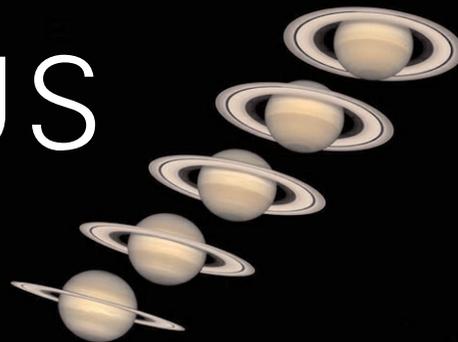


# PRIMEFOCUS

Tri-Valley Stargazers

March 2003



## Meeting Info:

### What

*Introduction to Astronomy and  
Columbia Re-entry Video Report*

### Who

Chuck Grant and  
Ron Bissinger

### When

March 21, 2003  
Conversation at 7:00 p.m.  
Lecture at 7:30 p.m.

### Where

Unitarian Universalist  
Church in Livermore  
1893 N. Vasco Road

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## March Double Header Meeting

### Introduction to Astronomy

*Chuck Grant*

Got a telescope as a present recently? Have one gathering dust in a closet? Thinking about buying one? Maybe wondering if buying a telescope is the best first step to start out in astronomy? Well, you are on the right track.

This month's beginner's session will be a non-technical discussion of what do you need to know to start enjoying stargazing, with or without a telescope. We will talk about some good things to observe first, some first steps at learning where things are in the sky, and some accessories and techniques to make your observing more rewarding.



### Columbia Re-entry Video Report

*Ron Bissinger*

On the morning of February 1st, 2003 the space shuttle Columbia presented observers with a great opportunity to witness her re-entry over northern California and Nevada. Many space fans and amateur astronomers rose early that morning and witnessed what appeared to be a beautiful re-entry. Within the next hour they, along with the nation and the world, would be horrified to learn the fate that befell Columbia and her crew.

Because they often have keen observation skills, and because they had photographed the re-entry using videocameras and still cameras, several amateur astronomers became key participants in the early investigation of the Columbia tragedy. One of them, TVS member Ron Bissinger, will describe how he videotaped the re-entry from Reno, Nevada, and how he and several other amateurs became involved with the NASA accident investigation and debris recovery teams. Ron will show how off-the-shelf image processing software commonly used by amateur astronomers was used to enhance video images and perform photometric and rudimentary spectral analyses of the Columbia breakup over northern California and Nevada. He'll discuss how he and other amateurs were able to help the accident investigators develop a timeline of the orbiter breakup. And perhaps most importantly, he'll show why the Columbia tragedy provided an opportunity for amateur astronomers and those interested in science to make real contributions of value to NASA and the professional scientific community.

## News & Notes

### Science Fun Fair Report

The skies were clear for our annual stint at the Pleasanton School District's Science Fun Fair. **Chuck Grant**, **David Feindel** and his daughter **Caroline** were outside showing M42, Saturn and Jupiter to lots of folks, while **Frank Rogue** and **Debbie Dyke** were inside answering questions and stamping the kids' "passports". Several parents were overheard telling their kids "This was your favorite booth last year, remember?". The kids and their parents really enjoyed looking through the telescopes.



Debbie Dyke at TVS's booth.



David Feindel and his daughter Caroline (and their Meade ETX-90).

### H2O Vandalized

By Chuck Grant

TVS's observing site, H2O, was vandalized "allegedly" by some kids from San Jose visiting their grandfather nearby. The alleged perps were caught and identified by Dave Christiansen (the rancher). This happened on the weekend of February 22. The Santa Clara Sheriffs are now handling the matter.

Spray painted graffiti was applied to the building. The observatory door lock/hasp was broken off. The battery recharger was "removed" from the wall inside the building. A first aid kit's contents were strewn about. The white plastic concrete filled post was painted dark blue (not a bad job either, too bad we need it to be white to see it at night). A chair (one of mine I didn't know I left there) also had spray paint graffiti applied. Aside from needing to repaint the observatory, the club suffered little damage. The Jack Marling 17.5" Telescope was untouched.

Herb Quick was not so lucky though. He suffered three smashed solar panels and the loss of about six good eye-pieces. A finder scope was removed, but was found later in

the Jack Marling Telescope's observatory. Otherwise Herb's 16" telescope was undamaged. Many tools were also strewn about. Herb's damages were approximately \$1,000.

The mother of the involved children has promised restitution. It is believed that this is the first such incident in the history of the Tri-Valley Stargazers (ignoring miscellaneous gunfire).

### Messier Marathon

Once again, TVS will conduct a Messier Marathon at H2O this year. The first date of choice is Saturday, March 29. In case of bad weather, our back-up date is Saturday, April 5. If you are interested in heading out to H2O for the Marathon, meet at 4:30 at the corner of Mines and Tesla in Livermore. The caravan will depart soon thereafter. Don't forget to bring \$3 in exact change for the entrance fee, and any and all observing gear and snacks. For more information, contact John Swenson at johnswenson1@attbi.com.

### 2003 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 April 6th deadline is for the April issue).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Mar. 21	Mar. 24	Mar. 9
Apr. 18	Apr. 21	Apr. 6
May 16	May 19	May 4

*continued on page 4*

## 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:

*ET*, April 4-6

*The Mummy*, May 2-4

#### Showtimes:

Friday – Sunday on the first weekend of each month.

Friday & Saturday – 7:30 p.m., Sunday – 4:00 p.m.

**Newsletter header image:** Saturn. These Hubble Space Telescope images, captured from 1996 to 2000, show Saturn's rings open up from just past edge-on to nearly fully open as it moves from autumn towards winter in its Northern Hemisphere.

*Photo and info: NASA and The Hubble Heritage Team (STScI/AURA)*

## Calendar of Events *continued*

**March 20, 7:30 p.m.**

**What:** *Patterns in the Void: Why It's Good to be Afraid of the Dark*

**Who:** Dr. Sten Odenwald  
(NASA Goddard Space Flight Center, MD)

**Where:** Chabot Space & Science Center, Oakland.

**Cost:** \$5

When we look at the night sky, we view mostly space. But space is far from empty. It contains the more interesting stellar flotsam and jetsam of the cosmic ocean. Astronomers have uncovered dark energies and matter lurking in the cosmic Void; mysterious ingredients that are driving our cosmos to a bleak eternal future. Invisible particles have been detected which make space a stage on which all of the rest of the physical world evolves. Physicists are now poised to discover the tell-tale traces of other universes that may exist next door to our own. Dr. Odenwald will re-acquaint us with the primal mystery of darkness and space, and show why it is that space and darkness, what the Ancients called 'the Void', is much more than Nothing.

Dr. Odenwald is the education and public outreach manager for the NASA IMAGE satellite program. His latest book is *Patterns in the Void: Why Nothing is Important*. He hosts an award-winning website called the *Astronomy Cafe* ([www.theastronomycafe.net](http://www.theastronomycafe.net)) where he has answered over 45,000 questions since 1995.



### Star Parties

A few major star parties have their dates selected. For those who need to plan their vacation time, here's the information we have so far:

**Desert Sunset Star Party**

**May 1-4**

Enjoy a dark sky star party in the Arizona desert. Visit <http://chartmarker.tripod.com/sunset.htm> for more info.

**Riverside Telescope Maker's Workshop (RTMC)**

**May 23-25**

As always, RTMC takes place over the Memorial Day weekend. This year's topic is home observatories.

**Shingletown Star Party 2003**

**June 25-30**

Shingletown is 17 miles from Mount Lassen Volcanic National Park. A public star party and community BBQ with the people of Shingletown and Shasta County. The star party takes place on a closed airstrip.

For information, images and more, visit their web site at <http://www.shingletownstarparty.org>.

**Yosemite**

**July 3-5**

TVS will host public star parties on Glacier Point on those three nights in exchange for free park entrance and camping for up to thirty people. Contact **Dave Rodrigues** to reserve a spot on this trip. [DaveVRod@aol.com](mailto:DaveVRod@aol.com) or 510-483-9191.

**White Mountain High Altitude Star Party**

**July 24-27**

View celestial wonders in a very dark, low oxygen environment. Space is limited. At press time, the cost per night was unknown, but to give an indication, last year it was \$50 for members, \$55 for non-members. Price includes meals.

#### **Officers**

##### **President:**

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

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

Frank Rogue  
[frankrogue@attbi.com](mailto:frankrogue@attbi.com)

##### **Treasurer:**

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

##### **Secretary:**

Maggie Halberg  
925-736-8627

##### **Board of Directors**

Alane Alchorn, Jim Alves,  
Mike Anderson, Paul Caswell,

Debbie Dyke, Gert Gottschalk,  
Signe McIntire, Mike Rushford,  
John Swenson.

#### **Volunteer Positions**

##### **Librarian:**

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

##### **Newsletter Editor:**

Debbie Dyke  
[ddfam@pacbell.net](mailto:ddfam@pacbell.net)  
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 Campbell  
[r\\_photo@hotmail.com](mailto:r_photo@hotmail.com)

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

Rich Campbell

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

### Money Matters

At the February Board meeting, Treasurer **Gary Steinhour** reported the balances (as of February 24, 2003) of the following TVS accounts were:

Checking	\$1,787.67	
CD #1	\$3,896.67	matures 02/17/03
CD #2	\$2,404.78	matures 02/27/03
CD #3	\$2,052.60	matures 04/16/03

### Sign Up for TVS's E-mail Discussion Group

by *Chuck Grant*

Yahoo Groups runs a large number of free e-mail discussion groups which also include other features such as chat, calendar, image and file sharing, customizable member home "portal" pages (myyahoo.com) and a free web access only e-mail account (yourID@yahoo.com).

The TVS e-mail discussion group is for TVS members only. It is a membership benefit. The e-mail group is different from the TVS newsletter notification list. Members can post anything astronomical or TVS in nature to the e-group.

#### Method 1:

To sign up to get all the features, go to:  
<http://groups.yahoo.com/group/trivalleystargazers/join>

If you already have a Yahoo ID you can sign in with it here. If you do not have a Yahoo ID you can click the link to sign up for one (free). You don't have to answer the personal questions accurately. I, for example, am listed as the 145 year old CEO of an aerospace corporation, and have elected not to receive any e-mail offers.

Be sure to list the e-mail addresses where you will read and post to the list in the alternate e-mail addresses section (unless you want to only access the group through your Yahoo e-mail account). Be sure to set one of these addresses as your primary address (after verification) so your e-mail list messages are sent there.

Yahoo will verify each e-mail address by sending a verification code to that e-mail address. Go to the web page listed in the verification e-mail and enter the verification code and your Yahoo password, then that e-mail address is all set.

When you sign in your Yahoo ID, your membership in the e-group will not start immediately. Your request to join will be forwarded to the moderator of the group for approval. Once your TVS membership is verified, your e-group membership will be approved and you will receive an e-mail telling you you are approved.

You can speed up this process by separately e-mailing [tvst@trivalleystargazers.org](mailto:tvst@trivalleystargazers.org) and giving your name, e-mail address and Yahoo ID so we can verify that you are a member.

#### Method 2:

If for some reason you do not want to sign up with Yahoo, you can still participate in the e-mail discussion group part of the TVS Yahoo group, but you will not get all the features.

Send an e-mail to the moderator of the group (currently me, [tvst@trivalleystargazers.org](mailto:tvst@trivalleystargazers.org)) asking to join without a Yahoo ID. Specify the e-mail address from which you will read and post. That's all.

#### Using the group

The archive of past e-mail discussions and the other features can be accessed at <http://groups.yahoo.com/group/trivalleystargazers>, which will require your Yahoo ID. You must have cookies enabled in your browser (Netscape or Internet Explorer) to log in (this is the usual and default setting).

You can send e-mail to the group (which will be sent to all the members and stored in the archive) by:

- Replying to someone's post on the group.
- Sending e-mail directly to:  
[trivalleystargazers@yahoogroups.com](mailto:trivalleystargazers@yahoogroups.com).
- Or logging into the web site,  
<http://groups.yahoo.com/group/trivalleystargazers>, and selecting "post" under "messages" in the menu on the left side of the page.

There are currently about sixty members in our e-mail group. It is the best way we have for most of the whole club to communicate quickly. So far the traffic on the group has not been nearly so heavy that there has been any problem with being overwhelmed with lots of messages, so don't worry about that.

Don't be left out! Sign up today.

## Astronomical insights

by *David Feindel*

I believe that it's already been reported to the Atlanta Center for Communicable Diseases...aperture fever. It's very contagious, most frequently caught at star parties and Scope City/Orion or even over the internet (and no, an anti-virus program does not protect you in this case). The antidote is well known—cash. Perhaps lots of it. But if you have the disease, but not the antidote, what do you do? Shop for used equipment, of course. But just where do you find a used 14" StarGazer with clock drive? How do you know that's the right cure for you?

There are many sources of information on telescopes; I've found two dedicated to used equipment: [skywatch.brainiac.com/sct-user/usedSCT.pdf](http://skywatch.brainiac.com/sct-user/usedSCT.pdf) for Rod Mollise's comments on SCTs over the past 20+ years, and [home.att.net/~telescopebluebook/](http://home.att.net/~telescopebluebook/) appears promising for

reports on what used telescopes have been going for over the past 3 years (a warning; this site requires \$2 for a 1-month membership; I haven't been "accepted" yet). So you've decided what you want; now where do you find it?

The auction sites are not terribly fruitful. Ebay normally has 1000+ items listed, but usually there are only a few used larger aperture 'scopes at any one time. Yahoo does not have nearly the listings for telescopes; 25 total when I looked, and all "department store" level. The specialty sites hold much more promise, albeit you can assume that they are knowledgeable sellers, so coming across that 12" Meade SCT for \$500 is not likely. Look at [astromart.com](http://astromart.com) first; they typically have 300+ ads for reflectors, refractors, cats and their accessories listed at any one time (plus another 300+ listings for eyepieces); almost all of which are in the serious telescope category. [Astrofinds.com](http://Astrofinds.com) is another good site; typically they have 5-10 telescopes at any one time. The Online Astro Trader ([members.aol.com/epsweb/ads.htm](http://members.aol.com/epsweb/ads.htm)) contains 20-30 scope ads, but it's unclear if ads are removed if/when items are sold. [Astronomy Mall classifieds \(201.pair.com/resource/telescopes.shtml\)](http://Astronomy Mall classifieds (201.pair.com/resource/telescopes.shtml)) typically has 20-30 listings. [Buytelescopes.com/classifieds/categories.asp](http://Buytelescopes.com/classifieds/categories.asp) has a few listings, as does [Astronomy-exchange.com](http://Astronomy-exchange.com).

The last resource for used equipment is asking around. Anyone know where I can get a used LX-90 or Nextstar 8i?

Book of the month: *The New Solar System*, 4th edition, 1999, edited by J. Kelly Beatty, Carolyn Collins Petersen, and Andrew Chaikin. Four hundred plus pages of information on the planets, written at college textbook level. It may be coffee-table book sized, but its content is way beyond that. For example, there is a full chapter devoted to the interior structure of the inner planets, and the effects this structure has on each planet's evolution. Considerable data is provided, including satellite images at various visible and invisible wavelengths, chemical analyses where available, etc.



## Invisible Tornadoes

by Tony Phillips

The biggest problem with tornadoes—next to the swirling 300—mph winds—is that it's hard to see them coming.

But soon scientists will be able to foresee, not merely tornadoes, but the severe storms that spawn them, hours before there's even a cloud in the sky! Mind you, this isn't a vague "30 percent chance of rain today" type forecast. Thanks to a new satellite technology being co-developed by NASA, NOAA and the U.S. Navy, emergency personnel will actually watch the invisible beginnings of a storm unfold.

"They're going to know where the storm centers are forming before the storms are there," says James Miller, project

manager for Earth Observing 3 (EO3), a satellite that will test out this new technology in 2005 or 2006.

Unlike the tiny water droplets that make up clouds, the water vapor that feeds storms is invisible to the human eye. Water vapor is easy to detect, however, at infrared (IR) wavelengths. EO3 will use an IR-sensitive device called GIFTS—short for Geosynchronous Imaging Fourier Transform Spectrometer—to make 3D movies of temperature, pressure, and water vapor in Earth's atmosphere.

Three or four hours before the storm clouds are visible, meteorologists will notice water vapor converging toward an area. This water vapor, which provides the "fuel" for the coming storm, is too close to the ground for today's weather satellites to see. Then meteorologists will check precisely how the air temperature over that area varies vertically (something else ordinary satellites can't do). This temperature variation determines whether the humid air will rise to form storm clouds. And when these conditions look ominous, the meteorologists can alert the public.

The goal of EO3 is to "test drive" this new technology and prove that it works. If successful, NOAA plans to incorporate GIFTS-style sensors into its next generation of weather satellites.

These future satellites will give meteorologists exactly what they need in order to give the people exactly what they need: an earlier warning that tornados may be on the way.

GIFTS and EO3 are managed by NASA's New Millennium Program. NASA and NOAA will operate EO3 during its first year in geosynchronous orbit above the United States. If the technology works as planned, the U.S. Navy will assume control of EO3, move the satellite to a point above the Indian Ocean, and use it to monitor weather in shipping lanes there.

For adults, the EO3 web site at <http://nmp.jpl.nasa.gov/eo3> has more about the mission and the GIFTS instrument. For children, The Space Place web site at [spaceplace.nasa.gov/eo3\\_compression.htm](http://spaceplace.nasa.gov/eo3_compression.htm) has a jazzy, interactive "squishy ball" demo of the data compression methods that will be used on EO3.

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



This severe tornado hit south of Dimmitt, Texas, on June 2, 1995.

All times Pacific Standard unless otherwise noted.

## March

- 2 Sun **New Moon** 6:35 p.m.
- 10 Mon **First Quarter Moon** 11:15 p.m.  
1977 James Elliot discovers the rings of Uranus.
- 11 Tues Saturn 3° from the Moon 4:00 a.m.
- 13 Thurs 1781 Wilhelm Herschel discovers Uranus using a 6-inch scope he built himself.
- 14 Fri Jupiter 4° from the waxing gibbous Moon.  
1879 Albert Einstein born.  
1986 Giotto spacecraft encounters Comet Halley.
- 16 Sun Jupiter will be within 1.5° of M44 (the Beehive Cluster) from mid-March to mid-April.
- 17 Mon **St. Patrick's Day.**
- 18 Tues **Full Moon** 2:34 a.m.  
Io and its shadow transits Jupiter in the early evening. See *Jupiter Transits* (next page) for details.  
1965 First walk in space by Cosmonaut Alexei Leonov from the Voskhod 2.
- 19 Wed Moon at perigee (223,085/359,816 km) 11:00 a.m.
- 20 Thurs Spring has sprung! The **Vernal Equinox** starts at 5:00 p.m.  
Jupiter occults a mag 8.28 star at 8:00 p.m. Great Red Spot to appear during occultation. See *Jupiter Transits*.
- 21 Fri **Tri-Valley Stargazers general meeting.** 7:30 p.m. at the Unitarian Universalist Church,  
1893 N. Vasco Road, Livermore.  
Superior conjunction of Mercury 4:00 p.m.
- 23 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.  
1993 Eugene and Carolyn Shoemaker and David Levy take a picture of what turns out to be comet  
Shoemaker-Levy 9.
- 24 Mon **Tri-Valley Stargazers Board meeting.** 7:00 p.m. at the Round Table Pizza in Livermore.  
**Last Quarter Moon** 5:51 p.m.
- 25 Tues Io and its shadow transits Jupiter in the evening. The Great Red Spot follows. See *Jupiter Transits*.  
1655 Christiaan Huygens discovers Saturn's largest moon, Titan.
- 28 Fri Venus 0.05° north of Uranus 5:00 a.m.
- 29 Sat **TVS Messier Marathon night at H2O.** See page 2 for details.  
1974 Mariner 10 makes first flyby of Mercury and sends pictures home.

## April

- 1 Tues **New Moon** 11:19 a.m. PST  
Io and its shadow transits Jupiter in the evening. The Great Red Spot follows. See *Jupiter Transits*.  
National Dark Sky Week starts today and goes through April 8.
- 3 Thurs Moon at apogee (251,849/406,209 km) 8:00 p.m.
- 5 Sat TVS Messier Marathon back-up night. See page 2 for details.
- 6 Sun **Daylight Savings Begins** 2:00 a.m. Spring forward—set your clocks forward one hour.
- 7 Mon Saturn's rings are at full tilt towards us – 27° 01' from edgewise. The waxing crescent Moon passes just to  
the north of Saturn.
- 9 Wed **First Quarter Moon** 4:40 p.m. PDT

# 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 or it is daylight at that time.

### March

Date	Object	Starts	Transits	Ends
Tues 11	GRS	7:10p	9:10p	11:10p
	E	8:53p	10:15p	11:38p
	Es	10:33p	11:47p	1:20a
Thurs 13	GRS	8:50p	10:50p	12:50a
Fri 14	GRS	na	6:40p	8:40p
Sat 15	GRS	2:45a	na	na
	GRS	10:25p	12:25a	2:25a
Sun 16	GRS	na	8:10p	10:10p
Tues 18	I	na	6:55p	8:03p
	Is	na	7:50p	8:58p
	GRS	8:00p	10:00p	12:00a
Thurs 20	Jupiter occults a mag 8.28 star (HIP42853 in Cancer) at 8:00 p.m. Star begins to reappear around 1:35 a.m.			
	GRS	9:30p	11:30p	1:30a
Fri 21	GRS	na	7:20p	9:20p
Sat 22	GRS	11:15p	1:15a	3:15a

Sun 23	GRS	7:10p	9:10p	11:10p
Mon 24	C	10:40p	1:00a	3:20a
Tues 25	I	7:37p	8:50p	9:53p
	Is	8:40p	9:35p	10:53p
	GRS	8:50p	10:50p	12:50a
Thurs 27	GRS	10:25p	12:25a	2:25a
Fri 28	GRS	na	8:10p	10:10p
Sat 29	Es	na	na	7:50p
Sun 30	GRS	12:00a	2:00a	na
	GRS	7:45p	9:45p	11:45p

### April

Date	Object	Starts	Transits	Ends
Tues 1	I	9:30p	10:30p	1:42a
	GRS	9:30p	11:30p	1:30a
	Is	10:35a	11:30p	12:47a
Wed 2	GRS	na	7:20p	9:20p
Fri 4	Gs	na	6:50p	8:45p
	GRS	7:00p	9:00p	11:00p
Sat 5	E	na	na	8:07p
	Es	7:38p	8:55p	10:27p
Sun 6	GRS	12:50a	2:50a	na

*Times listed below are Daylight Saving's Time*

(Sun 6)	GRS	9:40p	11:40	1:40a
Tues 8	GRS	11:20p	1:20a	3:10a
Wed 9	GRS	na	9:10p	11:10p

## 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



## 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.
  - \_\_\_\_\_ \$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.