

The Headphone Nebula



The Headphone Nebula, also known as Jones-Emberson 1, is a faint planetary nebula in the constellation Lynx. It lies some 1,600 light-years away. The photographer combined 36 hours of exposures to create this image.

Photo Courtesy: Douglas J. Struble from Taylor, Michigan for Astronomy Magazine

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The EAS newsletter, Observer, is published monthly. Anyone wishing to contribute articles or photos may mail them to the club's PO Box: EAS, PO Box 3474, Evansville, IN 47733, or e-mail them to the editor at:

dasiceman@yahoo.com

To the Members of the EAS

Again this month due to the COVID pandemic we will be doing an online Zoom Video Meeting on December 18th, 2020. Please Note that we will also be doing our annual Astronomy Quiz presented by Mitch Luman during this meeting, as well. Chuck Allen will have certificates for the winners.

Please check our Facebook Group Page and Website for updates.

If you are unfamiliar with online meetings, you may wish to visit the following link ahead of the meeting night to learn more:

<https://support.zoom.us/hc/en-us/articles/201362193-How-Do-I-Join-A-Meeting>

The Evansville Astronomical Society now has a Youtube Channel and for those that missed the live session of our December 2020 Meeting and Presentation, you can watch a video stream of this event. This link can also be found on our website

<http://evansvilleastro.org>

<https://www.youtube.com/channel/UC8A9iE6gz0JE1Rr8VuxqmDg?fbclid=IwAR0In5rjdsA-GdGKkhLTvVRFx1fENmVeSPpWtw2Rc6sBB79w702cLyB1n14&app=desktop>

The **Evansville Astronomical Society (EAS)** is a non-profit organization fully incorporated in the state of Indiana. It has, as its primary goal, the advancement of amateur astronomy. Founded in 1952, the society seeks to:

- 1... maintain adequate facilities for its members and the public in order to extensively study the skies and
- 2... promote an educational program for those who wish to learn more about the science of Astronomy.

Meetings are held the third Friday of each month, except June, when the annual EAS picnic is held. The society also sponsors monthly Open House events during the warmer seasons that afford the public an opportunity to tour the observatory.

EAS 2021 Officers and Contacts

President – Tony Bryan
812.827.3234

evansvilleastro@gmail.com

Vice President – Scott Conner

Secretary – David Kube
740.223.6854

Treasurer – Amy Barrett

Counselors
Ken Harris (2019)
Mitch Luman (2020)
Michael Borman (2021)

Webmaster – Michael Borman

Program Director
Chuck Allen

Newsletter editor – Dave Kube
dasiceman@yahoo.com

For more information about the EAS or directions to the Observatory, please visit the club's web page:

www.evansvilleastro.org



Local Events and Information

EAS Update

Please note that currently we have a Zoom Meeting Scheduled on Friday, December 18th, 2020 @ 7:30pm. Please Note our presentation will be our annual Astronomy Quiz presented by Mitch Luman.

EAS Update

Please note that currently all public meetings have been canceled and therefore we are trying to meet via online Zoom Meeting until further notice.

EAS Update

EAS Update

EAS Update

EAS Update

EAS Update:

Please visit our website www.evansvilleastro.org and our Facebook Group page to keep yourself up to date for any changes.

FOR SALE:

Telescopes and accessories for sale...

As mentioned in last month's issue, Mike Borman still has some excellent telescope equipment and imaging accessories for sale. Some of the gear has already been sold. If interested, go to Mike's web page. Here is the link: <http://www.mborman.org/forsale.htm>

How do Astronauts Escape a Failed Rocket Launch?



Rather than use a detachable launch escape system, SpaceX's Crew Dragon capsule has emergency escape engines built directly into the craft. Allowing it to flee potential danger at the drop of a hat.

Credit: SpaceX.

SpaceX made international headlines this May when their Crew Dragon spacecraft blasted into orbit aboard a Falcon 9 rocket, carrying astronauts Doug Hurley and Bob Behnken to the International Space Station. But what some astute viewers may have noticed during liftoff is that Crew Dragon did not have a traditional launch escape system (LES) tower on top of its nose cone.

Elon Musk's SpaceX has proven to be nothing if not innovative. While recognizing that crewed spacecraft must have an escape system. The Crew Dragon has eight SuperDraco engines incorporated into the body of the spacecraft itself, none of which utilize an external tower.

In a further break from tradition, the SuperDraco engine utilizes liquid propellants, which are more controllable than solid propellants. These propellants do not need an external ignition source. Hypergolic fuels ignite on contact with each other, further simplifying the design of the engine — and, of key importance, allowing the engine itself to be restarted.

Engines that use hypergolic fuels have been shown to be extremely reliable (the Apollo Service Module's engine used hypergolic fuel, as did the Lunar Module's descent and ascent engines). SpaceX performed a full launch abort test of their spacecraft on January 19, 2020, intentionally destroying a Falcon 9 rocket in the process.

How do we Know what's Deep Inside Earth?



The extreme conditions of inner Earth make it impossible to explore. But seismic waves during earthquakes, volcanic eruptions and light waves from the Sun all have helped reveal fascinating insights about our planet's mantle, crust, and core.

Credit: Vadim Sadovskii/Shutterstock

The final frontier isn't space: It's Earth itself. We've sent people to the Moon, robots to Mars and the New Horizons space probe 3.26 billion miles from Earth to snap photos of Pluto, while just 4,000 miles beneath our feet, unfathomable heat and pressure keep the center of Earth tantalizingly out of reach. But scientists have been able to puzzle out what's inside Earth — including olive-green crystals and a roiling sea of melted iron — by studying meteorites, volcanic eruptions and the seismic waves from earthquakes..

“We go and explore other planets, but in many ways, going inside the Earth and figuring out what's inside the Earth is actually technologically harder than going into space,” says Vedran Lekić, a seismologist at the University of Maryland..

There are four main layers to Earth: crust, mantle, outer core and inner core, along with transition zones between these layers. The world we know lies on tectonic plates making up Earth's crust, which varies in thickness from three miles to over 40. Beneath the crust lies the mantle, the layer of rock making up 84 percent of Earth's volume. The rocks in the upper mantle are white-hot, but if you could cool them to room temperature, they'd be a speckly olive green thanks to the mineral olivine — you might know it as the August birthstone peridot. “I think the mid-upper mantle would be gorgeous, because it would be olivine green, like 60 percent, and it would also have garnets, these beautiful red cubic minerals,” says Wendy Mao, a mineral physicist at Stanford University.

January 2021

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|-----|-----|-----|-----|-----|-----|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |

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Up and Coming Events 2020

EAS Meetings and Events are currently on hold or cancelled due to the current COVID-19 situation.

Please note we have an online Zoom Meeting Scheduled for December 18th, 2020 @7:30pm.

Please visit our Web Page <http://www.evansvilleastro.org> for updates.

Please visit our Facebook Group Page for updates.

Moon Phases

| New Moon | First Quarter | Full Moon | Third Quarter |
|---------------------------------|---------------------------------|---------------------------------|--------------------------------|
| January 13 th , 2021 | January 20 th , 2021 | January 28 th , 2021 | January 6 th , 2021 |

[Moon Phases courtesy of Time and Date.com](http://www.timeanddate.com)

EAS Unofficial Meeting Notes for November – 2020

We had an online Zoom Meeting for Members on November 20, 2020.

Our Zoom meeting was hosted by EAS President Tony Bryan with 14 members and our guest presenter logged in. Our 2021 slate of Officer and Counselors were voted upon at the beginning of the meeting. There were no new nominations for the 2021 year. All current slate of officers agreed to another term. Mike Borman's counselor position was up and was also re-elected. All said and done the members voted to keep the current slate of officers and counselors unanimously.

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Our presenter was Normand Fullum, owner, Optiques Fullum, Quebec was introduced by Chuck Allen. Here is a link to Optiques Fullum. <https://www.optiquesfullum.com/telescopes/>

Mike's presentation was a video walk thru of his mirror and telescope shop. It was very informative as to how he began this career path and technology involved.

If you are unfamiliar with online meetings, you may wish to visit the following link ahead of the meeting night to learn more: <https://support.zoom.us/hc/en-us/articles/201362193-How-Do-I-Join-A-Meeting>

Respectfully Submitted – Dave Kube – Secretary