

PRIMEFOCUS

Tri-Valley Stargazers



October 2018



Meeting Info

What: The Basics of Astrophotography: Part III

Who: Gert Gottschalk

When:

October 19, 2018
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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October Meeting

The Basics of Astrophotography, Part III: USB Camera Planetary, Solar, and Lunar Imaging

Gert Gottschalk

The presentation will give an introduction to USB camera based planetary, solar, and lunar imaging. Amateurs realized the potential of digital video astronomy for 'Lucky Imaging' when the first simple PC webcams entered the consumer market. Quickly an ecosystem evolved, many individuals contributed and turned the devices made for web video chats into astronomical cameras. What followed was amazing software development, also by amateurs, and free for all who turned video clips into high quality planetary images. We are going to learn how the technology evolved into using industrial computer vision cameras and now dedicated high end cameras made for astronomy. The presentation will show how we as amateurs can produce planetary, lunar, and solar images and time lapse animations of astounding quality.



Saturn 2018-09-04 03:56UT, CDK12 2.5x Barlow, ASI120MC, 20%/3kFrames, FC2.6/ASI3/RS6/PS-CS2, (c) Gert Gottschalk

Gert Gottschalk received his masters in physics and PhD in electrical engineering from the Technical University in Berlin, Germany. He is now in an engineering position in the tech industry in Silicon Valley. He joined an astronomy club in 1978 and is active in telescope making, observing, and imaging. He has been a TVS member since 1998.

News & Notes

2018 and 2019 TVS Meeting Dates

Below are the TVS meeting dates for 2018 and 2019. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting (except December*).

Lecture Meeting	Board Meeting	Prime Focus Deadline
Oct. 19	Oct. 22	
Nov. 16	Nov. 19	Oct. 26
Dec. 21	Dec. 17*	Nov. 30
Jan. 18	Jan. 22	Dec. 28
Feb. 15	Feb. 18	Jan. 25
Mar. 15	Mar. 18	Feb. 22
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 09/24/18, our club's checking account balance is \$15,893.20.

TVS Welcome to New Members

TVS would like to welcome new members Don Fraser, Moe Yassine, Sanjay Virkar, James Hawthorne, and Paul Schaich. Please say hello and chat with them at upcoming club meetings.

Club membership has reached 152 members, the largest since 1999! Now is a great time to become part of TVS. Normally our memberships are only good for the current calendar year, but anyone joining after October 1st will be given a membership for the remainder of 2018 and all of 2019. And for our current members, our dues for next year will not change. A regular membership will continue to be only \$30.

Outreach Star Parties

Tuesday, 10/16/18: Outreach party at John Green Elementary School, 3300 Antone Way, Dublin; 6:30pm

Saturday, 10/18/18: Outreach party at Livermore Library, 1188 S. Livermore Ave, 6:30pm

Saturday 11/10/18: Outreach party at Del Valle Arroyo Road staging area; 5:30pm

Please contact Eric Dueltgen for further information about the Outreach Star Parties

2019 RASC Handbooks and Calendars

In the past, the club has taken pre-orders for the Royal Astronomical Society of Canada's (RASC) annual Observer's Handbook and Observer's Calendar. We've purchased them in volume at a discount and passed the savings on to club members. Unfortunately, this club benefit has become increasingly difficult to administer, particularly distributing the materials after they arrive. So, we will no longer be offering this service. But have no fear! The Astronomical League is now offering the same benefit. If you'd like to purchase any 2019 RASC materials, please go to <https://store.astroleague.org> where you can still purchase them at a significant discount. Plus your RASC publications will be shipped directly to your home! For more information, go to the above website or refer to page 11 in the September issue of Reflector magazine.

Hidden Hill Observatory: Major Upgrades

Hidden Hill Observatory (H2O), the TVS dark sky observing site, is undergoing major upgrades thanks in part to a generous donation of an Astro-Physics 1200GTO mount and a Celestron 14-inch Schmidt-Cassegrain Telescope from the Eastbay Astronomical Society (EAS). The AP mount was donated to EAS by Nancy Finley in memory of Otis Finley and the C-14 was donated by John Westfall, both former EAS members. These items were offered subject to the requirement that they be used for outreach and education. In July, Gert Gottschalk presented to EAS the TVS proposal for use of these items. This winning proposal emphasized the extensive educational public outreach of TVS and the use of the equipment for upgrading the Marling Telescope at H2O. These additions will enable the training of patron members to facilitate outreach and improve H2O Open House capabilities. The proposal also included a time line and expense details of the H2O upgrades, which in addition includes construction of a new telescope tube that TVS President Rich Combs is overseeing. While the Marling telescope is being rebuilt the C-14 scope will be used. The image of the Moon on p.3 was taken by Gert Gottschalk using the C-14.

The A-P 1200GTO mount, capable of holding about 140 pounds of equipment (not including counterweights), will replace the existing 1970's era mount. It will provide goto capability with an extensive onboard library of deep-sky objects, as well as the ability to connect your own computer to drive the mount. With its renowned reputation for small periodic error, the mount will enable high-quality guided astroimaging. The mount did however require service, including replacement of the DEC servo motor and electronics, upgrade of the DEC + RA with new electrostatic surge protection circuit boards, upgrade of the controller box to the latest firmware, and an upgraded azimuth adjustment

Header Image: The October 7, 2018 launch of a SpaceX Falcon 9 carrying the SAOCOM-1A satellite produced a fantastic exhaust plume that was visible in sunlight passing through the upper atmosphere. Image Credit: Ken Sperber

block. The good-as-new mount should be back in the hands of TVS by the time of our October meeting!



Image Processing By Andy Coutant

While going out in the field to take deep-sky images requires many technical skills, as Ken and I discussed at last months TVS meeting, the art of image processing can be even more time consuming and challenging. Know right now that ‘You take better pictures than you think!’ Three years ago I sent my first image of M51 to TVS member Hilary Jones, an accomplished astro-imager (<http://www.darklights.org/gallery/>). My image showed the galaxy, but just in white with a little yellow near the middle. Hilary, with his advanced processing skill, was able to tease out much better color and detail, blues, magentas, etc... It was then I realized I had a ton to learn about processing. I continue to learn and become more efficient everyday. On page 4 see an image of the Heart

Nebula that I processed with a new work flow. This results in an improved image that is more 3-dimensional and has less over-stretching of the stars. The processing procedure I used is as follows:

Pixinsight

1. Subframe selector to weed out the worst subs
- a. Stacked 59 subframes of 124 seconds each
2. Dynamic crop – to cut out the worst of the corners before DBE
3. Dynamic Background Extraction (DBE) – subtraction
4. Photometric Color Calibration – this does background neutralization at the same time as color
5. Star mask – to isolate stars for reduction
6. Morphological tool to reduce stars x 2
7. Then clone
8. Then run Morphological transformation tool on cloned version until stars are as small as possible
9. Then Run HDR on starless clone
10. Use Histogram transformation tool to bring up the two images to about 80% of your desired brightness
11. If applicable run Dark structure enhancement script
12. Save both master and clone as tiffs

Photoshop

continued on p. 4

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

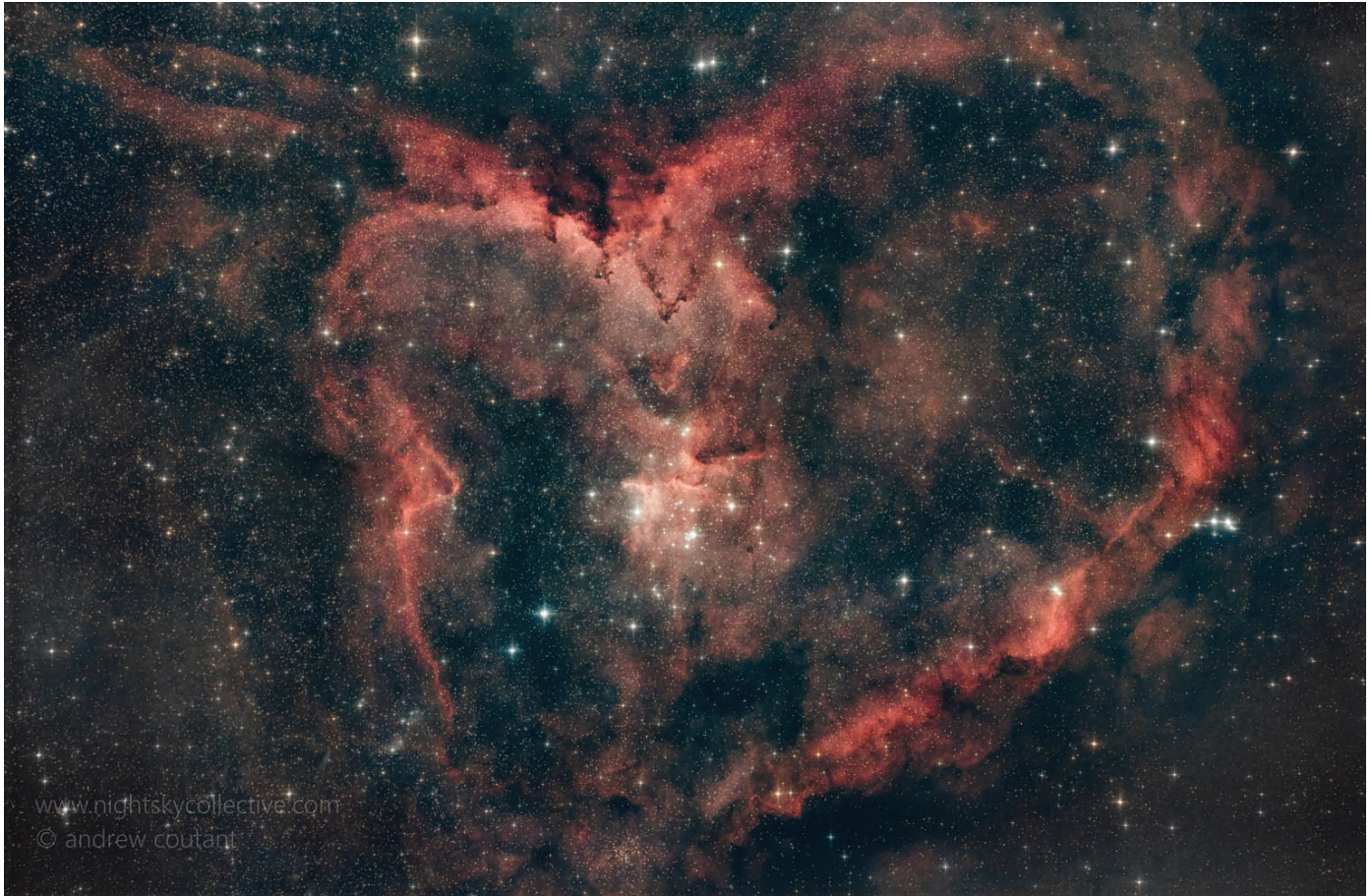


Image Caption: Andy Coutant imaged the Heart Nebula, IC1805, from Old Station, California. He used his Celestron CGX EdgeHD 11 and Hyperstar with a Canon T3i full spectrum modified camera and an Orion Sky Glow imaging filter.

13. Open both master and clone tiffs as layers in Photoshop
14. Duplicate starless cloned HDR layer = clone 2
15. Working on the clone 2 layer use the spot healing tool to remove any stubborn stars that you could not reduce with the Morphological transformation tool
16. Then run dust and scratches on that layer to kill any small artifacts
17. Then run a slight Gaussian blur to smooth it out
18. Now you have 3 layers
 - a. A HDR clone with reduced stars that you further worked with spot healing dust and scratches and G blur
 - b. A HDR clone with reduced stars
 - c. An original master with slightly reduced stars
 - d. *** In Photoshop they should be in this order from top to bottom
19. Working on just top layer (a) run a highpass filter adjusted to your choosing between 400-850 (better to be around 7-850 on this layer). Once run set the layer type to "soft light"
20. Working on the next layer down (b) run a highpass filter of your choosing between 400-850 (better to be around 475 on this layer) as it will bring out different detail from your top (a) layer giving more depth to your image. Then set this layer type also to soft light
21. At this stage you might find your total image is a bit bright so you can play with opacity sliders on the top two layers to bring out detail you want more and the get the brightness at the intensity you desire
22. Once you like your results, flatten the image and save as a jpeg and send to Ken for the newsletter

Calendar of Events

October 16, 7pm-8pm

What: Changing the Face of Space Exploration

Who: Dr. Jan Millsapps and Brian Patrick Green, and Margaret Race

continued on p.5

TVS Outreach: Livermore Airport Open House



Image Caption: Eric Dueltgen and K. Ross Gaunt spearheaded a group of TVS members who provided educational outreach at the October 6 Livermore Airport Open House. The public was treated to Hydrogen-alpha and whitelight views of the Sun with club members responding to all questions astronomical. Image Credit: Jennifer Siders.

Where: SRI Conference Center, 333 Ravenswood Ave.,
Menlo Park, CA 94205 (Enter from Middlefield Rd.)
Cost: Free, See the website to register

As humans prepare to venture once more into deep space, there is a clear need for creating new models for space exploration and expanding the roles for those who travel in space and eventually settle on other worlds and for those on the ground whose work ensures their success.

In our first space era, astronaut heroes thrilled us with their daring exploits in the high-flying rocket-ships they rode all the way to the moon and back. Women were not invited to go along, but many were integral to the effort, an invisible space community that we're just beginning to value and recognize, a revised and more comprehensive history that includes Hidden Figures, Rocket Girls, the Mercury 13, and more.

It's been six decades since we first left Earth. The heyday of the space cowboy has come and gone, and the face of space exploration is overdue for a makeover.

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

October 27, 7:30pm-9:00pm

What: Black Holier Than Thou
Who: Dr. Martin Gaskell, UC Santa Cruz
Where: Houge Park, 3872 Twilight Dr., San Jopse, CA
Cost: Free

I will explain how supermassive black holes are the root cause of a wide range of phenomena seen in galaxies and I will point out examples of these things that you can see with your own telescope.

For more information see: <https://www.meetup.com/SJ-Astronomy/events/254769234/>

November 2, 6:00pm-7:45pm

What: First Friday: Exploring the Solar System
Who: Jeff Kirschner, Founder of Litterati App.
Where: Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619
Cost: \$5 Admission begins at 6pm, Book Online

Each \$5 First Friday at Chabot is an exciting and immersive experience for all ages! Join us each month for hands-on activities and live demonstrations that are fun for the whole family.

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

All times are Pacific Daylight Time until 2am November 4, when Pacific Standard Time begins

October

- 16 Tue First-Quarter Moon (11:02am)
- 17 Wed Algol at minimum brightness for 2 hours centered on 10:50pm PDT
- 17- Wed- On the 17th (18th) the Moon is about 6^o right (left) of Mars (Evening)
- 20 Sat Algol at minimum brightness for 2 hours centered on 7:39pm PDT
- 20- Sat- The Orionid Meteor shower is visible from the 20-22, peaking on the afternoon of the 21st. It is best viewed in the early morning.
- 24 Wed Full Moon (9:45am)
- 26 Fri The Hyades cradles the waning gibbous Moon until sunrise
- 31 Wed Last-Quarter Moon (9:40am)

November

- 3-6 Sat- Mars passes Delta Capricorni over 4 nights, less than 0.5^o away on the 4th (Evening)
- 4 Sun Daylight Savings Time ends at 2am
- 7 Wed New Moon (8:02am)
- 11 Sun Saturn and the crescent Moon are about 3^o apart (Dusk)
- 14 Wed Venus and Spica separated by 1^o in the southeast (Dawn)
- 15 Thu First-Quarter Moon (6:54am) is 3^o to the lower-right of Mars (Evening)
- 17- Sat- The weak Leonid Meteor Shower (Evening of the 17th to the morning of the 18th)
- 22 Thu Full Moon (9:39pm)

Calendar of Events (continued)

Each month there will be new things to explore!

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

November 5, 7:30pm

- What: Light of the Stars: Alien Worlds and the Fate of the Earth
- Who: Adam Frank, University of Rochester
- 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.

Our Earth is just one of ten billion trillion planets in the Universe. Using the latest science, in this talk we'll see that we're likely not the first time a technological civilization has emerged from planetary evolution. More important, all those

other worlds and other possibilities have a lesson to teach us. Beginning with a revolutionary new understanding of life and planets gained through the field called "astrobiology," we see that how civilization formed on any planet is likely to have triggered its own version of climate change.

This "astrobiological" vantage point changes everything. Instead of seeing humanity as a greedy plague on the planet, in light of the stars, we become a kind of cosmic teenager. In this talk, we'll use the stories of scientists, famous and unknown, to explore new science like the discovery of distant planets, the exploration of the worlds of our solar system, and the un-packing of Earth's four billion-year history. Together they'll show us a new story of humanity's true coming of age in the Cosmos. It's a grand story of challenge, risk and hope, and fascinating science.

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

Observe the Moon

By Jane Houston Jones and
Jessica Stoller-Conrad

This year's International Observe the Moon Night is on Oct. 20. Look for astronomy clubs and science centers in your area inviting you to view the Moon at their star parties that evening!



On Oct. 20, the 11-day-old waxing gibbous Moon will rise in the late afternoon and set before dawn. Sunlight will reveal most of the lunar surface and the Moon will be visible all night long. You can observe the Moon's features whether you're observing with the unaided eye, through binoculars or through a telescope.

Here are a few of the Moon's features you might spot on the evening of October 20:

Sinus Iridum—Latin for “Bay of Rainbows”—is the little half circle visible on the western side of the Moon near the lunar terminator—the line between light and dark. Another feature, the Jura Mountains, ring the Moon's western edge. You can see them catch the morning Sun.

Just south of the Sinus Iridum you can see a large, flat plain called the Mare Imbrium. This feature is called a mare—Latin for “sea”—because early astronomers mistook it for a sea on Moon's surface. Because the Moon will be approaching full, the large craters Copernicus and Tycho will also take center stage.

Copernicus is 58 miles (93 kilometers) across. Although its impact crater rays—seen as lines leading out from the crater—will be much more visible at Full Moon, you will still be able to see them on October 20. Tycho, on the other hand, lies in a field of craters near the southern edge of the visible surface of the Moon. At 53 miles (85 kilometers) across, it's a little smaller than Copernicus. However, its massive ray system spans more than 932 miles (1500 kilometers)! And if you're very observant on the 20th, you'll be able to check off all six of the Apollo lunar landing site locations, too!

In addition to the Moon, we'll be able to observe two meteor showers this month: the Orionids and the Southern Taurids. Although both will have low rates of meteors, they'll be visible in the same part of the sky.

The Orionids peak on Oct. 21, but they are active from Oct. 16 to Oct. 30. Start looking at about 10 p.m. and you can continue to look until 5 a.m. With the bright moonlight you may see only five to 10 swift and faint Orionids per hour.

If you see a slow, bright meteor, that's from the Taurid meteor shower. The Taurids radiate from the nearby constellation Taurus, the Bull. Taurids are active from Sept. 10 through Nov. 20, so you may see both a slow Taurid and a fast Orionid piercing your sky this month. You'll be lucky to see five Taurids per hour on the peak night of Oct. 10.

You can also still catch the great lineup of bright planets in October, with Jupiter, Saturn and Mars lining up with the Moon again this month. And early birds can even catch Venus just before dawn!

You can find out more about International Observe the Moon Night at <https://moon.nasa.gov/observe>.

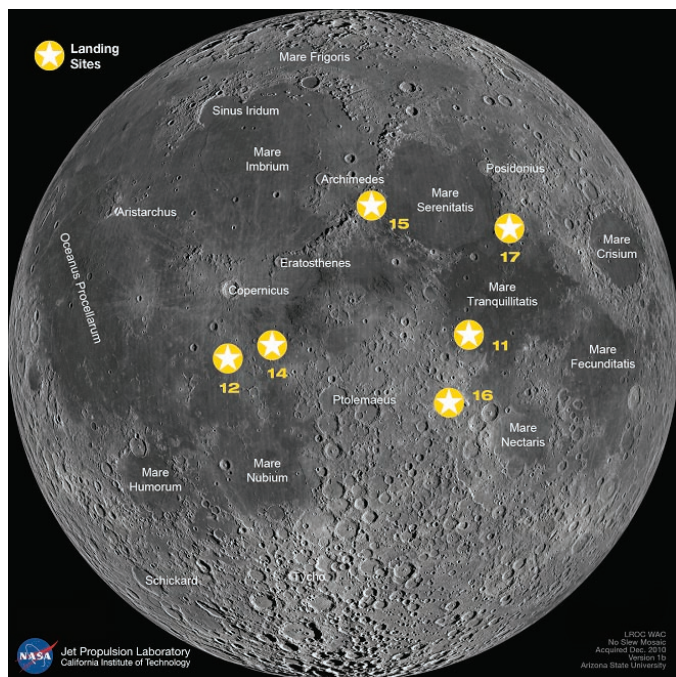


Image Caption: This image shows some of the features you might see if you closely observe the Moon. The stars represent the six Apollo landing sites on the Moon. Credit: NASA/GSFC/Arizona State University (modified by NASA/JPL-Caltech)



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.