



PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

"Mankind's 'Wright Brothers Moment' on Mars"

See article on page 3.



Ted Blank, NASA Solar System Ambassador, is the May 5th meeting Guest Speaker.



Mars Ingenuity on Mars.

May 2022 PAS Meeting

By Terri Finch, Event Manager

Please join PAS in welcoming Ted Blank as the May Guest Speaker. This meeting will happen through Zoom using this link:

<https://us02web.zoom.us/j/81032563398?pwd=UWpSOEZWRs96S3NTL3BD6CtFaGpQT09>. Guests can join the meeting when the link goes live at 7pm. After some discussion and set-up of the Guest Speaker,

President Stu opens the meeting at 7:30pm and turns it over to Ted. We hope you can attend this meeting. Invite everyone you know! It's open to all ages.

April 7th Meeting Review

"Creating a Space-Faring civilization – An Introduction to the National Space Society"

By: Stu Brackney, President PAS

Kids dream a lot. About things, like being super strong or flying like a bird or having a big playground full of toys and "stuff". Tonight's lecture by Mike Mackowski was an introduction to adults who dream. They not only dream about stuff, they gather and talk about their dreams, dreams of traveling to outer space. Landing on the moon, Mars, and destinations farther out. They are serious dreamers who have lots of background training in physics, astronomy, astrophotography, aerodynamic

engineering, and others are people who are just totally interested in space travel and setting up living stations on objects other than earth. Mike's background makes him the perfect person to address this topic.

Michael J. Mackowski is a retired spacecraft engineer whose career spanned 45 years. He has worked on such programs as Landsat 8, the Fermi and Swift gamma ray observatories, the Iridium communications satellite constellation, several other NASA science satellites, and the Space Shuttle. He started his career with McDonnell Douglas Astronautics Company in St.



Mike Mackowski at the April 7th PAS Meeting.

See "April 7th Meeting" at bottom of page 3.

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Past PAS Recorded Presentations

By Terri Finch, Event Manager

Did you miss a PAS Meeting and wish you could see it? You can get to the link of Past Recorded PAS Meetings with Guest Speakers any time by going to the left hand navigation tool on the PASaz.org website and clicking on "PAS Monthly Meetings." From there a drop down item will appear

and please click on "Videos of Speaker Presentations." You will then find recordings of Past PAS Meetings for your viewing pleasure. The collection is in oldest to newest order. Please work your way to the bottom of the collection to find the most recently recorded PAS Guest Speaker Presentation.

As long as PAS can record the PAS Meetings, PAS will continue to add more recordings to this page. Here is the direct link to the recorded PAS Meetings collection: <https://www.pasaz.org/pas-monthly-meetings/videos-of-speaker-presentations>. Enjoy!

Spring 2022 PAS Guest Speakers

By Terri Finch, Event Manager

Events@pasaz.org

Due to the Covid-19 pandemic, PAS Meetings are being held via Zoom over the internet. The Zoom link has been added to the calendar listing for that night's meeting and in the Newsletter in the article about the next PAS Meeting. Please visit the PAS calendar at PASaz.org to find out more about these upcoming Meetings and Guest Speakers. If a Meeting will happen

In-Person, the Calendar Listing will give you that info. For a complete list of Guest Speakers, visit: <https://docs.google.com/document/d/1OO-UpaYNvw3p7JCRXCKSiDcbsK60DnvWOoifbqPrNp8/edit?usp=sharing>

Do you have an idea for a guest speaker? Email Paul Facuna VicePresident@pasaz.org the details and contact info for that possible Guest Speaker.

Here are the next scheduled guest speakers at PAS:

V = Virtual Meeting through Zoom

P = In Person at PVCC Main Campus

Sept 1: TBA

Oct 6: TBA

Nov 3: TBA

Dec 1: David Williams, Topic: TBA

What's Up For May?

By Don K. Boyd, PAStimes Editor

Name	Date	Rise	Set
Mercury	05-15-22	05:59	20:03
Venus	05-15-22	03:40	16:06
Mars	05-15-22	02:42	14:23
Jupiter	05-15-22	03:00	15:00
Saturn	05-15-22	01:22	12:09
Uranus	05-15-22	05:01	18:32
Neptune	05-15-21	02:45	14:32
Pluto	05-15-22	00:02	10:00

All Times Arizona Time

Bold means the object is "visible" in the evening

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May 15, 2022

Sunrise: 05:28

Sunset: 19:22

Q1: May 8

Full: May 15

Q3: May 22

New: May 30



Stu's VIEWS

President's Corner May 2022



President Stuart Brackney.
Photo provided by Stu.

ELECTION TIME FOR PAS....YOU have a say in who leads PAS...VOTE!

It's that time of year again when Phoenix Astronomical Society (PAS) conducts its annual election of officers for its board of directors.

In my last update, I told you that a task force of volunteer PAS members resolved our email system issues. They have also set up a fabulous voting system for all of us, and I mean all of us, to use. This is perhaps the first time in PAS history that 100% of club members were able to cast their vote for board members via email. Nomination ballots were sent to home emails and were to be returned by April 17th. Next, "election of officers ballots" were emailed out, and votes were due no later than noon, April 30. Election results will be announced at our annual May meeting.

Do you have some time to volunteer for PAS? If so, contact me stuartbrackney@pasaz.org. We are looking for a few PAS Members to help out with events and membership. Have a great month everyone.

"Mankind's 'Wright Brothers Moment' on Mars"

(Continued from page 1.)

By Ted Blank, PAS Member & NASA Solar System Ambassador

Invite everyone you know to attend the May PAS Meeting for an in-depth look at the design, deployment and flights of the Mars Ingenuity helicopter, the first aircraft to ever fly on another planet. After hitching a ride to Mars underneath the Perseverance rover, this twin-blade rotorcraft is proving itself an able "scout" for the rover drivers back on Earth, exploring areas unreachable by the wheeled rover and enabling unattend-

ed drives longer than any attempted before.

Ted Blank had "first contact" with PAS during the 2012 Transit of Venus. He found he loved Arizona so much he moved here in 2014. His astronomy interests include studying the shape and composition of asteroids via the technique of stellar occultations, both from his backyard observatory and by doing mobile deployments to the occultation paths. Outreach to the public is his passion, and he was the first to receive

the 250 hour award pin for public outreach from the Sidewalk Astronomers of America. Ted enjoys speaking on topics ranging from solar system exploration to gravitational waves, and dreams of someday exploring Mars in person. He has a BA in Computer Science from SUNY Oswego and a MS in Aquatic Ecology from UC Berkeley. He worked for 25 years for IBM and another 12 for Oracle before retiring in 2019.

1st "After" Covid Public Star Party Apr 2nd

By Don Boyd, PAS Newsletter Editor

Mike Marron hosted this party at his home in Carefree. He had eight people at his party. No one except me showed up for the lecture. Pete and Andi Turner brought two pizzas, and a new member Damon Finnel brought a veggie pizza. Tim Clapp, new member, and his wife Pam also came and Joe Aquavella and his girlfriend, Vicki,

came after the potluck. Karl Edmark, new PAS Member, also attended this event. Damon and Tim took out the 14-inch Schmidt-Cassegrain that Alex Vrenious (PAS Secretary) donated to the club and showed M81 and M82. Pete took out an 11-inch Dob that was also donated to the club and showed the moon. It was a little chilly, with a few thin clouds on the horizon, but a good night for

viewing. Damon got a call and had to leave about 9pm so we called it a night.

Ron Walker was not feeling well, so Mike and I did not go to his place and he did not come to Mike's. It was a very successful much needed event at Mike's. Many thanks to Mike for hosting this event.

(Continued from page 1.)

Louis, Missouri in 1977 and retired in 2018 as an employee of Northrop Grumman Innovation Systems (formerly Orbital ATK) in Gilbert, Arizona.

These adult dreamers belong to a formidable nonprofit organization, the National Space Society (NSS). Members of this organization not only discuss their dreams and ideas, they put these ideas on paper, and share them with organizations such as NASA (National Aeronautics and Space

Administration), the European Space Agency (ESA), major universities, and private corporations who are starting to produce space travel vehicles. NSS publishes an award-winning magazine "ad Astra" that promotes their goals of defending earth from dangerous space objects, developing clean solar energy from space, making the vast resources of space available to all, and supporting the establishment of space settlements, making us an interplanetary species.

The NSS also has a local chapter here in the Phoenix community. Their internet link is: <https://nssphoenix.wordpress.com>

Mike's lecture gave all of us a word of encouragement about our dreams. Take those dreams somewhere they can be studied, such as the NSS.

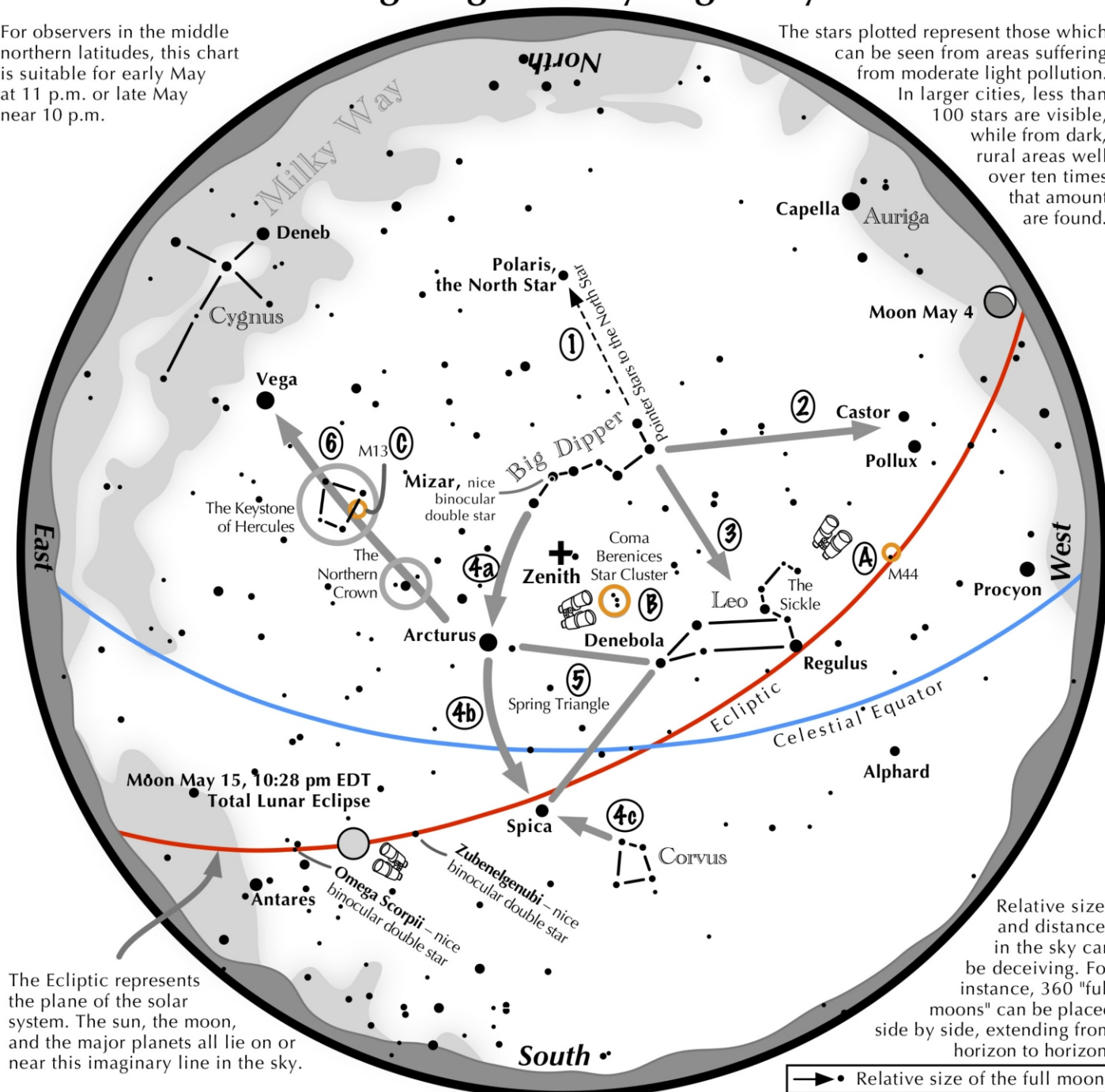
Enjoy a recording of this presentation through Zoom at this link: <https://www.pasaz.org/pas-monthly-meetings/videos-of-speaker-presentations>.

April 7th Meeting

Navigating the May Night Sky

For observers in the middle northern latitudes, this chart is suitable for early May at 11 p.m. or late May near 10 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.



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 May night sky: Simply start with what you know or with what you can easily find.

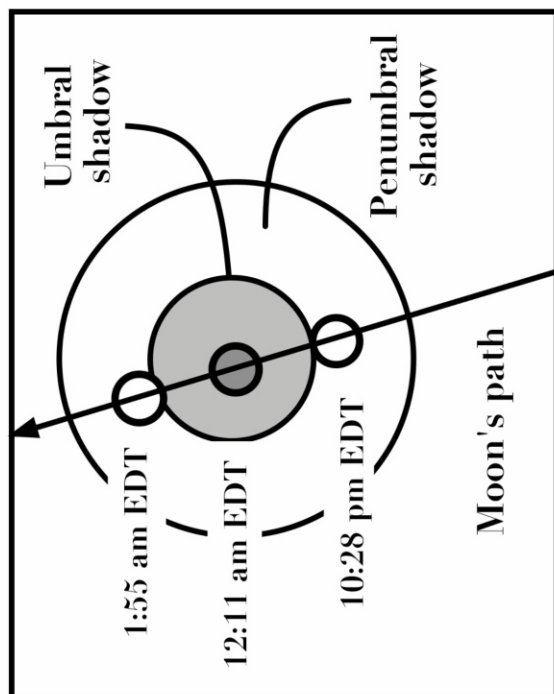
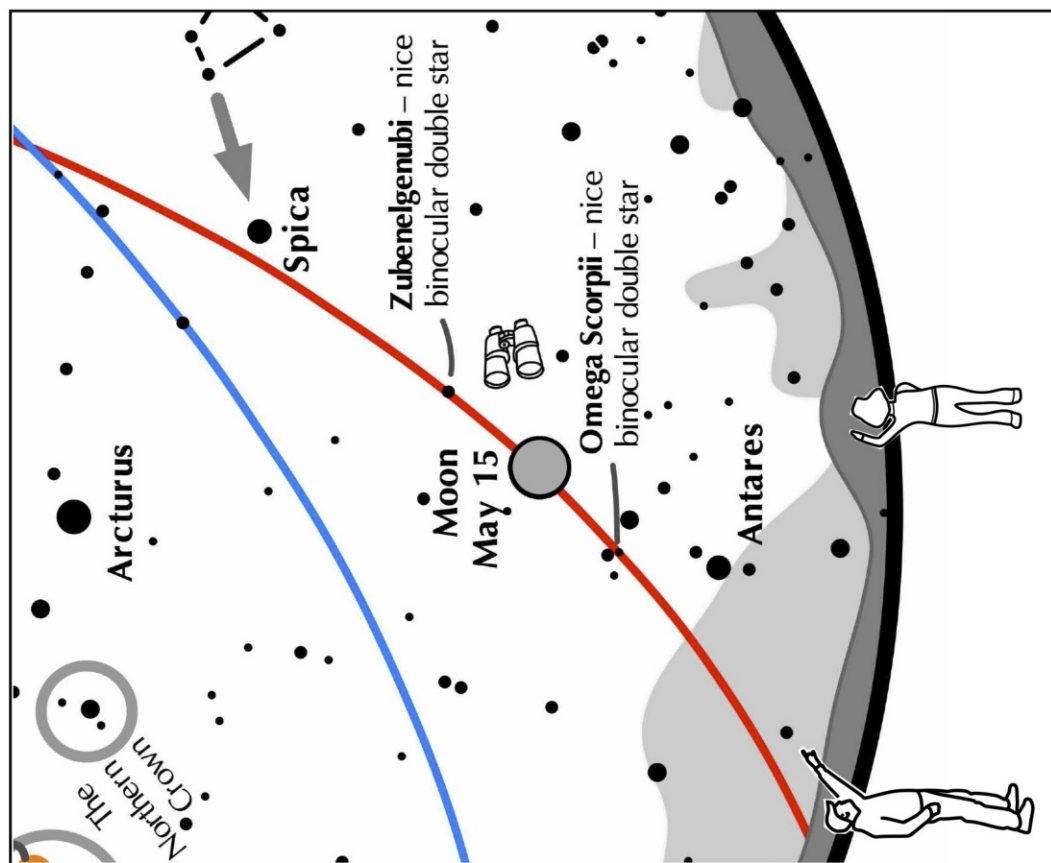
- 1 Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 3 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 4 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
- 5 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 6 Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **B:** Look near the zenith for the loose star cluster of Coma Berenices. **C:** M13, a round glow from a cluster of over 500,000 stars.



If you can observe only one celestial event in the evening this May, see this one.



The Moon slides through a total eclipse

In the evening hours of May 15, the brilliant full moon slides into Earth's shadow.

- Even though the partial umbral eclipse begins at 10:28 EDT, darkening may not be noticed for another 5 minutes.
- When totality is reached, the full moon's brilliance is gone, allowing the stars to appear. Can you spot the wide double star Zubenelgenubi to the moon's upper right? How about red Antares rising in the southeast?
- At mid eclipse, what color is the moon? How red is it?
- During the partial phases, can you notice that the shadow's edge is not straight, but curved?



**View to the southeast
on May 15
at 11 pm EDT,
8 pm PDT (near sunset)**





Night Lights: Aurora, Noctilucent Clouds, and the Zodiacal Light

David Prosper

Have you spotted any “night lights”? These phenomena brighten dark skies with celestial light ranging from mild to dazzling: the subtle light pyramid of the zodiacal light, the eerie twilight glow of noctilucent clouds, and most famous of all, the wildly unpredictable and mesmerizing aurora.

Aurora, often referred to as the northern lights (aurora borealis) or southern lights (aurora australis), can indeed be a wonderful sight, but the beautiful photos and videos shared online are often misleading. For most observers not near polar latitudes, auroral displays are relatively rare and faint, and without much structure, more gray than colorful, and show up much better in photos. However, geomagnetic storms can create auroras that dance and shift rapidly across the skies with several distinct colors and appear to observers much further away from the poles - on very rare occasions even down to the mid-latitudes of North America! Geomagnetic storms are caused when a magnetic storm on our Sun creates a massive explosion that flings a mass of particles away from its surface, known as a Coronal Mass Ejection (CME). If Earth is in the path of this CME,

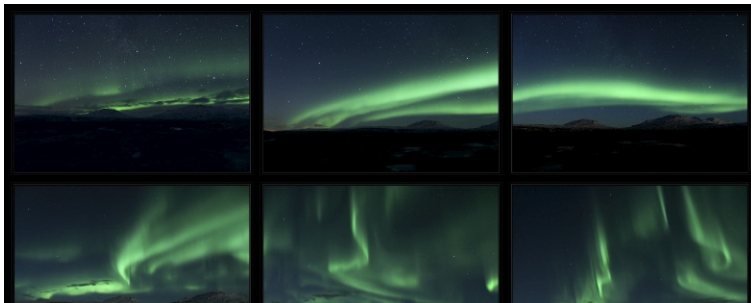
its particles interact with our planet’s magnetic field and result in auroral displays high up in our ionosphere. As we enter our Sun’s active period of its 11-year solar cycle, CMEs become more common and increase the chance for dazzling displays! If you have seen any aurora, you can report your sighting to the Aurorasaurus citizen science program at aurorasaurus.org

Have you ever seen wispy clouds glowing an eclectic blue after sunset, possibly towards your west or northwest? That wasn’t your imagination; those luminescent clouds are noctilucent clouds (also called Polar Mesospheric Clouds (PMC)). They are thought to form when water vapor condenses around ‘seeds’ of dust from vaporized meteorites - along with other sources that include rocket launches and volcanic eruptions - around 50 miles high in the mesosphere. Their glow is caused by the Sun, whose light still shines at that altitude after sunset from the perspective of ground-based observers. Noctilucent clouds are increasing both in frequency and in how far south they are observed, a development that may be related to climate change. Keeping in mind that observers closer in latitude to the poles have a better chance of spotting them, your best opportunity to spot noctilu-

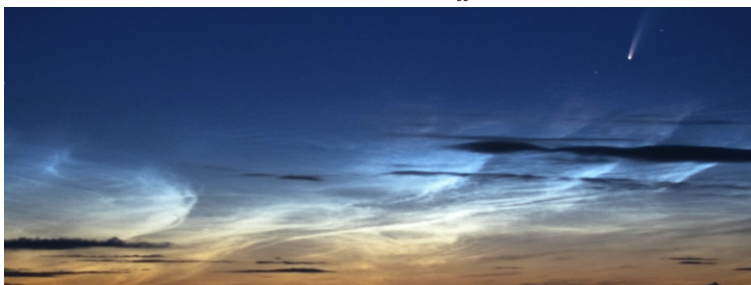
cent clouds occurs from about half an hour to two hours after sunset during the summer months. NASA’s AIM mission studies these clouds from its orbit high above the North Pole: go.nasa.gov/3uV3Yj1

You may have seen the zodiacal light without even realizing it; there is a reason it’s nicknamed the “false dawn”! Viewers under dark skies have their best chance of spotting this pyramid of ghostly light a couple of hours after sunset around the spring equinox, or a couple of hours before dawn around the autumnal equinox. Unlike our previous two examples of night lights, observers closer to the equator are best positioned to view the zodiacal light! Long known to be reflected sunlight from interplanetary dust orbiting in the plane of our solar system, these fine particles were thought to originate from comets and asteroids. However, scientists from NASA’s Juno mission recently published a fascinating study indicating a possible alternative origin: dust from Mars! Read more about their serendipitous discovery at: go.nasa.gov/3Onf3kN

Curious about the latest research into these night lights? Find news of NASA’s latest discoveries at nasa.gov.



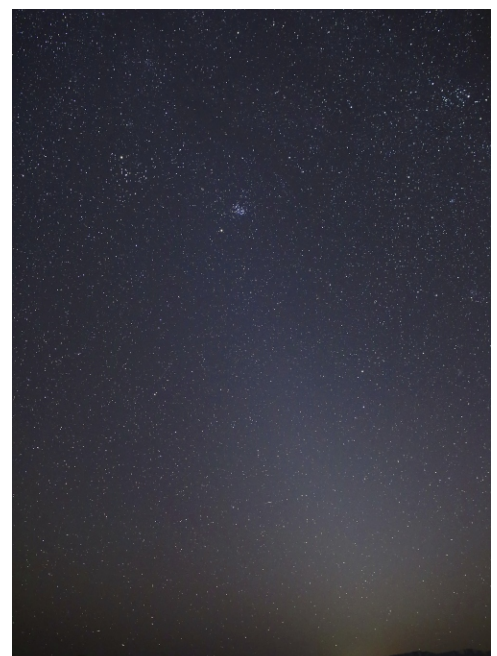
A sampling of some of the various patterns created by aurora, as seen from Iceland in 2014. The top row photos were barely visible to the unaided eye and were exposed for 20-30 seconds; in contrast, the bottom row photos were exposed for just 4 seconds- and were clearly visible to the photographer, Wikimedia contributor Shnuffel2022.



Comet NEOWISE flies high above a batch of noctilucent clouds in this photo from Wikimedia contributor Brwynog.

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https://commons.wikimedia.org/wiki/File:Comet_Neowise_and_noctilucent_clouds.jpg



The zodiacal light extends into the Pleiades, as seen in the evening of March 1, 2021 above Skull Valley. Utah. The Pleiades star cluster (M45) is visible near the top.

Credit and source:: NASA/Bill Dunford.

<https://www.flickr.com/photos/gsf/51030289967>