



Greg Smith – editor

**Volume 25, No.1
May 2019**

Program: "Big History, Factfulness and Sustainable Development". Greg Cermac

**Meeting: May 15 2019
Mark Morris LGIC**

Sharing and Encouragement

Our evening with the Middle schoolers and their parents and teachers was a great success. A success on a couple of levels; first, that we were fulfilling our mission as a club, bringing night sky education to the community, second seeing how many people attended and brought their own telescopes, third teaching them about the night sky and what they could see from their own backyards.

I was personally surprised how many families brought their own telescopes. Some of them were learning how to put them together, some were learning how to aim them, and some were even sharing what they could see with those around them.

The students and adults that came to our scopes got to see binary stars, galaxies and star clusters that they had heard about but had never seen for themselves. A few were asking about how expensive the telescopes that we were using were. One dad looked a bit disappointed at the price, but I asked him if he had a spotting scope for hunting. He said he did. I told him he already had a telescope and he would be able to see the rings of Saturn with it. He was surprised that he would be able to see that, with a sigh of relief. He realized that a spotting scope was really a telescope that could be used for more than hunting. Star gazing and bird watching were other activities that could be done year

round. He found out that his binoculars were great astronomy tools as well. Here was a father who realized he already had the tools needed to explore the night sky with his son.

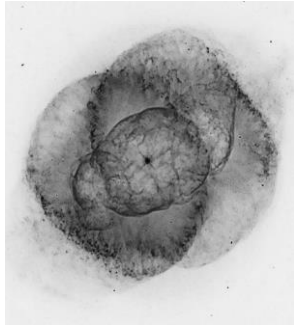
Indeed the evening at Cascade Middle School was a great success. We will see at the next meeting if we get some new visitors.

Ted, Mark, Becky, Tom and I had a great time and I am sure we all look forward to the next time we get to share with a group like this again. Becky, I'm sure you were an encouragement to the girls that they too can get involved with astronomy.

Maybe we should have a program on the women who were and are at the forefront of astronomy; Caroline Hershel, Henrietta Leavitt and the 'computers' of MIT, (who discovered the Cepheid variables), Annie Jump Cannon, inventor of the stellar-classification scheme, Vera Rubin, in confirmation of Dark Matter and others.

Did you know that nearly 60 percent of the astronomers in the youngest age bracket (21–23) are women? Astronomers between ages 23 and 28 are almost 40 percent female. This program could be a good community attraction.

**Every Day is a Star Filled Day
Every Night is a Starry Night**



The Mother Lode of Gold



Scientists Think They've Found the Ancient Neutron Star Crash That Showered Our Solar System in Gold.

By Brandon Specktor, Senior Writer, LiveScience.com | May 6,

Two astronomers think they've pinpointed the ancient stellar collision that gave our solar system its cache of precious gold and platinum — some of it, anyway.

In a new study published May 1 in the journal *Nature*, the duo analyzed the remnants of radioactive isotopes, or versions of molecules with different numbers of neutrons, in a very old meteorite. Then, they compared those values with isotope ratios produced by a computer simulation of neutron star mergers — cataclysmic stellar collisions that can cause ripples in the fabric of space-time. The researchers found that a single neutron star collision, starting about 100 million years before our solar system formed and located 1,000 light-years away, may have provided our cosmic neighborhood many of the elements heavier than iron, which has 26 protons. This includes about 70% of our early solar system's curium atoms and 40% of its plutonium atoms, plus many millions of pounds of precious metals like gold and platinum. In total, this single ancient star crash may have given our solar system 0.3% of all its heavy elements, the researchers found — and we carry some of them around with us every day.

"In each of us, we would find an eyelash-worth of these elements, mostly in the form of iodine, which is essential to life," lead study author Imre Bartos, an astrophysicist at the University of Florida, said in a statement.

He added that, if you wear a gold or platinum wedding ring, you're also wearing a bit of the explosive cosmic past. "About 10 milligrams [0.00035 ounces] of it likely formed 4.6 billion years ago," Bartos said.

“There's gold in them thar stars”

How does a star make a wedding ring? It takes an epic cosmic explosion (and a few billion years of patience).

Elements like plutonium, gold, platinum and others heavier than iron are created in a process called rapid neutron capture (also called the r-process), in which an atomic nucleus quickly gloms on to a bunch of free neutrons before the nucleus has time to radioactively decay. This process occurs only as a result of the universe's most extreme events — in stellar explosions called supernovas or colliding neutron stars — but scientists disagree about which of those two phenomena is chiefly responsible for the production of heavy elements in the universe.

In their new study, Bartos and his colleague Szabolcs Marka (of Columbia University in New York) make an argument for neutron stars being the predominant source of heavy elements in the solar system. To do so, they compared the radioactive elements preserved in an ancient meteorite with numerical simulations of neutron star mergers at various points in space-time around the Milky Way.

"The meteor contained the remnant of radioactive isotopes produced by neutron star mergers," Bartos told Live Science in an email. "While they decayed a long time ago, they could be used to reconstruct the amount of the original radioactive isotope at the time when the solar system was formed."

The meteorite in question contained decayed isotopes of plutonium, uranium and curium atoms, which the authors of a 2016 study in the journal *Science Advances* used to estimate the amounts of these elements present in the early solar system. Bartos and Marka plugged those values into a computer model to figure out how many neutron star mergers it would take to fill the solar system with the correct amounts of those elements.

A casual cataclysm

It turns out that a single neutron star merger would do the trick, if it happened close enough to our solar system — within 1,000 light-years, or about 1% of the diameter of the Milky Way.

Neutron star mergers are thought to be pretty rare in our galaxy, occurring only a few times every million years, the researchers wrote. Supernovas, on the other hand, are much more common; according to a 2006 study from the European Space Agency, a massive star explodes in our galaxy once every 50 years or so.

That supernova rate is much too high to account for the levels of heavy elements observed in early solar system meteors, Bartos and Marka concluded, ruling them out as the likely source of those elements. A single nearby neutron star merger, however, fits the story perfectly.

According to Bartos, these results "shed bright light" on the explosive events that helped make our solar system what it is.

Minutes of the April Meeting

Greg Smith called the meeting to order. He introduced the guests. Bill Norvell has reserved Canterbury Park for the July and August meetings.

Bob McGowan from Rose City Astronomers was our guest speaker tonight. He wrote a book called *Galaxy Groups and Clusters* that is available on the Astronomical League website. He talked about the Aurora Borealis. They range from a P-scale of 0-9. If it is at least a 7, it can be seen here in Washington.

Mark Thorson had a copy of a new magazine called *Astronomy Kids*. It looks like it will be a great magazine for children.

Roy Gawlick talked about a document he is making for all our club telescopes. We also have a 6" scope that was donated by Marty Brill.

Becky Standal from the Longview Public Library would like us to possibly help with a station during the Summer Reading Program this summer. It would be at the Kelso Library on July 16th and the Longview Library on July 17th from 3-5 pm. We could possibly do solar viewing or have telescopes to look at terrestrial objects. We could also have some type of activity station like making craters.

Cascade Middle School is inviting us for a Star Party on May 3rd/4th or the 10th / 11th as a backup. Ted had a sign up to help.

Earth Day is this Saturday at the fairgrounds. We still need more help.

Membership dues are being collected either tonight or next month. It is \$24 for the year.

Election of new officers will be next month. As of right now, it will be Ted Gruber for President, Mark Thorson for Vice President, Steve Powell for Treasurer, Becky Kent for Secretary, and Tom Meek for ALCOR. If you would like to run for an office, it is not too late. Just let Greg know.

Ted Gruber gave the Sky Report. Mars is high in the western sky as the sun sets. It is visible until it sets around 11pm. The morning sky has Jupiter, Saturn, and Venus. Jupiter rises around 1am followed by Saturn about 2 hours later, and Venus just before 6am. The Lyrid Meteor Shower is active from April 14th – 30th, peaking the night of April 22nd. It has a predicted rate of 18 meteors per hour. The Messier of the Month is M48. It is a magnitude 5.5 open cluster in the constellation Hydra. It contains over 400 stars. The cluster is easily seen through binoculars and even smaller telescopes resolve about 50 stars. It is best viewed at lower magnifications.

Meeting adjourned.

☞ **April 2019 Meeting** ☞

DATE: Wednesday, May 15, 2019

TIME 7:00 pm

**PLACE: Mark Morris High School
Large Group Instruction Center
Use 17th Ave. entrance**

**PROGRAM: "Big History, Factfulness and
Sustainable Development".
Greg Cermac**

SNACKS: Greg Smith

DRINKS: Mark Thorson

2019 FoG Activities and Viewing Schedule

MAY MOON: NEW=4, FULL=18

3 Cascade Middle School Star Party

15 Club Meeting + 24th Birthday Party (MMHS)

17>18 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

27 Memorial Day

31 Club Star Party (Mike's)

JUN MOON: NEW=3, FULL=17

7>8 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

14>15 Club Star Party (Mike's)

21 Friday - Solstice Picnic/Sun+Star Party (Willow Grove)

JUL MOON: NEW=2, FULL=16, NEW=31

4 Independence Day

5 Club Star Party (Mike's)

or RCA Star Party (Stub Stewart)

12>13 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

16+17 Moon Class (Kelso and Longview Libraries)

17 Club Meeting (Canterbury Park, President's Room)

26>27 Club Star Party (Mike's)

30 Oregon Star Party begins (through August 4)

AUG MOON: FULL=15, NEW=30

2>3 Club Star Party if 7/26+7/27 cancel (Mike's)

9>10 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

21 Club Meeting (Canterbury Park, President's Room)

23-24 Mt. St. Helens Sky & Star Party (Coldwater SLC)

SEP MOON: FULL=14, NEW=28

2 Labor Day

6>7 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

18 Club Meeting (MMHS)

27>28 Club Star Party (Mike's)

OCT MOON: FULL=13, NEW=27

4>11 Sidewalk Astronomy (Starbuck's, 808 OB Hwy)

16 Club Meeting (MMHS)

NOV MOON: FULL=12, NEW=26

11 Transit of Mercury (TBA)

20 Club Meeting (MMHS)

28 Thanksgiving Day

DEC MOON: FULL=12, NEW=26

11>18 Annual Christmas Party (Location TBA)

21 Solstice Lantern Walk (Lake Sacajawea)

Friends of Galileo Club Officers

PRESIDENT	Ted Gruber
VICE-PRESIDENT/ PROGRAM CHAIR	Mark Thorson
SECRETARY	Becky Kent
TREASURER	Steve Powell
WEBSITE	Ted Gruber
NEWSLETTER ED.	Greg Smith
ALCOR	Tom Meek

Next Month's Newsletter Deadline

The deadline for items in next month's newsletter is:

Wednesday: seven days before next meeting.

Please feel free to send in your thoughts and experiences about your astronomical adventure.

Submit your material by E-mail to:

grlyth@msn.com