PrimeFocus

May 2025

WHEN

May 18, 2025
Doors open at 7:00pm
Meeting starts at 7:30pm
Lecture starts at 8:00pm

WHERE

Unitarian Church
1893 North Vasco Road
Livermore, CA 945571
and via Zoom

TVS QR CODE

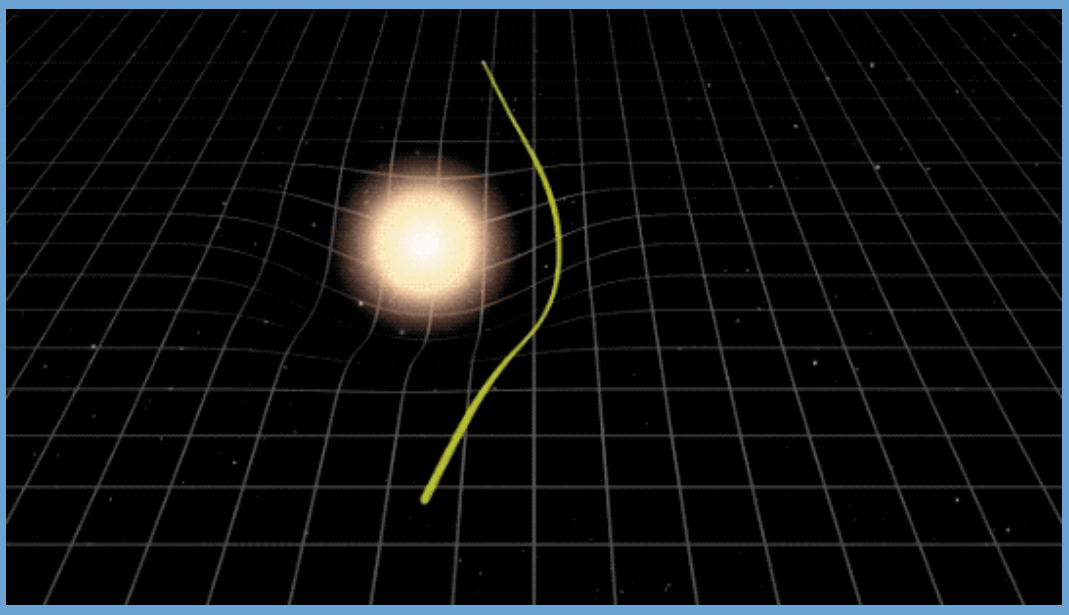
INSIDE THIS ISSUE

DEFLECTION OF LIGHT NEAR JUPITER
DR. WILLIAM (BILL) FISHER

In the August 2023 issue of Sky and Telescope Don Bruns made a call for volunteers to join an effort to attempt to measure the deflection of light due to Jupiter's gravity. Bill accepted that challenge.

Don and his other collaborators had noted that on October 27-27 2023 3 nearly collinear 7th magnitude stars would pass near Jupiter. One star would come within 25" of the surface of Jupiter and the two others were close enough to fit in the field of view of typical amateur imaging equipment. This configuration allowed for data reduction that could reduce the measurement error to around .003 arcsec, a factor of 2 greater than the expected deflection.

Bill will talk about the methods used; the results reported in the November 2024 issue of Sky and Telescope and follow on efforts to measure the deflection of light of Jupiter's moons.



This shows the path of light around an object that is warping space-time. The dent acts as a lens. Light from a distant object that passes near the lens will be bent, which can make the object appear brighter and distorted. NASA, ESA, and Goddard Space Flight Center/K. Jackson

Bill has been a member of TVS since 2018 when he retired after selling his company that provides the satellite scheduling algorithms for the aerospace industry (yes even NASA uses them). He has a Doctor of Science degree from MIT in Nuclear Engineering.

Prior to his software company he worked at the Lockheed Palo Alto Research Laboratory in experimental physics he developed programmable analog neural networks used for adaptive optics and high speed optimization. The adaptive mirror that Bill used for his experiments was also used at Lick observatory to demonstrate laser guide star adaptive optics.

He joined the Jupiter Star deflection effort in 2023.

NEWS AND NOTES

Meeting Dates

Club Meeting	Board Meeting	PrimeFocus Deadline
May 18	May 21	May 6
June 20	June 23	June 6
July 18	July 21	July 6

Money Matters

As of the last Treasurer's Report on 4/21/25, our club's account balance is $49,135.70, this includes $12,570.77 in the H2O Rebuild fund.

TVS Welcomes New Members

TVS welcomes new members George Ugarte and Steve Grau. Please say hello and chat with them during our meetings.

2025 TVS Club Star Party Schedule

Save the dates for the 2025 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 (Coords: 37.6196638, -121.7528899). The public is invited for the first 1.5-2 hours, while club members can stay the remainder of the night.

August 30: Del Valle Star Party, details to be determined

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.

June 21: Tesla Vintner's Star Party, 5143 Tesla Rd., Livermore. Set-up at 8:00pm, Observing 8:30-11:30pm.

July 19: Tesla Vintner's Star Party, 5143 Tesla Rd., Livermore. Set-up at 7:30pm, Observing 8:00-Midnight.

September 13: Tesla Vintner's Star Party, 5143 Tesla Rd., Livermore. Set-up at 6:30pm, Observing 7:00pm-11-30pm.

H2O Open House star parties are open to only club members and their guests. 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. No gas stations are available on the route, so be prepared. Admission is $3/car-bring exact change. H2O is a primitive site with two porta-potties. Bring water, food, and warm clothing, as needed. Red flashlights are to be used so observers can preserve their night vision.

June 14: H20 Open House, 5:00pm caravan to H2O PROMPTLY leaves the corner of Mines and Tesla Rds., Livermore. Observing until 11:30pm. Meeting times are tentative.

August 16: H20 Open House, 5:00pm caravan to H2O PROMPTLY leaves the corner of Mines and Tesla Rds., Livermore. Observing until 11:30pm. Meeting times are tentative.

May 31: Evening Stargazing at the Bankhead Theatre, 2466 8th Street Livermore. Set-up 7:30pm, Observing from 8:00-10:30pm. Livermore Amador Symphony will play a "Celestial Sounds" concert at the Bankhead Saturday evening May 31st. They would like us to set up out front for an intermission starting about 8:00-8:30. We would be looking at a first quarter moon in the daylight for this one. Then when the concert is over, a little starparty out front for until maybe 10 or so

June 28: Public star party at Sunol Regional Wilderness, 1895 Geary Road, Sunol. Set-up 8:00pm, Observing from 9:00-11:00pm.

CALENDAR OF EVENTS

May 23, 24, 30,31, June 6, 7, 13,14, 20, 21, 7:30-10:30pm

What	Free Telescope Viewing
Who	Chabot Staff
Where	Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost	Free

Join Chabot astronomers on the Observatory Deck for a free telescope viewing! Weather permitting, this is a chance to explore stars, planets and more through Chabot's historic telescopes. Chabot's three large historic telescopes offer a unique way to experience the awe and wonder of the Universe. Three observatory domes house the Center's 8-inch (Leah, 1883) and 20-inch (Rachel, 1916) refracting telescopes, along with a 36-inch reflecting telescope (Nellie, 2003).

Are the skies clear for viewing tonight? Viewing can be impacted by rain, clouds, humidity and other weather conditions. Conditions can be unique to Chabot because of its unique location in Joaquin Miller Park. Before your visit, check out the Weather Station to see the current conditions at Chabot.

For more information, see
https://chabotspace.org/events/events-listing/
https://eastbayastro.org/chabot-telescope-status/

May 28, 7:00 pm

What	Science at the Edge of the Solar System: Uncovering the Secrets of the Pluto System and Arrokoth
Who	Silicon Valley Astronomy Lecture Series
Where	Smithwick Theater (Bldg. 1000) at Foothill College, Los Altos
Cost	Free

Ten years ago the New Horizons spacecraft flew by the Pluto system and revealed an unexpectedly diverse range of landscapes on the dwarf planet and its largest moon Charon, implying complex geological histories for these distant worlds. Dr. White will lead a tour of their often bizarre terrains, some of which are still evolving, and will explain what processes scientists think molded them into their present appearances. After a brief stop at Pluto's four small moons, Dr. White will then extend the tour 2 billion km farther out into space to cover Arrokoth, the tiny planetesimal that New Horizons flew past three and a half years after visiting Pluto. It is the most primitive object in the Solar System yet visited by a spacecraft.

Dr. Oliver White is a planetary scientist at the SETI Institute. His research focuses on unraveling the geological histories of the planets and moons in our Solar System and learning how their surfaces have evolved. A member of the New Horizons mission team, he is particularly interested in the icy outer Solar System worlds, and has produced a geological map of Pluto to be published by the US Geological Survey. He is currently creating a similar map of Saturn's moon Tethys.

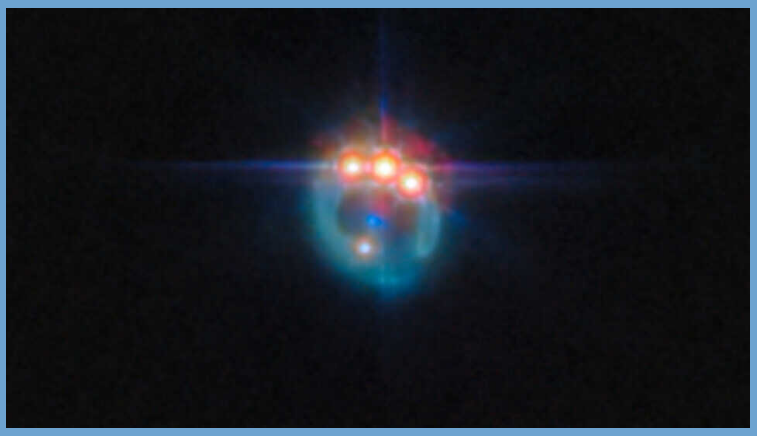
For more information, see https://www.seti.org/event/science-edge-solar-system-uncovering-secrets-pluto-system-and-arrokoth

June 2, 7:30 PM

What	Revealing Dark Matter with Strong Gravitational Lensing
Who	California Academy of Sciences
Where	Morrison Planetarium; 55 Music Concourse Drive, San Francisco, CA 94118
Cost	Public: $15; Members and seniors: $12

Featuring Dr. Anna Nierenberg, UC Merced

The overwhelming majority of matter in our Universe is believed to be an unknown new 'dark' particle that exists outside the standard model of physics and does not interact with light. An important goal of modern physics is to understand what this particle is. Dr. Nierenberg will provide an overview of the observational evidence for the existence of dark matter, introduce strong gravitational lensing- where space-time is bent by massive objects- and conclude by explaining how we are using this phenomenon to gain new insights into the nature of dark matter with the James Webb Space Telescope, Hubble Space Telescope, and Keck Observatories.



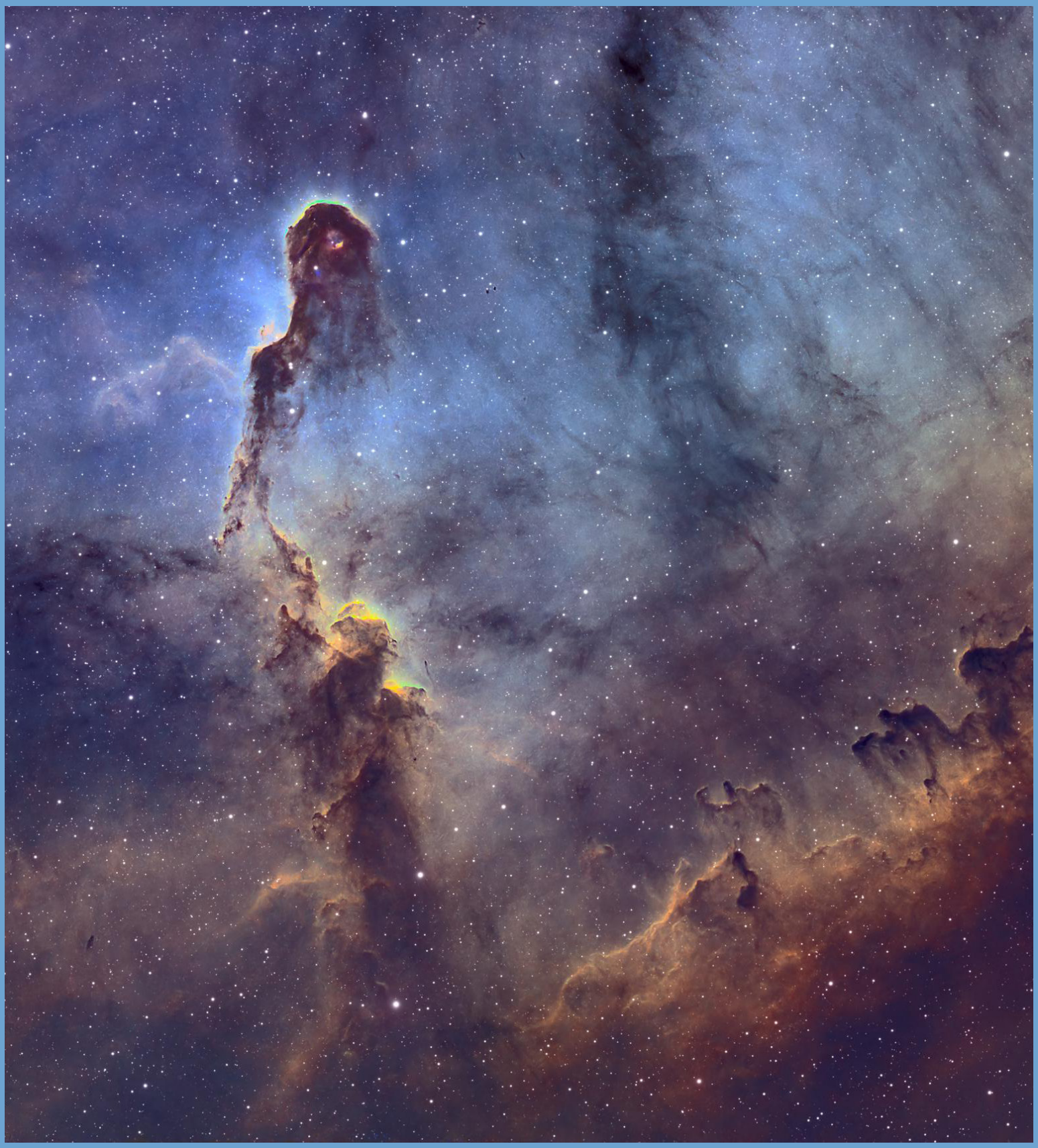
The gravitational lensing of the quasar known as RX J1131-1231 is considered one of the best lensed quasars discovered to date. The foreground galaxy smears the image of the background quasar into a bright arc and creates four images of the object. Credit: ESA/Webb, NASA & CSA, A. Nierenberg

Anna Nierenberg was born in Sacramento and raised in the Bay Area and San Diego. She received her B.S. in Physics from UCLA and her Ph.D. in Physics from UCSB. After a three-year stint at the University of Ohio as a Postdoctoral Fellow, Dr. Nierenberg was grateful to return to California and is currently a professor in the Physics Department at the University of California, Merced, researching dark matter.

For more information, see https://www.calacademy.org/events/benjamin-dean-astronomy-lectures/revealing-dark-matter-with-strong-gravitational-lensing

TVS ASTROPHOTOGRAPHY

The Sun, By Chris Irwin.
Imaged with a Coronado solarmax II double stack 60mm telescope and asi678mm camera from on the morning of May 5, 2025



Elephant's Trunk Nebula, By Swaroop Shere.
For a full resolution image see https://app.astrobin.com/i/1bsjmf

Soul Nebula, By Swaroop Shere.
For a full resolution image see https://app.astrobin.com/i/9dba70

WHATS UP

Adapted from Sky and Telescope

All times are Pacific Standard Time

May 2025		
20	Tue	Moon at last quarter
22	Thu	Early morning see Saturn trails the Moon by 3½° with Venus lower left as they rise in the east-southeast
23	Fri	Catch the thin crescent Moon, Saturn, & Venus in the morning as they arc along the eastern horizon
27	**Tue**	**New Moon**
29	Thu	In the evening, the waxing crescent moon is 5° below Pollux
31	Sat	See the Moon greet Mars for the second time this month, they will be less than 4° apart
June 2025		
1	Sun	At dusk, waxing crescent Moon about 1° upper right of Regulus
3	Tue	Moon at first quarter
5	Thu	Looking south-southwest in the evening, see the waxing gibbous Moon about 5° right of Spica
9	Mon	In the evening, look south-southeast to see the moon about 3½° upper right of Antares
11	**Wed**	**Full Moon**
16-17	Mon-Tue	Both nights, face west to see Mars ¾° above or upper right of Regulus
20	Fri	Longest day of the year, Summer begins at 7:42pm at the solstice

OFFICERS AND VOLUNTEER POSITIONS

Officers

President
Eric Dueltgen
president@trivalleystargazers.org

Vice-President
Aris Pope
vice_president@trivalleystargazers.org

Treasurer
John Forrest
treasurer@trivalleystargazers.org

Secretary
Dave Lackey
secretary@trivalleystargazers.org

Past President
Ron Kane
past_president@trivalleystargazers.org

Volunteer Positions

Astronomical League Rep.
Don Dossa
alrep@trivalleystargazers.org

Club Star Party Coordinator
Johnathan Bailey
coordinator@trivalleystargazers.org

Del Valle Coordinator
David Wright
delvalle@trivalleystargazers.org

Historian
OPEN
historian@trivalleystargazers.org

Librarian
Ron Kane
librarian@trivalleystargazers.org

Loaner Scope Manager
Ron Kane
telescopes@trivalleystargazers.org

Newsletter
Scott Schneider (Editor)
newsletter@trivalleystargazers.org

Webmaster
Swaroop Shere
webmaster@trivalleystargazers.org

Night Sky Network Rep.
Ross Gaunt
nnsn@trivalleystargazers.org

H2O Observatory Director / Rebuild Chairman
Chuck Grant
H20@trivalleystargazers.org

Observing Program Coordinator
Ron Kane
awards@trivalleystargazers.org

Outreach Coordinator
Johnathan Bailey
outreach@trivalleystargazers.org

Potluck Coordinator
OPEN
potluck@trivalleystargazers.org

Program Coordinator
Ron Kane
programs@trivalleystargazers.org

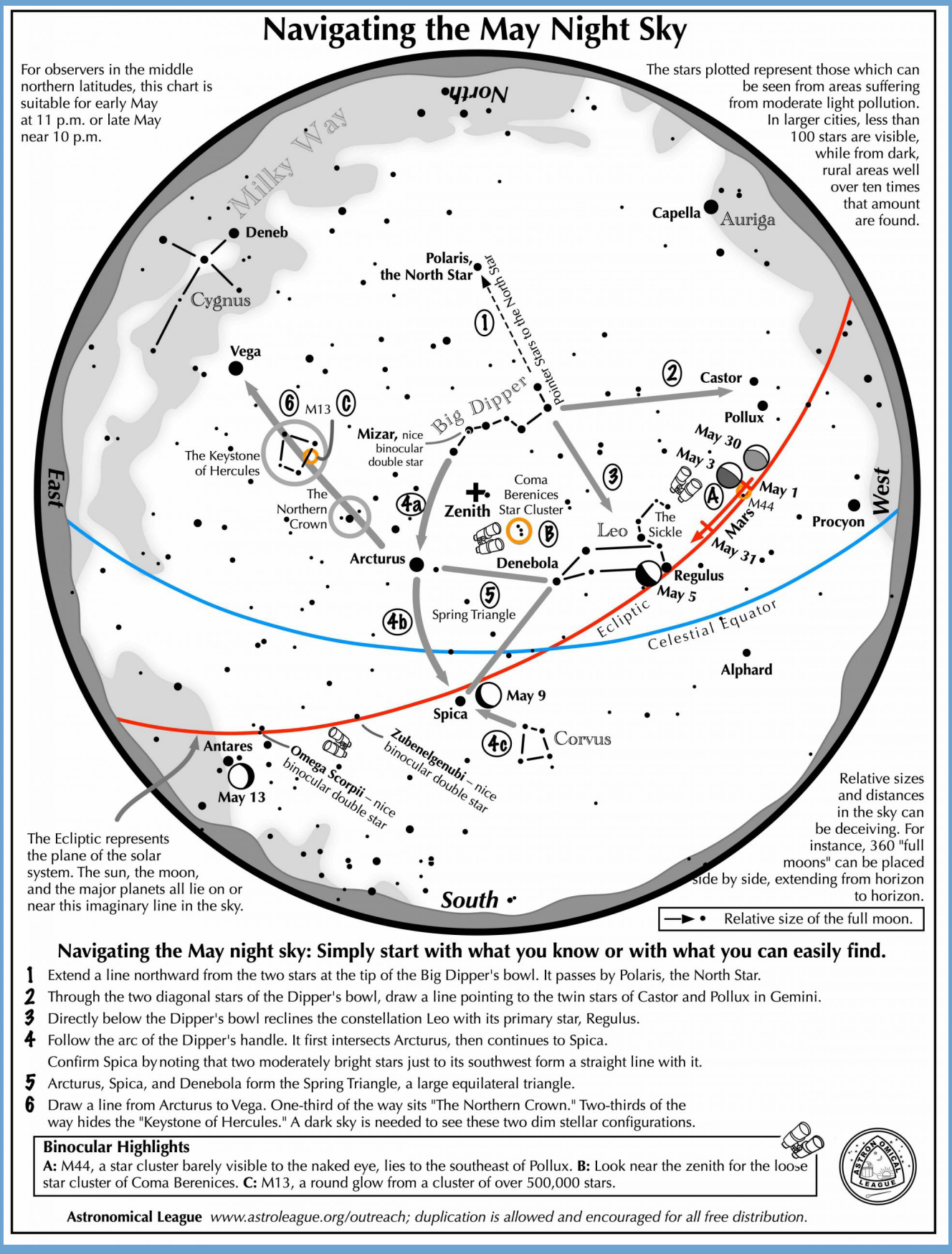
Publicity and Fundraising
OPEN
publicity@trivalleystargazers.org

Refreshment Coordinator
OPEN

Web and Email
www.trivalleystargazers.org
info@trivalleystargazers.org

TVS E-Group
To Join the TVS E-Group just send an email to TVS at info@trivalleystargazers.org asking to join the group. Make sure you specify the email address you want to use to read and post to the group.

NAVIGATING THE NIGHT SKY FOR MAY 2025



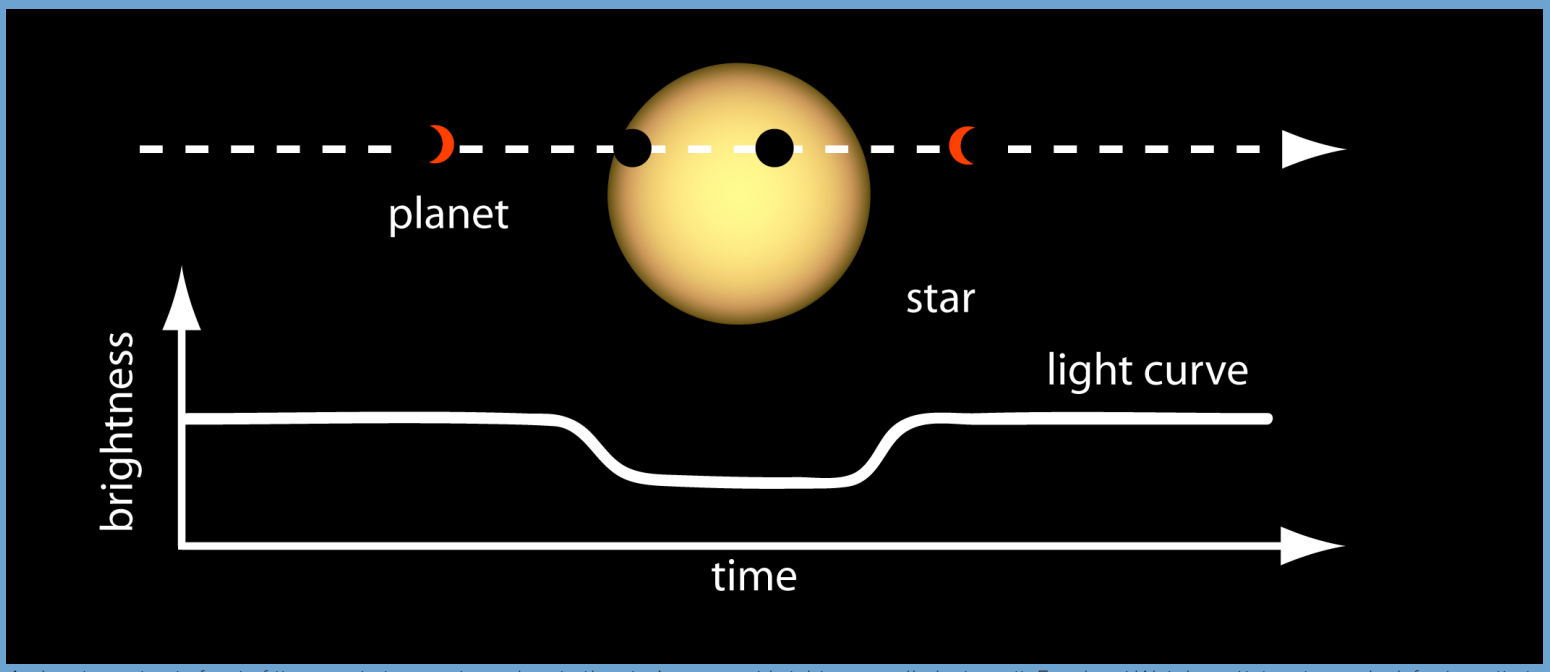
Download pdf here: https://www.astroleague.org/wp-content/uploads/2025/04/2025-May.pdf

NASA NIGHT SKY NOTES

How Do We Find Exoplanets?
By: Dave Prosper
Updated by: Kat Troche

Astronomers have been trying to discover evidence that worlds exist around stars other than our Sun since the 19th century. By the mid-1990s, technology finally caught up with the desire for discovery and led to the first discovery of a planet orbiting another sun-like star, Pegasi 51b. Why did it take so long to discover these distant worlds, and what techniques do astronomers use to find them?

The Transit Method



A planet passing in front of its parent star creates a drop in the star's apparent brightness, called a transit. Exoplanet Watch participants can look for transits in data from ground-based telescopes, helping scientists refine measurements of the length of a planet's orbit around its star. Credit: NASA's Ames Research Center

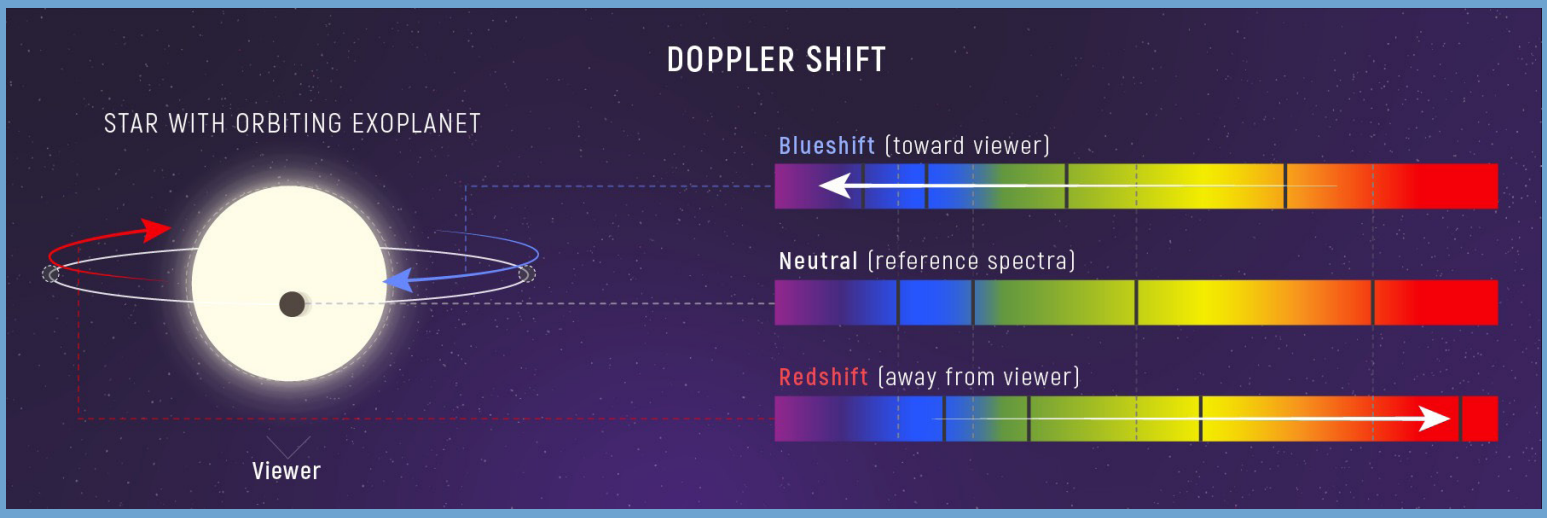
One of the most famous exoplanet detection methods is the transit method, used by Kepler and other observatories. When a planet crosses in front of its host star, the light from the star dips slightly in brightness. Scientists can confirm a planet orbits its host star by repeatedly detecting these incredibly tiny dips in brightness using sensitive instruments. If you can imagine trying to detect the dip in light from a massive searchlight when an ant crosses in front of it, at a distance of tens of miles away, you can begin to see how difficult it can be to spot a planet from light-years away! Another drawback to the transit method is that the distant solar system must be at a favorable angle to our point of view here on Earth – if the distant system's angle is just slightly askew, there will be no transits. Even in our solar system, a transit is very rare. For example, there were two transits of Venus visible across our Sun from Earth in this century. But the next time Venus transits the Sun as seen from Earth will be in the year 2117 – more than a century from now, even though Venus will have completed nearly 150 orbits around the Sun by then!

The Wobble Method

Spotting the Doppler shift of a star's spectra was used to find Pegasi 51b, the first planet detected around a Sun-like star. This technique is called the radial velocity or "wobble" method. Astronomers split up the visible light emitted by a star into a rainbow. These spectra, and gaps between the normally smooth bands of light, help determine the elements that make up the star. However, if there is a planet orbiting the star, it causes the star to wobble ever so slightly back and forth. This will, in turn, cause the lines within the spectra to shift ever so slightly towards the blue and red ends of the spectrum as the star wobbles slightly away and towards us. This is caused by the blue and red shifts of the planet's light. By carefully measuring the amount of shift in the star's spectra, astronomers can determine the size of the object pulling on the host star and if the companion is indeed a planet. By tracking the variation in this periodic shift of the spectra, they can also determine the time it takes the planet to orbit its parent star.

Exoplanets continues to page 10

Exoplanets continued



As a planet orbits a star, the star wobbles. This causes a change in the appearance of the star's spectrum called Doppler shift. Because the change in wavelength is directly related to relative speed, astronomers can use Doppler shift to calculate exactly how fast an object is moving toward or away from us. Astronomers can also track the Doppler shift of a star over time to estimate the mass of the planet orbiting it. Credit: NASA, ESA, CSA, Leah Hustak (STScI)

Direct Imaging

Finally, exoplanets can be revealed by directly imaging them, such as this image of four planets found orbiting the star HR 8799! Space telescopes use instruments called coronagraphs to block the bright light from the host star and capture the dim light from planets. The Hubble Space Telescope has captured images of giant planets orbiting a few nearby systems, and the James Webb Space Telescope has only improved on these observations by uncovering more details, such as the colors and spectra of exoplanet atmospheres, temperatures, detecting potential exomoons, and even scanning atmospheres for potential biosignatures!

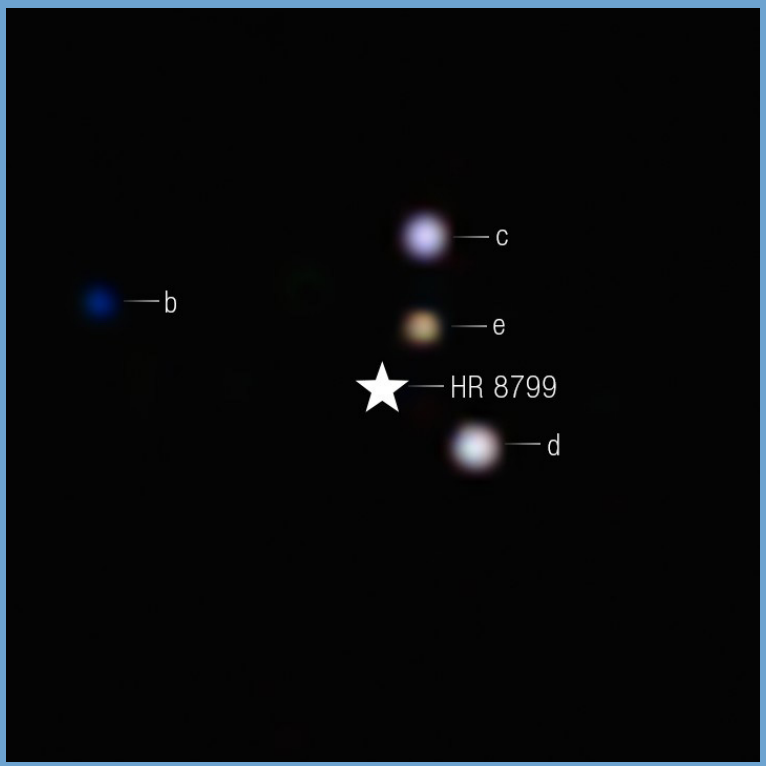


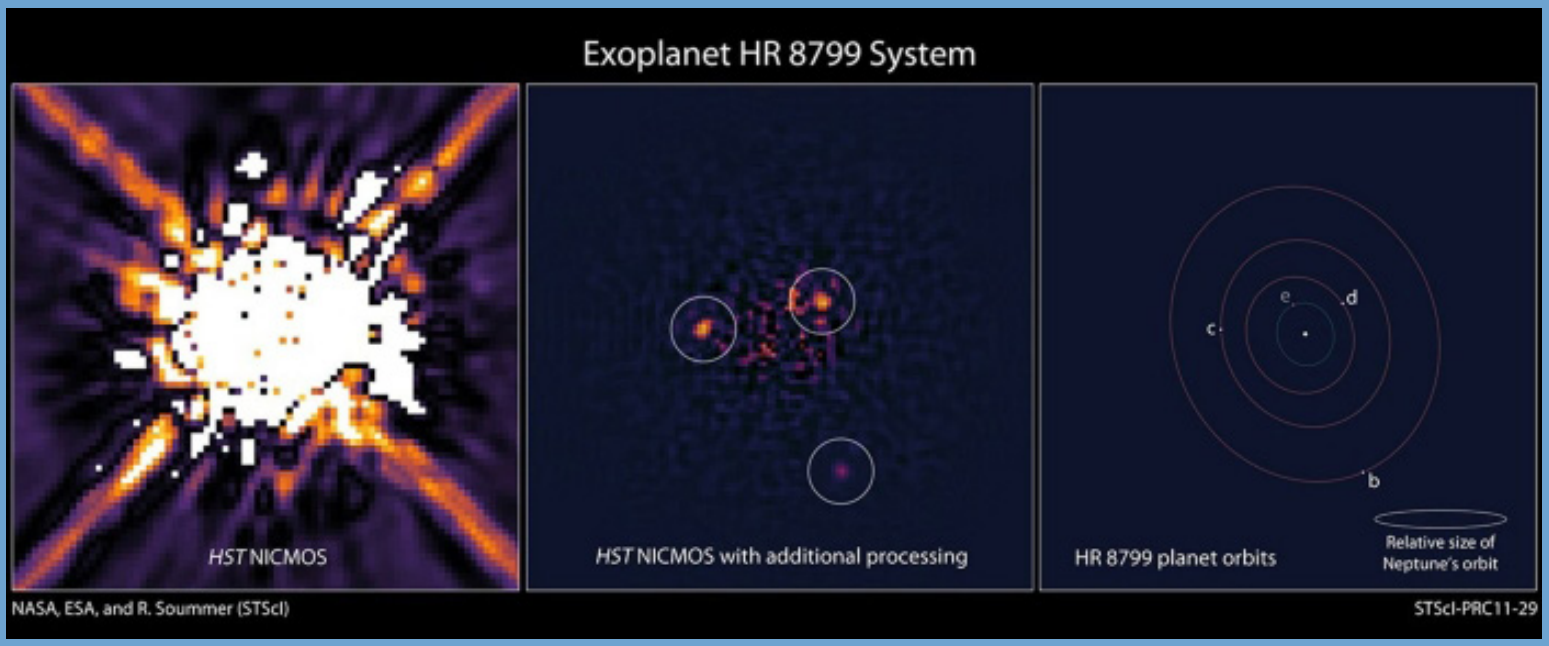
Image taken by the James Webb Space Telescope of four exoplanets orbiting HR 8799. Credit: NASA, ESA, CSA, STScI, Laurent Pueyo (STScI), William Balmer (JHU), Marshall Perrin (STScI)

Exoplanets continues to page 11

Exoplanets continued

You can find more information and activities on NASA's Exoplanets page, such as the Eyes on Exoplanets browser-based program, The Exoplaneteers, and some of the latest exoplanet news. Lastly, you can find more resources in our News & Resources section, including a clever demo on how astronomers use the wobble method to detect planets!

The future of exoplanet discovery is only just beginning, promising rich rewards in humanity's understanding of our place in the Universe, where we are from, and if there is life elsewhere in our cosmos.



Hubble HR 8799 System: https://i.imgur.com/RUeBxHc.jpg

ADDITIONAL LINKS:
Doppler Shift: https://webbtelescope.org/contents/media/images/01F8GFCAM7Q0EMKZ3QFAF9AQJ3
Hubble - HR 8799 Exoplanet System: https://science.nasa.gov/asset/hubble/hr-8799-exoplanet-system/
JWST - HR 8799 Exoplanet System: https://webbtelescope.org/contents/media/images/2025/114/01JNH6DYZE7RX03V4PY9E2K5DT
Activity - Wobbles and Transits: https://nightsky.jpl.nasa.gov/news/413/
NASA Exoplanets: https://science.nasa.gov/exoplanets/
Eyes on Exoplanets: https://eyes.nasa.gov/apps/exo/#/
The Exoplaneteers: https://exoplanets.nasa.gov/alien-worlds/the-exoplaneteers/?intent=021

This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, 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.