Tri-Valley Stargazers

July 2023

PrimeFocus

WHEN:

July 21, 2023
Doors open at 7:00pm
Meeting at 7:30pm
Lecture at 8:00pm

WHERE:

Unitarian Church
1893 North Vasco Rd.
Livermore, CA 94551

TVS QR Code

INSIDE THIS ISSUE:

SOHIP's First 100 Days on the ISS
Dr. Lance Simms, Lawrence Livermore National Laboratory

The Stellar Occultation Hypertemporal Imaging Payload is an instrument built by the LLNL Space Science and Security Program (SSSP) to measure atmospheric properties at high altitudes. It was launched on a SpaceX Dragon as part of the CRS-27 resupply mission to the International Space Station (ISS) on 2023/03/15 and successfully installed shortly thereafter. This talk will provide a brief introduction to SOHIP and describe the exciting results and challenges faced during its early commissioning activities. For more information, see: https://www.llnl.gov/news/prototype-telescope-designed-lawrence-livermore-researchers-launched-international-space

Caption: Launch of SpaceX CRS-27 with the LLNL Stellar Occultation Hypertemporal Imaging Payload. Credit: NASA

Lance Simms is the flight software and operations lead for SOHIP. He received his Ph.D. in Applied Physics from Stanford University in 2010 and has been working in the field of astronomy and space ever since. In his 13 years at LLNL, he has written flight software for a number of satellite payloads and worked on sensors ranging from the microwave to the gamma end of the spectrum. He and his wife, Tina, and their daughter, Madelyn, are all enthusiastic members of the Tri-Valley Stargazers.

WANTED: TVS Newsletter Editor

After nearly 14 years, I have decided to stepdown as the TVS Newsletter Editor at the end of this year. I have enjoyed working with the TVS board to provide club members with essential club news and other (hopefully interesting) content. When I took over newsletter preparation in 2010, I introduced the *Journal Club* column. Researching and summarizing peer-reviewed articles for the newsletter has broadened my perspective on astronomy, and made observing more pleasurable, as I have a greater appreciation of the physical processes occurring in many of the objects I observe. I am fortunate to have a Contributing Editor, Saanika Kulkarni, who has recently prepared contributions for *Journal Club*. We hope club members have enjoyed the articles as much as we have enjoyed preparing them. I am also amazed at the level of astrophotography that TVS members have continually produced over the years. It has been a pleasure to publish such high-quality work in the newsletter for all to enjoy.

My replacement has free reign to redesign the newsletter and its content as they see fit. The newsletter is presently prepared using MS Word. Monthly, it is due to the TVS Board ~1 week in advance of the general meeting so that it can be posted on the website and sent to the membership. I am happy to work with the incoming newsletter editor to ensure a smooth transition. If you are interested in becoming the next TVS Newsletter Editor, please contact any club officer (see the Officer's Block on p.3 for email addresses). --- Ken Sperber

News and Notes

2023 Meeting Dates

Lecture Meeting	Board Meeting	PrimeFocus Deadline
Jul. 21	Jul. 24	
Aug. 18	Aug. 21	Aug. 4
Sep. 15	Sep. 18	Sep. 1
Oct. 20	Oct. 23	Oct. 6
Nov. 17	Nov. 20	Nov. 3
Dec. 15	Dec. 18	Dec. 1

Money Matters

As of the last Treasurer's Report on 06/19/23, our club's account balance is $68,164.53. This includes $38,142.47 in the H2O Rebuild fund.

2023 Club Star Party Schedule

Save the dates for the 2023 Club Star Parties.

Del Valle star parties are also public outreach events. They are jointly hosted with the EBRPD and held at the Arroyo Staging Area. The public is invited for the first 1.5-2 hours, while club members can stay the remainder of the night.

Tesla Vintners star parties are open to only club members and their guests. These star parties end at midnight, but participants can leave earlier, should they wish.

H2O Open House star parties are open to only club members and their guests. The open house ends at midnight, and all participants are encouraged to stay the duration. The drive to H2O takes about 1 hour, and the caravan leaves promptly from the corner of Mines and Tesla Rds. No gas stations are available on the route, so be prepared. Admission is $3/car-bring exact change. H2O is a primitive site with two porta-potties. Bring water, food, and warm clothing, as needed. Red flashlights are to be used so observers can preserve their night vision.

July 22: Del Valle Arroyo Staging Area, just past 5055 Arroyo Road, Livermore. Set up at 7:30pm, public observing 8:30-10:00pm, TVS members can continue to observe after the public leaves.

August 5: H2O Open House. The caravan departs a 6:00pm sharp from the corner of Mines and Tesla Roads. Bring $3 for site admission. This is also an opportunity for members who want access but have not completed site orientation to do so.

August 12: Outreach/member star party and Perseid meteor observing at Del Valle Park (the exact location is TBD). Set-up at 7:30pm, public observing 8:30-10:00pm. For more information, see: trivalleystargazers/eventid=1867737

Barcroft High Altitude Star Party

Reservations for the Eastbay Astronomical Society's Barcroft High-Altitude Star Party are now open to members of the EAS, the Tri-Valley Stargazers, and the Mount Diablo Astronomical Society clubs. This year's event will be held from Sunday, August 13 through noon on Saturday, August 19 (with departure by noon on Saturday). That's six nights!

Before sending payments for reservations ($90 per night, per person), even if you've been there before, please FIRST contact Don Saito (barcroft@eastbayastro.org) to ensure the dates you wish to attend are available. You will also be asked to read the Barcroft Writeup, as it provides the information you'll need to have a safe, comfortable stay, and what is expected of guests to this University of California research facility.

Please visit: East Bay Astronomical Society - Barcroft High Altitude Star Party

Calendar of Events

July 19, 9:00am-10:00am

What: A Sign in Space: Writing in Response to ETI
Who: Co-Hosts: Daniella de Paulis and Gregory Betts; Panelists: Tracie Morris, Jaap Blonk, Christian Bok, and Luigi Serafini
Sponsor: SETI
Online: Free, Registration Required

A Sign in Space is a multidisciplinary art project conceived by artist Daniela De Paulis. De Paulis is leading a global team to send an encoded message from the European Space Agency (ESA) ExoMars Trace Gas Orbiter (TGO) back to Earth, simulating a signal an advanced extraterrestrial civilization could eventually send to Earth. The message was "detected" by four radio astronomy observatories on Earth: the SETI Institute's Allen Telescope Array (ATA), The Robert C. Byrd Green Bank Telescope (GBT), the National Science Foundation's Karl G. Jansky Very Large Array (VLA) and the Medicina Radio Astronomical Station observatory managed by INAF (the Italian National Institute for Astrophysics). De Paulis and her team developed the encoded message, but its contents remain unknown, even to most of the collaborating partners.

The message was transmitted from the TGO on May 24 at 19:16 UTC/12:15 pm PDT.

The A Sign in Space team is hosting a series of Zoom-based discussions open to the public around topics that consider the societal implications of detecting a signal from an extraterrestrial civilization.

For more information, see: https://www.seti.org/event/sign-space-wreti-writing-response-eti

continued on p.3

News and Notes (con't)

July 22, 28, 29, August 4, 5, 11, 12
7:30pm-10:30pm

What: Free Telescope Viewing
Who: Chabot Staff
Where: Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost: Free

Join Chabot astronomers on the Observatory Deck for a free telescope viewing! Weather permitting, this is a chance to explore stars, planets and more through Chabot's historic telescopes. Chabot's three large historic telescopes offer a unique way to experience the awe and wonder of the Universe. Three observatory domes house the Center's 8-inch (Leah, 1883) and 20-inch (Rachel, 1916) refracting telescopes, along with a 36-inch reflecting telescope (Nellie, 2003).

Are the skies clear for viewing tonight? Viewing can be impacted by rain, clouds, humidity and other weather conditions. Conditions can be unique to Chabot because of its unique location in Joaquin Miller Park. Before your visit, check out the Weather Station to see the current conditions at Chabot.

For more information, see:
https://chabotspace.org/events/events-listing/

July 25, 7:15pm-9:00pm

What: Gravitational Waves and Black Holes – New Results
Who: Prof. Luke Zoltan Kelley, (UC Berkeley)
Where: Lindsay Wildlife Experience Community Room, 1931 First Avenue, Walnut Creek, CA 94597
Cost: Lecture: Free, see link below for parking info

No details available.

For more information, see: nightsky.jpl.nasa.gov/event-view.cfm?Event_ID=125701

August 4, 6:00pm-10:00pm

What: First Friday: Colorful Constellations
Who: Chabot Staff
Where: Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost: $15 Adults, $10 kids/seniors, $5 Members

People have long used stars as tools for navigation and the grouping of stars in constellations to better understand the world. With the advent of modern telescopes, we can understand more about the identity of the stars that make up the constellations. Discover how astronomers classify the stars according to size, age, color, and composition.

As stars grow, age, expand, they change into many different forms such as red giants, white dwarfs, supernovae and black holes and others. Learn more about these celestial phenomena with hands-on activities, films, art installations and presentations. Visit us on the Observation Deck for a collection of constellation stories in a new edition of **Native Skies Star Stories** and a series of presentations from the Eastbay Astronomical Society (8-9pm).

For more information, see:
https://chabotspace.org/events/events-listing/

continued on p.4

Officers

President
Ron Kane
president@trivalleystargazers.org

Vice-President
Eric Dueltgen
vice_president@trivalleystargazers.org

Treasurer
John Forrest
treasurer@trivalleystargazers.org

Secretary
David Lackey
secretary@trivalleystargazers.org

Past President
Roland Albers
past_president@trivalleystargazers.org

Volunteer Positions

Astronomical League Rep.
Don Dossa
alrep@trivalleystargazers.org

Club Star Party Coordinator
Eric Dueltgen
coordinator@trivalleystargazers.org

Del Valle Coordinator
David Wright
delvalle@trivalleystargazers.org

Historian
OPEN
historian@trivalleystargazers.org

Librarian
Ron Kane
librarian@trivalleystargazers.org

Loaner Scope Manager
Ron Kane
telescopes@trivalleystargazers.org

Newsletter
Ken Sperber (Editor)
Saanika Kulkarni (Contributing Editor)
newsletter@trivalleystargazers.org

Night Sky Network Rep.
Ross Gaunt
nnsn@trivalleystargazers.org

Observatory Director/Rebuild Chairman
Chuck Grant
observatory@trivalleystargazers.org

Observing Program Coordinator
Ron Kane
awards@trivalleystargazers.org

Outreach Coordinator
Eric Dueltgen
outreach@trivalleystargazers.org

Potluck Coordinator
OPEN
potluck@trivalleystargazers.org

Program Coordinator
Dan Helmer
programs@trivalleystargazers.org

Publicity and Fundraising
OPEN
publicity@trivalleystargazers.org

Refreshment Coordinator
OPEN

Webmaster
Swaroop Shere
webmaster@trivalleystargazers.org

Web & E-mail
www.trivalleystargazers.org
info@trivalleystargazers.org

TVS E-Group
To join the TVS e-group just send an email message to TVS at: info@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 (con't)

August 6, 2:00pm-3:00pm

What: Native Skies Star Stories
Who: Chabot Staff
Where: Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost: Included with General Admission

For thousands of years, humans have looked at the night sky with a sense of wonder and meaning. Working with the East Bay Ohlone community, a native storyteller will speak to an Indigenous East Bay understanding of the sky and land as you gaze at the stars in an outdoor setting. Listen to old-time stories, living in the hearts and minds of the Ohlone community today, and teachings that will amplify the philosophy of the Ohlone and connect with the natural world as you gain a deeper understanding of the richness of their living culture.

For more information, see:
https://chabotspace.org/events/events-listing/

August 14, 7:30pm

What: Space Weather and Human Exploration
Who: Leila Mays and Elon Olsson (NASA/GSFC)
Where: Golden Gate Park, 55 Music Concourse Drive, San Francisco
Cost: Members and Seniors $12, Guests $15

Join Leila Mays, deputy director, and Elon Olsson, software lead, from the Community Coordinated Modeling Center (CCMC) at NASA's Goddard Space Flight Center, to explore the science of space weather. Tracking eruptions and radiation from the Sun to storms rippling throughout the Solar System, they will combine beautiful visualizations of computer simulations with cutting-edge observations to reveal the latest in space weather research—including how they forecast its effect on human space exploration.

Elon Olsson will be the program's interactive "pilot," immersing attendees in powerful solar storms in the OpenSpace visualization platform on the Morrison Planetarium dome.

For more information, see: Benjamin Dean Astronomy Lecture

Pre-Recorded Talk Sponsored by SETI

What: JWST: A Cosmic Time Machine for Astrobiology
Who: Dr. Stephanie Milam and Dr. Geronimo Villanueva (NASA GSFC)
Sponsor: SETI
Online: Free, https://www.seti.org/event/seti-talks-jwst-cosmic-time-machine-astrobiology

We are thrilled to announce an upcoming panel discussion that will take you on a journey to discover the secrets of our solar system and the search for life beyond our planet. What makes this topic exciting is the recent launch of the James Webb Space Telescope (JWST), the most powerful space telescope ever built. Dr. Milam and Dr. Villanueva will share their expertise on how this groundbreaking observatory will pave the way in the search for prebiotic chemistry, signatures of biology, and potential habitable worlds.

But it doesn't stop there. Our panelists will also explore some of the most promising targets for the search for life in our solar system: from the geysers of Enceladus, a small icy moon of Saturn, to Europa, Jupiter's moon believed to have a subsurface ocean of liquid water, and even to the potential for finding life on Titan, Saturn's moon with liquid methane and ethane lakes on its surface.

This event is a rare opportunity to learn from two of the most brilliant minds in space exploration and astrobiology. They will share their insights, perspectives, and the implications of such a discovery for our understanding of the universe and our place in it.

Pre-Recorded Talk Sponsored by SETI

What: Unveiling 'Oumuamua and its Mysterious Visit to Our Solar System
Who: Dr. Olivier Hainaut (ESO) and Prof. Jennifer Bergner (UC Berkeley)
Sponsor: SETI
Online: Free, www.seti.org/event/seti-talks-unveiling-oumuamua-and-its-mysterious-visit-our-solar-system

Get ready to unravel the mysteries of 'Oumuamua, the captivating cosmic messenger that has puzzled scientists and enthusiasts alike since 2017. With a deep understanding of cosmic dynamics, Hainaut will present the latest findings and theories from scientific observations. Drawing from her work, Prof. Bergner will present a comprehensive analysis of its orbit and activity, offering valuable insights into its potential origin and nature. It could be a comet, after all.

Our panelists will exchange ideas and explore various hypotheses and interpretations surrounding 'Oumuamua's enigmatic nature through a discussion with SETI Institute Senior Astronomer **Franck Marchis**. Prepare to be captivated as they present a balanced and informative forum encompassing scientific facts, emerging theories, and thought-provoking possibilities.

Join us for this engaging event, where the scientific community and enthusiasts alike will have the opportunity to deepen their understanding of 'Oumuamua and engage in a meaningful exploration of its mysteries. Let's come together to unravel the secrets of this celestial visitor and expand our knowledge of the vast universe we inhabit.

TVS: H2O Rebuild Update

Caption: TVS Observatory Director Chuck Grant reports that on June 26, two mixer trucks hauled 12.5 cubic yards of concrete up the hill and poured it into our holes and forms. This was the third full day of work by our contractor, Awesome Concrete of Tracy, using a team of 4 to 6 workers. Top: This panorama shows, from left to right, the new lower tier observing pad, the Herb Quick Dome, the new middle tier observing pad, the new foundation and pier for the 20-inch Planewave telescope, the new slab floor for the Planewave Control Room, the new slab floor for the roll-off roof visual observatory, and the temporary storage shed. Middle Left: A close-up view of the foundation and pier base for the 20-inch Planewave telescope. Middle Right: Construction crews have now put in six full days under the summer sun. We have a nearly complete circular wall to hold the dome. (Image Credits: Chuck Grant) Bottom: In the foreground is the slab floor for the roll-off roof visual observatory, with the Planewave Control Room slab and the walls of the Planewave observatory, behind. (Image Credit Gert Gottschalk)

TVS volunteers will be needed for the assembly of the dome and telescope mount. Contact TVS Observatory Director Chuck Grant if you can assist with the construction (observatory@trivalleystargazers.org).

What's Up By Ken Sperber (adapted from S&T)

All times are Pacific Daylight Time

July

17	**Mon**	**New Moon (11:32am)**
19	Wed	Near the western horizon, the crescent Moon, Mars, Venus, and Mercury form a rhomboid (Dusk)
20	Thu	In the west, the Moon, Venus, and Mars form a triangle near Regulus (Dusk)
22	Sat	In the west, Mars, Venus, and Mercury arc around Regulus (Dusk)
24	Sun	In the WSW, the Moon and Spica, separated by ~2°, sink toward the horizon (Evening)
25	**Mon**	**First-Quarter Moon (3:07pm)**
28	Thu	In the west, Mercury and Regulus are separated ~10 arc minutes. Use binoculars for the best view (Dusk)
28	Thu	In the SSW, the Moon is ~5° left of Antares (Evening)
30	Sat	The Southern Delta Aquariid Meteor Shower peaks on Saturday morning

August

1	Tue	In the SSW, the waning gibbous Moon and Saturn are separated by ~3.5° (Morning)
1	**Tue**	**Full Moon (11:32am)**
8	**Tue**	**Last-Quarter Moon (3:28am) and Jupiter are separated by ~2° (Morning)**
9	Wed	In the East, the Moon and M45, The Pleiades, are separated by ~2° (Morning)
10	Thu	Mercury and Mars, separated by ~5°, sink low in the west after sunset (Dusk)
11	Fri	In the ENE, the Moon sits between the stars that make up the horns od Taurus, the Bull (Morning)
12-13	Sat-	The Perseid meteor shower peaks in the wee hours of the 13th. (All Night; see the August S&T, p. 48)
13	Sun	In the ENE, the crescent Moon and Castor and Pollux form a triangle (Morning)
16	**Wed**	**New Moon (2:38am)**
18	Fri	Near the western horizon, the crescent Moon and Mars are separated by 1°. Use binoculars. (Dusk)
20	Sun	In the west, the Moon is ~6° right of Spica (Dusk)
24	**Thu**	**First-Quarter Moon (2:57am)**
24	Thu	The Moon Eclipses Antares. Reemergence should be visible for AZ TVS members at ~7:55pm MST (Evening; see the August S&T, p. 49 and https://is.gd/antaresoccultation)
30	**Wed**	**Full Moon (6:36pm) and Saturn are separated by 5°**

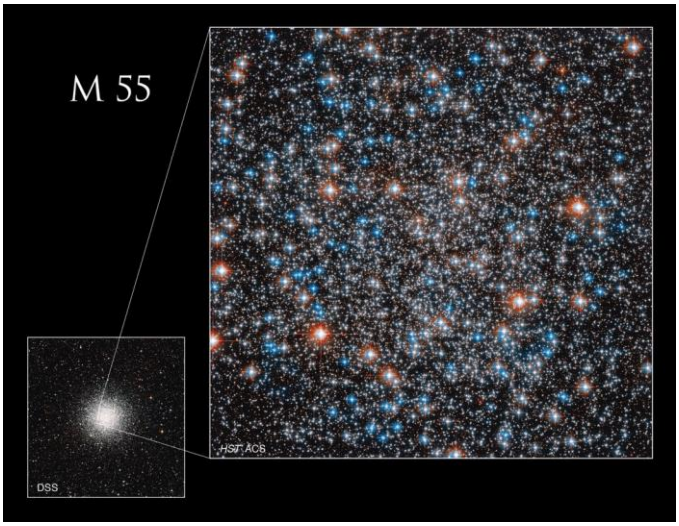
NASA Night Sky Notes

Find A Ball of Stars

By Linda Shore, Ed.D.

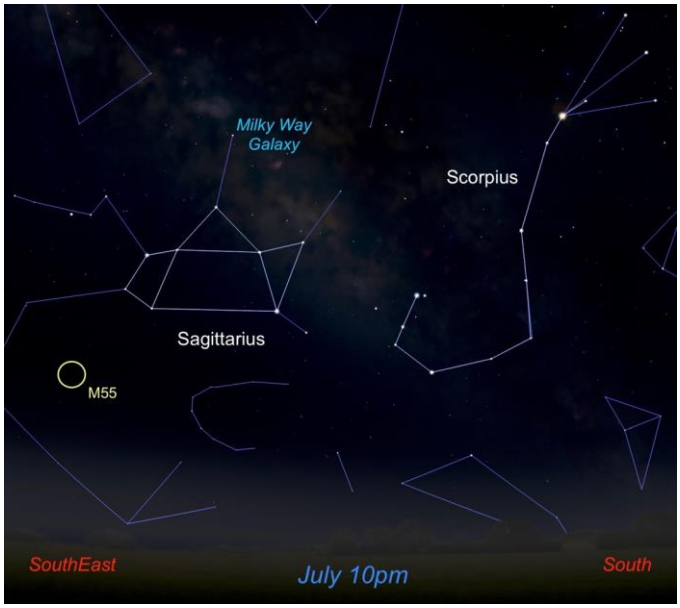
French astronomer Charles Messier cataloged over 100 fuzzy spots in the night sky in the 18th century while searching for comets – smudges that didn't move past the background stars so couldn't be comets. Too faint to be clearly seen using telescopes of the era, these objects were later identified as nebulas, distant galaxies, and star clusters as optics improved. Messier traveled the world to make his observations, assembling the descriptions and locations of all the objects he found in his *Catalog of Nebulae and Star Clusters*. Messier's work was critical to astronomers who came after him who relied on his catalog to study these little mysteries in the night sky, and not mistake them for comets.

Most easily spotted from the Southern Hemisphere, this "faint fuzzy" was first cataloged by another French astronomer, Nicholas Louis de Lacaille in 1752 from Southern Africa. After searching many years in vain through the atmospheric haze and light pollution of Paris, Charles Messier finally added it to his catalog in July of 1778. Identified as **Messier 55 (M55)**, this large, diffuse object can be hard to distinguish unless it's well above the horizon and viewed far from city lights.



Caption: The large image shows just the central portion of M55 taken by the Hubble Space Telescope. Above Earth's atmosphere, this magnificent view resolves many individual stars in this cluster. How many can you count through binoculars or a backyard telescope? Original Image and Credits: NASA, ESA, A. Sarajedini (Florida Atlantic University), and M. Libralato (STScI, ESA, JWST); Smaller image: Digital Sky Survey; Image Processing: Gladys Kober

But July is great month for getting your own glimpse of M55 – especially if you live in the southern half of the US (or south of 39°N latitude). Also known as the "Summer Rose Star," M55 will reach its highest point in northern hemisphere skies in mid-July. Looking towards the south with a pair of binoculars well after sunset, search for a dim (mag 6.3) cluster of stars below the handle of the "teapot" of the constellation Sagittarius. This loose collection of stars appears about 2/3 as large as the full Moon. A small telescope may resolve the individual stars, but M55 lacks the dense core of stars found in most globular clusters. With binoculars, let your eyes wander the "steam" coming from the teapot-shaped Sagittarius (actually the plane of the Milky Way Galaxy) to find many more nebulas and clusters.



Caption: Look to the south in July and August to see the teapot asterism of Sagittarius. Below the handle you'll see a faint smudge of M55 through binoculars. More "faint fuzzies" can be found in the steam of the Milky Way, appearing to rise up from the kettle. Credit: Image created with assistance from Stellarium: stellarium.org

As optics improved, this fuzzy patch was discovered to be a globular cluster of over 100,000 stars that formed more than 12 billion years ago, early in the history of the Universe. Located 20,000 light years from Earth, this ball of ancient stars has a diameter of 100 light years. Recently, NASA released a magnificent image of M55 from the Hubble Space Telescope, revealing just a small portion of the larger cluster. This is an image that Charles Messier could only dream of and would have marveled at! By observing high above the Earth's atmosphere, Hubble reveals stars inside the cluster impossible to resolve from ground-based telescopes. The spectacular colors in this image correspond to the surface temperatures of the stars; red stars being cooler than the white ones; white stars being cooler than the blue ones. These stars help us learn more about the early Universe. Discover even more: www.nasa.gov/feature/goddard/2023/hubble-messier-55
The Hubble Space Telescope has captured magnificent images of most of Messier's objects. Explore them all: www.nasa.gov/content/goddard/hubble-s-messier-catalog/

This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

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

Tri-Valley Stargazers Membership Application

Contact information:

Name: _____ Phone: _____

Street Address: _____

City, State, Zip: _____

Email Address: _____

Status (select one): _____ New member _____ Renewing or returning member

Membership category (select one): Membership term is for one calendar year, January through December.

_____ Student member ($10). Must be a full-time high-school or college student.

_____ Regular member ($30).

Hidden Hill Observatory Access (optional): Must be 18 or older.

_____ One-time key deposit ($20). This is a refundable deposit for a key to H2O. New key holders must first hear an orientation lecture and sign a usage agreement form before using the observing site.

_____ Annual access fee ($10). You must also be a key holder to access the site.

Donation (optional):

_____ Tax-deductible contribution to Tri-Valley Stargazers

Total enclosed: $ _____

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. TVS will not share information with anyone except as detailed in our Privacy Policy (http://www.trivalleystargazers.org/privacy.shtml).

Mail this completed form along with a check to: Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551.