

# PRIME FOCUS

Tri-Valley Stargazers

August 2008



## Meeting Info:

### What

*This Galactic Life:  
Neighborhood Watch*

### Who

Joshua Peek and  
Karin Sandstrom

### When

August 15, 2008  
Doors open 7:00 p.m.  
Lecture at 7:30 p.m.

### Where

Unitarian Universalist  
Church in Livermore  
1893 N. Vasco Road

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## August Meeting

This Galactic Life: Neighborhood Watch  
*Joshua Peek and Karin Sandstrom*

What does our Galaxy look like from the outside, and how do astronomers know when we're buried deep within it? This lecture will examine the structure and geography of the Milky Way in two presentations by two different astronomers. As an introduction we'll briefly survey the wide variety of galaxies found in our Universe. Then the first part of the presentation will explore the overall structure of our Galaxy, in particular, its spiral arms. What are spiral arms and how do we know the Milky Way has them? Then, we'll ponder how we know how far away astronomical objects are. Distance is a question that perpetually plagues astronomers, who look up at a sky that appears two-dimensional and must somehow deduce how to separate objects along the third dimension. Join us for an excursion through the observable Milky Way.

Josh Peek and Karin Sandstrom study Astronomy at University of California, Berkeley. Josh, who recently received his Ph.D., studies the assembly of the Milky Way with the Arecibo Observatory in Puerto Rico. Karin, who is a graduate student, studies the evolution of interstellar dust grains using observations from the Spitzer Space Telescope.



M31, the Andromeda Galaxy, and its companions, M32 and M110. Photo: Conrad Jung

## News & Notes

### 2008 TVS Meeting Dates

The following lists the TVS meeting dates for the rest of the year. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the October 5th deadline is for the October issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Aug. 15	Aug. 18	Aug. 3
Sept. 19	Sept. 22	Sept. 7
Oct. 17	Oct. 20	Oct. 5
Nov. 21	Nov. 24	Nov. 9
Dec. 19	Dec. 22	Dec. 7

### Money Matters

At the June board meeting, Treasurer **David Feindel** reported the TVS account balances as of July 21, 2008.

Checking	\$4,154.83	
CD #1	\$3,725.34	matures 08/17/08
CD #2	\$2,628.55	matures 08/27/08

### Camp Shelly Star Party - Aug. 15

The Camp Shelly star party is fast approaching. It takes place Friday and Saturday, August 15-16. Camp Shelly is located off of Highway 89 near South Lake Tahoe, and is operated by the LARPD (Livermore Area Recreation and Parks District).

TVS members that come to the camp are asked to host a star party for the other campers in exchange for free camping. Rich Combs will be giving a talk on Friday and Saturday evenings, with telescope viewing right after the talk. The campground is full, so we're guaranteed to have many people come to the event.

TVS' camp site is #5 (near the rest rooms), which has room for tents and/or a small trailer. The site can hold eight people, more if we squeeze in tight. For more information about the Camp, visit [http://www.larpd.dst.ca.us/cshelly\\_fs.html](http://www.larpd.dst.ca.us/cshelly_fs.html).

If you'd like to participate, please contact Rich at [combrichard -at- sbcglobal -dot- net](mailto:combrichard-at-sbcglobal-dot-net).

### White Mountain Star Party - Aug. 24

This year's high altitude star party will take place August 24th through September 7th. Time is running out for signing up, so if you're interested in attending, you'll need to contact Dave Rodrigues with your RSVP.

You can stay for however many days and nights you wish—you're not required to stay for the full two weeks. The cost is \$63 per day, which includes a cot in the dormitory, hot showers, and very good food. There's even an



The long drive up to Barcroft—about 12 miles and a 2,400' increase in elevation, all on a dirt and gravel road. But what a view from the top!

oxygen tank in the dining hall in case you are in need of some air. Due to the altitude, only those 16 and over can attend.

The White Mountain star party takes place at the Barcroft High Altitude Research Station at 12,400' elevation. White Mountain is located east of the Sierras, just east of Bishop. It is advised to spend a night at a slightly lower elevation, like at Mammoth Lakes (7-8,000') or the Grandview Campgrounds (9,000') getting acclimated to the higher altitude before heading up to the station.

The skies at Barcroft are very dark, with the Milky Way so bright that it casts shadows. It's the ideal place for photography and general deep sky observing.

If you'd like to sign up, or get more information, please contact our trip coordinator, Dave Rodrigues, at 510-483-9191.

### TVS New E-Mail

Due to the ever increasing and unrelenting amount of spam hitting our [tvst@trivalleystargazers.org](mailto:tvst@trivalleystargazers.org) e-mail address, the board has agreed to abandon ship and get a new e-mail address. From now on, people can send e-mails to our new account: [trivalleystargazers # at # gmail #dot# com](mailto:trivalleystargazers#@gmail.com).

*continued page 4*

**Newsletter header image:** NGC 6543 - the Cat's Eye nebula  
This Cat's Eye can be found in Draco. It's the remains of a dying star, located about 3,300 light years away. This image shows the concentric gas shells expanding out from the central star. The nebula is estimated to be about 1,000 years old.  
*Photo: Conrad Jung*

# Calendar of Events

## August 9, 8:30 p.m.

**What:** *Astrobiology, Planetary Protection and the Search for ET Life*

**Who:** Dr. Margaret S. Race (SETI Institute)

**Where:** Mt. Tamalpais

**Cost:** Free

A down to Earth view of preparations for space missions—it takes more than just rocket scientists. Following the lecture, members of the San Francisco Amateur Astronomers will provide telescopes for viewing in the Rock Spring parking lot. Viewing continues until about 11:00 p.m., weather permitting.

For driving directions and additional information call the hotline: 415-455-5370 or check out [www.mttam.net](http://www.mttam.net).

## August 29, 6:00 p.m. to 11:00 p.m.

**What:** *Lunar Lounge Express: Battle of the Bands*

**Who:** Everyone

**Where:** Chabot Space & Science Center

**Cost:** \$15 Adult, \$10 Student (with I.D.), \$8 Member  
Contact the Box Office at 510-336-7373

Bring your friends and party under the stars at Chabot's quarterly nocturnal celebration!

- Access to Chabot's hands-on interactive exhibits
- SonicVision - an alternative music Planetarium show
- Telescope viewing in our Observatory Complex
- Enjoy micro-brews from Buffalo Bill's Brewery
- Enjoy wine from R&B Cellars
- Enjoy food from Asqew Grill
- And much more!

The Oakland Fire Department will be our Celebrity Judges. The bands performing are:

### The TomorrowMen

Instro-surf rockers from the year 3000. Imagine if you put Dick Dale, Devo and The Buzzcocks in a super collider and flipped the switch. The result - The TomorrowMen!

### Variable Stars

Belle and Sebastian meet The Smiths. Catchy indie rock.

### Corner Laughters

An indie-pop band specializing in bouncy, clever, melodic songs about evolution, mythology, ancient history and guys who are jerks.

Chabot is offering 50% OFF ADMISSION to all firemen and their families (with I.D.).

## September 6, 8:00 p.m.

**What:** *Demarcation: Is There a Sharp Line Between Science and Pseudoscience?*

**Who:** Dr. Raymond Hall (CSU Fresno)

**Where:** Mt. Tam

**Cost:** Free

A look at ways to discern the difference between astronomy and astrology, and the application of these distinctions in the areas of law, public policy, and education policy.

Following the lecture, members of the San Francisco Amateur Astronomers will provide telescopes for viewing in the Rock Spring parking lot. Viewing continues until about 11:00 p.m., weather permitting. For driving directions and additional information call the hotline: 415-455-5370 or check out [www.mttam.net](http://www.mttam.net).

### Officers

#### **President:**

Chuck Grant  
cg@fx4m.com  
925-422-7278

**Vice-President:**  
unfilled

#### **Treasurer:**

David Feindel  
feindel1@comcast.net

#### **Secretary:**

David Woolsey  
fatdawg@comcast.net

#### **Board of Directors**

Alane Alchorn, Jim Alves,  
Debbie Dyke, Gert Gottschalk,  
Mike Rushford, John Swenson.

### Volunteer Positions

#### **Librarian:**

Jim Alves  
Ajaengr@yahoo.com  
209-833-9623

#### **Newsletter Editor:**

Debbie Dyke  
astrodeb@comcast.net  
925-461-3003

**Program Director:** unfilled

#### **Loaner Scope Manager:**

John Swenson  
johnswenson1@comcast.net

#### **Webmaster:**

Debbie Dyke

#### **Observatory Director/**

**Key Master:**  
Chuck Grant

**School Star Party Chair:**  
unfilled

### Public Star Party Chair:

unfilled

#### **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](http://www.trivalleystargazers.org)  
[trivalleystargazers@gmail.com](mailto:trivalleystargazers@gmail.com)

### Eyes on the Skies

Eyes on the Skies is a robotic solar telescope run by Mike Rushford ([rushford@eyes-on-the-skies.org](mailto:rushford@eyes-on-the-skies.org)). You may access it by visiting [www.eyes-on-the-skies.org](http://www.eyes-on-the-skies.org).

### TVS E-Group

So how do you join the TVS e-group, you ask? Just send an e-mail message to the TVS e-mail address ([trivalleystargazers@gmail.com](mailto:trivalleystargazers@gmail.com)) asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

### The 2008 Yosemite Star Party, a.k.a. "The Great Smoke Out"

TVS' weekend at Yosemite was July 25-26. Not the optimal weekend; the Moon would rise around 11:45 p.m. on Friday night, and 12:30 a.m. Saturday night/Sunday morning. But Yosemite is Yosemite.

The first sign that things were different than in the past was that Bridalveil campground didn't fill up until mid-afternoon Friday; whereas in years past, 10 a.m. or so was the cutoff. A clear sign the economy isn't doing well. A second difference was our speaker for Friday night—Rich Combs. I didn't know what to expect; clearly something different from the AstroWizard, but what? Rich did an excellent job of entertaining and informing our visitors; starting with an introductory monologue, and rapidly evolving into a stimulating Q&A session. Although there were only 60-70 visitors, there was a never-ending flow of questions, which Rich ably answered and then segued into a related topic. The club members had 7-8 scopes set up, ranging from a 90mm MCT and my 115mm refractor up to some 10" optics.

My highlight Friday night was finally seeing Jupiter's Great Red Spot. *Sky & Telescope's* article in August pinpointed the transit time at 11:45 p.m., and by 11:20 or so we could see it, using 155X on my refractor. What we didn't see was the 2nd and 3rd red spots; either my aperture was too small, or the seeing wasn't quite good enough. Trying higher mag (up to 268X) didn't gain anything, especially with my non-tracking mount.

Saturday was highlighted by the pot luck dinner (again ably chef'd by Bob McKoon). The arrival of the Dave Rodrigues, the AstroWizard, a half hour before show time put everyone at ease about the program. But...reported Saturday afternoon was a large wildfire burning out of control just north of Midpines, CA, about 15 miles outside the park. The fire had started sometime Friday, and

by Saturday evening, had filled the air with smoke and ash. The sun was reddish in the sky by 5 p.m. The combination of the fire and economy dampened attendance; Bridalveil campground never filled up at all for Saturday night! The fire also caused the AstroWizard problems; power to Glacier Point was knocked out, and in his spell to conjure up an inverter, he forgot to specify a 1200W one, so the one that appeared was too small. Even Wizards have limits! The show did go on (of course!), using a laptop screen, with the audience sympathetic to the problems.



The observing Saturday night was, as you would expect, not very good. Normally, Half Dome is clearly visible by the light of the Milky Way; at 10 p.m., it was only a vague shadow in the distance. The rangers advised us that usually under these conditions, the air clears sub-



Top: Roger Gathers takes aims at an unsuspecting target while the crowd watches.

Left: The AstroWizard, Dave Rodrigues, warning the park ranger about his routine.

Bottom: The AstroWizard conjures up some magic to the audience's delight. Now if only he could conjure up a 6" AP scope—that would be a very popular trick!





Top: Intrepid TVS campers doing the camping BBQ thing.

Upper Left: Home-made dobs are always a welcome addition to any star party.

Bottom: Bob McKoon makes the point that telescopes work best when pointed into the sky instead of the BBQ pit.

stantially by 2 or 3 a.m., as the cold mountain air flows back down into the valleys, but with the skies still fairly limiting at 10:30 p.m. when the last visitors left, most starting packing up. Those of us who stayed a bit longer did indeed notice the air clearing a bit by 11:30, but it was still noticeably worse than Friday night, and much worse than the best Yosemite has to offer. Highlights Saturday were seeing an adult and fledgling ptarmigan (as identified by the AW) and some deer in the parking lot at midnight.

### 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.

### August

Fri 8	I	7:53p	9:00p	10:09p
	Is	8:32p	9:35p	10:49p
	GRS	8:25p	10:23p	12:30a
Sat 9	GRS	na	na	9:50p
Mon 11	GRS	na	9:32p	11:40p
	G	8:32p	10:10p	11:50p
	Gs	11:40p	1:12a	2:57a
	I	3:12a	na	na
Wed 13	GRS	9:10p	11:05p	1:10a
	I	9:40p	10:43p	11:56p
	Is	10:27p	11:30p	12:44a
Thur 14	E	11:41p	1:00a	2:25a
	Es	1:19a	2:30a	na
Fri 15	GRS	10:45p	12:40a	2:45a
Sat 16	GRS	na	8:48p	10:45p
Mon 18	GRS	12:23a	2:28a	na

	GRS	8:26p	10:15p	12:15a
Tue 19	G	12:03a	1:37a	na
Wed 20	GRS	10:00p	11:57p	1:55a
	I	11:28p	12:35a	1:43a
	Is	12:22a	1:25a	2:37a
Thur 21	GRS	na	7:40p	9:45p
	Cs	7:40p	9:15p	11:25p
Fri 22	I	na	7:03p	8:10p
	Is	na	7:54p	9:08p
	GRS	11:32p	1:41a	na
Sat 23	GRS	na	9:25p	11:40p
Mon 25	GRS	9:10p	11:05p	1:15a
Wed 27	GRS	10:45p	12:41a	na
	I	1:17a	na	na
	Is	2:17a	na	na
Thur 28	GRS	na	8:32p	10:43p
Fri 29	I	7:44p	8:50p	10:00p
	Is	8:48p	9:44p	11:03p

### September

Mon 1	E	na	na	8:22p
	Es	na	9:00p	10:33p
	GRS	9:55p	11:47p	1:46a
Tue 2	GRS	na	7:45p	9:55p

## What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time.

### August

- 8 Fri **First Quarter Moon.** 1:20 p.m.  
St. Dominic - patron saint of astronomers.
- 10 Sun Moon at apogee (250,824 miles). 1:00 p.m.
- 11 Mon 1877 Asaph Hall Sr. discovers Mars' moon Deimos.
- 12 Tue Perseid meteors shower peaks. 4:00 a.m.
- 15 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,  
1893 N. Vasco Road, Livermore.  
Neptune at opposition. 8:00 a.m.
- 16 Sat **Full Moon.** 2:16 p.m.
- 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.  
1877 Asaph Hall discovers Mars' other moon, Phobos.
- 18 Mon **Tri-Valley Stargazers Board meeting.** 7:30 p.m. at the Round Table Pizza in Livermore.
- 20 Wed 1977 Voyager 2 launched toward Jupiter and Saturn.
- 21 Thur 1609 Galileo shows off his telescope to the Doge's navy.
- 23 Sat **Last Quarter Moon.** 4:49 p.m.
- 25 Mon Moon at perigee (228,591 miles). 9:00 p.m.  
1981 Voyager 2 flies past Saturn.  
1989 Voyager 2 flies past Neptune.
- 28 Thu For the look for the Zodiacal Light in the east before morning twilight.  
The thin crescent Moon 1° from the Beehive Cluster. 5:00 a.m.
- 29 Fri 1864 William Huggins discovers that nebulae are gas clouds.
- 30 Sat **New Moon.** 12:58 p.m.  
1983 Guion Bluford Jr. becomes the first African American in space.

### September

- 1 Mon **Labor Day.**  
Ramadan begins at sundown.  
1979 Pioneer 11 is first craft to fly past Saturn.
- 3 Wed Mercury at aphelion.  
Saturn in conjunction with the Sun. 7:00 p.m.  
1976 Viking 2 lands on Mars at Utopia Planitia.
- 5 Fri 1977 Voyager 1 launched toward Jupiter and Saturn.
- 6 Sat The Moon 1° from Antares. 9:00 p.m.
- 7 Sun **First Quarter Moon.** 7:04 a.m.  
Moon at apogee (250,612 miles). 8:00 a.m.  
Jupiter stationary. 8:00 p.m.
- 8 Mon 1966 Star Trek debuts. It's ranked 52nd out of 54 shows. It lived long and prospered.
- 9 Tue The Moon is 5° from Jupiter. 9:00 p.m.  
Pluto stationary.  
1975 Viking 2 launched towards Mars.
- 10 Wed Mercury at greatest elongation east (27°). 9:00 p.m.

## Death of a Supergiant

By all outward appearances, the red supergiant appeared normal. But below the surface, hidden from probing eyes, its core had already collapsed into an ultra-dense neutron star, sending a shock wave racing outward from the star's center at around 50 million kilometers per hour.

The shock wave superheated the plasma in its path to almost a million degrees Kelvin, causing the star to emit high-energy ultraviolet (UV) radiation. About six hours later, the shock wave reached the star's surface, causing it to explode in a Type IIP supernova named SNLS-04D2dc.

Long before the explosion's visible light was detected by telescopes on Earth, NASA's Galaxy Evolution Explorer (GALEX) space telescope captured the earlier pulse of UV light — scientists' first glimpse of a star entering its death throes.

"This UV light has traveled through the star at the moment of its death but before it was blown apart," explains Kevin Schawinski, the University of Oxford astrophysicist who led the observation. "So this light encodes some information about the state of the star the moment it died."

And that's exactly why astronomers are so excited.

Observing the beautiful nebula left behind by a supernova doesn't reveal much about what the star was like before it exploded; most of the evidence has been obliterated. Information encoded in these UV "pre-flashes" could offer scientists an unprecedented window into the innards of stars on the verge of exploding.

In this case, Schawinski and his colleagues calculated that just before its death, the star was 500 to 1000 times larger in diameter than our sun, confirming that the star was in fact a red supergiant. "We've been able to tell you the size of a star that died in a galaxy several billion light-years away," Schawinski marvels.

"GALEX has played a very important role in actually seeing this for a few reasons," Schawinski says. First, GALEX is a space telescope, so it can see far-UV light that's blocked by Earth's atmosphere.

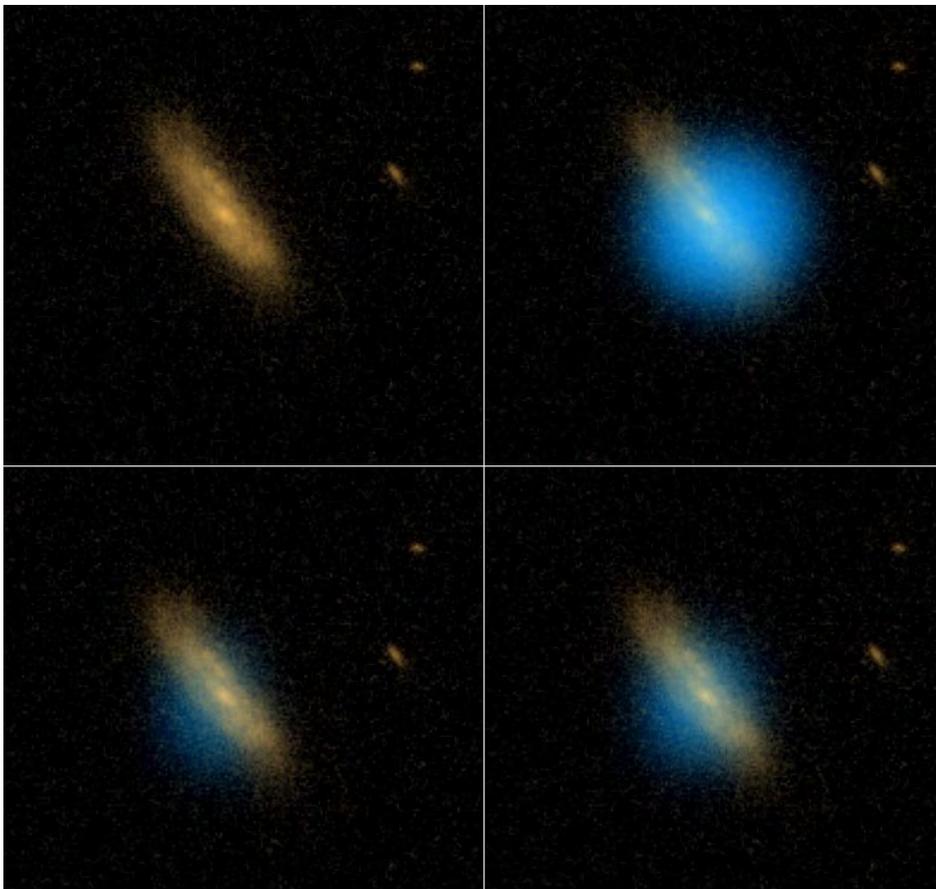
Also, GALEX is designed to take a broad view of the sky. Its relatively small 20-inch primary mirror gives it a wide, 1.2-degree field of view, making it more likely to catch the UV flash preceding a supernova.

With these advantages, GALEX is uniquely equipped to catch a supernova before it explodes. "Just when we like to see it," Schawinski says.

For more information, visit [www.galex.caltech.edu](http://www.galex.caltech.edu), "Ultraviolet Gives View Inside Real 'Death Star'." Kids can check out how to make a mobile of glittering galaxies at [spaceplace.nasa.gov/en/kids/galex\\_make1.shtml](http://spaceplace.nasa.gov/en/kids/galex_make1.shtml).

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

Sequence of images shows supernova start to finish. The top left image shows the galaxy before the supernova. At top right, the bright UV flash called the shock breakout indicates a red supergiant has collapsed. At bottom left, moments later, the flash is mostly gone. As the debris expands, it heats up again and becomes brighter (bottom right). The supernova became 10 times the size of the original over the following few days, thus becoming visible to supernova hunters.



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



## PRIMEFOCUS

### Tri-Valley Stargazers Membership Application

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function.

Name \_\_\_\_\_ Phone \_\_\_\_\_ e-mail \_\_\_\_\_

Address \_\_\_\_\_

Do not release my: \_\_\_\_\_ address, \_\_\_\_\_ phone, or \_\_\_\_\_ e-mail information to other TVS members.

- Membership category: \_\_\_\_\_ \$5 Student.  
\_\_\_\_\_ \$30 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.  
\_\_\_\_\_ \$40 Regular. You will receive a paper version of *Prime Focus* in the mail.  
\_\_\_\_\_ \$10 Hidden Hill Observatory (H2O) yearly access fee. You need to be a key holder to access the site.  
\_\_\_\_\_ \$20 H2O key holder fee. (A refundable key *deposit*—key property of TVS).  
\_\_\_\_\_ \$40 Patron Membership. Must be a member for at least a year and a key holder.  
\_\_\_\_\_ \$34 One year subscription to *Astronomy* magazine.  
\_\_\_\_\_ \$60 Two year subscription to *Astronomy* magazine.  
\_\_\_\_\_ \$32.95 One year subscription to *Sky & Telescope* magazine. **Note:** Subscription to *S&T* is for new subscribers only. Existing subscribers please renew directly through *S&T*.  
\$ \_\_\_\_\_ Tax deductible contribution to Tri-Valley Stargazers.  
\$ \_\_\_\_\_ TOTAL – Return to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551

Membership information: Term is one calendar year, January through December. Student members must be less than 18 years old or still in high school.