

PRIME FOCUS

Tri-Valley Stargazers

December 2002



Meeting Info:

What

*Winter Solstice Potluck
and Milky Way Panorama*

Who

You and Axel Mellinger

When

December 20, 2002
Set up at 6:30 p.m.
Dinner at 7:00 p.m.

Where

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Note the
time change!

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December Meeting

Winter Solstice Potluck and "Stars on Three Continents:
A Panoramic Image of the Milky Way"

You and Axel Mellinger

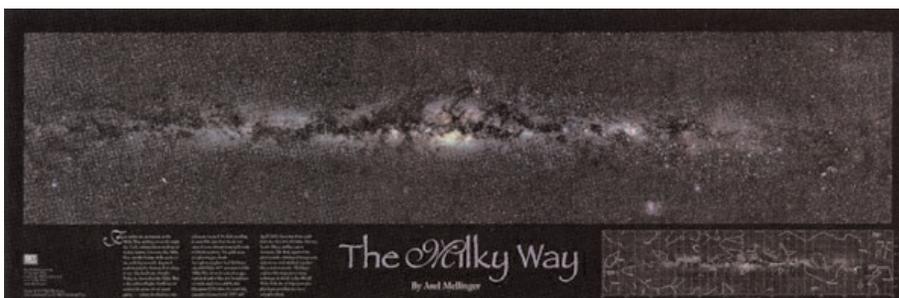
'Tis the season to stuff yourself with lots of food and drink. TVS will help you with this holiday tradition with our annual Winter Solstice Potluck. We will provide hot and cold drinks, and all the paper and plastic stuff (paper plates, plastic utensils, etc.) you could possibly need. So what do you need to bring to the potluck? Using the first letter of your last name, follow the guide below.

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

After dinner we will be treated to a presentation by **Axel Mellinger**. Axel created the Milky Way panorama image (available as a poster from *Sky & Telescope*, among others) shown below. If you have one of his posters bring it along and he will autograph it for you.

"In recent years amateur astrophotography has seen a strong move towards digital imaging. Traditional film still has its place as a recording medium for wide-field images, but nearly all of the darkroom work has been replaced by image processing techniques that reach far beyond the capabilities of even the most skillful darkroom experts. In particular, photographs can now be corrected for geometrical defects. Experienced photographers are well aware of the fact that the image scale at the center of a wide-angle frame is not the same as near its edge. Using special computer software, this distortion can be removed by

Axel's famous All Sky Milky Way Panorama image, in poster form.



News & Notes

“warping” the original exposure, allowing the creation of an all-sky mosaic by stitching together 51 individual images.

The presentation will not only discuss the processing steps, but also take you on a tour to some of the world’s darkest skies in California’s White Mountains and the Namib and Kalahari deserts of southern Africa.”

New Member

Please welcome our newest TVS member **Fabrizio Mantauti**. Say hello to him at our Solstice potluck.

2002 TVS Meeting Dates

Below are the next few TVS meeting dates. The lecture meetings are held on the third Friday of the month, with the Board meeting on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month’s issue (e.g., the January 5th deadline is for the January issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Dec. 20	Dec. 16	Dec. 8
Jan. 17	Jan. 20	Jan. 5
Feb. 21	Feb. 24	Feb. 9

Money Matters

At the November Board meeting, outgoing Treasurer **Mike Anderson** reported the balances (as of November 18, 2002) of the following TVS accounts:

Checking	\$1,183.10	
CD #1	\$3,896.67	matures 02/17/03
CD #3	\$2,404.78	matures 02/27/03
CD #4	\$2,046.71	matures 01/16/03

Membership Renewal Time

Our membership year ends this month. Don’t forget to renew! For those who subscribe to *Sky & Telescope* or *Astronomy* magazine through the club, the sooner you renew, the less chance there is of missing an issue.

We have three membership levels: The Student level is \$5 a year, Basic is \$25 and Regular is \$30. The only difference between Basic and Regular is that the Basic membership will access the newsletter in PDF format online, Regular will get a paper version mailed to them.

Patron Members will have their Patron status renewed automatically. Since the Marling scope is still unoperative, we will not be collecting a Patron Membership fee. In the meantime, we will be placing one of the club’s 10" dobs in the Sky Shack for Patron (and Open House star party) use.

TVS Election Results

At the November meeting, TVS members elected their officers for 2003. The winning candidates are:

President - Chuck Grant
Vice President - Frank Rogue
Secretary - Maggie Halberg
Treasurer - Gary Steinhour

Board of Directors

Alane Alchorn
Jim Alves
Mike Anderson
Paul Caswell
Debbie Dyke
Gert Gottschalk
Signe McIntire
Frank Rogue
Mike Rushford
John Swenson

We have a couple of volunteer positions that need to be filled—**Program Director** and **School Star Party Coordinator**. The Program Director is responsible for getting speakers for our monthly lectures. The School Star Party Coordinator does what the name suggests,

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Calendar of Events

Classic Sci-Fi Film Series Chabot Space & Science Center

The movies are shown at the Tien MegaDome Theater. Tickets are \$5 per person and are available at the door, at TicketWeb.com, or the Chabot Box Office, 510-336-7373.

Movies:

2001: A Space Odyssey (G), December 30 – January 5, 2003
2010 (PG), January 10-12, 2003

Showtimes:

Friday – Sunday on the first weekend of each month.

Fridays – 7:30 p.m.

Saturdays – 4:00 & 7:30 p.m.

Sundays – 4:00 p.m.

Newsletter header image: M33, The Triangulum Galaxy.

At a distance of 3 million light years, M33 is the most distant object visible to the naked eye! Numerous HII regions in M33 are large enough that they have been given their own NGC numbers.

Photo taken with a 4" Takahashi with f/5.9 focal reducer, IDAS light pollution filter, and hypered Kodak Supra 400. October 4-5, 2002, 11:09 p.m.–12:39 a.m.

Photo and text by TVSer Ken Sperber.

Calendar of Events *continued*

December 12, 7:30 p.m.

What: *Storms from the Sun: How Weather on the Sun Affects Life Down Here*

Who: Dr. Mike Carlowicz
(Woods Hole Oceanographic Institution)

Where: Tien MegaDome Theater
Chabot Space & Science Center, Oakland

Cost: \$5.00

We live within the atmosphere of a variable star, and that atmosphere is home to some of the most bizarre and unpredictable cosmic weather. Space weather is a range of disturbances that are born on the Sun, rush across space, and disturb Earth's environment and the various technologies we have come to depend upon. If you like your electronic toys and tools – or if you work for or invest in the companies that make them – you ought to learn something more about our nearest star... the only one that will affect you in your lifetime.

The lecture will be followed by a dessert reception in the Celestial cafe, where the audience can meet the speaker. For more information about this or any upcoming talk, or to obtain a brochure about the Distinguished Lecture 2002-03 series, please contact Denni Medlock at 510-336-7368. dmedlock@chabotspace.org

December 22, 6:30 p.m.

What: *Treasure Planet*

Where: Chabot Space & Science Center.

Cost: \$8.75 for Adults, \$6.50 for Youth/Children
Members receive \$1 off price.

Disney films is generously giving Chabot Space & Science Center a one-time showing of their brand new first run animated film, *Treasure Planet*.

Hunt For Planets with Dr. Geoff Marcy at W.M. Keck Observatory

The Astronomical Society of the Pacific (ASP) announces a unique fundraising auction—an observing night at the W.M. Keck Observatory in Hawai'i with internationally renowned astronomer Dr. Geoff Marcy. The ASP has pledged to donate 5% of the auction proceeds to the amateur astronomy club of the winner's choice.

The highlight of the five day/four night trip for two is a once-in-a-lifetime opportunity to spend a night in the Keck I control room with Dr. Marcy and his team during one of his scheduled observing runs. Dr. Marcy will host dinner that evening, and the winner will be able to sleep overnight at the VSQ (Visiting Scientists' Quarters), which is open only to astronomers. The auction package includes round trip airfare for two, resort accommodations, car rental, meals, and a behind-the-scenes VIP tour of the W.M. Keck Observatory conducted by a Keck staff member.

Potential bidders may visit the ASP Web site at www.astrosociety.org immediately to get full information and to be notified exactly when the auction will begin. The auction will be held in January 2003 on a popular auction Web site. The winner can schedule the trip to coincide with any of Dr. Marcy's scheduled observing nights in 2003.

The Keck I and II twin 10-meter telescopes are the world's largest optical telescopes, located at the summit of Mauna Kea on the Big Island of Hawai'i, at an altitude of 13,796 feet. The Observatory headquarters, Visiting Scientists' Quarters, and control rooms are located in Waimea, at about 2,500 feet.

Officers

President:

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

Vice-President:

Frank Rogue
frankrogue@attbi.com

Treasurer:

Gary Steinhour
steinhour1@juno.com

Secretary:

Maggie Halberg
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Board of Directors

Alane Alchorn, Jim Alves,
Mike Anderson, Paul Caswell,
Debbie Dyke, Gert Gottschalk,

Signe McIntire, Frank Rogue,
Mike Rushford, John Swenson.

Volunteer Positions

Librarian:

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Newsletter Editor:

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ddfam@pacbell.net
925-461-3003

Program Director: unfilled

Loaner Scope Manager:
John Swenson
johnswenson1@attbi.com

Webmaster:
Chuck Grant

Observatory Director/

Key Master:

Chuck Grant

School Star Party Chair:

unfilled

Public Star Party Chair:

Roger Gathers
925-846-1525

Historians:

Paul Caswell & Debbie Dyke

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
tvst@trivalleystargazers.org

Eyes on the Skies

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

News & Notes *continued*

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coordinates star parties for local schools, primarily elementary schools. If you are interested in either of these positions, please contact any TVS officer or board member.

RASC Handbooks Are In!

The RASC (Royal Astronomical Society of Canada) Observer's Handbook and Calendar are now available for purchase. The Handbook is \$15, the Calendar \$10 (and is in limited supply). If you'd like more information about these items, visit the RASC web site at www.rasc.ca and click on the 'Publications' link. If you wish to purchase one, or both, come to the December meeting and see our new Treasurer, **Gary Steinhour**.

Loaner Scopes

Hi, I'm John Swenson, your loaner scope program director. Many of you are not aware of what scopes and accessories we have available for rent to members, so I thought I'd give a quick rundown on what we have and a little info on each item. In further articles I'll give a more in-depth review of each item.

10" dobsonians: We have three of these. They are easy to use and a big enough aperture to see a LOT of objects. Fairly heavy when lifted in one piece, but not too bad when taken apart. They take a long time to cool down to really get good high power images. These are great for viewing galaxies, nebulas and other "Deep Space Objects" (DSOs), but not necessarily the best instrument for planetary viewing.

8" Schmidt-Cassegrain (SCT): We have two—both with a tripod, equatorial wedge and AC 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. These are good all around scopes, have a big enough aperture to see many DSOs, a long focal length which makes high power planetary viewing easy, and they can track the sky. Because of the design they are physically small for the aperture and focal length, but fairly heavy.

75 mm f/16 Unitron refractor: This is a long focal length achromatic refractor on an equatorial mount and tripod. It's great for planetary or lunar viewing, but the aperture is kind of small for most DSO work. The mount and tripod are very sturdy.

6" Newtonian on an equatorial mount: This little scope has not been used much as it's in need of cleaning and alignment. It's a good all around scope, big enough to see a lot, works well on planets, will track (needs inverter for battery use) and much lighter weight than many of our other scopes. The small mirror and open tube will cool



A few of the scopes available in our Loaner Scope Program—a 10" dob, a 75mm Unitron refractor, and an 8" Schmidt-Cassegrain.

down much faster than the other reflectors we have. **SPECIAL OFFER:** If anyone is willing to clean and align the 6" newt you can rent it for free!

8x56 Celestron binocular: If you are new to the obsession (er, hobby) of astronomy this is a nice way to learn your way around the sky. It's MUCH easier to get started with a low power binocular than a high power telescope, and it's much more portable!

Nagler 31mm type 5 eyepiece: This is the BIG one! The EP gives you a very wide razor sharp low magnification view. You do need a 2" focuser to use this.

Color filter set: Good for planetary viewing. Different colors will bring out different details in the planets.

Each scope rental is \$15 per month with a \$50 deposit (it's best to have 2 checks, one for \$50 that gets returned and one for \$15 that doesn't). If you bring the scope to a star party its free! See me at any of the meeting to rent a scope or ask questions.

Astronomical insights

by David Feindel

Amateur astronomers are indeed blessed these days. First, just in time for Christmas, new editions of two superb books are out—Phil Harrington's *Star Ware: The Amateur Astronomer's Ultimate Guide...* (3rd ed.) and Terence Dickinson/Alan Dyer's *The Backyard Astronomer's Guide* (2nd ed.). The latter has a companion web site, www.backyardastronomy.com, where the authors have placed considerable extra detail and are promising to provide updates. Both books are updated as of mid-2002, so their comments on equipment, resources, and research are up-to-the-minute. Both made specific product recommendations and tell you why. Second, telescope prices continue to drop;

Celestron just ratcheted down the price of a very competent 8" SCT package to \$1,199. Third, you can learn about these products before purchasing them through their on-line manuals and various on-line user groups.

Another blessing of amateur astronomy is the widespread nature of the hobby. We're traveling to northern Arizona for the holidays, and I've found two astronomy clubs with info on observing sites in the area and scheduled star parties for the time we'll be there. Reports from the Grand Canyon Star Party describe the South Rim as an observing area with excellent dark sky conditions (the nearest city, Flagstaff, is 70 miles away and has the nation's most stringent light pollution ordinance). If any club members have experience observing in the Grand Canyon/Flagstaff area, I'd like to hear about it!

One of the observing highlights this past month was, of course, the Leonids. Unfortunately, the near-full moon and high wispy clouds conspired to severely reduce the drama from what was forecasted to be a 3,000+/hour storm. Even employing the tricks of a site with a low eastern horizon and a tall obstruction to the west to shield the moon didn't help. The peak came quickly at about 2 a.m., and dropped off just as quickly. Most Bay Area ground observers reported seeing "a couple hundred" over an hour or more, with a couple "exceptional" meteors.



Black Holes: Feeling the Ripples

Astronomers have finally confirmed something they had long suspected: there is a super-massive black hole in the center of our Milky Way galaxy. The evidence? A star near the galactic center orbits something unseen at a top speed of 5,000 km/s. Only a black hole 2 million times more massive than our Sun could cause the star to move so fast. (See the October 17, 2002, issue of *Nature* for more info.)

Still, a key mystery remains. Where did the black hole come from? For that matter, where do any super-massive black holes come from? There is mounting evidence that such "monsters" lurk in the middles of most galaxies, yet their origin is unknown. Do they start out as tiny black holes that grow slowly, attracting material piecemeal from passing stars and clouds? Or are they born big, their mass increasing in large gulps when their host galaxy collides with another galaxy?

A new space telescope called LISA (short for "Laser Interferometer Space Antenna") aims to find out.

Designed by scientists at NASA and the European Space Agency, LISA doesn't detect ordinary forms of electro-

magnetic radiation such as light or radio waves. It senses ripples in the fabric of space-time itself—gravitational waves.

Albert Einstein first realized in 1916 that gravitational waves might exist. His equations of general relativity, which describe gravity, had solutions that reminded him of ripples on a pond. These "gravity ripples" travel at the speed of light and, ironically, do not interact much with matter. As a result, they can cross the cosmos quickly and intact.

Gravitational waves are created any time big masses spin, collide or explode. Matter crashing into a black hole, for example, would do it. So would two black holes colliding. If astronomers could monitor gravitational waves coming from a super-massive black hole, they could learn how it grows and evolves.

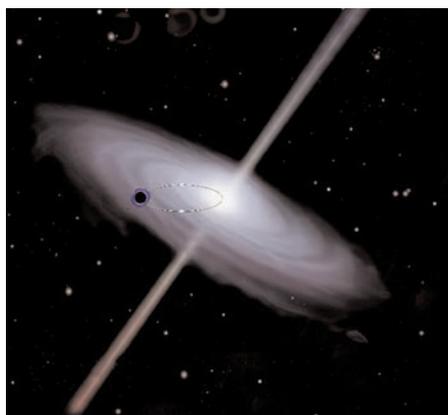
Unfortunately, these waves are hard to measure. If a gravitational wave traveled from the black hole at the center of our galaxy and passed through your body, it would stretch and compress you by an amount far less than the width of an atom. LISA, however, will be able to detect such tiny compressions.

LISA consists of three spacecraft flying in formation—a giant triangle 5 million km on each side. One of the spacecraft will shoot laser beams at the other two. Those two will echo the laser signal right back. By comparing the echoes to the original signal, onboard instruments can sense changes in the size of the triangle as small as 0.0000000002 meters (20 picometers).

With such sensitivity, astronomers might detect gravitational waves from all kinds of cosmic sources. The first, however, will probably be the weightiest: super-massive black holes. Will "feeling" the ripples from such objects finally solve their mystery, or lead to more questions?

Only time will tell. Scientists hope to launch the LISA mission in 2011.

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



An artist's conception of a black hole in the center of a galaxy.

What's Up *by Debbie Dyke*

All times Pacific Standard unless otherwise noted.

December

- 3 Tues **New Moon** 11:34 p.m. Total Solar eclipse visible from eastern Australia and western Africa.
1973 Pioneer 10 becomes the first spacecraft to fly by Jupiter.
- 11 Wed **First Quarter Moon** 7:49 a.m.
1973 Apollo 17 lands on the Moon 30 years ago today. It is to be the last time humans land on the Moon.
- 13 Fri Moon at apogee (251,046 mi) 8:00 p.m.
- 14 Sat Geminid meteors peak 1:00 a.m.
Double shadow transit on Jupiter in progress when Jupiter rises at 9:04 p.m. Callisto's shadow will already appear on the planet as Jupiter rises. At 11:30 p.m., Io's shadow appears, Callisto's shadow is more than half way across the surface. At 1:13 a.m. Callisto's shadow leaves the surface, followed by Io's at 1:49 a.m.
1546 Tycho Brahe born.
1962 Mariner 2 becomes the first spacecraft to flyby Venus.
- 15 Sun 1970 Venera 7 becomes the first craft to land on Venus and transmit data back to Earth.
- 16 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza on 1024 E. Stanley Blvd.
- 17 Tues Saturn at opposition 9:00 a.m.
- 19 Thurs **Full Moon** 11:10 a.m.
Saturn 3° W of the Moon 5:00 a.m.
- 20 Fri **Tri-Valley Stargazers Lecture Meeting and Winter Solstice Potluck.** 7:00 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
- 21 Sat **Winter Solstice** 5:14 p.m. Celebrate with your favorite Druid.
- 22 Sun Ursid meteors peak 10:00 a.m.
Tri-Valley Stargazers discussion meeting. 2:00 p.m. at the Round Table Pizza on 1024 E. Stanley Blvd., Livermore. Join other TVSers to chat about all things astronomy related.
- 23 Mon Jupiter 3.8° S of the Moon 5:00 a.m.
- 24 Tues 1968 Apollo 8 astronauts are first to orbit the Moon.
- 25 Wed **Christmas Day.**
Mercury at greatest elongation E (20°) 9:00 p.m.
1642 Isaac Newton born.
- 26 Thurs **Last Quarter Moon** 4:31 p.m.
- 27 Fri 1571 Johannes Kepler born.
- 29 Sun Moon at perigee (228,099 mi) 5:00 p.m.
- 30 Mon Look low in the east around 5:00 a.m. for the crescent Moon, with Venus and Mars just above it.
Double shadow transit on Jupiter. Europa's shadow appears first at 8:36 p.m. Io's shadow appears at 9:46 p.m., while Europa's shadow is almost to the middle of Jupiter. Europa's shadow leaves at 11:30 p.m., followed by Io's at 12:05 a.m.

January

- 1 Wed 1801 First asteroid (Ceres) discovered by Giuseppe Piazzi.
- 7 Sat 1610 Galileo saw three of Jupiter's moons for the first time.

Astro Events

Jupiter Transits

Below is 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 at that time.

December

Date	Object	Starts	Transits	Ends
Thur 12	GRS	na	10:40p	12:40p
Sat 14	Cs	na	11:00p	1:13a
	GRS	10:10p	12:10a	2:30a
	Is	11:30p	12:50a	1:49a
Sun 15	I	12:30a	1:40a	2:47a
Thur 19	GRS	9:30p	11:20p	1:30a
Sat 21	GRS	11:00p	1:15a	3:15a
Sun 22	Is	1:25a	2:45a	3:42a
	I	2:20a	3:30a	4:35a
	GRS	na	9:05p	11:05p
Mon 23	Es	na	na	8:54p
	E	na	9:15p	10:40p
	Is	na	9:10p	10:10p
	I	8:45p	9:55p	11:03p

Tues 24	GRS	8:30p	10:40p	12:40p
Fri 27	GRS	na	8:10p	10:10p
Sat 28	GRS	11:45p	2:00a	4:00a
Sun 29	Is	3:20a	4:35a	5:35a
	I	4:05a	5:18a	6:22a
	GRS	8:00p	9:45p	11:45p
Mon 30	Es	8:36p	10:10p	11:30p
	Is	9:46p	11:00p	12:05a
	E	10:10p	11:33p	1:00a
	I	10:32p	11:40p	12:48a
Tue 31	Europa eclipses Io at 12:04a			
	GRS	9:10p	11:25p	1:30a
	C	9:30p	11:45p	2:15a

January

Fri 3	GRS	na	9:00p	11:00
Sun 5	GRS	12:40a	2:45a	4:45a
	Is	5:15a	6:23a	na
	I	5:52a	na	na
	GRS	8:25p	10:35p	12:35a
Mon 6	Es	11:15p	12:45a	1:57a
	Is	11:40p	12:55a	2:04a
Tues 7	I	12:18a	1:25a	2:34a
	E	12:27a	1:55a	3:17a

2002-2003 Questionnaire

If it's membership renewal time, it must also be Questionnaire time. We've streamlined the Questionnaire a bit, so hopefully we'll get a few more responses than we ordinarily do. If you need more space to write, feel free to continue your comments on another piece of paper.

1. What kind of instrument do you use the most for observing? _____

2. What program topics would you like us to cover at the meetings? _____

3. Are there any books, DVDs, etc., you would like to see added to the TVS library? _____

4. Do you have any suggestions about ways that the club

could be improved, about activities you would like us to provide, etc.? _____

5. Are there any articles, features, etc., you would like to see in the newsletter? _____

6. Would you be interested in participating in a weekend public star party at Camp Shelly (Lake Tahoe) in the summer of 2003? _____
7. Would you be interested in participating in an telescope making workshop in the spring of 2003? _____

8. What improvements would you like to see at our dark sky site, H2O? _____



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

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.
 - _____ \$25 Basic. You will receive e-mail notification when the PDF version of *Prime Focus* is available for download off the TVS web site.
 - _____ \$30 Regular. You will receive a paper version of *Prime Focus* in the mail.
 - _____ \$29.95 Subscription to *Sky & Telescope* magazine.
 - _____ \$29 Subscription to *Astronomy* magazine.
 - _____ \$20 Hidden Hill Observatory (H2O) refundable key deposit (key property of TVS).
 - \$ _____ 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.