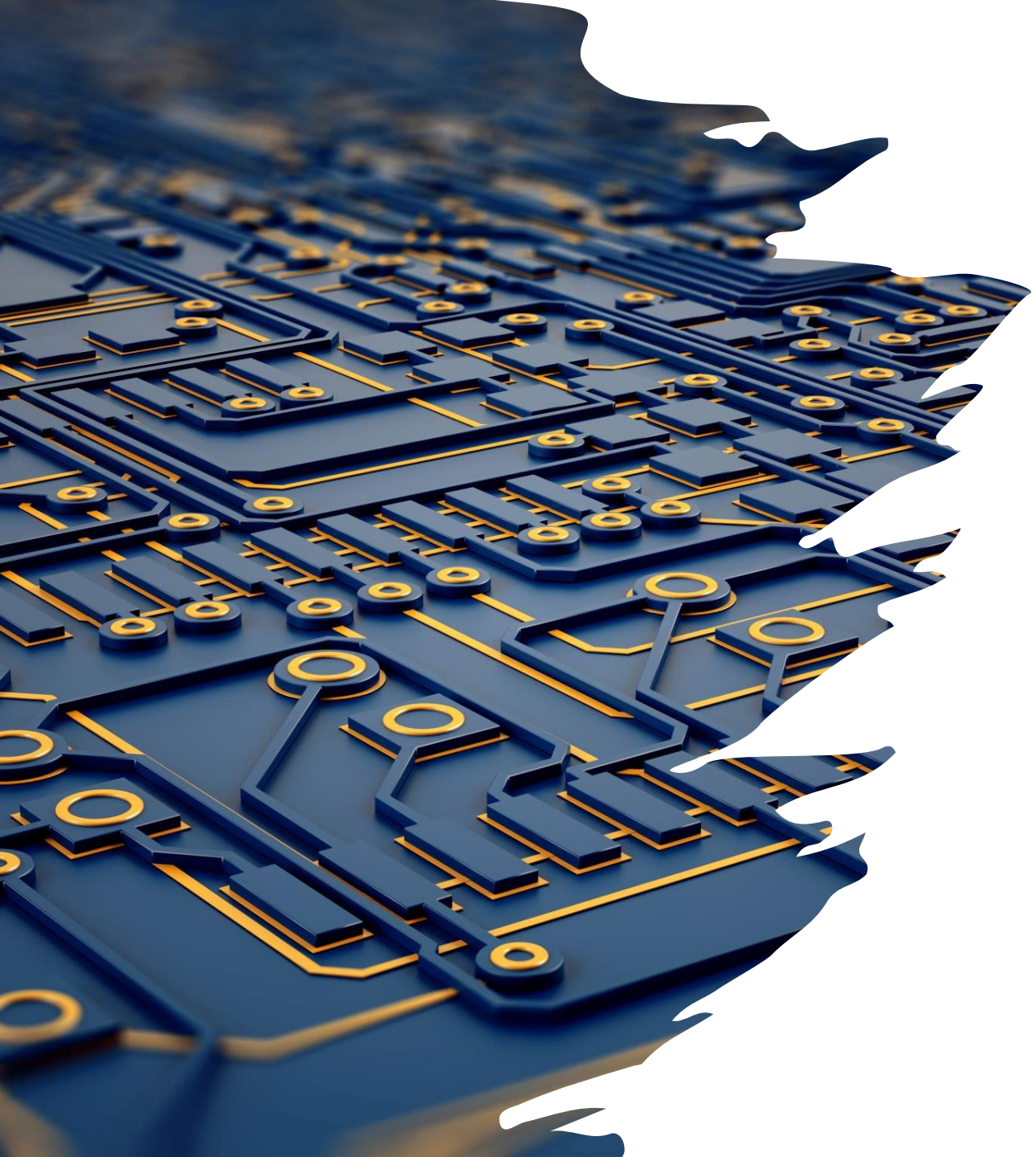


“Finale”

Grand Computers Club
New Technologies SIG
December 17, 2020

Joe Parla

Topics

- What is happening?
- NT/SIG & my background
- Technology history
- Tech future/predictions
- Questions

What is Happening?

Changes to the New Technologies Special Interest Group (NT/SIG)

- **Tom Sheppard will take on the role as facilitator in addition to his duties for "New to Computers"**
- **Let Tom know if you wish to continue as an active member, and if you have any ideas for meeting topics at: newtech@grandcomputers.org**

What is Happening?

Changes to the New Technologies Special Interest Group (NT/SIG)

- **The NT/SIG facilitator (Joe Parla) is stepping down.**
- **GCC will continue and support the NT/SIG**
- **There have been discussions about how the meetings will be scheduled, and conducted**
- **Possibility of different presenters each session**

My Background

- Over 50 years of Information Tech experience
- Bachelor’s degree in mathematics
- Graduate work towards master’s degree in computer science
- A personal computer hobbyist since 1975

My Background

- Work experience: IBM, Time Inc., Official Airline Guides, GTE, and Federal Reserve
- Positions and titles: programmer, systems engineer, network security engineer, manager of systems engineering, business continuity architect

My Background

Multiple technology certifications

- **CISSP (Certified Information Security Systems Professional)**
- **CBCP (Certified Business Continuity Professional)**
- **MCP (Microsoft Computer Professional)**
- **MCSE (Microsoft Certified System Engineer)**
- **MCSA (Microsoft Certified Systems Administrator)**

My Background

Tech Help Skills

- Most popular operating system installation, tune-up, and repairs
- Application installations and troubleshooting
- Most hardware installations and upgrades
- Home Entertainment advice
- Virtual reality concepts and devices
- Wearable gear setup & troubleshooting
- General smartphone setup & troubleshooting

My Background

My proudest projects (a small part of some large very talented teams)

- Universal Product Code (UPC) Bar code
  Selling Areas Marketing Inc. SAMI/Time Inc.
- Airline scheduling algorithms (SST)
  Official Airline Guides (OAG)
- IBM mainframe Remote Site Recovery (RSR)
  Federal Reserve System

NT/SIG Background

- Grand Computers Club started in September 1997
- Arnie Gelb and Leon Chapman proposed a special interest group for the more technically savvy members of the Club
- Arnie Gelb formed the Linux SIG in 2005
- Linux SIG renamed New Technologies SIG 2006

NT/SIG Background

- Mid-2008 Joe Parla became NT/SIG facilitator
  - Hold monthly meetings on current and trending tech topics
  - Publish monthly newsletter (over 120 issues!)
  - Procure and update equipment
    - Classroom 4K/UHD projector & screen
    - Classroom surround sound system
    - Virtual reality headsets

Technology History

Historical Technology Breakthroughs

- The printing press, 1430s
- Electricity, late 19th century
- Penicillin, 1928
- Semiconductor, mid-20th century
- Optical lenses, 13th century
- Paper, 2nd century
- Internal combustion engine, late 19th century
- Vaccination, 1796
- Internet, 1960s
- Steam engine, 1712

Technology History

Historical Technology Breakthroughs

- Nitrogen fixation, 1918
- Sanitation 19th century
- Refrigeration, 1850s
- Gunpowder, 10th century
- The airplane, 1903
- Personal computer, 1970s
- The compass, 12th century
- Automobile, late 19th century
- Steelmaking, 1850s
- Nuclear fission, 1939

Technology History

Historical Technology Breakthroughs

- Horse Domestication 3500 BC
- Paper Currency 9th Century
- Telegraph mid 1800s
- Electric Light 1890
- Antibiotics 1928

Technology History

Recent Technology Breakthroughs

- Retinal implants
- Gene editing
- Robotic exoskeletons
- 3D organ printing
- Robotic surgery
- Digital assistants
- Multi-use rockets
- High-density battery packs
- Online streaming
- Small satellites

Recent Breakthroughs

1954: Microwave Oven

In 1945 Raytheon's Percy Spencer stands in front of a magnetron (the power tube of radar) and feels a candy bar start to melt in his pocket: He is intrigued. When he places popcorn kernels in front of the magnetron, the kernels explode all over the lab. Ten years later Spencer patents a "radar range" that cooks with high-frequency radio waves; that same year, the Tappan Stove Co. introduces the first home microwave model.

Recent Breakthroughs

1955: Polio Vaccine

The year Jonas Salk finds a way to prevent polio, there are 28,985 global cases; by 2017, the number drops to 22.

Honorable Inventions: Velcro, TV remote control

Recent Breakthroughs

1957: Birth Control Pill

Enovid, a drug the FDA approves for menstrual disorders, comes with a warning: The mixture of synthetic progesterone and estrogen also prevents ovulation. Two years later, more than half a million American women are taking Enovid—and not all of them have cramps. In 1960 the FDA approves Enovid for use as the first oral contraceptive.

Honorable Invention: Three-Point Seat Belt

Recent Breakthroughs

1958: Jet Airliner

The Boeing 707-120 debuts as the world's first successful commercial jet airliner, ushering in the era of accessible mass air travel. The four-engine plane carries 181 passengers and cruises at 600 mph for up to 5,280 miles on a full tank. The first commercial jet flight takes off from New York and lands in Paris; domestic service soon connects New York and Los Angeles.

Honorable Invention: Laser Beam, Super Glue

Recent Breakthroughs

1961: Cordless Tools

Black and Decker releases its first cordless drill, but designers can't coax more than 20 watts from its NiCad batteries. Instead, they strive for efficiency, modifying gear ratios and using better materials. The revolutionary result puts new power in the hands of DIYers and—thanks to a NASA contract—the gloves of astronauts.

Honorable Invention: Industrial Robot, Carbon Fiber Composites

Recent Breakthroughs

1964: Unmanned Aerial Vehicles
Widespread use of remotely piloted aircraft begins during the Vietnam War with deployment of 1000 AQM-34 Ryan Firebees. The first model of these 29-foot-long planes was developed in just 90 days in 1962. AQM-34s go on to fly more than 34,000 surveillance missions. Their success leads to the eventual development of the UAVs widely used today.

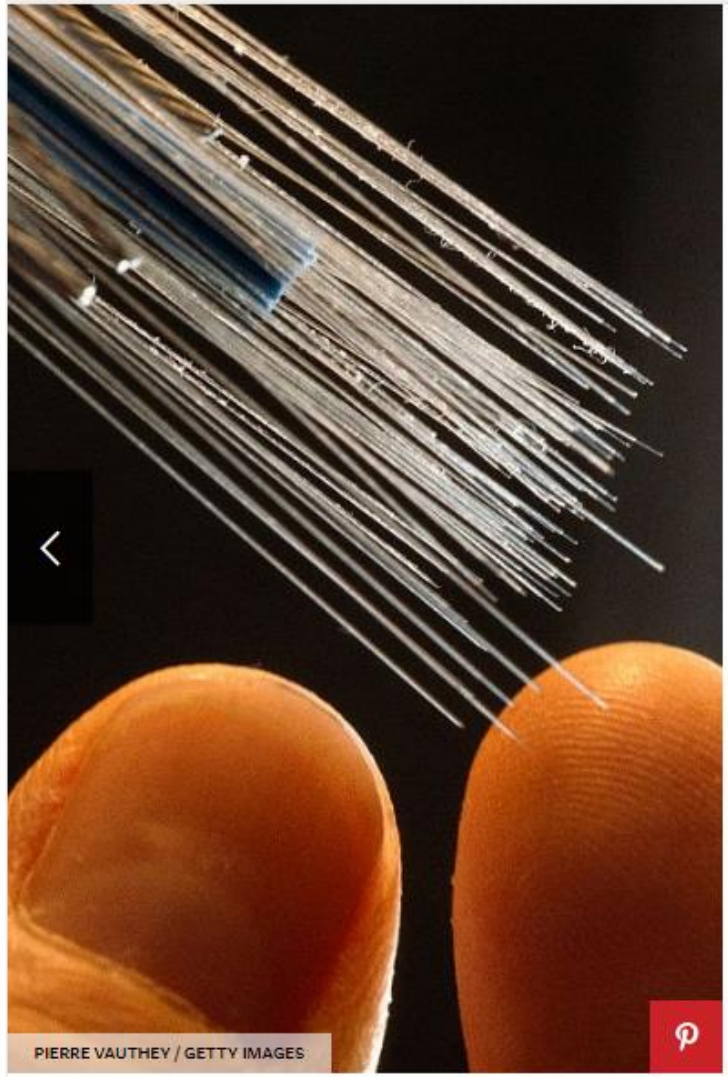
Honorable invention: Music Synthesizer

Recent Breakthroughs

1966: High-Yield Rice

The International Rice Research Institute in the Philippines releases a semi-dwarf, high-yield Indica variety that, in conjunction with high-yield wheat, ushers in the Green Revolution. Indica rice thrives in tropical regions of Asia and South America, raising worldwide production more than 20 percent by 1970.

Recent Breakthroughs



1970: Fiber Optics

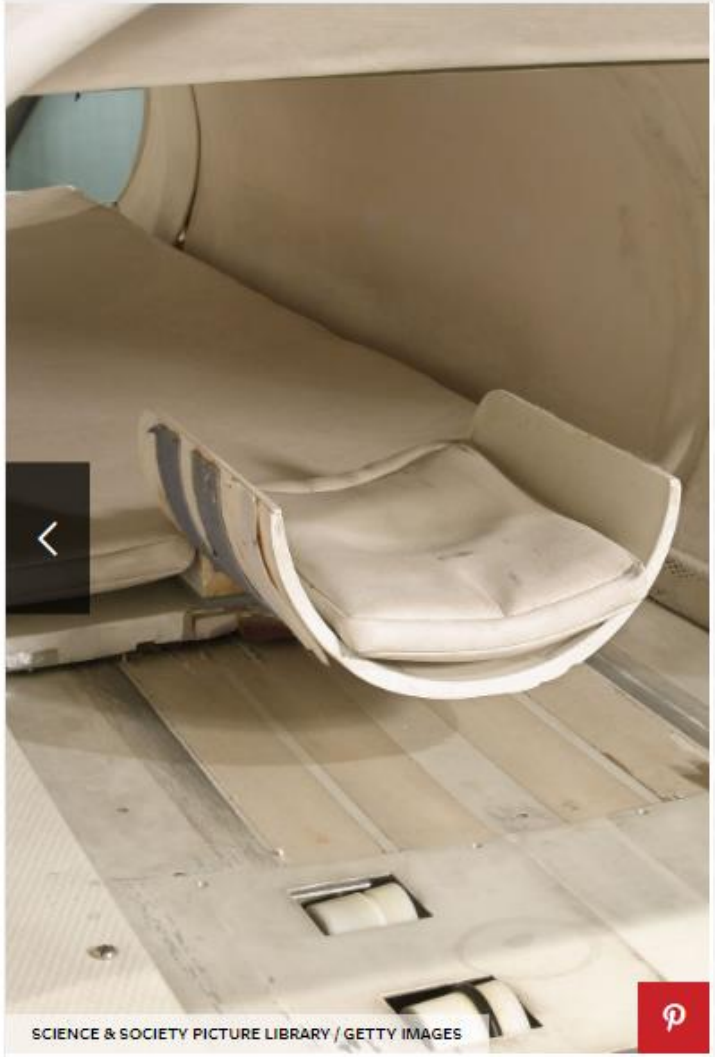
The term "fiber optic" is coined in 1956, but it isn't until 1970 that scientists at Corning produce a fiber of ultrapure glass that transmits light well enough to be used for telecommunications.

Honorable invention: Digital Music

Recent Breakthroughs

1973: MRI

Everyone agrees that magnetic resonance imaging (MRI) is a brilliant invention—but no one agrees on who invented it. The physical effect that MRIs rely on—nuclear magnetic resonance—earns various scientists Nobel Prizes for physics in 1944 and 1952. Many believe that Raymond Damadian establishes the machine's medical merit in 1973, when he first uses magnetic resonance to discern healthy tissue from cancer. Yet, in 2003, the Nobel Prize for medicine goes to Peter Lauterbur and Peter Mansfield for their "seminal discoveries." The topic of who is the worthiest candidate remains hotly debated.



Recent Breakthroughs

1974: Barcode

A 10-pack of Wrigley's Juicy Fruit chewing gum is the first product to integrate the usage of barcode technology when it's scanned at a grocery store in Ohio; the codes become the industry standard for storing pricing information at grocery stores and expand rapidly for both consumer-facing and internal tracking applications.

Recent Breakthroughs

1978: GPS

The first satellite in the modern Navstar Global Positioning System (GPS) is launched. (The GPS's precursor, TRANSIT, was developed in the early 1960s to guide nuclear subs.) It is not until the year 2000, though, that President Clinton grants nonmilitary users access to an unscrambled GPS signal. Now, cheap, handheld GPS units can determine a person's location to within 3 yards.

Honorable invention: Genetic Engineering, In-Vitro Fertilization

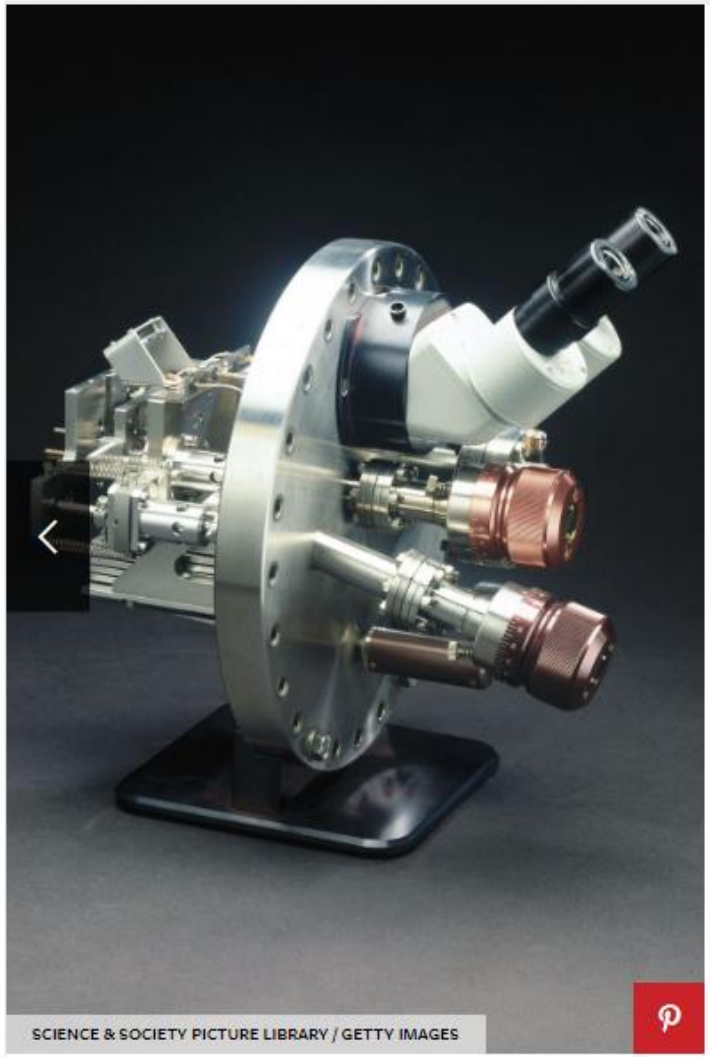
Recent Breakthroughs

1980: Cobalt-oxide Cathode

John Bannister Goodenough invents the cobalt-oxide cathode, a crucial component of lithium-ion batteries—the rechargeable and portable batteries that are now in every smartphone, laptop, and electric vehicle. In 2017, the 94-year-old Goodenough, apparently deciding that his last invention wasn't good enough announces that he's come up with a new glass-based battery with even better storage capability.

Recent Breakthroughs

1981: Scanning Tunneling Microscope
By moving the needle of the scanning tunneling microscope (STM) across a surface and monitoring the electric current that flows through it, scientists can map a surface to the level of single atoms. The STM is so precise that it not only looks at atoms—it also can manipulate them into structures. The microscope's development earns IBM researchers Gerd Binnig and Heinrich Rohrer a Nobel Prize and helps launch the emerging era of nanotechnology.



Recent Breakthroughs

1993: Fuel Cell Vehicle

The fuel cell goes back more than 150 years, and the first fuel cell vehicle—a 20-hp tractor—is built in 1959. But it isn't until 1993 that a Canadian company, Ballard Power Systems, demonstrates the first zero-emissions fuel cell bus. Since then, progress toward an economically viable fuel cell car has remained slow but steady.

Recent Breakthroughs

1998: International Space Station

On November 20, 1998, the Functional Cargo Block, aka Zarya, launched into space as the first piece of what would eventually become the International Space Station. Home of countless experiments and a shining example of international cooperation, the ISS is testament to what humanity can achieve when we work together.

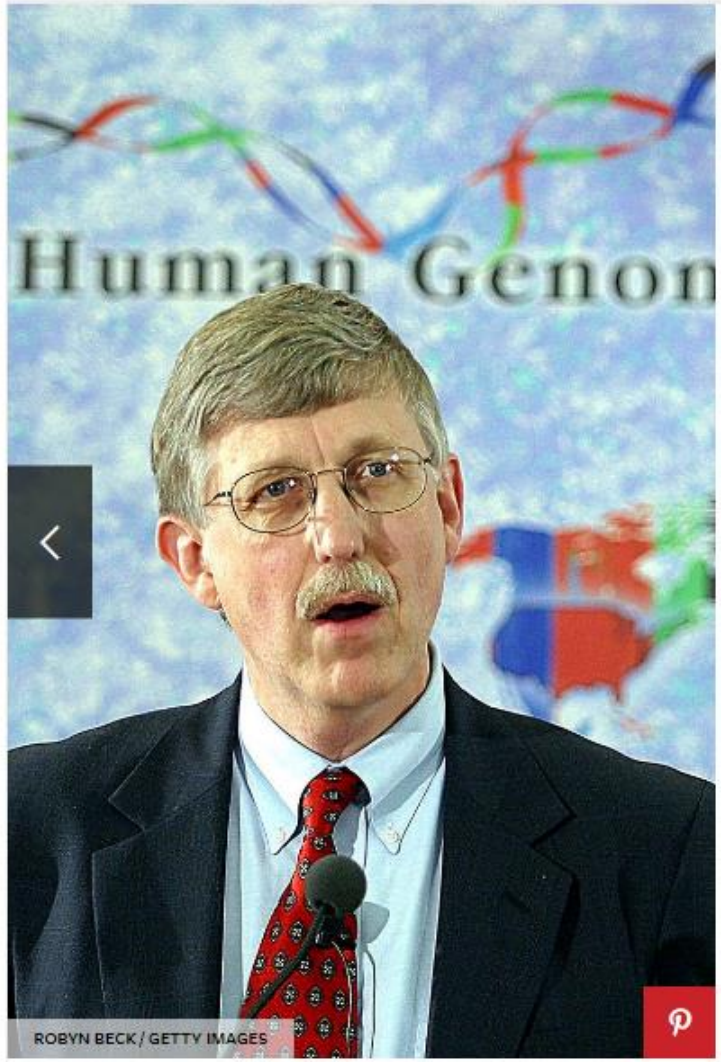
Recent Breakthroughs

2002: IEEE 802.16

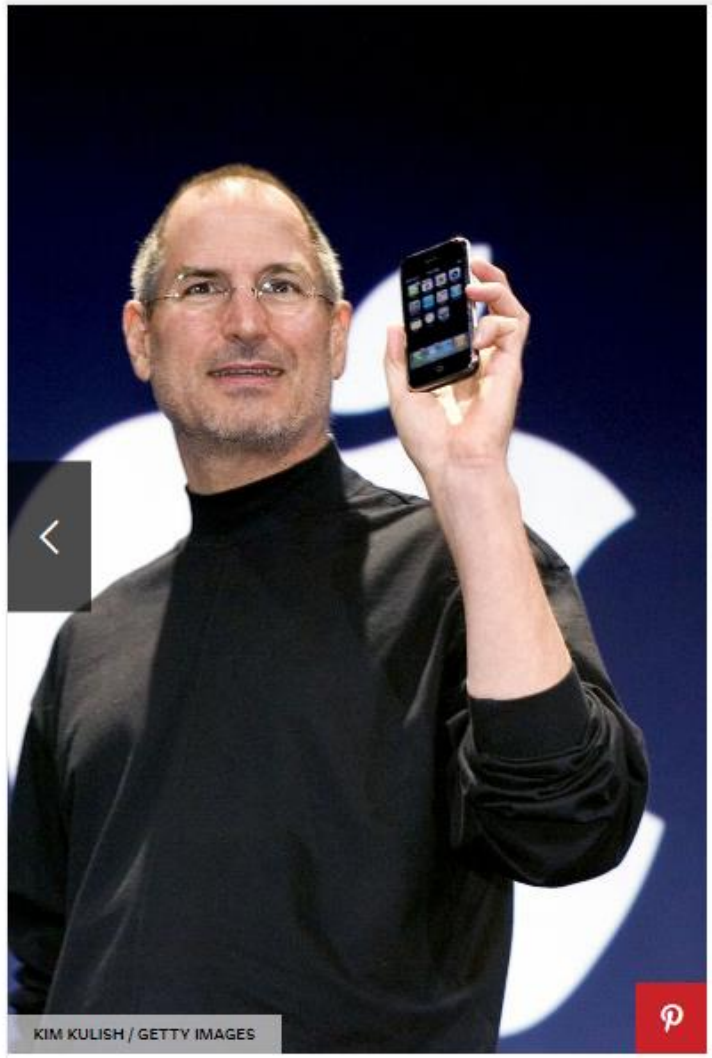
The geniuses at the Institute of Electrical and Electronics Engineers publish a wireless metropolitan area network standard that functions like Wi-Fi on steroids. An 802.16 antenna can transmit Internet access up to a 30-mile radius at speeds comparable to DSL and cable broadband. When it all shakes out, 802.16 could end up launching developing nations into the digital age by eliminating the need for wired telecommunications infrastructure.

Recent Breakthroughs

2003: The Human Genome Project
Officially completed on April 14, 2003, The Human Genome Project formed a foundation of understanding for creating further advances in future medicine and a better comprehension of where we come from. The fact that it's available to everyone online just makes it even more incredible.



Recent Breakthroughs



2007: iPhone

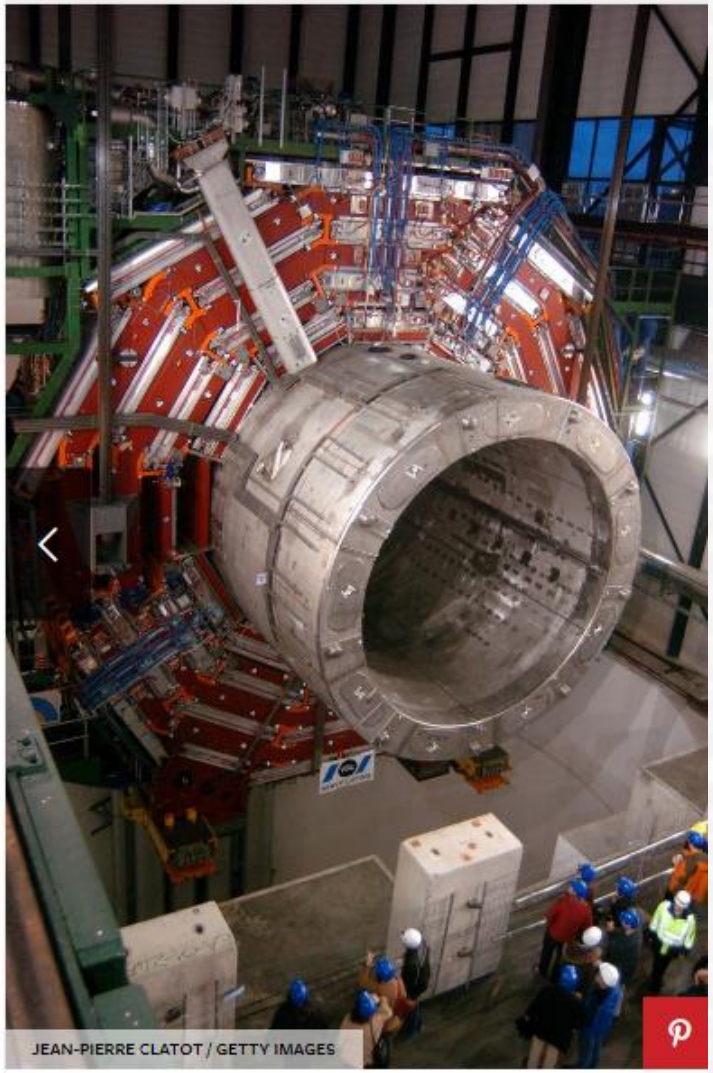
Steve Jobs introduces Apple's first smartphone with a prank-call order of 4,000 lattes from a nearby Starbucks. The iPhone is also the first U.S. smartphone without a physical keypad, and goes on to become the best-selling gadget ever, with more than 1.2 billion sold to date, and drives the development of app-based companies like Uber, Venmo, Tinder, Snapchat—and Postmates, which will indeed deliver Starbucks.

Honorable invention: Kindle

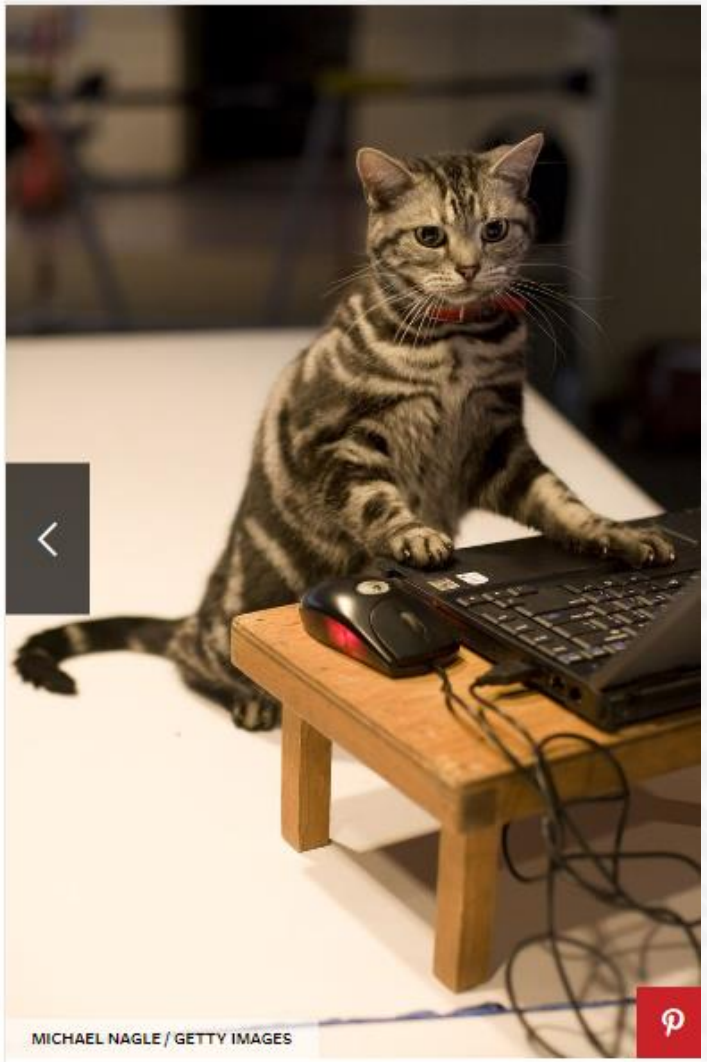
Recent Breakthroughs

2008: Large Hadron Collider

Ten years in the making at the European Organization for Energy Research (CERN), the LHC opens in 2008 as the world's largest and most powerful particle accelerator, capable of propelling energy beams at close to the speed of light. In 2012, tests at the LHC will reveal evidence of the Higgs boson, a subatomic particle believed to be instrumental in creating mass—and therefore one of the building blocks of the universe. Peter Higgs, the particle's namesake (and who disapproves of its being nicknamed "The God Particle"), wins the 2013 Nobel Prize in Physics for this advancement in scientific understanding of the properties of matter.



Recent Breakthroughs



2012: Google's Machine Learning Project

The *New York Times* reports that, as part of Google's deep learning research, a cluster of 16,000 computers has taught itself how to recognize a cat. These advances arguably push the tech industry into a more serious pursuit of artificial intelligence and machine learning projects—including self-driving car technology, facial recognition software (Face ID and automatic tagging on Facebook), and technology that will help voice assistants like Alexa get smarter over time.

Honorable invention: DJI Phantom Drone

Trending Breakthroughs

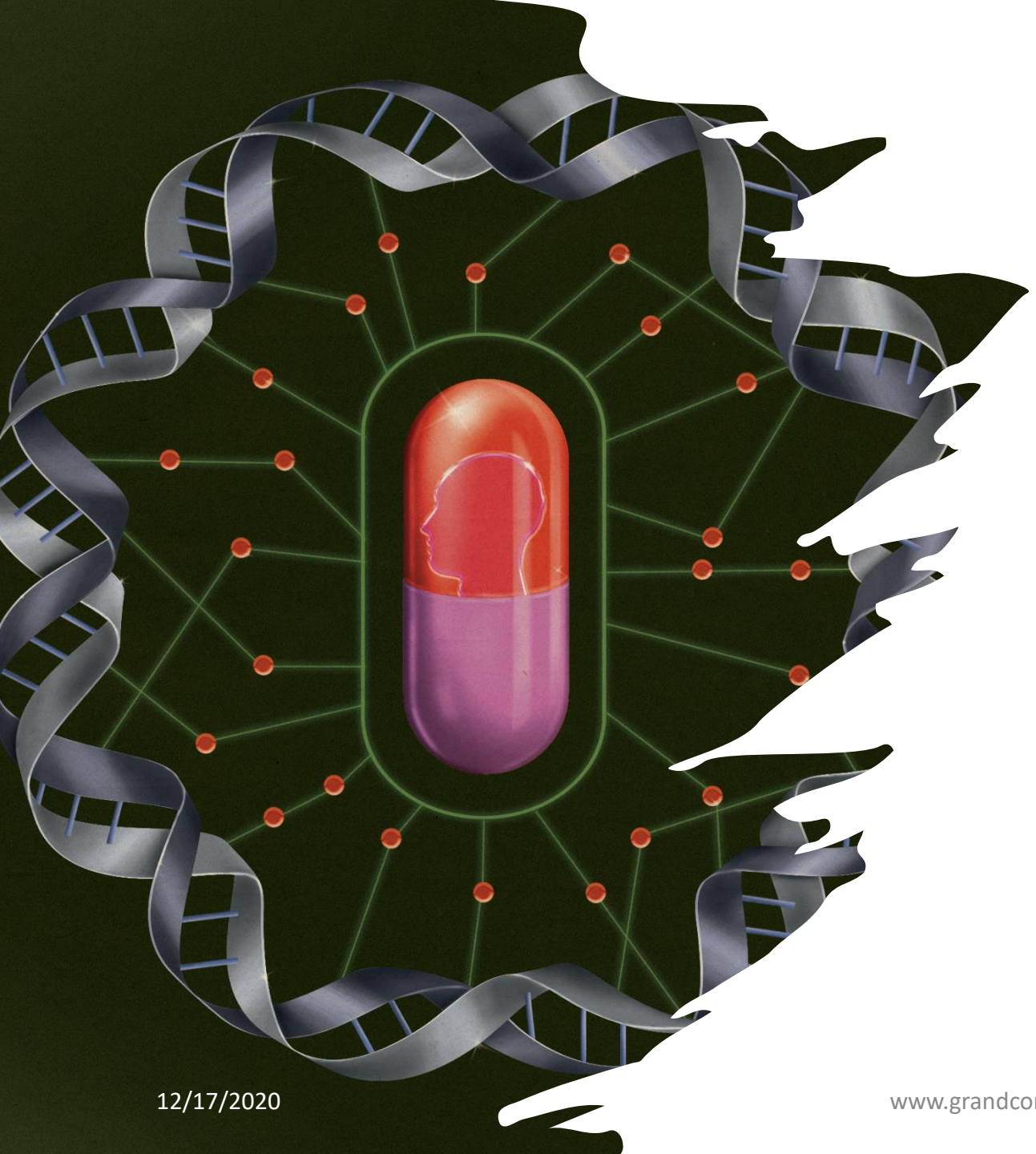
Unhackable internet

Why it matters

- **The internet is increasingly vulnerable to hacking; a quantum one would be unhackable.**

Availability

- **5 years**



Trending Breakthroughs

Hyper-personalized medicine

Why it matters

- **Genetic medicine tailored to a single patient means hope for people whose ailments were previously uncurable.**

Availability

- **Now**

Trending Breakthroughs

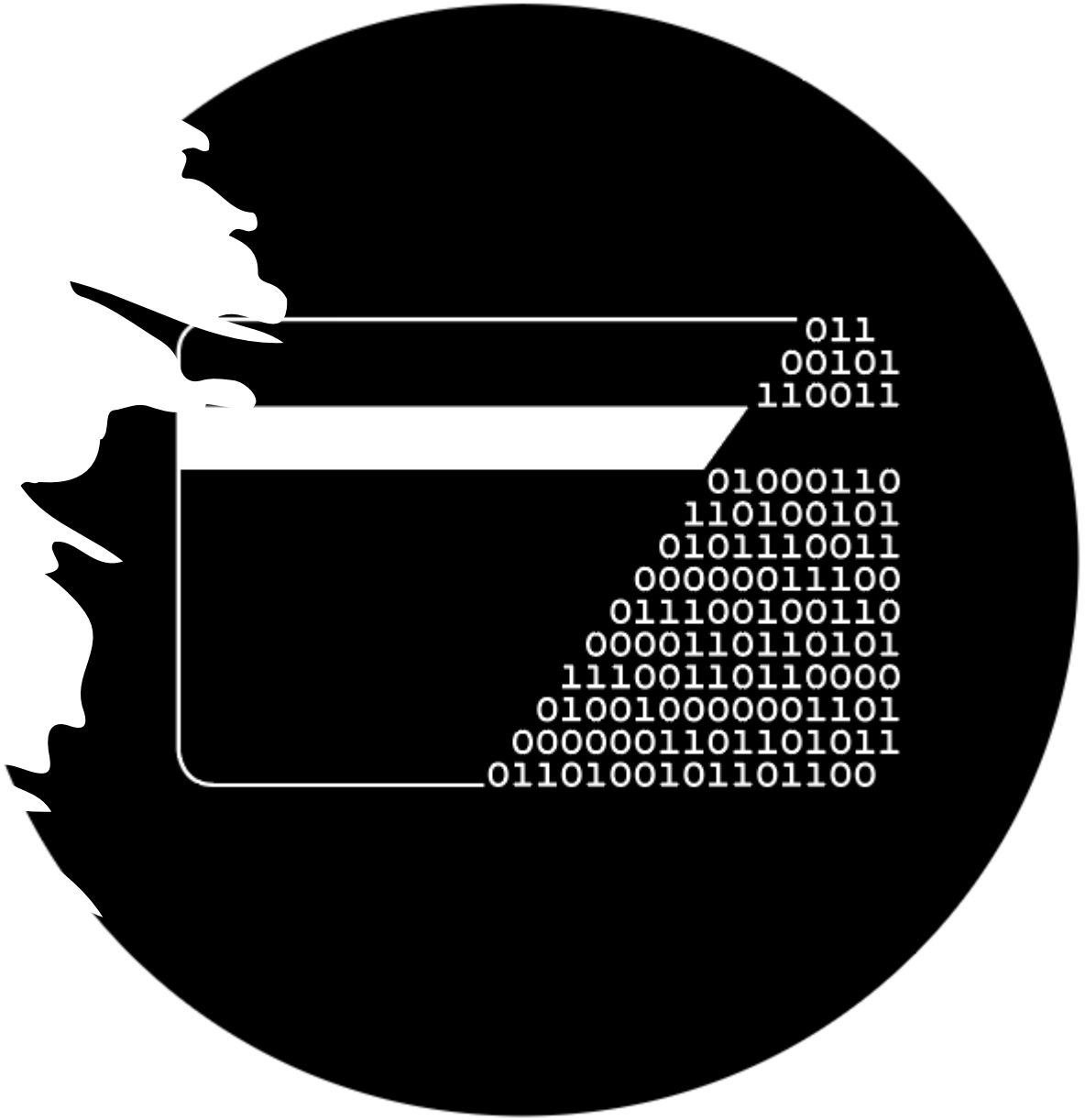
Digital money

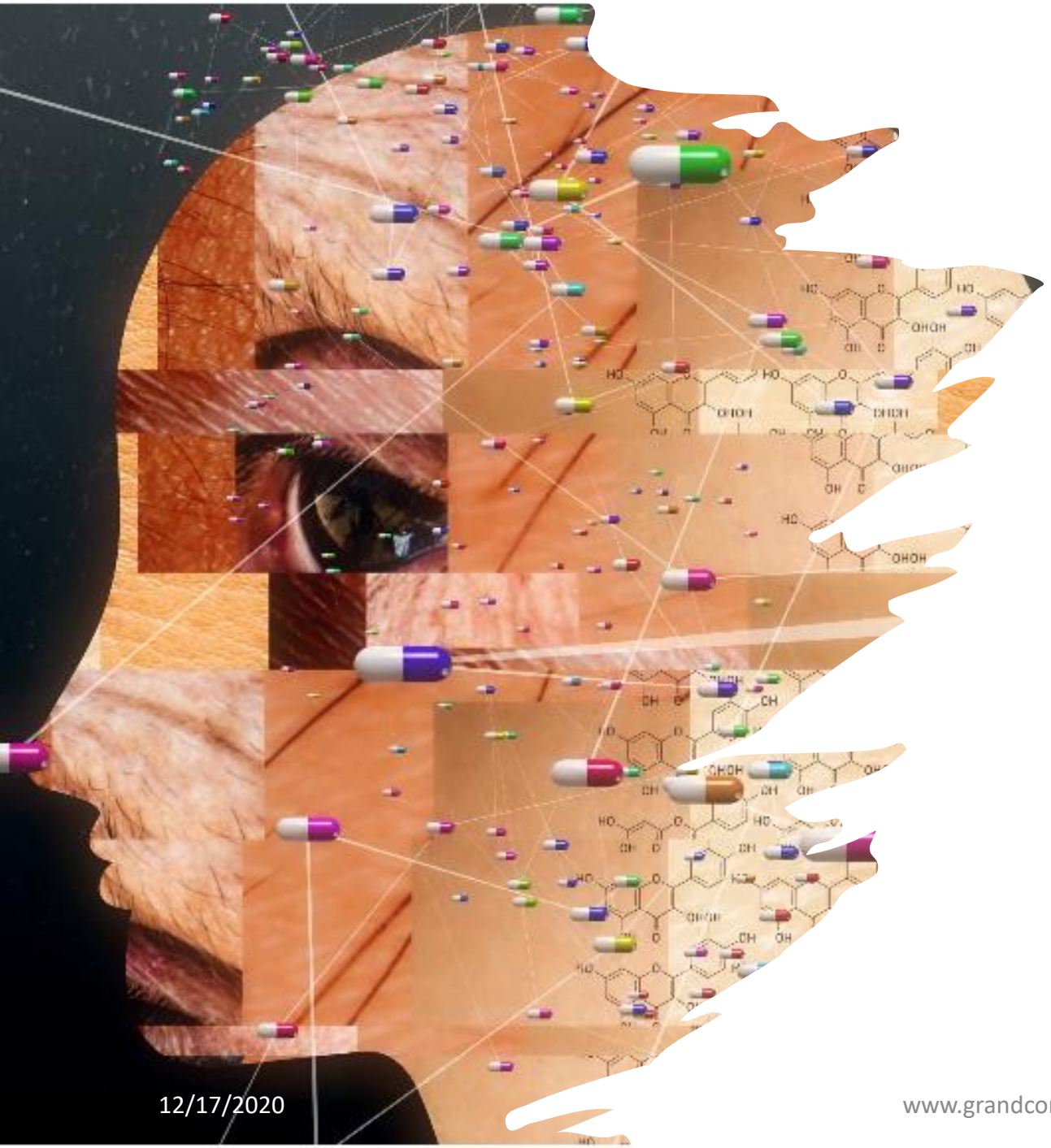
Why it matters

- **As the use of physical cash declines, so does the freedom to transact without an intermediary. Meanwhile, digital currency technology could be used to splinter the global financial system.**

Availability

- **This year**





Trending Breakthroughs

Anti-aging drugs

Why it matters

- **A number of different diseases, including cancer, heart disease, and dementia, could potentially be treated by slowing aging.**

Availability

- **Less than 5 years**

Trending Breakthroughs

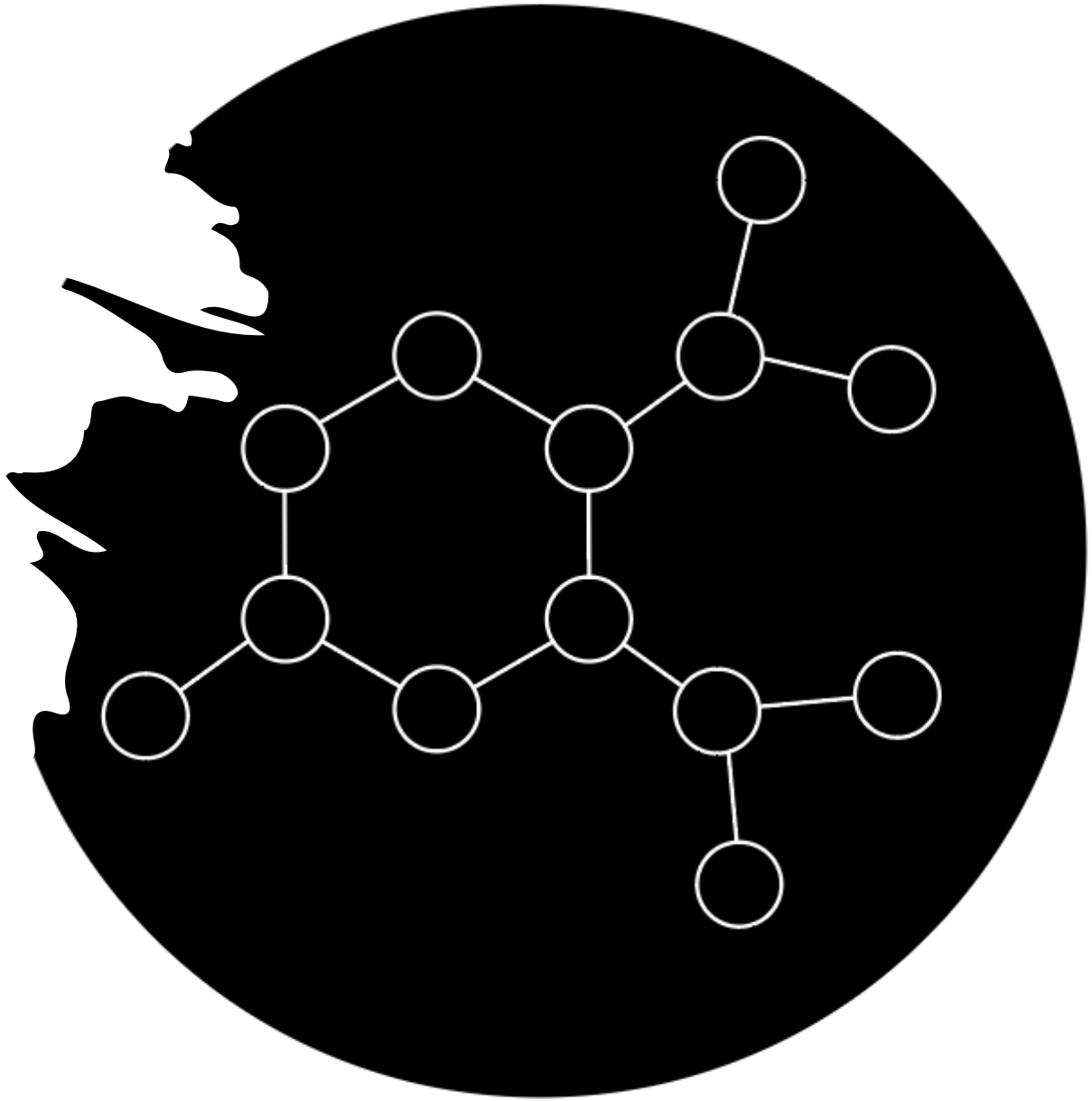
AI-discovered molecules

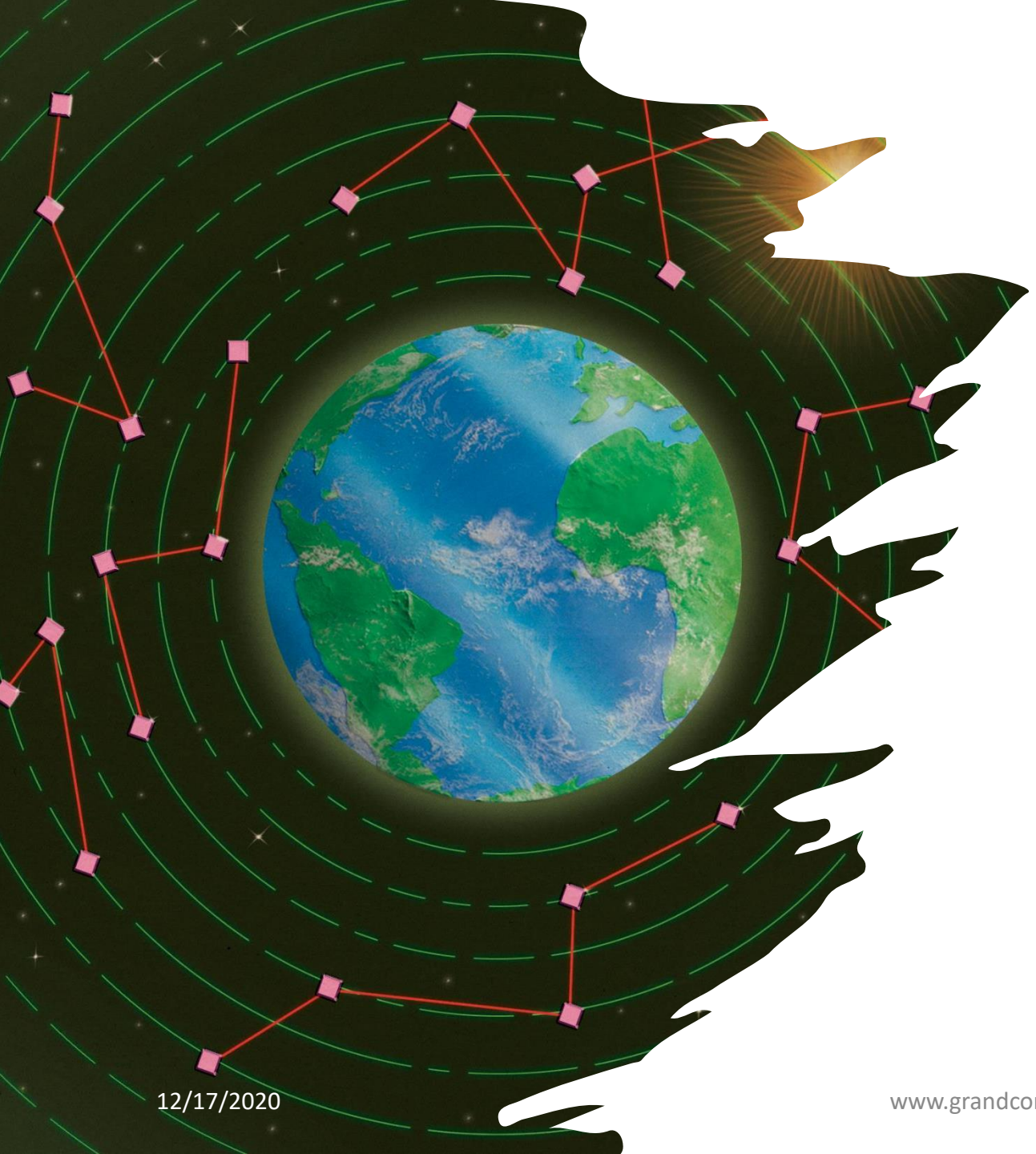
Why it matters

- **Commercializing a new drug costs around $2.5 billion on average. One reason is the difficulty of finding promising molecules.**

Availability

- **3-5 years**





Trending Breakthroughs

Satellite mega-constellations

Why it matters

- **These systems can blanket the globe with high-speed internet—or turn Earth's orbit into a junk-ridden minefield.**

Availability

- **Now**

Trending Breakthroughs

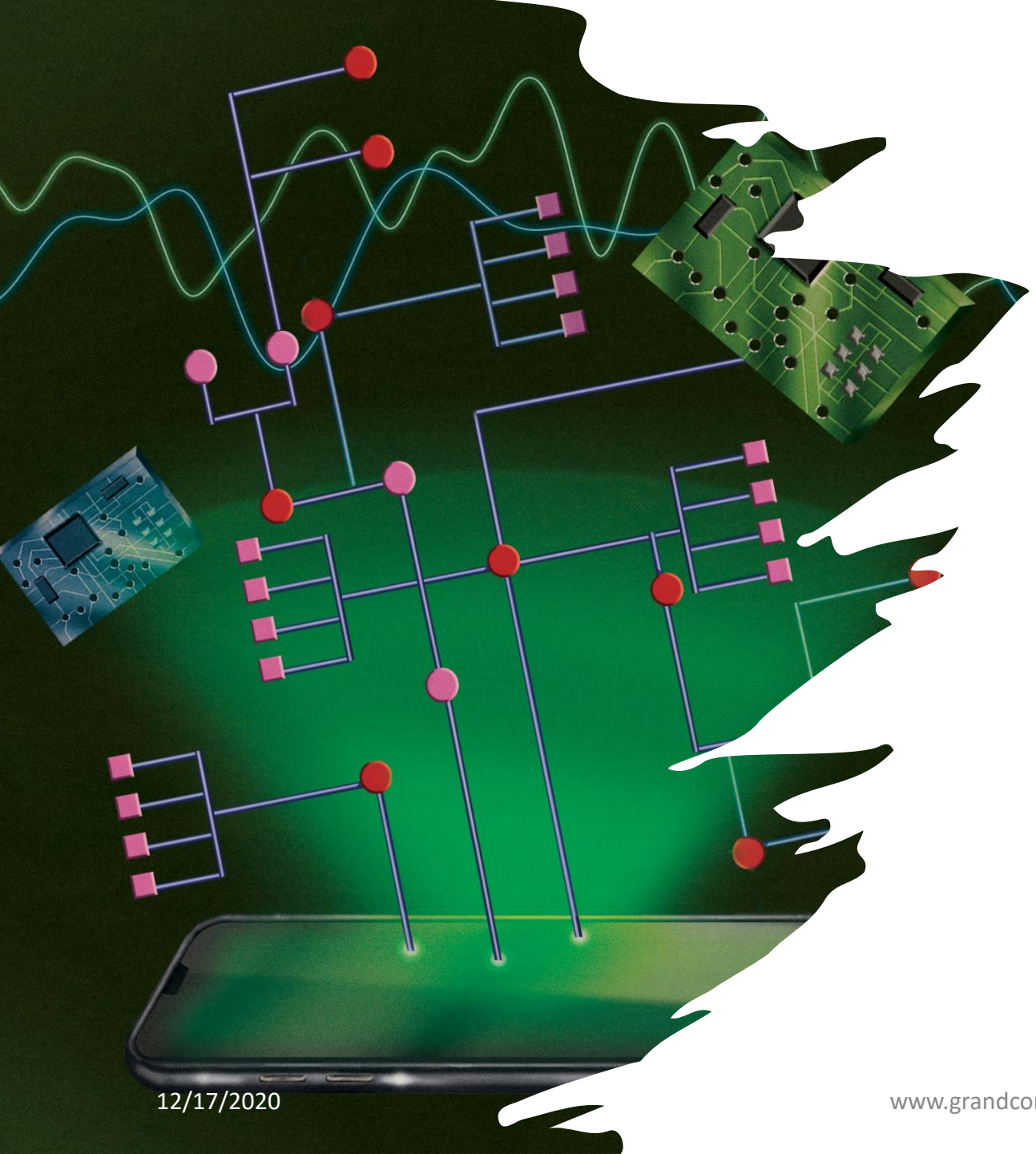
Quantum supremacy

Why it matters

- **Eventually, quantum computers will be able to solve problems no classical machine can manage.**

Availability

- **5-10+ years**



Trending Breakthroughs

Tiny AI

Why it matters

- **Our devices no longer need to talk to the cloud for us to benefit from the latest AI-driven features.**

Availability

- **Now**

Trending Breakthroughs

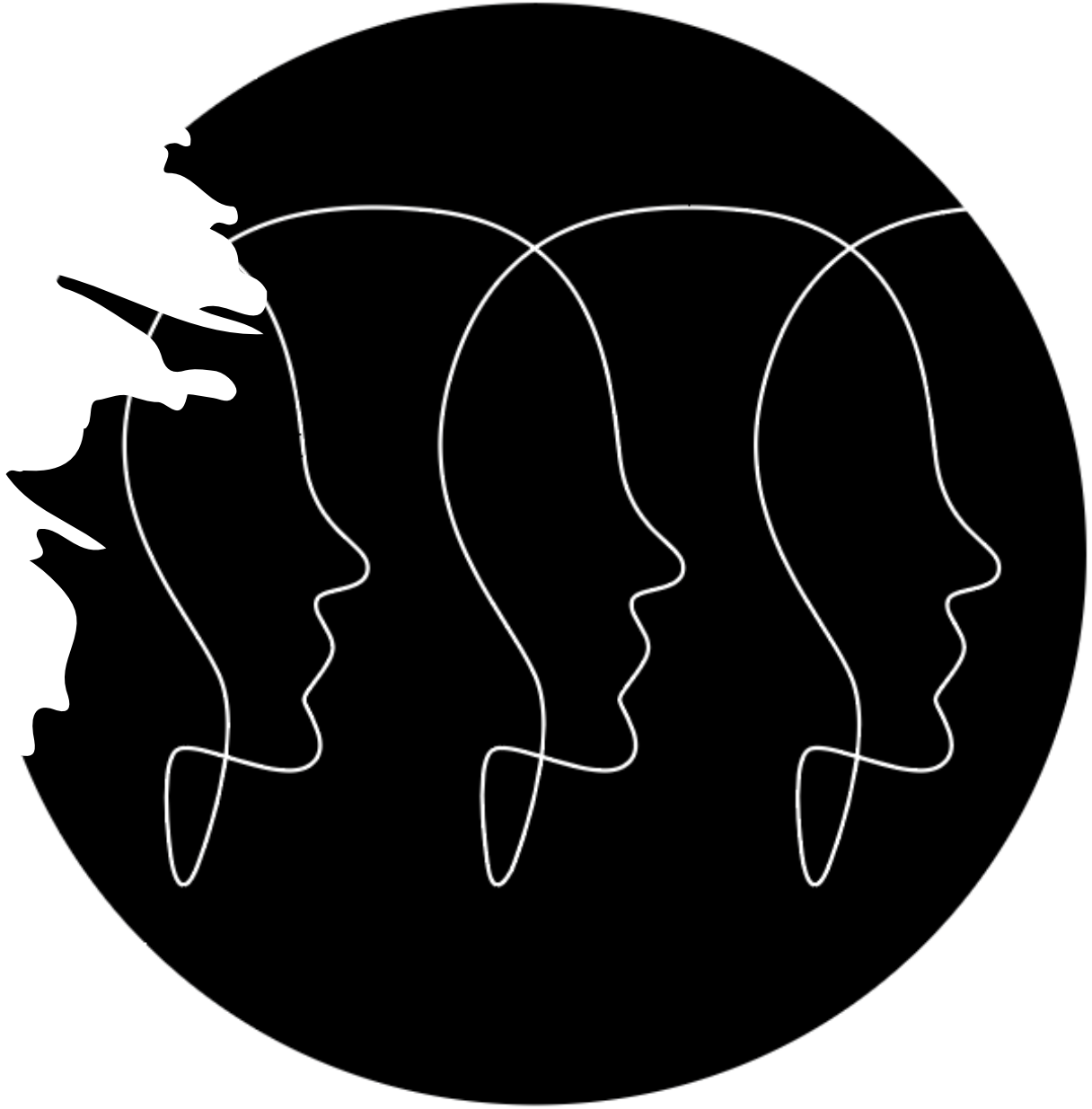
Differential privacy

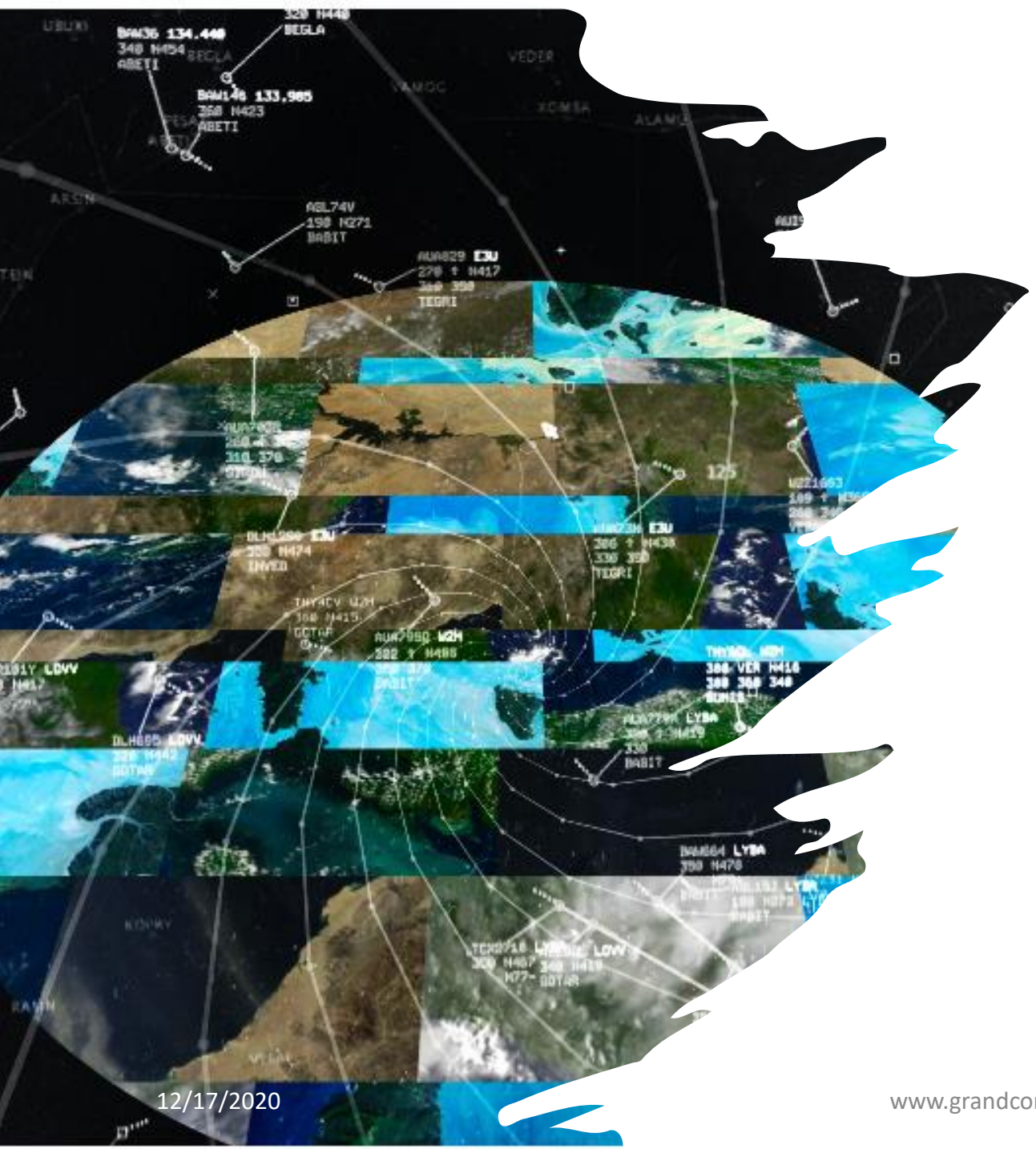
Why it matters

- **It is increasingly difficult for the US Census Bureau to keep the data it collects private. A technique called differential privacy could solve that problem, build trust, and also become a model for other countries.**

Availability

- **Its use in the 2020 US Census will be the biggest-scale application yet.**





Trending Breakthroughs

Climate change attribution

Why it matters

- **It's providing a clearer sense of how climate change is worsening the weather, and what we'll need to do to prepare.**

Availability

- **Now**

Trending Breakthroughs

- Synthetic media will undermine reality
- There will be a revolution in cloud robotics
- Diseases will be edited out of our DNA
- We will begin to see living machines
- Silicon Valley will try to go carbon negative
- Pests will be driven off without cruelty
- We will take mushrooms with us to space
- Paralyzed patients will walk again
- Natural language gadgets will get weird
- The human brain will be mapped

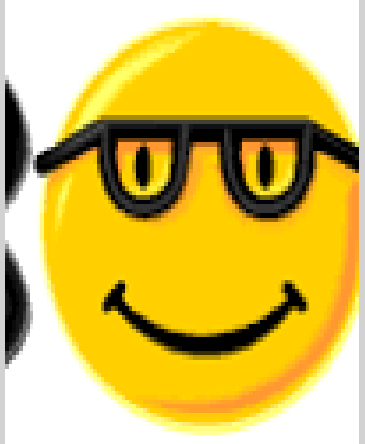
Trending Breakthroughs

- We will go to war with deep fakes
- Brain-machine interfaces will change how we work
- Machines will track your emotions
- Your AI psychiatrist will see you now
- We will set foot on the Moon (and maybe Mars)
- Privacy will really matter
- The internet will be everywhere
- Underground cities will rise
- We will continue to search for extra-terrestrial life
- Quantum computers will gain supremacy

Where is this technology?

- Flying cars
- Google glass
- Smart fridge
- Segway
- Optical discs
- 3D movies/programs
- Holograms

Obsolete/Failed Products



Other Useful Sites

The 50 Greatest Breakthroughs Since the Wheel
11 Innovations That Changed History
Technology timeline
Most Important Inventions of the 21st Century
How has Technology Developed from 1920 - 2020?
66 Best Inventions of the Past 66 Years
10 Breakthrough Technologies
20 new technology trends we will see in the 2020s

Questions???

Happy Trails!