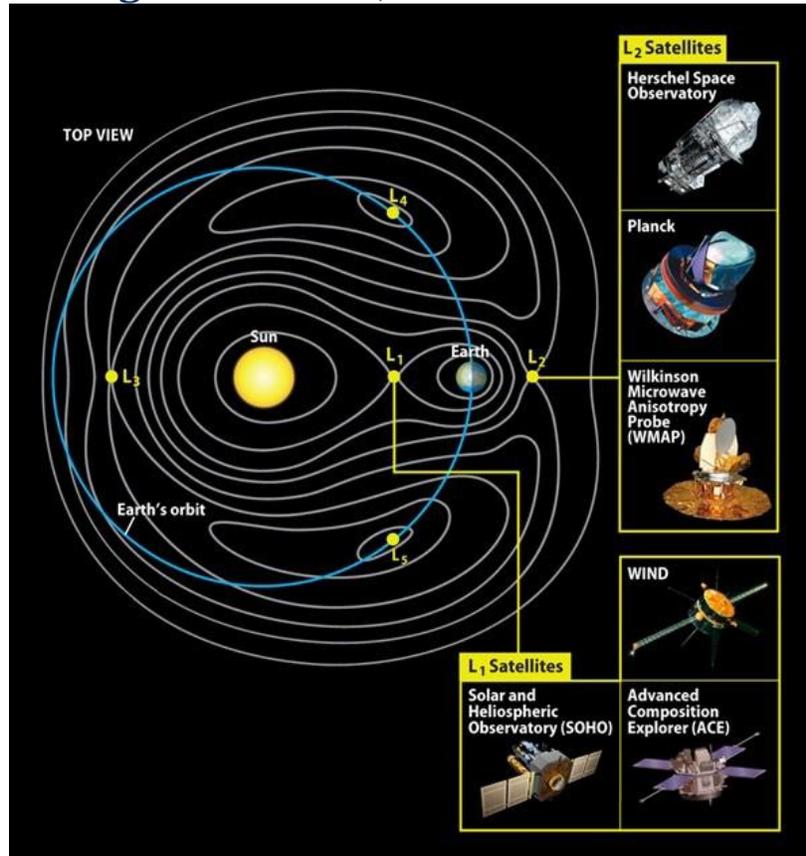


## EAS Meeting March 20<sup>th</sup>, 2020 - Cancelled COVID-19



### What are Lagrangian Points - Astronomy: Roen Kelly

The Lagrangian points are indeed points, infinitesimal in size, where the gravitational forces from a planet and another body (generally the Sun or a moon) exactly balance the centrifugal force. But, as you guessed, surrounding each actual Lagrangian point is an extended zone where a spacecraft can conveniently park itself in an orbit that requires little fuel to maintain. When you hear about a spacecraft orbiting at a certain Lagrangian point, it really means the probe is traveling within or near one of these extended, three-dimensional islands of orbits. The Earth-Sun system has five Lagrangian points, each with an extended region where spacecraft can orbit with little fuel. Scientists place probes that monitor the Sun at the L1 point and craft that survey the infrared and microwave sky at the L2 point.

#### Inside this Issue..

- 2 – Important Message, COVID-19
- 3 – Local Events and information
- 4 – News around the Globe
- 5 – Calendar
- 6 – EAS Business

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](mailto:dasiceman@yahoo.com)

## **EAS Members and Friends – Regarding COVID-19**

Throughout history, humans have been faced with challenges that required thoughtful action to overcome.

The Officers and Board Members of the EAS have determined it is in the best interest of the organization, its members, and the general public to cancel all events listed on our calendar until further notice. The Officers will regularly assess the situation and determine when a return to normalcy is prudent.

We look forward to a time where we can once again gather to socialize and share our love of astronomy with each other and the public.

Meanwhile, we should all continue to experience our beloved interest with personal observations, catching up on reading of books and those back-issues of astronomy publications, posting to and reading social media, and armchair astronomy (viewing astronomy news and videos from the Internet).

Be sure to watch our Facebook page, website, and future emails for updates.  
Clear skies, Officers and Board Members of the EAS

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 2020 Officers and Contacts**

President – Tony Bryan  
812.827.3234

[evansvilleastro@gmail.com](mailto:evansvilleastro@gmail.com)

Vice President – Scott Conner

Secretary – David M Kube  
740.223.6854

Treasurer – Amy Barrett

Counselors  
Michael Borman (2018)  
Ken Harris (2019)  
Mitch Luman (2020)

Webmaster – Michael Borman

Program Director  
Chuck Allen

Newsletter editor – Dave Kube  
[dasiceman@yahoo.com](mailto:dasiceman@yahoo.com)

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

[www.evansvilleastro.org](http://www.evansvilleastro.org)



## Local Events and Information

### **EAS Update – Cancelled COVID-19**

Please Note we have a Regular Meeting scheduled at the Observatory on Friday, March 20<sup>th</sup>, 2020 @ 7:30pm.

### **EAS Update – Cancelled COVID-19**

Please Note We have a Winter work day scheduled at the Observatory on March 21<sup>st</sup>, 2020 beginning at 10:00am.

### **EAS Update – Cancelled COVID-19**

Please Note we have a Venus Watch scheduled at the **Evansville Museum** on Saturday, March 28<sup>th</sup>, 2020 from 7:30-9:00pm.

### **EAS Update – Cancelled COVID-19**

Please Note we have a Regular Meeting scheduled at the Observatory on Friday, April 17<sup>th</sup>, 2020 @ 7:30pm.

### **EAS Update – Cancelled COVID-19**

Please Note we have a Regular Meeting scheduled at the Observatory on Friday, April 17<sup>th</sup>, 2020 @ 7:30pm

### **EAS Update – Cancelled COVID-19**

Please Note we have a PSW scheduled at the Observatory on Saturday, April 25<sup>th</sup>, 2020 @ 7:30pm.

### **EAS Update:**

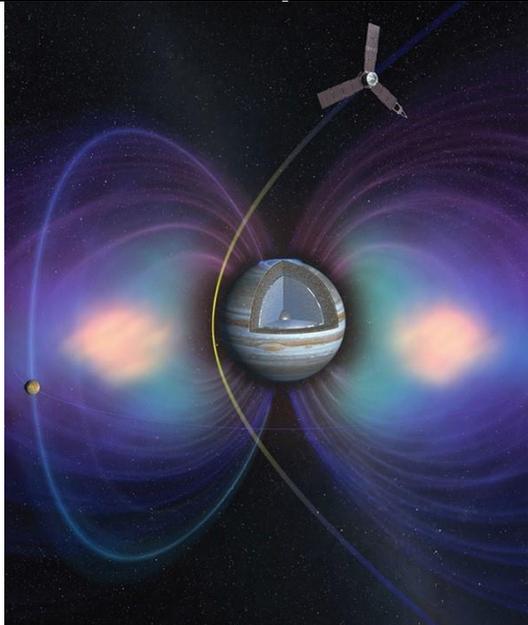
Please visit our website [www.evansvilleastro.org](http://www.evansvilleastro.org) and our Facebook page to keep yourself up to date for any changes.

### **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>

***What is the Source of Jupiter's Radiation?***



In this artist's rendition, depicted are the loops of the planet's strong magnetic field, as well as its moon Io. Juno's unique orbit minimizes the time it spends in the deadly radiation, while still allowing the spacecraft to study it.

NASA/JPL-Caltech

Not surprisingly, the king of the planets has the strongest magnetic field among the planets of our solar system, with a reach extending far beyond its orbiting moons. The huge region around the planet where Jupiter's magnetic field controls the environment is called its magnetosphere.

Any charged particles in the space around Jupiter will experience the planet's strong magnetic field and get accelerated to high energies. These negatively charged electrons and positively charged ions of hydrogen (i.e., protons), oxygen, and sulfur form Jupiter's radiation belts. The source of the protons is some combination of particles escaping from Jupiter's ionized atmosphere (the ionosphere) and particles leaking in from the solar wind. The dominant particle source, however, is the volcanic moon Io, which dumps a ton per second of sulfur dioxide gas into space where the molecules are broken up and ionized. These processes around the moon drive million-amp currents between Io and Jupiter's ionosphere, where they excite intense aurorae on the planet.

The highest fluxes of energetic particles are found closest to the planet, where they form a doughnut-shaped belt around the equator (which causes radio emission that astronomers have measured from Earth since the 1960s).

Most spacecraft avoid the radiation belts and the damage they cause to sensitive electronics. But the polar orbit of NASA's Juno spacecraft will evolve, and the craft will eventually cross the radiation belts, receiving a dosage equivalent to about 10 million dental X-rays!

***China's Chang'e-4 Mission peers beneath the Lunar Farside's Surface.***



In 2019, China's Chang'e 4 spacecraft became the first to ever land softly on the farside of the Moon. This image was taken by the country's Yutu-2 rover, which landed with the spacecraft.

CNSA via ESA

New data from the first spacecraft to land softly on the lunar farside is offering up fresh details about the part of the Moon that's hidden from view on Earth. The Chinese rover found that the ground beneath it is similar to what's found on our satellite's more familiar face.

It's further evidence that the Moon's entire surface — not just the limited parts that astronauts explored — is deeply covered in the fluffy Moon dirt that astronomers call regolith.

In January 2019, China's Chang'e-4 lander, along with a rover named Yutu-2 (Chinese for Jade Rabbit), touched down on the Moon's farside. It landed inside Von Kármán crater, a large impact site nestled inside the even more enormous South Pole-Aitken Basin crater. Aitken is the widest, deepest and oldest crater on the Moon. That status has made it a prime target for scientists who want to study how the 1,600-mile-wide (2,575 kilometers) basin formed and evolved over billions of years.

April 2020

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

Generated by [FreeHTMLCalendar.com](http://FreeHTMLCalendar.com) Copyright © 2011 John Dalbey.

**Up and Coming Events 2019 and 2020**

<b>Regular Meeting – Friday, March 20<sup>th</sup> @ Observatory @ 7:30 pm</b>
<b>Winter Work Day – March 21<sup>st</sup> @ Observatory @ 10:00 am</b>
<b>Venus Watch – Saturday, March 28<sup>th</sup> @ Museum @ 7:30 - 9:00 pm</b>
<b>Regular Meeting – Friday, April 17<sup>th</sup> @ Observatory @ 7:30 pm</b>
<b>PSW – Saturday, April 25<sup>th</sup> @ Observatory @ 7:30 pm</b>
<b>Astronomy Day – Saturday, May 2<sup>nd</sup>, @ Museum @ 8:00 - 9:30 am</b>

**Moon Phases**

New Moon	First Quarter	Full Moon	Third Quarter
April 22 <sup>nd</sup> , 2020	April 1 <sup>st</sup> , 2020 April 30 <sup>th</sup> , 2020	April 7 <sup>th</sup> , 2020	April 14 <sup>th</sup> , 2020
<a href="http://Time and Date.com">Moon Phases courtesy of Time and Date.com</a>			

## ***EAS Meeting Minutes for February – 2020***

The February 21<sup>st</sup>, 2020 meeting was called to order at 7:37 pm by President Tony Bryan. The officers present were Tony Bryan, Scott Conner and Amy Barrett. Secretary Dave Kube was absent so Ken Harris filled in for his duties. Matt Merlo motioned that the minutes from the January meeting be accepted as published in the February Newsletter. That motion was seconded by Donna Bryan and passed unanimously. We had 18 members and 17 guests in attendance. Most guests were from Matt and Kens classes. A new signup log sheet was instituted to maintain more accurate attendance records.

V. President Scott Conner announced the following upcoming events.

Regular Meeting	Friday, March 20	7:30 PM @ Observatory
Winter Work Day	Saturday, March 21	10:00 AM @ Observatory
Venus Watch	Saturday, March 28	7:30 @ Museum

### **TREASURER'S REPORT**

Treasurer Amy Barrett reported that our finances are doing well.

### **SPECIAL PROJECTS**

Chuck has been busy composing and revising grant applications. The first is a new single-level, roll-off-roof, and handicap-accessible, observatory to house the Questar being transferred from the museum and donated by Dan Depyatic, and a Meade 10" SCT donated by Bob Flatter. The second is a new telescope to replace our existing, and marginally performing, 14" SCT with a larger 20-inch f/6.3 telescope and accessories. Members of the Executive Committee and Board have assisted whenever called upon. Thanks go out Chuck and all others contributing to this task.

The plaque honoring those that contributed to the capital campaign for the Paramount mount and telescope upgrades is complete and Tony Bryan brought in to show everyone – Thanks Tony for completing this task.

There is no progress to report on the bathroom project.

### **OLD BUSINESS**

Planning Session Report – The Executive Committee and Board Members met for our 2020 Planning Session on January 26<sup>th</sup>. We finalized our calendar of events, accepted appointments of the Board Members, Amy Barret graciously accepted the ALCOR position that Ted previously held, and we went through various other EAS business. One change that was decided upon relates to provision of the alarm code and combinations to members. From this point forward, members desiring access will need to read and sign a form. The purpose of the form is threefold; it informs the member of their responsibilities; assures the member acknowledges those responsibilities; and provides the EAS a record of who has access to the facility. The calendar of events was posted to our website by Mike a couple days after the meeting. Thanks!

Cub Scout Pack – Pack 383 visited our observatory on February 15<sup>th</sup> as a night for the group to fulfill requirement for a NOVA Science Award. It was reported that the evening was cloudy but we were able to observe Venus. There were 28 total guests. Tony and Scott worked the Telescope and worked the crowd fielding questions. Dave Kube presented a short Light Pollution Video and presented a new Power Point designed specifically for the Nova Award criteria.

### **NEW BUSINESS**

Winter Work Day – It is never too early to begin talking up our annual Winter Work Day event. Please make some room on your calendars to come to the observatory to do spring cleaning and light maintenance. It takes place on Saturday, March 21 at 10:00 AM.

## EAS OBSERVER NEWSLETTER

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**NSN Award Pins** – Tony presented NASA Night Sky Network (NSN) award pins to Matt Merlo, Bob Flatter, Ken Harris, Scott Conner and Dave Kube. The criterion to receive a pin was involvement in a minimum of five NSW logged events during 2019. Meeting minutes and the President’s personal records were used in determining who qualified. Some events were not logged in the NSN, and some records were not very detailed. If any member not receiving a pin during this meeting believes they met the criterion, please see Tony after the meeting.

**Astronomical League Award** – Amy Barrett (ALCOR) presented Mitch Luman with the Astronomical League’s Globular Cluster Award.

No Other New Business was presented by the membership.

### **ANNOUNCEMENTS**

**Next Monthly Meeting** - Our next regular meeting is scheduled for 7:30 PM on March 20, at the observatory. As a reminder, do not go to the museum for our next monthly meeting night unless you wish solitude.

**Program Tonight** – After a brief introductory program by Tony on Light Pollution, our main program will be presented by Mitch Luman.

### **ADJOURN MEETING**

The meeting was adjourned at 8:10 pm by President Tony Bryan

Respectfully Submitted – Dave Kube – Secretary from notes by Ken Harris