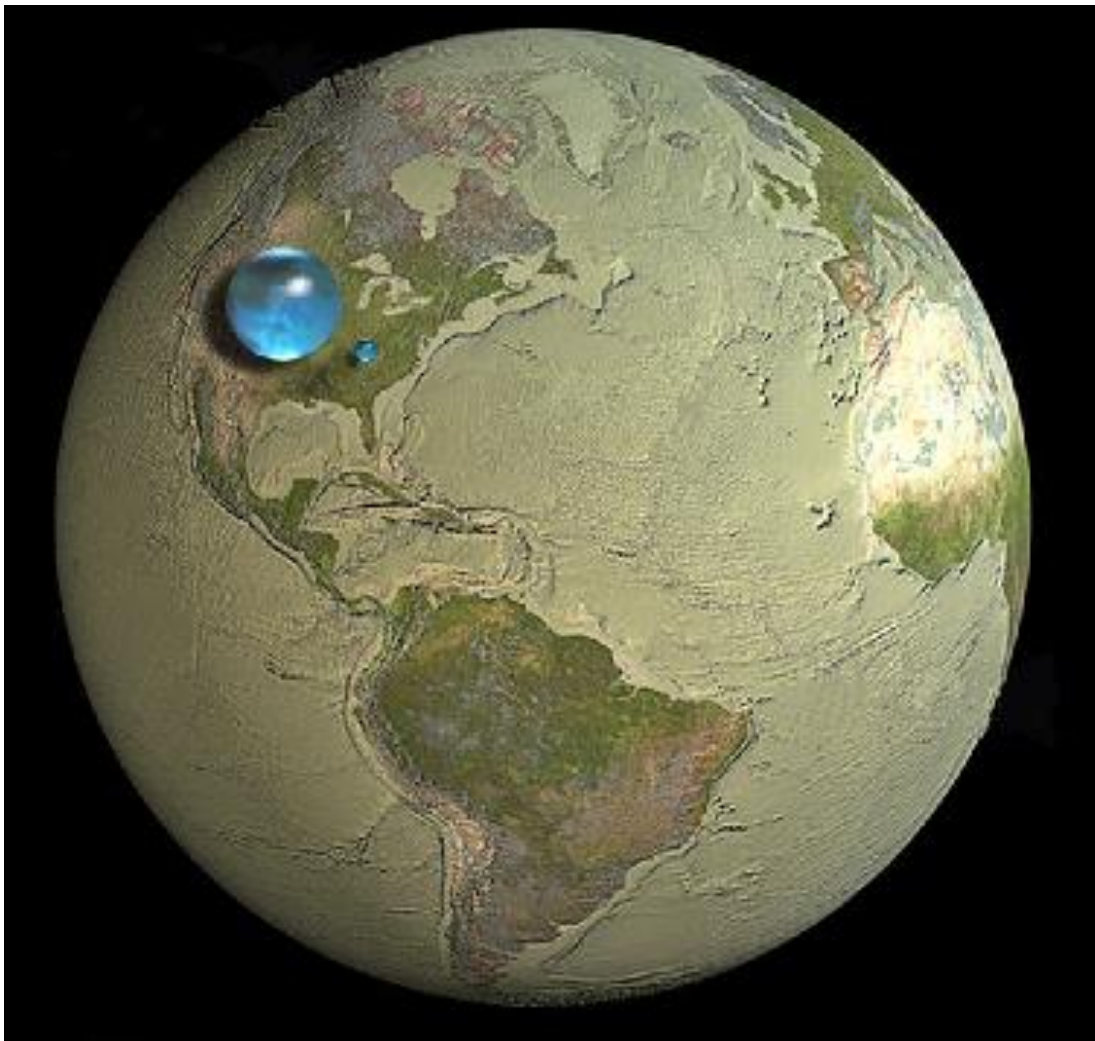


Ode to E Pluribus Unum for Sunday October 2 2022



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All the **Water** on **Planet Earth**



*Illustration: Jack Cook, Adam Nieman, Woods Hole Oceanographic Institution  
Data source: Igor Shiklomanov*

How much of planet Earth is made of water? Very little, actually. Although oceans of water cover about 70 percent of Earth's surface, these oceans are shallow compared to the Earth's radius.

The featured illustration shows what would happen if all of the water on or near the surface of the Earth were bunched up into a ball. The radius of this ball would be only about 700 kilometers, less than half the radius of the Earth's Moon, but slightly larger than Saturn's moon Rhea which, like many moons in our outer Solar System, is mostly water ice.

The next smallest ball depicts all of Earth's liquid fresh water, while the tiniest ball shows the volume of all of Earth's fresh-water lakes and rivers. How any of this water came to be on the Earth and whether any significant amount is trapped far beneath Earth's surface remain topics of research.

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## **The World's First Programmer?**



Lord Byron's daughter Ada Lovelace is often considered the world's first computer programmer.

The famous poet Lord Byron once wrote of his daughter Ada that he hoped "the gods have made her anything save poetical — it is enough to have one such fool in the family." He got his wish. Instead, Ada Lovelace followed a path many considered impossible for a woman in the early 19th century. Encouraged by her mother, Lady Byron, Lovelace developed a passion for mathematics at a young age. In 1833, a 17-year-old Lovelace met British mathematician Charles Babbage at a party, and he told her about a calculating machine he'd created called the Difference Engine. Fascinated, Lovelace eventually began a regular correspondence with Babbage.

About a decade later, while translating a French text regarding Babbage's proposed Analytical Engine — often considered the first mechanical computer — Lovelace added a few notes of her own. "Note G" detailed a method through which Babbage's creation could calculate complex numbers called Bernoulli numbers. This is often considered the

world's first computer program, making Lovelace the first computer programmer. While Babbage was the brains behind the machine, Lovelace was the one who truly grasped its wider importance, foreseeing a future where engines could use the "abstract science of operations" to do things beyond mere computation — like composing complex music, for example. It took the world nearly a century to catch up to her vision.

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## **Paul Harvey (1918-2009) His Final Oration**



<https://youtu.be/jRB1CWgMFU4>

If you look at nothing else in this week's Ode, please take the time to hear and see a master at work.

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## **How About a Vertical Axis Wind Turbine?**



[Photo: World Wide Wind]

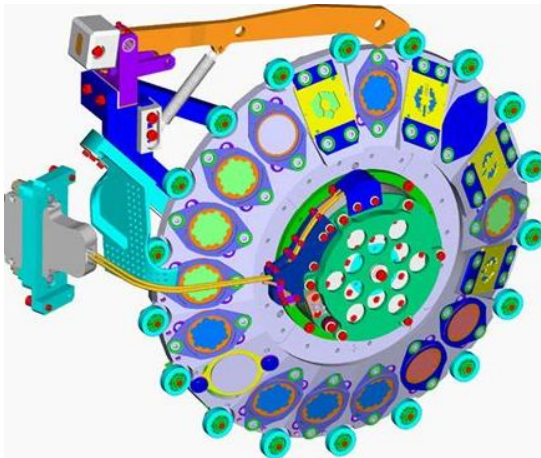
The concept of vertical axis turbines is not new, but the architecture of this machine—which World Wid Wind says is patent pending—is radically different. The design employs two coaxial, or counter-rotating, rotors mounted on a vertical shaft.

<https://bit.ly/3f8ej5X>

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## Webb Image Resources

You'll want to keep this as JWST presents more spectacular images



<https://webbtelescope.org/resource-gallery/images>

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### **3D Printing Drones Build and Repair Structures While Flying**

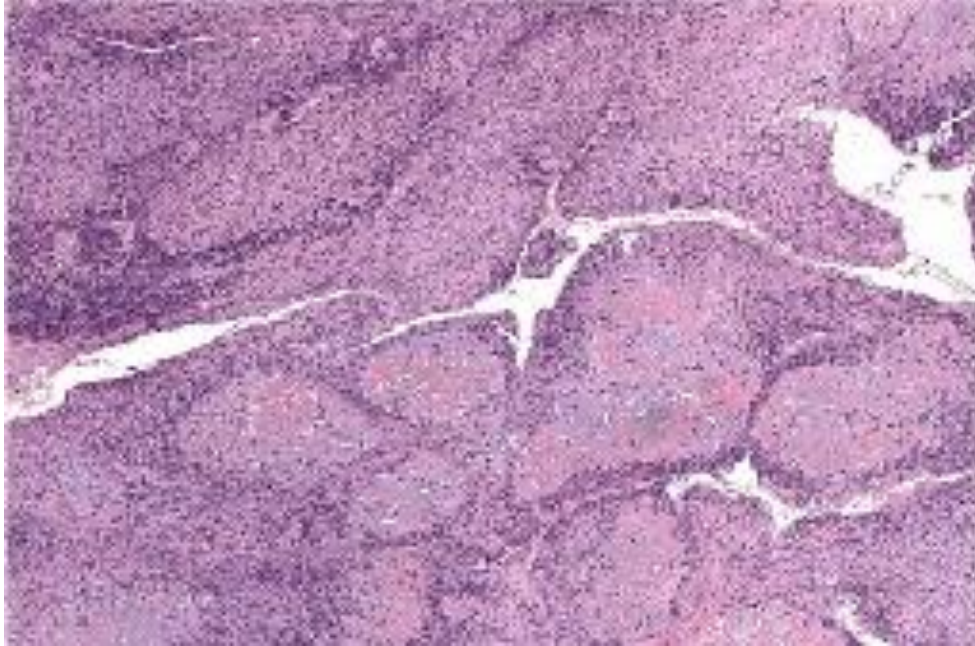


*BuilDrones (R) 3D print their material during flight, and ScanDrones (L) continuously measure their output for quality control.*

[https://www.imperial.ac.uk/news/239973/3d-printing-drones-work-like-bees/?utm\\_source=join1440&utm\\_medium=email](https://www.imperial.ac.uk/news/239973/3d-printing-drones-work-like-bees/?utm_source=join1440&utm_medium=email)

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### **Laser Light Offers New Tool for Treating Bone Cancer**



*An image of cancerous tissue prepared with the traditional hematoxylin and eosin (H&E) staining method.*

*Credit: Caltech*

A new diagnostic imaging technology developed by researchers at Caltech is offering surgeons the ability to make cuts 10 times more precisely, allowing them to preserve as much as 1,000 times more healthy tissue and to give patients easier recoveries.

<https://www.caltech.edu/about/news/laser-light-offers-new-tool-for-treating-bone-cancer>

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## **Environmentally Friendly Quantum Sensor Runs On Sunlight**

Trading power-hungry lasers for sunlight is a first step toward sustainable quantum tech



*A diamond sensor is the heart of a sunlight-powered quantum device.  
Yunbin zhu/university of science and technology of china*

<https://bit.ly/3feSIbR>

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## **Is Charging Cars at Home at Night the Way to Go?**

This Stanford study says No.



<https://stanford.io/3dyGwIS>

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## **2023 Breakthrough Prize Winners**



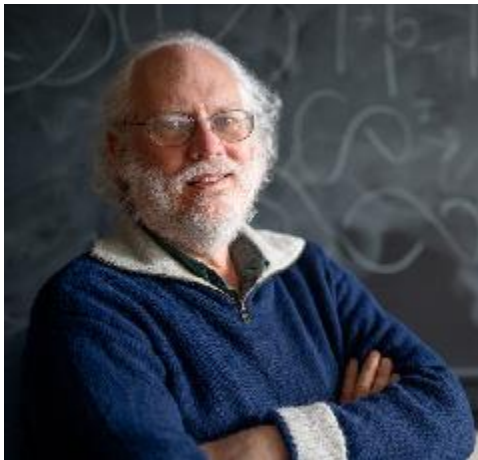
The 2023 Breakthrough Prize winners were announced today by the Breakthrough Prize Foundation and its founding sponsors — Sergey Brin, Priscilla Chan and Mark Zuckerberg, Julia and Yuri Milner, and Anne Wojcicki.

<https://phys.org/news/2022-09-winners-breakthrough-prizes-unveiled.html>

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### **Peter Shor wins Breakthrough Prize in Fundamental Physics**

MIT professor to share \$3 million prize with three others; Daniel Spielman PhD '95 wins Breakthrough Prize in Mathematics.



<https://news.mit.edu/2022/shor-spielman-breakthrough-prize-0922>

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### **Yale's Spielman wins \$3 million Breakthrough Prize**

Much of Spielman's work has focused on designing faster algorithms to solve systems in linear equations, and then leveraging those algorithms to perform other functions even faster.





<https://news.yale.edu/2022/09/22/yales-spielman-wins-3-million-breakthrough-prize>

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### **AlphaFold Developers Win US\$3-million Breakthrough Prize**

DeepMind's system for predicting the 3D structure of proteins is among five recipients of science's most lucrative awards.



*Demis Hassabis (left) and John Jumper (right) from DeepMind developed AlphaFold, an AI that can predict the structure of proteins.*

<https://www.nature.com/articles/d41586-022-02999-9>

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### **Breathtaking Pictures of World's Architectural Wonders**



<https://mail.google.com/mail/u/0/?shva=1#inbox/FMfcgzGqQctThxZjvxDRfrcsgplqZkTg>

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## **Navistar Graduates First Uptime Academy Class**



*Navistar*

Navistar has announced the graduation of its first Uptime Academy class of nine students, as well as nine equipment donations to accredited technical schools through its TECH EmPOWERment program.

Uptime Academy presents a unique approach to technician training from 90-day pre-program dealership employment to on-the-job class assignments. Students work with multiple vehicle types, including electric and fuel cell technologies. In addition to 3,200 hours of on-the-job training, students are assigned a mentor and receive 800 hours of classroom time and lab work, a journeyman toolbox, and laptop.

“The Navistar team and all partnered dealers are beyond proud to have helped launch the career of nine new technicians, providing them with valuable knowledge, mentors and hands-on experience,” said Ana Salcido, technician recruitment manager. “By offering a paid, on-the-job learning environment, we differentiated ourselves within the industry during a difficult time for technician recruitment.”

The 2022-2023 Uptime Academy class is slated to begin two more groups this month with 18 students, who are set to graduate in summer of 2023.

To further aid technician education, dealers from around the U.S. have donated equipment to local colleges and technical programs through the TECH EmPOWERment initiative. The program supplies accredited technical schools with equipment, real-world advisory counsel and employment prospects for aspiring technicians.

Recent donations by International truck dealers and Navistar include:

- State University of New York in Cobleskill, New York by Stadium International Trucks
- Texas State Technical College in Waco, Texas by Kyrish Truck Center
- Greater Altoona Career and Technology Center in Altoona, Pennsylvania by Allegheny Trucks
- Central Piedmont Community College in Charlotte, North Carolina by Rush Truck Centers
- Tennessee College of Applied Technology in Nashville, Tennessee by Cumberland International
- Western Technical College in La Crosse, Wisconsin by DeBauche Truck & Diesel
- Ohio Technical College in Cleveland, Ohio by Rush Truck Centers
- Southwest Research Institute in San Antonio, Texas by Navistar Corporate Engineering
- Michigan Technological University in Houghton, Michigan by Navistar Corporate Engineering.

*No student loans to repay, either.*

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## Height Comparison – Classic Hollywood Actresses



<https://app.getresponse.com/click.html?x=a62b&lc=SYLCp4&mc=CX&s=BV2dwL6&u=qU&z=EBotwZ8&>

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## Age Overcomes Gravity

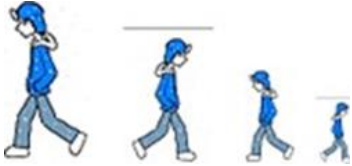


<https://youtu.be/6zvUDiyxaYQ?t=4>

*I'm two years older than the guy, so no big deal. What's your excuse?*

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## **My Walking Thoughts**



**For October 2 2022**

