

PRIMEFOCUS

Tri-Valley Stargazers



July 2018



Another Pale Blue Dot: The SETI Institute's Search for Exoplanets

Who:

Dr. Franck Marchis, SETI

When:

July 20, 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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July Meeting

Another Pale Blue Dot: The SETI Institute's Search for Exoplanets

Dr Franck Marchis - Senior Planetary Astronomer, Exoplanet Research Group Director, SETI Institute & Founder-Chief Scientific Officer at Unistellar

In only two decades, we've gone from the mere speculation about planets beyond our solar system (exoplanets) to being able to observe them through a variety of methods. Dr. Franck Marchis, Planetary Astronomer and chair of the exoplanet group at the SETI Institute will discuss new and sophisticated projects which aim to image directly those exoplanets. Future instruments could soon deliver an image of a cousin of Earth, or another Pale Blue Dot, a planet similar to our own. His talk will be followed by a demo of the Unistellar eVscope, an innovative robotic telescope developed in partnership with the SETI Institute.

What is Unistellar? Unistellar's Enhanced Vision Telescope, seen in the header image above, is the first telescope that accumulates light so the user can finally see hundreds of faint astronomical objects in all their shapes and colors live through its lens. Because classical high end telescopes only allow the user to see the four main planets, this technology will radically transform amateur astronomy. Relying on its on-board computer, the telescope also recognizes the observed area and can guide and inform the user in real time.

Unistellar telescopes are also a powerful tool that generates useful data about transient events like supernovae, near-earth asteroids, and comets. A partnership with the SETI Institute has been initiated to identify and develop these applications so any user, newbie or expert, will be able to learn while contributing to science. With Unistellar, finally, you'll see! <http://unistellaroptycs.com>

Dr. Franck Marchis is a Senior Scientist and Exoplanet Research Thrust Chair at the SETI Institute and Chief Scientific Officer at Unistellar. Franck earned his Ph.D. in Astrophysics at the Université Paul Sabatier, France, in 2000. He is a planetary astronomer with 22 years of experience in academic, international, and non-profit scientific institutions, and he has conducted multiple research projects in a wide range of areas. He is best known for his discovery and characterization of multiple asteroids, his study of Io volcanism and imaging of exoplanets, planets around other stars. Today, Marchis dedicates most of his energy to instruments capable of imaging and characterizing Earth-like exoplanets by being involved in education, public outreach, technology, and scientific investigations related to those ambitious projects both in the United States and in Europe. Marchis is also involved in startups related to astronomy. He is a co-founder of Unistellar and its Chief Scientific Officer, as well as scientific advisor of VR2Planets and NellyBenHayoun Studios.

In April 2007, the asteroid numbered 1989SO8 was named "(6639) Marchis" in honor of his work in the field of multiple asteroids. He has also been a consultant and interviewee in several science documentaries for the Science channel, BBC, ARTE, and news media in English, French, and Spanish.

News & Notes

2018 TVS Meeting Dates

Below are the TVS meeting dates for 2018. 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
Jul. 20	Jul. 23	
Aug. 17	Aug. 20	Jul. 27
Sep. 21	Sep. 24	Aug. 31
Oct. 19	Oct. 22	Sep. 28
Nov. 16	Nov. 19	Oct. 26
Dec. 21	Dec. 17*	Nov. 30

Money Matters

As of the last Treasurer's Report on 06/18/18, our club's checking account balance is \$16119.32.

Outreach Star Parties

Saturday, 07/21/18: Outreach party at Del Valle Arroyo staging area; 8:15pm

Sunday, 08/12/18: Outreach Party (Perseids) at Del Valle ridge near park entrance; 8:15

Friday-Sunday, 08/31/18-:09/02/18 Yosemite Star Party: Every year TVS does an outreach star party at Glacier Point in Yosemite National Park. In return for setting up our telescopes and binoculars at Glacier Point, we get free admission to the park, and free camping at the nearby Bridal Veil Creek campground.

This year's Glacier Point Star Party will be Friday-Sunday nights. The Moon is near last quarter this weekend, with moonrise occurring from 10:47pm to 00:08am.

We will have the usual Saturday evening pot luck, and TVS will provide hamburgers, hot dogs and veggie burgers. If you are planning to join us this year, please contact Eric Dueltgen as soon as possible, indicating how many people, how many tents, and for how many days you and your group plan to attend.

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

TVS Baseball Cap Available for Purchase

TVS Baseball Caps are available for purchase at a cost of \$15 each. The caps are Navy Blue with an embroidered club logo. The size is adjustable with a high quality strap and buckle-no plastic here! Purchase a cap to support the club and amateur astronomy. The cap will easily identify you as a TVS member at club outreach star parties, and they will even keep your head warm. Contact Club Treasurer Roland Albers if you are interested in purchasing a cap.

Calendar of Events

July 14, 8:00pm

What: Search for a Second Genesis of Life: Motive, Means, and Opportunity
Who: Alfonso Davila, NASA Ames Research Center
Where: Mt. Tamalpais State Park, Cushing Memorial Amphitheater, more commonly known as the Mountain Theater, Rock Spring parking area
Cost: Free

Understanding the concept of a second genesis and how to search for it. With the recent discovery of habitable environments beyond Earth, including the subsurface oceans of icy moons in the outer Solar System, the existence of a second genesis of life appears now both possible and realistic.

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

July 17, 7:30pm-10:00pm

What: SJJA Imaging SIG Meeting
Who: San Jose Astronomical Society
Where: Hogue Park, 3972 Twilight Drive, San Jose, CA
Cost: Free

The Imaging SIG meets roughly every month at Hogue Park to discuss topics about imaging. The SIG is open to people with absolutely no experience but want to learn what it's all about, but experienced imagers are also more than welcome, indeed, encouraged to participate.

For more information see: <https://www.meetup.com/SJ-Astronomy/events/251460921/> and <https://www.sjaa.net/calendar/> for other events.

July 19, August 16, 6:00pm-8:00pm

What: Astronomy on Tap
Who: San Jose Astronomical Society
Where: Sudwerk Brewing Co., 2001 2nd St, Davis, CA 95618
Cost: Free

Join Sudwerk at the Dock Store every third Thursday of the month to learn about the universe we live in with short astronomy talks by subject experts. The talks are organized by Victoria Strait, A Ph.D. student at UC Davis, and Prof. Stefano Valenti.

For more information see: <https://www.facebook.com/events/2079401342341812/>

July 28, 6:00pm-10:00pm

What: Highly Mixological: A Star Trek Celebration
Who: 21 yrs old and over event
Where: Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619

Header Image: Unistellar telescope prototype. See: <https://unistellaroptics.com/product/>

Calendar of Events (continued)

Cost: \$20

Join us for our 2nd Annual Star Trek adult night, Highly Mixological! This will be an amazing evening of all things Star Trek. Capture a memorable evening dressed in your Star Trek costumes at our photo booth, experiment with Star Trek themed cocktails or play Spock games and listen to music. Come dressed in your most impressive Star Trek inspired attire and enter to win our costume contest! Or you could always wear a red shirt. This event is 21+.

For more information see: <http://www.chabotspace.org/highly-mixological.htm> Pre-purchase your tickets for \$5 First Friday at: <http://www.chabotspace.org/first-fridays.htm> or for more information, call (510) 336-7373.

July 28, 7:30pm

What: Movie Night: Apollo 13

Who: You

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

Cost: Free

1995 award winning film dramatizes the aborted 1970 Apollo 13 lunar mission. Screening followed by expose of "fake" science in the film by Jeffrey Silverman and Kishore Hari from Science vs. Cinema.

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

September 10, 7:30pm

What: Our Journey Toward Mars

Who: J.R. Skok, Planetary Scientist, SETI Institute

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 journey toward Mars and beyond will be humanity's greatest adventure. It will determine the fate of our species and the extent of our legacy. This journey is already underway. Humans have walked on the Moon and have survived long-duration spaceflight. Our spacecraft have explored the solar system and mapped its routes and resources. Now we are on the verge of a revolution in space exploration as nations, corporations, and people like you are working to overcome the challenges that have held us back.

Planetary scientist J.R. Skok of the SETI Institute discusses how scientists and engineers are using the most alien places on Earth to develop the technology, resources, and experience that we will need to become a multi-planetary species. We will see how places like the polar deserts of Antarctica, the volcanoes of Hawaii, and the thermal fields of Iceland are providing the insight and experience that will prepare us for the journey toward Mars and beyond.

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

Officers

President:

Rich Combs
president@trivalleystargazers.org

Vice-President:

Eric Dueltgen
vice_president@trivalleystargazers.org

Treasurer:

Roland Albers
treasurer@trivalleystargazers.org

Secretary:

Ron Kane
secretary@trivalleystargazers.org

Past President:

Chuck Grant
past_president@trivalleystargazers.org

Volunteer Positions

Astronomical League Rep.:

Dennis Beckley
alrep@trivalleystargazers.org

Club Star Party Coordinator:

Eric Dueltgen
coordinator@trivalleystargazers.org

Del Valle Coordinator:

David Feindel
delvalle@trivalleystargazers.org

Historian:

Hilary Jones
historian@trivalleystargazers.org

Internat. Dark-Sky Assoc. Rep.:

Aadi Duggal
darksky@trivalleystargazers.org

Librarian:

Ron Kane
librarian@trivalleystargazers.org

Loaner Scope Manager:

Ron Kane
telescopes@trivalleystargazers.org

Night Sky Network Rep.:

Ross Gaunt
nnsn@trivalleystargazers.org

Newsletter Editor:

Ken Sperber
newsletter@trivalleystargazers.org
925-361-7435

Observatory Director/Key Master:

Chuck Grant
observatory@trivalleystargazers.org

Outreach Coordinator:

Eric Dueltgen
outreach@trivalleystargazers.org

Potluck Coordinator:

Jill Evanko
potluck@trivalleystargazers.org

Program Coordinator:

Lance Simms
programs@trivalleystargazers.org

Publicity Coordinator:

Jim Theberge
publicity@trivalleystargazers.org

Refreshment Coordinator:

Laurie Grefsheim

Webmaster:

Hilary Jones
webmaster@trivalleystargazers.org

Web & E-mail

www.trivalleystargazers.org
info@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.

RTMC 2018 Report By Alan Gorski



Image Caption: Stacked refractors imaged under moonlight at the 2018 Riverside Telescope Makers Conference. Image Credit: Alan Gorski.

This year's RTMC Expo was well attended as this was the event's 50th anniversary. There were a number of great talks, included talks given by three famous comet hunters; Don Machholz, David Levy, and Alan Hale of Comet Hale-Bopp fame.

There were several images of last year's Great American Solar Eclipse entered in the Digital Imaging Contest. "Best of Show" was awarded to a stacked multiple image of the solar coronal which exhibited incredible detail. This year I entered a digital image of the Heart Nebula (NGC 1805) in Cassiopeia taken with a modified Canon 6D DSLR. It was awarded a "Certificate of Astro-Imaging Excellence – Deep Sky."

Late Sunday afternoon I gave a talk entitled, "Digital Imaging with a Modified Canon 6D DSLR, Great Results in 3 Minutes or Less." I emphasize that you don't need to take "RAW" images, dark frames or flat frames. Let the camera do this for you and use your home computer to enhance your JPEG images using the photo editor that comes free with your computer's image viewer.

Next year's RTMC Expo: The grounds of Camp Oaks is currently undergoing excavation work in preparation to replace

many of the buildings, including the dorms. As some of you probably already know, next year's RTMC will be at Camp Oaks but held in September due to another scheduled event. For many of us RTMC had become a Memorial Day weekend tradition. RTMC organizers are hoping that the Expo can return to Memorial Day weekend in 2020.

Lastly, this year's RTMC coincided with the full Moon. So what's a deep sky imager to do? As for me, I took a few pictures by moonlight; something that I hadn't done in over 30 years. Since moonlight is reflected sunlight the night sky is a wonderful deep, deep blue. Imaging by moonlight is easy. Just mount your camera on a tripod, select a high ISO setting (1000 – 3000), set the lens aperture to its widest setting, and experiment with the time exposure (1 to 30 seconds). If your camera is modified, create a custom white balance using an 18% gray card imaged during the day.

Assorted Photos



Image Caption: Club Secretary, Librarian, and Loaner-Scope Manager Ron Kane with TVS Founding Member Jack Marling at the June 2018 club meeting. Image Credit: Rich Combs.



Image Caption: Left: The launch of a SpaceX Falcon 9 with the GRACE-FO twin satellites that measure the gravity field of the Earth. These measurements indicate changes in ocean currents, subsurface water and ice sheets. The data are important for assessing the impact of floods and droughts and monitoring of climate change. Five Iridium satellites were also launched on this flight. Right: NASA Photographer Bill Ingalls's camera after it was caught in a brushfire caused by the launch of the NASA/German GRACE-FO from Vandenberg Air Force Base on May 22, 2018. Despite the damage, the contents of the memory card were intact, showing the fire that engulfed it: <https://www.nasa.gov/feature/what-really-happened-to-that-melted-nasa-camera> Image Credits: NASA/Bill Ingalls

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

All times are Pacific Daylight Time

July

- 9 Mon Venus and Regulus are $\sim 1^\circ$ apart and set in the west (Early Evening)
- 10 Tue The crescent Moon is $\sim 0.5^\circ$ from Aldebaran as the Hyades rises in the east (Dawn)
- 10 Tue Jupiter stationary, after which it starts moving east against the backdrop of stars
- 11 Wed Mercury at greatest eastern elongation (26°)
- 12 Thu **New Moon (7:48pm)**
- 15 Sun The crescent Moon and Venus are $\sim 2^\circ$, and they trail Regulus by $\sim 5^\circ$ in the west (Dusk)
- 19 Thu **First-Quarter Moon (12:52pm)**
- 20 Fri The Moon, Jupiter, and Alpha-Libra form a compact triangle in the southwest
- 24 Tue The Moon and Saturn are in Sagittarius
- 26 Thu Mars at opposition, visible all night
- 27 Fri **Full Moon (1:20pm)**
- 30 Mon Mars closest to Earth since 2003, diameter 24.3", -2.8mag

August

- 1- Wed- Venus, Jupiter, Saturn, and Mars visible nightly, all month
- 4 Sat **Last-Quarter Moon (11:18am)**
- 6 Mon The crescent Moon shines near the Hyades in Taurus
- 11 Sat **New Moon (2:58am)**
- 12- Sun- The Perseid Meteor shower peaks on the morning of August 13
- 14 Tue Venus and the Crescent Moon about 6° apart (Evening)
- 16 Thu Jupiter 0.5° from Alpha Librae with the Moon about 7° to the west
- 18 Sat **First-Quarter Moon (00:48am)**
- 20 Mon Saturn 4° to the east of the waxing gibbous Moon
- 22- Wed- On the night of the 22-23 the Moon traces an arc from west to east $8-9^\circ$ above Mars
- 26 Sun **Full Moon (4:56am)**
- 26 Sun As the Moon sets, Mercury reaches greatest western elongation in the east-northeast (Dawn)
- 31 Fri Venus and Spica less than 1° apart as they set toward the west (Evening)

A Close-Up View of Mars

By Jane Houston Jones and
Jessica Stoller-Conrad

In July 2018, skywatchers can get an up close view of Mars—even without a telescope! In fact, on July 31, Mars will be closer to Earth than it has been in 15 years.



Why is that?

Like all the planets in our solar system, Earth and Mars orbit the Sun. Earth is closer to the Sun, and therefore it races along its orbit more quickly. Earth makes two trips around the Sun in about the same amount of time that Mars takes to make one trip.

Sometimes the two planets are on opposite sides of the Sun and are very far apart. Other times, Earth catches up with its neighbor and passes relatively close to it. This is called Mars's closest approach to Earth, and it's happening this year on July 31. The Moon will be near Mars on that night, too!

Keep in mind that even during its closest approach, Mars is still more than 35 million miles away from Earth. That's really far. So, Mars won't appear as big as the Moon in the sky, but it will appear bigger than it usually does.

July and August will be a great time to check out Mars. Through a telescope, you should normally be able to make out some of the light and dark features of the Red Planet—and sometimes even polar ice. However, a huge Martian dust storm is obscuring these features right now, so less planetary detail is visible.

There is another important Mars date in July: Mars opposition. Mars opposition is when Mars, Earth and the Sun all line up, with Earth directly in the middle. This event is happening on July 27 this year.

Although you may see news focusing on one of these two dates, Mars will be visible for many months. For about three weeks before and three weeks after opposition and closest approach, the planet will appear the same size to a skywatcher.

From July 7 through September 7 Mars will be the third brightest object in the sky (after the Moon and Venus), shining even brighter than Jupiter. The best time to view Mars during this time is several hours after sunset, when Mars will appear higher in the sky.

Mars will still be visible after July and August, but each month it will shrink in size as it travels farther from Earth in its orbit around the Sun.

In other sky news, there will be a partial solar eclipse on July 13, but it will only be visible from Northern Antarctica and southern Australia. On July 27 (beginning at 20:21 UTC), a total lunar eclipse will be visible in Australia, Asia, Africa, Europe and South America. For those viewers, Mars will be right next to the eclipsing Moon!

If you're wanting to look ahead to next month, prepare for August's summer Perseid meteor shower. It's not too early to plan a dark sky getaway for the most popular meteor shower of the year!

You can catch up on NASA's missions to Mars and all of NASA's missions at www.nasa.gov

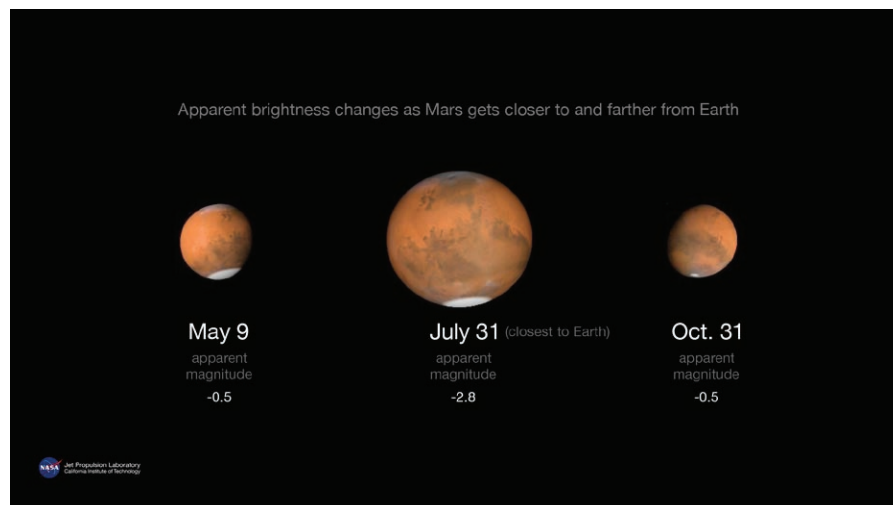


Image Caption: In 2018, Mars will appear brightest from July 27 to July 30. Its closest approach to Earth is July 31. That is the point in Mars' orbit when it comes closest to Earth. Mars will be at a distance of 35.8 million miles (57.6 million kilometers). Credit: NASA/JPL-Caltech



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.