

# PRIME FOCUS

Tri-Valley Stargazers

July 2002



## Meeting Info:

### What

*TVS Summer BBQ*

### Who

You

### When

July 19, 2002

Set up at 6:00 p.m.

Dinner starts 6:30ish p.m.

### Where

Unitarian Universalist

Church in Livermore

1893 N. Vasco Road

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## July Meeting

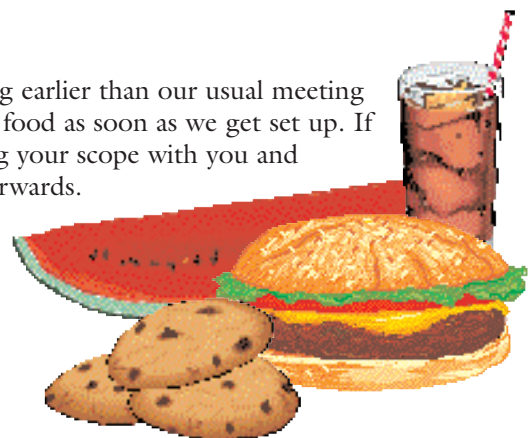
### Summer BBQ

Summer brings with it the American tradition of outdoor cooking. TVS will carry on the tradition by hosting our annual summer BBQ. We'll provide hamburgers and veggie burgers, condiments, hot and cold drinks, plates and plasticware. What you need to bring will depend on the first letter of your last name. Whatever you bring, please bring enough to feed 8-10 people.

- A-F Macaroni or Potato Salad
- G-L Green or Fruit Salad
- M-R Dessert
- S-Z Appetizer

Take note that we'll be starting earlier than our usual meeting time. We'll begin cooking the food as soon as we get set up. If the skies look promising, bring your scope with you and we'll do a little stargazing afterwards.

Friends and family are more than welcome to attend, so come on over and join your fellow TVS members for an evening of *very* casual dining, socializing, and perhaps a bit of stargazing afterwards.



# News & Notes

## Newsletter Costs

The results of the plea for switching from snail mail to e-mail delivery of *Prime Focus* was rather lackluster to say the least. To reiterate, TVS spends over \$1,000 a year in printing and mailing costs for the newsletter. We would rather spend some of that money on items to improve our loaner program, or to purchase a digital projector to be used at the meetings. We realize that not everyone has internet access, but for those that do have access and who are receiving the printed version, please consider switching to the web version. To paraphrase a famous quote: Ask not what your astronomy club can do for you, but what you can do for your astronomy club. If you'd like to switch to the web version, contact treasurer **Mike Anderson** at andersonm@prodigy.net.

We are still interested in having a company underwrite the costs of the newsletter, whether it's through advertisements or through through the use of their copier machines. If you work at a company that might be interested in helping out our little 501(c)(3) non-profit organization, let editor **Debbie Dyke** know. You can reach her at ddfam@pacbell.net or 925-461-3003.

## 2002 TVS Meeting Dates

Below are the meeting dates for 2002. 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 October 6th deadline is for the October issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
July 19	July 22	July 7
Aug. 16	Aug. 19	Aug. 4
Sep. 20	Sep. 23	Sep. 8
Oct. 18	Oct. 21	Oct. 6
Nov. 15	Nov. 18	Nov. 3
Dec. 20	Dec. 16	Dec. 8

## Money Matters

At the June Board meeting, treasurer **Mike Anderson** reported the current balances (as of June 24, 2002) of our various accounts:

Checking	\$1,383.11	
CD #1	\$3,867.54	matures 08/17/02
CD #2	\$2,386.80	matures 08/27/02
CD #3	\$2,031.49	matures 07/16/02

CD #3 holds the refundable H2O key deposits.

## New Members

A big TVS welcome to new members **Kevin Hammond & Family**, and **Paul & Lizzy Swanson & Family**. Please say hello to these folks the next time you see them at the lecture meeting.

# Calendar of Events

## Classic Sci-Fi Film Series Chabot Space & Science Center

Chabot continues its Sci-Fi series by showing the following movies 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:

*October Sky*, August 2 – 4  
*Indiana Jones and the Raiders of the Lost Ark*,  
 August 30 – September 2

### Showtimes:

Friday - Sunday on the first two weekends of each month.  
 Fridays – 7:30 p.m.  
 Saturdays – 4:30 & 7:30 p.m.  
 Sundays – 4:30 p.m.

## June 29–September 15

**What:** *The Lost Spacecraft: Liberty Bell 7 Recovered*  
**Where:** Chabot Space & Science Center  
**Cost:** General Admission price

See the actual spacecraft that sunk to the bottom of the ocean in 1961 and learn about its recovery 38 years later. Climb inside space capsule replicas, watch rocket launches, experience centrifuge-training, pilot a remote-controlled vehicle, and learn about the history and technology of space flight. This interactive exhibition was developed and

**Newsletter header image:** Glowing gaseous streamers of red, white, and blue — as well as green and pink — illuminate the heavens like Fourth of July fireworks. The colorful streamers that float across the sky in this photo taken by NASA's Hubble Space Telescope were created by the universe's biggest firecracker, the titanic supernova explosion of a massive star. The star blew up 300 years ago, a few decades before our United States celebrated its birth with a bang. The dead star's shredded remains are called Cassiopeia A, or "Cas A" for short. Cas A is the youngest known supernova remnant in our Milky Way Galaxy and resides 10,000 light-years away in the constellation Cassiopeia.  
*Photo & Caption: NASA and The Hubble Heritage Team (STScI/AURA)*

## Calendar of Events *continued*

presented by Discovery Channel and produced by Clear Channel Entertainment-Exhibitions (formerly BBH, Inc.). [Editor's note: I had a sneak preview of this exhibit a few weeks ago and highly recommend it. It's remarkable how much of the Liberty Bell's interior held up after 38 years under water.]

**July 18, 7:30-9:00 p.m.**

**Who:** Dr. Timothy McCoy

**What:** *It's a Bird! It's a Plane! No-it's a Meteorite!*

**Where:** Chabot Space & Science Center

**Cost:** \$5

Dr. McCoy (gotta love that name) will address what these ancient rocks from space tells us about the origins of the Earth, Moon, and Solar System.

**July 19-20**

**What:** *The Davis Starshow*

**Where:** Veteran's Memorial Center,  
203 E. 14th Street, Davis, CA

**Cost:** Free

The Davis Star Show, a festival of astronomy and related sciences, is a public celebration of our universe. They'll have speakers talking about exciting new discoveries in astronomy, a trade show featuring instruments and accessories appealing to a wide range of amateurs, an exhibit hall with displays and activities for all ages, daytime viewing of sunspots and other solar activity, a planetarium for the kids, astronomy club booths and demonstrations, a teacher/educational literature table, workshops, a lunar observing party at night on the 19th and a public star party at night on the 20th.

Among the guest speakers are **Andreas Albrecht** (U.C. Davis: *What do we know about the Universe?*), **Steven**

**Stahler** (U.C. Berkeley, Radio Astronomy Group: *How Stars are Made*), **Phil Plait** (Sonoma State University & BadAstronomy.com: *Bad Astronomy: The Moon Hoax*), **Stephen James O'Meara** (contributing editor, Sky & Telescope Magazine: *The Trials and Tribulations of a 19th-Century Astronomer living in the 21st-Century* and *Volcano Moon: Does the Moon's Gravity Affect Volcanic Eruptions?*), **Tony Hallas** (Hallas Digital Systems: *Astrophotography from the Foothills of the Sierra*), **Robert Naeye** (editor, ASP Mercury Magazine: *Solving the Universe's Mysteries Through Extra Dimensions*), **Kent Cullers** (SETI Institute: *SETI and Astronomy from DC to Daylight*).

If you've got a scope and are interested in helping with the public star party on Saturday night, please contact Jane Smith at [jessmith@ucdavis.edu](mailto:jessmith@ucdavis.edu) or 530-758-4104 evenings/weekends.

There is a lot going on during the two days, so visit [www.DavisStarShow.org](http://www.DavisStarShow.org) to view the schedule of events.

**July 26, 8:00 p.m.**

**Who:** Carribean Jazz Ensemble

**What:** *Music Under the Stars*

**Where:** Chabot Space & Science Center

**Cost:** \$15 regular

\$12 Chabot members, youths & seniors

Sit back and relax in the Ask Jeeves Planetarium while steelbands take center stage in this mixture of Caribbean jazz and Latin music.

**September 28-29**

**What:** *The ASP's 2002 Annual Meeting*

**Where:** Various Bay Area locations

**Cost:** \$35, \$30 ASP members, \$25 students

*continued next page*

### Officers

#### **President:**

Chuck Grant  
[cg@fx4m.com](mailto:cg@fx4m.com)  
925-422-7278

#### **Vice-President:**

Gary Steinhour  
[steinhour1@juno.com](mailto:steinhour1@juno.com)

#### **Treasurer:**

Mike Anderson  
[andersonm@prodigy.net](mailto:andersonm@prodigy.net)

#### **Secretary:**

Maggie Halberg  
925-736-8627

### Board of Directors

Alane Alchorn, Jim Alves, Dave Anderson, Dennis Beckley, Paul Caswell, Rich Combs, Debbie Dyke, Gert Gottschalk, Kathleen

Kelley, Signe McIntire, Dave Rodrigues, Frank Rogue, Mike Rushford, Debbie Scherrer, John Swenson, Norm Thomas, Phil Waide

### Volunteer Positions

#### **Librarian:**

Jim Alves  
[jim\\_alves\\_engr@yahoo.com](mailto:jim_alves_engr@yahoo.com)  
925-634-0220

#### **Newsletter Editor:**

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925-461-3003

#### **Program Director:** unfilled

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

John Swenson  
[johnswenson1@attbi.com](mailto:johnswenson1@attbi.com)

### **Webmaster:**

Chuck Grant

### **Observatory Director/**

**Key Master:**

Chuck Grant

### **School Star Party Chair:**

Rich Green (unofficially)  
[richgreen@pacbell.net](mailto:richgreen@pacbell.net)  
925-449-2190

### **Public Star Party Chair:**

Roger Gathers  
925-455-6039

### **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 Meeting:*

Round Table Pizza  
1024 E. Stanley Blvd., Livermore

### Web & E-mail

[www.trivalleystargazers.org](http://www.trivalleystargazers.org)

[tvst@trivalleystargazers.org](mailto: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](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).

## Calendar of Events *continued*

Is life widespread through the cosmos, or is Earth a lonely oasis? The Astronomical Society of the Pacific cordially invites you to learn more about this fascinating topic by attending its 114th Annual Meeting. The theme of this year's meeting is "The Cosmic Thread: From Stars to Life."

On Saturday, September 28, the Society will be sponsoring a free public astronomy lecture by renowned comet discoverer and author **David H. Levy**. The lecture will be held at 7:30 p.m. in the amphitheater near the summit of Mt. Tamalpais in Marin County. Levy's talk is entitled "From Stars to Life: Suppose You Had to Design a Universe?" A free public star party, sponsored by the San Francisco Amateur Astronomers (SFAA), follows Levy's talk. Don't worry about bringing a telescope; SFAA members will be out in force!

On Sunday, September 29, the Society will host a full day of lectures by some of the world's leading astronomers. The lectures will run from 9:00 a.m. to 5:35 p.m. at Pimentel Hall on the U.C. Berkeley campus. Scheduled speakers include **Alex Filippenko** (ASP President, U.C. Berkeley), **Geoff Marcy** (U.C. Berkeley), **Chris McKay** (NASA's Ames Research Center), **David Morrison** (NASA's Ames Research Center), **Jill Tarter** (SETI Institute), **Chris Impey** (University of Arizona), **Ben Zuckerman** (U.C.L.A.), and **Seth Shostak** (SETI Institute).

From 7:00 to 10:00 p.m. the ASP will be hosting a reception at the U.C. Berkeley Faculty Club, followed by a dinner banquet in the Heyns Room. Award-winning author and journalist **Timothy Ferris** will speak at the banquet. Following Ferris's talk, the ASP will present its 2002 Annual Awards, including the Society's prestigious Bruce Medal for lifetime achievement in astronomical research. Banquet seating is extremely limited, so please sign up now! Admission to the reception and banquet is \$60.00.

For more details and for registration information, please visit the Society's web site at: [www.astrosociety.org/events/meeting.html](http://www.astrosociety.org/events/meeting.html)

## Star Parties

The summer star party season is in full swing. Check the club's web site for updates and more information.

### July 13 Fremont Peak

Please mark your calendars for Rob Toebe Night at Fremont Peak – a special event to commemorate the life of Rob Toebe, a long time member of FPOA, board member, and dedicated observer. Information is available at [www.fpoa.net/toebe](http://www.fpoa.net/toebe). Please e-mail if you plan to attend: [toebenight@fpoa.net](mailto:toebenight@fpoa.net).

### July 13 Mt. Diablo Star Party

The Mt. Diablo Astronomical Society's public star parties on top of Mt. Diablo. Check their web site for more info: [www.mdas.net](http://www.mdas.net). The topic for this month's star party is "Why does the moon have phases?"

### July 20, Aug 10, Sept 7 Sycamore Grove Star Party, Livermore

TVS, in conjunction with the LARPD, puts on public star parties at Sycamore Grove Park in Livermore. If you'd like to help, contact our new public star party coordinator **Roger Gathers** at 925-455-6039.

### August 3, Sept. 28 H2O Open House

If you've ever wanted to check out the club's dark sky site, this is your opportunity. Meet at the corner of Mines

*continued next page*



### Partial Solar Eclipse

The partial solar eclipse on June 10 was captured by **Gert Gottschalk** with his 80mm f8 APO refractor and Canon G1 digital camera. For projection he used an 18mm LV eyepiece. For filtering he used the German made Baader solar filter. For location he was at his workplace's parking lot.



## Astronomical insights

by David Feindel

You just can't keep me quiet about my new find in astronomical software, or more precisely, lunar software. Brush up on your French, and go to [www.astrosurf.com/avl](http://www.astrosurf.com/avl), where you can find Christian Legrand's & Patrick Chevalley's latest effort (the latter of Cartes de Ceil fame). *Virtual Moon Atlas* is a stunning observational tool for the moon, with its main screen view a superbly detailed view of the moon as viewed at any date and time you choose. You can pan and zoom (to maybe 300x?) to find specific features; get detailed lists of features ranked in four levels of "interest" and selected for your telescope's aperture; detailed moon ephemeris, and 50-200 words of detail on each of several hundred moon features. It's release 1.0, so there are some rough edges, at least one bug, and is somewhat slow to update the screen, but it is the best there is. Can't image moon observing without it.

Which brings up another subject. Using computers while observing. What do you do to reduce the brightness of your laptop screen? The laptop screen that seems "only OK" during daytime use turns into something rivaling the Point Reyes lighthouse at a dark sky site. Has anybody developed a Windows "theme" to make laptop displays more dark-sky-friendly? Some astronomical programs have dark-sky settings, but not all. I've seen a couple people put their laptops in a cardboard box; another person had some red cellophane rubber-banded over the screen. Are there any better alternatives?

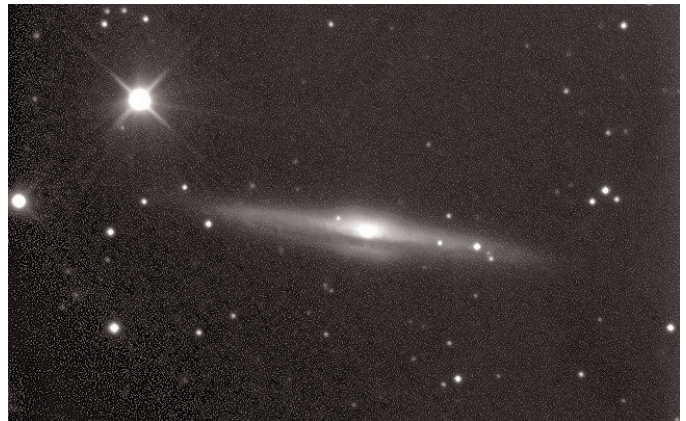
This summer seems to be a good time to buy books. *The Planets* by David McNab/James Younger, and *Advanced Skywatching*, by Robert Burnham, et. al. were both available on-line for \$10 each. Both appear on numerous "best astronomy books" lists. I've also started reading Martin Gorst's *Measuring Eternity*, a history of man's view of the age of the earth and the universe. Since I'm only up to Rene Descartes challenging the view that the earth was created in 4022 BC, I'm not ready to pass final judgment, but *Astronomy's* review of it in the August issue seems to be on the mark.

Observing this month has been fruitful, if not prolific. The highlight was a night at Del Valle Park last week, in a session with a half dozen other observers and four 'scopes. The plan for the evening was to warm up with some eye candy in Lyra and Hercules, spend an hour or two in Sagittarius looking for Messiers, and spend the last half hour before moonrise locating Uranus and Neptune. The first part was easy; M57 is now almost "obvious" to me. The Double-Double ( $\epsilon$  Lyrae) and the Double-Double's Double (Struve 2470 and 2474) were both located. But my 140x magnification wasn't able to split  $\epsilon$  Lyrae into four; I had to cheat and go to a larger scope (thanks, Dave N., for the look through your C9.25 and the Nagler!). Struve, however, split nicely into 4 stars

(14" and 16" separation for the two pairs). M56, a globular cluster, Alberio, and a brief stop at M13 finished the warmup.

Sagittarius yielded M 8,16, 17, 18, and 22 after some study of the charts and the sky. The Swan, in particular, seemed to benefit from longer viewing—studying it for awhile, looking away, then returning to it seemed to provide the most detailed view. One of the big benefits of observing with others is walking around, sharing views, and socializing. But the drawback is that stars and moon don't stop while you socialize, and all of a sudden, I realized it was 12:30 am and the moon was due up in 15 minutes. So a hurried scan of the south-east horizon showed Capricornus in position and unfortunately a lightning on the horizon. Dave took pity on me, and did a quick scan through his scope, showing me where Uranus was. So I'm confident I'll find it on my own at Yosemite this week. Neptune escaped me, but Friday night...

See you all at Yosemite!



**NGC 5746**

Another wonderful astrophoto by our resident astrophotographer **Gert Gottschalk**. Gert took this photo last month with his 13" f4 newt and Starlight HX516 CCD camera at 21x4 min.

## Star Parties *continued*

& Tesla at a time yet to be determined (probably around 6 or 6:30). There is a \$3 per car fee, bring exact change. The observing site is primitive – there are two outhouses and no water or power outlets. Be sure to bring everything you think you might need (e.g., food, water, red flashlights, warm clothing in case it gets cold, extra batteries, your telescope or binoculars, etc.). Expect to stay until after midnight. Check the TVS web site for more current information about the meeting time. If you have any questions, contact President **Chuck Grant** at 925-422-7278 or [cg@fx4m.com](mailto:cg@fx4m.com).

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## What's Up *by Debbie Dyke*

All times Pacific Daylight unless otherwise noted.

### July

- 2 Tues **Last Quarter Moon** 10:19 a.m.
- 10 Wed **New Moon** 3:26 a.m.  
Venus  $1.1^\circ$  N of Regulus low in the west at 9:30 p.m.
- 12 Fri TVS Yosemite trip, ends on 13 Saturday.
- 14 Sun Moon at perigee (228,065 mi) 6:00 a.m.  
1965 Mariner 4 makes first flyby of Mars and takes pictures.
- 16 Tues **First Quarter Moon** 9:47 p.m.  
1994 Comet Shoemaker-Levy 9 begins to crash into Jupiter.
- 17 Wed 1850 First photo of a star (Vega).
- 19 Fri Jupiter in conjunction with the Sun 6:00 p.m.  
**Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,  
1893 N. Vasco Road, Livermore.  
The **Davis Star Show** starts today and goes through tomorrow.
- 20 Sat Mercury in superior conjunction 7:00 p.m.  
1969 First men on the Moon.  
1976 Viking 1 makes first robotic landing on Mars.
- 21 Sun **Tri-Valley Stargazers discussion meeting.** 2:00 p.m. at the Round Table Pizza on 1024  
E. Stanley Blvd., Livermore. Get together with your fellow members to chat about  
all things astronomy related.
- 22 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.  
1972 Venera 8 makes the first soft landing on Venus.
- 24 Wed **Full Moon** 2:07 a.m.
- 28 Sun S  $\delta$ -Aquadrid meteors peak 5:00 p.m.
- 29 Mon Moon at apogee (250,940 mi) 7:00 p.m.

### August

- 1 Thurs **Last Quarter Moon** 3:22 a.m.  
Neptune at opposition 6:00 p.m.  
1818 Maria Mitchell born.
- 3 Sat **H2O Open House.**
- 8 Thurs **New Moon** 12:15 p.m.  
St. Dominic - patron saint of astronomers.  
Start of the **White Mountain Star Party** trip. The trip ends on Wednesday, August 14.
- 9 Fri Stellafane Convention in Springfield, Vermont begins. The fun ends on the 10th.
- 10 Sat Moon at perigee (225,014 mi) 4:00 p.m.  
**Fremont Peak Star-B-Q.**

## Star Parties *continued*



### White Mountain Research Station

An exterior view of the facilities. The snow will be gone by our August star party, so no need to pack your snow shoes. However, it still gets cold at night – temps at 32°F are normal.

### August 8–14 White Mountain Trip

Our annual high altitude, low oxygen star party. Join other hardy souls in observing from the Barcroft High Altitude Research Station (altitude 12,400 feet) in the White Mountains east of the Sierras.

The trip begins on Thursday August 8 at the Grandview campground at 8,600 feet. This is an optional, but recommended, stay as the human body needs to get acclimatized to low oxygen environments in order to function properly. For those not fond of camping, an alternative is to stay at a motel at Mammoth, altitude around 7,500 feet.

On Friday, August 9, the trip up the mountain begins. The road takes you past the Bristlecone Pine Forest (elev. 10,000 feet), a nice place to stop and admire some of the oldest living things on this planet. It takes about an hour and a half to go the last 18 miles as you rarely go faster than 15 mph. The facilities at Barcroft are homey. There are men's and women's dorms (with lots of bunkbeds), a TV viewing area, a library/pool table/ping pong table room, and a dining room complete with oxygen tank. The food is prepared by a very good cook, and we are expected to help out with the clean up of the kitchen and dining room.



### White Mountain Research Station

This photo shows some of the many things you can do at Barcroft during the boring daylight hours. This is the library with its ping pong and pool tables, said to be the highest library, ping pong and pool table in the US.

This year the cost is \$50 per person per night for TVS & EAS members, \$55 for non-members. The cost includes your meals. This is a very popular star party, so get your reservations in to **Dave Rodrigues** soon. Send your check (made out to Dave) to him at 1633 Graff Ct., San Leandro, CA 94577. For more info, you may contact him at 510-483-9191 or davevrod@aol.com.

### August 10 Fremont Peak

The annual Fremont Peak Star-B-Que. The BBQ and potluck, including the Gastronomical contest, begins around 5:00 p.m with games and door prizes afterwards. Once it gets dark there will be viewing through the 30-inch Challenger scope. If you plan to attend, PLEASE call the FPOA hotline 831-623-2465 by August 4 and leave your name, number of guests, name of your astronomy club and whether or not you are a FPOA member. You do not have to be a member of a club to attend. There is a \$3 per car fee. For more info visit [www.aanc-astronomy.org/starbq.html](http://www.aanc-astronomy.org/starbq.html).

### August 28 - September 3 Sierra Foothills

**Don Machholz** (still comet hunting and Messier Marathoning in the foothills) is organizing *Starry Starry Nights in the Foothills (7 Nites at 7 Sites)*.

An ambitious and impressive series of star parties will be held in the foothills area of Northern California during Labor Day Week. The public is invited. Astronomers are invited to join in to share the heavens through their telescopes. It is called "Starry Starry Nights (Seven Nites at Seven Sites)" and will be held from Wednesday August 28 through Tuesday September 3. We will be at a different dark-sky site each night. We'll be highlighting the wonders of the Milky Way. The Colfax Greater Area Chamber of Commerce is sponsoring it and handling the publicity and logistics. I am responsible for finding the sites and organizing the astronomy end of it.

We begin at the Sugar Bowl Ski Resort and through the week we'll appear in the Foresthill area, Colfax, Big Bend, Dutch Flat and Soda Springs. These are dark areas and we'll highlight the Milky Way.

Astronomers who are willing to participate by showing the heavenly sights through their telescopes are asked to contact me in advance. Those coming through the Colfax area during that week are invited to an informal open house at my home and observatory.

For more information, see the Starry Starry Night Page at [www.geocities.com/donmachholz/index.html](http://www.geocities.com/donmachholz/index.html) and the Colfax Greater Area Chamber of Commerce at [www.colfaxarea.com](http://www.colfaxarea.com), or call Don Machholz at 530-346-8963.

# PRIMEFOCUS



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 \_\_\_\_\_

Choose one: \_\_\_\_\_ I wish to download *Prime Focus* from the web (an e-mail notification will be sent to me when it's available for download). I understand that a paper version will *not* be mailed to me.  
\_\_\_\_\_ I wish *Prime Focus* to be mailed to me.

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

Membership category: \_\_\_\_\_ \$5 Student \_\_\_\_\_ \$20 Individual \_\_\_\_\_ \$25 Family  
\_\_\_\_\_ \$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.