



**CENTI ASTRO-SPACE
ACTIVITIES**

PHONE:
(716) 338 - 7596

WEBSITE:
www.centiastrospace.com

Young Stars, Stellar Jets

Image Credit: [NASA](#), [ESA](#), [CSA](#), Processing: Joseph DePasquale ([STScI](#))

Hello and welcome to the August edition of COSMIC DIMENSIONS, the newsletter that explores the mysteries of the universe and Space Exploration. In this issue, we will dive into topics such as:

- What's up in the night sky for August
- Perseid Meteor Shower
- Europa Clipper
- 30 Interesting Images from Apollo 11
- **Opting in to Email List**
- and more

Whether you are a curious beginner or a seasoned enthusiast, COSMIC DIMENSIONS will take you on a journey of intrigue and fascination. So begin to explore and enjoy the ride!

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| <ul style="list-style-type: none">• WHAT'S UP IN THE NIGHT SKY FOR AUGUST• PERSEID METEOR SHOWER• "ZERO DEBRIS" AGREEMENT• EUROPA CLIPPER• 30 INTERESTING IMAGES FROM APOLLO 11• OCTOBER 2023 ANNULAR ECLIPSE | <ul style="list-style-type: none">• FAMOUS ASTRONOMER• ICE-HUNTING MOON ROVER• SPACE PIC OF THE MONTH• LAVA TUBES• OPTING IN TO EMAIL LIST• INTERESTING QUOTES |
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WHAT'S UP IN THE NIGHT SKY FOR AUGUST
Presented by

Adventure Science Center Nightwatch - Bill McClain
<https://www.youtube.com/watch?v=w1nXGICPoNc>

Tonight's Sky: July
https://www.youtube.com/watch?v=83n_obMEk0o



PERSEID METEOR SHOWER

Every year, around mid-August, the night sky is lit up by a spectacular show of shooting stars. These are not stars at all, but tiny bits of dust and debris from a comet called Swift-Tuttle, which orbits the sun every 133 years. As the Earth passes through the comet's trail, some of these particles enter our atmosphere and burn up, creating bright streaks of light.

The Perseid Meteor Shower is named after the constellation Perseus, where the meteors appear to originate from. It is one of the most active and popular meteor showers of the year, with up to 100 meteors per hour at its peak. The best time to watch the Perseids is between midnight and dawn, when the sky is darkest and the meteors are most frequent.

To enjoy the Perseid Meteor Shower, you don't need any special equipment or skills. All you need is a clear and dark sky, a comfortable spot to lie down, and some patience. You can also use a star map or an app to locate Perseus in the sky, but you don't have to look at it directly. The meteors can appear anywhere in the sky, so just relax and enjoy the show.

The Perseid Meteor Shower is a wonderful opportunity to witness the beauty and wonder of nature. It is also a reminder of our connection to the cosmos, and our place in the vast universe. As you watch the meteors streak across the sky, you might feel a sense of awe, gratitude, or even wish for something. Whatever you do, don't forget to make a wish when you see a shooting star. You never know, it might come true.

ESA, EUROPEAN COMPANIES BACK "ZERO DEBRIS" AGREEMENT

Jeff Foust June 26, 2023

The European Space Agency and three European satellite manufacturers have announced plans to work together to develop "ambitious and meaningful targets" for dealing with orbital debris.

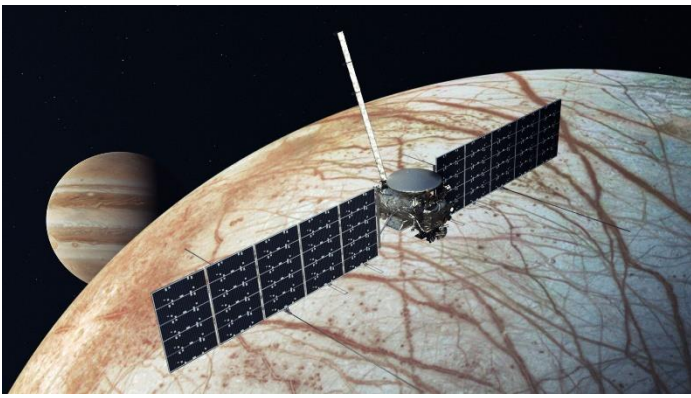
At an event during the Paris Air Show June 22, ESA Director General Josef Aschbacher and executives with Airbus Defence and Space, OHB and Thales Alenia Space said they would jointly develop a "Zero Debris Charter" with the overarching goal of preventing the creation of new debris, particularly in low Earth orbit.

"The principle is a very simple one," he said. "The Zero Debris Charter is a principle where we would like to ensure that there is zero debris left behind in space."

Details backing that principle will be worked out by ESA and the companies later this year, according to an ESA statement. That included developing "ambitious and meaningful targets to be achieved by 2030" and including them in the text of the charter by the end of the year. To read more click the following link:

<https://spacenews.com/esa-european-companies-back-zero-debris-agreement/>





EUROPA CLIPPER

NASA's Europa Clipper will conduct detailed reconnaissance of Jupiter's moon Europa and investigate whether the icy moon could harbor conditions suitable for life.

The mission will place a spacecraft in orbit around Jupiter in order to perform a detailed investigation of Europa -- a world that shows strong evidence for an ocean of liquid water beneath its icy crust and which could host conditions favorable for life. The mission will send a highly capable, radiation-tolerant spacecraft into a long, looping orbit around Jupiter to perform repeated close flybys of the icy moon. To learn more about this exciting mission and to add your name to a poem that will be on board the probe click on the following links:

<https://www.jpl.nasa.gov/missions/europa-clipper>

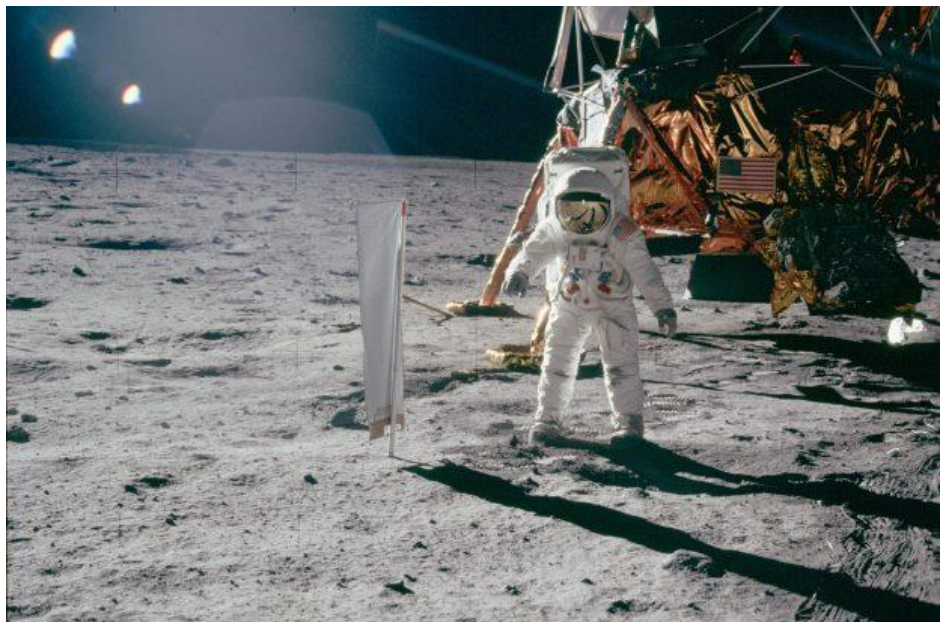
<https://europa.nasa.gov/>

[SpaceWatchtower: Add Your Name to Poem to be Launched to Jupiter Moon Europa](#)

30 INTERESTING IMAGES FROM APOLLO 11

Samantha Hill July 20, 2023

On July 16, 1969, Apollo 11 launched from Cape Kennedy in Florida with astronauts Buzz Aldrin, Michael Collins and Neil Armstrong aboard. On July 20, the Lunar Module, *Eagle*, landed in the Sea of Tranquility on the Moon. That evening, Armstrong left the module, followed by Aldrin 20 minutes later, changing the course of human history by being the first people on the Moon.



Buzz Aldrin photographed by Neil Armstrong, early during the Apollo 11

One of the crew's objectives was to take many photographs on the surface — both of lunar geology and their own scientific equipment, as well as anything that others back on Earth might find interesting. As a result, the mission is a visually magnificent voyage in both black and white and color.

Although a few photos of the trip come easily to mind, it's hard to distill such an iconic journey into just a few pictures. For the 54th anniversary of those astronauts' brave steps, here is an image gallery, taken from the [NASA Apollo archives](#). These 30 stills provide a brief insight into the training, liftoff, Earth orbit, and of course, the Moon. Click on the link to see the pictures: <https://www.astronomy.com/space-exploration/30-interesting-images-from-apollo-11/>

OCTOBER 2023 ANNULAR ECLIPSE



The October 2023 annular eclipse is a rare and spectacular event that will cross North, Central, and South America on **Saturday, October 14, 2023**. An annular eclipse occurs when the Moon is too far from the Earth to completely cover the Sun, leaving a bright ring of light around the dark disk of the Moon. [This is also known as the “ring of fire” phenomenon¹](#).

The path of annularity, where the ring of fire is visible, will start in Oregon at **9:13 a.m. PDT** and end in Texas at **12:03 p.m. CDT**. [It will also pass over parts of California, Nevada, Utah, New Mexico, Mexico, Guatemala, Belize, Honduras, Nicaragua, Panama, Colombia, and Brazil¹²](#). [The duration of annularity will vary from place to place, but the maximum will be about 4 minutes and 28 seconds in Colombia²](#).

Outside the path of annularity, a partial solar eclipse will be visible in all 48 contiguous U.S. [states plus Alaska¹](#). A partial eclipse occurs when the Moon covers only a part of the Sun. The degree of partiality will depend on how close you are to the path of annularity. [For example, in](#)

[Seattle, Washington, the Moon will cover about 40% of the Sun’s diameter at maximum eclipse²](#).

[To watch the annular or partial eclipse safely, you need to use specialized eye protection designed for solar viewing or an indirect viewing method such as a pinhole projector¹](#). You should never look directly at the Sun without proper protection as it can cause permanent eye damage or blindness.

[Some of the best locations to see the October 2023 annular eclipse are³:](#)

- Crater Lake National Park, Oregon: The park offers stunning views of the deepest lake in the U.S. and the surrounding volcanic landscape. The annular eclipse will occur at **9:18 a.m. PDT** and last for about **2 minutes and 10 seconds**.
- Grand Canyon National Park, Arizona: The park is one of the most iconic natural wonders in the world and a UNESCO World Heritage Site. The annular eclipse will occur at **10:29 a.m. MDT** and last for about **3 minutes and 6 seconds**.
- Albuquerque International Balloon Fiesta, New Mexico: The fiesta is the largest hot air balloon festival in the world and attracts hundreds of thousands of visitors every year. The annular eclipse will occur at **10:35 a.m. MDT** and last for about **3 minutes and 51 seconds**. [The fiesta will also host a special “eclipse glow” event where balloons will light up in sync with the eclipse⁴](#).
- Big Bend National Park, Texas: The park is home to diverse ecosystems, wildlife, and geological features. It is also one of the darkest places in the U.S., making it ideal for stargazing. The annular eclipse will occur at **11:54 a.m. CDT** and last for about **4 minutes and 13 seconds**.
- Medellin, Colombia: The city is known for its cultural vibrancy, innovation, and social transformation. It is also close to the point of greatest eclipse where the ring of fire will be widest and longest. The annular eclipse will occur at **1:32 p.m. COT** and last for about **4 minutes and 28 seconds**.

I hope this information helps you plan your eclipse viewing experience. If you want to learn more about eclipses or find out where and when to see them in your location, you can visit these websites:

- <https://solarsystem.nasa.gov/eclipses/2023/oct-14-annular/>
- <https://www.greatamericaneclipse.com/october-14-2023>
- <https://www.timeanddate.com/eclipse/solar/2023-october-14>

In April 2024 there will be a total solar eclipse which I will discuss in next month’s issue.

To view the upcoming eclipses safely there are many products available. Click on the link below to see them. **This is an affiliate link which means if you click on it and purchase any items, I will receive an affiliate commission at no extra cost to you.** This commission helps support my education programs.

https://www.eclipseglasses.com?sca_ref=4135201.w76xb24WqN

FAMOUS ASTRONOMER

Dr. Duane W. Hamacher is an Australian astrophysicist, anthropologist, and cultural astronomer who was born in the United States and raised in Wisconsin. He has devoted his career to the study of indigenous astronomical knowledge and the intersection between traditional Indigenous beliefs and Western science.

Education and Early Career: Duane Hamacher earned his Bachelor's degree in astrophysics and anthropology from the University of Wisconsin-Madison. Later, he moved to Australia to pursue a Ph.D. at Macquarie University, where he conducted groundbreaking research on Aboriginal Australian astronomy and ethnoastronomy.

Research and Contributions: Dr. Hamacher's research primarily focuses on the rich and diverse astronomical knowledge of Indigenous Australian cultures. He has worked closely with Aboriginal communities to document their celestial traditions, including the ways in which they observe, interpret, and pass down astronomical knowledge through oral traditions and cultural practices.

One of his notable contributions to the field was the discovery of the world's oldest recorded astronomical event, involving the Aboriginal Australian interpretation of a meteor impact that occurred in what is now known as the Henbury Craters in the Northern Territory, dating back approximately 4,700 years.

Through his work, Duane Hamacher seeks to promote cross-cultural understanding and respect for the Indigenous knowledge systems, encouraging dialogue between Indigenous communities and the scientific community.

Academic and Outreach Efforts: Dr. Hamacher has published numerous academic papers and co-authored books, sharing the findings of his research with both the scientific community and the general public. He has been a passionate advocate for the recognition of Indigenous astronomy within the broader field of astronomy and science.

Beyond his research, Dr. Hamacher has been involved in educational outreach and collaborated with various Indigenous organizations and institutions. He has conducted workshops and public talks, fostering a deeper appreciation for the connections between cultural heritage and the sky.



Dr. Duane Hamacher, an astrophysicist and cultural astronomer of Wiradjuri heritage:



Artist's concept of the VIPER rover working in lunar darkness. [NASA/Daniel Rutter](#)

NASA STARTS BUILDING ICE-HUNTING MOON ROVER

Stephen Clark 07/19/2023

The search for ice at the Moon's poles has loomed large in the field of lunar science since an instrument on an Indian satellite discovered water molecules inside shadowed crater floors more than a decade ago. NASA is now assembling a golf cart-size rover to drive into the dark polar craters to [search for ice deposits](#) that could be used by future astronauts to make their own rocket propellant and breathable air.

“A large group of people have been working on this idea for 10-plus years,” said Anthony Colaprete, project scientist for NASA’s Volatiles Investigating Polar Exploration Rover (VIPER) mission.

Earlier this year, engineers at NASA’s Johnson Space Center in Houston started building the rover’s chassis. In June, the space agency formally approved VIPER’s team to move into full-scale assembly and testing ahead of the rover’s scheduled launch in November 2024. To read more click the link:

<https://arstechnica.com/space/2023/07/nasa-starts-building-ice-hunting-moon-rover/amp/>

SPACE PIC OF THE MONTH



Apollo 11: Catching Some Sun

Image Credit: [Apollo 11](#), [NASA](#) (Image scanned by Kipp Teague)

Explanation: Bright sunlight glints as long dark shadows mark this image of the [surface of the Moon](#). It was taken [fifty-four](#) years ago, July 20, 1969, by Apollo 11 astronaut [Neil Armstrong](#), the first to walk on the lunar surface. [Pictured is](#) the mission's lunar module, the

Eagle, and spacesuited lunar module pilot Buzz Aldrin. Aldrin is unfurling a long sheet of foil also known as the [Solar Wind Composition Experiment](#). Exposed facing the Sun, the foil trapped particles streaming outward in the solar wind, catching a sample of [material from the Sun](#) itself. Along with moon rocks and lunar soil samples, the solar wind collector was returned for analysis in earthbound laboratories.

LAVA TUBES: NATURE'S SHELTERS FOR COSMIC COLONIZATION

Jordan Strickler July 26, 2023

In the realm of space exploration and potential colonization, the concept of utilizing caves – particularly lava tubes – as habitats has garnered both fascination and skepticism.

Proponents argue that caves could provide natural shelters on extraterrestrial bodies like the Moon and Mars. Critics raise concerns about their stability and practicality. Either way, lava tubes have always been an intriguing feature for space exploration enthusiasts.



The Nāhuku-Thurston Lava Tube, located in Hawai'i Volcanoes National Park, could look similar to those found on Mars. Credit: NPS Photo/D. Boyle

In addition to their potential as habitats for future human colonization, lava tubes can be studied to provide insights into the geological history of their celestial body. Click the link to continue reading:

<https://www.astronomy.com/space-exploration/lava-tubes-natures-shelters-for-cosmic-colonization/>

OPTING IN TO CONTINUE GETTING COSMIC DIMENSIONS

Changes are being made in how COSMIC DIMENSIONS will be delivered in the future. Also, you will be receiving periodic fact sheets that relate to my courses and other news. In order to abide by non-spam email regulations, I need you to click on ["Join our mailing list!"](#). This will direct you to the first page of my website. At the bottom is the opt-in form to be a subscriber. When you complete this you will continue receiving COSMIC DIMENSIONS and other news items. Many of you have already done this, but in order to avoid being dropped from the list I would appreciate it if you would opt-in again. I urge you to do this soon to avoid being taken off the list.

INTERESTING QUOTES

"If people sat outside and looked at the stars each night, I bet they'd live a lot differently. When you look into infinity, you realize there are more important things than what people do all day." -- **Calvin & Hobbes**

"Astronomy compels the soul to look upwards and leads us from this world to another." -- **Plato**

----- CONTACT -----



CENTI ASTRO-SPACE ACTIVITIES

Christopher S. Centi, "C the Rocket Man"

91 East Main Street

Brocton, New York 14716

Business Mobile: (716) 338 - 7596

E-mails: centiastropace@gmail.com centiastropace@centiastropace.com

Web Site: <https://www.centiastrospace.com>

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