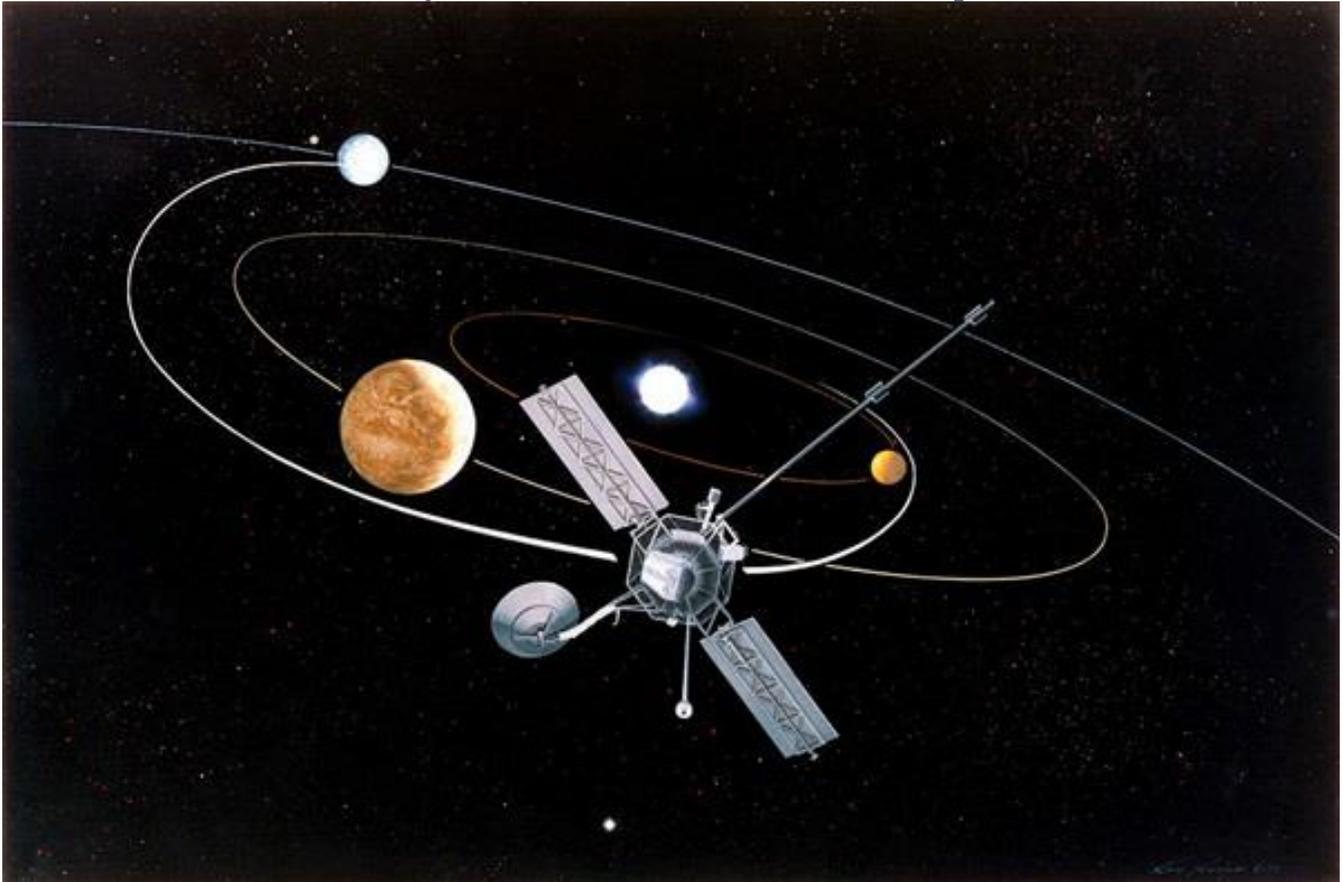


**December Meeting at the Museum
Friday December 15th, 2017 @ 7:30pm**



**The Mariner 10 spacecraft experienced several problems, but nonetheless accomplished its goals, thanks to a smart mission team and some quick fixes.
Photo Courtesy NASA – Article Continued on Page 5**

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3 – News around the Globe

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5 – Space Missions that Dodged Disaster

6 – EAS Business – Minutes

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

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 2017 Officers and Contacts

President – Tony Bryan
812.827.3234

evansvilleastro@gmail.com

Vice President – Scott Conner

Secretary – David M Kube
740.223.6854

Treasurer – Ted Ubelhor

Counselors
Michael Borman
Ken Harris
Mitch Luman

Webmaster – Michael Borman

Program Director
Tony Bryan

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 Schedule Update:

Please Note we have a Regular scheduled meeting on Friday, December 15th, 2017 @ Museum @ 7:30 pm. This is our annual Christmas Pot Luck and Astronomy Quiz.

EAS Update:

Please Note we have a Regular scheduled meeting on Friday, January 19th, 2018 @ Museum @ 7:30 pm.

EAS Update:

Please Note we have a Regular scheduled meeting on Friday, February 16th, 2018. Location and time yet to be determined.

EAS Update:

Please Note.

EAS Update:

Please Note.

EAS Update:

Please Note.

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>

The Case of the Shrinking White Dwarf.



This artist's concept, a white dwarf (left) in the binary system HD 49798/RX J0648.0-4418 is shown spinning while surrounded by an accretion disk of matter taken from its binary companion (right). Francesco Mereghetti)

A Potentially Habitable Planet has been Discovered just 11 Light-years away.



Ross 128b is a possibly temperate, Earth-sized world circling a red dwarf just 11 light-years from Earth. ESO/M. Kornmesser

What is Dead may Never Die.



In this artist's concept of a supernova, an expanding shell of dust and gas is blown outward, away from the star's dense, white-dwarf core. NASA/ESA/STSC/I/G. Bacon

For the first time, astronomers have found observational evidence of a contracting white dwarf star.

A lot of white dwarfs have been spotted over the years, but a study published this week in *Monthly Notices of the Royal Astronomical Society* presented the first observational evidence of a shrinking white dwarf, which they found has been consistently contracting for the past 2 million years.

According to theory, a typical white dwarf can shrink its radius by several hundred kilometers during its first million years, but astronomers have never actually witnessed this behavior before. "For decades it has been theoretically clear that young white dwarfs are contracting," said astrophysicist and lead author of the study, Sergei Popov, in a press release. "Yet, that very phase of contraction has never been observed in 'real time.'"

Ross 128 may be our nearest chance to find life in another solar system.

Our local planetary neighborhood just got a new neighbor — and it may be a good place to find some vital signs.

Just 11 light-years away, a sleepy red dwarf star named Ross 128 has at least one planet orbiting it. Ross- 128b is roughly the size of Earth, and a little more massive. Despite a year that lasts a hair under 10 days, it may also be the nearest place to find life near Earth.

Only one confirmed exoplanet is closer to us, Proxima Centauri b (also called Prox b). But Proxima Centauri, despite its similar size and mass to Ross 128, has one key difference: it's an active star, continuously cooking its known planetary system with scorching radiation that may have blasted away any chance of Prox-b having an atmosphere, and hence, life.

Astronomers discovered a bizarre "zombie" star that went supernova not just once, but twice. Most supernovae explode just once, which ends their lives for good. However, iPTF14hls appears to have gone supernova twice in just 60 years.

To quote the first line of a letter published today in the journal *Nature*, "Every supernova so far observed has been considered to be the terminal explosion of a star." In other words, when a massive star blows itself up, it should remain dead. This is something astronomers have witnessed thousands of times before with absolutely no exceptions.

That is, until now.

January 2018

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 Reg. Mtg 7:30pm Museum	20
21	22	23	24	25	26	27
28	29	30	31			

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Up and Coming Events 2017/2018

Regular Meeting – Friday December 15th – Museum @ 7:30 pm

Regular Meeting – Friday January 19th – Museum @ 7:30 pm

Regular Meeting – Friday February 16th – To Be Determined

Moon Phases

New Moon	First Quarter	Full Moon	Third Quarter
January 16 th , 2018	January 24 th , 2018	January 1 st , 2018 January 31 st , 2018	January 8 th , 2018

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

Space Missions that Dodged Disaster cont.

Voyager 1 Almost Ran Out of Gas.



Voyager 1's launch was almost the end of the mission, instead of the beginning. NASA

Voyager 1, the mission that paved the way for Galileo and Cassini, almost didn't make it out of Earth orbit.

As Mission Control counted down the seconds until launch, a nasty surprise waited in the Titan second stage's fuel system: a leak, small enough to have been missed in pre-launch inspections, but big enough to potentially doom the mission. By the time the team on the ground discovered the problem, Voyager 1 was already on its way to space, with the Titan rocket's second stage short about 1200 pounds of propellant.

That meant the spacecraft might not make it into a high enough orbit around Earth for the maneuver that would break it away from Earth's gravity and set it on a course for Jupiter.

If Voyager 1 didn't make it, its sister ship, Voyager 2, which had launched about two weeks earlier, would have shifted its course, skipping its flyby of Uranus and Neptune in favor of getting a closer look at Saturn's largest moon, Titan.

Huygens Would Have Disappeared on Titan.



The Huygens probe still holds the record for the farthest spacecraft landed on another world. ESA-D. Ducro

The Huygens lander would have been a titanic failure if one engineer hadn't insisted on doing an extra radio test at the last minute.

The Huygens lander didn't have enough power to send its data back to Earth itself, so it was programmed to transmit its data from Titan's surface to Cassini, in orbit around Saturn. Cassini would then relay the lander's messages to the massive satellite dishes of the Deep Space Network on Earth.

When ESA radio engineer Boris Smeds ran a quick test of the link on Cassini's last Earth flyby before slingshotting outward in an accelerating arc toward Jupiter — that vital link failed.

Cassini's mission committee initially rejected the test as unnecessary.

Hubble was a Nearsighted Telescope.



Astronauts install corrective optics to give the Hubble Space Telescope perfect sight. NASA

It took NASA a month of investigation to find the tiny problem that nearly doomed the enormous telescope. It turned out to have been lying in wait for nine years, since 1981: a miniscule 1.3-millimeter spacing error in an instrument used to guide the final grinding of Hubble's 94.5-inch-wide primary mirror. The result was that the edges of the mirror ended up ground very slightly too flat — a difference of a fraction the thickness of a human hair. But it was enough to cause the mirror to scatter the light from distant objects, which produced fuzzy images surrounded by a halo-like blur. The telescope humanity had built to look farther out into the universe than ever before was nearsighted.

NASA engineers spent the next three years building a set of spectacles for the nearsighted telescope: five pairs of moveable, curved mirrors that would help correctly focus the light from Hubble's main mirror as it passed into the telescope's three science instruments. They called it the Corrective Optics Space Telescope Axial Replacement.

EAS MEETING Minutes for November 17th, 2017

The meeting was called to order at 7:32 pm by President Tony Bryan. There were 20 members present. The reading of the minutes was called to be accepted as published in the newsletter and seconded. The motion passed by majority vote. There were 5 visitors present all students for Ken Haris's class.

UPCOMING EAS EVENTS – V. President Scott Conner announced the below list of up-coming events.

PSW #7	Saturday, November 18	7:30 pm @ Observatory
EAS Meeting	Friday, December 15	7:30 pm @ Evansville Museum
EAS Meeting	Friday, January 19	7:30 pm @ Evansville Museum

TREASURER'S REPORT – Treasurer Ted Ubelhor reported that we now have 44 paid members. Ted, also reports, that we have funds in our accounts. He also reported that we received another \$23 from the Amazon.Smile program after receiving \$37 the previous month.

SPECIAL PROJECTS

Scott Conner reported no change in preparation of manufacture and we are still a ways away from installation of the Astro-Tech AT8RC. Tony Bryan reported that we need to get the roof repairs completed before we can consider further progress on the Storage Room No change from previous month. Tony Bryan reports that he is restoring the water fountain and supplies will cost about \$50. Tony also reports that the refrigerator is still working but the seals are beginning to fail. He would like to see if anyone has one that could be donated or if they may know of someone that has someone who does.

OLD BUSINESS

We had our 6th PSW on Saturday, October 21st, 2017. Ken Harris presented to 20 guests while Bob Flater and Matt Merlo and Dave Kube operated the dome and telescope. Tony Bryan reported that Dave Kube, Bob Flater, Glen Bye and himself was present for the event held for the **Patoka Wildlife Refuge Appreciation Day**. Tony Bryan has been in contact with the owner of the **Skypod** for the **Questar** from the Museum and will continue negotiations after the first of the year. Mitch Luman reported no update for the **Questar**.

NEW BUSINESS

PSW #7 will be held on Saturday, November 18th, 2017. This will be the last PSW for the year and we will likely have a group of 10-20 people present. We will need a lead and extra help for this event.

ANNOUNCEMENTS

Upcoming Elections – The current slate of officers is as follows: President-Tony Bryan, Vice President – Scott Conner, Treasurer – Ted Ubelhor, Secretary – Dave Kube. Current Counselors are: Mike Borman, Ken Harris, and Mitch Luman. Mike Borman's term is expiring. There were no new nominations at the meeting and all officers have agreed to serve another term in their current rolls. There were no new nominations for counselor and is suggested to nominate Mike to be placed back into rotation as first year counselor.

Voting will take place by ballot (if a nomination is present) or acclamation (if positions are unopposed).

December Meeting Presentation – As in previous years the December meeting will be our annual Christmas Potluck and Astronomy Quiz. This year the quiz will be presented by Scott Conner. Please note that the December meeting will take place at the Evansville Museum at the usual 7:30pm time.

Program for Tonight – Chuck Allen is presenting on the subject of Gravity

Meeting was adjourned at 7:49pm