

PRIMEFOCUS

Tri-Valley Stargazers



November 2018



Meeting Info

What: Starhopping 101

Who: Rob Hawley

When:

November 16, 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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November Meeting

Starhopping 101

Rob Hawley

Manufacturers would like to sell you a fancy fully-automated scope. However, with some education it is straightforward to find objects in the sky by knowing how to use a star chart. This talk will cover the techniques I use both using paper charts and newer iPad planetarium programs. We will learn how to read a star chart and how to gain hints for searching using the information embedded in them. I will show how to use field of view to give hints of how

to move your telescope. These are the same things I do to locate objects with the 30" Challenger Telescope. Finally, I will teach you some simple star hops to impress your customers at the next star party.

One of the most popular parts of my website is my instructions on how to find objects during a Messier Marathon. Those star hops, of course, apply all year. For more information, see: <http://www.robhawley.net/>

I have been very active in astronomy for the past 16 years; first as a visual astronomer and more recently as an imager. TVS is already acquainted with my passion for Solar Eclipses. I am Treasurer of the Fremont Peak Observatory Association and have been volunteering in their public programs for the last nine years. I did public programs for SJAA before that, including running CalStar for 5 years.

TVS Elections at the November Meeting

TVS will hold its annual election at the November 16 meeting. Rich Combs will present the slate of candidates, and election is by acclamation. The present nominations are:

- President: Roland Albers
- Vice President: Eric Dueltgen
- Secretary: Ron Kane
- Treasurer: Dave Feindel

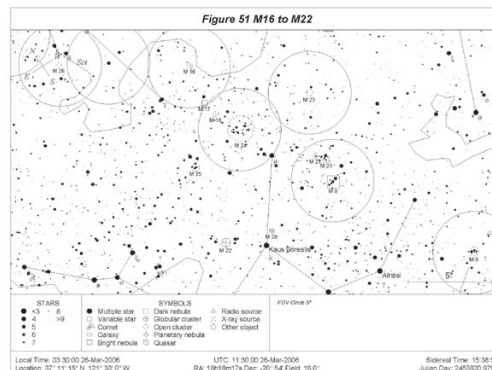


Image Caption: Finder Chart for locating various Messier objects in the southern Milky Way. See: <http://www.robhawley.net/mm/51-M16-to-M22.pdf>

News & Notes

2018 and 2019 TVS Meeting Dates

Below are the TVS meeting dates for 2018 and 2019. 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
Nov. 16	Nov. 19	
Dec. 21	Dec. 17*	Nov. 30
Jan. 18	Jan. 22	Dec. 28
Feb. 15	Feb. 18	Jan. 25
Mar. 15	Mar. 18	Feb. 22
Apr. 19	Apr. 22	Mar. 29
May 17	May 20	Apr. 26
Jun. 21	Jun. 24	May 31
Jul. 19	Jul. 22	Jun. 28
Aug. 16	Aug. 19	Jul. 26
Sep. 20	Sep. 23	Aug. 30
Oct. 18	Oct. 21	Sep. 27
Nov. 15	Nov. 18	Oct. 25
Dec. 20	Dec. 23	Nov. 29

Money Matters

As of the last Treasurer's Report on 10/22/18, our club's checking account balance is \$13,827.98.

TVS Welcome to New Members

TVS would like to welcome new member Kaushik Bhowmik. Please say hello and chat with him at upcoming club meetings.

Time to Renew Club Membership for 2019

TVS membership has reached 153, the largest since 1999! Now is a great time to become part of TVS. Membership is open to anyone with an interest in astronomy. Amateurs and professionals are equally welcome; skilled amateurs comprise the majority of the membership. You do not have to own a telescope in order to be a member.

Those renewing their club membership are encouraged to do so by using the online application before the end of December. Normally our memberships are only good for the calendar year, but anyone joining after October 1st will be given a membership for the remainder of 2018 and all of 2019. The regular club membership remains a bargain at \$30. Student membership (High School or College) is only \$5! Alternatively, Patron Membership, which grants use of the club's 17.5" reflector at H2O, is available at the annual rate of \$100.00.

You can join TVS or renew your membership online at:

<http://www.trivalleystargazers.org/membership.shtml> After filling out the application form you are connected to the

PayPal payment form. You do not need to have a PayPal account to pay online, since PayPal will accept credit cards. Everyone is encouraged to use the online application. Alternatively, you can mail in the Membership Application on the last page of this newsletter along with a check to the Tri-Valley Stargazers, P.O. Box 2476, Livermore, CA 94551-2476. Note that TVS will not share your information with anyone. We only use the e-mail address to notify you when the newsletter becomes available.

All members agree to hold the 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.

2019 RASC Handbooks and Calendars

In the past, the club has taken pre-orders for the Royal Astronomical Society of Canada's (RASC) annual Observer's Handbook and Observer's Calendar. We've purchased them in volume at a discount and passed the savings on to club members. Unfortunately, this club benefit has become increasingly difficult to administer, particularly distributing the materials after they arrive. So, we will no longer be offering this service. But have no fear! The Astronomical League is now offering the same benefit. If you'd like to purchase any 2019 RASC materials, please go to <https://store.astroleague.org> where you can still purchase them at a significant discount. Plus your RASC publications will be shipped directly to your home! For more information, go to the above website or refer to page 11 in the September issue of Reflector magazine.

Holiday Gifts: TVS Crystal Wine Glasses and Baseball Caps For Sale

TVS is offering elegant crystal wine glasses for sale to club members. You don't have to drink wine to enjoy the beautiful TVS logo-etched stemware. Use them for your favorite beverage, or they can be used as a beautiful container for small plants. They are the perfect gifts for loved ones or friends. Look for them at club meetings, where they will be sold for \$10/each. Don't drink alone, buy two! Support TVS!

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 wine glass or cap.

Header Image: Hidden Hill Observatory before the recent upgrades. See p.4 for the report on the amazing transformation that has occurred! Image Credit: Gert Gottschalk

Calendar of Events

November 13, 7:00pm-8:00pm

What: A Tribute to Kepler: Past, Present and Future of the Search for Exoplanets
Who: Prof. Natalie Batalha and Dr. Doug Caldwell
Where: SRI Conference Center, 333 Ravenswood Ave., Menlo Park, CA 94205 (Enter from Middlefield Rd.)
Cost: Free, see the website to register

A few days ago, NASA announced the end of Kepler's data collection, the search and characterization of extra-solar planets and life they could harbor. This is not the end of the NASA Kepler mission since there is still a significant amount of data to be analyzed.

Kepler was NASA's first mission dedicated to the search for planets around other stars, called exoplanets. The first exoplanet was discovered just 20 years prior to launch, and only a few hundred more were discovered in that time, with most of them inhabitable and more similar to gas giants like Jupiter than Earth. In the nearly ten years since Kepler's launch, data from the spacecraft has resulted in the detection of thousands of exoplanets, with a multitude of them the size of Earth or smaller, and many of them at the right distance from their star to possibly support life. Thanks to data from Kepler we now have greater understanding of two terms of the Drake Equation that had eluded us for fifty-seven years --- we now know there are even more planets than stars in our galaxy and that a significant number of them could have the right conditions to be habitable.

The search will continue with new space telescopes like TESS, and future generation of large space telescopes like JWST.

For more information see: <http://www.seti.org/talks>, e-mail

info@seti.org, or phone 650-961-6633.

November 14, 7:00pm

What: Cosmology and Ambition: Losing the Nobel Prize
Who: Dr. Brian Keating, UC San Diego
Where: Smithwick Theatre, 12345 El Monte Road, Los Altos Hills, CA 94022
Cost: Free, \$3 parking (Credit Cards or \$1 dollar bills)

What would it have been like to be an eyewitness to the Big Bang? In 2014, astronomers using the powerful BICEP2 telescope at the South Pole thought they'd glimpsed evidence of the period of cosmic inflation at the beginning of time. Millions around the world tuned in to the announcement, and Nobel whispers spread like wildfire. But had these scientists been deceived by a galactic mirage? In this popular-level talk, cosmologist Brian Keating tells the inside story of BICEP2's detection and the ensuing scientific drama. He provocatively argues that the Nobel Prize actually hampers scientific progress by encouraging speed and competition while punishing inclusivity, collaboration, and bold innovation.

Afterward, Dr. Keating will autograph copies of his book (available for purchase, *Losing the Nobel Prize: A Story of Cosmology, Ambition, and the Perils of Science's Highest Honor*).

For more information see: <https://foothill.edu/astronomy/> or phone 650-949-7888.

November 17, 7:30pm-9:30pm

What: Mountains I Have Known: A Photographic Journey Through Art, Astronomy, and Place
Who: Laurie Hatch
Where: Houge Park, 3872 Twilight Dr., San Jose, CA

continued on p. 4

Officers	Volunteer Positions	Night Sky Network Rep.:	Refreshment Coordinator:
President: Rich Combs president@trivalleystargazers.org	Astronomical League Rep.: Dennis Beckley alrep@trivalleystargazers.org	Ross Gaunt nnsn@trivalleystargazers.org	Laurie Grefsheim
Vice-President: Eric Dueltgen vice_president@trivalleystargazers.org rs.org	Club Star Party Coordinator: Eric Dueltgen coordinator@trivalleystargazers.org	Newsletter Editor: Ken Sperber newsletter@trivalleystargazers.org 925-361-7435	Webmaster: Hilary Jones webmaster@trivalleystargazers.org
Treasurer: Roland Albers treasurer@trivalleystargazers.org	Del Valle Coordinator: David Feindel delvalle@trivalleystargazers.org	Observatory Director/Key Master: Chuck Grant observatory@trivalleystargazers.org	Web & E-mail www.trivalleystargazers.org info@trivalleystargazers.org
Secretary: Ron Kane secretary@trivalleystargazers.org	Historian: Hilary Jones historian@trivalleystargazers.org	Outreach Coordinator: Eric Dueltgen outreach@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.
Past President: Chuck Grant past_president@trivalleystargazers.org rs.org	Internat. Dark-Sky Assoc. Rep.: Aadi Duggal darksky@trivalleystargazers.org	Potluck Coordinator: Jill Evanko potluck@trivalleystargazers.org	
	Librarian: Ron Kane librarian@trivalleystargazers.org	Program Coordinator: Lance Simms programs@trivalleystargazers.org	
	Loaner Scope Manager: Ron Kane telescopes@trivalleystargazers.org	Publicity Coordinator: Jim Theberge publicity@trivalleystargazers.org	

Calendar of Events (continued)

Cost: Free

Laurie Hatch will take you on an insider's photo tour of Lick Observatory on Mount Hamilton and W. M. Keck Observatory on Mauna Kea. You'll also visit the Eastern Sierra's Alabama Hills, and Mount Whitney where early Lick Observatory astronomers made definitive studies of the Martian atmosphere. The talk includes behind-the-scenes material and references which will interest astronomy buffs and photographers alike.

For more information see: <https://www.meetup.com/SJ-Astronomy/events/255991611/>

December 3, 7:30pm

What: Journeys to the Moon With NASA

Who: Brian H. Day, NASA Ames Research Center

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.

As NASA, the nation, and the world prepare to celebrate the 50th anniversary of the first human landing on the Moon, we will examine NASA's missions of lunar exploration. We will review the missions that led to Apollo as well as the six individual Apollo missions, explore missions that came after Apollo, and finally look ahead to what's in store for future lunar exploration. After the talk, you'll have a chance to touch an actual piece of the Moon!

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

December 7, 6:00pm-7:45pm

What: First Friday

Who: Fun for the Family

Where: Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619

Cost: \$5 Admission begins at 6pm, Book Online

Each \$5 First Friday at Chabot is an exciting and immersive experience for all ages! Join us each month for hands-on activities and live demonstrations that are fun for the whole family. Each month there will be new things to explore!

For more information see: <https://chabotspace.org/events/events-listing/> or for more information, call (510) 336-7373.

H2O Upgrade Report

Hidden Hill Observatory (H2O) Director Chuck Grant, and club members Gert Gottschalk, Roland Albers, Rich Combs, Eric Dueltgen, and K. Ross Gaunt made multiple trips to H2O to upgrade the observatory. Roland Albers reports that they

replaced a rotted side panel, the decking on the west side of the building, the carpeting inside the building, and repainted the entire building, and installed the new mount.



Caption: Rich Combs removes a rotted side panel. Credit: Ross Gaunt



Caption: Eric Dueltgen nails the new decking into place. Credit: Ross Gaunt



Caption: Roland Albers applies a sealant to underside of the roof. Credit: Ross Gaunt

H2O Upgrade Report (continued)



Caption: With a new coat of paint the observatory structure will be protected for years to come. Credit: Ross Gaunt

In the meantime Chuck Grant and Gert Gottschalk worked on installing the AP-1200 mount. Gert reported that Chuck's previous eyeball alignment of the mount attachment plate on the pier was spot-on, and minimal azimuth adjustment was needed to polar align the telescope.



Caption: Chuck and Gert complete the attachment of the AP-1200 mount to the pier. Credit: Gert Gottschalk

Chuck predrilled the optical tube assembly (OTA) mounting plate to facilitate bolting the telescope to the Declination plate of the AP-1200. With Gert's additional counterweight bar extension and 25 pound weight on loan to TVS, they were able to balance the 130 pound OTA. Due to the weight of the OTA, Chuck installed a step-up voltage converter to

provide 15 volts to drive the mount, as recommended by Astro-Physics. Slewing in both axis draws about 2 amps of current at the 15V boosted supply. The cabling to power the telescope and hook up a laptop to the mount were run under the floor to prevent a trip and fall hazard in the dark.



Caption: Mounted and balanced on the AP-1200, the Jack Marling telescope is ready to provide stunning views of night sky objects. Credit: Gert Gottschalk

After dark the scope was polar aligned using drift and meridian flip. It was necessary to shim the OTA to eliminate cone error. Cone error would prevent the OTA from pointing exactly to the celestial north pole. It also creates pointing errors when the mount flips across the meridian. There will surely be more precision alignment in the future but for the first light pointing it was OK.

First light was Mars, though the seeing was pretty bad. M2, M15, M27, M71, M74, M31, M33, NGC457, and other objects were successfully observed. Roland established the serial connection between Stellarium on his laptop and the mount and slewed to Uranus and Neptune, which were near the center of the field of view.

The deployment was a great success and at 9:30pm we shut the mount down. There will be additional work needed to replace a faulty battery charger for the solar cells in the coming weeks, and a counterweight bar extension and a 25 pound counterweight need to be purchased to replace those on loan from Gert.

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

All times are Pacific Standard Time

November

- 11 Sun Saturn and the crescent Moon are about 3° apart (Dusk)
- 14 Wed Venus and Spica separated by 1° in the southeast (Dawn)
- 15 Thu **First-Quarter Moon (6:54am) is 3° to the lower-right of Mars (Evening)**
- 17-18 Sat- The weak Leonid Meteor Shower (Evening of the 17th to the morning of the 18th)
- 22 Thu **Full Moon (9:39pm)**
- 23 Fri The Moon and Aldebaran are about 3° apart (Evening)
- 29 Thu Regulus about 2° to the lower-right of the Moon (Morning)
- 29 Thu **Last-Quarter Moon (4:19pm)**
- 29 Thu Algol at minimum brightness for 2 hours centered on 10:04pm PST

December

- 2-4 Sun- The crescent Moon approaches Venus and Spica (Early Morning)
- 2 Sun Algol at minimum brightness for 2 hours centered on 6:53pm PST
- 6 Thu **New Moon (11:20pm)**
- 13-14 Thu Geminid Meteor shower peaks on the morning of the 14th
- 14 Fri The Moon and Mars are separated by 4° in the southeast (Evening)
- 15 Sat **First-Quarter Moon (4:49am)**
- 19 Wed Algol at minimum brightness for 2 hours centered on 11:47pm PST
- 20-21 Thu The almost full Moon is near the Hyades (All Night)
- 21 Fri Jupiter and Mercury are less than 1° in the southeast (Predawn)
- 22 Sat **Full Moon (10:49am)**
- 22 Sat Algol at minimum brightness for 2 hours centered on 8:36pm PST
- 24-25 Mon The Moon passes 0.5° - 4° from M44, the Beehive Cluster (All Night)
- 29 Sat **Last-Quarter Moon (1:34am)**

November's Dance of the Planets

By Jane Houston Jones and
Jessica David Prosper

November's crisp autumn skies bring great views of our planetary neighbors. The Moon pairs up with Saturn and Mars in the evenings, and mornings feature eye-catching arrangements with dazzling Venus.



Stargazers wanting a challenge can observe a notable opposition by asteroid 3 Juno on the 17th and watch for a few bright Leonid meteors.

Red Mars gleams high in the southern sky after sunset. Saturn sits westward in the constellation Sagittarius. A young crescent Moon passes near Saturn on the 10th and 11th. On the 15th a first quarter Moon skims by Mars, coming within 1 degree of the planet. The red planet receives a new visitor on November 26th, when NASA's InSight mission lands and begins its investigation of the planet's interior. News briefings and commentary will be streamed live at: bit.ly/landsafe

Two bright planets hang low over the western horizon after sunset as November begins: Jupiter and Mercury. They may be hard to see, but binoculars and an unobstructed western horizon will help determined observers spot them right after sunset. Both disappear into the Sun's glare by mid-month.

Early risers are treated to brilliant Venus sparkling in the eastern sky before dawn, easily outshining everything except the Sun and Moon. On November 6th, find a location with clear view of the eastern horizon to spot Venus next to a thin cres-

cent Moon, making a triangle with the bright star Spica. The following mornings watch Venus move up towards Spica, coming within two degrees of the star by the second full week of November. Venus will be up three hours before sunrise by month's end – a huge change in just weeks! Telescopic observers are treated to a large, 61" wide, yet razor-thin crescent at November's beginning, shrinking to 41" across by the end of the month as its crescent waxes.

Observers looking for a challenge can hunt asteroid 3 Juno, so named because it was the third asteroid discovered. Juno travels through the constellation Eridanus and rises in the east after sunset. On November 17th, Juno is at opposition and shines at magnitude 7.4, its brightest showing since 1983! Look for Juno near the 4.7 magnitude double star 32 Eridani in the nights leading up to opposition. It is bright enough to spot through binoculars, but still appears as a star-like point of light. If you aren't sure if you have identified Juno, try sketching or photographing its star field, then return to the same area over the next several days to spot its movement.

The Leonids are expected to peak on the night of the 17th through the morning of the 18th. This meteor shower has brought "meteor storms" as recently as 2002, but a storm is not expected this year. All but the brightest meteors will be drowned out by a waxing gibbous Moon. Stay warm and enjoy this month's dance of the planets!

You can catch up on all of NASA's current and future missions at nasa.gov

With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!

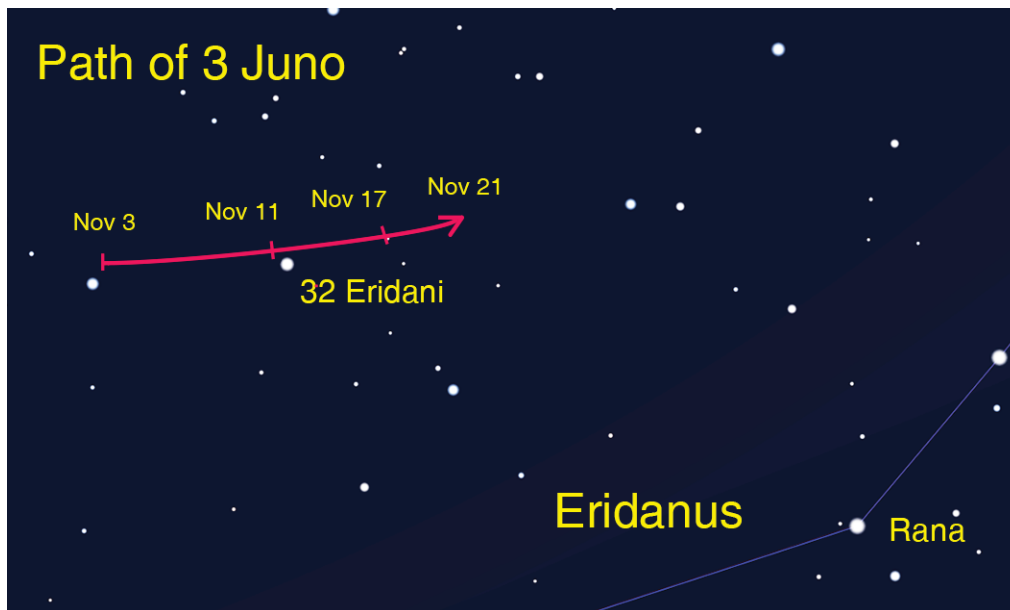


Image Caption: This finder chart shows the path of the asteroid 3 Juno as it glides past 32 Eridani in November 2018. The asteroid's position is highlighted for selected dates, including its opposition on the 17th. Image created in Stellarium for NASA Night Sky Network.



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.