PRIMEFOCUS

Tri-Valley Stargazers

November 2006

Meeting Info:

What
Mercury

Who
TVS Members

When
November 10, 2006
Conversation at 7:00 p.m.
Lecture at 7:30 p.m.

Where
Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

Note meeting date is one week earlier

Inside

November Meeting

Mercury
TVS Members

November 8th is the transit of Mercury. For our November meeting, which has been moved up a week to the 10th, we'd like to invite TVS members to show their transit images. After oohing and aahing the pictures, we'll show a video about Mercury.

Mercury, known as Hermes & Apollo to the Greeks, is the messenger of the gods. He was also the god of travel, commerce, and thievery. He ruled Wednesdays (how appropriate that the transit is on a Wednesday!) and youngsters we're sacrificed on Wednesdays in his honor. Fortunately, we don't follow that tradition anymore.

Mercury transits the Sun about thirteen times each century, during the months of May and November. It happens every 13 and 33 years in May, and every 7, 13, and 33 years in November. The next Mercury transit won't take place until May 9, 2016.

Mercury is 3,032 miles in diameter and is smaller than the moons Ganymede and Titan (although it's twice as massive). Its day is 176 Earth days and its year is 88 days. The Sun would appear almost three times as large as it does on Earth, and 11 times brighter. The temperatures range from 840°F in the daylight, to -300°F at night.

It's 35,904,200 miles away from the Sun and about 57,095,800 miles from the Earth. The Mariner 10 spacecraft is the only craft to have visited Mercury. The spacecraft Messenger was launched in 2004 to go visit Mercury, but it won't get there until 2011.

Planet Mercury

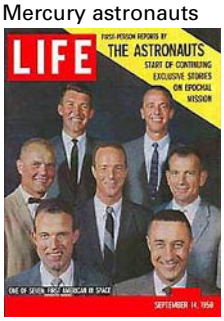
Mercury the god

Freddie Mercury

Mercury the element

Mercury car

Mercury astronauts



News & Notes

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 December 3rd deadline is for the December issue).

Lecture Meeting	**Board Meeting**	***Prime Focus* Deadline**
Nov. 17	Nov. 20	Nov. 5
Dec. 15	Dec. 18	Dec. 3

Money Matters

Treasurer **David Feindel** reports the TVS account balances (as of October 15, 2006):

Checking	$2,827.41	
CD #1	$3,556.37	matures 11/17/06
CD #2	$2,513.57	matures 11/27/06

TVS November Elections

The yearly TVS elections will take place at the November meeting. We'll be voting for club officer and board of director positions. Any member can run for any office or to be on the board, just add your name to the nomination list at the November meeting. You don't have to have experience, just a desire to help the club.

The current nominations are as follows:

President: Chuck Grant
The President runs the general and board meetings.

Vice-President: Rich Campbell
The VP fills in when the President isn't available.

Treasurer: David Feindel
The Treasurer handles the membership dues and pays the bills.

Secretary: (no nominations received)
The Secretary takes the minutes at the board meetings, and handles general correspondence.

Current Board of Directors: Alane Alchorn, Jim Alves, Debbie Dyke, Gert Gottschalk, Stan Isakson, Mike Rushford, John Swenson.

The Board meets in Livermore on the Monday after the general meeting to discuss club related business and to make decisions regarding the future of the club. Meetings usually last a couple of hours.

In addition, there are several volunteer positions that need to be filled. The Program Director is in charge of finding speakers for the monthly meetings. We need 10 speakers a year (the other two months of the year are our potluck dinners).

The Hospitality position requires bringing the refreshments to the meeting and making coffee and tea, and coordinating the summer and holiday potlucks.

The Publicity position involves contacting local newspapers regarding club activities and meetings. S/he would also arrange to have flyers available at our public outreach events.

TVS conducts star parties for any teacher, school, or group that requests our presence. Our star party coordinator, Rich Campbell, can't always be at every star party, so we'd like to have one or two back-ups that would be able to do a little slide show, or do a Night Sky activity for the group. We have an assortment of Night Sky Network activities for members to use for public outreach events.

Please consider helping out in whatever way you can, and don't be afraid to add your name to the nomination list.

School Star Parties

We have a couple of star parties scheduled for the next few months.

On November 9th we'll be at the Livermore Valley Charter School from 6:00 to 9:00 p.m. Mike Rushford is the star party coordinator for this event.

December 7th we'll be helping out a Livermore Cub Scout group.

We'll have more information about these events when we get closer to their dates. Check our web site and the TVS eGroups list for the latest info.

Project Systemic

UCSC astronomers are seeking the public's help to find and understand planets outside our solar system. But you don't need an advanced degree or even a telescope to participate—just a computer, access to the Internet, and an interest in astronomy.

The project, called Systemic, enlists volunteers to help astronomers better understand what kinds of planetary systems inhabit our galaxy, the Milky Way, and whether systems like our solar system are common.

For more information about the program, and how you might help, visit their web site at http://currents.ucsc.edu/06-07/10-16/systemic.asp.

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Newsletter header image: Mercury Transit
This image was taken of the November 15, 1999, transit of Mercury. It was taken prime focus with an 80mm f/8 refractor with a 2x barlow lens, Kodak Gold 200 film.
Photo: Gert Gottschalk

Calendar of Events

November 8, 10:00 a.m. - 7:00 p.m.
What: *The Planet Pluto: Maligned but Not Forgotten*
Who: Dale Cruikshank (NASA Ames Research Center)
Where: Foothill College, Los Altos
Cost: Free ($2 parking–need 8 quarters)

This non-technical, illustrated talk is part of the Silicon Valley Astronomy Lectures in the Smithwick Theater, Foothill College, at El Monte Road and Freeway 280 in the Los Altos Hills. Call the series hot-line at 650-949-7888 for more information and driving directions.

Although Pluto is only one of many worlds beyond Neptune that are now recognized as dwarf planets, it is the one we know best.

And to generations of Americans who in their youth learned about Pluto's discovery by a Kansas farm boy in 1930, it is perhaps the one that is most loved. With a thin atmosphere, a layer of smog, three moons, and a patchy surface made of many kinds of ice, Pluto is the gateway to the vast outer fringe of the Solar System, where trillions of lumps of ice, rock, and organic chemicals orbit the Sun in a permanent deep freeze.

Recognizing Pluto's importance to our understanding of the outer regions of the Solar System, NASA launched the New Horizons spacecraft in January, 2006. Streaking outward at nearly 70,000 miles per hour, New Horizons will reach Pluto in July 2015. The knowledge gained from this first close-up inspection of Pluto and its moons will expand our understanding of all the dwarf planets beyond Neptune. This new understanding will be all the more important as the completion of new and powerful survey telescopes begins to accelerate the discovery of new objects out there.

Dr. Cruikshank is one of the world's foremost authorities on the outer solar system. He and his colleagues discovered the ices that make up Pluto's surface and evaporate to form its thin atmosphere. As a former amateur astronomer, he has a knack for explaining scientific ideas in simple, direct language.

The lecture is co-sponsored by: NASA Ames Research Center, The Foothill College Astronomy Program, The SETI Institute, The Astronomical Society of the Pacific.

November 12, 1:15 & 3:15 p.m.
What: *Alien Clones from Outer Space Workshop*
Who: H.B. Homzie
Where: Chabot Space & Science Center, Oakland
Cost: Free with General Admission

Join award winning children's book author H. B. Homzie for two of her out-of-this-world workshops.

1:15 p.m. - Create Your Own Alien Comic Book
Create the first page in your space adventure, satire, mystery or comedy as you learn the fundamentals of story and character from the creator of Alien Clones From Outer Space, which is soon to become an animated television show produced by Suppertime Entertainment and Telescreen.

3:15 p.m. - Design Your Own Alien
Create your own alien being, design a bio, and then draw and color your being and launch him/her out into the world.

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Officers

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

Vice-President:
Rich Campbell
r_photon@yahoo.com

Treasurer:
David Feindel
feindel1@comcast.net

Secretary:
Debbie Dyke
(acting secretary)

Board of Directors

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

Volunteer Positions

Librarian:
Jim Alves
jim_alves_engr@yahoo.com
209-833-9623

Newsletter Editor:
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925-461-3003

Program Director: unfilled

Loaner Scope Manager:
John Swenson
johnswenson1@comcast.net

Webmaster:
Chuck Grant

Observatory Director/ Key Master:
Chuck Grant

School Star Party Chair:
Rich Campbell
r_photon@yahoo.com

Public Star Party Chair:
Rich Campbell

Historian:
Debbie Dyke

Mentor:
Mike Rushford
rushford@eyes-on-the-skies.org

Addresses

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

Lecture Meeting:
Unitarian Universalist Church
1893 N. Vasco Road, Livermore

Board & Discussion Meetings:
Round Table Pizza
1024 E. Stanley Blvd., Livermore

Web & E-mail

www.trivalleystargazers.org
tvs@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.

TVS E-Group

So how do you join the TVS e-group you ask? Just send an e-mail message to the TVS e-mail address (tvs@trivalleystargazers.org) asking to join the group. Make sure you specify the e-mail address you want to use to read and post to the group.

Calendar of Events *continued*

Known for her zany and hysterical chapter books, this Wine Country-based author is a visiting professor in children's literature at Hollins University and has starred off-Broadway in sketch comedy shows, David Letterman and Saturday Night Live.

November 27, 7:00 p.m.

What: *Spitzer - The Last of the Great Observatories*
Who: Dr. George Rieke, Deptuty Director (Steward Observatory, Univ,. of Arizona)
Where: Jewish Community Center, San Francisco
Cost: $4.00 at the door or by mail

Over 20 years after starting the project, NASA launched the Spitzer infrared telescope into space as the last of the great observatories that began with the Hubble Telescope. Why did it take so long? Was it worth it? This talk will illustrating Spitzer's capabilities by showing what we have learned about other planetary systems. Spitzer results are revealing new aspects of how the Earth formed and about the collisions that still occur among planets and asteroids.

News & Notes *continued*

Observing across the Atlantic September-October, 2006

Two weeks, four observatories, new friends, old stones.

by Jane Houston Jones

Jane with Sir Patrick Moore on a visit to his home, Farthings.

Longitude 0° 47'W, Latitude 50° 43'N – Selsey, Sussex, UK

Near the 17th century thatched roof of Sir Patrick Moore's "Farthings" residence in Sussex stand two observatories. The larger one contains a 15-inch f/6 Fullerscope reflector, and the smaller one holds a 5-inch Cooke refractor. The night we spent at Farthings was magical despite increasing clouds. Sir Patrick ("just Patrick, please") was admitted as a member of the British Astronomical Association at age 11 in 1934, 5 years after he first read The Story of the Solar System, by G. F. Chambers, F.R.A.S. This little book, written in 1898, was a gift from his mother. Local amateur astronomer Ian Sharp, who refurbished the 15-inch joined us in the observatory on the night of our visit, and the BBC crew from Patrick's "The Sky at Night" TV show were there to film his October show in the morning. My biggest thrill, in addition to talking about sketching with Patrick, was to view a couple of his 7 Moon sketching journals, and some of his Jupiter, Saturn, Venus and Mars sketch collections. His first sketches were dated 1933, shortly before he joined the B.A.A. We were able to view a few stars through the 15-inch, but soon the clouds obscured the skies and we headed inside for conversation and stargazing of a different kind. To see Sir Patrick's telescope refurbishment by Ian Sharp and others, visit http://www.astro-sharp.com/pm_restoration_page1.asp.

Mojo assembled this panorama from four individual pictures.

Longitude 1° 50'W, Latitude 51° 11'N – Stonehenge, Wiltshire, UK

It is not likely that ancient observers used Stonehenge for astronomical predictions. More likely, any astronomical observations made at Stonehenge were of a simple kind carried out for religious and ritual practices.

The main axis of the monument faces the horizon where the Sun rises on midsummer morning, the longest day of the year. But the axis really only lines up roughly. The Sun actually rises to the left of the Heel Stone (the marker for the axis). And because of the Earth's precession, 4,000 years ago, the Sun would have risen even farther off the center axis.

Is Stonehenge a tribute to Stone Age brilliance or the farmer's common knowledge of the sky? A visit to Stonehenge or megoliths in Europe, Russia, the Americas, Africa, Asia, the Pacific reveal the remnants of ancient or accidental astronomers, who looked up in wonder just as we do today.

The Leviathan Telescope at Birr Castle, view from the south in its rest position.

Longitude 7° 54'W, Latitude 55° 5'N – The Leviathan, Birr Castle and the Whirlpool Star Party, Co. Offaly, Ireland

For over 150 years, amateur and professional astronomers alike have been inspired by the science of William Parsons, the 3rd Earl of Rosse. The annual Whirlpool Star Party, held adjacent to the Earl's castle and telescope, honors the work of the past with results of the present. On September 29, 2006, we met many of our fellow speakers and attendees at Dooley's Hotel, the home of the Whirlpool Star party, in the shadow of Birr Castle and the great 72-inch Leviathan Telescope.

After wine and cheese, we all headed through the stone arch to the grounds of Birr Castle, inhabited by the current Lord Rosse, the patron and supporter of the Whirlpool Star Party. With only the starry sky to guide us, we were soon standing against the great 72-inch Leviathan telescope. Originally operated by chains and pulleys, the telescope is being renovated. Many attendees set up their own telescopes adjacent to the Leviathan and soon star party murmurs mixed with stunning views of the fall sky splendors.

Mojo and I were honored to be invited speakers at this year's Whirlpool Star Party. My talk was about my work on the Cassini Mission and a snapshot of Cassini's second year at the Saturnian system. Mojo's talk was about astronomy in the national parks of the US, part travelogue followed by the Milky Way talk he gives each summer in the national parks. These were just a small part of the speaker lineup, which included one other American visitor, Johnson Space Center's research pilot, Triple Nickel.

Any amateur astronomers thinking of an Autumn trip to Ireland would enjoy this wonderful star party. We left after just a few days with dozens of new friends. I can't wait to go back!

Flamsteed House, Royal Greenwich Observatory.
The octagon room at Flamsteed house, and time signal ball, at the Royal Greenwich Observatory.

Longitude 0° 0', Latitude 51° 28'N – Royal Observatory Greenwich, London, UK

The Royal Observatory, home of Greenwich Mean Time and the Prime Meridian line, is one of the most important historic scientific sites in the world. Founded in 1675, it is the official starting point for each new day, year and millennium. We took a stroll though the time galleries in Flamsteed House and listened to a Flamsteed lecture in the Octagon Room. John Harrison's marine timekeepers H1-H4 are on display along with regulators, precision clocks and watches, chronometers in the 1,000 object collection. Telescopes of Halley, Flamsteed and Airy fill the observatory. Out in the drizzling rain, we spotted an 8-foot section of William Herschel's 40-foot reflector telescope. No photographs were allowed in the museums. A virtual tour of the museum collections are at http://www.nmm.ac.uk/collections//explore/listCollections.cfm.

Photos by Mojo and Jane, using a Canon EOS 20D, with 17-85 IS lens.

Astro Events

Mercury transit of 1999. Photo: by Gert Gottschalk

Transit of Mercury

On November 8th, Bay Area residents can witness the transit of Mercury. Mercury first makes contact with the Sun at 11:12 a.m. PST. It's completely within the Sun's disk at 11:13. It reaches the midpoint at 1:41 p.m., and starts to leave the Sun's disk at 4:08 p.m. Just two minutes later, at 4:10, it is free of the Sun. If you miss this transit, you'll have to wait until 2016 for the next one.

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What's Up *by Debbie Dyke*

All times Pacific Standard Time.

November

5 Sun **Full Moon**. 4:58 a.m. PST
S. Taurid meteors peak. 8:00 a.m. PST

7 Tues Election Day.
1991 The 10-meter Keck Telescope dedicated on Mauna Kea, Hawai'i.

8 Wed Mercury in inferior conjunction. 2:00 p.m. PST
Transit of Mercury. 1st Contact 11:12 a.m. PST – 2nd Contact 11:13 a.m. – Greatest transit 1:41 p.m. – 3rd Contact 4:08 p.m. – 4th Contact 4:10 p.m.
1656 Edmond Halley born.

9 Thurs 1934 Carl Sagan born.

10 Fri **Tri-Valley Stargazers general meeting**. 7:30 p.m. at the Unitarian Universalist Church, 1893 N. Vasco Road, Livermore.

11 Sat Veterans Day.
The Moon is 3° from the Beehive Cluster (M45). 5:00 a.m.

12 Sun N. Taurid meteors peak. 8:00 a.m.
Last Quarter Moon. 9:45 a.m.

13 Mon Mercury at perihelion.
The Moon is 1.5° from Regulus. 5:00 a.m.
1971 Mariner 9 becomes the first spacecraft to orbit Mars.

15 Wed Moon at apogee (251,220 miles). 3:00 p.m.

16 Thurs 1974 Arecibo radio telescope sends a 3-minute message towards M13 — it should arrive in about 24,000 years.

17 Fri Mercury stationary. 11:00 a.m.
Leonid meteors peak. 1:00 p.m.

19 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.

20 Mon **Tri-Valley Stargazers Board meeting**. 7:00 p.m. at the Round Table Pizza in Livermore.
New Moon. 2:18 p.m.
1998 The first section of the International Space Station is launched from Baikonur.

21 Tues Jupiter in conjunction with the Sun. 3:00 p.m.

22 Wed 1682 Edmond Halley sees the comet that will later bear his name.

23 Thurs **Thanksgiving Day.**

25 Sat Mercury at greatest elongation west (20°) 5:00 a.m.

26 Sun Neptune 4° from the Moon. 6:45 p.m.

27 Mon **First Quarter Moon**. 10:29 p.m.

28 Tues 1964 Mariner 4 launched toward Mars.
1967 Jocelyn Bell discovers pulsars.

December

2 Sat 1993 Hubble Space Telescope gets corrective optics.

3 Sun 1971 USSR's Mars 3 becomes the first spacecraft to make a soft landing on Mars.
1973 Pioneer 10 becomes the first spacecraft to fly by Jupiter.

7 Thurs 1995 Galileo space craft arrives at Jupiter.

The Planet in the Machine

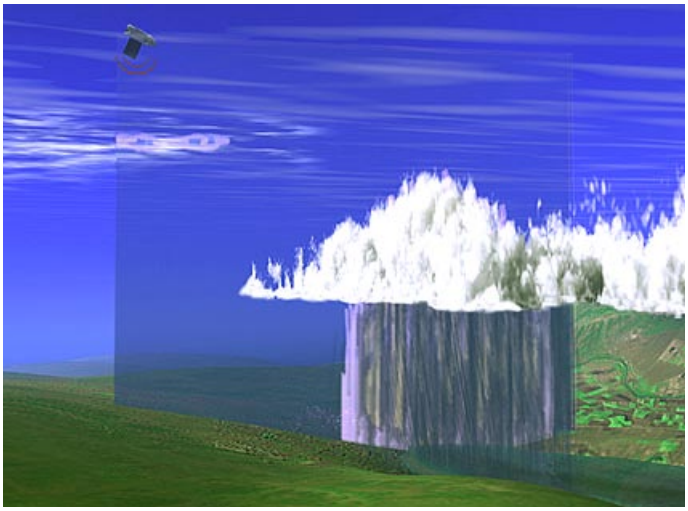
by Diane K. Fisher and Dr. Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The "butterfly effect" is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes. Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real "butterfly effect" is driven by, for example, global winds and ocean currents, polar ice (melting and freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there's the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth's carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.



CloudSat is one of the Earth observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat's unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun's energy in the atmosphere. See animation of this data simulation at www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html.

NASA's Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth's land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit science.hq.nasa.gov/missions/earth.html. Kids can get an easy introduction to Earth system science and play Earthy word games at spaceplace.nasa.gov/en/kids/earth/wordfind.

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

Astro Events *continued*

Comet SWAN was discovered in early July by the SWAN (Solar Wind ANisotropies) camera on board the SOHO spacecraft. SWAN made its closest approach to Earth in September and is now making its way out of our solar system. It is on a hyperbolic trajectory and will not be returning to our solar system.

This picture was taken on October 26 at Henry Coe State Park with a telephoto lens. It's a composite of eight 40-second images taken with a Canon 20D, with the ISO setting at 1600.

Photo: Conrad Jung

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.