

PRIME FOCUS

Tri-Valley Stargazers

November 2005



Meeting Info:

What

TVS Town Hall Meeting

Who

TVS Officers, Board, Members

When

November 18, 2005
Conversation 7:00 p.m.
Lecture at 7:30 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

News & Notes	2
Calendar of Events	2
Astro Insights	5
What's Up	6
NASA's Space Place	7
Astro Events	7
Membership/Renewal Application	8

November Meeting

TVS Town Hall Meeting
TVS Officers, Board, and Members

At the last board meeting, the expenses for 2005 and the budget for 2006 were discussed. The board has decided to bring the membership in on the discussion to get feedback as to what direction and improvements the membership would like to see the club undertake.

To start the discussion process, our President, Chuck Grant, has written the following "State of the Club" address.

There was a time when TVS ran with a substantial income surplus each year, but times have changed. We have been running at a loss for several years now. This has not been an immediate problem as we have saved a substantial surplus which could cover us for many years. But now the projection for next year shows that if we continue at the 2005 levels, we only have enough surplus cash to hold us for about two more years.

Why the big difference?

Insurance: We didn't used to have any. But since it was pointed out that a corporation not having insurance was considered negligent and would leave the corporate officers personally liable for any lawsuit against the club, we decided it was a must have item, like it or not. Initially, this only cost us \$400/year. Then insurance rates went way up after 9-11. I expect the rates will also go up after all the hurricanes this year. **Difference:** \$800/year loss.

Newsletter: Once we had a member working at Xerox PARC, where they had a program for non-profit clubs that printed their newsletters for free. Now we pay for the printing, labels, label printing, fasteners, and postage at nearly one dollar per newsletter. We reduced the number of printed newsletters by making the newsletter available on-line, but so far this has only resulted in about \$180 of savings.

In 2005, the club's cost for sending one newsletter to one member for one year was about \$12, whereas the difference in membership dues members paid to receive a newsletter was only \$5. **Difference:** \$700/year (total cost for all newsletters).

Rent: Our rent for the meeting space at the church has increased substantially, and we now rent storage space at the church. **Difference:** \$600/year loss.

Dues: Our dues have only increased slightly since the club was founded in the late 1970's. **Difference:** \$500/year gain.

Membership: At our peak, we had just less than 200 members. Currently we have just less than 100. **Difference:** \$2500/year loss. (At previous dues levels.)

continued page 2

In addition to these reoccurring costs, we have had many large non-reoccurring or long-term expenses to deal with in the past few years. The eventual need to address these expenses had been largely ignored in the budgets of previous years, making our surplus seem larger.

Replacing the sagging cardboard tube on the Jack Marling 17.5 inch telescope with a new aluminum tube.

Replacing the overloaded mount on the Jack Marling 17.5 inch telescope.

Observatory roof and structural repairs.

Solar panel and battery replacement.

Projector and DVD player for meetings.

Loaner telescope accessories.

These expenses cost us about \$5000 over the past few years.

The bottom line is if we proceed at the 2005 levels, without any new large expenditures, we expect to be, at best, about \$2500 in the red for 2006 (and we don't expect the situation to improve for 2007). So time is getting short. We have to make some changes in the financial structure of the club to survive.

What can we do?

There are a number of measures we are considering, in addition to general belt-tightening. We will try to liquidate some of our assets which we are not using, but this is not a long term solution.

Raise dues: Hope this isn't counter-productive by causing too many members to quit. But clearly we have to raise the base dues some and this must be done now in our yearly cycle. With a \$5 increase we are still in line with other clubs in the area. Additional changes in the dues structure may be necessary next year. Increase income by \$500/year.

Also the difference between an e-newsletter membership and a printed newsletter membership will be increased to \$10 so that it approximately covers the cost of printing and mailing. Increase income by \$200/year.

Under consideration:

Seek a corporate sponsor to print the newsletter: save \$500/year.

Reduce number of complementary newsletters: save \$300/year.

Stop printing the newsletter and distribute it on-line only: save \$700/year.

Seek donations: \$2,500 to \$3,500 a year would fix everything, if we could count on it (that is only \$35 per member per year).

Charge an annual fee for H2O access: Charge an addi-

tional per-visit fee for H2O access. The current \$3 fee goes to the ranch owner.

Charge for Yosemite and/or White Mtns trips.

Charge for star parties.

Seek other sources of income.

Find a free meeting place: save \$900/year.

Find free storage: save \$300/year.

Get more paying members to join.

The implementation of some of these measures is currently under discussion. Your input is welcome. Donations are particularly welcome.

It looks like 2006 is going to be a challenging year for TVS.

News & Notes

Money Matters

At the October Board meeting, Treasurer **Gary Steinhour** reported the TVS account balances (as of October 22, 2005):

Checking	\$829.91	
CD #1	\$3,482.64	matures 11/17/05
CD #2	\$2,461.46	matures 11/27/05

2005 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 December 4th deadline is for the December issue).

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

Welcome!

TVS would like to welcome our newest members, **Jonathan Crawhurst** and **Phil Grassow**.

continued page 4

Newsletter header image: Mars!

Mars as seen on the night of November 1st, 7:37 UT (that would be October 31st, 11:37 PST). Image taken with an 11" f/5 Newt., 5x barlow, ToUCam740k, 100/800 exposure.
Photo by: Gert Gottschalk.

Calendar of Events

November 12, 7:00 p.m.

What: *Skywatchers of Ancient Mexico*
Who: Dr. Anthony Aveni
Where: Chabot Space & Science Center, Oakland
Cost: \$8 non-members, \$7 members

Dr. Aveni, one of the foremost authorities on Maya archaeoastronomy, will talk about the roll that Venus played in the Maya culture and the role of astronomical alignments in their architecture.

November 19, 7:00 p.m.

What: *Celestial Triple Feature*
Who: John Dobson-ophiles
Where: El Campanil Theatre in Antioch
Cost: \$5.00, \$4.00 for seniors (over 62)

Celestial Triple Feature

The El Campanil Theatre in Antioch presents a three-part astronomy evening: a film, a personal appearance by John Dobson, and telescopic viewing of the sky itself.

A Sidewalk Astronomer

A Sidewalk Astronomer is a documentary film featuring John Dobson, the one-time Vedanta monk who revolutionized amateur astronomy, whose invention, the now ubiquitous “Dobsonian” telescope, brought hands-on telescopic observing to multitudes around the world. Not one to be content with past accomplishments, the 90-year-old Dobson now devotes himself to bringing astronomy to the public by personal appearances and through the organization he founded in 1968, the “San Francisco Sidewalk Astronomers”.

Produced and directed by Jeffrey Fox Jacobs, this 78-minute independent film will have its first Eastbay showing at 7:00 p.m. tonight.

John Dobson In Person

Immediately following the showing of *A Sidewalk Astronomer*, John Dobson will appear personally on the theatre’s stage, describing his life and his multifaceted interests and activities, and to answer questions from, and interact with, the audience.

Telescopic Skygazing

Continuing the evening’s theme, at about 9:30 p.m., just after the film showing and John’s appearance, you can move outdoors to a site by the theatre to enjoy telescopic viewing of the heavens yourself. One target will be Mars, now high in our sky and particularly close to the Earth. And there will be plenty of other objects to be viewed: double stars, clusters of stars and even galaxies. (This portion of the evening will of course be dependent on the weather.) The telescopes are kindly provided by members of the Mount Diablo Astronomical Society.

The El Campanil Theatre

The El Campanil is located in the historic Rivertown Business District of Antioch, at 602 W. Second Street. It’s located at the corner of Second and “G” Streets. Public parking is located a few yards past the theatre, with lots on both the right and left sides of Second Street.

You may purchase tickets next to the theatre, at 604 W. Second Street, starting at 6 p.m.. Tickets are \$5.00 per person, and \$4.00 for seniors (over 62).

continued page 4

Officers

President:
 Chuck Grant
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 925-422-7278

Vice-President:
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Treasurer:
 Gary Steinhour
 garyjane1@yahoo.com

Secretary:
 Mike Rushford
 rushford@eyes-on-the-skies.org

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 Debbie Dyke, Gert Gottschalk,
 Stan Isakson, Mike Rushford,
 John Swenson.

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Program Director: unfilled

Loaner Scope Manager:
 John Swenson
 johnswenson1@comcast.net

Webmaster:
 Chuck Grant

**Observatory Director/
 Key Master:**
 Chuck Grant

School Star Party Chair:
 Rich Campbell
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Public Star Party Chair:

Rich Campbell

Historian:
 Debbie Dyke

Mentor:
 Mike Rushford
 rushford@eyes-on-the-skies.org

Addresses

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

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
 tvs@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 (tvs@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.

Calendar of Events *continued*

November 28, 7:30 p.m.

What: *The SuperMACHO Project*
Who: Dr. Doug Welch (McMaster University)
Where: Jewish Community Center, San Francisco
Cost: \$4

The nature of dark matter is still unknown. The best hope for understanding it is to find it in our galaxy, the Milky Way. In this talk, Dr. Doug Welch will describe results from the most ambitious dark matter search to date, the so-called SuperMACHO Project.

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.

December 5, 7:30 p.m.

What: *Searching for and Studying Supernovae with a Robotic Telescope*
Who: Dr. Weidong Li (UC Berkeley)
Where: Jewish Community Center, San Francisco
Cost: \$4

Finding supernovae systematically is crucial for the study of these violent stellar explosions billions of times brighter than the Sun. The Katzman Automatic Imaging Telescope at Lick Observatory is a robotic thirty-inch telescope and the world's most successful nearby supernova search engine, and discovers close to 100 supernovae each year.

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.

News & Notes *continued*

TVS Elections

Our annual club elections take place every November. We have quite a selection of positions TVS members can run for, some are critical in keeping this club in existence.

We are in great need of a Treasurer. This is a 'must have' position in order for the club to continue to operate as a non-profit organization. Our current Treasurer, Gary Steinhour, can no longer continue with the Treasurer position. He would help the next Treasurer transition into his or her new post.

Another critical position is that of Secretary. As the Secretary, you'd be responsible for taking the board meeting minutes as well as general correspondence. That's it!

Our current President and Vice President will be running for their respective offices once again. However, the President wouldn't mind if someone else wanted the job. If you're interested in either of the positions, let your voice be heard at the elections.

The above officer positions require attendance at the majority of the board meetings (always the Monday following the lecture meeting).

We also have some non-elected positions available as well.

We are still in need of a Program Director. The Program Director is responsible for getting speakers for the monthly lectures (10 speakers a year—the Summer BBQ and Winter Potluck take care of the other two meetings per year).

We could also use someone to take over the Refreshments Coordinator position. All it involves is bringing the refreshments and setting up the tea and coffee for the monthly meetings. You would also be responsible for coordinating the Summer BBQ and Holiday Potluck food purchases.

To top it off, we have openings on the Board of Directors. If you'd like to help chart the course of the club, consider adding your voice to the Board.

RASC Handbooks and Calendars

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

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 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 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.

Astronomical insights

by David Feindel

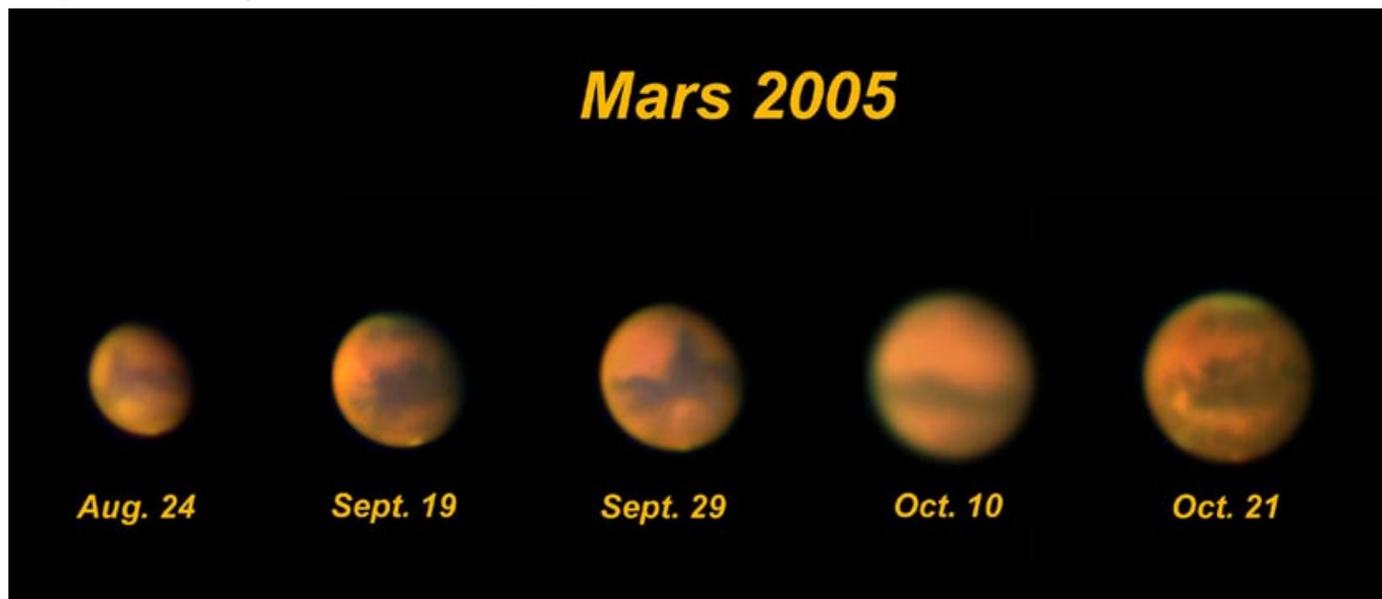
Observing this month has to be about Mars. Its bright, big (well, relatively), and in October and November, well positioned during the evening hours. It's actually about perfectly positioned in early November; it rises 5-5:30 p.m., and by 9 p.m. or so (3+ hours after sunset), it's 45 degrees above the horizon, and the local environment has had time to cool off and settle down. Best viewing then usually extends to 2 or 3 in the morning. At its current size, about 20 arc seconds, it is bright enough to require filters on your eyepieces, even with my "small" 115mm refractor. By using filters to reduce the intensity, you can better detect subtle differences in contrast and/or color to pick out various surface features.

Filters are a whole 'nother subject when it comes to planetary observing. I didn't begin to appreciate how useful they are until this Mars opposition. I acquired a couple of filters as a throw-in to an Astromart purchase; they're proving valuable on Mars. An #80A medium blue filter makes the Martian polar caps more visible, as well as bringing out any cloud-like formations, particularly around the limb. My #25 red filter improved the contrast of Syrtis Major and some other surface features. Somewhat surprisingly, my neutral density filter didn't sharpen surface details as much as the color filters did, despite having about the same transmission (13% vs. 14-30% for the color filters). From perusing several web sites, recommendations are to have at least 4 or 5 filters; the good news is that reasonable quality ones are \$15-\$20 each, and less when purchased in sets. And of course, they have application for Jupiter and Saturn, and to some extent the other planets as well.

Three other internet resources have proven valuable to me in my Mars observing. Akkana Peck (of SJAA) has writ-

ten a java applet showing what Mars feature are in view at any specific time (www.shallowsky.com/marslet/). The program Mars Previewer II written by Leandro Rios, an amateur astronomer, but with a pretty impressive list of people who helped (www.skyandtelescope.com/esources/software/article_328_2.asp) provides a similar capability. You probably also should plan on an hour or more to read *Observing the Planet Mars* by Jeffrey Beish at www.tnmi.net/~dustymars/Observing_Mars.html.

The book for this month is *Astronomical Enigmas*, by Mark Kidger, an astronomer working at La Palma and Tenerife. Although it is clearly aimed at the "popular astronomy" market, its scientific information is well-researched and detailed, on the order of a Timothy Ferris or Ken Croswell book. He devotes a chapter to each of eight astronomical questions, including life on Mars, the Star of Bethlehem, and whether Pluto is a planet or not, and then four chapters on more forward-looking issues, including one speculating on whether humankind will be the next dinosaurs. As an example of his thoroughness, he cites the well-known fact that Neptune was first discovered "mathematically", by calculating what had to exist that would affect Uranus' orbit. Remarkably, both a British and a French mathematician provided answers within a few months of each other. What I didn't know, though, was that BOTH their answers were as much luck as anything else. Yes, their forecast for where Neptune was proved accurate (within a degree, remarkable for complex calculus done pre-computers)! But their prediction of where Neptune was or would be more than a few years on either side of 1844-1845 when they did the calculations was way, way off. Recommended.



The progression of Mars' closest approach as seen by Rachel (20" refractor). Photo by: Conrad Jung

What's Up *by Debbie Dyke*

All times Pacific Daylight Standard Time unless otherwise noted.

November

- 7 Mon Mars at opposition. 12:00 a.m.
1991 The 10-meter Keck Telescope dedicated on Mauna Kea, Hawai'i.
- 8 Tues Neptune 5.5° North of the Moon. 7:00 p.m.
First Quarter Moon. 5:57 p.m.
- 9 Wed Moon at perigee (229,406 miles). 4:00 p.m.
- 11 Fri Veterans' Day.
1572 Tycho Brahe discovers a supernova in Cassiopeia. The remnant wasn't discovered until the 1960's.
- 12 Sat N. Taurid meteors peak. 1:00 a.m.
- 13 Sun 1971 Mariner 9 becomes the first spacecraft to orbit Mars.
- 14 Mon Mars 2.5° South of the Moon in the evening.
- 15 Tues **Full Moon.** 4:57 p.m.
Moon 4° South of the Pleiades (M45). 8:00 p.m.
- 16 Wed 1974 Arecibo radio telescope sends a 3-minute message towards M13—it should arrive in about 24,000 years.
- 17 Thurs Leonid meteors peak 7:00 a.m.
1970 Luna 17 lands on the Moon and sends Lunokhod 1 (a wheeled vehicle) to ramble along the surface.
- 18 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,
1893 N. Vasco Road, Livermore.
- 20 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.
1998 The first section of the International Space Station is launched from Baikonur.
- 21 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.
- 22 Tues Moon at apogee (250,709 miles). 10:00 p.m.
1682 Edmond Halley sees the comet that will later bear his name.
- 23 Wed **Last Quarter Moon.** 2:11 p.m.
1885 First photo of a meteor shower.
- 24 Thurs **Thanksgiving Day.**
Mercury in inferior conjunction. 8:00 a.m.
- 27 Sun Mercury at perihelion.
- 28 Mon 1967 Jocelyn Bell discovers pulsars.

December

- 1 Thurs **New Moon.** 7:01 a.m.
- 2 Fri 1993 Hubble Space Telescope gets corrective optics.
- 3 Sat 1971 USSR's Mars 3 becomes the first spacecraft to make a soft landing on Mars.
- 4 Sun Venus 4.5° North of the Moon. 6:00 p.m.
Moon at perigee (227,766 miles). 9:00 p.m.
1901 Werner Heisenberg born.
- 5 Mon Neptune 4° North of the Moon. 7:00 p.m.
- 7 Wed Uranus 2° North of the Moon. 9:00 a.m.
1995 Galileo space craft arrives at Jupiter.
- 8 Thurs **First Quarter Moon.** 1:36 a.m.

A Wrinkle in Space-Time

by Trudy E. Bell

When a massive star reaches the end of its life, it can explode into a supernova rivaling the brilliance of an entire galaxy. What's left of the star fades in weeks, but its outer layers expand through space as a turbulent cloud of gases. Astronomers see beautiful remnants from past supernovas all around the sky, one of the most famous being the Crab Nebula in Taurus.

When a star throws off nine-tenths of its mass in a supernova, however, it also throws off nine-tenths of its gravitational field.

Astronomers see the light from supernovas. Can they also somehow sense the sudden and dramatic change in the exploding star's *gravitational field*?

Yes, they believe they can. According to Einstein's general theory of relativity, changes in the star's gravitational field should propagate outward, just like light—indeed, at the speed of light.

Those propagating changes would be a gravitational wave.

Einstein said what we feel as a gravitational field arises from the fact that huge masses curve space and time. The more massive an object, the more it bends the three dimensions of space and the fourth dimension of time. And if a massive object's gravitational field changes suddenly—say, when a star explodes—it should kink or wrinkle the very geometry of space-time. Moreover, that wrinkle should propagate outward like ripples radiating outward in a pond from a thrown stone.

The frequency and timing of gravitational waves should reveal what's happening deep inside a supernova, in con-

trast to light, which is radiated from the surface. Thus, gravitational waves allow astronomers to peer inside the universe's most violent events—like doctors peer at patients' internal organs using CAT scans. The technique is not limited to supernovas: colliding neutron stars, black holes and other exotic objects may be revealed, too.

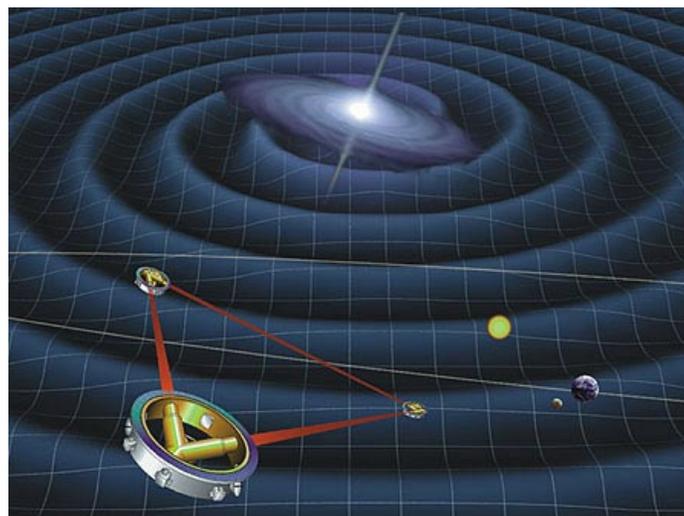
NASA and the European Space Agency are now building prototype equipment for the first space experiment to measure gravitational waves: the Laser Interferometer Space Antenna, or LISA.

LISA will look for patterns of compression and stretching in space-time that signal the passage of a gravitational wave. Three small spacecraft will fly in a triangular formation behind the Earth, each beaming a laser at the other two, continuously measuring their mutual separation. Although the three 'craft will be 5 million kilometers apart, they will monitor their separation to one *billionth* of a centimeter, smaller than an atom's diameter, which is the kind of precision needed to sense these elusive waves.

LISA is slated for launch around 2015.

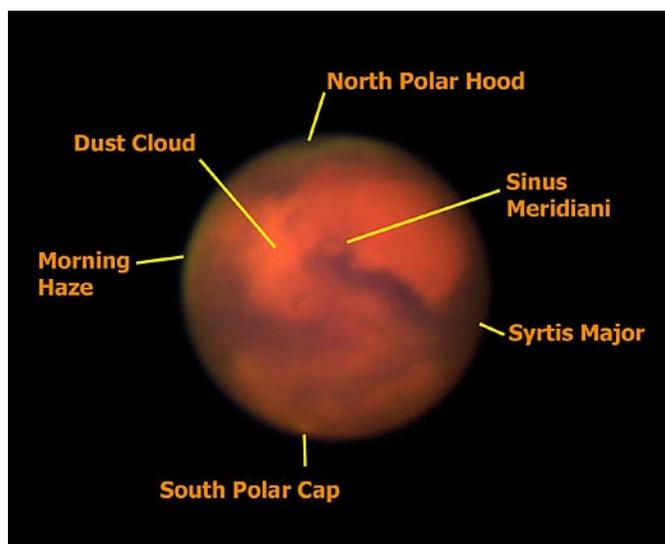
To learn more about LISA, go to <http://lisa.jpl.nasa.gov>. Kids can learn about LISA and do a gravitational wave interactive crossword at <http://spaceplace.nasa.gov/en/kids/lisaxword/lisaxword.shtml>.

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



LISA's three spacecraft will be positioned at the corners of a triangle 5 million kilometers on a side and will be able to detect gravitational waves induced changes in their separation distance of as little as one billionth of a centimeter.

Astro Events



Mars as seen on the night of October 31st. Photo taken with Rachel, Chabot's 20-inch refractor and a Canon EOS 20D. The software program Registax was used to combine 138 images, and Photoshop was used for final processing of the image.

Photo by: Conrad Jung

Tri-Valley Stargazers
P.O. Box 2476
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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.
_____ \$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.