

# PRIMEFOCUS

Tri-Valley Stargazers



April 2017



## Meeting Info

### What:

**Charles Messier, and Planning a Messier Marathon**

### Who:

**Don Machholz**

### When:

April 21, 2017  
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

### Charles Messier, and Planning a Messier Marathon Don Machholz

Famed comet discoverer, and lifetime TVS member, Don Machholz will give a presentation on Charles Messier, his comets, the missing Messier Objects, the idea behind the Marathon, and how to run a Messier Marathon. Then, in the course of about 15 minutes, we will go through the Marathon, object by object, all 110!

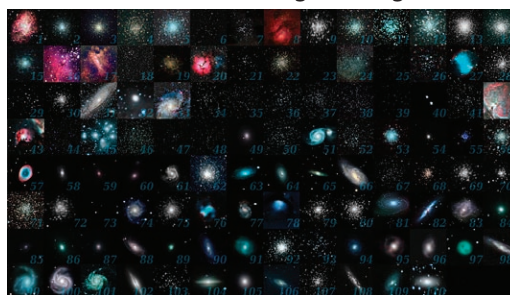


Image Caption: Images of all 110 Messier objects taken by Michael A. Phillips. Creative Commons Attribution 4.0. See: <http://astromaphilli14.blogspot.com.br/p/m.html>

In 1965 Don Machholz received his first telescope for his 13th birthday. In 1968-69 he found all of the Messier Objects using a 6-inch Criterion Dynascope. In 1978 he helped to develop the Messier Marathon, and he has conducted more than 50 in the past 39 years. Since 2002 he has been finding all of the Messier objects from memory, using no charts or setting circles. Don has written a book covering the Messier Marathon, based on his years of helping to develop and run Messier Marathons. It was revised and published in 2002 by Cambridge University Press.

In 1975, Don began a life-long passion: visual comet hunting. He found his first comet on Sept. 12, 1978, after 1700 hours of searching. His second find took an additional 1742 hours. Since 1993 he has been comet hunting from his home in Colfax, CA, using an 18.5-inch reflector and homemade binoculars. He has now spent 8000 hours of comet hunting during which he has visually discovered a total of 11 comets, which bear his name. He is presently the number one living visual comet discoverer in the world. From 1978 until 2000 he wrote a monthly column called "Comet Comments," designed for astronomy club newsletters and interested individuals. Between 1988 and 2000 he was the Comets Recorder for the Association of Lunar and Planetary Observers. His publication, "A Decade of Comets", is a study of the visual comet discoveries between 1975 and 1984, and in 1996 he published a book on Comet Hale-Bopp. Don is an avid participant in public outreach, sharing his hobby with others in Colfax, Auburn, and the Sierras. He conducts astronomy classes at Sierra College and the Placer Nature Center, and authors articles for local newspapers and radio stations.

For more information on Don, see his website: <http://thecomethunter.com/index.html>, where you can download a copy of his book "A Decade of Comets."

## News & Notes

### 2017 TVS Meeting Dates

The following lists the TVS meeting dates for 2017. 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. 21	Apr. 24	
May 19	May 22	Apr. 28
Jun. 16	Jun. 19	May 26
Jul. 21	Jul. 24	Jun. 30
August: No General Meeting or Board Meeting		
Sep. 15	Sep. 18	Aug. 25
Oct. 20	Oct. 23	Sep. 29
Nov. 17	Nov. 20	Oct. 27
Dec. 15	Dec. 18	Nov. 24

### Money Matters

As of the last Treasurer's Report on 3/20/17, our club's checking account balance is \$14,962.65.

### Outreach Star Parties: Request for Assistance

Eric Dueltgen is looking for volunteers to bring telescopes and/or binoculars to the following Outreach Star Party:

Saturday, May 6: Girl Scouts, Tracy

### Club Star Parties: 2017 Spring/Summer/Autumn

The following club star parties have been approved by the TVS Board:

April 29: Tesla Winery star party

May 20: H2O Open House

June 17: Tesla Winery star party - (Saturn Opposition)

July 15: H2O Open House

July 22: Tesla Winery star party

August 25 – 27: Yosemite/Glacier Point weekend

September 23: Tesla Winery star party

October 21: Tesla Winery star party (Orionids Meteors).

## Calendar of Events

### Present - August 31, 10:00am-5:00pm, Wednesday-Sunday

What: California's First Philanthropist: The Legacy of James Lick

Who: Prof. Alex Filippenko, UC Berkeley

Where: Pioneer Hall at the Presidio, 101 Montgomery, Suite 150, Presidio of San Francisco, 94129

Cost: Free

James Lick used his wealth to establish charitable organizations to address the basic needs of the many who were less fortunate. He willed his entire fortune to benefit the people of California. In addition to endowing existing service organizations, including homes for the elderly, schools for orphans, and The Society for the Prevention of Cruelty to Animals, Lick allocated \$700,000 to build "a telescope superior to and more powerful than any telescope yet made" on Mount Hamilton. Other beneficiaries included the California Academy of Sciences, The Mechanics Library, landmarks in Golden Gate Park, as well as The California School for Mechanical Arts, the first to enroll young women interested in studying industrial design and manufacturing. This exhibition considers the legacy of James Lick, and features images by Isaiah West Taber, who documented many of the projects Lick funded, including The Lick Observatory and The Academy of Sciences.

For more information see: <http://www.californiapioneers.org/museum/today-in-the-museum/>

### April 22, 5:30pm-

What: Spaceball – An Out of this World Gala!

Who: In conjunction with The SETI Institute and Comic Con 2017

Where: Hilton San Jose Convention Center, 300 South Almaden Blvd., San Jose, CA

Cost: \$150 Individual Ticket, \$200 with Comic Con Package, \$300 VIP Package, ...

The SETI Institute will be holding its inaugural gala fundraiser: "Spaceball – An Out of this World Gala!" in conjunction with the Silicon Valley Comic Con 2017, on Saturday, April 22nd, at the Hilton at the San Jose Convention Center. The theme of this year's Silicon Valley Comic Con is "THE FUTURE OF HUMANITY: WHERE WILL WE BE IN 2075?" In partnership with NASA, SVCC17 will feature a Space Exploration Zone with interactive displays, spaceship models, and educational exhibits. The SETI Institute will host a booth in the Space Exploration Zone as well as participate in two panel discussions.

The SpaceBall will feature a cocktail hour with live Theremin music by Project: Pimento, "Ignite Space," talks by SETI scientists, a cocktail buffet, a live auction, and many fun and interactive surprises.

More information and tickets are available at [www.seti.org/spaceball](http://www.seti.org/spaceball)

### April 29, 8:30pm

What: The American Total Solar Eclipse of August 2017

Who: Prof. Alex Filippenko, UC Berkeley

Header Image: Comet Hale-Bopp as imaged by E. Kolmhofer, H. Raab; Johannes-Kepler-Observatory, Linz, Austria (<http://www.sternwarte.at>). This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license.

## Calendar of Events (continued)

**Where:** Mt. Tamalpais State Park, Cushing Memorial Amphitheater, more commonly known as the Mountain Theater, Rock Spring parking area  
**Cost:** Free

A total solar eclipse is one of nature's most magnificent spectacles. On August 21, 2017, for the first time in 38 years, the very narrow path of a total solar eclipse falls across the continental US. Come learn about total solar eclipses and how to view this one!

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

### May 1, 7:30pm

**What:** The Great American Eclipse  
**Who:** Dr. Laura Peticolas, UC Berkeley  
**Where:** California Academy of Science, 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.

For the first time since 1918, there will be a total solar eclipse crossing the United States from the Pacific to the Atlantic on August 21, 2017. This astronomical event will bring people from around the world to the United States to experience and to perform scientific research, while also creating a motivation for communities throughout the U.S. to understand simple orbital dynamics, the dynamic Sun as a star, and the practices of astronomical research. Since 2011, a team of solar scientists, eclipse chasers, educators, outreach professionals, and filmmakers have been working toward a dream of gathering images from—and ultimately for—the public during the

2017 eclipse across the United States. The goal of this project is to collect these images for use by the public, including scientists, to create an "Eclipse Megamovie" of the corona from images taken from Oregon to South Carolina. An archive of all the images will be used for research on the Sun's corona as well as science education, art, and videos—all to enhance the experience of the eclipse. Dr. Peticolas will provide an overview of the upcoming 2017 total solar eclipse, describe some potential scientific research that will result during this eclipse, and invite members of the audience to participate in gathering images for the Eclipse Megamovie by becoming volunteers.

See [www.calacademy.org/events/benjamin-dean-astronomy-lectures](http://www.calacademy.org/events/benjamin-dean-astronomy-lectures) for lecture and reservation information.

### May 6, 11:00am - 4:00pm

**What:** Galaxy Explorers & Champions of Science Open House  
**Who:** Chabot Exhibit  
**Where:** Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619  
**Cost:** Chabot Admission \$18 Adults, \$14 Youth, \$15 Seniors, Free for Members

Our incredible Galaxy Explorer teen volunteers are learning and teaching science all year long. Join us for a showcase of this year's accomplishments from teen led science demonstrations to planetarium shows.

See <http://www.chabot.space.org/exhibits.htm> for more information, or call (510) 336-7373.

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#### Officers

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#### Volunteer Positions

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**Refreshment Coordinator:**  
 Laurie Grefsheim

**Webmaster:**  
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#### Web & E-mail

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[info@trivalleystargazers.org](mailto:info@trivalleystargazers.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 ([info@trivalleystargazers.org](mailto: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.

## Club Member Photos: Thin is In



**Venus 2017-03-25 19:03UT, 130mm F6.5 APO, 3x Barlow, ASI120MC 10%/4000Frames, AS!2, RS6, PS-CS2, (c) Gert Gottschalk**

Image Caption: Gert Gottschalk took this image of Venus on March 25, 2017, as Venus passed through Inferior Conjunction. At Inferior Conjunction the planet is passing between the Earth and the Sun. Venus was located about 8 degrees north of the Sun.



Image Caption: Ken Sperber stacked multiple images to create this view of the setting of the 24-hour old crescent Moon that occurred on March 28. The first image in the stacked sequence was taken at 7:58pm PDT at ISO-8000, 1/500 sec. The last image was taken at 8:10pm PDT at ISO-12800, 1/60 sec. Ken used used a Canon 6D, with a Tamron 150-600mm lens set at 600mm, f/6.3. Ken and Karen were also able to see the 1% illuminated Moon with their unaided eyes.

## Club Member Photos: Jupiter and the Galilean Moons



Image Caption: Andy Coutant took this image of Jupiter and the four Galilean moons on March 18, 2017. Europa, Io, and Ganymede are to the left of Jupiter, and Callisto is to the right. He used a Celestron CGX edgeHD 11, stacking 550 frames from a Celestron Neximage Burst Camera.

## Jupiter Double Shadow Transit Graphic: May 25

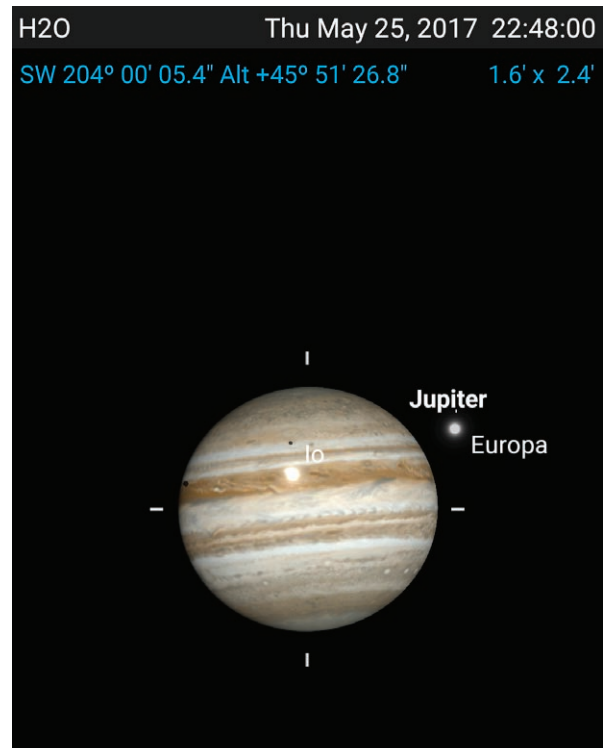
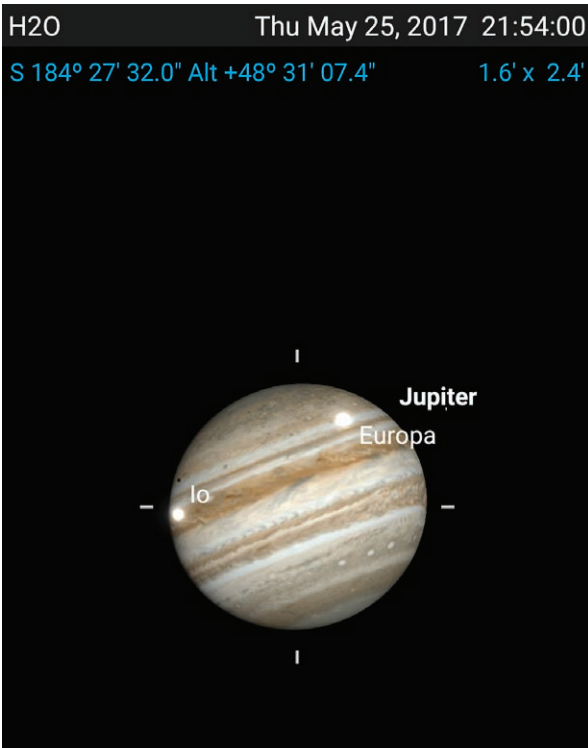


Image Caption: Two double shadow transits of Europa and Io are visible in May. The best opportunity is on May 25 when the Europa shadow transit begins about 9:54pm (left) and the Io shadow transit begins at 10:48pm. Europa (Io) egress occurs on May 26 at 00:19am (00:58am). On May 18 Europa (Io) shadow ingress occurs at 7:16pm (8:53pm), with shadow egress at 9:42pm (11:04pm).The graphic images were generated using SkySafari 4 Pro.

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

All times are Pacific Daylight Time

### April

- 16 Sun Saturn about 5 degrees below or lower-left of the Moon (highest 1 hour before sunrise)
- 18- Tue- Mars less than 4 degrees from the Pleiades for 5 nights (west; Evening)
- 19 **Wed Last-Quarter Moon (2:57am)**
- 22 Sat The weak Lyrid meteor shower peaks (predawn)
- 23 Sun Crescent Moon 8 degrees to the right of Venus (east; Dawn)
- 26 **Wed New Moon (5:16am)**
- 28 Fri Mars about 1.5 degrees above the thin crescent Moon (30-45 minutes after sunset)

### May

- 2 Tue **First-Quarter Moon (7:47pm)**
- 3 Wed The Moon pairs with Regulus, the brightest star in Leo
- 5 Fri Mars is 6 degrees to the north (upper-right) of Aldebaran (dusk)
- 7 Sun Jupiter about 3 degrees to the right of the Moon, with Spica 9 degrees below the pair
- 10 **Wed Full Moon (2:42pm)**
- 18 **Thu Last-Quarter Moon (5:33pm)**
- 18 Thu Jupiter double shadow transit [Europa (Io) shadow ingress at 7:16pm (8:53pm); shadow egress 9:42pm (11:04pm)]
- 22 Mon Crescent Moon about 4 degrees below Venus (predawn)
- 25 **Thu New Moon (12:44pm)**
- 25 Thu Jupiter double shadow transit [Europa (Io) shadow ingress at 9:54pm (10:47pm); shadow egress May 26 at 00:19am (00:58am)]. See p.5 of this newsletter for SkySafari 4 Pro graphics of the ingresses
- 29 Mon Crescent Moon about 3 degrees to the lower-left of M44, the Beehive Cluster (Evening)

## Calendar of Events (continued)

### June 21-25

What: Golden State Star Party  
Who: Chabot Exhibit  
Where: Aiden, CA  
Cost: \$60 Early registration (through March 30), \$70 thereafter, or \$25/night. No refunds, but registration can be transferred to other parties without restriction.

If you've never been out to a sky beyond your backyard or local astronomy sites, you're in for an amazing treat. Have you seen a dark sky, or only remember them from childhood? For you, that first view at GSSP will be truly incredible.

Do you need a telescope to attend? No! But if you have one, bring it (nothing is too small). If not, binoculars, or just

your eyes will do. There will be plenty of telescopes to look through.

Do you think you're too much of a beginner? It's a friendly and helpful group – you'll fit right in and make new friends under an amazing sky. Whether you're an observer or imager, you'll have lots of company, get plenty of help, and see lots of new equipment and sights.

Campers, and RV's are welcome (no hookups). There is limited hotel accommodations in nearby towns.

For more information see: <http://goldenstatostarparty.org/index.php/golden-state-star-party/newcomers-and-novices-welcome/>

## What It's Like on a TRAPPIST-1 Planet

By Marcus Woo

With seven Earth-sized planets that could harbor liquid water on their rocky, solid surfaces, the TRAPPIST-1 planetary system might feel familiar. Yet the system, recently studied by NASA's Spitzer Space Telescope, is unmistakably alien: compact enough to fit inside Mercury's orbit, and surrounds an ultra-cool dwarf star—not much bigger than Jupiter and much cooler than the sun.



If you stood on one of these worlds, the sky overhead would look quite different from our own. Depending on which planet you're on, the star would appear several times bigger than the sun. You would feel its warmth, but because it shines stronger in the infrared, it would appear disproportionately dim.

"It would be a sort of an orangish-salmon color—basically close to the color of a low-wattage light bulb," says Robert Hurt, a visualization scientist for Caltech/IPAC, a NASA partner. Due to the lack of blue light from the star, the sky would be bathed in a pastel, orange hue.

But that's only if you're on the light side of the planet. Because the worlds are so close to their star, they're tidally locked so that the same side faces the star at all times, like how the Man on the Moon always watches Earth. If you're on the planet's dark side, you'd be enveloped in perpetual darkness—maybe a good thing if you're an avid stargazer.

If you're on some of the farther planets, though, the dark side might be too cold to survive. But on some of the inner planets, the dark side may be the only comfortable place, as the light side might be inhospitably hot.

On any of the middle planets, the light side would offer a dramatic view of the inner planets as crescents, appearing even bigger than the moon on closest approach. The planets only take a few days to orbit TRAPPIST-1, so from most planets, you can enjoy eclipses multiple times a week (they'd be more like transits, though, since they wouldn't cover the whole star).

Looking away from the star on the dark side, you would see the outer-most planets in their full illuminated glory. They would be so close—only a few times the Earth-moon

distance—that you could see continents, clouds, and other surface features.

The constellations in the background would appear as if someone had bumped into them, jostling the stars—a perspective skewed by the 40-light-years between TRAPPIST-1 and Earth. Orion's belt is no longer aligned. One of his shoulders is lowered.

And, with the help of binoculars, you might even spot the sun as an inconspicuous yellow star: far, faint, but familiar.



Image Caption: This artist's concept allows us to imagine what it would be like to stand on the surface of the exoplanet TRAPPIST-1f, located in the TRAPPIST-1 system in the constellation Aquarius. Credit: NASA/JPL-Caltech/T. Pyle (IPAC)

Want to teach kids about exoplanets? Go to the NASA Space Place and see our video called, "Searching for other planets like ours": <https://spaceplace.nasa.gov/exoplanet-snap/>

This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit [spaceplace.nasa.gov](https://spaceplace.nasa.gov) to explore space and Earth science!



Tri-Valley Stargazers  
P. O. Box 2476  
Livermore, CA 94551  
[www.trivalleystargazers.org](http://www.trivalleystargazers.org)

## Tri-Valley Stargazers Membership Application

(or apply for membership online: [www.trivalleystargazers.org/membership.shtml](http://www.trivalleystargazers.org/membership.shtml))

### 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.

**Magazine Subscriptions** (optional): Discounted subscriptions are available only to new subscribers. All subsequent renewals are handled directly with the magazine publishers.

One-year subscription to Sky & Telescope magazine (\$32.95).

One-year subscription to Astronomy magazine (\$34).

**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 other than other club members and the Astronomical League without your express permission.

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