

PRIMEFOCUS

Tri-Valley Stargazers



March 2019



Meeting Info

What: Telescope Mirror Making

Who: Richard Ozer, EAS President

When:

March 15, 2019
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

Inside

News & Notes	2
Calendar of Events	3
Ultima Thule in 3D	5
What's Up	6
NASA Night Sky Notes	7
Membership/Renewal Application	8

March Meeting

Telescope Mirror Making: Back to the Future, or is it Forward to the Past

By Richard Ozer, President, Eastbay Astronomical Society

In this talk, Richard will discuss how to make your own telescope mirror in the 21st century and end up with a fine instrument that will last your entire life.

Richard Ozer is the current President of the Eastbay Astronomical Society and, for the last 20 years, co-director of the Chabot Telescope Makers' Workshop, the longest continually running mirror making workshop in the US and possibly the world. Richard is also on the board of the RTMC (Riverside Telescope Makers' Conference) where he runs the telescope making merit award program.

Some of you may also know him from the Golden State Star Party, where he has continually led the team that organizes both that event as well as its predecessor in Shingletown. Richard was also involved in the restoration of the Mt. Diablo observatory and generally can't get enough of anything and everything related to amateur astronomy (except for cloudless nights... he doesn't get enough of those).

TVS: groups.io is the New Club Bulletin Board By Roland Albers

TVS has completed our switch from Yahoo groups to Groups.io! More reliable than our old Yahoo group, groups.io also offers more features. Here are a few tips:

First, log into groups.io and select the trivalleystargazers group. You can select "Home" from the top of the left-hand panel to see some information about our group. Most main features of the site are accessed using this left-hand panel.

To change how messages are delivered to your email, select "Subscription" from the left-hand panel and then select an option under "Email Delivery". I suggest either "Individual Messages" or "Daily Summary".

Assuming you've set messages to be delivered to your email, you can read most messages from your email application. You can also read messages when logged onto the groups.io website by simply selecting "Messages" from the left-hand panel. Using the drop-down button at the top of the message, you can either view messages grouped by "Topics" or a list of individual "Messages".

To write a message you can use your email app and send an email to trivalleystargazers@groups.io. When logged into the groups.io website, you can also write a message by simply selecting "New Topic" from the left-hand panel.

To see a calendar of upcoming club events, select "Calendar" from the left-hand panel. Upcoming club meetings, outreach events, and star parties will be listed.

Finally, if you'd like to learn how to directly email other club members, see my January 17th post to groups.io entitled "How to email other TVS club members". Try the search button at the top of the groups.io webpage to find it.

News & Notes

2019 TVS Meeting Dates

Below are the TVS meeting dates for 2019. The lecture meetings are on the third Friday of the month, with the Board meetings on the Monday following the lecture meeting.

Lecture Meeting	Board Meeting	Prime Focus Deadline
Mar. 15	Mar. 18	
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 2/18/19, our club's checking account balance is \$18,475.87.

TVS Welcome to New Members

TVS would like to welcome new member, John Hayes. Please say hello and chat with him at upcoming club meetings.

Outreach Star Parties

Friday, April 12: Murray Elementary School, 8435 Davona Drive, Dublin; 7:30 set-up

Saturday, April 13: Del Valle Arroyo Staging Area; 7:30 set-up

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

2019 Club Star Parties

Save the dates for the 2019 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 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.

April 13: Del Valle (Arroyo Staging Area), set-up at 7:30pm

May 25: H2O Open House, Caravan departs at 6:30pm

June 22: Tesla Vintners, set-up at 8:00pm

July 20: Tesla Vintners, set-up at 8:00pm

August 3: Del Valle (Arroyo Staging Area), set-up at 7:30pm

August 24: H2O Open House, Caravan departs at 6:00pm

September 21: Tesla Vintners, set-up at 6:30pm

October 5: Del Valle (Arroyo Staging Area), set-up at 6:00pm

2019 Barcroft High-Altitude Star Party

The Eastbay Astronomical Society has reserved the nights of Monday, July 29 - Saturday, August 3 for a star party at Barcroft High-Altitude Research Center. Barcroft is located in the White Mountains at about 12,450ft above sea level. In order to acclimatize to the high altitude it is recommended that one should spend at least one night at about 8000ft, such as a motel in Mammoth Lakes, or at Grandview Campground in the White Mountains.

Barcroft amenities include delicious hot meals, hot drinks and snacks, satellite TV, a book and video library, microwave oven, a radiotelephone, hot showers, bathrooms, and tools in case of an equipment emergency. The staff is extremely helpful. Guests are expected to help out with some light cleanup chores.

Reservations must be submitted no later than 2 weeks before the event, and a maximum of only 10-12 people can be there at any given time. The rate is \$60 per person, per night. If you want to go, contact Don Saito at donsaito"at"yahoo.com first, to find out what time slots are still available for reservation. Once you determine which days you'd like to attend, go to <http://eastbayastro.org/events/> and scroll down to the Barcroft section of the page, fill-out the application fields, and use the PayPal link to pay for your reservation.

CalStar Events and Golden State Star Party Registration

CalStar Star Parties will be held on April 3-7 and September 25-28. The location is only 3 hours away at Lake San Antonio in southern Monterey County. CalStar is a loosely organized party with no registration and no structure held at the County park. Just show up and pay the camping fee and join the group of about 100 star gazers in a section of the park reserved for us. For more information see: <https://calstar.observers.org/>

The Golden State Star Party will be held over four nights on June 29-July 2 (departure (July 3) near Aiden, CA. Early Registration online is \$60 through March 30, \$70 thereafter, or \$75 onsite. If you do not plan on spending 4 nights, registration is \$25/night. For additional fees you can feast at the BBQ's on Sunday and Monday nights, and there is a free pancake breakfast on July 2. Attendance is typically 300-400 people. For more informations see: <http://goldenstatestar-party.org/> and TVS member Curtis Macchioni's presentation on GSSP can be found at: <http://www.trivalleystargazers.org/pdfs/GSSP.pdf>

Header Image: Debbie Dyke, lifetime TVS member, won "Honorable Mention for a Well Built First Telescope" at the 1997 Riverside Telescope Makers' Conference. (RTMC) See: <http://www.trivalleystargazers.org/telescopes.shtml>

Calendar of Events

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

What: Exploring Ultima Thule: Humanity's Next Frontier
Who: Drs. Alan Stern/Mark Showalter/Ross Beyer
Where: SRI Conference Center, 333 Ravenswood Ave.,
 Menlo Park, CA 94205 (Enter from Middlefield Rd.)
Cost: Free, Registration Required: <https://www.eventbrite.com/e/exploring-ultima-thule-humanitys-next-frontier-tickets-56359127668>

NASA's New Horizons made history when it flew by Kuiper Belt object 2014 MU69, nicknamed 'Ultima Thule' on New Year's Day of this year. Today, even though only 10% of the scientific data that the spacecraft collected has been sent to Earth, New Horizons has provided an amazing glimpse into the primordial solar system and revealed that Ultima Thule is the first contact binary object ever observed "in the wild," where it formed, and in a largely unmodified state since its birth. High resolution images and the first comprehensive compositional spectroscopy data are now in-hand with the science team and many more scientific results will no doubt soon be forthcoming.

To discuss the key results of this successful flyby and the future of the mission, we invited Alan Stern, planetary scientist at Southwest Research Institute and the Principal Investigator of NASA's New Horizons mission who will join us remotely via video-conferencing. Two Senior Research Scientists from our own SETI Institute who are part of the mission will participate in this discussion as well. Mark Showalter is a Fellow of the Institute who led the New Horizons risk assessment team before the flyby, and Ross Beyer, also a member of the New Horizons Geology and Geophysics team, who is helping to understand the 3D shape of MU69.

For more information see: <http://www.seti.org/talks>, e-mail info@seti.org, or phone 650-961-6633.

March 16, 11:00am

What: Are Red Dwarf Planets Habitable?
Who: Prof. Gibor Basri, UC Berkeley
Where: UC Berkeley, Genetics and Plant Biology Building,
 Room 100 (northwest corner of campus)
Cost: Free, limited hourly pay parking on/nearby campus. The venue is within walking distance of BART and bus lines.

Much recent news about exoplanets has concerned the discovery of earth-sized planets in the "habitable zone" of "red dwarf" stars. This is partly because such planets are more easily found around small stars, and partly because most stars are red dwarfs. Can planets in the habitable zone around a red dwarf actually harbor earth-like life? Until recently most astronomers would have said "no" but this is changing. Professor Basri will explain why and talk about recent discoveries.

Gibor Basri joined the faculty of the Berkeley Astronomy Department in 1982. His areas of research include star formation, solar and low mass stars, and stellar magnetic activity. He was an early pioneer in the study of brown dwarfs. He has extensively used telescopes at the Lick and Keck Observatories, and was a Co-Investigator on NASA's Kepler mission, which has revolutionized our knowledge about exoplanets. He is a recipient of the Sagan award for communicating science.

For more information see: <http://scienceatcal.berkeley.edu/the-sciencecal-lecture-series>

continued on p.4

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

March 27, 6:30pm

What: The Future of Women in STEM
Who: Jennifer Liebler-Moderator
Where: At My Sphere, 1212 Broadway, Oakland, CA 94611
Cost: \$30: <https://14884.blackbaudhosting.com/14884/Women-in-STEM-Event>

This engaging panel discussion will focus on how to empower the next generation of women in STEM and how to build a thriving leadership pipeline for women. Our panel will also address the role that Chabot Space & Science Center and other community organizations play in fostering opportunities for Oakland's young women to explore and achieve success in STEM fields.

Moderated by Jennifer Liebler Michael, Chabot Board Member and Senior Environmental Policy Advisor for Chevron, this panel will feature Margaret Race, Astrobiologist at SETI; Vanessa Kuroda, Wireless and Communications Architect at Airbus; Lisa Hoover, Programs Manager at Chabot, and several other women at various stages in their careers.

6:30 p.m. Reception and Networking

7 p.m. Panel Discussion

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

March 30, 7:30pm-10:30pm

What: San Jose Astronomical Association Astro-Imaging Workshop
Who: Glenn N.
Where: Little Uvas Open Space Preserve, Morgan Hill CA (GPS: 37.091536, -121.719594)
Cost: Free

SJAA is proud to sponsor this outdoor workshop where we help those folks who are interested in learning about the mechanics of AstroPhotography and Imaging. Bring your questions, and/or your complete astrophotography rig (battery powered). I usually give an hour talk about the different kinds of night time photography, then after full dark, demonstrate deep space astrophotography (Nebulae, Galaxies, Globular Clusters, etc.).

All events will now be held at Little Uvas Open Space Preserve, instead of Coyote Valley. This is a darker spot, much better for nighttime photography and astroimaging. Note the following please:

This is a dirt road and field to park in, no modern conveniences although sometimes there is a porta potty, but not always.

There are horses loose in the field, PLEASE be careful opening the gate and be sure to close it behind you so the horses don't end up on the busy road! Don't assume the person(s)

behind you will close the gate. Please check that they do or do it yourself.

Please arrive BEFORE sunset, which will be at 7:15. The gate should be "dummy locked" so you can open it, enter, and close it behind you. You can park in the flat field to your left just after you drive in.

If you have a rig you can set it up in the field close to the road. You can leave anytime, just again be careful with the gate/horses and close the gate behind you.

This site has fewer creature comforts, but it's darker than Coyote Valley and even darker than RCDO, if you been there for a Starry Nights Star Party.

In the mean time, check out my YouTube channel:

<https://www.youtube.com/channel/UCzKlrQdzoy9n-s1VYa-FOLJA/videos>

For more information see: <https://www.meetup.com/SJ-Astronomy/events/257517764/>.

April 1, 7:30pm

What: Building a Galaxy-Scale Gravitational Wave Detector
Who: Dr. Shami Chatterjee, Cornell/Carl Sagan 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.

Galaxies grew in the early universe by merging with each other, and as they coalesced, the supermassive black holes at their hearts merged with each other, too. Einstein's theory of general relativity predicts the existence of gravitational waves—the stretching and squeezing of space itself—as such black hole mergers take place. We have recently detected these ripples from the mergers of stellar black holes, but the mergers of supermassive black holes produce ripples with much longer wavelengths, requiring a galaxy-scale detector to observe them.

Dr. Chatterjee will describe how we are using rapidly spinning neutron stars as clocks to build such a long-wavelength gravitational wave detector, how the searches for these neutron stars have turned up fast radio bursts, and how these mysterious radio flashes from distant galaxies are teaching us more about the universe we live in.

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

April 5, 6:00pm - 10:00pm

What: \$5 First Friday: The Science of Baseball (partnership with Oakland A's)

Ultima Thule in 3D From New Horizons

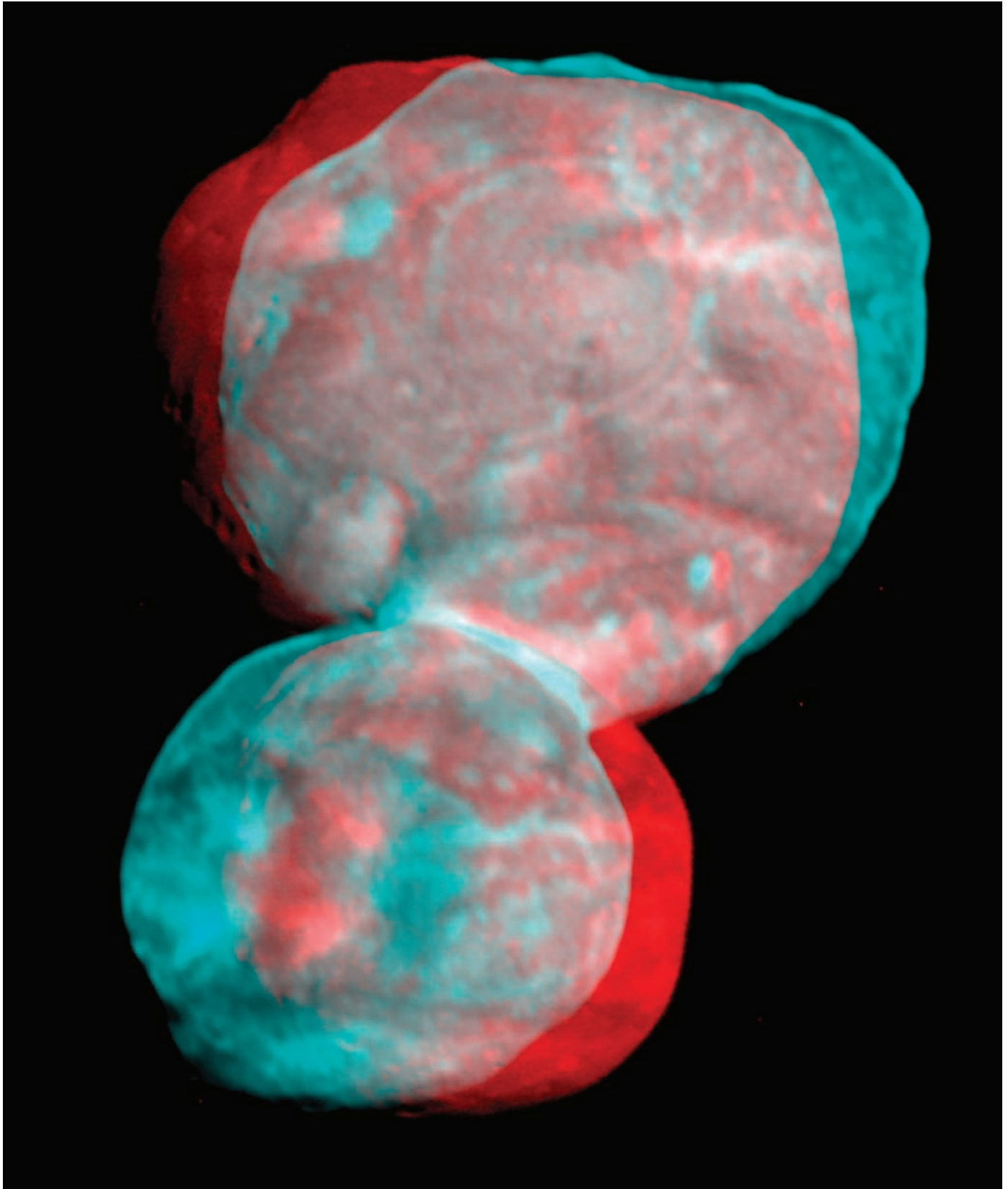


Image Caption: This image of Ultima Thule can be viewed with red-blue stereo glasses to reveal the Kuiper Belt object's three-dimensional shape. Credits: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute/National Optical Astronomy Observatory See: <https://www.nasa.gov/feature/ultima-thule-in-3d>

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

All times are Pacific Daylight Time

March

- 11 Mon The crescent Moon and Mars are 7° apart, setting together at about midnight
- 12 Tue The Moon is close to the Hyades (Evening)
- 14 Thu **First-Quarter Moon (3:27am)**
- 18-19 Mon The Moon and Regulus are 2° apart at dusk, with the distance increasing to 5.5° near dawn
- 18 Mon Algol at minimum brightness for 2 hours centered on 10:15pm PDT
- 20 Wed Spring begins at 2:58pm PDT
- 20 Wed **Full Moon (6:43pm)**
- 21- Thu- Zodiacal light visible in the west after sunset for the next 2 weeks (Evening)
- 21 Thu Algol at minimum brightness for 2 hours centered on 7:04pm PDT
- 26-29 Tue- Over 4 nights the Moon traverses the domain from Jupiter to Saturn (Morning)
- 27 Wed **Last-Quarter Moon (9:10pm)**

April

- 2 Tue Venus and the crescent Moon rise in the east, less than 5° apart (Dawn)
- 5 Fri **New Moon (1:50am)**
- 8 Mon The crescent Moon, Aldebaran, Mars, and the Pleiades form a diamond in Taurus (Evening)
- 9 Tue The crescent Moon is about 5° above Aldebaran (Evening)
- 10 Wed Algol at minimum brightness for 2 hours centered on 8:49pm PDT
- 11 Thu Mars approaches Aldebaran, about 7° apart. Compare their red colors. (Evening)
- 12 Fri **First-Quarter Moon (11:06am)**
- 13 Sat The Moon is about 2° from M44, the Beehive Cluster (Evening)
- 14 Sun The Moon is about 5° from Regulus in Leo (Evening)
- 19 Fri **Full Moon (2:12am)**

Calendar of Events (continued)

Who: Family Night
Where: Chabot Space and Science Center, 10000 Skyline Blvd., Oakland, CA 94619
Cost: \$5

Have you ever wondered what the inside of a baseball looks like or how to measure the momentum of a fastball pitch? Did you know that weather, temperature, and altitude all have effects on the flight distance of a baseball? Join nine-time World Series champs the Oakland A's at Chabot and learn all of this and much more during our homerun First Friday, The Science of Baseball, complete with a special appearance from A's mascot, Stomper!

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

April 10, 7:00pm

What: Ocean Worlds of the Outer Solar System
Who: Dr. Kevin Hand, NASA JPL
Where: Smithwick Theatre, 12345 El Monte Road, Los Altos Hills, CA 94022
Cost: Free, \$3 parking (Credit Cards or \$1 dollar bills)

No details available.

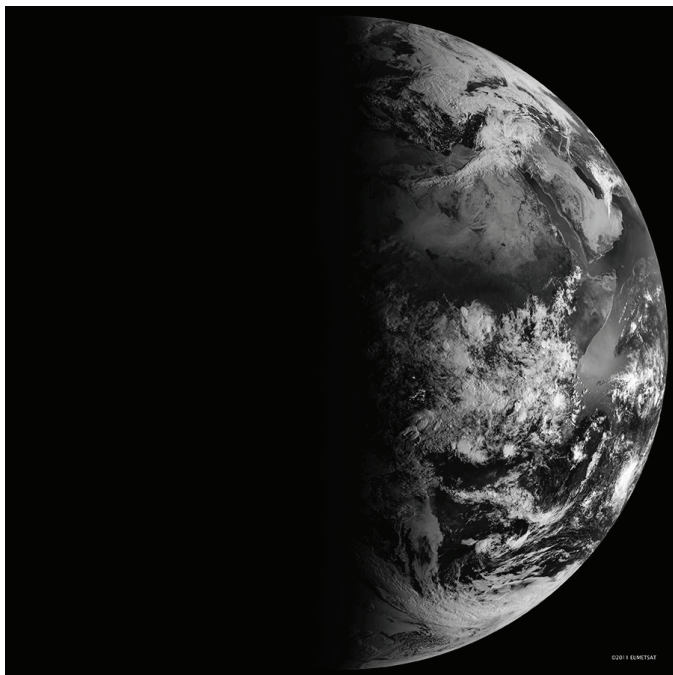
For more information see: <https://foothill.edu/astronomy/> or phone 650-949-7888.

NASA Night Sky Notes

Springtime Planet Party

By David Prosper

March brings longer days for Northern Hemisphere observers, especially by the time of the equinox. Early risers are treated to the majority of the bright planets dancing in the morning skies, with the Moon passing between them at the beginning and end of the month.



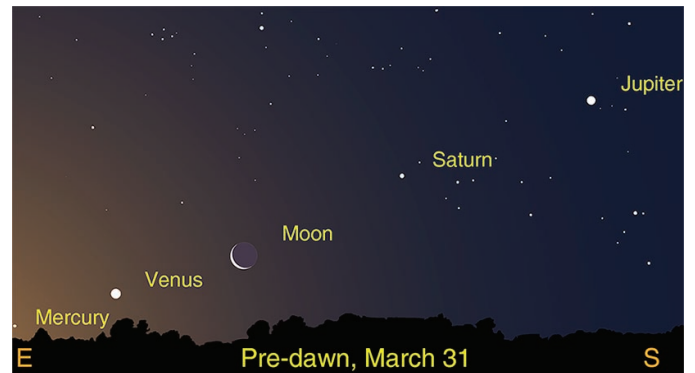
Caption: Earth from orbit on the March equinox, as viewed by EUMETSAT. Notice how the terminator – the line between day and night - touches both the north and south poles. Additional information can be found at <http://bit.ly/earthequinox> Image credit: NASA/ Robert Simmon

The vernal equinox occurs on March 20, marking the official beginning of spring for the Northern Hemisphere. Our Sun shines equally on the Northern and Southern Hemispheres during the moment of equinox, which is why the March and September equinoxes are the only times of the year when the Earth's north and south poles are simultaneously lit by sunlight. Exacting astronomers will note that the length of day and night on the equinox are not precisely equal; the date when they are closest to equal depends on your latitude, and may occur a few days earlier or later than the equinox itself. One complicating factor is that the Sun isn't a point light source, but a disc. Its edge is refracted by our atmosphere as it rises and sets, which adds several minutes of light to every

day. The Sun doesn't neatly wink on and off at sunrise and sunset like a light bulb, and so there isn't a perfect split of day and night on the equinox - but it's very close!

Ruddy Mars still shines in the west after sunset. Mars scoots across the early evening skies from Aries towards Taurus and meets the sparkling Pleiades star cluster by month's end.

March opens with the morning planets of Jupiter, Saturn, and Venus spread out over the southeastern horizon before sunrise. A crescent Moon comes very close to Saturn on the 1st and occults the ringed planet during the daytime. Lucky observers may be able to spot Mercury by the end of the month. March 31 opens with a beautiful set of planets and a crescent Moon strung diagonally across the early morning sky. Start with bright Jupiter, almost due south shortly before dawn. Then slide down and east towards Saturn, prominent but not nearly as bright as Jupiter. Continue east to the Moon, and then towards the beacon that is Venus, its gleam piercing through the early morning light. End with a challenge: can you find elusive Mercury above the eastern horizon? Binoculars may be needed to spot the closest planet to the Sun as it will be low and obscured by dawn's encroaching glow. What a way to close out March!



Caption: The morning planets on March 31. Image created with assistance from Stellarium.

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

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 (\$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.