription to *Astronomy* magazine.
_____ \$60 Two year subscription to *Astronomy* magazine.
_____ \$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.
\$ _____ 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.

BENJAMIN DEAN LECTURES

Fall/Winter 2006/2007 Series

All programs begin at 7:30 pm in Kanbar Hall at the Jewish Community Center of San Francisco, 3200 California Street. Tickets are \$4 at the door or by mail. For more information, call (415) 321-8000.

New Location:

During the reconstruction of the Academy, the Dean Lectures have temporarily moved to the San Francisco Jewish Community Center at 3200 California Street (at Presidio Avenue). Parking is available across the street in the UCSF Laurel Heights campus parking lot for \$1.25 per night. Parking in the JCC garage is \$1.25 per half-hour. The #1 California, #3 Jackson, #4 Sutter, and #43 Masonic MUNI lines stop directly in front of the building. The #38 Geary and #24 Divisadero buses stop only a few blocks away.

No more lectures until November.

REMINDER: The next lecture in the fall series is Monday, November 27 at 7:30pm at the Jewish Community Center, 3200 California Ave. Dr. George Rieke will speak about the Spitzer Space Telescope.

2006 MT TAM ASTRONOMY PROGRAMS

Telephone:

(415) 388-2070 (Pantoll Ranger Station)

(415) 455-5370 (taped message, after 4:00pm)

San Francisco Amateur Astronomers:

415-289-6636 (415-289-NOFOG)

San Francisco Sidewalk Astronomers:

<http://www.sfsidewalkastronomers.org/>

info@sfsidewalkastronomers.org

Mt Tam Astronomy Program in the Mt Theater followed by observing in the Rock Spring Parking Area.

www.mttam.net

All talks are free and open to the general public. Please car pool if possible, dress warmly and bring a flashlight. If the weather is questionable on program dates, the hotline: 415-455-5715, will be updated after 3:00pm.

If you are interested in volunteering at the programs, please contact Tinka 415-454-4715 (or tinkaross@comcast.net)

2007 SPEAKERS

6/23 8:30 pm

The Birth of the Universe

Prof. Alex Filippenko - UC Berkeley

There is evidence in favor of a "big bang" origin for the cosmos - a hot, dense beginning with an inflationary expansion. More recent theories, however, also suggest that our universe may be only one of many.

SATURDAY, JUNE 23, 8:30 in the MOUNTAIN THEATRE on Mt Tamalpais

Prof. Alex Filippenko of UC Berkeley will discuss "The Birth of the Universe". He will present evidence in favor of a Big Bang origin for the cosmos - a hot, dense beginning with an inflationary expansion. He will also discuss recent theories suggesting that our universe may be only one of many. Prof. Filippenko is a favorite repeat speaker on the mountain, and his talks always entertain and elucidate.

Carpool with your friends, bring flashlights and dress warmly. It can be cold sitting on rocks! All programs are free, and we encourage you to bring students and family members of all ages. Telescope viewing will follow the program, weather permitting, until about 11:00pm in the Rock Springs Parking Lot.

If the weather is questionable on the day of the program, call the SFAA hotline at 289-6636 (the Astronomy hotline will not be changed on this program). Usually the program goes even if the sky is not inviting for observing. And remember that when the fog comes in we are usually above it and welcome it to block out the lights of San Francisco.

Programs sponsored by your State Park, organized by the Mount Tamalpais Interpretive Association with viewing conducted by the San Francisco Amateurs.

7/21 8:30 pm

Life as an Astronaut: Highlights of STS-99

Dr. Janice Voss - NASA-Ames Research Center

Shuttle Mission STS-99 launched on Feb 11, 2000 was Dr. Voss' fifth space flight. Dr. Voss will describe the mission and other aspects of life as an astronaut.

8/18 8:30 pm

Weighing the Dark Matter in the Universe with Gravitational Lensing

Dr. Joseph F. Hennawi - UC Berkeley

A description of the mysterious problem of Dark Matter in the Universe which has confounded astronomers and physicists for nearly half a century, and recent progress on understanding it based on one of the predictions of Einstein's theory of general relativity.

9/15 8:00 pm

When Astronomy Became a Science

John Dillon - Randall Museum

An examination of the amazingly sophisticated astronomy that flowered more than 2000 years ago at the legendary Museum of Alexandria.

10/13 7:30 pm

How Stars Are Made

Dr. Steve Stahler (UC Berkeley)

Stars are the natural out come of processes that occur through out galaxies. Research has led to a good understanding of the basic evolutionary process, but deep mysteries still remain

Parking: Parking is free but limited. Please Car Pool. When you approach the Rock Springs Parking Area, you will find the lot has been divided into two sections by a string of orange cones. Astronomers with telescopes park to the left of the cones, while the general public is asked to park to the right. There will be signs and volunteers to assist you. If the lot is filled, there will be a sign directing you to the upper parking lot. Go past the entrance to the Mountain Theater for about another 1/4 mile. The road will be closed by a gate, and there will be a sign directing you to park in the lot to your right. There is a short trail from the lot to the Mountain Theater. It is recommended that if you wish to observe after the program and you are in the upper lot, that you take the trail back to your car then drive down to Rock Springs for the observing. Some patrons do not stay for the observing, so you should find a parking space.

Directions:

From Highway 101 take the Highway 1, Stinson Beach exit. At Tam Junction (the first stop light), turn left onto the Shoreline Highway (also called Highway 1). In about 2 miles turn right onto Panoramic Highway. In another 3/4 miles the road splits 3 ways. Take the middle fork. In about 5 miles the Pan Toll Ranger Station will be on your left. Turn right through the gates across the road from the station and continue for about another 1 1/2 miles to the Rock Springs parking area.

Mountain Theater:

The programs, held in the outdoor amphitheater, are about a three minute walk from the parking area. We gather at the end of evening twilight, and when visibility is adequate. But, by the time the program is concluded (45 minute to 1 hour) it will be dark. Bring Flashlights. There are lanterns along the path and on the stairs at the theater, but if you feel that you need any assistance please do not hesitate to ask one of the State Park Volunteers to help you. There are also a few flashlights available for loan at the Mountain Theater which can be returned at Rock Spring when you are finished with them. (Or for a \$5.00 donation you can take the flashlight as a memento of the evening.)

SILICON VALLEY LECTURE SERIES

The lecture is co-sponsored by the Foothill College Astronomy Program, NASA Ames Research Center, SETI Institute and Astronomical Society of the Pacific.

Phone us at: (650) 949-7888

[Click here for more information.](#)

Special Notice: Free admission; parking is \$2

Sample:

May 17, 7:00 p.m.

What: *Giant Cosmic Explosions: The Gamma-ray Burst Boom*

Who: Joshua Bloom (UC Berkeley)

Where: Smithwick Theater, Foothill College

Cost: Free, but parking is \$2 in quarters

Foothill College is located on El Monte Road, west of Freeway 280, in the Los Altos Hills. Call the series hotline at 650-949-7888 for more information and driving directions. No background in science will be required for this talk. It's co-sponsored by the NASA Ames Research Center, The Foothill College Astronomy Program, The SETI Institute, The Astronomical Society of the Pacific.