

Betsy says HI!!!!

Announcements

The next LABQUEST meeting will be Wednesday, September 11 at 12:30 in the GSA trailer.

Science Report Highlights

Betsy and Dan thought all the items in following science report from Charles were interesting but most liked the following:

- Eastern Equine Encephalitis (EEE) in Vermont
- FDA Says Skip The Antibacterial Soap
- Free At-Home Covid Tests
- FDA Announces Class 2 Recall Of A Brand of Apple Juice
- More On Lung Cancer
- FDA Granted Marketing Authorization For Gel That Stops Bleeding In Seconds
- Sterilization Of Certain Medical Instruments By UV-C (Not Ethylene Gas)
- FDA Final Rule On Age Related Restrictions For Tobacco Sales
- New Experimental Idea For Treating Alzheimer's Disease (AD)
- Regenerating Knee Cartilage
- Record For Hottest Month On Planet Earth - July, 2024

Science Report

Self-Protective Measures -

You should get your medical advice from official sources, your doctor, or your pharmacist ... not from this Report or the internet. Per recommendations by FDA and CDC, everyone should maintain current vaccinations for the three respiratory viruses: Covid, flu and RSV (for RSV, adults [over 60](#) and children [younger than 8 months](#)) - unless your doctor advises against it based on your medical record. Adults over 50 should have had the [Shingrix vaccine for shingles](#) (two doses 2 to 6 months apart, good indefinitely).

- [Mosquitoes Spread Disease](#) - by flying from human to human, and giving them the equivalent of **involuntary blood transfusions**. This is a particularly intense season for mosquito breeding. Leave no unscreened openings to your home - the *Aedes aegypti* species now prevalent at night in the DMV can follow you inside, and breed *in* your house. CDC advice on clothing and repellents to prevent mosquito bites, [here](#). [Example](#).
- [Eastern Equine Encephalitis \(EEE\) in Vermont](#) - The [Vermont health department](#) has issued an advisory on [EEE](#), especially for the towns they consider high-risk: Alburgh, Burlington, Colchester and Swanton. A similar caution for bordering areas in Canada has also been issued by Quebec. Summary: cover up, use insect repellent, or stay indoors. The first hard frost will end the risk. [Grady J., Barbara R., Julian G.]
- [FDA Says Skip The Antibacterial Soap](#) - Just [wash your hands](#) with soap and water, and avoid exposure to the chemicals used in the antibacterial soap [Details](#). Hand sanitizer and hand wipes are OK.

- [FDA and USDA Complete Second Round of *Pasteurized* Dairy Product Testing For Avian Flu](#) - [no viable virus](#) detected. CDC current status report, [here](#).
- [FDA Advice On Sleep Apnea](#) - [here](#).
- [FDA Advice On Prostate Cancer](#) - [here](#). Screening by blood test for prostate-specific antigen (PSA) is recommended through age 70.
- [Free At-Home Covid Tests](#) - will be available again in late September. [Details](#). Keep two unexpired kits onhand.
- [CDC Advice On Eye Care](#) - [here](#). Eyes are one of the body's 5 microbiomes. They are all interconnected.
- [FDA Announces Class 2 Recall Of A Brand of Apple Juice](#) - due to inorganic [arsenic](#). Details and photo of container, [here](#).
- [NIH BMI Calculator](#) - Use the [NIH](#) National Heart, Lung and Blood Institute [calculator](#) to find your Body Mass Index (BMI). Above 25 - overweight. Above 30, check with your doctor, consider better nutrition, and exercise.
- [Basal Metabolic Rate \(BMR\)](#) - Use the [calculator](#) to get your BMR. Then consult the exercise table to see how many calories you can consume daily with your current exercise plan and still maintain your current weight.
- [CDC Advice On Respiratory Illnesses](#) - [here](#).

Vaccine and Therapeutic News -

- [FDA Approves New Formulation Covid Vaccine](#) - [here](#). More background in a lay article [here](#).
- [FDA Authorizes At-Home Over-The-Counter Test for Syphilis \(*Treponema pallidum*\)](#) - no prescription needed, results in 15 minutes at home, detects past or present infections that may show no symptoms. [Details](#). [NOWDiagnostics](#) (Springdale Arkansas) is authorized to market their '[First To Know Syphilis Test](#)'. The test is a screening test - a positive result should be followed up by a definitive lab test administered by a doctor. CDC [reports](#) an 80% increase in syphilis from 2018 to 2022.
- [New Treatment For Non-Small Cell Lung Cancer](#) - FDA has [approved](#) the Janssen Biotech treatment 'azcluze' (lazertinib), in combination with amivantamab, for first-line treatment of patients with locally advanced or metastatic non-small cell lung cancer.
- [More On Lung Cancer](#) - Lung cancer is the leading cause of cancer death worldwide, 1.8 million fatalities annually. Now, BioNTech (Germany) has launched the world's first mRNA lung cancer vaccine clinical trial to test the safety and efficacy of its [mRNA vaccine candidate BNT116 against non-small cell lung cancer \(NSCLC\)](#), the most common form of the disease. This is a very deadly cancer because of late detection.
- [FDA Granted Marketing Authorization Of Sound Beam Device To Target Cancerous Liver Tumors](#) to [HistoSonics](#) (Minneapolis MN) last year, [details](#). The company calls its technology 'Histotripsy', and has named their device the 'Edison Histotripsy System'. A multicenter clinical trial is now underway to extend the indications for use of the authorized system to *kidney* tumors, beginning at [AdventHealth Celebration](#) in Osceola County FL (Orlando) early this year. Histotripsy is a minimally invasive *mechanical* process (using cavitation, not heat). It isn't chemotherapy or surgery, and does not replace those treatments. Stay tuned for other applications. Promising.
- [FDA Granted Marketing Authorization For Gel That Stops Bleeding In Seconds](#) - FDA has cleared [Cresilon](#) (Brooklyn NY) to market [Traumagel](#) for temporary external use for [controlling moderate to severe bleeding](#). The new treatment will be useful for emergency situations, and has obvious implications for use on the battlefield.

- Eli Lilly Continues Postapproval Clinical Trials of Tirzepatide - already FDA approved for reducing progression from pre-diabetes to Type 2 diabetes (Mounjaro), and for medically diagnosed overweight (Zepbound). [Preliminary results](#) indicate a reduction in risk of Type 2 diabetes of 94%, and weight losses up to 22.9%.
- Bladder Cancer - The EU has granted marketing approval for the Johnson & Johnson treatment [Balversa](#) (erdafitinib) for metastatic urothelial carcinoma (UC). UC is the most common type of bladder cancer. FDA had granted accelerated approval (requires continuing clinical trial) in 2019, and [granted full approval January 2024](#).
- Automated Insulin Dosing For **Type 2** Diabetics - FDA has granted [marketing approval](#) for expanded indications-for-use for the Insulet's 'SmartAdjust' technology, an interoperable automated glycemic controller previously cleared for the management of type 1 diabetes. This is the first FDA cleared automated insulin injection device for Type **2** diabetes. Check with your doctor, or a registered dietician, for using natural foods and life-style changes to reduce risk of Type 2 diabetes.
- Coronary Artery Calcium Deposits - FDA has granted [Nano-X Imaging](#) (Petach Tikva Israel) [marketing clearance](#) for 'HealthCCSng V2.0', an upgrade to the previously cleared software for AI-assisted assessment of X-ray images to characterize coronary artery Calcium deposits. Version 2.0 adds the capability to provide an additional 'zero calcium' categorization, and create a numerical calcium score for more precise staging. Patients with the [highest levels of calcification are over 13 times more likely to suffer a cardiac event](#).
- Stents Authorized For Pediatric Use - FDA authorized marketing for [Renata Medical](#) (Newport Beach CA) 'Minima Stent System' for the treatment of pulmonary artery stenosis and aortic coarctation (two forms of narrowing of the arteries) in [neonates, infants, and children](#) at least 3.3 lbs - a less invasive option for these vulnerable infants, other than cardiac surgery, for repair of pulmonary artery stenoses and aortic coarctation.
- Sterilization Of Certain Medical Instruments By UV-C (Not Ethylene Gas) - FDA has authorized [Germitec](#) UV-C [Chronos](#) for high-level disinfection of surfaces of transvaginal, transrectal, and *external* ultrasound probes that do not contain internal passages or any indentations or channels that are deeper than their widths.
- FDA Approves Gaithersburg-MD-Based Novavax's Protein-Based, Adjuvanted Covid-19 Vaccine - Details [here](#).

Other Health Science News -

- Mammography Quality Standards Act of 1992 (MQSA) - FDA issued a Final Rule in March 2023 that amends regulations for compliance with the MQSA, and is now issuing guidance, the '[Small Entity Compliance Guide](#)', to assist small entities in meeting the amended regulations. One of the new requirements (effective 9/10/24) is requiring the mammography report given to patients to specify whether the patient has dense or non-dense breast tissue, including a prescribed paragraph on the significance of breast density. Mayo Clinic advice, [here](#).
- FDA Final Rule On Age Related Restrictions For Tobacco Sales - Includes e-cigarettes. Further interpreting the 2019 legislation raising the age limit from 19 to 21, there are [two additional restrictions](#): 1) photo ID required for purchasers *under age 30*, 2) no sales from vending machines located where those under 21 have access at any time. More than 95% of US adults who smoke daily smoked their first cigarette by the age of 21.
- FDA Issues Clinical Trials Grant Opportunity For Rare Neurodegenerative Diseases - [here](#).
- Symptoms Of Vitamin B12 (cobalamin) Deficiency - See a list of symptoms [here](#), and why it's important to bring them to your doctor's attention - check blood

work. Summary: Weakness and fatigue, Pallor, State of confusion/irritability/depression, Decline in concentration, Weight loss, Shortness of breath, Dizziness, Accelerated heartbeat, Enlarged liver and spleen, Tingling in hands and feet, Feeling of weakness in arms and legs, Muscle weakness. Also note the results of a [study](#) associating migraine headaches with B12 deficiency. Most can get enough B12 from natural foods, but vegans should be especially alert for a deficiency.

- [Can You Have Too Much Vitamin B12](#) - Ask your doctor to check B12 levels in your blood work during your annual physical, and make recommendations. B12 is water soluble, and the body *generally* washes out excess, but there are medical conditions and drug interactions that can interfere with that - so no supplements of *any kind*, including B12, without your doctor's specific advice. [Details](#) from a registered dietician.
- [14 Signs Of Vitamin D Deficiency](#) - Of course your Vitamin D levels should be reported in the blood work of your annual physical, and you should take correcting any deficiencies seriously - many natural foods can help with this, or your doctor may recommend Vitamin D supplements. You don't want any of [these things](#) to happen. Note the association in some studies between [low Vitamin D levels and risk of developing Alzheimer's Disease](#).
- [Map Of Alzheimer's Disease \(AD\) Incidence](#) - Researchers at the University of Michigan have mapped the incidence of diagnosed AD for adults in the US over 66 years of age, [here](#).
- [New Experimental Idea For Treating Alzheimer's Disease \(AD\)](#) - The glymphatic system is the brain's unique waste removal process that uses cerebrospinal fluid to wash away excess proteins generated by metabolic processes in the brain. An accumulation of these proteins, such as amyloid and tau, is associated with AD. Read a very clear lay description of the process [here](#). Researchers at the University of Rochester have shown in a recently [published](#) mouse study that a medication already in clinical use can clear these waste products from the brains of mice. Promising lab experiment. Human trials?
- [Is There a Cheap Natural Cure for Baldness?](#) - A [sugar naturally occurring in the human body](#), pentose sugar 2-deoxy-D-ribose (2dDR), could be the key for male-pattern baldness. Scientists at the University of Sheffield report promising results (in mice) from a small, smeared-on dose of 2dDR gel applied to exposed skin, [here](#). See their publication [here](#). Male pattern baldness affects up to [40% of the population](#). In the meantime, guys, keep wearing your hat on sunny days.
- [Best Temperature For Sleeping](#) - according to some experts is 65° F. See other tips for good sleep, and the health benefits, [here](#).
- [Walking Can Help Control Inflammation](#) - and has other benefits as well. See what [these rheumatologists](#) say.
- [Regenerating Knee Cartilage](#) - Adult human [cartilage does not have an inherent ability to heal](#), but scientists at Northwestern University believe they have discovered how to induce healing in cartilage of the joints (articular cartilage) using a supramolecular-covalent polymer hybrid scaffold - particularly knees. It works well in sheep, [publication](#). This is urgently needed. Human trials next?
- [Know These 7 Metrics About Your Body](#) - [here](#). Cholesterol profile, Waist circumference, Blood pressure, Blood Sugar as measured by hemoglobin A1C, basal metabolic rate ([BMR](#)), Grip strength (>age 30), Vitamin D level (>age 60). Get an update for each during your annual physical exam.

- Are Your Stools Healthy? - Check the Bristol Stool Chart [here](#). Ideally you should be a Type 3 or 4. This simple check, that you can routinely do yourself in a few seconds, may help catch a problem early, and could provide important information for your doctor. [Details](#).

Practical Nutrition -

- Get To Know Your Raspberries - They are a [powerhouse of nutrients](#): protein, calcium, iron, magnesium, potassium, zinc, niacin, riboflavin, folate, vitamin B12, vitamin K, fiber, and antioxidants like anthocyanins with anti-inflammatory properties. Frozen OK. See USDA nutritional analysis [here](#).
- How To Eat Flax Seeds - and why, explained by a registered dietician and health coach [here](#). Summary: rich in fiber, richest plant source of Omega-3 fatty acids (good fats), little saturated fat (bad fat), zinc, iron, vitamin E, calcium, lignans, potassium, and magnesium. Mayo Clinic recommendations [here](#). Tune-up option: not required, but to *maximize* nutritional value, flash-grind the seeds in a coffee or spice grinder just before use.
- The Right Way To Cut A Bell Pepper - details and a practical video [here](#).
- Indoor Salmon Farming - Superior Fresh in Hixton Wisconsin became the first land-based Atlantic salmon farm in the US in 2018 - [no antibiotics or pesticides](#), organic feed, filtered and recycled water, fish waste water used to fertilize greenhouse-grown leafy greens. Farmed Atlantic salmon is two thirds of the salmon consumed in the US, and about 90% is imported. It's a bit richer in healthy omega-3 fatty acids than wild-caught. [Healthy](#). Tuneup: You *can* just buy your salmon already grilled at the salad bar at Whole Foods ... for less than at the seafood counter. There is no *fresh* seafood, unless you're right at the docks. It's delivered to the store frozen.
- 14 Seasonings To Enhance Cooking Salmon - [here](#). Salmon, and other fatty fish, are healthy grilled or broiled.
- See What A Cardiologist With Low Cholesterol Has For Dinner - [here](#). Make your own salad dressing with balsamic or apple vinegar, and either olive oil or avocado oil with powdered herbs of your choice.
- See A Florida Gastroenterologist Describe What He Eats In A Day - [video](#). Summary: plant based whole foods.
- High Protein Low Sodium Snacks - recommended by a registered dietician as healthy, [here](#).
- Avocado Egg Toast - Very tasty, and declared healthy by a registered dietician, [details](#). Choose whole grain bread for fiber and other nutrients. Cook all eggs thoroughly to inactivate any avian flu virus that may be present. In addition to the toppings suggested, consider a slather of vegan, avocado-oil-based mayonnaise (refrigerated case at the grocery), and a drizzle of freshly squeezed lemon juice for a zippy antioxidant boost.
- You've Been Cutting Your Peaches Wrong - all your life. See how it's done, [here](#). [double tap on image]
- Are High Water Content Vegetables Healthy? - Yes. See a registered dietician's explanation of which ones and why, [here](#). Summary: spinach, zucchini, celery, tomato, cucumbers.
- Prunes - see a nutritional analysis [here](#). Healthy, but not more than two portions of 5 per day. Good antioxidants.
- Healthy Green Enchilada Sauce - You can make your own, [here](#). Tune-ups: Use low-sodium salt and avocado oil. Make a big batch, and freeze it in separate portions to use as needed. Frozen is even *more* healthy.
- Misleading Words For Sugar - High-fructose corn syrup, sucrose, barley malt, dextrose, maltose and rice syrup are all [forms of sugar](#). Certain blood alcohols sometimes used as sweeteners, such as Erythritol and Xylitol, are made by the body and occur naturally in certain foods - but in

very small amounts. As additives they have recently been [linked to heart disease and stroke by Cleveland Clinic researchers](#), and should be avoided.

- [Is Your Favorite Food Ultra-Processed?](#) - and if so, what's a good substitute. View the Northeastern University [TrueFood Dashboard](#).
- [Most Nutritious Vegetables and Fruits Rank-Ordered by CDC](#) - See the list [here](#). Chinese cabbage = bok choy.

Environmental Science News -

- [US Environmental Protection Agency Orders Emergency Suspension Of Registrations For Pesticide](#) - dimethyl tetrachloroterephthalate ([DCPA or Dacthal](#)), the first such [EPA emergency action](#) in 40 years. The unborn whose pregnant mothers are exposed to DCPA could experience changes to fetal thyroid hormone levels linked to low birth weight, impaired brain development, decreased IQ, and impaired motor skills - may be irreversible.
- [US Department Of Interior \(DOI\) Final Record Of Decision To Retain Protection Of 28 Million Acres Of Public Lands And Waters In Alaska](#) - [Map](#) and [DOI announcement](#).
- [Wind Beat Coal For US Electrical Power Generation In Both March And April, 2024](#) - Details, and a very clear graph, [here](#). More to come as the trend continues. [Thanks Barbara R.]
- [6,700 Square Mile Dead Zone](#) - this Summer in the Mississippi-Atchafalaya River Basin at the bottom of the Gulf of Mexico due to agricultural runoff from rivers in Louisiana and Eastern Texas. Runoff nutrients cause an algae bloom, which dies off in mid-summer and sinks to the bottom to create a hypoxic (low oxygen) region that can't support life - details and a photo [here](#). The Chesapeake Bay has a similar dead zone that has gotten a bit smaller as states in the Bay's watershed get control of nutrients inputs. The DMV is doing OK, Pennsylvania isn't. Forty percent of the fresh water entering the Chesapeake is from the Susquehanna River, rising in PA.
- [Record For Hottest Month On Planet Earth](#) - July, 2024. [Details](#)
- [Given A Potential Food Source, Something Will Evolve to Eat It](#) - is a basic tenant of evolutionary biology. A microbiologist and doctoral candidate at Leiden University in the Netherlands has [discovered](#) that one in five bacterial strains she tested [could be induced to eat](#) the widely used plastic Polyethylene terephthalate (PET). Let's pursue this. [Publication](#).
- [Owl Rescued From Drowning](#) - A small Eastern Screech Owl had fallen into a swimming pool in Virginia, and it didn't look good [[story and photos](#)] for him. But the homeowner thought to call the [Blue Ridge Wildlife Center](#), they rode to the rescue, and now the young owl is back in his forest. Well done by all.
- [Injured Baby Mockingbird Masters Withering Stare](#) - to reject food not to his taste. He made his high culinary standards very clear - mockingbirds have attitude. Story and photo [here](#). You'd be techy too if you'd been carried around in the mouth of a well meaning dog while being [rescued](#). He's making good progress.
- [Vultures And Other Raptors Have Their Place](#) - and had always been an [important part of the ecosphere in India as a natural sanitation system](#). Vultures can eat a large dead animal in a few hours. But farmers in India began feeding their livestock a common human painkiller ([diclofenac](#)), the remains of which led to kidney failure in vultures, and in a few years most of them were dead. At that point the numbers of feral dogs and rats began to rise, along with the incidence of rabies and anthrax. There were also downstream effects on the water supply, and [excess human deaths began to rise](#) - a 4.2% annual increase in the years following the vulture population collapse. Now there is an effort to reestablish vultures. What comes around goes around. [Arlene G.]

- [Extraordinary Efforts To Save The *Kapako* Flightless Nocturnal Parrot in New Zealand](#) - bird backpacks with transmitters, sensors outside nests, incubators, 3D-printed smart eggs that make noise, a drone nicknamed the 'cloacal courier' to fly semen to waiting females. Photo/details, [here](#). All 147 birds have been gene sequenced.
- [Why Are Australian Scientists Gluing Cameras to Sea Lions?](#) - To go where they go, see what they see, and [map benthic habitats](#) cheaply - without renting a submarine, or burning a lot of stinky ship fuel. Sweet idea!
- [Golden Retriever Adopts and Cares For Stray Kitten](#) - Maternal instinct at work, video [here](#). [Karen W.]
- [36 Million Trees Go Down In The US Annually](#) - from a variety of hazards: storm, disease, decay, development, etc. Many of them get dumped in landfills, turned into wood chips for mulch, or get used in other low utility factor ways. The start-up [Cambium Carbon](#) (Dupont Circle, Washington DC) has formed a network, [Carbon Smart Wood](#), to keep more trees out of landfill and put them into the timber supply chain for higher level uses that would otherwise require cutting down more trees. The circular economy at work. Climate impact chart [here](#).
- [6,000 Sheep Keep Their Texas-Sized Lawn Well Mowed](#) - The solar power company [Enel North America](#) (Andover MA) has contracted with Texas Solar Sheep to [graze 8 Texas solar farms covering 10,100 acres](#). [Collateral benefits](#): improved soil health, more efficient use of water, reduced maintenance and operations costs.
- [200 MW Salt River Project's New Solar Plant, Pinal County AZ](#) - is set to come online soon in the [Brittlebush Solar Park](#) near Coolidge AZ - single axis tracking panels. *All* of its power is dedicated to the new [Meta Platforms \(Facebook\) data center](#) (396 acres) in Mesa AZ - 2 buildings now, 5 by 2026, \$1 billion
- [Hydrogen Powered Commuter Train To Operate *This Year* in California](#) - The San Bernardino County Metrolink line, a 9 mile run between San Bernardino and Redlands CA, is now testing the 'Flirt H2' (Fast Light Intercity and Regional Train) before it goes into service replacing existing diesel-powered trains later this year. The new train sets will be provided by Swiss based Stader Rail, and will operate on existing tracks. Emissions - water vapor. [Thanks for the \\$80 million Governor Newsom](#). If all goes well, additional trains will be converted to H2. [Details](#).
- [What The Kids Think About Lake Shore NY School Buses Going Electric](#) - [Details](#). New York state has mandated that only electric school buses will be bought by public schools after 2027. This being America, the adults are arguing about it, of course, but what do the actual customers (kids) think about their new quiet/smooth ride? Here are some comments from the kids: "I like that we can hear the music", "I like that it can go fast", "I like it because it's quiet, so when I have headaches, my headache doesn't get worse". The new buses also dramatically improve air quality and help prevent pediatric asthma attacks, acute bronchitis cases, and upper and lower respiratory symptoms. Win win.
- [New Large-Scale Battery Storage Plant For Southeast Michigan](#) - Detroit based [DTE Energy](#) will build a new utility scale battery storage plant, the Trenton Channel Energy Center, based on LFP (lithium/iron/phosphate) technology - on the 20 acre site of the former coal burning Trenton Channel Power Plant, making cost-effective use of existing grid connectivity at the site. \$140 million of the required \$500 million in funding for the [220-megawatt, 880-megawatt-hour plant](#) is through the US Department of Energy from the US 2022 Inflation Reduction Act. [Power for 40,000 homes](#).
- [New EV Battery Technology](#) - The [Forge Nano](#) (Thornton CO) subsidiary Forge Battery has announced the achievement of [300 Whr/kg specific energy density for its new battery technology](#) - higher energy density implies greater EV range. The company uses a lithium nickel manganese cobalt oxide (NMC 811) cathode, a silicon oxide (SiOx) graphite composite anode,

and its batteries can fast charge in 10 minutes without sacrificing battery life. Forge Battery has announced that it will build a battery factory in Morrisville, North Carolina with an annual capacity of 24 GWhr, scheduled to start production in 2026, with 90% US content.

- New Battery Technology - [Lyten](#) (San Jose CA) is introducing [Lithium/Sulphur/Graphene technology batteries](#) for [combat drone applications](#) - could also be a step toward adapting them for domestic uses in laptops and EVs. The batteries are lighter than for Lithium ion technology, with twice the energy density. Stay tuned.
- New Tech High Density Electric Motors - for aerospace and other power density sensitive applications have been designed by [H3X](#) (Denver CO). When used in electric aircraft, their reduced weight can extend the aircraft's range substantially by freeing up capacity for storing energy producing material such as Hydrogen.
- Montana/North Dakota North Plains Grid Connector Project - The 415 mile long, \$3.5 billion project, connecting several electrical grids in the two states, will receive a \$700 million grant from the US Department of Energy's Grid Resilience and Innovation Partnerships ([GRIP](#)) program. [Details](#) and map. The project will support the creation of up to 3,800 MW of renewable power, will help strengthen grid affordability and reliability for balancing solar/wind generation, and be completed in 2031. Full list (with MD and VA) of GRIP grants funded, [here](#).

Other Science News -

- University At Buffalo (UB) Researchers Achieve Superconductor Breakthrough - Previously, superconductive wire has required temperatures close to absolute zero, 0° Kelvin, to conduct electricity without resistance. [UB researchers](#) have designed a material that, at 20° K, allows a [4 millimeter wide \(0.2 micron thick\) wire segment to conduct 1,200 amps!](#) Several new solid state physics procedures were invented to make this development possible. Impressive ... with implications for fusion power and other applications. [Ari H.]
- Successful First Hot Fire of Archimedes Rocket Engine - has been [reported](#) by [Rocket Lab](#) (Long Beach CA). This is the engine the company will use in its planned, reusable, medium-lift 'Neutron' rocket (13 ton payload) - first launch in mid-2025. The company has already launched over 50 payloads on its current, smaller 'Electron' rocket, and has three launch locations - Wallops Island VA, and two private spaceports on northern New Zealand's Mahia Peninsula. Competition for SpaceX. Other rocket science news [here](#).
- Successful Test Of Army's Hypersonic Ground-To-Ground Missile 'Dark Eagle' - in August. Additional details [here](#). The maneuverable glide body can reach Mach 17, range 2,000 miles. On track for deployment.
- European Space Agency Jupiter Icy Moons Explorer (JUICE) - executed the world's first first double sling-shot gravity assist in August, and is on its way to the Jupiter system in 2031 - first around the moon, followed immediately by rounding the Earth, and then off to round Venus. There will be 3 more gravity assist fly-bys before arriving at Jupiter. JUICE will tour Jupiter's moons, and take up orbit around Ganymede to look for life.
- Chips And Science Act Success - The law passed two years ago has [now committed most of the appropriated \\$39 billion](#), and has catalyzed about \$400 billion in additional associated private investment. The goal was to restore US-based *advanced* chip manufacturing from near zero to about 20% of world production by 2030. Major chip companies have now been successfully incentivized to build or expand in the US - Intel, Micron Technology, Taiwan Semiconductor Manufacturing Company (TSMC) and Samsung Electronics. Output should begin to be visible by the end of next year. This is a good start on prudent long-term reshoring action vital for both economic and defense security reasons. Thanks US Commerce Secretary Raimondo.

- Montessori Schools - began to be popularized in the US in the 50s, but *really* began to flourish when social media made it easier for parents to share the results for their children with other parents. Now there are more than [3,000 Montessori Schools in the US](#), of which almost 600 are in *public* school systems See a description of the teaching approach, and good videos, from the National Center for Montessori in the Public Sector, [here](#).
- Abandoned Baby Donkey Gets Adopted - A good [example of animal imprinting](#), but who is imprinting whom?
- Ukraine Prepares To Send In The Dogs - the stealthy agile robot dogs, that is, to replace soldiers for risky work like spying on Russian trenches, detecting mines, carrying weapons/ammunition/medicines to the front. Details and photos [here](#), and [here](#) and on the prowl [here](#). See a [video](#) of their more mechanical-looking cousins.
- Non-Contact Surrender - Ukraine has begun encouraging Russian soldiers to surrender to drones, [safer](#).

Nice Thing - [skip ad, full screen]

Political Season - Political teaching story [Betsy B.]

- Painting the Roses Red - Alice in Wonderland, by Disney - [here](#).