Tri-Valley Stargazers

May 2021

PrimeFocus

WHEN:

May 21, 2021
Meeting at 7:30pm
Lecture at 8:00pm

WHERE:

Virtual Meeting using Zoom
See the April 2020 issue of PrimeFocus for info on getting connected using Zoom

TVS QR Code

INSIDE THIS ISSUE:

A Walking Tour of Optical History -- Artifacts and Anecdotes from the Astronomical Lyceum
John W. Briggs

Pioneering telescope makers allowed a revolutionary ascendancy of American astronomy in the 19th and early 20th centuries. The Astronomical Lyceum in New Mexico, originally built in 1936 as a theater and gymnasium, now houses a collection of telescopes, optics, archives, and literature from this ascendancy. Its volunteer staff find the artifacts and associated history surprisingly engaging for visitors of all interest levels. The presentation will include unusual items, large and small, created by some of the America's greatest early optical artists, including Henry and Harry Fitz, Alvan Clark and Sons, Carl and Robert Lundin, John A. Brashear, George Willis Ritchey, and the pioneer of astronomical spectroscopy and photography, Lewis Morris Rutherfurd. The collection includes artifacts originating right up through the Space Age, including from the amateur telescope making movement and its surprising influence. While time allows only an overview, the presentation hopes to remind participants how history of science and technology can be powerfully engaging and interesting for essentially anyone when offered in the right spirit.

Caption: John Briggs giving a presentation at the 25th Annual Convention of the Antique Telescope Society, held at Lowell Observatory in 2016. Credit: Ken Sperber

John W. Briggs has lived and worked at far-ranging observatories in various technical capacities, including Mount Wilson, Yerkes, National Solar, Maria Mitchell, Venezuelan National, Chamberlin, and South Pole Station. He came to New Mexico with his family in 1997 to assist in the final commissioning of the Sloan Digital Sky Survey. In the 1980s he was an assistant editor at Sky & Telescope magazine and built Bogsucker Observatory in Massachusetts. He is a member of many astronomical organizations, including the Springfield Telescope Makers responsible for the annual Stellafane Convention in Vermont, and he has recently been elected to the board of the century-old American Association of Variable Star Observers.

News and Notes

2021 Meeting Dates

Lecture Meeting	Board Meeting	PrimeFocus Deadline
May 21	May 24	
Jun. 18	Jun. 21	Jun. 4
Jul. 16	Jul. 19	Jul. 2
Aug. 20	Aug. 23	Aug. 6
Sep. 17	Sep. 20	Sep. 3
Oct. 15	Oct. 18	Oct. 1
Nov. 19	Nov. 22	Nov. 5
Dec. 17	Dec. 20	Dec. 3

Money Matters

As of the last Treasurer's Report on 4/19/21, our club's account balance is $63,245.31. This includes $43,362.57 in the H2O Rebuild fund.

TVS Welcomes New Members

TVS welcomes new members Tracy Cao, Kent Crispin (past member in the 90's), Paul Harden, Brian Kring, and Sameep Mondhe. Please say hello and chat with them during our Zoom meetings.

H2O and Del Valle Observing Sites Reopened

The club is happy to announce that the Del Valle and Hidden Hill Observatory sites have reopened for observing by those who have paid their 2021 TVS Membership dues and are approved key holders.

Due to the ongoing COVID-19 emergency, the following restrictions must be followed:

*The sites are open for individual use only by club members and immediate family; no guests or group events allowed

*You use each observing site at your own risk and agree to hold the club and the landowners free of all liability

*Do not use either observing site if you are not feeling well or suspect you were recently exposed to the virus

*Announce your intention to use either site on our groups.io group

*While at either site maintain social distancing of at least 15 feet (about a car's length)

*Bring hand sanitizer and use it before and after touching any locks or facilities

*H2O users should wear a mask while at the landowner's home depositing the daily usage fee

*Club members should not touch or look through each other's equipment. Focuser knobs and eyepieces can potentially spread the virus.

*H2O keyholders who wish to use the Quick Dome should first contact Ross Gaunt (secretary"at"trivalleystargazers.org) to reserve it for individual use for the day

*Note that these restrictions do not replace or negate any Alameda or Santa Clara County health orders in place at this time.

Ross Gaunt, our club secretary, emailed the updated lock combinations and usage instructions for each site to all H2O key holders and all Del Valle registered users. If you are a H2O key holder or Del Valle registered user and didn't get Ross's email, please let Ron (president"at"trivalleystargazers.org) or Ross know and we'll straighten it out.

H2O orientation has been tentatively scheduled for May 29 for those who have paid the annual access fee but have not received their key.

Outreach Star Party Schedule

Cancelled through May.

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

H2O Rebuild

The large pine tree at H2O has been felled. Observatory Director Chuck Grant will set a date for assembly of a storage shed and additional tree work at H2O.

Calendar of Events

May 15, 7:30pm

What: Gravitational Lensing: Bends in Spacetime
Who: Fatima Abdurrahman (UC Berkeley)
Sponsor: Mt. Tam Astronomy Program
Online: https://us02web.zoom.us/j/89697734661#success

One hundred years ago, Einstein predicted that light rays would bend in the space near a massive object — much as light rays refract in an optical lens. Today, we use this fact to weigh galaxies, to discover planets of other stars, and to "see" invisible black holes. How did this idea of gravitational lensing come about, and how do we use it today to probe all fields of astrophysics?

For more information see:
https://www.mttamastronomy.org/calendar and
https://youtube.com/MtTamAstronomy

May 15, 22, 29, June 5, 12, 9:30pm-10:30pm

What: Virtual Telescope Viewing
Who: Chabot Staff
Sponsor: Chabot Space and Science Center

Calendar of Events (con't)

Online: www.youtube.com/channel/UCarFXs-04xmdHW_PVc7LWRg

Each week, our astronomers will guide us through spectacular night sky viewing through Nellie, Chabot's most powerful telescope. Weather permitting, we will be able to view objects live through the telescopes and our astronomers will be available to answer your pressing astronomy questions.

Nellie is a 36-inch reflector telescope, housed in a rolling roof observatory that allows access to 180 degrees of sky. This modern, research-quality telescope offers breathtaking views of the cosmos.

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

May 19, 10:00am

What: Why is Earth Still Habitable?
Who: Sarah Rugheimer (Oxford University) and Toby Tyrrell (University of Southampton)
Sponsor: SETI Institute
Online: REGISTRATION REQUIRED
https://www.eventbrite.com/e/seti-talks-why-is-earth-still-habitable-tickets-153701020891

Earth, a Pale Blue Dot in our solar system, is also the result of 4 billion years of evolution leading to a technologically advanced and intelligent civilization, humanity. When you look around almost anywhere on Earth, you see life. In the air, in the water, in the land and even underground. But was this inevitable? We know that there have been mass extinction events in the past, some taking out most of life on Earth, but not all of it, since we are here to ponder it.

Current global warming shows us that the climate can change considerably over even a few centuries. Over geological timescales, it is even easier to see climate change. Calculations show that there is the potential for Earth's climate to deteriorate to temperatures below freezing or above boiling in just a few million years. Abrupt changes can come from natural disasters like super-volcanoes, asteroid impacts, solar flares, supernovae, and many other threatening events. Even the amount of heat from the Sun has increased as it ages, so why is Earth still habitable?

This work consists of running simulations looking at how 100,000 randomly different planets responded to random climate-altering events spread out across three billion years.

Most of those planets which remained life-sustaining throughout the three-billion-year period only had a probability, not a certainty, of staying habitable.

Is Earth's success in remaining habitable just a fluke? What can we learn from studying the climate of planets in our solar system and those orbiting other stars?

We hope to answer these questions with our speakers in this conversation moderated by SETI Institute Senior Astronomer Franck Marchis.

For more information, see: https://www.seti.org/talks

May 26, 1:30am-6:00am

What: Lunar Eclipse Virtual Watch Party

Calendar of Events (con't)

Who: Chabot Staff
Sponsor: Chabot Space and Science Center
Online: www.youtube.com/watch?v=4bhus6UBPcg

Stay up with Chabot astronomers to virtually watch a total eclipse of the Moon as it passes through the shadow of the Earth. It has been more than two years since we've enjoyed a total lunar eclipse, and this one will be extra special: it will happen during a perigean full Moon – a "supermoon."

Starting at 1:47 a.m. PDT, the Moon will fade only slightly as it enters the penumbra, the outer part of the Earth's shadow. Then at 2:45 a.m., the Moon begins to enter the umbra, the darker rusty red part of the Earth's shadow. By 4:11 a.m., the Moon will be fully immersed in the umbral shadow, but not for long as it begins to emerge from the umbra at 4:28 a.m.

Chabot astronomers will be live streaming the eclipse, using a telescope mounted camera, starting at 1:30 a.m. PDT.

For more information, see:
https://chabotspace.org/calendar/lunar-eclipse-party/

May 26, 7:00pm-8:30pm

What: A Little Talk About Aliens: Techno-signatures and the New Science of Life in the Universe
Who: Dr. Adam Frank (University of Rochester)
Sponsor: SETI Institute/Silicon Valley Astronomy Lecture S.
Online: www.youtube.com/user/SVAstronomyLectures

Today, the search for intelligent, civilization-building life in the Universe is undergoing a profound renewal. Thanks to the discovery of thousands of planets orbiting other stars, the introduction of new observing technologies, and increased support from both public and private sectors, a new science of searching for "techno-signatures" is emerging.

In this talk Dr. Frank will unpack this frontier area, discussing what counts as a techno-signature; how to be systematic in thinking about exo-civilizations and their evolution; what techno-signatures can tell us about our own future. He believes that within the next few decades we will likely have actual data relevant to the question life, perhaps even the intelligent kind, in the Universe.

Dr. Adam Frank is a leading expert on the final stages in the evolution for stars like the Sun, but his current work also focuses on life in the universe. His research group at the University of Rochester has developed advanced supercomputer tools for studying how stars form and how planets evolve. His most recent book is Light of the Stars: Alien Worlds and the Fate of the Earth, which won the 2019 Phi Beta Kappa Award for Science. He has written two other books, The Constant Fire: Beyond the Religion and Science Debate, and About Time: Cosmology and Culture at the Twilight of the Big Bang. He is the co-founder of the blog 13.8 on BigThink.com and an on-air commentator for NPR's All Things Considered. He has contributed pieces to the New York Times, NBC, The Washington Post and elsewhere, and served as the science consultant for Marvel's Doctor Strange. Frank's work in public outreach was recently honored via the American Physical Society's 2020 Joseph A. Burton Forum Award.

The lecture is co-sponsored by:

- The Foothill College, Tech, Engineering, & Math Division
- The SETI Institute
- The Astronomical Society of the Pacific
- The University of California Observatories (including Lick Observatory)

Past lectures in the series can be found on YouTube at http://www.youtube.com/SVAstronomyLectures

June 19, 7:30pm

What: Prediction: Forecasting on Time Scales from Micro-seconds to Eons
Who: Prof. Greg Laughlin (Yale University)
Sponsor: Mt. Tam Astronomy Program
Online: https://us02web.zoom.us/j/89697734661#success

Scientific forecasts span a staggering breadth of time scales, and they range in precision from vague & qualitative to exact & quantitative. This presentation will provide an overview of predictability. We'll look at examples drawn from trading, meteorology, celestial mechanics, and cosmology. Finally, we'll end with the latest research-based forecasts for what will happen to the Universe in the extremely distant future.

For more information see:
https://www.mttamastronomy.org/calendar and
https://youtube.com/MtTamAstronomy

TVS Astrophotos

Caption: Images of CZ-2C R/B, the rocket body of a Chinese Long March 2C launched in 2018. These images were taken on May 8, 2021 at about 4:15am as the rocket body passed through the Milky Way in Cygnus. Equipment: Canon 6D Astro-modified, 14mm, f2.8, ISO-3200, 30 seconds. Image Credit: Ken Sperber

Caption: Images of a tumbling satellite. Despite searching numerous satellite catalogs, the satellite could not be identified-that's a UFO in my book! These images were taken on May 8, 2021 at about 4:33am as the satellite passed through the Milky Way in Cygnus, though impending dawn washed out the Milky Way. Equipment: Canon 6D Astro-modified, 14mm, f2.8, ISO-800, 15 seconds. Image Credit: Ken Sperber

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

All time are Pacific Daylight time

May

19	**Wed**	**First-Quarter Moon (12:13pm)**
19	Wed	The Moon in Leo is ~5° from Regulus (Dusk)
23	Sun	The Moon in Virgo is ~7° from Spica (Dusk)
26	**Wed**	**Full Moon (4:14am): Total Lunar Eclipse (4:11-4:28am; Umbral entry 2:45am)**
26	Wed	The Moon is ~6° from Antares as they rise in the east (Dusk)
27	Thu	Mars is ~6° from Pollux as they emerge in the west as twilight deepens (Dusk)

June

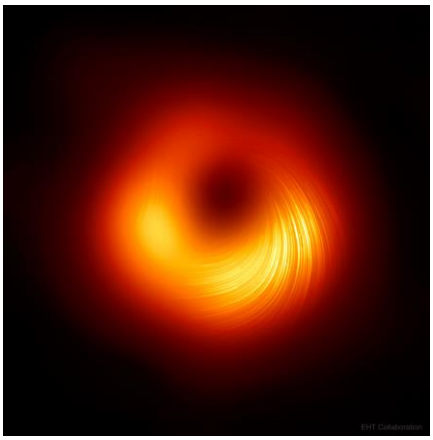
1	Tue	The Moon and Jupiter are ~5° apart in the south-southeast, with Saturn ~18° to their right (Dawn)
2	Wed	The Moon, Jupiter, and Saturn form a shallow arc in the southeast (Dawn)
2	**Wed**	**Last-Quarter Moon (00:24am)**
10	**Thu**	**New Moon (3:53am)**
13	Sun	The Moon in Cancer is ~3° from Mars, with M44, the Beehive Cluster ~4° left of the Moon (Dusk)
15	Tue	The Moon in Leo is ~4° from Regulus (Dusk)
17	**Thu**	**First-Quarter Moon (8:54pm)**
19	Sat	The Moon in Virgo is ~5° from Spica (Evening)
20	Sun	Summer Solstice: Longest day of the year in the Northern Hemisphere
21	Mon	Venus is 5° from Pollux, very low near the west-northwest horizon (Dusk, see June S&T, p.47)
22	Tue	The Moon in Scorpius is ~3.5° from Antares (Evening)
23	Wed	Mars is in M44, the Beehive Cluster (Dusk, see June S&T, p.47)
24	**Thu**	**Full Moon (11:40am)**
27	Sun	The Moon and Saturn are ~5° apart in the south, with Jupiter to their left (Dawn)
28	Mon	The Moon forms a triangle with Jupiter and Saturn (Dawn)
30	Wed	The Moon, Jupiter, and Saturn form a graceful arc in the south (Dawn)

Virgo's Galactic Harvest

By David Prosper

May is a good month for fans of galaxies, since the constellation Virgo is up after sunset and for most of the night, following Leo across the night sky. Featured in some ancient societies as a goddess of agriculture and fertility, Virgo offers a bounty of galaxies as its celestial harvest for curious stargazers and professional astronomers alike.

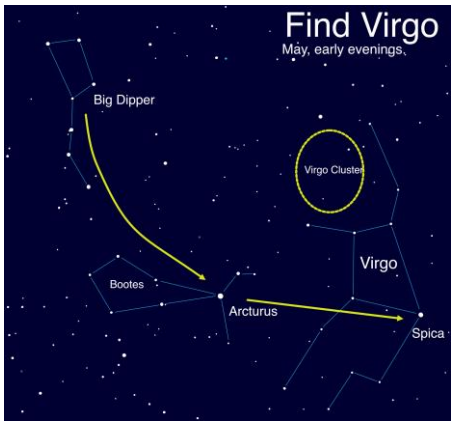
Virgo is the second-largest constellation and largest in the Zodiac, and easily spotted once you know how to spot Spica, its brightest star. How can you find it? Look to the North and start with the Big Dipper! Follow the general curve of the Dipper's handle away from its "ladle" and towards the bright orange-red star Arcturus, in Boötes – and from there continue straight until you meet the next bright star, Spica! This particular star-hopping trick is summed up by the famous phrase, "arc to Arcturus, and spike to Spica."



Caption: The first image of a black hole's event horizon was taken in the center of one of the most prominent galaxies in Virgo, M87! This follow-up image, created by further study of the EHT data, reveals polarization in the radiation around the black hole. Mapping the polarization unveils new insights into how matter flows around and into the black hole - and even hints at how some matter escapes! More details: apod.nasa.gov/apod/ap210331.html Credit: Event Horizon Telescope Collaboration

This large constellation is home to the Virgo Cluster, a massive group of galaxies. While the individual stars in Virgo are a part of our own galaxy, known as the Milky Way, the Virgo Cluster's members exist far beyond our own galaxy's borders. Teeming with around 2,000 known members, this massive group of galaxies are all gravitationally bound to each other, and are themselves members of the even larger Virgo Supercluster of galaxies, a sort of "super-group" made up of groups of galaxies. Our own Milky Way is a member of the "Local Group" of galaxies, which in turn is also a member of the Virgo Supercluster! In a sense, when we gaze upon the galaxies of the Virgo Cluster, we are looking at some of our most distant cosmic neighbors. At an average distance of over 65 million light years away, the light from these galaxies first started towards our planet when the dinosaurs were enjoying their last moments as Earth's dominant land animals! Dark clear skies and a telescope with a mirror of six inches or more will reveal many of the cluster's brightest and largest members, and it lends itself well to stunning astrophotos.

Virgo is naturally host to numerous studies of galaxies and cosmological research, which have revealed much about the structure of our universe and the evolution of stars and galaxies. The "Universe of Galaxies" activity can help you visualize the scale of the universe, starting with our home in the Milky Way Galaxy before heading out to the Local Group, Virgo Cluster and well beyond! You can find it at bit.ly/universeofgalaxies. You can further explore the science of galaxies across the Universe, along with the latest discoveries and mission news, at nasa.gov.



Caption: Find Virgo by "arcing to Arcturus, then spiking on to Spica." Please note that in this illustration, the location of the Virgo Cluster is approximate - the borders are not exact.

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

_____ Regular member ($30).

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

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

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

Donation (optional):

_____ Tax-deductible contribution to Tri-Valley Stargazers

Total enclosed: $ _____

Member agrees to hold Tri-Valley Stargazers, and any cooperating organizations or landowners, harmless from all claims of liability for any injury or loss sustained at a TVS function. TVS will not share information with anyone except as detailed in our Privacy Policy (http://www.trivalleystargazers.org/privacy.shtml).

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