

PrimeFocus



WHEN:

October 21, 2022
Meeting at 7:30pm
Lecture at 8:00pm

WHERE:

Unitarian Church
1893 North Vasco Rd.
Livermore, CA 94551

and via Zoom

TVS QR Code

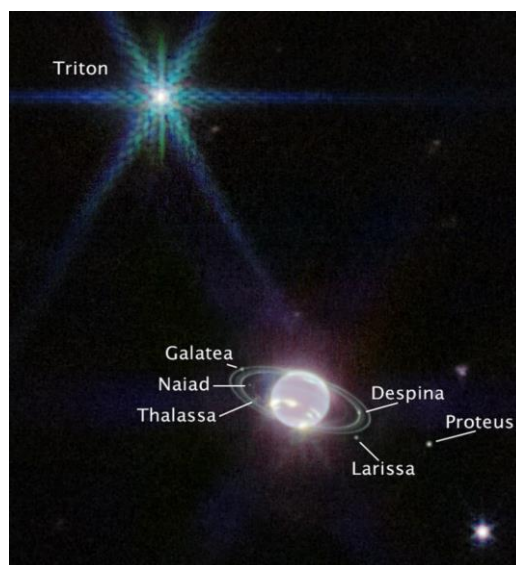


INSIDE THIS ISSUE:

News and Notes	2
Calendar of Events	3
TVS Astrophotos	4-5
What's Up	6
NASA Night Sky Notes	7
Membership/Renewal Application	8

Near Infrared Camera on the James Webb Space Telescope Dr. Alison Nordt, Lockheed Martin's Advanced Technology Center

On December 25, 2021 the James Webb Space Telescope launched into space aboard an Ariane V rocket from French Guiana. The observatory carries four science instruments that will enable observations and measurements to achieve an ambitious science program spanning from observing the first light in the universe and the formation of the first galaxies to characterizing exoplanets and protoplanetary disks. The Near Infrared Camera (NIRCam) is the primary imager and serves dual purposes both as a science instrument and as the observatory's wavefront sensor supporting alignment of the 18 primary mirror segments. The design, integration, and testing of this unique cryogenic, refractive instrument provided tremendous engineering challenges demanding numerous innovations. The story of NIRCam's development, challenges, and success is presented by the instrument's Principal Engineer.



Caption: In this Webb image, Neptune resembles a pearl with rings that look like ethereal concentric ovals around it. There are 2 thinner, crisper rings and 2 broader, fainter rings. A few extremely bright patches on the lower half of Neptune represent methane ice clouds. Six tiny white dots, which are six of Neptune's 14 moons, are scattered among the rings. Bright Triton is to the top-left of the planet.

Image Credits: NASA, ESA, CSA, STScI

Dr. Alison Nordt is the Director for Space Science and Instrumentation at Lockheed Martin's Advanced Technology Center. She is currently the Principal Investigator for TechMAST (Technology Maturation for Astrophysics Space Telescopes) and several related internal research and development efforts.

Previously, Dr. Nordt was the senior manager for Astrophysics and held several roles on the NIRCam (Near Infrared Camera for the James Webb Space Telescope) program including Program Manager, IPT Lead and Certified Principal Engineer. She was responsible for the design, development, testing, and delivery of the NIRCam instrument including optics, structures, mechanisms, electronics, and software.

She holds Doctor of Philosophy and Master of Science degrees in Aeronautics and Astronautics from Stanford University and a Bachelor of Science degree in Mechanical Engineering from Cornell University. She is passionate about speaking to students about her work in space science. She is an AIAA Associate Fellow and member of the International Academy of Astronautics.

News and Notes

2022-2023 Meeting Dates

Lecture Meeting	Board Meeting	PrimeFocus Deadline
Oct. 21	Oct. 24	
Nov. 18	Nov. 21	Nov. 4
Dec. 16	Dec. 19	Dec. 2
Jan. 20	Jan. 23	Jan. 6
Feb. 17	Feb. 20	Feb. 3
Mar. 17	Mar. 20	Mar. 3
Apr. 21	Apr. 24	Apr. 7
May 19	May 22	May 5
Jun. 16	Jun. 19	Jun. 2
Jul. 21	Jul. 24	Jul. 7
Aug. 18	Aug. 21	Aug. 4
Sep. 15	Sep. 18	Sep. 1
Oct. 20	Oct. 23	Oct. 6
Nov. 17	Nov. 20	Nov. 3
Dec. 15	Dec. 18	Dec. 1

Money Matters

As of the last Treasurer's Report on 09/19/22, our club's account balance is \$66,989.49. This includes \$43,124.90 in the H2O Rebuild fund.

TVS Elections in November

TVS will soon be electing new members for the board. Please nominate candidates to replace members who will be retiring this year. Contact any club officer with your suggestions, including self-nomination. This is your opportunity to impact the future direction of the club!

TVS Welcomes New Members

TVS welcomes new members Puneet Katyai and Andrew Wang. Please say hello and chat with them during our meetings.

Time to Renew Club Membership for 2023

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 2022 and all of 2023.

The regular club membership remains a bargain at \$30. Student membership (full-time High School or College student) is only \$10! To become a key holder to H2O, you must be 18 or older. There is a one-time \$20 Key deposit and a \$10 annual access fee.

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.

2022 Club Star Party Schedule

Save the dates for the 2022 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. 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 observer's can preserve their night vision.

October 29: Outreach and Club Star Party Del Valle Arroyo Staging Area, setup at 6:00pm, Public 6:30-8:00pm. Club Star Party thereafter.

November 3: Livermore Library, setup at 6:00pm, intro-talk at 6:30pm, and stargazing at 7:00pm

November 26: Public Stargazing at Sunol Regional Wilderness, 1895 Geary Road, Sunol, Exact location TBD, setup at 4:30pm, Public 5:00-6:30pm

Telescope Donation to TVS

In lieu of the club purchasing a Unistellar eVscope, TVS Observatory Director, Chuck Grant, donated his eVscope to TVS. This generous donation will be used at TVS star parties and for public outreach. Thank you, Chuck!

continued on p.3

News and Notes (con't)

TVS Telescopes for Sale

If you have been wanting to purchase a telescope, TVS has numerous options available. These include a 12-inch Dobsonian, Celestron and Meade Schmidt-Cassegrain's ranging in size from 4-8 inches, and Meade and Celestron Maksutov telescopes. Also, available is a tabletop classic 4-inch Astroscan. Full descriptions of the available equipment can be found at: [TVS Telescope Sales](#).

Calendar of Events

October 29, 10:00am-4:00pm

What: Halloween: Spooky Science
Who: Chabot Staff
Where: Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost: Free with General Admission

Uncover the creepy crawlies of the night in our special Halloween science program. Learn about animals and insects that frighten us and get to see them up close. People of all ages are welcome to come in full costume, ready to trick-or-treat for a frightful collection of spiders, insects, bats, slime, and ghosts! Information on the multiple events can be found at: chabot.space.org/calendar/halloween-spooky-science/

For COVID-19 Restrictions, see: <https://chabot.space.org/visit/plan-your-visit/>

October 29, 6:00pm-9:00pm

What: Halloween Hike and Sip
Who: Chabot Staff
Where: Chabot Space and Science Center, 10000 Skyline Blvd. Oakland, CA 94619
Cost: Advance sale required, \$30 Adult, \$27 Members, 21+ Only

The journey begins at sunset from the Center into the beautiful surrounding redwood forest. We'll moderately hike 3-4.25 miles (90-120 minutes) along some of the most popular trails as you learn about the history of Oakland, local plants, and the majestic Redwood trees. We'll stop to watch the first few planets and stars appear and share constellation storytelling. Upon return to Chabot, hikers will enjoy a charcuterie board and two complimentary glasses of wine, beer, or non-alcoholic beverages. The night will end with stargazing and telescope viewing (weather permitting). A perfect evening for a date night or fun with friends! Limited to 40.

For COVID-19 Restrictions, see: <https://chabot.space.org/visit/plan-your-visit/>

For more information, see: <https://chabot.space.org/events/events-listing/>

October 1, 7:00pm-10:00pm

What: The FAST Radio Sky: A New Window on the Violent Universe
Who: Dr. Victoria Kaspi, McGill University
Sponsor: Foothill College, Silicon Valley Astronomy Lecture

continued on p.4

Officers

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Webmaster

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info@trivalleystargazers.org

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.

TVS Astrophotography By Chris Irwin



Caption: Chris Irwin imaged the Andromeda Galaxy using an Astro-Tech 80ED telescope on an iOptron Smarteq Pro+ Mount with a ZWO AI294MM camera. 20 exposures of 180sec were obtained for each LHaRGB filter.

Calendar of Events (con't)

Series

Online: www.youtube.com/user/SVAstronomyLectures

This free, non-technical lecture will be streamed live.

For more information, see: <https://foothill.edu/astronomy/>

November 7, 7:30pm

What: JWST: NASA's Greatest Observatory and Its Great

Science!

Who: Dr. Thomas Greene (NASA/Ames Research Center)

Where: Golden Gate Park, 55 Music Concourse Drive,
San Francisco

Cost: Members and Seniors \$12, Guests \$15

The James Webb Space Telescope (JWST) is the most complex and powerful astronomical space observatory ever built. It launched on Christmas Day in 2021 and has recently been

continued on p.6



Caption: Adam Wong-Brooks imaged an International Space Station Lunar Transit that was visible from the Bay area on October 3, 2022. He used an Explore Scientific ED APO 127mm f/7.5 FCD-100 refractor with a 3" 0.7x reducer, giving a focal length of 666mm, on an Orion Atlas EQ-G mount. He used a ZWO ASI294MM Pro camera shooting at 30 frames/sec.

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

All times are Pacific Daylight Time thru November 6, 2am, Pacific Standard Time thereafter

October

17 Mon Last-Quarter Moon (10:15am)

18 Tue The Moon in Cancer is $\sim 5^\circ$ above the Beehive Cluster, M44 (Predawn)

20 Thu The Moon and Regulus are separated by 4.5° in the east (Predawn)

20- Thu- The Orionid Meteor shower peaks in the predawn hours of the 21st (see p.48, October S&T)

24 Mon The Moon and Mercury rise in the ENE, though they are a challenging duo (Dawn)

25 Tue New Moon (3:49am)

27 Thu The crescent Moon and Antares, separated by $\sim 3^\circ$, sink toward the SW horizon (Dusk)

27 Thu Algol at minimum brightness for two hours centered on 9:53pm

31 Mon First-Quarter Moon (11:37pm)

November

1 Tue The Moon is $\sim 4.5^\circ$ below Saturn (Dusk, see p.46, November S&T)

4 Fri The Moon is $\sim 3^\circ$ below left of Jupiter (Evening)

6 Sun Pacific Standard Time begins at 2am

8 Tue Full Moon (3:02am, Total Lunar Eclipse Visible, see p.48, November S&T)

9 Wed The Moon is $\sim 3^\circ$ from the Pleiades, M45, in the west. Use binoculars (Morning)

11 Fri The Moon and Mars, separated by $\sim 2.5^\circ$, are located between the horns of Taurus (Morning)

13 Sun The Moon, Castor, and Pollux form a line above the ENE horizon (Evening)

16 Wed Last-Quarter Moon (5:27am)

16 Wed Algol at minimum brightness for two hours centered on 10:26pm

17 Thu The Moon and Regulus are separated by 6° , high in the SE (Morning)

17- Thu- The Leonid Meteor shower peaks in the predawn hours of the 18th (see p.50, November S&T)

19 Sat Algol at minimum brightness for two hours centered on 7:25pm

21 Mon The Moon trails Spica by $\sim 4^\circ$ (Morning)

23 Wed New Moon (2:47pm)

28 Mon The crescent Moon is $\sim 6^\circ$ below Saturn (Evening)

30 Wed First-Quarter Moon (6:37am)

Calendar of Events (con't)

commissioned in its final orbit in the Sun–Earth system. The large 6.5-m diameter JWST primary mirror and its science instruments will allow it to see some of the very first galaxies that formed in the Universe shortly after the Big Bang. Other major science themes of JWST encompass studying the assembly of galaxies, the birth of stars and planetary systems, and studying planetary systems and the origins of life. JWST will be the premier astrophysics space observatory for NASA and the European and Canadian Space Agencies (ESA and CSA), and it was in development for over 20 years. Scientists from all over the world will use it during its mission lifetime—which could be 20 years or more! JWST will augment the Hubble Space Telescope, which primarily works at shorter visible and ultraviolet light wavelengths. In this talk, Dr. Greene will illustrate the mission's science goals and highlight some aspects of its design, technologies, and initial science results.

In addition to these topics, many scientists will use JWST to make discoveries that we have not yet imagined. For more information, see: [Benjamin Dean Astronomy Lecture](#)

NASA Night Sky Notes

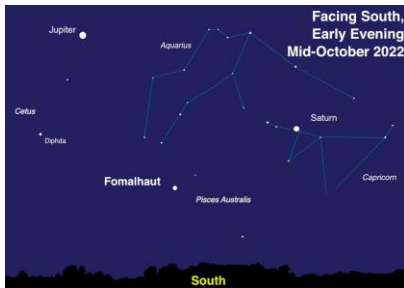


Fomalhaut: Not So Lonely After All

By David Prosper

Fall evenings bring a prominent visitor to southern skies for Northern Hemisphere observers: the bright star **Fomalhaut**! Sometimes called “The Autumn Star,” Fomalhaut appears unusually distant from other bright stars in its section of sky, leading to its other nickname: “The Loneliest Star.” Since this star appears so low and lonely over the horizon for many observers, is so bright, and often wildly twinkles from atmospheric turbulence, Fomalhaut’s brief but bright seasonal appearance often inspires a few startled UFO reports. While definitely out of this world – Fomalhaut is about 25 light years distant from us – it has been extensively studied and is a fascinating, and very identified, stellar object.

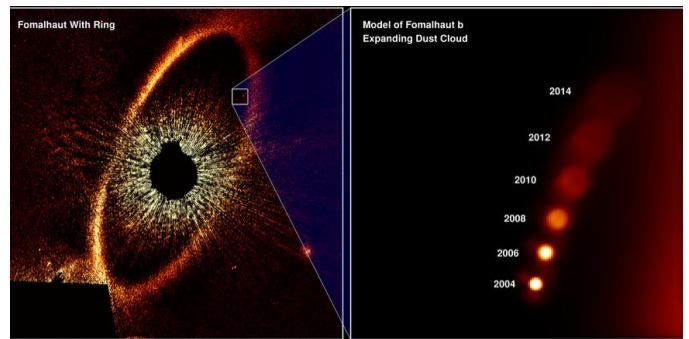
Fomalhaut appears solitary, but it does in fact have company. Fomalhaut’s entourage includes two stellar companions, both of which keep their distance but are still gravitationally bound. Fomalhaut B is an orange dwarf star almost a light year distant from its parent star (Fomalhaut A), and Fomalhaut C (aka LP 876-10), a red dwarf star located a little over 3 light years from Fomalhaut A! Surprisingly far from its parent star – even from our view on Earth, Fomalhaut C lies in the constellation Aquarius, while Fomalhaut A and B lie in Piscis Australis, another constellation! – studies of Fomalhaut C confirm it as the third stellar member of the Fomalhaut system, its immense distance still within Fomalhaut A’s gravitational influence. So, while not truly “lonely,” Fomalhaut A’s companions do keep their distance.



Caption: Sky map of the southern facing sky for mid-latitude Northern Hemisphere observers. With Fomalhaut lying so low for many observers, its fellow member stars in the constellation Piscis Australis won’t be easily visible for many without aid due to a combination of light pollution and atmospheric extinction (thick air dimming the light from the stars). Fomalhaut is by far the brightest star in its constellation, and is one of the brightest stars in the night sky. While the dim constellations of Aquarius and Capricorn may also not be visible to many without aid, they are outlined here. While known as the “Loneliest Star,” you can see that Fomalhaut has two relatively close and bright visitors this year: Jupiter and Saturn! Illustration created with assistance from Stellarium: [stellarium.org](https://www.stellarium.org)

Fomalhaut’s most famous feature is a massive and complex disc of debris spanning many billions of miles in diameter. This disc was first detected by NASA’s IRAS space telescope in the

1980s, and first imaged in visible light by Hubble in 2004. Studies by additional advanced telescopes, based both on Earth’s surface and in space, show the debris around Fomalhaut to be differentiated into several “rings” or “belts” of different sizes and types of materials. Complicating matters further, the disc is not centered on the star itself, but on a point approximately 1.4 billion miles away, or half a billion miles further from Fomalhaut than Saturn is from our own Sun! In the mid-2000s a candidate planetary body was imaged by Hubble and named Fomalhaut b (Note: Astronomers use capital letters to label companion stars, while lowercase letters are used to label planets). However, Fomalhaut b was observed to slowly fade over multiple years of observations, and its trajectory appeared to take it out of the system, which is curious behavior for a planet. Scientists now suspect that Hubble observed the shattered debris of a recent violent collision between two 125-mile wide bodies, their impact driving the remains of the now decidedly non-planetary Fomalhaut b out of the system! Interestingly enough, Fomalhaut A isn’t the only star in its system to host a dusty disc; Fomalhaut C also hosts a disc, detected by the Herschel Space Observatory in 2013. Despite their distance, the two stars may be exchanging material between their discs - including comets! Their co-mingling may help to explain the elliptical nature of both of the stars’ debris discs. The odd one out, Fomalhaut B does not possess a debris disc of its own, but may host at least one suspected planet.



Caption: The magnificent and complex dust disc of the Fomalhaut system (left) with the path and dissolution of former planetary candidate Fomalhaut b displayed in detail (right). Image credits: NASA, ESA, and A. Gáspár and G. Rieke (University of Arizona) Source: <https://www.nasa.gov/feature/goddard/2020/exoplanet-apparently-disappears-in-latest-hubble-observations>

While Hubble imaged the infamous “imposter planet” of Fomalhaut b, very few planets have been directly imaged by powerful telescopes, but NASA’s James Webb Space Telescope will be imaging Fomalhaut and its disc in the near future, and its tremendous power is sure to tease out more amazing discoveries from its dusty grains. You can learn about the latest discoveries from Webb and NASA’s other amazing missions at [nasa.gov](https://www.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 (\$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.