



A little science...A touch of fiction...A lot of adventure...

News from the Den

30+" of snow. Whoa! That's correct more than 2' of snow. After the 2nd warmest September and the warmest and driest October on record, we plunged into winter overnight with a 3-day storm. A low pressure system became cutoff from the jet stream and just sat over the area. It pulled moisture out of the Gulf of Mexico and hammered Colorado. Luckily, due to the storm being an isolated low, we had relatively low winds. Hence, no drifts. Don't know if the el Nino cycle will continue to bring more moisture to the state but after our dry September and October we need as much as we can get.

Last month we shared the winners of the 2024 Nobel prizes. Again congratulations to each of them. If you didn't know about another 'Nobel' award you're missing out on some fun! The Ig Nobel Prize awards honor scientific achievements which ... wait for it ... first make people laugh. The 2024 Iggies went to 10 individuals and teams, chosen by past Nobel laureates. An example of one of this year's winners went to three countries for recognizing that living plants will imitate the shapes of neighboring plastic plants. There are no set categories for these awards but they do receive more nominations than the Nobels. And more importantly, awards can be given posthumously. ([Laughs are here](#))

Latest and greatest science news

As most of you know I have written a sci-fi trilogy which use some pretty far-out concepts in physics and cosmology. I'm well into completing the next book in this series. This one is all about time. This requires a lot of reading about the latest and greatest science advances in physics, astronomy, astrophysics, cosmology, etc. Which led me to an Einstein quote which spurred deeper thought. He was always interested in light - what it was, how it manifested itself, where it came from, how it traveled through space. In fact, one of his most famous thought experiments was imagining what it would be like to 'ride on a light beam'. The quote is about how we can measure light but conversely know we cannot measure the absence of light. What is the absence of light? This led me down a rabbit hole - what is in the blackness of space? Is it nothing? If so, what is nothing? I realized just thinking about nothing actually makes nothing something. And then I found a unique article on nothing. With three definitions of nothing: 1. non-existence: no matter, no energy, no controlling fields 2. the absence of space time - e.g. you own a permit to build a house, but don't have any land on which to build it: this nothing lacks things but has a bunch of rules and regulations to control it 3. this is the most extreme definition of nothing - here is only void, no things, no fields, no framework for boundaries, no set of rules. ([Stretch Your Brain here](#))

So, once I'd warped my brain thinking about nothing, I returned to think about something and this led to a review of Arthur C. Clarke's three scientific premises: 1. When a scientist says something is possible it most certainly is, when a scientist says something is impossible they're most probably incorrect. 2. The road to new discoveries is going beyond the possible into the impossible, 3. Advanced technology is often perceived as magic.

Do me a favor and think about your definition of nothing, then drop me a note at cafauthor@earthlink.net and share your definition. I would appreciate it. I'm lost in a world of nothing.

Here in the US we're getting ready to enjoy Thanksgiving. Our Canadian readers celebrated this holiday last month. Usually, Thanksgiving requires some sort of travel - trains, planes or automobiles. Thinking about earth-centric travel - lets see where four active space missions are headed. Making news this month: Polaris Dawn, Europa Clipper, JUICE and Curiosity rover on Mars.

Polaris Dawn: The first of three privately-funded and operated missions to low-Earth orbit will study the impact of space flight on humans. Their first mission - Dawn - blasted off from the Kennedy space center in Florida and lasted 5 days. The four astronauts were carried to an elliptical orbit 870 miles above the Earth. The highest apogee attained by humans. They completed the first commercial spacewalk using a new suit. And tested the StarLink satellite constellation. Stay tuned for the next two flights ([Soar Away Here](#))

Europa Clipper: October 14 was a huge day for NASA and the Jet Propulsion Laboratory. On that day, they launched their spacecraft to Europa - the smallest of the four Galilean moons of Jupiter. (Named such as one of four moons of Jupiter discovered by Galileo Galilei in 1610. As the sixth largest moon in the solar system (slightly smaller than our Moon) its surface is a smooth whiteish-beige ice. The ice surface moves in a process similar to plate tectonics due to tidal push-pull of Jupiter. This tug-of-war heats the satellite and keeps the ocean beneath its icy cover liquid. Some think early single-celled life may exist in Europa's ocean. The Clipper is scheduled to arrive in orbit around Jupiter in 2030 and make 49 close-passes of the moon Europa. ([Visit Europa Here](#))

JUICE - no, it's not a new smoothie bar - the acronym stands for Jupiter Icy Moon Explorer. This European Space Agency's craft will take a long and winding path to the gas giant. With two Lunar-Earth flybys followed by a swing past Venus, then Earth again twice to gain momentum and sling-shot itself to Jupiter, arriving in 2031. Launched last year, the orbiter has completed several key missions around Earth. ([See the 1st results here](#)) Once in Jovian orbit it will focus its ten scientific instruments on Ganymede, Callisto and Europa. Its broader mission is to understand the jovian environment and correlate this to gas giant exoplanets elsewhere in the galaxy.

CURIOSITY - go rover go! Curiosity landed on the surface of Mars in August 2012. The largest of the rovers - about the size of a small SUV - sent to Mars, this guy just keeps on trucking within the Gale Crater. It's drilled 42 exploratory holes in the Martian surface looking for the chemical building blocks of life. Over the 20 plus miles traveled during its wanderings on Mars, Curiosity discovered something beyond cool in October. From hole 41, it cracked open a rock sample and found a nest of interlaced crystals of elemental sulphur. The presence of raw sulphur. Scientists harkened this to finding an oasis in the desert. It also tells us, Mars had free-flowing water on its surface in the past. And sulphur is one of the key nutrients for life. ([SulphurCrystals!](#))

When you think about our solar system, what planet is your favorite? Jupiter's Giant Red Spot, the brilliance of Venus' atmosphere, the deep blue of Uranus or the amazing rings of Saturn? For me it's the beauty of Saturn and its rings. So, where would our Pale Blue Dot be in this list if our planet had rings? Well, about 466 million years ago, our little place in the universe did have rings. The equatorial-orbiting rings were made up of remains of a giant asteroid captured in the Earth's gravity well. For a time, Earth had two moons. But the low-Earth orbit of this body caused it to be torn apart by the push-pull of Earth's tidal forces. Eventually, the parts and pieces fell to Earth - remnants of these impact events are mapped around the globe in rocks of a similar age. More interesting, the rings may have been dense enough to block some of the solar radiation from the sun - creating a global cooling event. ([Rings in Earth's Past](#))

One of the key technical groups highlighted in my geopolitical thriller - *The Paris Contagion* - is DARPA (US Defense Advanced Research Projects Agency). This amazing group is tasked with evaluating and fostering future, high risk science. Including the platform for the rapid production of mRNA vaccines, as proven in the Sars-Co-V2 successes. Now, the UK will have its own DARPA - christened ARIA

(Advanced Research and Invention Agency). ARIA will distribute more than 800 million Pound Sterling in its first four years. Some believe this will lay the ground work for the future - others not so much. They feel science should be maintained in an open environment to flourish and grow. ([Let the Sunshine In](#)) I for one feel science should be the basis for all we do going forward. For our electoral decisions, our business and commerce and our moral foundations.

Science Factoid of the Month

57 days. The period of time our Earth will have a second moon as near-Earth object 2024 PT5 will be temporally caught in Earth orbit.

Photos of the month



This is a Water Anole, a small semi-aquatic lizard, who lives in Costa Rica. They can explore underwater for more than 16 minutes. Scientists have wondered how these little guys do that. Seems they blow a bubble and cover their snouts with this mini-scuba tank. ([Dive Deep Here](#))



We've discussed the wonder of mathematical intricacies in music, but what about art. Physicists have discovered microscale turbulences defused through the entire canvas within the illusion of movement within the atmospheric swirls in van Gogh's The Starry Night. Painted in 1889 during his stay in an asylum, has been interpreted as a reflection of the artist's inner turmoil. Turbulence whether in water or air are a struggle for mathematicians. In 1940, Andrei Kolmogorov predicted a correlation between flow speed and the rate of energy loss due to friction. Two students analyzed the painting and determined it shares its turbulent images with those found in the molecular clouds of star-birthing nebulae. And that the entire painting conforms to Kolmogorov laws of movement. ([Mind and Matter](#))



I couldn't pass up sharing this amazing photo of the power of moving water from Valencia, Spain. Torrential rains lashed the region, killing 95 and producing flash flooding. And some don't believe in climate change - this includes the newly nominated US Energy Secretary. If not this image, then what will it take to convince you, climate change is real!

Science Foundations - Svetlana Mojsov

Dr. Mojsov, a chemist at Rockefeller University, was stunned when she learned three biochemists would receive the Canadian Gairdner Award for Biomedical Research. The prize was been given for their work underpinning diabetes and obesity. But the prize was missing a key awardee - Dr. Mojsov. She laid the groundwork for discoveries about GLP-1 in key papers published in the 1980's while at Massachusetts General Hospital. She arrived in the US in 1972 from Belgrade, then within Yugoslavia, to work with diabetes pioneer Bruce Merrifield. In 1986 she published a joint paper with one of the Gairdner winners. Often those who come first are not the ones recognized- this is especially true for women scientists. [Who Came First](#)

Science Foundations - Three Mile Island

In 1979, Unit 2 of Three Mile Island Nuclear Reactor Complex, experienced a partial meltdown. This led to a nation-wide distrust of fission-reactors used for power generation. This became a global issue following the Chernobyl events in the Number 4 reactor. Now, a private energy company-Constellation - will reopen the Three Mile Island facility's reactor. After striking a 20-year deal with Microsoft to power its server farms, the company will spend \$1.6B to refurbish Unit 1. Rescheduled restart is 2028. 57% of Pennsylvanian residents are in favor of the project. It will be named the Crane Clean Energy Center. [\(Computer Power\)](#)

Minutiae

Fall here in the Den has been amazing. I've retired. The Paris Contagion won another award. And my webmistress and I are the 2024 eLit Gold Medal recipients for the Best Author Website! If you've not visited lately, head on over to cafarlow.com and take a tour!

We'll be back next month with another installment. Be well, be kind. CA

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