

PRIME FOCUS

Tri-Valley Stargazers

December 2005



Meeting Info:

What

Holiday Potluck

Who

TVS Members

When

December 16, 2005
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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December Meeting

Holiday Potluck
TVS Members

Ho, ho, ho, it's time for our annual [insert holiday of your choice] potluck!

TVS will provide hot and cold drinks, and all the paper and plastic stuff (paper plates, plastic utensils, etc.) you could possibly need.

So what do you need to bring? Using the first letter of your last name, follow the list below.

- A-F Veggie or fruit side dish
- G-L Dessert
- M-R Main Dish
- S-Z Rice or potato side dish



Bring enough food to feed eight people. We'll be starting a little earlier than usual—set up is at 6:30 p.m. and we'll start eating at 7:00. Family, friends, and visitors from other planets are all welcome to attend.

Should the skies be clear, we might drag one of our loaner scopes out and do a little stargazing. The waxing gibbous Moon will be up all night long, so only the brightest objects will be favorable for viewing. Saturn rises at 8:17 p.m., so once it clears the hills we should be able to take a peek. Of course Mars will be visible all night as it moves away from the Earth. It will be about 60 million miles away on potluck night, so it may be a challenge to see the surface features.

The Double Cluster in Perseus will be well positioned for viewing, as well as the Pleiades—both look good in small scopes that allow you to see all of the cluster. And of course you can't miss M42, the Orion Nebula. It's the brightest nebula visible from our not-so-dark skies. To see what it looks like from the camera of one of our members, go to page 5.

News & Notes

2005 - 2006 TVS Meeting Dates

Below are 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 January 9th deadline is for the January issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Dec. 16	Dec. 19	Dec. 4
Jan. 21	Jan. 24	Jan. 9
Feb. 18	Feb. 21	Feb. 6

TVS Election Results

We held our annual elections at last month's meeting. The results are the officer and board lists remain the same with the exception of the Treasurer position. **David Feindel** bravely stepped up to the plate and agreed to take on the Treasurer job. Yea David! If you have any questions regarding membership issues, you may contact Dave at feindel1 [at] comcast.net.

We still need someone to take on the Secretary position. It is a fairly easy job to do, as all you have to do is take the board meeting minutes and deal with any general correspondence that comes to our PO box (which is very little). Obviously, attendance at the board meetings are necessary.

We have some volunteer positions still open as well. The Refreshments Coordinator would like to hang up her shopping hat, so if anyone would like to take on the *very* important job of bringing yummy treats and making tea and coffee, please let any officer or board member know.

If you like to meet new people, the job of Program Director may be right up your alley. The Program Director is responsible for getting speakers for the meeting. Speakers can be anyone with some knowledge about astronomy or space—someone from the Lab, UC Berkeley, NASA Ames, a knowledgeable amateur, etc.

Membership Renewal Time

The TVS membership year runs from January to December, so our renewal period is just starting. As was mentioned in the last newsletter, and at the November lecture meeting, our dues will be increasing due to increased operating costs.

The Basic membership (you get the newsletter online) is now \$30 a year. The Regular membership (you get the newsletter mailed to you) is now \$40 a year. Student membership level remains the same.

We've instituted at \$10 a year H2O access fee. All key-holding members will need to pay the fee in order to

continue to access the club's observing site. On March 1st, the gate combinations will change and members who have paid the fee will get the new combination. This fee is in addition to the \$3 per car entrance fee, which goes directly to the landowners.

If you are not a key holder and would like to be, there is a refundable \$20 key deposit and an orientation required before you can gain access the site (plus the aforementioned \$10 site access fee). Our observing site is located on private property, so there are rules regarding our conduct while on the property, as well as rules regarding the use of our site. Key holders get use of the site, but not the observatory.

Patron membership is for those who have been a member for at least one year and are in good standing. Patron membership allows members to use the club's 17.5" telescope. Patron members go through an orientation on the proper procedures for opening the observatory and operating the telescope. Patron dues are an additional \$40 to whatever membership level (Basic or Regular) is signed up for. Patron members also need to be key holding members and pay the \$10 access fee.

This year we will have membership cards available for members who shop at Orion Telescope and Scope City, which require proof of membership in order to get a 10% discount. Cards will be available at the meetings, or you can send a self-addressed stamped envelope to the club's PO box and one will be mailed to you.

Marling Scope Update

The club's 17.5" is available for use to Patron members, although the power supply has yet to be installed. We do have a new solar panel that has been tested (it works!), but have yet to install it on the roof of the observatory. We also need to get a new battery to run the scope.

We may be replacing the focuser soon, as it has become quite stiff and difficult to make fine adjustments. President Grant may have one available for transplant, otherwise the club will look into the costs of a replacement.

RASC Handbooks and Calendars

The handbooks and calendars have arrived! We'll have them available at the December potluck for purchase. The handbooks are \$20, the calendar \$10.

Newsletter header image: NGC 309 in Cetus

NGC 309 is a face on spiral galaxy about 250 light years away. This image, taken this past November, was taken with an 13" f/4 Newt., ST10XME -15C, L: 30x 2 minute; RGB: 5x 2 minute exposure (2x2).

Photo by: Gert Gottschalk.

For those who are unfamiliar with the Handbook, it is produced by the Royal Astronomical Society of Canada and contains a wealth of information. The “Sky for 2006” section contains a month by month list of interesting astronomical events. It is what your editor will use to compile the “What’s Up” section of the newsletter for the coming year. The Handbook also contains info about the Sun and Moon rise and set times, eclipses, and occultations. It also has sections on optics, stars, object lists, basic data, and sky maps. It is a very handy, useful resource.

Calendar of Events

December 31, 3:45 p.m. to 5:00 p.m.

What: *New Year’s Balloon Drop*
Who: Chabot visitors
Where: Chabot Space & Science Center, Oakland
Cost: Free with General Admission

Join Chabot for their fifth annual Balloon Drop to cheer the arrival of New Year 2006. At the stroke of 4:00 p.m. (midnight Greenwich Mean Time) celebrate the start of the real New Year with music and balloons dropping from their Rotunda, many filled with prizes. Children ages 5 and under are invited to their own balloon drop in the Discovery Lab.

Space is limited, advance tickets required (available at the Box Office 510-336-7373).

January 23, 7:30 p.m.

What: *Digging a Comet: Results from NASA’s Deep Impact Mission*
Who: Dr. Peter Schultz (Brown University)
Where: Jewish Community Center, San Francisco
Cost: \$4

In July 2005, the Deep Impact spacecraft flew by Comet Tempel 1 and released a probe which steered into the comet’s path. Overtaken at about ten kilometers per second, the impactor collided with the comet while the flyby spacecraft watched. Data from this mission is providing an amazing glimpse into the life of a comet, and telling us important information about the early solar system.

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.

All programs begin at 7:30 pm in Kanbar Hall at the Jewish Community Center of San Francisco, 3200 California Street. Tickets are \$4 and are available in advance or at the door.

<p>Officers</p> <p>President: Chuck Grant cg@fx4m.com 925-422-7278</p> <p>Vice-President: Rich Campbell r_photon@yahoo.com</p> <p>Treasurer: David Feindel feindel1@comcast.net</p> <p>Secretary: Debbie Dyke (acting secretary)</p> <p>Board of Directors Alane Alchorn, Jim Alves, Debbie Dyke, Gert Gottschalk, Mike Rushford, John Swenson.</p>	<p>Volunteer Positions</p> <p>Librarian: Jim Alves jim_alves_engr@yahoo.com 925-634-0220</p> <p>Newsletter Editor: Debbie Dyke ddfam@pacbell.net 925-461-3003</p> <p>Program Director: unfilled</p> <p>Loaner Scope Manager: John Swenson johnswenson1@comcast.net</p> <p>Webmaster: Chuck Grant</p> <p>Observatory Director/ Key Master: Chuck Grant</p> <p>School Star Party Chair: Rich Campbell r_photon@yahoo.com</p>	<p>Public Star Party Chair: Rich Campbell</p> <p>Historian: Debbie Dyke</p> <p>Mentor: Mike Rushford rushford@eyes-on-the-skies.org</p> <p>Addresses</p> <p><i>Mailing:</i> Tri-Valley Stargazers P.O. Box 2476 Livermore, CA 94551</p> <p><i>Lecture Meeting:</i> Unitarian Universalist Church 1893 N. Vasco Road, Livermore</p> <p><i>Board & Discussion Meetings:</i> Round Table Pizza 1024 E. Stanley Blvd., Livermore</p>	<p>Web & E-mail www.trivalleystargazers.org tvst@trivalleystargazers.org</p> <p>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.</p> <p>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.</p>
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Voices from the Cacophony

by *Trudy E. Bell and Dr. Tony Phillips*

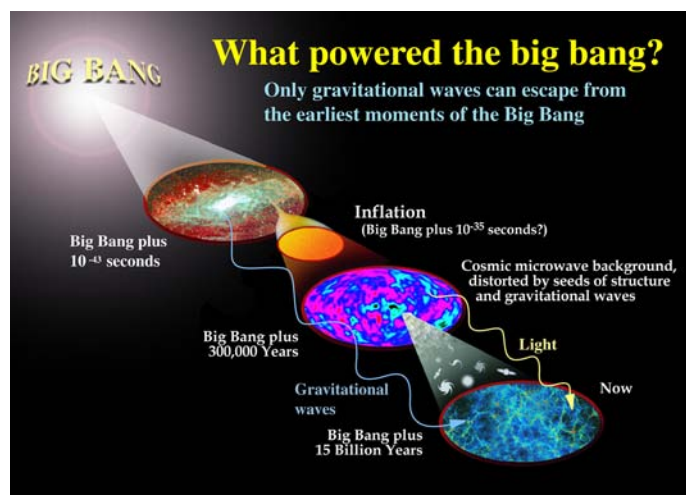
Around 2015, NASA and the European Space Agency plan to launch one of the biggest and most exacting space experiments ever flown: LISA, the Laser Interferometer Space Antenna.

LISA will consist of three spacecraft flying in a triangular formation behind Earth. Each spacecraft will beam a laser at the other two, continuously measuring their mutual separation. The spacecraft will be a mind-boggling 5 million kilometers apart (12 times the Earth-Moon distance) yet they will monitor their mutual separation to one *billionth* of a centimeter, smaller than an atom's diameter.

LISA's mission is to detect gravitational waves—ripples in space-time caused by the Universe's most violent events: galaxies colliding with other galaxies, supermassive black holes gobbling each other, and even echoes still ricocheting from the Big Bang that created the Universe. By studying the shape, frequency, and timing of gravitational waves, astronomers believe they can learn what's happening deep inside these acts of celestial violence.

The problem is, no one has ever directly detected gravitational waves: they're still a theoretical prediction. So no one truly knows what they "sound" like.

Furthermore, theorists expect the Universe to be booming with thousands of sources of gravitational waves. Unlike a regular telescope that can point to one part of the sky at a time, LISA receives gravitational waves from many directions at once. It's a cacophony. Astronomers must figure how to distinguish one signal from another. An outburst is detected! Was it caused by two neutron stars colliding *over here* or a pair of supermassive black holes tearing each other apart in colliding galaxies *over there*?



LISA will be able to detect gravitational waves from as far back as 10⁻³⁶ second after the Big Bang, far earlier than any telescope can detect.

"It's a profound data-analysis problem that ground-based astronomers don't encounter," says E. Sterl Phinney, professor of theoretical physics at the California Institute of Technology in Pasadena.

Profound, but not hopeless: "We have lots of good ideas and plans that work—in theory," he says. "The goal now is to prove that they actually work under real conditions, and to make sure we haven't forgotten something."

To that end, theorists and instrument-designers have been spending time together brainstorming, testing ideas, scrutinizing plans, figuring out how they'll pluck individual voices from the cacophony. And they're making progress on computer codes to do the job.

Says Bonny Schumaker, a member of the LISA team at the Jet Propulsion Laboratory: "It's a challenge more than a problem, and in fact, when overcome, a gift of information from the universe."

For more info about LISA, see lisa.nasa.gov. Kids can learn about black holes and play the new "Black Hole Rescue!" game on The Space Place Web site at <http://spaceplace.nasa.gov/en/kids/blackhole>.

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

First Light: Beginners' Astronomy

by *Richard Campbell*

Unexpected gadget

A rolling couch and bilberry jam. A cape that flutters with secret compartments. Sketches and verse hide under a desert canopy. Sounds like an inventory for a magician, yet these are the *secret gadgets* of the California stargazer, present in our very own back yard.

1. *Bilberry jam* comes to us from World War 2. Rumour has it, WW2 night bomber pilots used bilberry to dilate their pupils for better night vision. The technique works for astronomers as well, though not without consequences (you may have bloodshot eyes the next day). If jam is not available, you may find it in pill form.
2. The *rolling couch* is a portable camping couch that folds out automatically to seat *two*. It also supports telescope accessories like eyepiece cases, or mount components during assembly. The beer holders in the arm rests are for daytime when you're sitting in the hot sun awaiting the stars.
3. The *cape* was spotted at the 2002 Davis Star Show. An attendee wowed the crowd with a Galileo costume accurate to the finest detail—Renaissance fabric, custom tailoring and a feather in his cap. The *original* Astro Wizard had come to life, attracting crowds of children!

4. Less elegant, but hardy, is the *Hunter's Insulated Jumpsuit*. Dorkier than Galileo, but warmer than the cat's pajamas during winter nights.

5. *The sketches and verse* are artwork inspired by astronomical observing. Rough sketches of planets will hone your observing skills, while artistic renderings might don the walls of Lick Observatory. If you watch the Astronomy Picture of the Day web site, you may notice the *astronomers's quilt* displayed at Lick. Another stargazer brought her fabric and needle to a solar eclipse cruise, creating striking eclipse flags that fly outside her home. These designs would match the poetry of David Levy, who brings pen and paper to his dark sky site. Personally, I'd like to see more *stained glass windows* with astronomy themes—to sanctify what we behold in our optical glass.

6. *The Canopy* is a portable shade device made of tent material. It's surprisingly spacious and affordable (you can acquire a 10' by 10' canopy for under \$100). Some summer star parties get unbearably hot during the day (especially Shingletown), where scores of these canopies are tied together. Now this begs the question: if you have the canopy, do you have the astronomer's fan...or the *Dome-a-bago RV* with air-con?

7. Finally, the secret goggles! When your eyes are dark-adapted, you want to avoid rooms with bright lights. But what about the free hot chocolate room on White Mountain? Don the red goggles, enter the bright room containing the precious chocolate, and exit with pupils intact, dilated and ready.

What's Up by Debbie Dyke

All times Pacific Standard Time unless otherwise noted.

December

- | | | |
|----|-------|--|
| 8 | Thurs | First Quarter Moon. 1:36 a.m. |
| 11 | Sun | Mars 1° South of the Moon in the evening. |
| 12 | Mon | Mercury at greatest elong. W (21°). 5 a.m. |
| 13 | Tues | Moon 5° S of the Pleiades (M45). 8:00 p.m. |
| 14 | Wed | Geminid meteors peak. 8:00 p.m.
1972 Gene Cernan (Apollo 17) becomes the last man on the Moon. |
| 15 | Thurs | Full Moon. 8:15 a.m.
Pluto in conjunction with the Sun. 8:00 p.m. |
| 16 | Fri | Tri-Valley Stargazers general meeting. 7:30 p.m. at the Unitarian Universalist Church |
| 18 | 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.
Saturn 3° South of the Moon. 9:00 p.m. |
| 19 | Mon | Tri-Valley Stargazers Board meeting. 7:00 p.m. at the Round Table Pizza in Livermore.
1966 Space is declared a Nuclear Weapon Free Zone. |
| 20 | Tues | Moon at apogee (251,108 miles). 7:00 p.m. |
| 21 | Wed | Winter Solstice 10:35 a.m. |
| 22 | Thurs | Ursid meteors peak at 5:00 a.m. |
| 23 | Fri | Last Quarter Moon. 11:36 a.m. |
| 25 | Sun | Christmas Day.
First day of Hanukkah starts at sundown.
Spica 0.9° South of the Moon. 6:00 a.m.
1642 Isaac Newton born. |
| 30 | Fri | New Moon. 7:12 p.m. |
| 31 | Sat | Start of Eid al-Adha (Festival Sacrifice) |



M42 / NGC 1976 - The Orion Nebula. This image was taken in November 2005 using a 13" f4 scope and a ST10XME 1x1 -15C camera, with a compilation of 20 1 minute exposures in the RGB channel. *Photo: Gert Gottschalk*

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 yearly access fee. You need to be a key holder to access the site.
_____ \$20 Hidden Hill Observatory (H2O) 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.