Tri-Valley Stargazers

September 2021

PrimeFocus

WHEN:

September 17, 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:

Astronomy: From Passion to Profession
Rachel Freed, President-Institute for Student Astronomical Research

I will discuss how I turned my passion for astronomy and outreach into a profession. I teach astronomy research seminars to students and educators around the country and the world, and get to use telescope networks covering the globe. Following my passion and taking advantage of opportunities that came my way, along with meeting some amazing mentors has led me to a life better than I could have dreamed of in astronomy.

Caption: Hubble Space telescope images of some of the Messier objects, surrounding a portrait of their namesake, Charles Messier. Charles Messier was a comet hunter, and he catalogued these objects so he wouldn't confuse them with comets when making future observations. The Messier catalog contains a wide variety of astronomical objects that are visible to amateur astronomers through a modest telescope under a dark sky. For more information and credit see: https://www.nasa.gov/feature/goddard/2017/new-hubble-gallery-features-objects-from-popular-not-a-comet-messier-catalog.

Rachel Freed is a co-founder and the President of the Institute for Student Astronomical Research with a goal of incorporating scientific research into high school and undergraduate education. She is currently working on a PhD in astronomy education. She has a B.S. degree in Biology and an M.S. in Neuroscience. Rachel taught high school chemistry and astronomy for 10 years, and has conducted research on chemistry education. She has been an amateur astronomer for over 20 years and is involved in public outreach. She has been a volunteer docent at the Robert Ferguson Observatory in Sonoma County for 13 years. She is also the editor of the Journal of Double Star Observations, and on the board of the Advanced Imaging Conference. Rachel's work focuses on promoting changes in education that build on students' intrinsic motivations and interests.

News and Notes

2021 Meeting Dates

Lecture Meeting	Board Meeting	PrimeFocus Deadline
Sep. 17	Sep. 20	
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 8/23/21, our club's account balance is $64,179.96. This includes $44,156.20 in the H2O Rebuild fund.

TVS Welcomes New Members

TVS welcomes new members Alan Achor, Parveen Jagajeevan, Stefan Schmitz, and Manny Sawit. Please say hello and chat with them during our Zoom meetings.

H2O and Del Valle Observing Sites Reopened

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.

As of June 15, California state guidance on COVID-19 indicates that use of masks is not required for **outdoor** activities. However, common sense dictates that club members and guests

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

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

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

*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

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.

Outreach and Club Star Party Schedule

Unvaxed persons are required to wear masks for all indoor settings. For indoor Outreach Events, both vaxed and unvaxed persons are required to wear masks for events at K-12 Schools and at long term care facilities. For more information on COVID Guidance see:

https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/guidance-for-face-coverings.aspx

https://covid19.ca.gov/safely-reopening/

Save the dates for the 2021 Outreach and 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 Open House 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.

October 2, 6:30pm: TVS Club Star Party, Tesla Vintners, 5143 Tesla Rd., Livermore
October 9, 6:00pm: Outreach party at Del Valle Arroyo staging area
October 14, 6:30pm: Public Stargazing at Livermore Library, Observe the Moon program
November 7, 4:00pm: Outreach party at Sycamore Grove, near Arroyo and Veterans Roads

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

H2O Rebuild

Construction has started for a shed at H2O which will hold some large telescopes for use while the main observatories are being constructed. The job is now about half done and will require one more work party before the shed itself can be erected by a third work party. Once the summer heat and smoke abate, please consider participating in the rebuild effort when the call for work parties is forthcoming.

Calendar of Events

Available Anytime

What: How to Put Your Own Spin on JunoCam Images
Who: Dr. Candice Hansen (Planetary Science Institute)
Sponsor: SETI Institute
Online: https://www.youtube.com/watch?v=anonva8Dwg0

JunoCam takes images of Jupiter during the spacecraft's numerous flybys, and those raw images are available for citizen scientists and artists to process.

For more information on Juno, see:

Calendar of Events (con't)

https://www.nasa.gov/mission_pages/juno/main/index.html

September 11, 7:30pm

What: Advanced Instrumentation in Optical Astronomy
Who: Dr. Franck Marchis (SETI Institute)
Sponsor: Mt. Tam Astronomy Program
Online: https://us02web.zoom.us/j/89697734661

Ground-based telescopes have come a long way in recent decades. Today they can take advantage of adaptive optics systems that reduce the effect of atmospheric image distortion, and, also, of fast compact computers that allow small telescopes to reach the capability of large telescopes. The result is a lively community of citizen astronomers who (among other things) can detect exoplanets and help study the size, shape, and trajectory of near-Earth asteroids.

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

September 18, 25, October 2, 9:00pm-10:30pm

What: Virtual Telescope Viewing
Who: Chabot Staff
Sponsor: Chabot Space and Science Center
Online: https://www.youtube.com/channel/UCarFXs-04xmdHW_PVc7LWRg

Join our resident astronomers on Facebook Live and YouTube every Saturday evening live from Chabot's Observation deck!

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 for an open forum for all of your most 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/

September 21, 6:00pm

What: Planetary Defense: Defending Earth from Hazardous Asteroids
Who: Dr. Paul Abell (Johnson Space Center)
Sponsor: NASA Night Sky Network
Online: https://youtu.be/ldX5dtDLwQM

Dr. Paul Abell when he will share plans for the DART mission to demonstrate a technique to change the motion of an asteroid in space. This presentation will provide some background on potentially hazardous asteroids, recent Earth impacts, and NASA's activities to help protect Earth from asteroids.

The presentation will describe NASA's Double Asteroid Redirection Test (DART) mission as well as share information on the European Space Agency's (ESAs) Hera mission. DART will be the first demonstration of the kinetic impactor technique to change the motion of an asteroid in space.

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TVS E-Group
To join the TVS e-group just send an email message to TVS at: 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.

Calendar of Events (con't)

For more information, see:
https://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=696

September 22, 7:00pm

What: Is a Sixth Mass Extinction the Future of Living Species on Earth?
Who: Dr. Scott Sampson (California Academy of Sciences) and Dr. Peter Roopnarine Carol Cleland (California Academy of Sciences)
Sponsor: SETI Institute
Online: REGISTRATION REQUIRED
https://www.seti.org/event/seti-talks-sixth-mass-extinction-future-living-species-earth

Human society and the global ecosystem are at a critical point in time, facing climate and biodiversity crises. According to a recent analysis, the sixth mass extinction of wildlife on Earth is accelerating. More than 500 species of land animals are on the brink of extinction and are likely to be lost within 20 years, a number equivalent to the number lost over the entire last century.

Earth ecosystems have been through severe extinction crises in the past. There have been five mass extinction events during the last 450 million years, each destroying 70-95% of the species of plants, animals and microorganisms that previously existed. Causes of these events included massive volcanic eruptions, depletion of ocean oxygen or collision with an asteroid. Following each event, it took millions of years to regain the numbers of species comparable to those before the extinction event.

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

September 26, October 8, 6:30pm-10:00pm

What: Sunset Science
Who: Chabot Staff
Where: Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619
Cost: Members Free, Adults $15, Youth $5

Enjoy a warm summer evening of activities and stargazing on Chabot's stunning Observation Deck! Learn about stellar concepts and preview our new offerings with special demonstrations, hands-on challenges and more. When the Sun goes down, the stars come out for exploring the cosmos through historic telescopes.

During this event, we'll be learning all about meteors! Those illusive streaks of light that flash across the sky hold clues to the remnants of space rocks like asteroids and comets. Enjoy comet demonstrations, hands-on activities, and games and simulations that unlock the mysteries about these space objects. Find out where meteors originate and where to catch the next meteor shower.

Food, wine and beer will be available for purchase on-site.

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

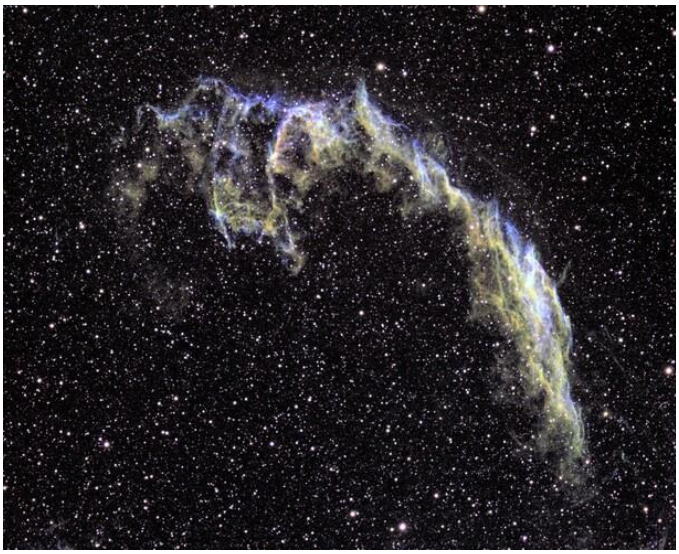
October 16, 7:30pm

What: Galactic Archaeology: Galaxy Assembly with Globular Star Clusters
Who: Prof. Charli Sakari (San Francisco State University)
Sponsor: Mt. Tam Astronomy Program
Online: https://us02web.zoom.us/j/89697734661

Globular star clusters are among the oldest objects in the Universe. Accordingly, they can provide valuable information about the early evolution of the galaxies they inhabit. This presentation, focusing on the Milky Way and Andromeda galaxies, will show what globular clusters reveal about their host galaxies' chemical composition. We will also explore the mysteries that still surround globular cluster formation, and possibilities for future observations.

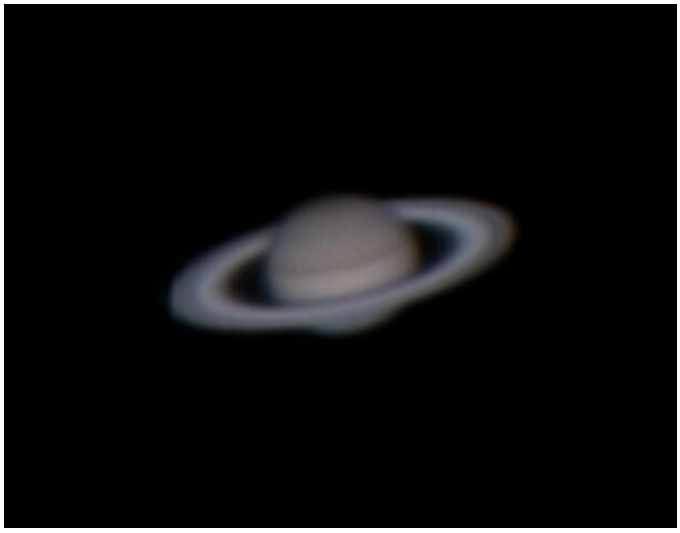
For more information see:
https://www.mttamastronomy.org/calendar and
https://youtube.com/MtTamAstronomy

TVS Astrophotos



Srikanth Gollapudi imaged the Eastern Veil Nebula using a Williams Optics GT71 and an ASI294mm Pro camera using Sulfur, Hydrogen, and Oxygen narrowband filters. For each filter 20 shots of 2 minutes duration were taken.

Lalitya Sawant imaged the Lagoon and Trifid Nebulas on August 4 using a full frame DSLR with a 70-200mm lens at f/2.8 without a tracker. The exposures were 200 x 1 sec at ISO6400, 200 x 1.3 sec at ISO3400, and 200 x 1.3 sec at ISO3200.



Scott Neith imaged Jupiter and Saturn, making the best of smokey skies. He used a Celestron 9.25” Schmidt Cassegrain telescope, a 2.5x TeleVue Powermate, an ASI224MC, and an atmospheric dispersion corrector with a Baader UV/IR cut filter. The images used the best 25% of 18,000 frames, obtained using Firecapture, and were processed using Registax.

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

All time are Pacific Daylight time

September

13	**Mon**	**First-Quarter Moon (1:39pm)**
15	Wed	The Moon , Saturn, and Jupiter form a line in the south-southeast (Evening)
16	Thu	The Moon and Saturn are ~4° apart (Evening)
17	Fri	The Moon and Jupiter are ~5.5° apart (Evening)
20	**Mon**	**Full Moon (4:55pm)**
26	Sun	The Moon is about halfway between Aldebaran and the Pleiades (Dawn)
28	**Tue**	**Last-Quarter Moon (6:57pm)**
30	Thu	The Crescent Moon in Gemini is ~2.5° from Pollux (Dawn)

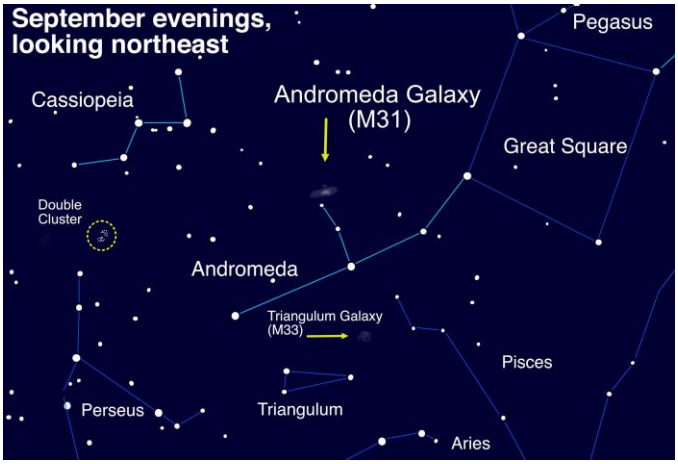
October

2	Sat	Algol at minimum brightness for 2 hours centered on 10:24pm
3	Sun	The Crescent Moon and Regulus, rising in the east, are separated by ~4° (Dawn)
4-	Mon-	Over the next 2 weeks the Zodiacal Light is visible in the east (beginning 2 hours before morning twilight)
5	Tue	Algol at minimum brightness for 2 hours centered on 7:13pm
6	**Wed**	**New Moon (4:05am)**
9	Sat	The Moon and Venus are ~2.5° apart in the southwest, with Antares 6° to their left (Dusk)
12	**Tue**	**First-Quarter Moon (8:25pm)**
14	Thu	The Moon, Jupiter, and Saturn form a triangle in the south-southeast (Dusk)
15	Fri	Venus is ~1.5° from Antares (Dusk)
20	Wed	Mercury and Porrima (Gamma Virginis) rise together in the east. Use binoculars (Dawn)
20	**Wed**	**Full Moon (7:57am)**
21	Thu	The Orionid Meteor shower peaks in the early hours, but the nearly Full Moon hampers viewing (Morning)
23	Sat	The Moon is ~4° left the Pleiades (Dawn)
24	Sun	The Moon is ~6.5° to the upper right of Aldebaran (Dawn)
25	Mon	Algol at minimum brightness for 2 hours centered on 8:54pm
27	Wed	The Moon is ~5° to the lower right of Pollux (Dawn)
28	**Thu**	**Last-Quarter Moon (1:05pm)**
28	Thu	Algol at minimum brightness for 2 hours centered on 8:43pm
31	Sun	Mercury leads Spica by ~5° in the east southeast (Dawn)

Catch Andromeda Rising

By David Prosper

If you're thinking of a galaxy, the image in your head is probably the Andromeda Galaxy! Studies of this massive neighboring galaxy, also called M31, have played an incredibly important role in shaping modern astronomy. As a bonus for stargazers, the Andromeda Galaxy is also a beautiful sight.

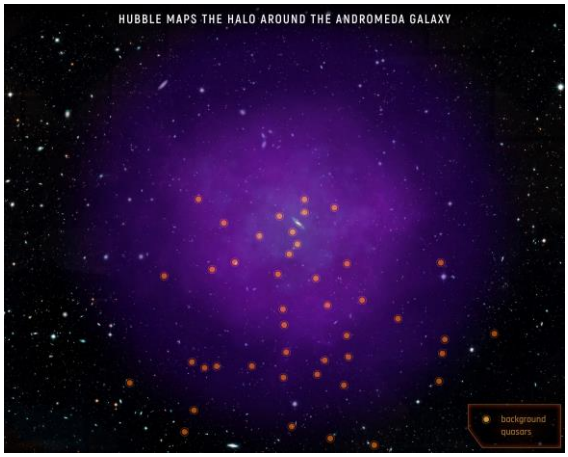


Caption: Spot the Andromeda Galaxy! M31's more common name comes from its parent constellation, which becomes prominent as autumn arrives in the Northern Hemisphere. Surprising amounts of detail can be observed with unaided eyes from dark sky sites. Hints of it can even be made out from light polluted areas. *Image created with assistance from Stellarium*

Have you heard that all the stars you see at night are part of our Milky Way galaxy? While that is mostly true, one star-like object located near the border between the constellations of Andromeda and Cassiopeia appears fuzzy to unaided eyes. That's because it's not a star, but the Andromeda Galaxy, its trillion stars appearing to our eyes as a 3.4 magnitude patch of haze. Why so dim? Distance! It's outside our galaxy, around 2.5 million light years distant - so far away that the light you see left M31's stars when our earliest ancestors figured out stone tools. Binoculars show more detail: M31's bright core stands out, along with a bit of its wispy, saucer-shaped disc. Telescopes bring out greater detail but often can't view the entire galaxy at once. Depending on the quality of your skies and your magnification, you may be able to make out individual globular clusters, structure, and at least two of its orbiting dwarf galaxies: M110 and M32. Light pollution and thin clouds, smoke, or haze will severely hamper observing fainter detail, as they will for any "faint fuzzy." Surprisingly, persistent stargazers can still spot M31's core from areas of moderate light pollution as long as skies are otherwise clear.

Modern astronomy was greatly shaped by studies of the Andromeda Galaxy. A hundred years ago, the idea that there were other galaxies beside our own was not widely accepted, and so M31 was called the "Andromeda Nebula." Increasingly detailed observations of M31 caused astronomers to question its place in our universe – was M31 its own "island universe," and not part of our Milky Way? Harlow Shapley and Heber Curtis engaged in the "Great Debate" of 1920 over its nature. Curtis argued forcefully from his observations of dimmer than expected nova, dust lanes, and other oddities that the "nebula" was in fact an entirely different galaxy from our own. A few years later, Edwin Hubble, building on Henrietta Leavitt's work on Cepheid variable stars as a "standard candle" for distance measurement, concluded that M31 was indeed another galaxy after he observed Cepheids in photos of Andromeda, and estimated M31's distance as far outside our galaxy's boundaries. And so, the Andromeda Nebula became known as the Andromeda Galaxy.

These discoveries inspire astronomers to this day, who continue to observe M31 and many other galaxies for hints about the nature of our universe. One of the Hubble Space Telescope's longest-running observing campaigns was a study of M31: the Panchromatic Hubble Andromeda Treasury (PHAT): bit.ly/m31phat . Dig into NASA's latest discoveries about the Andromeda Galaxy, and the cosmos at large, at nasa.gov.



Caption: While M31's disc appears larger than you might expect (about 3 Moon widths wide), its "galactic halo" is much, much larger – as you can see here. In fact, it is suspected that its halo is so huge that it may already mingle with our Milky Way's own halo, which makes sense since our galaxies are expected to merge sometime in the next few billion years! The dots are quasars, objects located behind the halo, which are the very energetic cores of distant galaxies powered by black holes at their center. The Hubble team studied the composition of M31's halo by measuring how the quasars' light was absorbed by the halo's material. *Credits: NASA, ESA, and E. Wheatley (STScI) Source: https://bit.ly/m31halo*

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
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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.