

San Diego Astronomy Association

Celebrating Over 50 Years of Astronomical Outreach



February 2021

<https://www.sdaa.org/>
A Non-Profit Educational Association
P.O. Box 23215, San Diego, CA 92193-3215

SDAA Update

Next SDAA Business Meeting

February 9th at 7:00pm
10070 Willow Creek Rd
San Diego, CA 92131
Via Zoom

Next Program Meeting

February 17th at 7:00pm
Live Stream

In keeping with state and local mandates in regards to social distancing, the **SDAA has cancelled all public outreach and club events** for the foreseeable future. These include our regularly scheduled monthly meetings at Mission Trails Regional Park.

Look for updates on the Lipp telescope.

Since TDS is private space there is no reason to lock down the facility but there are actions you can take to help keep the site safe for all of us. If you plan to visit and use the facility, please bring along some disinfectant wipes or disinfectant spray cleaner. When you finish using the restrooms or the warming room, please wipe down the areas that you touched in order to help prevent the spread of any viruses. As much as we love sharing the views of the night sky, try to maintain the recommended 6-foot social distance guideline.

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San Diego Astronomy Association
Incorporated in California in 1963

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February 17th Program Meeting

Speaker: Jimmy Lilly – Steward Observatory
Topic: Identifying Prestellar Cores in Molecular Clouds

Jimmy Lilly was a 2019-2020 Lucas Scholarship recipient and majored in Astronomy / Physics. He graduated in May 2020. He works with Yancy Shirley from the Department of Astronomy on “Characterizing Physical Properties Associated with Hierarchical Structure in Star-Forming Regions.



Newsletter Deadline

The deadline to submit articles for publication is the **15th** of each month.

[Link to SDAA Merchandise Store](#)

<https://sdaa28.wildapricot.org/SDAA-Store>

[Link to Outreach Calendar](#)

<https://calendar.google.com/calendar/embed?src=g-calendar@sdaa.org&ctz=America/Los>



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San Diego Astronomy Association Board of Directors Meeting *January 12, 2021* – Unapproved and subject to revision

1. Call to Order

The meeting was held via Zoom and was called to order at 7:04pm with the following board members in attendance: Dave Wood, President; Melany Biendara, Treasurer; Gene Burch, Recording Secretary; Alicia Linder, Corresponding Secretary; Dave Decker, Director; Hiro Hakozaiki, Director; Mike Chasin, Director; Pat Boyce, Director, Member; Dan Kiser

2. Priority / Member Business

None

3. Approval of Last Meeting Minutes

The December meeting minutes approved.

4. Treasurers & Membership Report

The treasurer's report was approved. There was a large drop in the number of student members, but Pat has a list of new students to be added this month. We are already receiving donations for the 2021 Banquet.

5. Standard Reports

a. Site Maintenance Report:

No updates at this time (see old business for further)

b. Observatory/Loaner Scope Report:

Observatory: The condition of the Lipp telescope remains excellent. No star parties are planned for January. Trained hosts continue to utilize it for private observing. This operation provides a minimum exercising of the gears, clutches, etc. It will be good when the scope can get traditional usage.

Loaner Scopes: We continue to have had a lot of activity in the loaner program. Nearly all of the scopes are in use. This continues to be an appreciated service.

c. Private Pad Report:

We currently have 3 unleased pads (Pad 5 will be returned to us in February) and 9 people on the waiting list (2 who currently have pads and are looking to upgrade). As reported separately, there are appear to be a couple of unapproved pad improvements, some of which may be problematic.

Note that there are 6 pads that have been used twice or less for each of the last 4 years, 3 of which were unused in the last 4 years. There are two pads that haven't met their minimum in a decade (both Grandfathered). Dave W is going to talk with the pad chairperson, Mark Smith, and begin the process of taking back the unused pads so they can be offered up to those on the waiting list.

d. Program Meetings Report:

16 Dec 2020 Speaker / Topic:

- Speaker: Dr. Alex Ji - Caltech

- Presentation: The First Stars

- Attendees: 47

Current Program Meeting Petty Cash as of 6 Aug 2020 = \$524

Expenses Since 6 Aug 2020 Report

- None



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e. AISIG Report:

No Report – next Zoom Meeting will be on January 27th

f. Newsletter Report:

Current issue looks good – nothing new to report.

g. Website Report:

The new website is up and running at <https://sdaa.org>. Please report any problems or send any suggestions for improvements. Also, if you haven't already done so, please check your picture on the Contacts page and send me a new one if you want it replaced.

h. Social Media:

People are visiting our YouTube channel and we currently have 377 subscribers.

i. Outreach Report:

In December, Gary Hawkins and I completed two, YouTube live stream, outreach events on the SDAA YouTube channel. The first was an exploration of several objects in Orion with notes and comments from Robert Burnham's Celestial Handbook. We currently do not have any host venues, so Gary and I worked from our homes via a Skype video call that included live images, which were then streamed to our SDAA YouTube channel. Our second December event, the Great Conjunction of Jupiter and Saturn, was live streamed on Dec 21. We hosted this from the home of a friend who invited us to take advantage of his great view of the western horizon.

All of our live stream videos are available to the public on the SDAA channel for viewing. Since these events are often lengthy, we have also created abridged versions of the December Burnham-Orion and November Lunar Eclipse events. These are posted on our channel home page where the monthly meetings and presenter videos are currently available.

Responding to interest in EAA procedures, Gary has also hosted an instructional stream on our channel concerning the use of SharpCap for sequencing an observing session. He plans to present this and other EAA concepts to the AISIG group sometime soon.

Significant public interest in these virtual events has been generated via the SDAA website, group postings, calendars, social media, Timeanddate.com embedded link, and via the Cloudy Nights EAA forum. YouTube analytics on our site show the number of concurrent participants in each stream, as well as the number of post-stream views of each video. A more significant metric is the number of subscribers to our channel, since they receive notification of all posted SDAA activity and are much more likely to join us for future SDAA events. The SDAA currently has 377 subscribers.

With the completion of our new website, an update of the OSIG Outreach content was overdue. I have now re-written the page and Jeff Stevens has posted it. This page confirms the current status of our "in person" outreach events and introduces the virtual, EAA program. Included is a link to the SDAA YouTube channel and an invitation to subscribe.

Future challenges include identification of venues with internet access, continued authorization to use the YouTube channel for live streaming, and identification of SDAA members willing to assist in the virtual outreach program.

j. TARO Report:

New UPS batteries have been installed and TARO is back online. Operations testing will take a few more weeks after which new object requests can be submitted.

k. Cruzen Report:

Gene/Ed are still working on an observatory operations manual.



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l. Merchandise Report:

A few sales last month. Discussed having a “super sale” to coincide with the banquet.

m. Astronomical League Report:

Nothing new to report for December. Reminder: The Astronomical League annual conference, ALCON, will be held next August 4-7, 2021, in Albuquerque, NM. This will probably conflict with our own Julian StarFest.

n. JSF Report:

Dan Kiser reported in person – we are in the initial planning stages for JSF 2021, but as of now, the County is still not issuing permits and it’s unknown when they will start. We’ll need to make a decision by the end of April or first part of May if we’re going to be able to hold it August 5th – 8th.

6. Old Business:

a. Probably a good time to make any repairs on the LIPP since it’s not being used.

b. The water tank has lost about 1/3 of its water and we’ll look into getting a water truck to refill it.

c. Still need to check electrical boxes on private pads to see if any need repair.

d. Going to find a company to check and service the septic tank.

e. Northwest chain link fence - ground has eroded exposing several inches of the cement bases for several posts. Will look into temporary measures to slow runoff.

f. Observatory/Warming room – New lights and heater have been installed. We’re waiting now to have the drywall repaired and patched, and then we can re-paint.

g. Downing Observatory Donation update – still working on the transition and how the observatory will be used by SDAA

h. Banquet/Fund Raising activities – We’ve had several Zoom meetings and plans are progressing for our first virtual banquet to be held on Zoom. Tentative date is Saturday, February 6th and our guest speaker will be Blaine Baggett.

i. Software Asset Updates – Mike C is working to catalog all of our digital and software assets and is making good progress.

j. Other old business - None

7. New Business:

a. Discussed possible issues with one of the private pads and determined there is nothing that violates current pad rules. Dave W is going to get with Mark Smith (pad chairperson) to check on the progress of re-writing the private pad rules.

8. Adjournment: The meeting was adjourned at 8:32pm.



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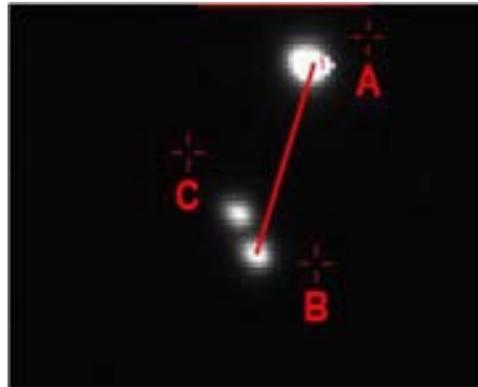
Boyce-Astro invites SDAA members to join the DoubleSTARS™ seminar on February 17 – and be a published scientist by 2022

Boyce-Astro will be conducting the DoubleSTARS™ astronomy research seminar online for citizen scientists, college students, and high school students this spring. Your research in double stars will build your foundation in astronomy, astrophysics, and the scientific method. You will learn astrometry, observational techniques, astronomical software and databases, and data reduction. After the seminar we will introduce you to opportunities in other fields of astronomical research such as exoplanets, photometry of variable stars, data mining, and advanced astrometry to undertake on your own equipment or our remote observatories.

- **5th year – over 300 students and 50 papers so far – <http://boyce-astro.org/doublestars/>**

When you complete Step 1 and Step 2, you will have experienced the scientific process from proposal all the way through to publication.

- Propose and conduct original research in astrometry as a member of a research team
- Complete a peer-reviewed research paper accepted for publication



Do Step 1 [now](#) to be able to join the February DoubleSTARS™ class. See if you like it.

STEP 1
IntroSTARS™ – An overview of the astronomy needed for your DoubleSTARS™ research and paper
Enroll online at any time at Boyce-Astro.org - the course is free, online, and self-paced
Stellar motion and what it tells us: sky coordinates, star motions, Kepler's Laws, Newton's Laws, distances
Stellar light and what it tells us: electromagnetic radiation, colors, temperatures, Doppler effect, masses, lives
Take online quiz to qualify for DoubleSTARS™ - sent to registered students before DoubleSTARS™ start

- [To learn more and to sign up for FREE to IntroSTARS™, the Step 1, just click here.](http://boyce-astro.org/introstars-your-step-1/) <http://boyce-astro.org/introstars-your-step-1/>
 - When you're finished, join the DoubleSTARS™ online seminar on February 17
 - Pass the IntroSTARS™ qualifying quiz by February 20 to continue
 - Attend seven more Zoom classes on Wednesday nights through April 21
 - Then finish your research, present your results, and prepare your scientific paper.
- [For more information on Step 2, the DoubleSTARS™ seminar, click here](http://boyce-astro.org/doublestars/) <http://boyce-astro.org/doublestars/>

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Outreach Special Interest Group (OSIG)

"The Outreach Special Interest Group, (OSIG) is a group within the San Diego Astronomy Association devoted to advancing the SDAA goals of educating our members and the public in Astronomical observing skills and knowledge."

This Mission Statement was published in the SDAA newsletter, January, 2016. Now in 2021, our *Mission* has not changed. Our methods have.

New Website

The SDAA has a new face! In case you haven't seen it, go to "sdaa.org" and take look. We also have a new perspective on outreach programs. Check out the OSIG page at "sdaa.org/sdaa-outreach/." Now that you have taken notice and have seen the new SDAA website, and the OSIG page, you also know about our *virtual events*, and *new resources*, all of which support the same, traditional *message*.

New Virtual Events

We still have telescopes and eyepieces, but we have added cameras and computers, Zoom and YouTube. This allows us to share the observing experience with others when we cannot be together at a school or local park.

We call this virtual event Electronically Assisted Astronomy, or EAA.

The SDAA has hosted the monthly program meetings via the Zoom virtual process most of the year, 2020. We will be hosting our annual banquet for 2021, in the same way. Now we are inviting members and public to enjoy our virtual star parties via Zoom or YouTube as well. Take a look at the SDAA YouTube channel. The link is at the bottom of our website home page. There you will find recorded program meetings and videos of our past observing sessions.

New Resources

Many SDAA members are familiar with "live viewing" or "video astronomy", which has been an important part of our traditional outreach program. What we have added is the ability to stream the captured images, along with live commentary, to a Zoom, Skype, Facebook or YouTube channel. This is low budget, in the field, video production. The dialog is not rehearsed, equipment is not perfect, but we enjoy the process and we are reaching lots of people, locked down at home.





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Same Message

Take heart, all is not lost! Our mission is the same. The Universe is still very dynamic and begs to be shared. Here are a few naked eye events from 2020, that you may have missed:

Oppositions of Mars, Jupiter and Saturn;

Jupiter and Saturn race across the ecliptic toward a Great Conjunction;

Comet NEOWISE;

Venus invading the Pleiades;

Four penumbral lunar eclipses;

Two solar eclipses, one annular, one total;

Dimming and brightening of Betelgeuse by mag change of 1.4 in three months.

Several of these were included in our EAA presentations this year. We plan to continue this virtual programming, even when we are able to return to our traditional venues. Be assured, we are in contact with our long-time partners in schools, and city, county and state parks, looking for that opportunity to re-establish at least some of our “in person” star party events.

COVID may have impacted our social paradigm, but it has not changed Earth or our solar system. Nor has it impacted the dynamic Universe! Look around, look up! It is all still there and available to restore our perspective on life. We encourage members to get involved in all of our outreach efforts, by contacting the Outreach Coordinator at outreach@sdaa.org. Share the news, about the SDAA, about our outreach efforts, but mostly about the wonder of our visible Universe.

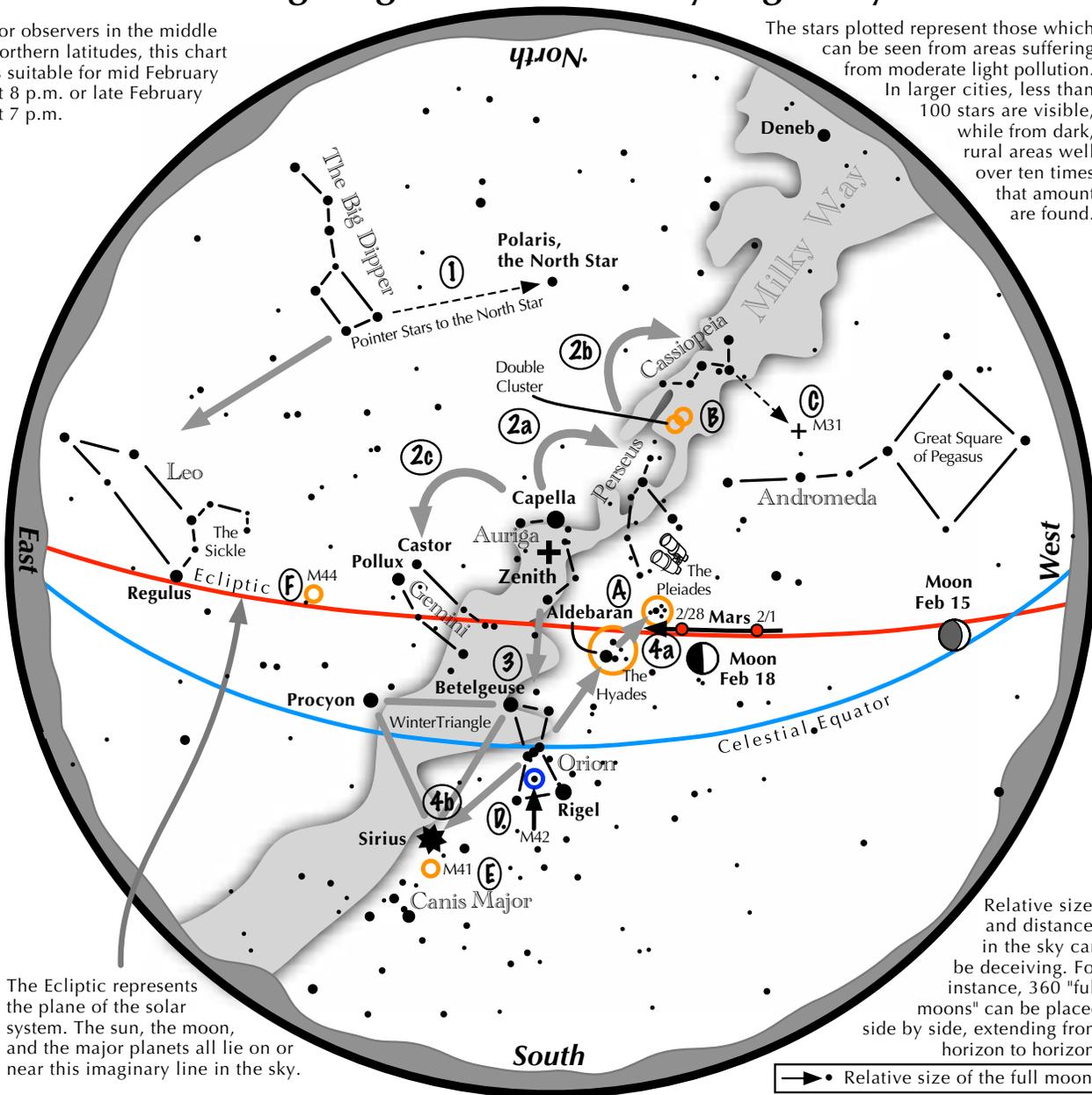


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Navigating the mid February Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid February at 8 p.m. or late February at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

Navigating the February night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius, a member of the Winter Triangle.

Binocular Highlights

- A: Examine the stars of two naked eye star clusters, the Pleiades and the Hyades.
- B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
- C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D: M42 in Orion is a star forming nebula. E: Look south of Sirius for the star cluster M41. F: M44, a star cluster barely visible to the naked eye, lies southeast of Pollux.



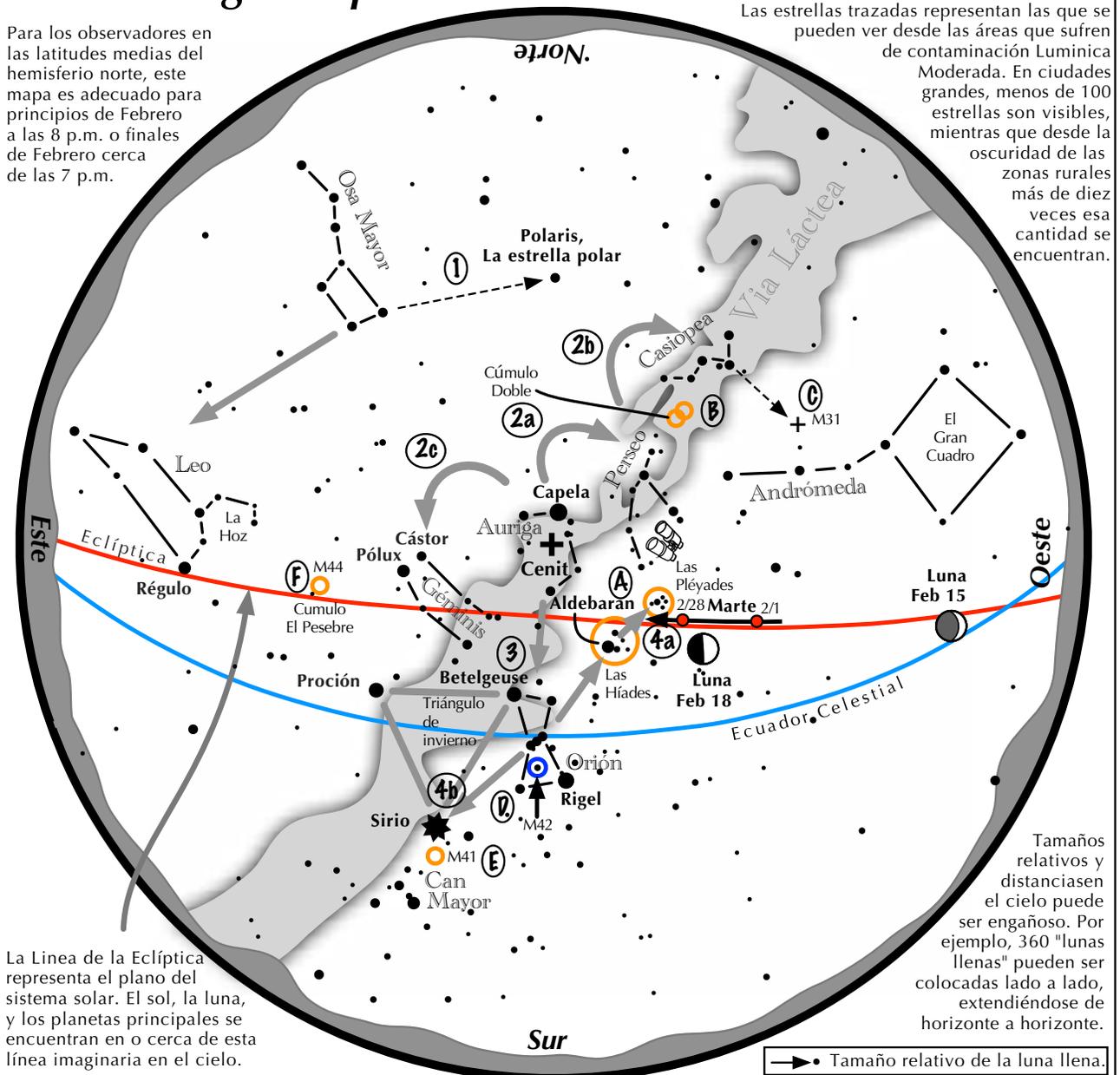


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Navegando por el cielo nocturno de Febrero

Para los observadores en las latitudes medias del hemisferio norte, este mapa es adecuado para principios de Febrero a las 8 p.m. o finales de Febrero cerca de las 7 p.m.

Las estrellas trazadas representan las que se pueden ver desde las áreas que sufren de contaminación Luminica Moderada. En ciudades grandes, menos de 100 estrellas son visibles, mientras que desde la oscuridad de las zonas rurales más de diez veces esa cantidad se encuentran.



La Línea de la Eclíptica representa el plano del sistema solar. El sol, la luna, y los planetas principales se encuentran en o cerca de esta línea imaginaria en el cielo.

Tamaños relativos y distancias en el cielo pueden ser engañoso. Por ejemplo, 360 "Lunas llenas" pueden ser colocadas lado a lado, extendiéndose de horizonte a horizonte.

→• Tamaño relativo de la luna llena.

Navegando por el cielo nocturno: simplemente comience con lo que sabe o con lo que puede encontrar fácilmente.

- 1 Sobre el horizonte noreste se alza la Osa Mayor. Dibuja una línea desde sus dos estrellas finales hasta la estrella polar.
- 2 Desde Capela, salte hacia el noroeste a lo largo de la Vía Láctea hacia Perseo, luego hacia la "W" de Casiopea. Siguiente salto hacia el sureste desde Capela a las estrellas gemelas de Cástor y Pólux en Géminis.
- 3 Directamente al sur de Capela se encuentra la constelación de Orión con sus tres estrellas del Cinturón de Orión, su brillante estrella roja Betelgeuse y su brillante estrella azul-blanca Rigel.
- 4 Usa las tres estrellas del Cinturón de Orión para apuntar al noroeste hacia la estrella roja Aldebarán y el cúmulo estelar Hiades, y luego hacia el cúmulo estelar de las Pléyades. Viaja hacia el sureste desde las estrellas del cinturón hasta la estrella más brillante en el cielo nocturno, Sirio. Es un miembro del Triángulo de invierno.

Puntos destacados con binoculares

A: Examina las estrellas de las Pléyades y las Híades. **B:** Entre la "W" de Casiopea y Perseo se encuentra el Doble Cúmulo de Perseo. **C:** Las tres estrellas más occidentales de la "W" de Casiopea apuntan hacia el sur hasta M31, la Galaxia de Andrómeda, un óvalo "borroso." **D:** M42 en Orión es una nebulosa formadora de estrellas. **E:** Mire al sur de Sirio para ver el cúmulo estelar M41. **F:** M44, un cúmulo de estrellas apenas perceptible a simple vista, se encuentra al sureste de Pollux.





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If you can observe only one evening celestial event this month, consider this one:

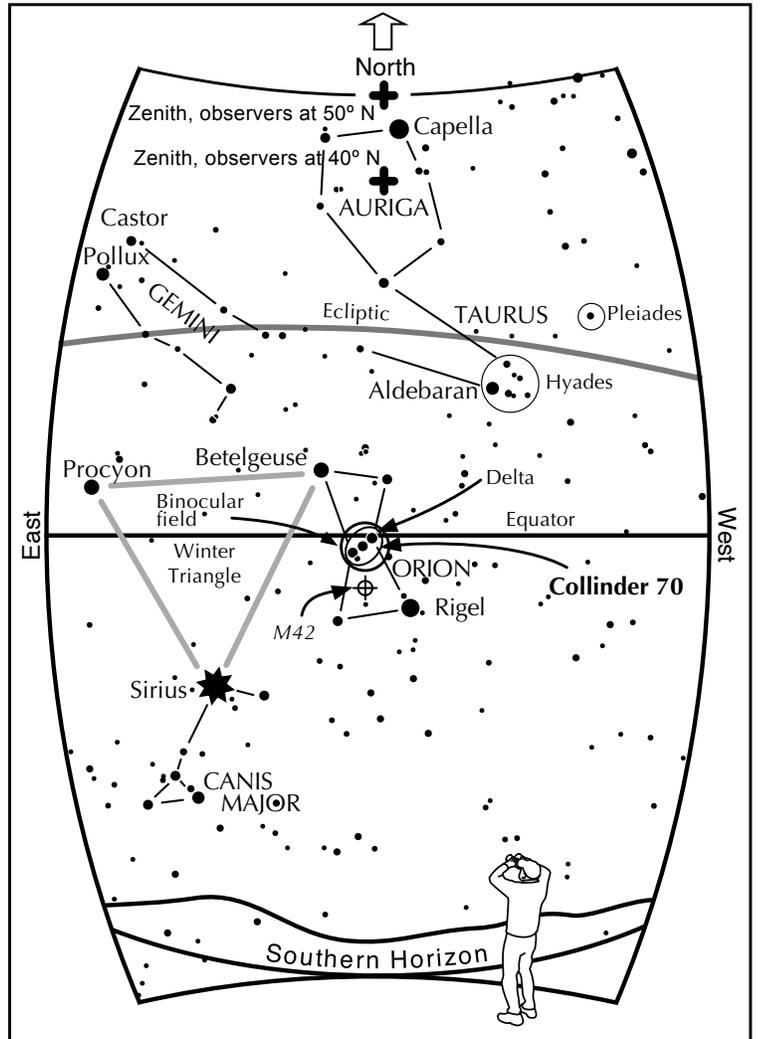
Have you ever seen or even heard of the large open star cluster Collinder 70?

Look high in the south around 8 p.m. for the constellation Orion.

- Its three equally bright belt stars shine noticeably between bright Rigel at the southwest corner of the constellation and bright red Betelgeuse at the northeast corner.
- Aim a pair of binoculars directly at the three belt stars.
- From a dark location, you will discover many dimmer lights in the field. Move the binoculars one field around the belt stars, and you will notice a quick drop in the concentration of dim stars.
- You are outlining the cluster of stars known as Collinder 70, lying 1000 light-years from Earth.



- Aim binoculars at Delta Orionis (Mintaka). Can you see its 6.8 mag. secondary star just 1 minute north of its 2.4 mag. primary?





San Diego Astronomy Association

Orange County Astronomers

You are invited to join your fellow astronomy enthusiasts at the following online events:

General Meeting

Friday February 12th, 7:30pm PST

Dr. Brian Monacelli from JPL will talk about "Exploring Martian Geology"

<https://ocastronomers.org/calendar/general-meeting-2021-02/>

Open Spiral Bar

Saturday February 13th, 10:00pm PST

Come and present your club, astrophotos, activities, etc. or not, ask your astronomy questions and socialize.

<https://ocastronomers.org/calendar/open-spiral-bar-2021-02/>

Beginner's Class

Friday February 5th, 7:30pm PST

David Pearson and Don Lynn will teach "How to Use Your Telescope"

<https://ocastronomers.org/calendar/beginners-class-2021-02/>

Ventura County Astronomical Society's General Meeting (held by OCA)

Friday February 19th, 8:30pm PST

Award Winning Astro-Photographer Wally Pacholka will talk about his work.

<https://ocastronomers.org/calendar/vcas-general-meeting-2021-02/>

All meetings are free and open to the public. To attend please register with zoom in advance by visiting the respective webpage for each event.

Reza AmirArjomand

Vice President

Orange County Astronomers

P.S. You might also be interested in:

Golden Webinars in Astrophysics

<http://astro.uc.cl/en/item-3-menu-izquierdo-2/573-golden-webinars-in-astrophysics-now-on-youtube>

AstroZoom (Public Introductory Astronomy Webinars)

<https://www.astrozoom.space/>

Powerful Telescopes for Teachers Around the World

<https://www.gofundme.com/f/powerful-telescopes-for-teachers-around-the-world>



San Diego Astronomy Association

SDAA Contacts

Club Officers and Directors

President	Dave Wood	President@sdaa.org	(858) 735-8808
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S. County Star Parties	-Vacant-	SouthStarParty@sdaa.org	
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Grants/Fund Raising	-Vacant-	Grants@sdaa.org	
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Publicity	Jeff Flynn	Publicity@sdaa.org	(619) 806-6505
Loaner Scopes	Ed Rumsey	loanerscopes@sdaa.org	(858) 722-3846
Governing Documents	TBD		
TDS Network	Dave Wood	TDSNet@sdaa.org	(858) 735-8808
Amateur Telescope Making	-Vacant-		
ALCOR (Astronomical League Correspondent)	Dave Decker	ALCOR@sdaa.org	(619) 972-1003

SDAA Editorial Staff

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newsletter@sdaa.org

Assistant Editor: Craig Ewing

Have a great new piece of gear? Read an astronomy-related book that you think others should know about? How about a photograph of an SDAA Member in action? Or are you simply tired of seeing these Boxes in the Newsletter rather than something, well, interesting?

Join the campaign to rid the Newsletter of little boxes by sharing them with the membership. In return for your efforts, you will get your very own byline or photograph credit in addition to the undying gratitude of the Newsletter Editor. Just send your article or picture to Newsletter@SDAA.Org.



San Diego Astronomy Association

NASA Night Sky Notes

February 2021



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Landing On Mars: A Tricky Feat!

David Prosper

The Perseverance rover and Ingenuity helicopter will land in Mars's Jezero crater on February 18, 2021, NASA's latest mission to explore the red planet. Landing on Mars is an incredibly difficult feat that has challenged engineers for decades: while missions like Curiosity have succeeded, its surface is littered with the wreckage of many failures as well. Why is landing on Mars so difficult?

Mars presents a unique problem to potential landers as it possesses a relatively large mass and a thin, but not insubstantial, atmosphere. The atmosphere is thick enough that spacecraft are stuffed inside a streamlined aeroshell sporting a protective heat shield to prevent burning up upon entry - but that same atmosphere is not thick enough to rely on parachutes alone for a safe landing, since they can't catch sufficient air to slow down quickly enough. This is even worse for larger explorers like Perseverance, weighing in at 2,260 lbs (1,025 kg). Fortunately, engineers have crafted some ingenious landing methods over the decades to allow their spacecraft to survive what is called *Entry, Descent, and Landing (EDL)*.

The Viking landers touched down on Mars in 1976 using heat shields, parachutes, and retrorockets. Despite using large parachutes, the large Viking landers fired retrorockets at the end to land at a safe speed. This complex combination has been followed by almost every mission since, but subsequent missions have innovated in the landing segment. The 1997 Mars Pathfinder mission added airbags in conjunction with parachutes and retrorockets to safely bounce its way to a landing on the Martian surface. Then three sturdy "petals" ensured the lander was pushed into an upright position after landing on an ancient floodplain. The Opportunity and Spirit missions used a very similar method to place their rovers on the Martian surface in 2004. Phoenix (2008) and Insight (2018) actually utilized Viking-style landings. The large and heavy Curiosity rover required extra power at the end to safely land the car-sized rover, and so the daring "Sky Crane" deployment system was successfully used in 2012. After an initial descent using a massive heat shield and parachute, powerful retrorockets finished slowing down the spacecraft to about 2 miles per hour. The Sky Crane then safely lowered the rover down to the Martian surface using a strong cable. Its job done, the Sky Crane then flew off and crash-landed a safe distance away. Having proved the efficacy of the Sky Crane system, NASA will use this same method to attempt a safe landing for Perseverance this month!

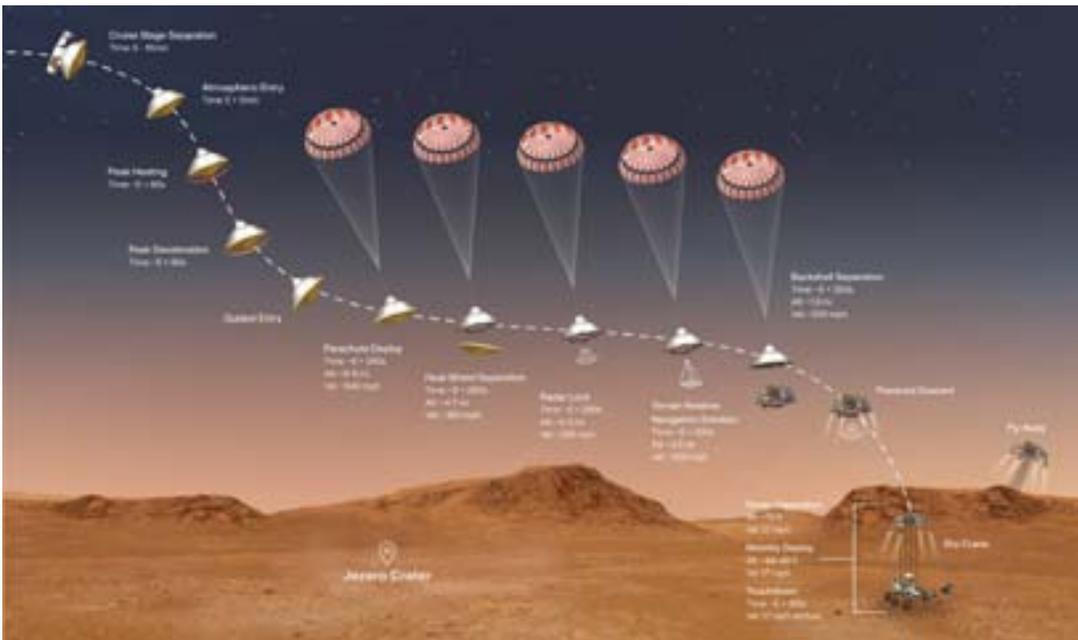
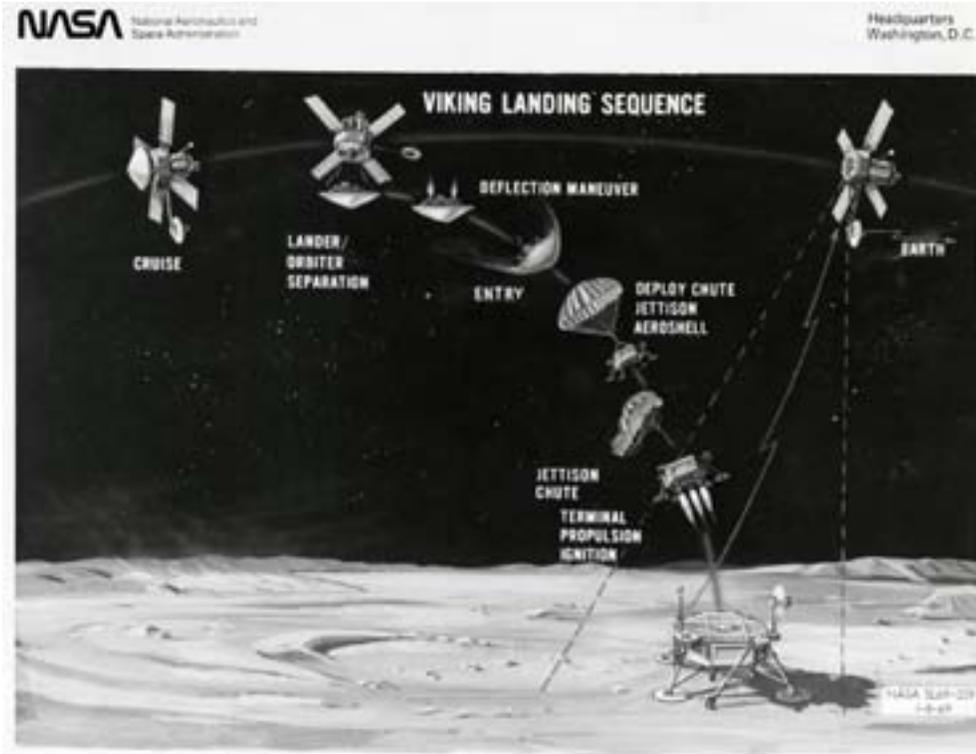
You can watch coverage of the Mars Perseverance landing starting at 11:00 AM PST (2:00 PM EST) on February 18 at nasa.gov/nasalive. Touchdown is expected around 12:55 PM PST (3:55 PM EST). NASA has great resources about the Perseverance Rover and accompanying Ingenuity helicopter on mars.nasa.gov/mars2020. And of course, find out how we plan to land on many different worlds at nasa.gov.



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NASA Night Sky Notes

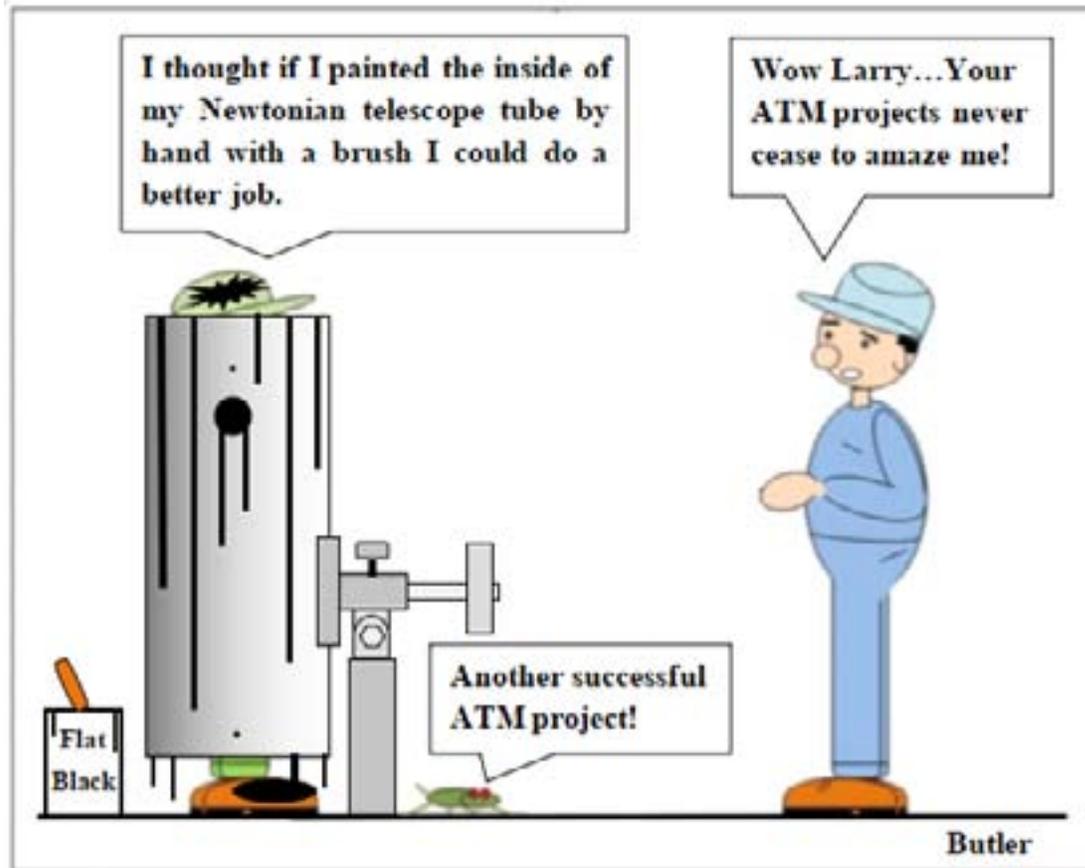
February 2021



Illustrations of the Entry, Descent, and Landing (EDL) sequences for Viking in 1976, and Perseverance in 2021. Despite the wide gap between these missions in terms of technology, they both performed their landing maneuvers automatically, since our planets are too far apart to allow Earth-based engineers to control them in real time! (NASA/JPL/Caltech)



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