PRIMEFOCUS
Tri-Valley Stargazers

April 2008

Meeting Info:

What
Stardust—
A Taste of Comet Dust

Who
Dr. Hope Ishii

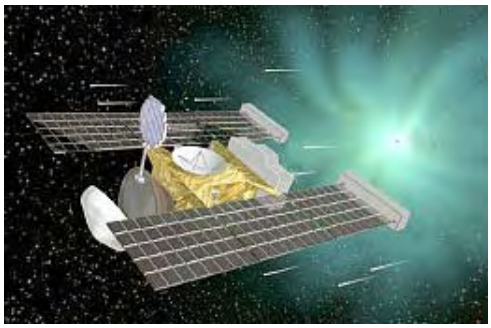
When
April 18, 2008
Doors open at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

April Meeting

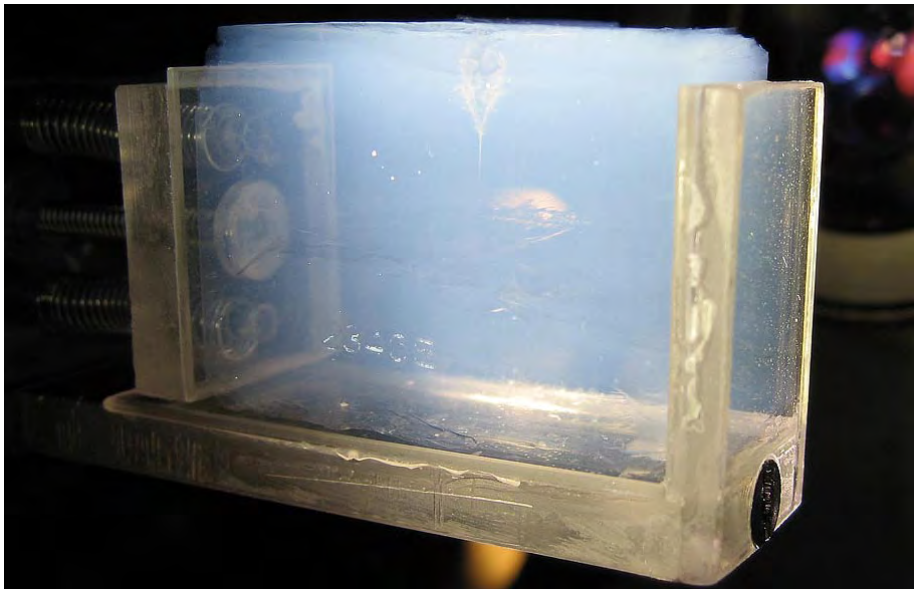
Stardust—
A Taste of Comet Dust
Dr. Hope Ishii



Artist's conception of the Stardust spacecraft on its way to Comet Wild 2.

Two years ago, NASA's Stardust spacecraft returned to Earth releasing its capsule to reenter the atmosphere and land safely in the Utah desert. During its seven-year-long mission, Stardust flew through the tail of Comet Wild 2 and captured comet dust in a specially-designed collector. This comet dust was anticipated to contain the most ancient and primitive materials preserved in a frozen state since the formation of our solar system. Comet Wild 2 dust particles, the first solids ever returned to Earth from a known cometary body, are now being studied in our laboratories and compared to other extraterrestrial samples and to astronomical observations. Along the way, we have had some very unexpected findings that have changed our understanding of how our solar system formed.

Dr. Hope Ishii is an astro-materials scientist at the Institute of Geophysics and Planetary Physics at Lawrence Livermore National Laboratory.



Stardust aerogel tile in which a track left by the capture of a large comet dust particle is visible. *Photo: NASA*

News & Notes

2008 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 May 16th deadline is for the May issue).

Lecture Meeting	Board Meeting	*Prime Focus* Deadline
Apr 18	Apr 21	Apr 6
May 16	May 19	May 4
June 20	June 23	June 8

Money Matters

Our March board meeting was canceled due to lack of quorum. However, Treasurer **David Feindel** left word of the TVS account balances as of March 24, 2008.

Checking	$3,583.03	
CD #1	$3,712.17	matures 05/17/08
CD #2	$2,619.26	matures 05/27/08

School Star Party - April 23

Croce will be having its Space Night on April 23rd, from 6:30-8:30 p.m. This year will be scaled down from previous years. The focus will be on the Croce School GATE children, about 80 total, and their families. There is no guest speaker, no special exhibits. There will be three sessions for the children to attend, put on by *Spectrum of Science*. Before and after the sessions would be the only time that the children could visit with the TVS scopes. Croce is located at 5650 Scenic Ave., Livermore.

Cassini Essay Contest For Kids

For students who've ever wondered what it's like to be a NASA scientist, look no further.

NASA is giving 5th to 12th grade students the opportunity to study Saturn and make decisions, just as scientists on the Cassini-Huygens mission do on a daily basis.

"It's a really fun way for kids to learn about Saturn and what the mission is doing," said Rachel Zimmerman-Brachman, an education and public outreach specialist with NASA's Jet Propulsion Laboratory in Pasadena, CA. "Students have to do their own research to write their essay. That way, they learn how to ask questions about the solar system and what we still need to understand."

The Cassini spacecraft, launched just over a decade ago, has been sending back never-before-seen views of Saturn, its rings and its moons for nearly four years. Part of the Cassini team's job is to pick which image targets will yield the best science results.

Cassini's cameras will take images of three designated targets on June 10. The choices include Saturn's moons Rhea and Enceladus, and a region of Saturn's rings that includes the tiny moon Pan. Students must write a 500-word essay on why the image they chose would be the most scientifically rich for Cassini's cameras to take. Essays will be judged by a panel of Cassini scientists, mission planners, and by the JPL education and outreach team. Winners will be invited to discuss their essays with JPL Cassini scientists via teleconference.

Entries are divided into three groups: grades five through six, seven through eight, and high school. One winner will be chosen from each group.

The deadline for entries is May 8, 2008, at noon Pacific time. All participants with valid entries will receive a certificate of participation.

For complete info go to: http://saturn.jpl.nasa.gov/education/scientist/5th_edition/index.cfm

Sycamore Grove Star Parties

After a several year abscence, the TVS-LARPD (Livermore Area Recreation and Park District) Sycamore Grove Star Parties will be held once again. Rich Combs has been working with the LARPD to come up with some dates, and we'll keep you posted when details are announced. Rich is also talking with the LARPD to see if the Camp Shelly (Lake Tahoe) star party can be resurrected as well.

Rich has been a busy man, and will be doing many public star parties throughout the Sierras. Should you find yourself at one of these locations while Rich is entertaining the masses, stop by and say hello.

June 6-8 at the Inn at the Pinnacles (a Bed & Breakfast, so it's probably booked up already).

Thursday nights, July 10 through August 14, near Pinecrest, at the Summit Ranger Station. More info at 209-965-3434 and their web site http://www.fs.fed.us/r5/stanislaus/summit/index.shtml (they may not have the starparties on the web site).

August 1-2, near Glacier Point, on behalf of the Yosemite Association. Info at www.yosemite.org/seminars. Called *Stars Over the High Sierra*. Also probably booked up, as it's a Bed and Breakfast. Info at http://innatthepinnacles.com/attractions_local_events.html.

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Newsletter header image: NGC 5139 - Omega Centauri
Omega is one of the largest and most massive globular clusters known, with 10 million stars in the cluster. It is 17,300 light years away in the constellation Centaurus.
Researchers recently announced the possible detection of an intermediate-mass black hole at the core of the cluster.
Photo: NASA, ESA, and the Hubble Heritage Team (STScI/SURA)

Calendar of Events

April 23, 7:00 p.m.

What: *The Allen Telescope Array: The Newest Pitchfork for Exploring the Cosmic Haystack*
Who: Jill Tarter (SETI)
Where: Smithwick Theater, Foothill College
Cost: Free, but parking is $2 in quarters

Astronomer Jill Tarter, of the SETI Institute, will give a non-technical, illustrated talk as part of the Silicon Valley Astronomy Lectures in the Smithwick Theater, Foothill College, El Monte Road and Freeway 280, in Los Altos Hills, California.

Call the series hot-line at 650-949-7888 for more information and driving directions. Seating is first come, first served.

SETI—the search for extra-terrestrial intelligence—seeks evidence of technologies from civilizations among the stars to answer the age-old question "Are we alone?" The task is enormous—it's often likened to looking for a needle in a haystack. Yet even that metaphor doesn't begin to describe how much searching may be needed to find our counterparts out there—the cosmic haystack is at least nine-dimensional!

Dr. Tarter is Director of the Center for SETI Research, and the leader of the main project looking for radio signals from alien civilizations (she was the model for the character Jodi Foster played in the movie "Contact"). She will update us on the latest tools and plans in the SETI quest.

Digital technologies are making possible huge improvements in our search systems. The Allen Telescope Array, being constructed in Northern California as a partnership between the SETI Institute and the University of California Berkeley Radio Astronomy Lab, will be the most powerful tool for finding SETI signals ever built. It is an innovative radio telescope assembled from a large number of small dishes, using consumer off-the-shelf technologies whenever possible to minimize costs. In the next decade, this new 'pitchfork' will enable exploration of 1000 to 10,000 times more of the cosmic haystack than was searched in the previous decade. This may just be enough!

Dr. Tarter holds the Bernard Oliver Chair for SETI at the SETI Institute and is one of the best known astronomers in the world. Although she is best known for her SETI work, she also coined the term "brown dwarf" for an object that just misses being a star. In 2004, Time Magazine named her one of the 100 most influential people in the world.

Come early for this very special event in our series.

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

Past Silicon Valley Astronomy Lectures are now available in MP3 format at: http://www.astrosociety.org/education/podcast/index.html.

April 25, 8:00 p.m. - 11:00 p.m.

What: *Lunar Lounge Express—Science & Art Appreciation Night*
Who: Chabot Visitors
Where: Chabot Space & Science Center
Cost: $15 Adult, $10 Student, $8 Member

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Round Table Pizza
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Web & E-mail

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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*

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

Featuring live music, refreshments, activities and fun!

- Full access to Chabot Space & Science Center interactive exhibits
- SonicVision—a new alternative music Planetarium show
- Telescope viewing in our Observatory Complex (weather permitting)
- Enjoy $3 micro-brews from Buffalo Bill's Brewery
- Food for purchase from Bay Leaf Catering
- Enjoy wine and other refreshments from the cash bar
- And much more!

Kinetic Sculpture: The Wave

Opening reception in conjunction with Chabot's Lunar Lounge! The exhibit will be on display April 23-June 29.

Reuben Margolin.
Photo: Pamela Palma

Suspended above Chabot's main lobby, Reuben Margolin's large-scale kinetic sculpture will captivate visitors with its fluid movement. The Wave invites contemplation from a variety of perspectives: as a mesmerizing kinetic sculpture; as a visualization of the complexities of wave motion and related scientific and mathematical concepts; and as an intricate and beautiful mechanical device.

For more information on the artist's work, go to www.reubenmargolin.com.

Music: Wave Array

Wave Array is a four-piece rock band hailing from the East Bay that is stretching the limits of alternative/indie rock into the psychedelic and experimental realms. Using vibrant guitar and bass work, driving rhythms, and palpable melodies, the quartet aims to resonate frequencies of human emotion and thought buried beneath the preoccupation of everyday life.

Check out our Lunar Lounge myspace page!

Purchase tickets or call the Chabot Box Office at: 510-336-7373.

April 28, 7:30 p.m.
What: *The X-ray Universe*
Who: Dr. Chris Mauche (Lawrence Livermore National Laboratory)
Where: Kanbar Hall, Jewish Community Center
Cost: $5.00

Progress in the field of X-ray astronomy has been rapid since the dawn of the space age: we knew of only a single cosmic X-ray source in 1962, but we had discovered nearly 19,000 by 1999. This talk will be a general overview of the many different—but (almost) always extremely hot, violent, and variable—sources that populate the X-ray sky: our Sun and other stars, X-ray binaries, supernova remnants, galaxies, clusters of galaxies, and million- to billion-solar-mass black holes.

Program begins at 7:30 p.m. in Kanbar Hall at the Jewish Community Center of San Francisco, 3200 California Street (at Presidio Avenue). Ticket prices: $5 per lecture or $20 for the complete series available in advance or at the door.

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.

You can purchase tickets online at http://www.calacademy.org/lectures/tickets or buy them at the door. For more information, call 415-321-8000.

News & Notes *continued*

AANC-Con 2007 on YouTube

In case you missed the conference, there are three videos out on YouTube of AANC-Con 2007.

http://www.youtube.com/watch?v=pZ_L3_4-6uA
http://www.youtube.com/watch?v=TEYf0yZ7S60
http://www.youtube.com/watch?v=_PEmLeKuODE

The videos feature Chanan Greenberg, Vice President, and John Fisk, both of SMCAS, Mike Koop of FPOA, Barbara Vance of SETI, Dr. Peter Jenniskens of SETI & NASA/Ames, Dave Barosso of TMW, Jane Jones of NASA/JPL and finally featured are Marni Berendsen and Vivian White of the ASP. Take a look and up the hit count!

If you haven't viewed the photos of the conference check out: http://photo.whiteoaks.com/2007-09-29-aanc/ .

The archived conference web site is here: http://aanc-stars2007.org/index.shtml .

TVS Loaner Scope Program

In case you didn't know, TVS has a telescope loaner program. For just a $50 refundable deposit, and $15/month fee ($5 for student members), any member can check out one of our telescopes. Even better, if you bring the telescope to one of our public or school star parties, we will refund your entire rental fee.

Scopes are available on a first-come, first-serve basis at each TVS lecture meeting. You can also reserve the telescope before the meeting by contacting our Loaner Scope Director, John Swenson, by e-mail (johnswenson1 -at- comcast -dot- net). The scope must be returned at the next lecture meeting, unless prior arrangements have been made.

We have the following telescopes available for rent:

- Two 10" f/4.5 Coulter Odyssey Dobsonians. Includes a Telrad finder, and one of them comes with a Lumicon Sky Vector.
- Another 10" dob
- Two 8" Schmidt-Cassegrains (SCTs). Includes a tripod, equatorial wedge and drive motor for tracking. One has an inverter to run the drive off a battery.

We also have a separate drive controller which would work well with either of these.

- 75mm (3") f/16 Unitron refractor. This scope is on a German equatorial mount and tripod, with a small finder scope. It's best for lunar and planetary views.

- Astroscan.

Each rented scope comes with a few eyepieces, star charts, books, and planisphere.

If you're looking for something other than a telescope, we do have a few other items available for rent.

- 8x56 Celestron binoculars
- Nagler 31mm type 5 eyepiece. (You'll need a 2" focuser to use this).

- Color filter set (good for planetary viewing)
- Black and White video camera "eyepiece", designed to be used with a telescope. The camera fits in where your eyepiece would normally go, and connects to a monitor. Works best with the Moon as your target.

The M58 (NGC4579) galaxy in the Virgo Cluster. M58, located 70 million light years away in Virgo, is an example of a barred spiral galaxy. This image was taken using the 36" Cassegrain (Nellie) at the Chabot Space & Science Center. *Photo: Conrad Jung*

SJAA Auction & Swap Meet

The San Jose Astronomical Association's (SJAA) annual auction and swap meet will be held on Sunday, April 20 at Hogue Park in San Jose. The SJAA Auction is a great opportunity for beginners to purchase their first telescope at a great price! Experienced observers often find equipment they need for their next observing project, from O–III filters to finders to star charts. All kinds of interesting items are found in the auction. You do not have to be an SJAA member to attend.

Doors open at 11:30 a.m. to register material for the auction. Registration will end by 12:30 p.m. There will be a total limit of 100 items for the auction so the auction does not last too long. Please limit yourself to about four items maximum for the auction. SJAA strongly suggest you pre–register your items so that people know what you are bringing. Please check the SJAA web site (www.SJAA.net) for more information regarding selling items at the auction.

The auction will begin at 1 p.m., and will run as long as needed (typically ending about 3 p.m.).

Swap Meet

After the auction, material for the swap meet will be allowed into the hall. The swap also allows people some additional haggling time for those items that did not sell during the auction. Sellers are encouraged to bring items that would interest the astronomical audience such as astronomical, science, computer, or tech items. Vendors typically attend the swap as well selling their own merchandise. At the swap, each buyer pays the seller. SJAA asks Sellers to keep track of their sales, and ask they make a donation (10% is suggested) as during the auction.

What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time.

April

7 Mon Moon at perigee (223,869 miles) 12:00 p.m.

10 Thur The Moon is 3° from M35. 11:00 p.m.

11 Fri Venus 2.75° from the Pleiades (M45). 9:00 p.m.
Mars just 0.5° from the Moon. Midnight.

12 Sat **First Quarter Moon**. 11:32 a.m.
Venus at greatest heliocentric latitude south.
1961 Yuri Gagarin becomes the first man to orbit the Earth (orbit lasted 1h 48m)
"Circling the Earth in the orbital spaceship I marvelled at the beauty of our planet. People of the world! Let us safeguard and enhance this beauty—not destroy it!"
1981 First space shuttle, Columbia, launched.

13 Sun 1970 Apollo 13 disaster strikes.

14 Mon 1629 Christiaan Huygens born.

16 Wed Easter.

17 Thur 1970 The Apollo 13 astronauts return safely to Earth. Whew.

18 Fri **Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
1955 Albert Einstein dies.

20 Sun **Full Moon**. 3:25 a.m.
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.
1972 Apollo 16 lands on the Moon at Descartes.

21 Mon **Tri-Valley Stargazers Board meeting**. 7:30 p.m. at the Round Table Pizza in Livermore.
Lyrid meteor shower peaks. 9:00 p.m.

22 Tue Earth Day.

23 Wed Moon at apogee (251,684 miles) 3:00 a.m.

24 Thur Saturn 2.5° from the Moon. 11:00 p.m.

25 Fri 1990 Hubble Space Telescope deployed from shuttle Discovery.

26 Sat 1962 Kosmos 4 becomes the first Soviet photo reconnaissance satellite was launched.

27 Sun 4977 B.C. According to Kepler, the Creation occurs on this date.

28 Mon **Last Quarter Moon**. 7:12 a.m.
1900 Jan Oort born.

May

1 Thur 1006 A supernova in Lupus is discovered by Ali ibn Ridwan, with the Japanese, Chinese, and a Swiss monk also recording the event.

5 Mon **New Moon**. 5:18 a.m.
Eta Aquarid meteors peak. 11:00 a.m.
Moon at perigee (221,818 miles) 8:00 p.m.
1961 Alan Shepard becomes the first American in space with a 15 minute ride on Freedom 7. He was paid $14.38 for his efforts.

10 Sat The Moon is less than 2° from the Beehive Cluster (M44). 11:00 p.m.

11 Sun Mother's Day.
First Quarter Moon. 8:47 p.m.

Tracking Wildlife from Space

by Patrick L. Barry

It's 10 o'clock, and do you know where your Oriental Honey Buzzard is?

Tracking the whereabouts of birds and other migrating wildlife across thousands of miles of land, air, and sea is no easy feat. Yet to protect the habitats of endangered species, scientists need to know where these roving animals go during their seasonal travels.

Rather than chasing these animals around the globe, a growing number of scientists are leveraging the bird's-eye view of orbiting satellites to easily monitor animals' movements anywhere in the world.

The system piggybacks on weather satellites called Polar Operational Environmental Satellites, which are operated by the National Oceanic and Atmospheric Administration (NOAA), as well as a European satellite called MetOp. Sensors aboard these satellites pick up signals beamed from portable transmitters on the Earth's surface, 850 kilometers below. NOAA began the project—called Argos—in cooperation with NASA and the French space agency (CNES) in 1974. At that time, scientists placed these transmitters primarily on buoys and balloons to study the oceans and atmosphere. As electronics shrank and new satellites' sensors became more sensitive, the transmitters became small and light enough by the 1990s that scientists could mount them safely on animals. Yes, even on birds like the Oriental Honey Buzzard.

"Scientists just never had the capability of doing this before," says Christopher O'Connors, Program Manager for Argos at NOAA.

Today, transmitters weigh as little as 1/20th of a pound and require a fraction of a watt of power. The satellites can detect these feeble signals in part because the transmitters broadcast at frequencies between 401 and 403 MHz, a part of the spectrum reserved for environmental uses. That way there's very little interference from other sources of radio noise.

"Argos is being used more and more for animal tracking," O'Connors says. More than 17,000 transmitters are currently being tracked by Argos, and almost 4,000 of them are on wildlife. "The animal research has been the most interesting area in terms of innovative science."

For example, researchers in Japan used Argos to track endangered Grey-faced Buzzards and Oriental Honey Buzzards for thousands of kilometers along the birds' migrations through Japan and Southeast Asia. Scientists have also mapped the movements of loggerhead sea turtles off the west coast of Africa. Other studies have documented migrations of wood storks, Malaysian elephants, porcupine caribou, right whales, and walruses, to name a few.

The ARGOS program tracks the whereabouts of endangered migrating animals via miniature transmitters on the animals and the POES satellites in orbit.

Argos data is available online at www.argos-system.org, so every evening, scientists can check the whereabouts of all their herds, schools, and flocks. Kids can learn about some of these endangered species and play a memory game with them at spaceplace.nasa.gov/en/kids/poes_tracking.

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

Get Your Gummy Greenhouse Gases!

Making science edible—and sweet—is a reliable way to attracts kids' interest. The new "Gummy Greenhouse Gases" activity on The Space Place web site makes it fun and easy to learn a bit of chemistry and to find out why too many of these kinds of molecules in the air are likely to cause Earth to get warmer. At http://spaceplace.nasa.gov/en/kids/tes/gumdrops, kids use gumdrops and toothpicks to make simple molecules of ozone, nitrous oxide, carbon dioxide, water vapor, and methane. The curious can go on to http://spaceplace.nasa.gov/en/kids/tes/gases to learn more about the greenhouse effect and about the "good and bad" roles of ozone. A short video shows how new space technology can literally paint a 3-D picture of these gases all around the globe. Afterwards, the ghastly gases can be consumed (mind the toothpicks!), thus helping the environment.

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.
_____ $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.