

The STEAM–steinettes Gazette

Edition 5
Earth
Science
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“Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts.”

Rachel Carson

Leaf Sheep: The Ocean's Cuteness Factor

By: Aynsley

Yes, you read that right – leaf sheep! Scientifically known as *Costasiella kuroshimae*, this adorable little creature is actually a sea slug that lives a tranquil life in marine ecosystems with soft substrates, munching on an algae species called *Avrainvillea* and floating along amidst other members of their colony. The leaf sheep's astonishing ability to incorporate ingested chloroplasts into its own body - known as kleptoplasty -

has been the subject of much research and makes leaf sheep one of the only sea animals that can photosynthesize. Their leaflike appearance is due to the bright green cerata projecting from their body, which are usually tipped with pink, purple, or white and contain digestive glands, and their adult size is between 7 or 8 millimeters. And if you aren't yet convinced about how cool these little creatures are, check out a picture of their egg masses, which they lay in tiny spirals! From the ear-like projections on the head (called rhinophores, which interpret chemical signals in the water) to the little black eyes, it's unsurprising that this creature is known fondly in the Philippines as "Shaun the Sheep."



Read on!

FEMALE SCIENTIST SPOTLIGHT

By: Jasmine

EUNICE NEWTON
FOOTE



Eunice Newton Foote, a scientist from the 1800s, did important research that preceded the discovery of the greenhouse effect. Her studies led to her hypothesis that Earth would've been warmer in the past if its carbon dioxide levels were higher. Her ideas about the atmosphere's gasses and the Earth's climate helped provide new insights on temperature fluctuations and climate change, but sadly, her work went overlooked for more than a century. (Huddleston, Climate.gov)

Foote was born on July 17, 1819 in Goshen Connecticut to Theriza Newton and Isaac Newton Jr, a distant relative of mathematician and physicist Isaac Newton. Her family later moved to Bloomfield, New York where she spent most of her childhood.

As an adult she was actively invested in the Women's Rights Movement and she attended a Troy Female Seminary which encouraged women to pursue higher educations.

In 1856, she conducted an experiment that tapped into theories on how the sun heated the Earth. "She placed two identical thermometers in identical glass cylinders, 30 inches long and 4 inches in diameter. Using an air pump, she exhausted air from one cylinder and added air into the other. After the temperatures equalized, she placed the jars next to each other in the Sun and recorded the resulting temperature every three minutes (Shapiro, Physics Today)." She conducted a follow up experiment with the jars in the shade. She observed that the thermal action directly increased with the density of the jar. Again, she repeated the experiment using moist and dry air by adding water to one cylinder and dehydrating the other using calcium chloride. She found that the damp air grew hotter than the dry air. (Shapiro, Physics Today)

Foote's experiment conclusions were recorded under the name "Circumstances Affecting the Heat of the Sun's Rays" and were printed in the American Journal of Science and Arts. In August her work was presented by Joseph Henry, another scientist, at an American Association for the Advancement of Science (AAAS) meeting. In the 19th century, very few women were allowed into the association and even fewer presented their own work. What's more, Henry discredited the significance of her findings and, ultimately, her research did not gain a lot of attention or traction until much later.

She died on September 30, 1888 in Lenox, Massachusetts with her findings ultimately ignored and forgotten despite being acknowledged for a brief time. Only recently, two centuries later, has she begun to get more of the recognition she deserves.

Science Experiments!

By: Hitej

ADVANCED



Do you like mushrooms? No matter your opinion on these *fun gi's*, you can grow them by yourself in a bag with a toilet paper roll! All you need are some seeds, water, a toilet paper roll, and a sealable bag. Have fun!

DIY Fungi

INTERMEDIATE



The Circle of Life

Curious about why plants need water? Here's a fun experiment idea! Take 3 plants, one that gets water and sunlight, one that gets only sunlight or water, and one that gets nothing. Over the course of a couple weeks, watch as some plants flourish while others wilt.

Global Science Happenings

Algae in the ice of the Arctic has extremely high amount of microplastics, which are incredibly small particles of plastic.

Artificial intelligence has been used to create a system that detects tsunamis!

By: Hitej

Summer in 2021 was the hottest summer since the year 900!

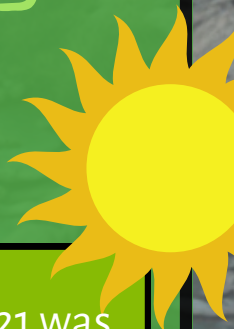




Fig. 2. — Le globe de feu dans la salle.

BALL LIGHTNING: A SHOCKINGLY RARE PHENOMENON

By: Barros

When I was a little kid, I used to watch The Weather Channel a lot. When they weren't live broadcasting the weather of the day, they would have this show about strange meteorological phenomena, called Strangest Weather. One of the most impressive things that ever stood out to me in this show, even after all these years, is "ball lightning." Now, let's dive into what that even is, shall we?

Ball lightning is an extremely rare phenomenon where lightning (aka plasma) condenses into a ball, and can, according to observers, float across roads, into windows, and through the sky. It has been observed and recorded since the 1200's! The following hyperlinked video (by The Weather Channel themselves) is an excerpt of the very episode I watched as a little kid, which describes briefly what ball lightning is, and shows videos of the phenomena caught on camera! [Click me!](#)

Unfortunately, there is no one proven theory as to why these balls of lightning exist, what happens as they dissipate or "explode," or how they can apparently move through windows with ease. Some researchers even claim not to believe the phenomenon is real at all, given how little research there is on it and how rare it is (which is mostly why it's so hard to research in the first place). One study, however, attempted by Russian researcher Pyotr Kapitsa, tried to make the claim that ball lightning was created due to standing waves of electromagnetic radiation, though this was criticized and never fully proved. Nikola Tesla even took a stab at hypothesizing about ball lightning, stating that they could possibly be made out of "highly rarefied (but hot) gas," and not even be plasma at all!

Hopefully one day researchers will be able to fully understand the science behind this, as well as the many, many other rare yet spectacular meteorological phenomena that go on daily, right here on our beautifully mysterious planet Earth.



Movie Review: WALL-E

By: Barros

Break into the world of WALL-E with the eye opening realization of what the world could become if we don't stop the constant pollution and littering that is an all too common practice in cities and suburbs alike. Witness what could become of the human race, and watch eagerly as the last WALL-E (Waste Allocation Load Lifter - Earth-Class) robot left on our abandoned planet goes along its day... seemingly, with a consciousness. With a setting change out of this world, follow along as the only remaining waste collection robot brings the evidence of natural life still living on Earth to a distantly roaming ship containing the final remnants of the human race and other robots who believed all hope was lost. Be sure not to blink as the race to get home takes a turn for what seems to be the worst, and fall in love with the characters' lovable, powerful and unbreakable personalities. Action, betrayal, slight romance and sci-fi are whipped together into a delightfully entertaining futuristic Disney-Pixar movie that's fit for the whole family to enjoy!

**Spoilers
Rating: 6/10**

**Movie
Rating: G**



There are about 500,000 earthquakes per year, but only 20% are felt by humans.

Fantastic Facts!

By: Sofia

The F.L.I.P. Ship (floating instrument platform) is a 355-foot-long research ship designed by the U.S. Navy to research wavelength, density and temperature of water, and other data to study marine flora and fauna.

Over 90% of the world's oceans, and over 50% of the U.S. waters have yet to be mapped.

Meet the Team

A

STEAM
Club

+

The
Einsteinettes

collab

Ace

Aynsley

Barros

Halee

Hitej

Sofia

Jasmine

Special
thanks
to our
awesome
advisors,
Ms. Cristen
Jones and
Mr. Chad
Hamblin

The *STEAM-steinettes Gazette* is an interclub collaborative science newsletter created entirely by POA students from STEAM Club (6-12) and The Einsteinettes (9-12). A new issue will be published monthly for grades 6-12, each focusing on a different realm of science.

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