
Contributions of
USA
to SCIENCE
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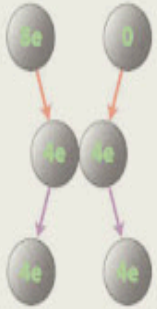
1740

1747

CHARGE CONSERVATION

Benjamin Franklin

Benjamin Franklin was the first to propound charge conservation. He defined it as the principle that electric charge can neither be created nor destroyed. He also came to the conclusion that there are two states of electricity, positive and negative, the charge is never created or destroyed but instead transferable from one place to another.



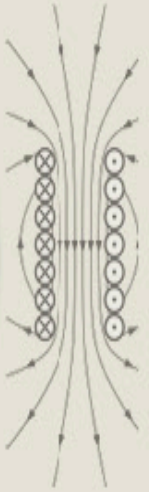
1750

1831

ELECTROMAGNETISM

Joseph Henry

In 1831, Henry discovered the principle of electromagnetic induction, which underlies the operation of generators and electric motors. He also invented the first electric motor and became the first secretary of the Smithsonian Institution in 1846, a role in which he fostered the communication of science to the public.



1760

1770

1780

1790

1831

DISCOVERY OF CHLOROFORM

Samuel Guthrie

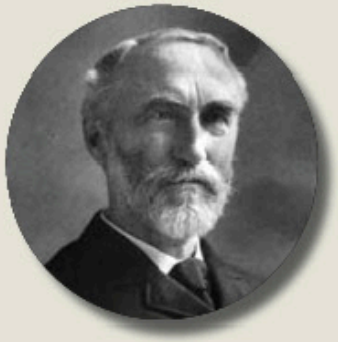
Samuel Guthrie an American physician discovered Chloroform in 1831. Chloroform is a chemical compound in the trihalomethane family that does not undergo combustion in air, although it will burn when mixed with more flammable substances.

1873

μ

Josiah Willard Gibbs

The chemical potential, symbolized by μ, is a thermodynamic concept developed by the American scientist Josiah Willard Gibbs in his 1873 paper. A Method of Geometrical Representation of the Thermodynamic Properties of Substances by Means of Surfaces. Gibbs's work had an enormous impact on the development of modern physical chemistry.



μ

1875

TELEPHONE

Alexander Graham Bell

Alexander Graham Bell thought he was on to something, hear the first verbal messages to travel by wire and through the air. A telephone converts sound, typically and most efficiently the human voice, into electronic signals suitable for transmission via cables or other transmission media over long distances, and replays such signals simultaneously in audible form to its user.

1800

1810

1820

1903

AIRPLANE

Wright brothers

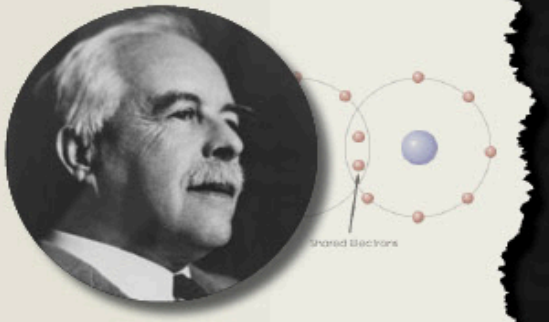
The Wright brothers piloted the first powered airplane 20 feet above a wind-swept beach in North Carolina. The flight lasted 12 seconds and covered 120 feet. Three more flights were made that day with the brothers piloting the record flight lasting 59 seconds over a distance of 852 feet.

1916

COVALENT BONDING

Gilbert N. Lewis

The idea of covalent bonding can be traced several years to Gilbert N. Lewis, who in 1916 described the sharing of electron pairs between atoms. He introduced the so-called Lewis notation or electron dot notation or 'The Lewis Dot Structure' in which valence electrons are represented as dots around the atomic symbols.



1929

EXTRAGALACTIC ASTRONOMY

Edwin Hubble

Edwin Hubble discovered the existence of Cepheid variables in the Andromeda Galaxy. This discovery proved the existence of a galaxy over one million light-years away and thus extragalactic astronomy was created. In 1929, Hubble announced that the universe is expanding, based on observations of starlight from distant galaxies. The finding formed the basis of inflationary big-bang theory.

1830

1840

1850

1931

COSMIC RADIO WAVES

Karl Guthe Jansky

Radio astronomy is a subfield of astronomy that studies celestial objects at radio frequencies. While trying to track down a source of electrical interference on telephone transmissions, Karl Guthe Jansky of Bell Telephone Laboratories discovered radio waves emanating from stars in outer space while investigating static that interfered with short wave transatlantic voice transmissions. Thus, the field of radio astronomy was born.

1947

TRANSISTOR

John Bardeen, Walter Brattain and William Shockley

William Shockley, the father of transistor, saw the potential in an experiment, two gold point contacts were applied to a crystal of germanium, a signal was produced whereby the output power was larger than the input and worked over the next few months greatly expanding the knowledge of semiconductors in order to construct the first point-contact transistor.

1947

SUPERSONIC AIRCRAFT

Chuck Yeager

In aerodynamics, the sound barrier usually refers to the point at which an aircraft moves from transonic to supersonic speed. On October 14, 1947, just under a month after the United States Air Force had been created as a separate service, tests culminated in the first manned supersonic flight where the sound barrier was broken, piloted by Air Force Captain Chuck Yeager in the Bell X-1.

1860

1870

1880

1890

1948

VIDEO GAME

William Higinbotham

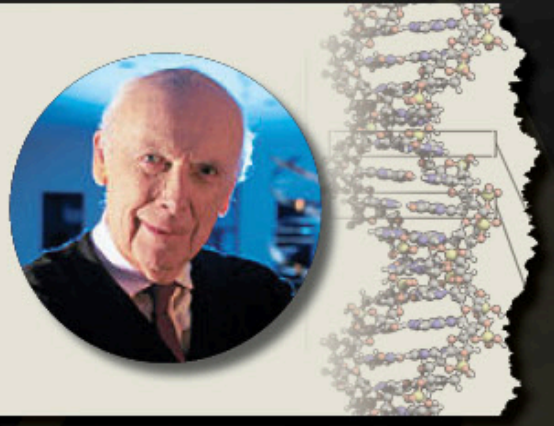
In 1948, ten years before William Higinbotham's Tennis for Two was developed, Thomas T. Goldsmith Jr. and Estle R. Mann co-patented the "Cathode-Ray Tube Amusement Device," making it the earliest documented video game.

1953

DNA STRUCTURE

James Watson

In 1953, based on X-ray diffraction images and the information that the bases were paired,James D. Watson along with Francis Crick co-discovered what is now widely accepted as the first accurate double-helix model of DNA structure.

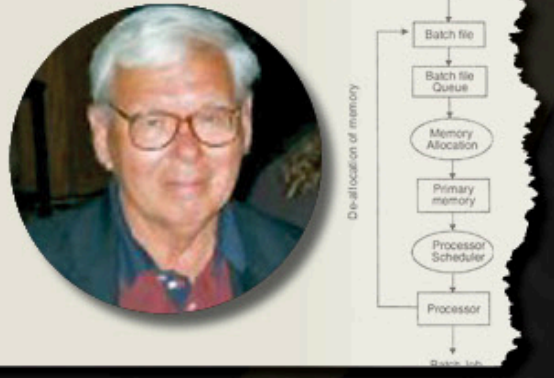


1956

OPERATING SYSTEM (batch processing)

Owen Mock and Bob Patrick

The GM-NAA I/O, created by Owen Mock and Bob Patrick of General Motors Research Laboratories in early 1956 (or late 1955) for their IBM 701 mainframe computer is generally considered to be the first "batch processing" operating system and possibly the first "real" operating system. This is the first of its kind that would manually load each program as what previous systems were only capable of doing.



1965

MINICOMPUTER

Wesley A. Clark and Charles Molnar

A minicomputer is a class of multi-user computers that lies in the middle range of the computing spectrum, in between the largest multi-user systems and the smallest single-user systems. Wesley A. Clark and Charles Molnar co-invented the PDP-8 in 1965, the world's first minicomputer, using integrated circuit technology. Because of its relatively small size and its $18,000 price tag, it only sold several hundred units.

1900

1969

MOON LANDING

Neil Armstrong

On July 20, 1969, the U.S. celebrated one of its greatest technological feats by landing astronauts on the moon. As Neil Armstrong famously said while planting the first human foot on another world, "That's one small step for man; one giant leap for mankind."

1910

1972

C (PROGRAMMING LANGUAGE)

Dennis Ritchie

C is a general-purpose computer programming language originally invented in 1972 by Dennis Ritchie at the Bell Telephone Laboratories in order to implement the Unix operating system. Although C was designed for writing architecturally independent system software, it is also widely used for developing application software.

1920

1930

1940

1950

1973

MOBILE PHONE

Martin Cooper

In 1973, Martin Cooper invented the first handheld cellular/mobile phone. His first mobile phone call was made to Joel S. Engel in April 1973. The basic network and supporting infrastructure of hexagonal cells used to support a mobile telephony system while remaining on the same channel were devised by Douglas H. Ring and W. Rae Young at AT&T Bell Labs in 1947.

1981

SPACE SHUTTLE

George Mueller

In 1981, NASA successfully launched its reusable spacecraft called the Space Shuttle. George Mueller, an American from St. Louis, Missouri is widely credited for jump starting, designing, and overseeing the Space Shuttle program after the demise of the Apollo program in 1972. The Space Shuttle, part of the Space Transportation System (STS), is a spacecraft operated by NASA for orbital human spaceflight missions.

1984

3D PRINTING

Chuck Hull

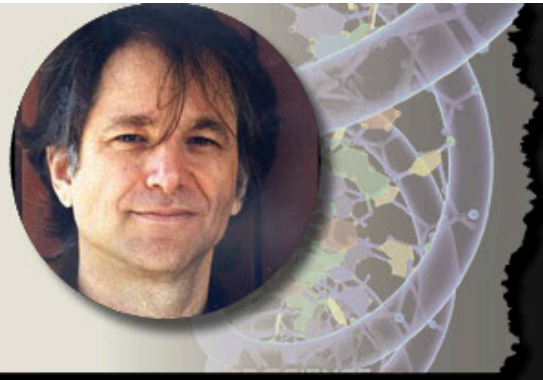
Chuck Hull is the co-founder, executive vice president and chief technology officer of 3D Systems. He is the inventor of the solid imaging process known as stereo lithography (3D Printing), the first commercial rapid prototyping technology, and the STL file format. He made on more than 60 U.S. patents as well as other patents around the world in the fields of ion optics and rapid prototyping.

1960

DNA COMPUTING

Leonard Adleman

DNA computing is fundamentally similar to parallel computing in that it takes advantage of the many different molecules of DNA to try many different possibilities at once. This field was initially invented by Leonard Adleman of the University of Southern California in 1994. Adleman demonstrated a proof-of-concept use of DNA as a form of computation which solved the seven-point Hamiltonian path problem.



1970

2003

MARS EXPLORATION ROVER LAUNCH

NASA's Mars Exploration Rover Mission (MER) is an ongoing robotic space mission involving two rovers, Spirit and Opportunity, exploring the planet Mars. It began in 2003 with the sending of the two rovers - MER-A Spirit and MER-B Opportunity-to explore the Martian surface and geology. The probes were launched June and July 2003 and landed January 2004 in widely separated equatorial locations on Mars.

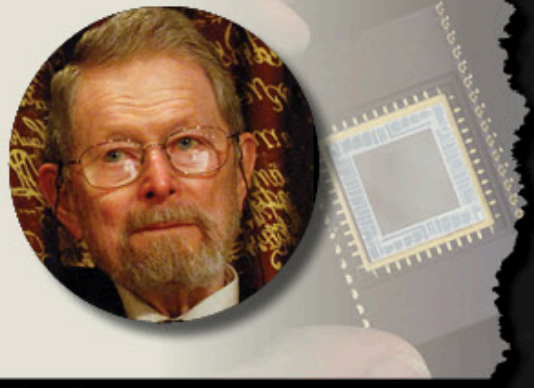
1980

2009

CHARGED COUPLE DEVICE

George Elwood Smith

A charge-coupled device (CCD) is a device for the movement of electrical charge, usually from within the device to an area where the charge can be manipulated, for example conversion into a digital value. This is achieved by "shifting" the signals between stages within the device one at a time. George Elwood Smith an American scientist, won a Nobel Prize in 2009 for coinventing of the charge - coupled device.



1990

2000

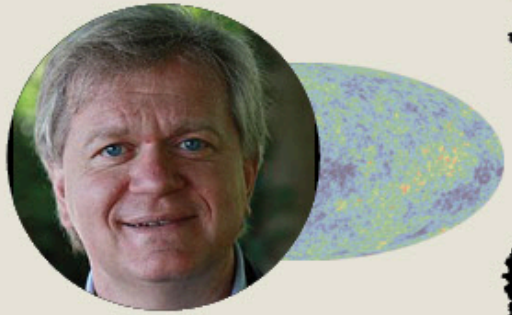
2010

2011

EXPANSION OF THE UNIVERSE

Brain Schmidt

Brain Schmidt along with Saul Perlmutter and Adam Riess won a Nobel Prize in Physics for providing evidence that the expansion of the universe is accelerating. It was this team along with the competing High-z Supernova Search Team led by Riess and Schmidt, which found evidence of the accelerating expansion of the universe based on observing Type Ia supernova in the distant universe.



2013

VOYAGERT 1 GOES INTERSTELLAR

NASA's Voyager 1 spacecraft, which launched in 1977, officially entered interstellar space and was more than 19 billion kilometers from our sun, nearly 130 times farther away than our planet. Telltale measurements from the probe revealed that it had slipped out from the area where the sun's electromagnetic influence reigns and tasted the space between stars.

2014

GRAVITATIONAL WAVES FROM BIG BANG DETECTED

Marc Kamionkowski

Physicists have found a long-predicted twist in light from the big bang that represents the first image of ripples in the universe called gravitational waves. Marc Kamionkowski, professor of physics and astronomy at Johns Hopkins University, who was not, involved in the discovery but who predicted back in 1997 how these gravitational waves imprint could be found.