

PRIMEFOCUS

Tri-Valley Stargazers



April 2019



Meeting Info

What: Reflections on Human Space Flight

Who: Dr. James Newman

When:

April 19, 2019
Doors open at 7:00 p.m.
Meeting at 7:30 p.m.
Lecture at 8:00 p.m.

Where:

Unitarian Universalist
Church in Livermore
1893 N. Vasco Road

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April Meeting

Reflections on Human Space Flight (Why Single-Planet Species Don't Survive)

By Dr. James H. Newman, Chair and Professor in the Space Systems Academic Group (SSAG) and Retired NASA Astronaut

This presentation starts with personal reminiscences about the first assembly mission for the International Space Station and the fourth repair mission to the Hubble Space Telescope. Following a brief review of a couple of Hubble's accomplishments and a short digression on the topic of the definition of intelligence, the presentation turns to the perspective needed to ensure long-term species survival.

Since October 2016, Dr. Newman has been serving as the Chair and Professor of the SSAG after finishing up almost a year as the NPS Acting Provost. Prior to that he was Professor in the SSAG, after transferring from NASA to the Department of the Navy in July 2008. From March 2006 until July 2008 he was a NASA Visiting Professor detailed to NPS from NASA Johnson Space Center (JSC). From 1985 until 2006, he worked at NASA JSC, first as an instructor, then since 1990 as an Astronaut serving on four space shuttle missions, STS-51, 69, 88, and 109. From 2003 to 2006, he served in Moscow as the Director, NASA's Human Spaceflight Program, Russia.

His teaching and research interests include the use of CubeSats and other very small satellites for focused research

of National interest. These interests include space computing, distributed ground stations, unique sensors, and the use of hands-on, laboratory projects to motivate the research and learning process. Academic productivity includes numerous technical publications, presentations, and two patents, authored with students and colleagues. Among others, his awards include the Department of the Navy Superior Civilian Service (2016), the AIAA Haley Space Flight Award (2014), Rice University Distinguished Alumni Award (2007), and NASA's Space Flight Awards (STS-51, 69, 88, 109).

Dr. Newman is a member of the American Physical Society, Sigma Xi, and an Associate Fellow of the American Institute of Astronautics and Aeronautics. He received the B.A. Degree from Dartmouth College in 1978 and the M.A. and PhD in Physics from Rice University in 1982 and 1984, respectively.



Caption: STS-51 Astronaut James Newman testing out a foot restraint in anticipation of the first Hubble Space Telescope (HST) servicing mission. He is positioned on the edge of Discovery's payload bay. Behind him is the starboard Orbital Maneuvering System. Credit: NASA

News & Notes

2019 TVS Meeting Dates

Below are the TVS meeting dates for 2019. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting.

Lecture Meeting	Board Meeting	Prime Focus Deadline
Apr. 19	Apr. 22	Mar. 29
May 17	May 20	Apr. 26
Jun. 21	Jun. 24	May 31
Jul. 19	Jul. 22	Jun. 28
Aug. 16	Aug. 19	Jul. 26
Sep. 20	Sep. 23	Aug. 30
Oct. 18	Oct. 21	Sep. 27
Nov. 15	Nov. 18	Oct. 25
Dec. 20	Dec. 23	Nov. 29

Money Matters

As of the last Treasurer's Report on 3/18/19, our club's checking account balance is \$18,794.53.

TVS Welcome to New Members

TVS would like to welcome new member, Gokul Palanisamy. Please say hello and chat with him at upcoming club meetings.

Outreach Star Parties

Wednesday, May 1: Bankhead Theater; 8:00 set-up

Sunday, May 5: Muslim Community Center, 5724 W. Las Positas Blvd., Pleasanton; 7:30 set-up

Friday, May 10: Valley Christian Elementary School; 8:00 set-up

Contact Eric Dueltgen if you are interested in participating (outreach"at"trivalleystargazers.org).

2019 Club Star Parties

Save the dates for the 2019 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 star parties are open to the public. 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.

May 25: H2O Open House, Caravan departs at 6:30pm

June 22: Tesla Vintners, set-up at 8:00pm

July 20: Tesla Vintners, set-up at 8:00pm

August 3: Del Valle (Arroyo Staging Area), set-up at 7:30pm

August 24: H2O Open House, Caravan departs at 6:00pm

September 21: Tesla Vintners, set-up at 6:30pm

October 5: Del Valle (Arroyo Staging Area), set-up at 6:00pm

2019 Barcroft High-Altitude Star Party

The Eastbay Astronomical Society has reserved the nights of Monday, July 29 - Saturday, August 3 for a star party at Barcroft High-Altitude Research Center. Barcroft is located in the White Mountains at about 12,450ft above sea level. In order to acclimatize to the high altitude it is recommended that one should spend at least one night at about 8000ft, such as a motel in Mammoth Lakes, or at Grandview Campground in the White Mountains.

Barcroft amenities include delicious hot meals, hot drinks and snacks, satellite TV, a book and video library, microwave oven, a radiotelephone, hot showers, bathrooms, and tools in case of an equipment emergency. The staff is extremely helpful. Guests are expected to help out with some light cleanup chores.

Reservations must be submitted no later than 2 weeks before the event, and a maximum of only 10-12 people can be there at any given time. The rate is \$60 per person, per night. If you want to go, contact Don Saito at donsaito@yahoo.com first, to find out what time slots are still available for reservation. Once you determine which days you'd like to attend, go to <http://eastbayastro.org/events/> and scroll down to the Barcroft section of the page, fill-out the application fields, and use the PayPal link to pay for your reservation.

CalStar Events and Golden State Star Party Registration

The CalStar Star Party will be held on September 25-28. The location is only 3 hours away at Lake San Antonio in southern Monterey County. CalStar is a loosely organized party with no registration and no structure held at the County park. Just show up and pay the camping fee and join the group of about 100 star gazers in a section of the park reserved for us. For more information see: <https://calstar.observers.org/>

The Golden Star Star Party will be held over four nights on June 29-July 2 (departure (July 3) near Aiden, CA. Early Registration online is \$60 through March 30, \$70 thereafter, or \$75 onsite. If you do not plan on spending 4 nights, registration is \$25/night. For additional fees you can feast at the BBQ's on Sunday and Monday nights, and there is a free pancake breakfast on July 2. Attendance is typically 300-400 people. For more informations see: <http://goldenstatestar-party.org/> and TVS member Curtis Macchioni's presentation on GSSP can be found at: <http://www.trivalleystargazers.org/pdfs/GSSP.pdf>

Header Image: Image of the supermassive black hole at the center of M87. The image was obtained at a wavelength of 1.3mm using Very Long Baseline Interferometry by the Event Horizon Telescope Collaboration.

Calendar of Events

April 13, 7:30pm

What: Exoplanets: The How, What & Why of Planets Around Other Stars
Who: Dr. Megan Ansdell, Postdoctoral Fellow, Center for Integrative Planetary Sciences, UC Berkeley
Where: Mt. Tamalpais State Park, Cushing Memorial Amphitheater, more commonly known as the Mountain Theater, Rock Spring parking area
Cost: Free. Registration not required, but RSVP requested: <https://www.sjaa.net/events/swap-meet/>

In the last decade, the commissioning of new observatories (both on Earth and in space) and the development of new techniques for analyzing large datasets (including the application of deep learning) have allowed dramatic advancements in our understanding of extrasolar planets. This talk will explore how exoplanets are formed, what techniques allow their discovery, and why they have been fundamental to understanding our place in the Universe.

For more information see: <http://www.friendsofmonttam.org/astronomy/schedule>

April 17, 7:00pm - 8:00pm

What: Where is the Origin of Life on Earth?
Who: Drs. David Deamer/Bruce Damer/Lynn Rothschild
Where: SRI Conference Center, 333 Ravenswood Ave., Menlo Park, CA 94205 (Enter from Middlefield Rd.)
Cost: Free, Registration Required: <https://www.eventbrite.com/e/exploring-ultima-thule-humanitys-next-frontier-tickets-56359127668>

To answer the iconic question "Are We Alone?", scientists around the world are also attempting to understand the ori-

gin of life. There are many pieces to the puzzle of how life began and many ways to put them together into a big picture. Some of the pieces are firmly established by the laws of chemistry and physics. Others are conjectures about what Earth was like four billion years ago, based on extrapolations of what we know from observing Earth today. However, there are still major gaps in our knowledge, and these are necessarily filled in by best guesses.

We invited talented scientists to discuss their different opinions about the origin of life and the site of life's origin. Most of them will agree that liquid water was necessary, but if we had a time machine and went back in time, would we find life first in a hydrothermal submarine setting in sea water or a fresh water site associated with emerging land masses?

Biologist David Deamer (UC Santa Cruz) and multi-disciplinary scientist Bruce Damer (UC Santa Cruz,) will describe their work which infers that hydrothermal pools are the most plausible site for the origin of life.

Lynn Rothschild (NASA's Ames Research Center and Adjunct Professor Brown University) will provide an evolutionary biologist's perspective on the subject.

For more information see: <http://www.seti.org/talks>, e-mail info@seti.org, or phone 650-961-6633.

April 21, Noon-3:00pm

What: San Jose Astronomical Association Spring Swap Meet
Who: Sellers
Where: Houge Park, 3972 Twilight Drive, San Jose, CA
Cost: Free

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Officers	Volunteer Positions	Night Sky Network Rep.: Ross Gaunt nnsn@trivalleystargazers.org	Refreshment Coordinator: Laurie Grefsheim
President: Roland Albers president@trivalleystargazers.org	Astronomical League Rep.: Dennis Beckley alrep@trivalleystargazers.org	Newsletter Editor: Ken Sperber newsletter@trivalleystargazers.org 925-361-7435	Webmaster: Hilary Jones webmaster@trivalleystargazers.org
Vice-President: Eric Dueltgen vice_president@trivalleystargazers.org	Club Star Party Coordinator: Eric Dueltgen coordinator@trivalleystargazers.org	Observatory Director/Key Master: Chuck Grant observatory@trivalleystargazers.org	Web & E-mail www.trivalleystargazers.org info@trivalleystargazers.org
Treasurer: David Feindel treasurer@trivalleystargazers.org	Del Valle Coordinator: David Feindel delvalle@trivalleystargazers.org	Outreach Coordinator: Eric Dueltgen outreach@trivalleystargazers.org	TVS E-Group To join the TVS e-group just send an e-mail message to the TVS e-mail address (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.
Secretary: Ron Kane secretary@trivalleystargazers.org	Historian: Hilary Jones historian@trivalleystargazers.org	Potluck Coordinator: Jill Evanko potluck@trivalleystargazers.org	
Past President: Rich Combs past_president@trivalleystargazers.org	Internat. Dark-Sky Assoc. Rep.: Aadi Duggal darksky@trivalleystargazers.org	Program Coordinator: Dan Helmer programs@trivalleystargazers.org	
	Librarian: Ron Kane librarian@trivalleystargazers.org	Publicity Coordinator: Jim Theberge publicity@trivalleystargazers.org	
	Loaner Scope Manager: Ron Kane telescopes@trivalleystargazers.org		

Calendar of Events (continued)

This very low-key, flea market-like event. You can make your underused astronomy gear available to the local astronomy community, and make a couple bucks while you're at it. If you are looking for gear, come by and see what's available. Please have your items priced ahead of time.

And finally, remember that this is a service to the local astronomy community.

Donations of 10% of sales to the SJAA are suggested.

For more information see: <https://www.sjaa.net/events/swap-meet/>

April 26, 6:00pm - 9:00pm

What: Teen Night
Who: You and your Teen(s)
Where: Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619
Cost: \$5, Free to members and current GEs

Join us at Chabot for our first ever Teen Night, created by teens for teens. Youth (ages 13-18) and their families are invited to the museum after hours to celebrate teen accomplishments in STEAM and explore involvement opportunities!

What originally started as an opportunity for our Teen Galaxy Explorers to showcase their yearly projects has evolved into a full blown, Center-wide celebration of amazing youth work in science, technology, engineering, arts, and mathematics.

Chabot welcomes teens and families on a Friday night to check out the Galaxy Explorer STEAM Project Showcase, try hands-on activities and demos, catch a Planetarium show, explore the museum, and learn about opportunities with Bay Area teen programs. This event will also feature a DJ, snack bars, and food truck.

For more information see: <https://chabot.space.org/events/events-listing/> or for more information, call (510) 336-7373.

May 6, 7:30pm

What: A Billion Stars Reveal the Milky Way as You've Never Seen It Before
Who: Jackie Faherty, Senior Scientist & Senior Education Manager, American Museum of Natural History
Where: California Academy of Sciences, 55 Music Concourse Dr., Golden Gate Park, San Francisco, CA
Cost: Advanced ticketing required. Academy members \$12, Seniors \$12, General \$15. Reserve a space online or call 1-877-227-1831.

The Gaia space telescope recently released its second catalog of over 1.3 billion stellar distances, which is helping astronomers map the Milky Way like never before. Jackie Faherty will guide you through cutting-edge visualizations of the most spectacular astronomical dataset of our time—a virtual tour of hundreds of millions of stars, highlighting the revolution-

ary scientific progress that astronomers have accomplished in the one short year since the data was released. You'll be immersed in the measured motions and distances of over a billion stars, revealing the history of our galaxy, from recent stellar flybys to long ago Milky Way mergers.

See www.calacademy.org/events/benjamin-dean-astronomy-lectures for lecture and reservation information.

Making a Commitment to Observe in 2019

By Roland Albers

The rain clouds have finally parted and it's time to dust off your observing equipment and spend some time under the stars. You can make the most out of the 2019 observing season by following these three simple steps:

1. Schedule Time to Observe

Life gets busy, especially here in the Bay Area, and observing can quickly get crowded out. The solution? Just a little planning ahead. Simply open your calendar now and reserve some time for yourself out under the night skies. The week-ends close to a new moon are always a good choice. You can find a moon phase calendar at http://www.moonconnection.com/moon_phases_calendar.phtml. The upcoming week-ends of May 4th and June 1st look promising, for example.

Of course, another great option is attending a star party. Star parties are an opportunity to observe in the company of fellow stargazers, compare views through different equipment, and share observing notes. TVS will be holding monthly star parties throughout the observing season, all at locations conveniently close to home. See the table below for the details. I hope every club member will make the time to attend at least one TVS star party this year.

If you're ready to commit to more than just an evening now and then throughout the year, you can also plan to attend a regional star party. These star parties are held under truly dark skies and span several days. For Northern California, your options include the Golden State Star Party in Adin, California from June 29th to July 3rd (registration is required, see <http://goldenstatestarparty.org/> for more info) and CalStar in Lake San Antonio from September 25th to 28th (see <http://calstar.observers.org/> for more info). Those willing to brave high altitudes can plan to visit the Barcroft High Altitude Research Station at White Mountain from July 29th to August 3rd (registration is required, see <http://eastbayastro.org/events/> for more info).

Wherever and whenever you decide to observe this year, you can make it happen by marking your calendars now.

2. Create an Observing Plan

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Making a Commitment to Observe in 2019 (continued)

You'll find your nights observing far more productive and rewarding if you're observing with a purpose. Maybe you'd like to track down a few new Messier objects or catch sight of some diminutive planetary nebulae. Or maybe you'd like to see a transit of one or more of Jupiter's moons or add another asteroid sighting to your list. Whatever you decide, plan ahead and have a list ready when you first peer through your eyepiece.

Fortunately, multiple resources are available to help with your planning. Monthly astronomy magazines, such as *Sky & Telescope*, often have one or more articles each month that include observing lists, perhaps centering on a portion of the sky or on a particular type of object. For the more ambitious, I highly recommend undertaking one of the Astronomical League's observing programs, such as the Messier program (see <https://www.astroleague.org/al/obsclubs/messier/mess.html>). All the AL programs include object lists that you can use to structure your night's observations. Another option is using an observing planning program, such as AstroPlanner (see <http://www.astroplanner.net/>). Programs such as AstroPlanner help you build observing lists by setting criteria such as your observing location, date and times, object types to observe, and magnitude limits.

3. Record Your Observations

To make the most of your time with your binoculars or telescope, spend a little time recording your observations. This simple task will help you do more than just glance at an object. You'll be truly observing it and noting detailed characteristics, such as size, shape, brightness, colors, compactness, and the surrounding field of view.

You can use something as simple as a notebook for recording your observations. If you have an artistic bent, you may wish to use an unlined notebook so that you can include some sketches with your records. And for those who like to keep a laptop or tablet handy while observing, you can use an observing planning program to also keep written observations. No matter what method you use, be sure to include the dates, times, equipment used, and sky conditions along with your observations. If you decide to work on any of the Astronomical League observing programs, they include templates for recording your observations that will help you develop these valuable observing skills.

2019 CLUB STAR PARTIES

Saturday	Location	Set-up	Sunset	Moon	Notes
4/13/19	Del Valle	7:30 PM	7:40 PM	1Q+1 s3:52AM	8:00 PM start
5/25/19	H2O Open House	6:30 PM	8:17 PM	3Q-1 r1:58AM	
6/22/19	Tesla Vintners	8:00 PM	8:32 PM	3Q-3 r12:29AM	
7/20/19	Tesla Vintners	8:00 PM	8:25 PM	Full+4 r10:59PM	Moon landing
8/03/19	Del Valle	7:30 PM	8:13 PM	New+3 s10:59PM	8:30 PM start
8/24/19	H2O Open House	6:00 PM	7:47 PM	3Q+1 r1:14AM	
9/21/19	Tesla Vintners	6:30 PM	7:05 PM	3Q r11:56PM	
10/5/19	Del Valle	6:00 PM	6:44 PM	1Q s12:18AM	7:00 PM start

- Notes:
 - Del Valle star parties are also public outreach events
 - Jointly hosted with EBRPD and held at the Arroyo Staging Area
 - Public invited for the first 1.5 to 2 hours, club members can stay remainder of night
 - Tesla Vintners star parties open to only club members and guests
 - Star parties end at midnight but participants can leave earlier
 - H2O Open House star parties open to the public
 - Open Houses end at midnight and all are strongly encouraged to stay the duration

What's Up By Ken Sperber (adapted from S&T and The Year in Space)

All times are Pacific Daylight Time

April

- 12 Fri **First-Quarter Moon (11:06am)**
- 13 Sat The Moon is about 2° from M44, the Beehive Cluster (Evening)
- 14 Sun The Moon is about 5° from Regulus in Leo (Evening)
- 19 Fri **Full Moon (2:12am)**
- 22 Mon The Lyrid Meteor shower peaks on the morning and evening of the 22nd. The bright Moon interferes.
- 23 Tue The Moon, Jupiter, and 51 Ophiuchus, rising at midnight, form a tight triangle
- 25 Thu The Moon and Saturn are about 3° apart (Morning)
- 26 Fri **Last-Quarter Moon (1:18pm)**

May

- 2 Thu Venus and the crescent Moon rise in the east, less than 5° apart (Dawn)
- 4 Sat **New Moon (2:46pm)**
- 6 Mon Eta Aquariid meteor shower, debris from Comet Halley, peaks this morning
- 6 Mon The crescent Moon is about 3° to the upper-right of Aldebaran (Evening)
- 7 Tue The crescent Moon is about 0.5° from Zeta Tauri and about 4° from Mars (Evening)
- 10 Fri The Moon is near the Beehive Cluster (M44) in Cancer (Evening)
- 11 Sat **First-Quarter Moon is located near Regulus (5:12pm)**
- 15 Wed The Moon is about 8° above Spica (Dusk)
- 18 Sat **Full Moon (2:11pm)**
- 19 Sun The Moon forms a triangle with Jupiter and Antares (All night)
- 20- Mon- On the 20th the Moon is about 5° right of Jupiter. Over the next 3 mornings the Moon approaches and overtakes Saturn, ending about 5° left of Saturn
- 26 Sun **Last-Quarter Moon (8:34am)**
- 28 Tue Asteroid 1 Ceres at opposition. Visible in binoculars on the border of Scorpius and Ophiuchus

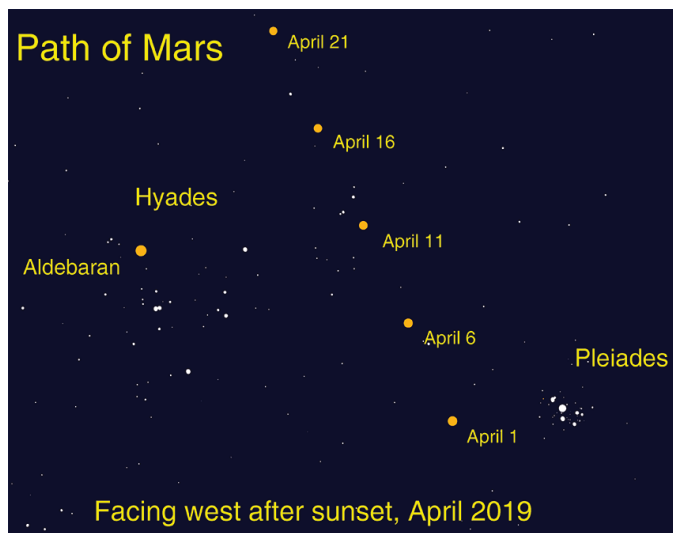
NASA Night Sky Notes

Mars the Wanderer

By David Prosper

April's skies find Mars traveling between star clusters after sunset, and a great gathering of planets just before sunrise.

Mars shows stargazers exactly what the term "planet" originally meant with its rapid movement across the evening sky this month. The ancient Greeks used the term planets, meaning wanderer, to label the bright star-like objects that travelled between the constellations of the zodiac year after year.



Caption: The path of Mars between the Pleiades and Hyades in April. Image created with assistance from Stellarium.

You can watch Mars as it wanders through the sky throughout April, visible in the west for several hours after sunset. Mars travels past two of the most famous star clusters in our night sky: the Pleiades and Hyades. Look for the red planet next to the tiny but bright Pleiades on April 1st. By the second week in April, it has moved eastward in Taurus towards the larger V-shaped Hyades. Red Mars appears to the right of the slightly brighter red-orange star Aldebaran on April 11th. We see only the brightest stars in these clusters with our unaided eyes; how many additional stars can you observe through binoculars?

Open clusters are made up of young stars born from the same "star nursery" of gas and dust. These two open clusters are roughly similar in size. The Pleiades appears much smaller as they are 444 light years away, roughly 3 times the distance of the Hyades, at 151 light years distant. Aldebaran is in the

same line of sight as the Hyades, but is actually not a member of the cluster; it actually shines just 65 light years away! By comparison, Mars is practically next door to us, this month just a mere 18 light minutes from Earth - that's about almost 200 million miles. Think of the difference between how long it takes the light to travel from these bodies: 18 minutes vs. 65 years!

The rest of the bright planets rise before dawn, in a loose lineup starting from just above the eastern horizon to high above the south: Mercury, Venus, Saturn, and Jupiter. Watch this month as the apparent gap widens considerably between the gas giants and terrestrial planets. Mercury hugs the horizon all month, with Venus racing down morning after morning to join its dimmer inner solar system companion right before sunrise. In contrast, the giants Jupiter and Saturn move away from the horizon and rise earlier all month long, with Jupiter rising before midnight by the end of April.

The Lyrids meteor shower peaks on April 22nd, but sadly all but the brightest meteors will be washed out by the light of a bright gibbous Moon.

You can catch up on all of NASA's current and future missions at nasa.gov

This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, stargazing info 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 (\$5). Must be a full-time high-school or college student.

Regular member (\$30).

Patron member (\$100). Patron membership grants use of the club's 17.5" reflector at H2O. You must be a member in good standing for at least one year, hold a key to H2O, and receive board approval.

Hidden Hill Observatory Access (optional):

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 (www.trivalleystargazers.org/privacy.shtml).

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