PRIMEFOCUS
Tri-Valley Stargazers

May 2006

Meeting Info:

What
Eclipse Night

Who
Eclipse Travellers

When
May 19, 2006
Conversation 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Inside

May Meeting

Eclipse Night
Eclipse Travellers

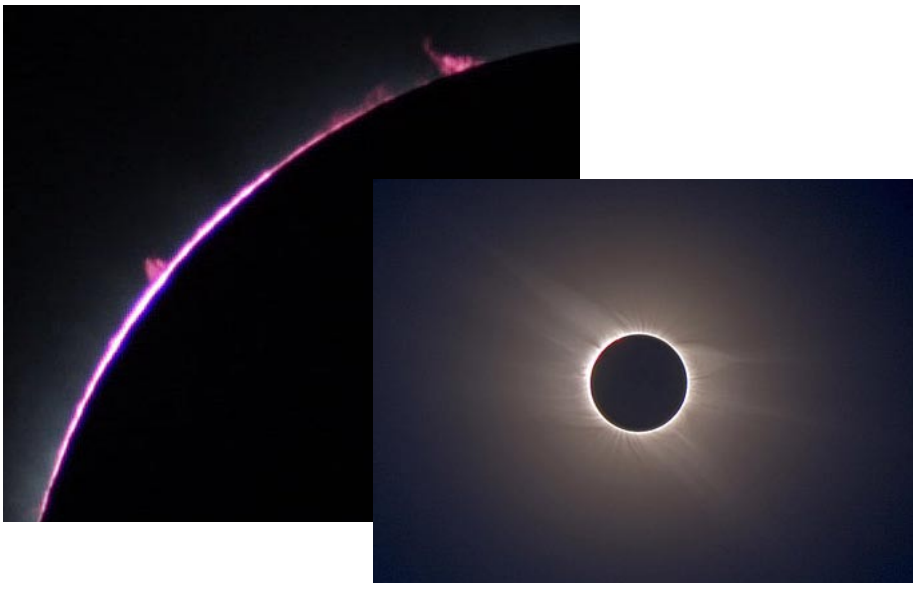
On Wednesday, March 29th, 2006, the Moon's shadow passed over Africa, across the Mediterranean Sea, into Turkey and the Soviet Union. Several TVS members travelled across the globe to be at a spot where the shadow was cast upon the Earth.

Our May meeting will be our eclipse night. Several eclipse chasers will present their travel and eclipse photos from such places as Turkey and Libya. Ken Sperber has written his account of eclipse day experience, which you can find on page 4.

Our lists of presenters include Chuck Grant, Gert Gottschalk, and Ken Sperber showing their views of Aksaray, Turkey. Eric Dueltgen was at Side, Turkey. Chris Kitting viewed the eclipse from the Egyptian border, and Debbie Dyke and Carter Roberts saw it from different locations within Libya.

Please join us for a night of travel and eclipse stories and images.

Below: Solar prominences. Notice the pink brontosaurus feature on the top right.
Right: The Sun's corona.
Photos: Below - Gert Gottschalk, Right - Carter Roberts.



News & Notes

Money Matters

Treasurer **David Feindel** reports the TVS account balances (as of April 24, 2006):

Checking	$3,047.59	
CD #1	$3,508.90	matures 5/17/06
CD #2	$2,480.02	matures 5/27/06

2006 TVS Meeting Dates

Below are the TVS meeting dates for the next few months. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting. The *Prime Focus* deadline applies to that month's issue (e.g., the May 7th deadline is for the May issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
May 19	May 22	May 7
June 16	June 29	June 4
July 21	July 24	July 9

School Star Party

The school star party that had been scheduled for May 3rd has been postponed until Saturday, May 20th. The party is at the Altamont Creek Elementary School at 6500 Garaventa Ranch Rd, Livermore, CA. Start time is 8:00 p.m. Rain does not cancel.

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.

May

Wed 10	GRS	na	7:30p	9:27p
	G	10:00p	10:39p	11:30p
	Gs	10:21p	11:16p	12:15a
Fri 12	GRS	na	9:00p	11:00p
Sat 13	I	11:02p	12:03a	1:09a
	Is	11:14p	12:16a	1:23a
Sun 14	GRS	12:49a	2:46a	4:50a
	GRS	8:40p	10:43p	12:38a
Tues 16	GRS	10:20p	12:15a	2:20a
Wed 17	E	1:33a	2:45a	4:00a
	Es	2:06a	3:20a	4:38a
Thurs 18	G	1:10a	1:57a	2:48a
	Gs	2:18a	3:13a	4:12a
Fri 19	GRS	na	9:50p	11:53p
Sun 21	I	12:46a	1:48a	2:53a
	Is	1:08a	2:08a	3:17a
	GRS	1:37a	3:28a	na
	GRS	9:32p	11:27p	1:28a
Mon 22	GRS	na	na	9:15p
	I	na	8:16p	9:19p
	Is	na	8:41p	9:45p
Wed 24	GRS	na	9:00p	10:55p
Fri 26	GRS	8:55p	10:32p	12:32a
Sun 28	GRS	2:20a	4:17a	na
	I	2:30a	3:30a	na
	Is	3:03a	4:00a	na
Mon 29	I	na	9:58p	11:05p
	Is	9:30p	10:30p	11:40p
	GRS	na	na	9:58p
Wed 31	GRS	na	9:40p	11:40p

June

Fri 2	GRS	na	11:23p	1:20a
Sat 3	E	na	na	9:46p
	Es	na	9:46p	11:08p
Mon 5	GRS	na	8:51p	10:49p
	I	10:40p	11:47p	12:51a
	Is	11:26p	12:23a	1:33a
Wed 7	GRS	na	10:33p	12:23p
Sat 10	GRS	na	12:03a	2:00a
	GRS	na	8:00p	10:00p
	E	9:35p	10:51p	12:07a
	Es	11:14p	12:19a	1:44a

White Mountain Star Party

This year our high altitude star party takes place from Thursday, August 17 through the 24th. As is tradition, the first night is spent getting acclimated to higher altitudes while at the Grandview Campgrounds (8,000' elevation). Friday through Thursday is at the Barcroft High Altitude Research Station (12,400' elevation). For a view of the site, visit ww.wmrs.edu/facilities/BAR/default.htm.

Attendees can choose how many days they would like to stay at Barcroft. The cost is $55 per person, which includes a bunk bed in a dormitory setting, very good food, and very dark skies.

If you are interested in the star party, contact the trip co-ordinator, Dave Rodrigues, at 510-483-9191.

continued page 4

Newsletter header image: Totality

An almost abstract view of the total solar eclipse of March 29, 2006. *Photo: Debbie Dyke*

Calendar of Events

May 17, 7:00 p.m.
What: *Giant Cosmic Explosions: The Gamma-ray Burst Boom*
Who: Joshua Bloom (UC Berkeley)
Where: Smithwick Theater, Foothill College
Cost: Free, but parking is $2 in quarters

Dr. Bloom will discuss the brightest explosions in the universe, which were discovered accidentally by spy satellites in the 1960's. Called Gamma-Ray Bursts (GRB's), these explosions involve mind-boggling amounts of energy. New satellites in orbit around the Earth are allowing scientists to monitor these sudden bursts and to watch the afterglow that follows the explosions.

Dr. Bloom will recount the history of how astronomers have been learning about these bursts and their connections with the deaths of stars and the births of black holes. He will also discuss new research about a kind of GRB's that results when two star corpses collide.

Dr. Bloom is assistant professor at UC Berkeley, having joined the faculty in 2005. He has been working on various aspects of the GRB mystery since 1994. He has an undergraduate degree from Harvard, a masters degree from Cambridge University, and a PhD from Caltech. His other research areas include exploding stars and black holes.

Foothill College is located on El Monte Road, west of Freeway 280, in the Los Altos Hills. Call the series hotline at 650-949-7888 for more information and driving directions. No background in science will be required for this talk. It's co-sponsored by the NASA Ames Research Center, The Foothill College Astronomy Program, The SETI Institute, The Astronomical Society of the Pacific.

May 21, 11:00 a.m. to 4:15 p.m.
What: *Sally Ride Science Festival*
Who: You
Where: NASA Ames Research Center
Cost: $18

Reach for the Stars at the Sally Ride Science Festival at NASA Ames Research Center on Sunday, May 21, 2006, from 11:00 am to 4:15 pm.

The festival features:

- An inspiring talk by astronaut Janice Voss
- Discovery Workshops for girls, given by local veterinarians, astronomers, microbiologists, and engineers
- Workshops for parents and teachers on ways to support girls' interests in science and math
- A Street Fair with hands-on activities, booths, food, and music.

Advance registration is required and is $18. The registration fee includes the featured talk, workshops, lunch, and the Street Fair. www.sallyridefestivals.com/06nasaames0521/index.shtml

June 3, 8:30 p.m.
What: *The Latest Skinny on SETI*
Who: Seth Shostak (SETI Institute)
Where: Mt. Tamalpais Mt. Theater (www.mttam.com)
Cost: Free

Despite more than four decades of searching, astronomers have heard nothing. Is this a quixotic mission, or could there soon be proof that someone is out there? What are the latest efforts to find someone in space who's at least as clever as you are?

continued page 4

Calendar of Events *continued*

The program is FREE and open to the general public. Families, students and youth groups are encouraged to attend. The Madrone Picnic area is reserved from 6:30 p.m. and the talk will be followed by telescope viewing in the Rock Spring Parking Area until around 11:30 p.m. Dress warmly and bring a flashlight. Carpool if possible.

If you can volunteer to help out, call Tinka Ross at 415-454-4715.

Sponsored by your State Park, assisted by the Mount Tamalpais Interpretive Association and telescopes courtesy of the San Francisco Amateur Astronomers.

If the weather is iffy the day of the program, call the hotline 415-455-5370. The message changes around 3:00 p.m., but only if there is a cancellation. If the programs will go as scheduled the tape will not be updated. You can also check with SFAA at 415-289-NOFOG.

June 19, 7:30 p.m.
What: *The First Stars in the Universe*
Who: Dr. Aparna Venkatesan (Univ. of Colorado)
Where: S.F. Jewish Community Center
Cost: $4

Modern cosmological observations imply that the first stars in the universe were unique objects that strongly influenced their environment, despite their brief existence. This talk will present the current data and theoretical ideas on these stars, and how future telescopes can detect them.

This lecture is part of the Morrison Planetarium Benjamin Dean Lecture Series.

During the reconstruction of the Academy, the Dean Lectures have temporarily moved to the San Francisco Jewish Community Center at 3200 California Street (at Presidio Avenue). Parking is available across the street in the UCSF Laurel Heights campus parking lot for $1.25 per night. Parking in the JCC garage is $1.25 per half-hour. The #1 California, #3 Jackson, #4 Sutter, and #43 Masonic MUNI lines stop directly in front of the building. The #38 Geary and #24 Divisadero buses stop only a few blocks away.

All programs begin at 7:30 pm in Kanbar Hall at the Jewish Community Center of San Francisco, 3200 California Street. Tickets are $4 and are available in advance or at the door. For more information, call 415-750-7141.

A non-eclipsed picture of the Sun. This image was taken on May 6th, 2006, with a Coronado PST and a Nikon 4500 digital camera. *Photo by: Sibylle Fröhlich.*

News & Notes *continued*

Solar Eclipse 2006: Aksaray, Turkey

Ken Sperber

It is difficult to put into words the solar eclipse experience. To set the scene, we are observing the eclipse from a village outside of Aksaray, Turkey. The area consists of four hills where several excavations are at various stages of exposure. Finds at this site date back to about 3000BC, and the 5000 years of human occupation suggest the possibility that numerous solar eclipses have been witnessed from this location. By coincidence, about 15 minutes after first contact, the Islamic call to prayer is sounded from two nearby Mosques. To me, this adds to the mystic of the scene despite the fact that I cannot understand the chant.

It is early afternoon as the eclipse gets underway. As the moon obscures the sun the decreased sunlight is unlike that which occurs during a typical sunset since the sun rides high in the sky. As such, lacking is the increased reddening that typically accompanies the oncoming twilight. As totality approaches it is a combination of tunnel vision as one goes about the robotic task of trying to photograph the eclipse, while at the same time trying to appreciate the experience with your own eyes. The tunnel vision is amplified by the rapidity with which the darkness descends, yet hearing the excitement of the local children as they bandy about attests to the scope of the event I am about to witness. The fair-weather clouds, that at times obscured the moons transit across the sun's face, have dissipated as faux-night approaches. As the temperature drops noticeably, I feel the anticipation that is manifested as an increase in the frequency of my breathing as I realize that I am actually going to see a total solar eclipse! Almost hyperventilating, I remove my solar filter and peer through my viewfinder to the sight of Baily Beads exploding at the limb. I snap off photos, unsure of the shutter speeds that I am selecting. I then gaze with my unaided eye at totality, and for an instant I think I have been tricked; my first impression is that I am viewing an annular eclipse. I then realize that I am viewing the inner corona, and as my eyes adjust the amorphous structure of the outer corona comes into view. Despite the fact that this eclipse is occurring near the minimum of the 11-year solar cycle, many streamers are visible, including off-equatorial ones that occur less frequently at this point in the solar cycle. While cycling forward and back through different shutter speeds, I take the time to appreciate the enhanced image size in my viewfinder. Also visible to my unaided eye are pinkish-red prominences, most notably at the 4 o'clock position and possibly the 11 o'clock position. Time will tell if my photos will bear out my observations with my less than perfect 46 year old eyes. Suddenly, with a twinge of disappointment, I run out of film—I couldn't have taken 30 exposures already; I'll miss photographing 3rd contact and the diamond ring effect. Then, the happy thought that I have no choice but to wit-

ness the end of totality with my naked eye as our ancestors did in this ancient land. Within a few seconds a huge blast of white light from the southwestern limb makes me wince as the corona is overwhelmed, and disappears from view. The landscape around noticeably brightens and my heart sinks with the realization that totality is over. Surely, nearly 4 minutes of totality can't have passed so quickly—I don't want this to end! After loading up another roll of film I begin to photograph the now mundane departing lunar "black hole" that marches across the solar disk—I'll finish my task of photographing the eclipse through 4th contact.

Through totality, 4th contact, and beyond I am accompanied by at least a half dozen locals, including a few 3-4 year olds, some 7-10 year olds, and a couple of 12-13 year olds (see the accompanying photo). The latter are dressed in blue school dress jackets and grey slacks that belie the local village existence. Why these people chose to spend the eclipse with me will forever remain unknown to me, but I think I got the best out of this random intersection of lives. While gazing up my hat fell off, revealing my (mostly) shaved bald head. As I reached for my hat the gentleman who accompanied the kids removed his hat and we both rubbed our bald heads with a laugh. He then asked the second-most common question of the day: "How old are you?" after revealing he was 42. He looked good for his age, considering what must be a tough existence, either sheepherding and/or working the land. When I let one kid have a look through a proper solar filter (I quickly corrected a few that tried gaze naked eye or through floppy disks) word spread like wildfire and the kids came in droves, tramping up the dust. They calmly passed my filter among themselves, always saying "Thank you" when finished. Afterwards (and before the eclipse) all of the locals wanted their picture taken, especially the kids. Thankfully, such images will serve as a reminder of the common interests our diverse group shared. Among our peers from TVS and the Berlin club the eclipse itself would have been spectacular, but the interaction with the locals made it a lifetime event.

H2O Open House

Our first club observatory Open House of the year is fast approaching. Saturday, May 20th is the designated date, with June 17th and August 19th being the other dates for the year. We will meet at 7:00 p.m. at the corner of Mines and Tesla for the caravan trip down to the site. It takes about an hour to get to the site and there is a $3 per car entrance fee (exact change).

If you haven't been to the site before, you'll need to know that the site is primitive—no water or electricity. It might be good to bring some TP for the outhouse just in case. The nearest place to grab a bite to eat is way back in Livermore, so you'll want to bring whatever you'll need to sustain you during the evening.

There are several places you can set up your scope, and we have a great view to the south as the site looks over a valley. If you'd like to see what the site looks like during the day, go to the TVS web site and click on the Site Index link. From there, scroll down to the bottom to *Resources* and click on the *H2O (Hidden Hill Observatory)* link.

If you've been wanting to try out our dark sky location, the Open House nights are the best time to do so. Should you decide you'd like to have access to the site throughout the year, you can become a Key holding member (after paying the requisite dues, of course) and make the journey whenever the dark sky bug bites.

Bryce Canyon Needs Volunteers

Astronomy Volunteers sought for some of the darkest skies in the country: Bryce Canyon National Park

- Free park housing (But Astronomers with RVs are especially welcome!)
- Dark magnitude 7+ skies
- April-October 2006
- 4 week commitment
- Share the sky with thousands of visitors

The National Park Service is seeking volunteers with a solid knowledge of the sky, telescope operation, and good communication skills to participate in a robust public astronomy program. Stargazing and protection of dark skies has become an important theme at Bryce Canyon with over 27,000 visitors attending night sky programs last summer.

For further information: http://www.nps.gov/brca/astro_volunteer.html or contact:
Kevin Poe at 435-834-4412, kevin_poe@nps.gov
or Chad Moore at 435-834-4904, chad_moore@nps.gov

continued page 7

What's Up *by Debbie Dyke*

All times Pacific Daylight Saving Time unless otherwise noted.

May

7	Sun	Moon at apogee (250,834 miles). 12:00 a.m.
10	Wed	Spica 3° south of the Moon. 5:00 p.m.
11	Thurs	Jupiter 6° north of the Moon during the evening.
12	Fri	**Full Moon**. 11:51 p.m.
14	Sun	Mother's Day.
16	Tues	1969 Venera 5 impacts Venus.
17	Wed	Mercury at ascending node. Venus at aphelion. 1969 Venera 6 impacts Venus.
18	Thurs	Mercury in superior conjunction. 1:00 p.m. 1910 Earth passes safely through tail of Comet Halley.
19	Fri	Mars at greatest heliocentric latitude north. Neptune 4° north of the Moon. 8:00 a.m. **Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.
20	Sat	**Last Quarter Moon**. 2:20 a.m.
21	Sun	Mercury at perihelion. Uranus 1.5° north of the Moon. 4:30 a.m. **Tri-Valley Stargazers discussion meeting**. 2:00 p.m. at the Round Table Pizza on 1024 E. Stanley Blvd., Livermore. Discuss astro stuff with your fellow members.
22	Mon	Moon at perigee (228,536 miles). 8:00 a.m. Neptune stationary. 10:00 a.m. **Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.
23	Tues	1980 The Tri-Valley Stargazers become incorporated as a non-profit organization.
24	Wed	Venus 5° south of the Moon. 5:00 a.m.
26	Fri	**New Moon**. 10:26 p.m. Start of RTMC-Riverside Telescope Makers Conference.
29	Mon	Memorial Day. 1919 Einstein's theory of general relativity is tested for the first time during a total solar eclipse.
30	Tues	Mars 2.5° south of the Moon in the west. 8:00 p.m. 1966 Surveyor 1 makes the first soft landing on the Moon.
31	Wed	Saturn 4° south of the Moon during the evening. 1935 Robert Goddard's rocket reaches 7,500'.

June

1	Thurs	1858 Lick Observatory dedicated
2	Fri	1858 G. Donati at Florence, Italy discovers one of the comets of the century, named Donati's Comet in his honor.
3	Sat	1948 Dedication of the 200-inch Hale telescope at Palomar. Full time use of the scope doesn't take place until the following January.
4	Sun	1965 Ed White becomes first American to walk in space. His walk lasted 22 minutes.
8	Thurs	1625 Giovanni Cassini born.

Who Wants to be a Daredevil?

by Patrick L. Barry & Dr. Tony Phillips

When exploring space, NASA naturally wants to use all the newest and coolest technologies—artificial intelligence, solar sails, onboard supercomputers, exotic materials.

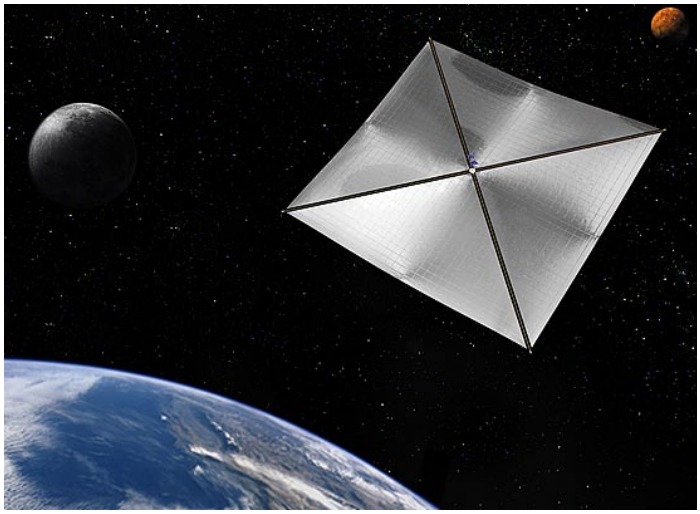
But "new" also means unproven and risky, and that could be a problem. Remember HAL in the movie "2001: A Space Odyssey"? The rebellious computer clearly needed some pre-flight testing.

Testing advanced technologies in space is the mission of the New Millennium Program (NMP), created by NASA's Science Mission Directorate in 1995 and run by JPL. Like the daredevil test pilots of the 1950s who would fly the latest jet technology, NMP flies new technologies in space to see if they're ready for prime time. That way, future missions can use the technologies with much less risk.

Example: In 1999, the program's Deep Space 1 probe tested a system called "AutoNav," short for *Autonomous Navigation*. AutoNav used artificial intelligence to steer the spacecraft without human intervention. It worked so well that elements of AutoNav were installed on a real mission, Deep Impact, which famously blasted a crater in Comet Tempel 1 on July 4, 2005. Without AutoNav, the projectile would have completely missed the comet.

Some NMP technologies "allow us to do things that we literally could not do before," says Jack Stocky, Chief Technologist for NMP. Dozens of innovative technologies tested by NMP will lead to satellites and space probes that are smaller, lighter, more capable and even cheaper than those of today.

Another example: An NMP test mission called Space Technology 9, which is still in the planning phase, may test-fly a solar sail. Solar sails use the slight pressure of sunlight itself, instead of heavy fuels, to propel a spacecraft. Two proposed NASA missions would be possible only with dependable solar sails—L1 Diamond and Solar Polar Imager—both of which would use solar sails to fly spacecraft that would study the Sun.



Artist's rendering of a four-quadrant solar sail propulsion system, with payload. NASA is designing and developing such concepts, a sub-scale model of which may be tested on a future NMP mission.

"The technologies that we validate have future missions that need them," Stocky says. "We try to target [missions] that are about 15 to 20 years out."

A menagerie of other cool NMP technologies include ion thrusters, hyperspectral imagers, and miniaturized electronics for spacecraft navigation and control. NMP focuses on technologies that have been proven in the laboratory but must be tested in the extreme cold, vacuum, and high radiation environment of space, which can't be fully recreated in the lab.

New NMP missions fly every year and one-half to two years, taking tomorrow's space technology for a daredevil test drive.

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

News & Notes *continued*

More Eclipse Stuff

Seeing the eclipse images and reading the stories about it might give those who haven't seen a total solar eclipse an urge to go out and see the next one. But when and where is the next total solar eclipse?

August 1, 2008 is your next chance. The path of totality starts in northern Canada, goes across Greenland, crosses over the Arctic Circle, down into Russia and into Mongolia. There is already an eclipse tour planned for taking the Trans Siberian Railroad to a Soviet center line, as well as a tour to China. Weather prospects for the areas along the eclipse path aren't all that great, and combined with a totality duration of just 2 minutes, 27 seconds, it may be one only for the die hard eclipse chasers.

The next eclipse will be much better. On July 22, 2009, the Moon's shadow will traverse India, China, some small Japanese islands, and even smaller islands in the middle of the Pacific Ocean. The maximum duration for this eclipse is a whopping 6 minutes, 39 seconds. Shanghai is on the eclipse path and will be included on future eclipse tours.

On July 11, 2010 you'll want to be in Chile, Argentina, Easter Island, or sailing about the Pacific Ocean. Maximum duration is 5 minutes, 20 seconds.

Mark your calendars and start saving your money. A trip to a far away land is in your future.

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.
_____ $32.95 One year subscription to *Sky & Telescope* magazine.
_____ $34 One year subscription to *Astronomy* magazine.
_____ $60 Two year subscription to *Astronomy* magazine.
_____ $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.
$_____ 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.