**Gregor Johann Mendel** (20 July 1822 – 6 January 1884) was a meteorologist, mathematician, biologist, [Augustinian](https://en.wikipedia.org/wiki/Augustinians) [friar](https://en.wikipedia.org/wiki/Friar) and [abbot](https://en.wikipedia.org/wiki/Abbot) of [St. Thomas' Abbey](https://en.wikipedia.org/wiki/St_Thomas%27s_Abbey,_Brno) in [Brno](https://en.wikipedia.org/wiki/Brno), [Margraviate of Moravia](https://en.wikipedia.org/wiki/Margraviate_of_Moravia). Mendel was born in a German-speaking family in the [Silesian](https://en.wikipedia.org/wiki/Austrian_Silesia) part of the [Austrian Empire](https://en.wikipedia.org/wiki/Austrian_Empire) (today's [Czech Republic](https://en.wikipedia.org/wiki/Czech_Republic)) and gained posthumous recognition as the founder of the modern science of [genetics](https://en.wikipedia.org/wiki/Genetics). Though farmers had known for millennia that crossbreeding of animals and plants could favour certain desirable [traits](https://en.wikipedia.org/wiki/Trait_(biological)), Mendel's [pea](https://en.wikipedia.org/wiki/Pea) plant experiments conducted between 1856 and 1863 established many of the rules of [heredity](https://en.wikipedia.org/wiki/Biological_inheritance), now referred to as the laws of [Mendelian inheritance](https://en.wikipedia.org/wiki/Mendelian_inheritance).

Mendel worked with seven characteristics of pea plants: plant height, pod shape and colour, seed shape and colour, and flower position and colour. Taking seed colour as an example, Mendel showed that when a true-breeding yellow pea and a true-breeding green pea were cross-bred their offspring always produced yellow seeds. However, in the next generation, the green peas reappeared at a ratio of 1 green to 3 yellow. To explain this phenomenon, Mendel coined the terms "[recessive](https://en.wikipedia.org/wiki/Dominance_(genetics))" and "[dominant](https://en.wikipedia.org/wiki/Dominance_(genetics))" in reference to certain traits. In the preceding example, the green trait, which seems to have vanished in the first filial generation, is recessive and the yellow is dominant. He published his work in 1866, demonstrating the actions of invisible "factors"—now called [genes](https://en.wikipedia.org/wiki/Gene)—in predictably determining the traits of an organism.

The profound significance of Mendel's work was not recognized until the turn of the 20th century (more than three decades later) with the rediscovery of his laws. [Erich von Tschermak](https://en.wikipedia.org/wiki/Erich_von_Tschermak), [Hugo de Vries](https://en.wikipedia.org/wiki/Hugo_de_Vries) and [Carl Correns](https://en.wikipedia.org/wiki/Carl_Correns) independently verified several of Mendel's experimental findings in 1900, ushering in the modern age of genetics.

**Thomas Alva Edison** (February 11, 1847 – October 18, 1931) was an American inventor and businessman. He developed many devices in fields such as [electric power generation](https://en.wikipedia.org/wiki/Electricity_generation), [mass communication](https://en.wikipedia.org/wiki/Mass_communication), [sound recording](https://en.wikipedia.org/wiki/Sound_recording), and [motion pictures](https://en.wikipedia.org/wiki/Film). These inventions, which include the [phonograph](https://en.wikipedia.org/wiki/Phonograph), the [motion picture camera](https://en.wikipedia.org/wiki/Movie_camera), and early versions of the electric [light bulb](https://en.wikipedia.org/wiki/Incandescent_light_bulb), have had a widespread impact on the modern [industrialized world](https://en.wikipedia.org/wiki/Industrial_society). He was one of the first inventors to apply the principles of organized science and teamwork to the process of invention, working with many researchers and employees. He established the first industrial [research laboratory](https://en.wikipedia.org/wiki/Research_laboratory).

Edison was raised in the American [Midwest](https://en.wikipedia.org/wiki/Midwest); early in his career, he worked as a [telegraph operator](https://en.wikipedia.org/wiki/Telegraph_operator), which inspired some of his earliest inventions. In 1876, he established his first laboratory facility in [Menlo Park, New Jersey](https://en.wikipedia.org/wiki/Menlo_Park,_New_Jersey), where many of his early inventions were developed. He later established a [botanical](https://en.wikipedia.org/wiki/Botany) laboratory in [Fort Myers, Florida](https://en.wikipedia.org/wiki/Fort_Myers,_Florida), in collaboration with businessmen [Henry Ford](https://en.wikipedia.org/wiki/Henry_Ford) and [Harvey S. Firestone](https://en.wikipedia.org/wiki/Harvey_S._Firestone), and a laboratory in [West Orange, New Jersey](https://en.wikipedia.org/wiki/West_Orange,_New_Jersey), that featured the world's first [film studio](https://en.wikipedia.org/wiki/Film_studio), the [Black Maria](https://en.wikipedia.org/wiki/Edison%27s_Black_Maria). He was a [prolific inventor](https://en.wikipedia.org/wiki/List_of_prolific_inventors), holding 1,093 [US patents in his name](https://en.wikipedia.org/wiki/List_of_Edison_patents) as well as patents in other countries. Edison married twice and fathered six children. He died in 1931 of complications of [diabetes](https://en.wikipedia.org/wiki/Diabetes).

**Robert Hooke** (18 July 1635 – 3 March 1703) was an English [polymath](https://en.wikipedia.org/wiki/Polymath) active as a [scientist](https://en.wikipedia.org/wiki/Natural_philosopher) and architect, who, using a microscope, was the first to visualize a micro-organism. An impoverished scientific inquirer in young adulthood, he found wealth and esteem by performing over half of the architectural surveys after London's [great fire of 1666](https://en.wikipedia.org/wiki/Great_Fire_of_London). Hooke was also a member of the [Royal Society](https://en.wikipedia.org/wiki/Royal_Society) and since 1662 was its curator of experiments. Hooke was also [Professor of Geometry at Gresham College](https://en.wikipedia.org/wiki/Gresham_Professor_of_Geometry).

As an assistant to physical scientist [Robert Boyle](https://en.wikipedia.org/wiki/Robert_Boyle), Hooke built the vacuum pumps used in Boyle's experiments on [gas law](https://en.wikipedia.org/wiki/Gas_law), and himself conducted experiments. In 1673, Hooke built the earliest [Gregorian telescope](https://en.wikipedia.org/wiki/Gregorian_telescope), and then he observed the rotations of the planets [Mars](https://en.wikipedia.org/wiki/Mars) and [Jupiter](https://en.wikipedia.org/wiki/Jupiter). Hooke's 1665 book [*Micrographia*](https://en.wikipedia.org/wiki/Micrographia) spurred microscopic investigations. Investigating in [optics](https://en.wikipedia.org/wiki/Optics), specifically light [refraction](https://en.wikipedia.org/wiki/Refraction), he inferred a [wave theory of light](https://en.wikipedia.org/wiki/Wave_theory_of_light). And his is the first recorded hypothesis of heat expanding matter, air's composition by small particles at larger distances, and heat as energy.

In physics, he approximated experimental confirmation that [gravity](https://en.wikipedia.org/wiki/Gravity) heeds an [inverse square law](https://en.wikipedia.org/wiki/Inverse_square_law), and first hypothesised such a relation in planetary motion, too, a principle furthered and formalised by [Isaac Newton](https://en.wikipedia.org/wiki/Isaac_Newton) in [Newton's law of universal gravitation](https://en.wikipedia.org/wiki/Newton%27s_law_of_universal_gravitation). Priority over this insight contributed to the rivalry between Hooke and Newton, who thus antagonized Hooke's legacy. In [geology](https://en.wikipedia.org/wiki/Geology) and [paleontology](https://en.wikipedia.org/wiki/Paleontology" \o "Paleontology), Hooke originated the theory of a terraqueous globe, disputed the literally Biblical view of the Earth's age, hypothesised the extinction of species, and argued that fossils atop hills and mountains had become elevated by geological processes. Thus observing microscopic fossils, Hooke presaged the theory of biological [evolution](https://en.wikipedia.org/wiki/Evolution). Hooke's pioneering work in land surveying and in [mapmaking](https://en.wikipedia.org/wiki/Cartography) aided development of the first modern plan-form map, although his grid-system plan for London was rejected in favour of rebuilding along existing routes. Even so, Hooke was key in devising for London a set of planning controls that remain influential. In recent times, he has been called "England's [Leonardo](https://en.wikipedia.org/wiki/Leonardo_da_Vinci)".

**Rosalind Elsie Franklin** (25 July 1920 – 16 April 1958) was an English [chemist](https://en.wikipedia.org/wiki/Chemist) and [X-ray crystallographer](https://en.wikipedia.org/wiki/X-ray_crystallographer) whose work was central to the understanding of the molecular structures of [DNA](https://en.wikipedia.org/wiki/DNA) (deoxyribonucleic acid), [RNA](https://en.wikipedia.org/wiki/RNA) (ribonucleic acid), [viruses](https://en.wikipedia.org/wiki/Viruses), [coal](https://en.wikipedia.org/wiki/Coal), and [graphite](https://en.wikipedia.org/wiki/Graphite). Although her works on coal and viruses were appreciated in her lifetime, her contributions to the discovery of the structure of DNA were largely unrecognized during her life, for which she has been variously referred to as the "wronged heroine",the "dark lady of DNA" the "forgotten heroine", a "feminist icon", and the "[Sylvia Plath](https://en.wikipedia.org/wiki/Sylvia_Plath) of molecular biology".

She graduated in 1941 with a degree in [natural sciences](https://en.wikipedia.org/wiki/Natural_Sciences_(Cambridge)) from [Newnham College, Cambridge](https://en.wikipedia.org/wiki/Newnham_College,_Cambridge), and then enrolled for a PhD in [physical chemistry](https://en.wikipedia.org/wiki/Physical_chemistry) under [Ronald George Wreyford Norrish](https://en.wikipedia.org/wiki/Ronald_George_Wreyford_Norrish), the [1920 Chair of Physical Chemistry](https://en.wikipedia.org/wiki/1920_Chair_of_Physical_Chemistry) at the [University of Cambridge](https://en.wikipedia.org/wiki/University_of_Cambridge). Disappointed by Norrish’s lack of enthusiasm, she took up a research position under the [British Coal Utilisation Research Association](https://en.wikipedia.org/wiki/British_Coal_Utilisation_Research_Association) (BCURA) in 1942. The research on coal helped her earn a PhD from Cambridge in 1945. Moving to Paris in 1947 as a *chercheur* (postdoctoral researcher) under [Jacques Mering](https://en.wikipedia.org/wiki/Jacques_Mering) at the Laboratoire Central des Services Chimiques de l'État, she became an accomplished X-ray crystallographer. After joining [King's College London](https://en.wikipedia.org/wiki/King%27s_College_London) in 1951 as a research associate, she discovered the key properties of DNA, which eventually facilitated the correct description of the [double helix](https://en.wikipedia.org/wiki/Double_helix) structure of DNA. Owing to disagreement with her director, [John Randall](https://en.wikipedia.org/wiki/John_Randall_(physicist)), and her colleague [Maurice Wilkins](https://en.wikipedia.org/wiki/Maurice_Wilkins), she was compelled to move to [Birkbeck College](https://en.wikipedia.org/wiki/Birkbeck_College) in 1953.

Franklin is best known for her work on the X-ray diffraction images of DNA while at King's College London, particularly [Photo 51](https://en.wikipedia.org/wiki/Photo_51), taken by her student [Raymond Gosling](https://en.wikipedia.org/wiki/Raymond_Gosling), which led to the discovery of the DNA [double helix](https://en.wikipedia.org/wiki/Double_helix) for which [Francis Crick](https://en.wikipedia.org/wiki/Francis_Crick), [James Watson](https://en.wikipedia.org/wiki/James_Watson), and [Maurice Wilkins](https://en.wikipedia.org/wiki/Maurice_Wilkins) shared the [Nobel Prize in Physiology or Medicine](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physiology_or_Medicine) in 1962. Watson suggested that Franklin would have ideally been awarded a [Nobel Prize in Chemistry](https://en.wikipedia.org/wiki/Nobel_Prize_in_Chemistry), along with Wilkins but, although there was not yet a rule against posthumous awards, the Nobel Committee generally did not make posthumous nominations.

Working under [John Desmond Bernal](https://en.wikipedia.org/wiki/John_Desmond_Bernal), Franklin led pioneering work at Birkbeck on the molecular structures of viruses. On the day before she was to unveil the structure of [tobacco mosaic virus](https://en.wikipedia.org/wiki/Tobacco_mosaic_virus) at an international fair in Brussels, she died of [ovarian cancer](https://en.wikipedia.org/wiki/Ovarian_cancer) at the age of 37 in 1958. Her team member [Aaron Klug](https://en.wikipedia.org/wiki/Aaron_Klug) continued her research, winning the Nobel Prize in Chemistry in 1982.

**Carl Linnaeus** (23 May[[note 1]](https://en.wikipedia.org/wiki/Carl_Linnaeus#cite_note-birthdate-1) 1707 – 10 January 1778), also known after his [ennoblement](https://en.wikipedia.org/wiki/Nobility#Ennoblement) as **Carl von Linné** was a Swedish botanist, zoologist, taxonomist, and physician who formalised [binomial nomenclature](https://en.wikipedia.org/wiki/Binomial_nomenclature), the modern system of naming organisms. He is known as the "father of modern [taxonomy](https://en.wikipedia.org/wiki/Taxonomy_(biology))".Many of his writings were in Latin, and his name is rendered in Latin as ***Carolus Linnæus*** (after 1761 **Carolus a Linné**).

Linnaeus was born in [Råshult](https://en.wikipedia.org/wiki/R%C3%A5shult" \o "Råshult), the countryside of [Småland](https://en.wikipedia.org/wiki/Sm%C3%A5land" \o "Småland), in southern Sweden. He received most of his higher education at [Uppsala University](https://en.wikipedia.org/wiki/Uppsala_University) and began giving lectures in botany there in 1730. He lived abroad between 1735 and 1738, where he studied and also published the first edition of his [*Systema Naturae*](https://en.wikipedia.org/wiki/Systema_Naturae) in the Netherlands. He then returned to Sweden where he became professor of medicine and botany at Uppsala. In the 1740s, he was sent on several journeys through Sweden to find and classify plants and animals. In the 1750s and 1760s, he continued to collect and classify animals, plants, and minerals, while publishing several volumes. He was one of the most acclaimed scientists in Europe at the time of his death.

Philosopher [Jean-Jacques Rousseau](https://en.wikipedia.org/wiki/Jean-Jacques_Rousseau) sent him the message: "Tell him I know no greater man on earth."[Johann Wolfgang von Goethe](https://en.wikipedia.org/wiki/Johann_Wolfgang_von_Goethe) wrote: "With the exception of Shakespeare and [Spinoza](https://en.wikipedia.org/wiki/Baruch_Spinoza), I know no one among the no longer living who has influenced me more strongly."[[](https://en.wikipedia.org/wiki/Carl_Linnaeus#cite_note-autogenerated3-6) Swedish author [August Strindberg](https://en.wikipedia.org/wiki/August_Strindberg) wrote: "Linnaeus was in reality a poet who happened to become a naturalist." Linnaeus has been called *Princeps botanicorum* (Prince of Botanists) and "The [Pliny](https://en.wikipedia.org/wiki/Natural_History_(Pliny)) of the North".He is also considered one of the founders of modern [ecology](https://en.wikipedia.org/wiki/Ecology).[[8]](https://en.wikipedia.org/wiki/Carl_Linnaeus#cite_note-9)

In botany and zoology, the abbreviation **L.** is used to indicate Linnaeus as the authority for a species' name.[[9]](https://en.wikipedia.org/wiki/Carl_Linnaeus#cite_note-10) In older publications, the abbreviation "Linn." is found. Linnaeus's remains constitute the [type specimen](https://en.wikipedia.org/wiki/Type_(biology)#Lectotype) for the species [*Homo sapiens*](https://en.wikipedia.org/wiki/Homo_sapiens) following the [International Code of Zoological Nomenclature](https://en.wikipedia.org/wiki/International_Code_of_Zoological_Nomenclature), since the sole specimen that he is known to have examined was himself.[[note 2]](https://en.wikipedia.org/wiki/Carl_Linnaeus#cite_note-holotype-11)

**Lewis Howard Latimer** (September 4, 1848 – December 11, 1928) was a inventor and patent draftsman. His inventions included an [evaporative air conditioner](https://en.wikipedia.org/wiki/Evaporative_cooler), an improved process for manufacturing [carbon filaments](https://en.wikipedia.org/wiki/Incandescent_light_bulb#Filament) for [light bulbs](https://en.wikipedia.org/wiki/Incandescent_light_bulb), and an improved [toilet](https://en.wikipedia.org/wiki/Toilet) system for railroad cars. In 1884, he joined the [Edison Electric Light Company](https://en.wikipedia.org/wiki/Edison_Electric_Light_Company) where he worked as a draftsman and wrote the first book on electric lighting. His house is located near the Latimer Projects and is a historic house located at 34-41 137th Street in [Flushing](https://en.wikipedia.org/wiki/Flushing,_Queens), [Queens](https://en.wikipedia.org/wiki/Queens), [New York City](https://en.wikipedia.org/wiki/New_York_City).

**Maria Mitchell** (August 1, 1818 – June 28, 1889) was an American [astronomer](https://en.wikipedia.org/wiki/Astronomer), [librarian](https://en.wikipedia.org/wiki/Librarian), [naturalist](https://en.wikipedia.org/wiki/Naturalist), and [educator](https://en.wikipedia.org/wiki/Educator). In 1847, she discovered a [comet](https://en.wikipedia.org/wiki/Comet) named 1847 VI (modern designation [C/1847 T1](https://en.wikipedia.org/wiki/C/1847_T1)) that was later known as “[Miss Mitchell’s Comet](https://en.wikipedia.org/wiki/Miss_Mitchell%27s_Comet)” in her honor. She won a gold medal prize for her discovery, which was presented to her by King [Christian VIII of Denmark](https://en.wikipedia.org/wiki/Christian_VIII_of_Denmark) in 1848. Mitchell was the first internationally known woman to work as both a professional astronomer and a professor of astronomy after accepting a position at [Vassar College](https://en.wikipedia.org/wiki/Vassar_College) in 1865. She was also the first woman elected Fellow of the [American Academy of Arts and Sciences](https://en.wikipedia.org/wiki/American_Academy_of_Arts_and_Sciences) and the [American Association for the Advancement of Science](https://en.wikipedia.org/wiki/American_Association_for_the_Advancement_of_Science).

**Dame Jane Morris Goodall**  (born **Valerie Jane Morris-Goodall** on 3 April 1934), formerly **Baroness Jane van Lawick-Goodall**, is an English [primatologist](https://en.wikipedia.org/wiki/Primatology) and [anthropologist](https://en.wikipedia.org/wiki/Anthropology). Seen as the world's foremost expert on [chimpanzees](https://en.wikipedia.org/wiki/Common_chimpanzee), Goodall is best known for her 60-year study of social and family interactions of wild chimpanzees since she first went to [Gombe Stream National Park](https://en.wikipedia.org/wiki/Gombe_Stream_National_Park) in [Tanzania](https://en.wikipedia.org/wiki/Tanzania) in 1960, where she witnessed human-like behaviours amongst chimpanzees, including [armed conflict](https://en.wikipedia.org/wiki/Gombe_Chimpanzee_War). In April 2002, she was named a [UN Messenger of Peace](https://en.wikipedia.org/wiki/United_Nations_Messengers_of_Peace). Goodall is an honorary member of the [World Future Council](https://en.wikipedia.org/wiki/World_Future_Council).

**Kathryn Dwyer Sullivan** (born October 3, 1951) is an American [geologist](https://en.wikipedia.org/wiki/Geologist), [oceanographer](https://en.wikipedia.org/wiki/Oceanographer), and a former [NASA astronaut](https://en.wikipedia.org/wiki/NASA_astronaut) and [U.S. Navy](https://en.wikipedia.org/wiki/U.S._Navy) officer. A crew member on three [Space Shuttle](https://en.wikipedia.org/wiki/Space_Shuttle) missions, she was the first American woman to walk in space on October 11, 1984.

During her first mission, [STS-41-G](https://en.wikipedia.org/wiki/STS-41-G), Sullivan performed the first [extra-vehicular activity](https://en.wikipedia.org/wiki/Extra-vehicular_activity) (EVA) by an American woman. Sullivan was [Under Secretary of Commerce for Oceans and Atmosphere](https://en.wikipedia.org/wiki/Under_Secretary_of_Commerce_for_Oceans_and_Atmosphere) and Administrator of the [National Oceanic and Atmospheric Administration](https://en.wikipedia.org/wiki/National_Oceanic_and_Atmospheric_Administration) (NOAA) after being confirmed by the U.S. Senate on March 6, 2014. Her tenure ended on January 20, 2017, with the swearing in of President [Donald Trump](https://en.wikipedia.org/wiki/Donald_Trump). Following completion of her service at NOAA, she was designated as the 2017 Charles A. Lindbergh Chair of Aerospace History at the [Smithsonian Institution](https://en.wikipedia.org/wiki/Smithsonian_Institution)’s [National Air and Space Museum](https://en.wikipedia.org/wiki/National_Air_and_Space_Museum), and has also served as a Senior Fellow at the [Potomac Institute for Policy Studies](https://en.wikipedia.org/wiki/Potomac_Institute_for_Policy_Studies). On June 7, 2020, she became the first woman to dive to the [Challenger Deep](https://en.wikipedia.org/wiki/Challenger_Deep) in the [Mariana Trench](https://en.wikipedia.org/wiki/Mariana_Trench), the deepest part of the Earth's oceans.

**Marie Salomea Skłodowska Curie** (born **Maria Salomea Skłodowska**; 7 November 1867 – 4 July 1934) was a [Polish and naturalized-French](https://en.wikipedia.org/wiki/Polish_minority_in_France) [physicist](https://en.wikipedia.org/wiki/Physicist) and [chemist](https://en.wikipedia.org/wiki/Chemist) who conducted pioneering research on [radioactivity](https://en.wikipedia.org/wiki/Radioactivity). She was the [first woman](https://en.wikipedia.org/wiki/List_of_female_Nobel_laureates) to win a [Nobel Prize](https://en.wikipedia.org/wiki/Nobel_Prize), the first person and the only woman to [win the Nobel Prize twice](https://en.wikipedia.org/wiki/Nobel_Prize#Multiple_laureates), and the only person to win the Nobel Prize in two scientific fields. Her husband, [Pierre Curie](https://en.wikipedia.org/wiki/Pierre_Curie), was a co-winner on her first Nobel Prize, making them the [first ever married couple](https://en.wikipedia.org/wiki/Nobel_Prize#Statistics) to win the Nobel Prize and launching the [Curie family legacy](https://en.wikipedia.org/wiki/Nobel_Prize#Family_laureates) of five Nobel Prizes. She was, in 1906, the first woman to become a professor at the [University of Paris](https://en.wikipedia.org/wiki/University_of_Paris).

She was born in [Warsaw](https://en.wikipedia.org/wiki/Warsaw), in what was then the [Kingdom of Poland](https://en.wikipedia.org/wiki/Congress_Poland), part of the [Russian Empire](https://en.wikipedia.org/wiki/Russian_Empire). She studied at Warsaw's clandestine [Flying University](https://en.wikipedia.org/wiki/Flying_University) and began her practical scientific training in Warsaw. In 1891, aged 24, she followed her elder sister [Bronisława](https://en.wikipedia.org/wiki/Bronis%C5%82awa_D%C5%82uska" \o "Bronisława Dłuska) to study in Paris, where she earned her higher degrees and conducted her subsequent scientific work. In 1895 she married the French physicist [Pierre Curie](https://en.wikipedia.org/wiki/Pierre_Curie), and she shared the 1903 [Nobel Prize in Physics](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physics) with him and with the physicist [Henri Becquerel](https://en.wikipedia.org/wiki/Henri_Becquerel) for their pioneering work developing the theory of "radioactivity"—a term she coined. In 1906 Pierre Curie died in a Paris street accident. Marie won the 1911 [Nobel Prize in Chemistry](https://en.wikipedia.org/wiki/Nobel_Prize_in_Chemistry) for her discovery of the elements [polonium](https://en.wikipedia.org/wiki/Polonium) and [radium](https://en.wikipedia.org/wiki/Radium), using techniques she invented for isolating radioactive [isotopes](https://en.wikipedia.org/wiki/Isotope). Under her direction, the world's first studies were conducted into the treatment of [neoplasms](https://en.wikipedia.org/wiki/Neoplasm) by the use of radioactive isotopes. In 1920 she founded the [Curie Institute in Paris](https://en.wikipedia.org/wiki/Curie_Institute_(Paris)), and in 1932 the [Curie Institute in Warsaw](https://en.wikipedia.org/wiki/Maria_Sklodowska-Curie_National_Research_Institute_of_Oncology); both remain major centres of medical research. During [World War I](https://en.wikipedia.org/wiki/World_War_I) she developed mobile radiography units to provide [X-ray](https://en.wikipedia.org/wiki/X-ray) services to [field hospitals](https://en.wikipedia.org/wiki/Field_hospital).

While a French citizen, Marie Skłodowska Curie, who used both surnames, never lost her sense of [Polish identity](https://en.wikipedia.org/wiki/National_identity). She taught her daughters the [Polish language](https://en.wikipedia.org/wiki/Polish_language) and took them on visits to Poland. She named the first [chemical element](https://en.wikipedia.org/wiki/Chemical_element) she discovered *polonium*, after her native country. Marie Curie died in 1934, aged 66, at she [Sancellemoz](https://en.wikipedia.org/wiki/Sancellemoz" \o "Sancellemoz) [sanatorium](https://en.wikipedia.org/wiki/Sanatorium) in [Passy](https://en.wikipedia.org/wiki/Passy,_Haute-Savoie) ([Haute-Savoie](https://en.wikipedia.org/wiki/Haute-Savoie)), France, of [aplastic anemia](https://en.wikipedia.org/wiki/Aplastic_anemia) from exposure to radiation in the course of her scientific research and in the course of her radiological work at field hospitals during [World War I](https://en.wikipedia.org/wiki/World_War_I). In addition to her Nobel Prizes, she has received numerous other honours and tributes; in 1995 she became the first woman to be entombed on her own merits in Paris' [Panthéon](https://en.wikipedia.org/wiki/Panth%C3%A9on), and Poland declared 2011 the Year of Marie Curie during the [International Year of Chemistry](https://en.wikipedia.org/wiki/International_Year_of_Chemistry). She is the subject of numerous biographical works, where she is also known as **Madame Curie**.

**Barbara McClintock** (June 16, 1902 – September 2, 1992) was an American scientist and [cytogeneticist](https://en.wikipedia.org/wiki/Cytogenetics) who was awarded the 1983 [Nobel Prize in Physiology or Medicine](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physiology_or_Medicine). McClintock received her PhD in [botany](https://en.wikipedia.org/wiki/Botany) from [Cornell University](https://en.wikipedia.org/wiki/Cornell_University) in 1927. There she started her career as the leader in the development of maize cytogenetics, the focus of her research for the rest of her life. From the late 1920s, McClintock studied [chromosomes](https://en.wikipedia.org/wiki/Chromosome) and how they change during reproduction in maize. She developed the technique for visualizing Maize chromosomes and used microscopic analysis to demonstrate many fundamental genetic ideas. One of those ideas was the notion of [genetic recombination](https://en.wikipedia.org/wiki/Genetic_recombination) by [crossing-over](https://en.wikipedia.org/wiki/Chromosomal_crossover) during [meiosis](https://en.wikipedia.org/wiki/Meiosis)—a mechanism by which chromosomes exchange information. She produced the first [genetic map](https://en.wikipedia.org/wiki/Genetic_linkage) for maize, linking regions of the chromosome to physical traits. She demonstrated the role of the [telomere](https://en.wikipedia.org/wiki/Telomere) and [centromere](https://en.wikipedia.org/wiki/Centromere), regions of the chromosome that are important in the conservation of [genetic information](https://en.wikipedia.org/wiki/Genetic_information). She was recognized as among the best in the field, awarded prestigious fellowships, and elected a member of the [National Academy of Sciences](https://en.wikipedia.org/wiki/United_States_National_Academy_of_Sciences) in 1944.

During the 1940s and 1950s, McClintock discovered [transposition](https://en.wikipedia.org/wiki/Transposon) and used it to demonstrate that [genes](https://en.wikipedia.org/wiki/Gene) are responsible for turning physical characteristics on and off. She developed theories to explain the suppression and expression of genetic information from one generation of maize plants to the next. Due to skepticism of her research and its implications, she stopped publishing her data in 1953. Later, she made an extensive study of the cytogenetics and [ethnobotany](https://en.wikipedia.org/wiki/Ethnobotany) of maize [races](https://en.wikipedia.org/wiki/Race_(biology)) from South America. McClintock's research became well understood in the 1960s and 1970s, as other scientists confirmed the mechanisms of genetic change and [protein expression](https://en.wikipedia.org/wiki/Regulation_of_gene_expression) that she had demonstrated in her maize research in the 1940s and 1950s. Awards and recognition for her contributions to the field followed, including the [Nobel Prize in Physiology or Medicine](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physiology_or_Medicine), awarded to her in 1983 for the discovery of [genetic transposition](https://en.wikipedia.org/wiki/Transposable_element); as of 2022, she remains the only woman who has received an unshared Nobel Prize in that category.

**Sally Kristen Ride** (May 26, 1951 – July 23, 2012) was an American [astronaut](https://en.wikipedia.org/wiki/Astronaut) and [physicist](https://en.wikipedia.org/wiki/Physicist). Born in Los Angeles, she joined [NASA](https://en.wikipedia.org/wiki/NASA) in 1978, and in 1983 became the first American woman in [space](https://en.wikipedia.org/wiki/Outer_space). She was the third woman in space overall, after USSR [cosmonauts](https://en.wikipedia.org/wiki/Cosmonaut) [Valentina Tereshkova](https://en.wikipedia.org/wiki/Valentina_Tereshkova) (1963) and [Svetlana Savitskaya](https://en.wikipedia.org/wiki/Svetlana_Savitskaya) (1982). Ride remained the youngest American astronaut to have travelled to space, having done so at the age of 32, until 2021 when [Hayley Arceneaux](https://en.wikipedia.org/wiki/Hayley_Arceneaux) flew on [SpaceX](https://en.wikipedia.org/wiki/SpaceX)'s [Inspiration4](https://en.wikipedia.org/wiki/Inspiration4) mission at the age of 29. After flying twice on the Orbiter [*Challenger*](https://en.wikipedia.org/wiki/Space_Shuttle_Challenger), she left NASA in 1987.

Ride worked for two years at [Stanford University](https://en.wikipedia.org/wiki/Stanford_University)'s [Center for International Security and Arms Control](https://en.wikipedia.org/wiki/Center_for_International_Security_and_Cooperation" \o "Center for International Security and Cooperation), then at the [University of California, San Diego](https://en.wikipedia.org/wiki/University_of_California,_San_Diego), primarily researching [nonlinear optics](https://en.wikipedia.org/wiki/Nonlinear_optics) and [Thomson scattering](https://en.wikipedia.org/wiki/Thomson_scattering). She served on the committees that investigated the [*Challenger*](https://en.wikipedia.org/wiki/Space_Shuttle_Challenger_disaster) and [*Columbia*](https://en.wikipedia.org/wiki/Space_Shuttle_Columbia_disaster) Space Shuttle disasters, the only person to participate in both. Having been married to astronaut [Steven Hawley](https://en.wikipedia.org/wiki/Steven_Hawley) during her spaceflight years and in a private, long-term relationship with former Women's Tennis Association player [Tam O'Shaughnessy](https://en.wikipedia.org/wiki/Tam_O%27Shaughnessy) in her years after, she is the earliest space traveller to have been recognized as [LGBT](https://en.wikipedia.org/wiki/LGBT). Ride died of [pancreatic cancer](https://en.wikipedia.org/wiki/Pancreatic_cancer) on July 23, 2012.

**Stephen William Hawking** [CH](https://en.wikipedia.org/wiki/Companion_of_Honour) [CBE](https://en.wikipedia.org/wiki/Commander_of_the_Order_of_the_British_Empire) [FRS](https://en.wikipedia.org/wiki/Fellow_of_the_Royal_Society) [FRSA](https://en.wikipedia.org/wiki/Fellow_of_the_Royal_Society_of_Arts) (8 January 1942 – 14 March 2018) was an English [theoretical physicist](https://en.wikipedia.org/wiki/Theoretical_physics), [cosmologist](https://en.wikipedia.org/wiki/Cosmology), and author who, at the time of his death, was director of research at the [Centre for Theoretical Cosmology](https://en.wikipedia.org/wiki/Centre_for_Theoretical_Cosmology) at the [University of Cambridge](https://en.wikipedia.org/wiki/University_of_Cambridge). Between 1979 and 2009, he was the [Lucasian Professor of Mathematics](https://en.wikipedia.org/wiki/Lucasian_Professor_of_Mathematics" \o "Lucasian Professor of Mathematics) at the University of Cambridge.

Hawking was born in [Oxford](https://en.wikipedia.org/wiki/Oxford), into a family of physicians. In October 1959, at the age of 17, he began his university education at [University College, Oxford](https://en.wikipedia.org/wiki/University_College,_Oxford), where he received a [first-class](https://en.wikipedia.org/wiki/First_Class_Honours) [BA degree](https://en.wikipedia.org/wiki/Honours_degree) in physics. In October 1962, he began his graduate work at [Trinity Hall, Cambridge](https://en.wikipedia.org/wiki/Trinity_Hall,_Cambridge), where in March 1966, he obtained his PhD degree in [applied mathematics](https://en.wikipedia.org/wiki/Applied_mathematics) and theoretical physics, specialising in [general relativity](https://en.wikipedia.org/wiki/General_relativity) and [cosmology](https://en.wikipedia.org/wiki/Cosmology). In 1963, Hawking was diagnosed with an early-onset slow-progressing form of [motor neurone disease](https://en.wikipedia.org/wiki/Motor_neurone_disease) (amyotrophic lateral sclerosis – ALS, for short) that gradually, over the decades, paralysed him. After the loss of his speech, he communicated through a [speech-generating device](https://en.wikipedia.org/wiki/Speech-generating_device) initially through use of a handheld switch, and eventually by using a single cheek muscle. Hawking's scientific works included a collaboration with [Roger Penrose](https://en.wikipedia.org/wiki/Roger_Penrose) on [gravitational singularity theorems](https://en.wikipedia.org/wiki/Penrose%E2%80%93Hawking_singularity_theorems) in the framework of [general relativity](https://en.wikipedia.org/wiki/General_relativity), and the theoretical prediction that [black holes](https://en.wikipedia.org/wiki/Black_hole) emit radiation, often called [Hawking radiation](https://en.wikipedia.org/wiki/Hawking_radiation). Initially, Hawking radiation was controversial. By the late 1970s and following the publication of further research, the discovery was widely accepted as a major breakthrough in theoretical physics. Hawking was the first to set out a theory of cosmology explained by a union of the general theory of relativity and [quantum mechanics](https://en.wikipedia.org/wiki/Quantum_mechanics). He was a vigorous supporter of the [many-worlds interpretation](https://en.wikipedia.org/wiki/Many-worlds_interpretation) of [quantum mechanics](https://en.wikipedia.org/wiki/Quantum_mechanics). Hawking achieved commercial success with several works of [popular science](https://en.wikipedia.org/wiki/Popular_science) in which he discussed his theories and cosmology in general. His book [*A Brief History of Time*](https://en.wikipedia.org/wiki/A_Brief_History_of_Time) appeared on the [*Sunday Times*](https://en.wikipedia.org/wiki/The_Sunday_Times) bestseller list for a record-breaking 237 weeks. Hawking was a [Fellow of the Royal Society](https://en.wikipedia.org/wiki/Fellow_of_the_Royal_Society), a lifetime member of the [Pontifical Academy of Sciences](https://en.wikipedia.org/wiki/Pontifical_Academy_of_Sciences), and a recipient of the [Presidential Medal of Freedom](https://en.wikipedia.org/wiki/Presidential_Medal_of_Freedom), the highest civilian award in the United States. In 2002, Hawking was ranked number 25 in the [BBC](https://en.wikipedia.org/wiki/BBC)'s poll of the [100 Greatest Britons](https://en.wikipedia.org/wiki/100_Greatest_Britons). He died on 14 March 2018 at the age of 76, after living with motor neurone disease for more than 50 years.

**Mae Carol Jemison** (born October 17, 1956) is an American [engineer](https://en.wikipedia.org/wiki/Engineer), [physician](https://en.wikipedia.org/wiki/Physician), and former [NASA](https://en.wikipedia.org/wiki/NASA) astronaut. She became the first [black](https://en.wikipedia.org/wiki/Black_people) woman to travel into space when she served as a [mission specialist](https://en.wikipedia.org/wiki/Mission_specialist) aboard the [Space Shuttle *Endeavour*](https://en.wikipedia.org/wiki/Space_Shuttle_Endeavour). Jemison joined NASA's [astronaut corps in 1987](https://en.wikipedia.org/wiki/NASA_Astronaut_Group_12) and was selected to serve for the [STS-47](https://en.wikipedia.org/wiki/STS-47) mission, during which she orbited the Earth for nearly eight days on September 12–20, 1992.

Born in Alabama and raised in Chicago, Jemison graduated from [Stanford University](https://en.wikipedia.org/wiki/Stanford_University) with degrees in [chemical engineering](https://en.wikipedia.org/wiki/Chemical_engineering) as well as [African](https://en.wikipedia.org/wiki/African_studies) and [African-American studies](https://en.wikipedia.org/wiki/African-American_studies). She then earned her medical degree from [Cornell University](https://en.wikipedia.org/wiki/Cornell_University_Medical_School). Jemison was a doctor for the [Peace Corps](https://en.wikipedia.org/wiki/Peace_Corps) in [Liberia](https://en.wikipedia.org/wiki/Liberia) and [Sierra Leone](https://en.wikipedia.org/wiki/Sierra_Leone) from 1983 until 1985 and worked as a [general practitioner](https://en.wikipedia.org/wiki/General_practitioner). In pursuit of becoming an astronaut, she applied to NASA.

Jemison left NASA in 1993 and founded a technology research company. She later formed a non-profit educational foundation and through the foundation is the principal of the [100 Year Starship](https://en.wikipedia.org/wiki/100_Year_Starship) project funded by [DARPA](https://en.wikipedia.org/wiki/DARPA). Jemison also wrote several books for children and appeared on television several times, including in [a 1993 episode](https://en.wikipedia.org/wiki/Second_Chances_(Star_Trek:_The_Next_Generation)) of [*Star Trek: The Next Generation*](https://en.wikipedia.org/wiki/Star_Trek:_The_Next_Generation). She holds several [honorary doctorates](https://en.wikipedia.org/wiki/Honorary_doctorate) and has been inducted into the [National Women's Hall of Fame](https://en.wikipedia.org/wiki/National_Women%27s_Hall_of_Fame) and the [International Space Hall of Fame](https://en.wikipedia.org/wiki/List_of_inductees_in_the_International_Space_Hall_of_Fame).

**J. Robert Oppenheimer** (April 22, 1904 – February 18, 1967) was an American [theoretical physicist](https://en.wikipedia.org/wiki/Theoretical_physics) who was professor of physics at the [University of California, Berkeley](https://en.wikipedia.org/wiki/University_of_California,_Berkeley). Oppenheimer was the wartime head of the [Los Alamos Laboratory](https://en.wikipedia.org/wiki/Los_Alamos_Laboratory) and is among those who are credited with being the "father of the atomic bomb" for their role in the [Manhattan Project](https://en.wikipedia.org/wiki/Manhattan_Project) – the [World War II](https://en.wikipedia.org/wiki/World_War_II) undertaking that developed the first [nuclear weapons](https://en.wikipedia.org/wiki/Nuclear_weapon). Oppenheimer was among those who observed the [Trinity test](https://en.wikipedia.org/wiki/Trinity_test) in [New Mexico](https://en.wikipedia.org/wiki/New_Mexico), where the first atomic bomb was successfully detonated on July 16, 1945.

He later remarked that the explosion brought to mind words from the [*Bhagavad Gita*](https://en.wikipedia.org/wiki/Bhagavad_Gita): "Now I am become Death, the destroyer of worlds." In August 1945, the weapons were used in the [atomic bombings of Hiroshima and Nagasaki](https://en.wikipedia.org/wiki/Atomic_bombings_of_Hiroshima_and_Nagasaki).

After the war ended, Oppenheimer became chairman of the influential General Advisory Committee of the newly created [United States Atomic Energy Commission](https://en.wikipedia.org/wiki/United_States_Atomic_Energy_Commission). He used that position to lobby for international control of [nuclear power](https://en.wikipedia.org/wiki/Nuclear_power) to avert [nuclear proliferation](https://en.wikipedia.org/wiki/Nuclear_proliferation) and a [nuclear arms race](https://en.wikipedia.org/wiki/Nuclear_arms_race) with the [Soviet Union](https://en.wikipedia.org/wiki/Soviet_Union). He opposed the development of the [hydrogen bomb](https://en.wikipedia.org/wiki/Hydrogen_bomb) during a 1949–1950 governmental debate on the question and subsequently took stances on defense-related issues that provoked the ire of some factions in the U.S. government and military. During the [Second Red Scare](https://en.wikipedia.org/wiki/Second_Red_Scare), those stances, together with past associations Oppenheimer had with people and organizations affiliated with the [Communist Party](https://en.wikipedia.org/wiki/Communist_Party_USA), led to him suffering the revocation of his [security clearance](https://en.wikipedia.org/wiki/Security_clearance#United_States) in a [much-written-about hearing](https://en.wikipedia.org/wiki/Oppenheimer_security_hearing) in 1954. Effectively stripped of his direct political influence, he continued to lecture, write and work in physics. Nine years later, President [John F. Kennedy](https://en.wikipedia.org/wiki/John_F._Kennedy) awarded (and [Lyndon B. Johnson](https://en.wikipedia.org/wiki/Lyndon_B._Johnson) presented) him with the [Enrico Fermi Award](https://en.wikipedia.org/wiki/Enrico_Fermi_Award) as a gesture of [political rehabilitation](https://en.wikipedia.org/wiki/Political_rehabilitation). Oppenheimer's achievements in physics included the [Born–Oppenheimer approximation](https://en.wikipedia.org/wiki/Born%E2%80%93Oppenheimer_approximation) for molecular [wave functions](https://en.wikipedia.org/wiki/Wave_function), work on the theory of [electrons](https://en.wikipedia.org/wiki/Electron) and [positrons](https://en.wikipedia.org/wiki/Positron), the [Oppenheimer–Phillips process](https://en.wikipedia.org/wiki/Oppenheimer%E2%80%93Phillips_process) in [nuclear fusion](https://en.wikipedia.org/wiki/Nuclear_fusion), and the first prediction of [quantum tunneling](https://en.wikipedia.org/wiki/Quantum_tunneling). With his students he also made important contributions to the modern theory of [neutron stars](https://en.wikipedia.org/wiki/Neutron_star) and [black holes](https://en.wikipedia.org/wiki/Black_hole), as well as to [quantum mechanics](https://en.wikipedia.org/wiki/Quantum_mechanics), [quantum field theory](https://en.wikipedia.org/wiki/Quantum_field_theory), and the interactions of [cosmic rays](https://en.wikipedia.org/wiki/Cosmic_ray). As a teacher and promoter of science, he is remembered as a founding father of the American school of theoretical physics that gained world prominence in the 1930s. After World War II, he became director of the [Institute for Advanced Study](https://en.wikipedia.org/wiki/Institute_for_Advanced_Study) in [Princeton, New Jersey](https://en.wikipedia.org/wiki/Princeton,_New_Jersey).

**Ivan Petrovich Pavlov** (26 September [[O.S.](https://en.wikipedia.org/wiki/Old_Style_and_New_Style_dates) 14 September] 1849 – 27 February 1936) was a Russian [physiologist](https://en.wikipedia.org/wiki/Physiologist) known primarily for his work in [classical conditioning](https://en.wikipedia.org/wiki/Classical_conditioning).

From his childhood days, Pavlov demonstrated intellectual curiosity along with an unusual energy which he referred to as "the instinct for research". Inspired by the progressive ideas which [Dmitry Pisarev](https://en.wikipedia.org/wiki/Dmitry_Pisarev), a Russian literary critic of the 1860s, and [Ivan Sechenov](https://en.wikipedia.org/wiki/Ivan_Sechenov), the father of Russian physiology, were spreading, Pavlov abandoned his religious career and devoted his life to science. In 1870, he enrolled in the physics and mathematics department at the [University of Saint Petersburg](https://en.wikipedia.org/wiki/Saint_Petersburg_State_University) to study natural science.

Pavlov carried out experiments on the digestive glands, as well as investigated the [gastric](https://en.wikipedia.org/wiki/Stomach) function of dogs, and eventually won the [Nobel Prize for Physiology or Medicine](https://en.wikipedia.org/wiki/Nobel_Prize_for_Physiology_or_Medicine) in 1904, becoming the first Russian Nobel laureate. A survey in the [*Review of General Psychology*](https://en.wikipedia.org/wiki/Review_of_General_Psychology), published in 2002, ranked Pavlov as the 24th most cited psychologist of the 20th century. Pavlov's principles of classical conditioning have been found to operate across a variety of [behavior therapies](https://en.wikipedia.org/wiki/Behavior_therapy" \o "Behavior therapy) and in experimental and clinical settings, such as educational classrooms and even reducing phobias with [systematic desensitization](https://en.wikipedia.org/wiki/Systematic_desensitization).

**Mary Daly** (October 16, 1928 – January 3, 2010) was an American [radical feminist](https://en.wikipedia.org/wiki/Radical_feminism) [philosopher](https://en.wikipedia.org/wiki/Philosophy), academic, and [theologian](https://en.wikipedia.org/wiki/Theology). Daly, who described herself as a "radical lesbian feminist", taught at the [Jesuit](https://en.wikipedia.org/wiki/Society_of_Jesus)-run [Boston College](https://en.wikipedia.org/wiki/Boston_College) for 33 years. Daly retired in 1999, after violating university policy by refusing to allow male students in her advanced [women's studies](https://en.wikipedia.org/wiki/Women%27s_studies) classes. She allowed male students in her introductory class and privately tutored those who wanted to take advanced classes.

**Nikola Tesla** (10 July [[O.S.](https://en.wikipedia.org/wiki/Old_Style_and_New_Style_dates) 28 June] 1856 – 7 January 1943) was a [Serbian-American](https://en.wikipedia.org/wiki/Serbian-American)[inventor](https://en.wikipedia.org/wiki/Inventor), [electrical engineer](https://en.wikipedia.org/wiki/Electrical_engineer), [mechanical engineer](https://en.wikipedia.org/wiki/Mechanical_engineering), and [futurist](https://en.wikipedia.org/wiki/Futurist) best known for his contributions to the design of the modern [alternating current](https://en.wikipedia.org/wiki/Alternating_current) (AC) [electricity supply](https://en.wikipedia.org/wiki/Electricity_supply) system.

Born and raised in the [Austrian Empire](https://en.wikipedia.org/wiki/Austrian_Empire), Tesla studied engineering and physics in the 1870s without receiving a degree, gaining practical experience in the early 1880s working in [telephony](https://en.wikipedia.org/wiki/Telephony) and at Continental Edison in the new [electric power industry](https://en.wikipedia.org/wiki/Electric_power_industry). In 1884 he emigrated to the United States, where he became a naturalized citizen. He worked for a short time at the [Edison Machine Works](https://en.wikipedia.org/wiki/Edison_Machine_Works) in New York City before he struck out on his own. With the help of partners to finance and market his ideas, Tesla set up laboratories and companies in New York to develop a range of electrical and mechanical devices. His [alternating current](https://en.wikipedia.org/wiki/Alternating_current) (AC) [induction motor](https://en.wikipedia.org/wiki/Induction_motor) and related [polyphase](https://en.wikipedia.org/wiki/Polyphase_system) AC patents, licensed by [Westinghouse Electric](https://en.wikipedia.org/wiki/Westinghouse_Electric_Corporation) in 1888, earned him a considerable amount of money and became the cornerstone of the polyphase system which that company eventually marketed. Attempting to develop inventions he could patent and market, Tesla conducted a range of experiments with mechanical oscillators/generators, electrical discharge tubes, and early X-ray imaging. He also built a wireless-controlled boat, one of the first-ever exhibited. Tesla became well known as an inventor and demonstrated his achievements to celebrities and wealthy patrons at his lab, and was noted for his showmanship at public lectures. Throughout the 1890s, Tesla pursued his ideas for wireless lighting and worldwide wireless electric power distribution in his high-voltage, high-frequency power experiments in New York and [Colorado Springs](https://en.wikipedia.org/wiki/Colorado_Springs,_Colorado). In 1893, he made pronouncements on the possibility of [wireless communication](https://en.wikipedia.org/wiki/Wireless_communication) with his devices. Tesla tried to put these ideas to practical use in his unfinished [Wardenclyffe Tower](https://en.wikipedia.org/wiki/Wardenclyffe_Tower" \o "Wardenclyffe Tower) project, an intercontinental wireless communication and power transmitter, but ran out of funding before he could complete it.

After Wardenclyffe, Tesla experimented with a series of inventions in the 1910s and 1920s with varying degrees of success. Having spent most of his money, Tesla lived in a series of New York hotels, leaving behind unpaid bills. He died in New York City in January 1943. Tesla's work fell into relative obscurity following his death, until 1960, when the [General Conference on Weights and Measures](https://en.wikipedia.org/wiki/General_Conference_on_Weights_and_Measures) named the [SI unit](https://en.wikipedia.org/wiki/SI_unit) of [magnetic flux density](https://en.wikipedia.org/wiki/Magnetic_flux_density) the [tesla](https://en.wikipedia.org/wiki/Tesla_(unit)) in his honour. There has been a resurgence in popular interest in Tesla since the 1990s.

**Sir Isaac Newton** PRS (25 December 1642 – 20 March 1726/27) was an English mathematician, physicist, astronomer, alchemist, theologian, and author (described in his time as a "natural philosopher") widely recognised as one of the greatest mathematicians and physicists of all time and among the most influential scientists. He was a key figure in the philosophical revolution known as the Enlightenment. His book Philosophiæ Naturalis Principia Mathematica (Mathematical Principles of Natural Philosophy), first published in 1687, established classical mechanics. Newton also made seminal contributions to optics, and shares credit with German mathematician Gottfried Wilhelm Leibniz for developing infinitesimal calculus.

In the Principia, Newton formulated the laws of motion and universal gravitation that formed the dominant scientific viewpoint until it was superseded by the theory of relativity. Newton used his mathematical description of gravity to derive Kepler's laws of planetary motion, account for tides, the trajectories of comets, the precession of the equinoxes and other phenomena, eradicating doubt about the Solar System's heliocentricity. He demonstrated that the motion of objects on Earth and celestial bodies could be accounted for by the same principles. Newton's inference that the Earth is an oblate spheroid was later confirmed by the geodetic measurements of Maupertuis, La Condamine, and others, convincing most European scientists of the superiority of Newtonian mechanics over earlier systems.

Newton built the first practical reflecting telescope and developed a sophisticated theory of colour based on the observation that a prism separates white light into the colours of the visible spectrum. His work on light was collected in his highly influential book Opticks, published in 1704. He also formulated an empirical law of cooling, made the first theoretical calculation of the speed of sound, and introduced the notion of a Newtonian fluid. In addition to his work on calculus, as a mathematician Newton contributed to the study of power series, generalised the binomial theorem to non-integer exponents, developed a method for approximating the roots of a function, and classified most of the cubic plane curves.

Newton was a fellow of Trinity College and the second Lucasian Professor of Mathematics at the University of Cambridge. He was a devout but unorthodox Christian who privately rejected the doctrine of the Trinity. Unusually for a member of the Cambridge faculty of the day, he refused to take holy orders in the Church of England. Beyond his work on the mathematical sciences, Newton dedicated much of his time to the study of alchemy and biblical chronology, but most of his work in those areas remained unpublished until long after his death. Politically and personally tied to the Whig party, Newton served two brief terms as Member of Parliament for the University of Cambridge, in 1689–1690 and 1701–1702. He was knighted by Queen Anne in 1705 and spent the last three decades of his life in London, serving as Warden (1696–1699) and Master (1699–1727) of the Royal Mint, as well as president of the Royal Society (1703–1727).

**Louis Pasteur** (27 December 1822 – 28 September 1895) was a French [chemist](https://en.wikipedia.org/wiki/Chemist) and [microbiologist](https://en.wikipedia.org/wiki/Microbiologist) renowned for his discoveries of the principles of [vaccination](https://en.wikipedia.org/wiki/Vaccination), [microbial fermentation](https://en.wikipedia.org/wiki/Fermentation), and [pasteurization](https://en.wikipedia.org/wiki/Pasteurization). His research in chemistry led to remarkable breakthroughs in the understanding of the causes and preventions of [diseases](https://en.wikipedia.org/wiki/Diseases), which laid down the foundations of hygiene, public health and much of modern medicine. His works are credited to saving millions of lives through the developments of vaccines for [rabies](https://en.wikipedia.org/wiki/Rabies) and [anthrax](https://en.wikipedia.org/wiki/Anthrax). He is regarded as one of the founders of modern [bacteriology](https://en.wikipedia.org/wiki/Bacteriology) and has been honoured as the "father of bacteriology"and as the "father of [microbiology](https://en.wikipedia.org/wiki/Microbiology)" (together with [Robert Koch](https://en.wikipedia.org/wiki/Robert_Koch), and the latter epithet also attributed to [Antonie van Leeuwenhoek](https://en.wikipedia.org/wiki/Antonie_van_Leeuwenhoek" \o "Antonie van Leeuwenhoek)).

Pasteur was responsible for disproving the doctrine of [spontaneous generation](https://en.wikipedia.org/wiki/Spontaneous_generation). Under the auspices of the [French Academy of Sciences](https://en.wikipedia.org/wiki/French_Academy_of_Sciences), his experiment demonstrated that in sterilized and sealed flasks, nothing ever developed; and, conversely, in sterilized but open flasks, microorganisms could grow. For this experiment, the academy awarded him the Alhumbert Prize carrying 2,500 [francs](https://en.wikipedia.org/wiki/Francs) in 1862. Pasteur is also regarded as one of the fathers of [germ theory of diseases](https://en.wikipedia.org/wiki/Germ_theory_of_diseases), which was a minor medical concept at the time. His many experiments showed that diseases could be prevented by killing or stopping germs, thereby directly supporting the germ theory and its application in clinical medicine. He is best known to the general public for his invention of the technique of treating [milk](https://en.wikipedia.org/wiki/Milk) and [wine](https://en.wikipedia.org/wiki/Wine) to stop bacterial contamination, a process now called [pasteurization](https://en.wikipedia.org/wiki/Pasteurization). Pasteur also made significant [discoveries](https://en.wikipedia.org/wiki/Louis_Pasteur#Molecular_asymmetry) in chemistry, most notably on the molecular basis for the [asymmetry](https://en.wikipedia.org/wiki/Asymmetry) of certain [crystals](https://en.wikipedia.org/wiki/Crystals) and [racemization](https://en.wikipedia.org/wiki/Racemization). Early in his career, his investigation of [tartaric acid](https://en.wikipedia.org/wiki/Tartaric_acid) resulted in the first resolution of what is now called [optical isomers](https://en.wikipedia.org/wiki/Chirality_(chemistry)). His work led the way to the current understanding of a fundamental principle in the structure of organic compounds.

He was the director of the [Pasteur Institute](https://en.wikipedia.org/wiki/Pasteur_Institute), established in 1887, until his death, and his body was interred in a vault beneath the institute. Although Pasteur made groundbreaking experiments, his reputation became associated with various controversies. Historical reassessment of his notebook revealed that he practiced deception to overcome his rivals.

**Galileo di Vincenzo Bonaiuti de' Galilei** (15 February 1564 – 8 January 1642), commonly referred to as **Galileo**, was an Italian [astronomer](https://en.wikipedia.org/wiki/Astronomer), [physicist](https://en.wikipedia.org/wiki/Physicist) and [engineer](https://en.wikipedia.org/wiki/Engineer), sometimes described as a [polymath](https://en.wikipedia.org/wiki/Polymath), from the city of [Pisa](https://en.wikipedia.org/wiki/Pisa), then part of the [Duchy of Florence](https://en.wikipedia.org/wiki/Duchy_of_Florence). Galileo has been called the "father" of [observational astronomy](https://en.wikipedia.org/wiki/Observational_astronomy), modern physics, the [scientific method](https://en.wikipedia.org/wiki/Scientific_method), and [modern science](https://en.wikipedia.org/wiki/Modern_science).

Galileo studied [speed](https://en.wikipedia.org/wiki/Speed) and [velocity](https://en.wikipedia.org/wiki/Velocity), [gravity](https://en.wikipedia.org/wiki/Gravity) and [free fall](https://en.wikipedia.org/wiki/Free_fall), the [principle of relativity](https://en.wikipedia.org/wiki/Principle_of_relativity), [inertia](https://en.wikipedia.org/wiki/Inertia), [projectile motion](https://en.wikipedia.org/wiki/Projectile_motion) and also worked in applied science and technology, describing the properties of [pendulums](https://en.wikipedia.org/wiki/Pendulums) and "[hydrostatic](https://en.wikipedia.org/wiki/Hydrostatic) balances". He invented the [thermoscope](https://en.wikipedia.org/wiki/Thermoscope) and various [military compasses](https://en.wikipedia.org/wiki/Sector_(instrument)), and used the [telescope](https://en.wikipedia.org/wiki/Telescope) for scientific observations of celestial objects. His contributions to observational astronomy include telescopic confirmation of the [phases of Venus](https://en.wikipedia.org/wiki/Phases_of_Venus), observation of the [four largest satellites](https://en.wikipedia.org/wiki/Galilean_Moons) of [Jupiter](https://en.wikipedia.org/wiki/Jupiter), observation of [Saturn's rings](https://en.wikipedia.org/wiki/Saturn%27s_rings), and analysis of [lunar craters](https://en.wikipedia.org/wiki/Lunar_craters) and [sunspots](https://en.wikipedia.org/wiki/Sunspots). Galileo's championing of [Copernican heliocentrism](https://en.wikipedia.org/wiki/Copernican_heliocentrism) (Earth rotating daily and revolving around the sun) was met with opposition from within the [Catholic Church](https://en.wikipedia.org/wiki/Catholic_Church) and from some astronomers. The matter was investigated by the [Roman Inquisition](https://en.wikipedia.org/wiki/Roman_Inquisition) in 1615, which concluded that heliocentrism was foolish, absurd, and heretical since it contradicted Holy Scripture. Galileo later defended his views in [*Dialogue Concerning the Two Chief World Systems*](https://en.wikipedia.org/wiki/Dialogue_Concerning_the_Two_Chief_World_Systems) (1632), which appeared to attack [Pope Urban VIII](https://en.wikipedia.org/wiki/Pope_Urban_VIII) and thus alienated both the Pope and the [Jesuits](https://en.wikipedia.org/wiki/Jesuits), who had both supported Galileo up until this point. He was tried by the Inquisition, found "vehemently suspect of heresy", and forced to recant. He spent the rest of his life under house arrest. During this time, he wrote [*Two New Sciences*](https://en.wikipedia.org/wiki/Two_New_Sciences) (1638), primarily concerning [kinematics](https://en.wikipedia.org/wiki/Kinematics) and the [strength of materials](https://en.wikipedia.org/wiki/Strength_of_materials), summarizing work he had done around forty years earlier.

**Sir Alexander Fleming** (6 August 1881 – 11 March 1955) was a Scottish [physician](https://en.wikipedia.org/wiki/Physician) and [microbiologist](https://en.wikipedia.org/wiki/Microbiologist), best known for discovering the world's first broadly effective [antibiotic](https://en.wikipedia.org/wiki/Antibiotic) substance, which he named [penicillin](https://en.wikipedia.org/wiki/Penicillin). His discovery in 1928 of what was later named [benzylpenicillin](https://en.wikipedia.org/wiki/Benzylpenicillin) (or penicillin G) from the mould [*Penicillium rubens*](https://en.wikipedia.org/wiki/Penicillium_rubens) is described as the "single greatest victory ever achieved over disease." For this discovery, he shared the [Nobel Prize in Physiology or Medicine](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physiology_or_Medicine) in 1945 with [Howard Florey](https://en.wikipedia.org/wiki/Howard_Florey) and [Ernst Boris Chain](https://en.wikipedia.org/wiki/Ernst_Boris_Chain).

He also discovered the [enzyme](https://en.wikipedia.org/wiki/Enzyme) [lysozyme](https://en.wikipedia.org/wiki/Lysozyme) from his nasal discharge in 1922, and along with it a bacterium he named *Micrococcus Lysodeikticus*, later renamed [*Micrococcus luteus*](https://en.wikipedia.org/wiki/Micrococcus_luteus).Fleming was [knighted](https://en.wikipedia.org/wiki/Orders,_decorations,_and_medals_of_the_United_Kingdom) for his scientific achievements in 1944 In 1999, he was named in [*Time*](https://en.wikipedia.org/wiki/Time_(magazine)) magazine's list of the [100 Most Important People of the 20th century](https://en.wikipedia.org/wiki/Time_100:_The_Most_Important_People_of_the_Century). In 2002, he was chosen in the BBC's television poll for determining the [100 Greatest Britons](https://en.wikipedia.org/wiki/100_Greatest_Britons), and in 2009, he was also voted third "greatest Scot" in an opinion poll conducted by [STV](https://en.wikipedia.org/wiki/STV_(TV_channel)), behind only [Robert Burns](https://en.wikipedia.org/wiki/Robert_Burns) and [William Wallace](https://en.wikipedia.org/wiki/William_Wallace).

**Charles Robert Darwin**  (12 February 1809 – 19 April 1882) was an English [naturalist](https://en.wikipedia.org/wiki/Natural_history#Before_1900), [geologist](https://en.wikipedia.org/wiki/Geologist) and [biologist](https://en.wikipedia.org/wiki/Biologist),[[6]](https://en.wikipedia.org/wiki/Charles_Darwin#cite_note-6) best known for his contributions to [evolutionary biology](https://en.wikipedia.org/wiki/Evolution). His proposition that all species of life have descended from [common ancestors](https://en.wikipedia.org/wiki/Common_ancestors) is now widely accepted and considered a fundamental concept in science. In a joint publication with [Alfred Russel Wallace](https://en.wikipedia.org/wiki/Alfred_Russel_Wallace), he introduced his scientific theory that this [branching pattern](https://en.wikipedia.org/wiki/Phylogenetics) of [evolution](https://en.wikipedia.org/wiki/Evolution) resulted from a process that he called [natural selection](https://en.wikipedia.org/wiki/Natural_selection), in which the [struggle for existence](https://en.wikipedia.org/wiki/Struggle_for_existence) has a similar effect to the artificial selection involved in [selective breeding](https://en.wikipedia.org/wiki/Selective_breeding). Darwin has been described as one of the most influential figures in [human history](https://en.wikipedia.org/wiki/Human_history), and he was honoured by [burial in Westminster Abbey](https://en.wikipedia.org/wiki/Burials_and_memorials_in_Westminster_Abbey).

Darwin published his theory of evolution with compelling evidence in his 1859 book [*On the Origin of Species*](https://en.wikipedia.org/wiki/On_the_Origin_of_Species). By the 1870s, the scientific community and a majority of the educated public had accepted [evolution as a fact](https://en.wikipedia.org/wiki/Evolution_as_fact_and_theory). However, many favoured [competing explanations](https://en.wikipedia.org/wiki/The_eclipse_of_Darwinism) that gave only a minor role to natural selection, and it was not until the emergence of the [modern evolutionary synthesis](https://en.wikipedia.org/wiki/Modern_synthesis_(20th_century)) from the 1930s to the 1950s that a broad consensus developed in which natural selection was the basic mechanism of evolution. Darwin's scientific discovery is the unifying theory of the [life sciences](https://en.wikipedia.org/wiki/Life_sciences), explaining the [diversity of life](https://en.wikipedia.org/wiki/Diversity_of_life). Darwin's early interest in nature led him to neglect his medical education at the [University of Edinburgh](https://en.wikipedia.org/wiki/University_of_Edinburgh_Medical_School); instead, he helped to investigate [marine invertebrates](https://en.wikipedia.org/wiki/Marine_invertebrates). Studies at the [University of Cambridge](https://en.wikipedia.org/wiki/University_of_Cambridge) ([Christ's College](https://en.wikipedia.org/wiki/Christ%27s_College,_Cambridge)) encouraged his passion for [natural science](https://en.wikipedia.org/wiki/Natural_science).[His five-year voyage](https://en.wikipedia.org/wiki/Second_voyage_of_HMS_Beagle) on [HMS *Beagle*](https://en.wikipedia.org/wiki/HMS_Beagle) established him as an eminent geologist whose observations and theories supported [Charles Lyell](https://en.wikipedia.org/wiki/Charles_Lyell)'s [conception of gradual geological change](https://en.wikipedia.org/wiki/Uniformitarian), and publication of his [journal of the voyage](https://en.wikipedia.org/wiki/The_Voyage_of_the_Beagle) made him famous as a popular author.

Puzzled by the geographical distribution of wildlife and fossils he collected on the voyage, Darwin began detailed investigations and in 1838 conceived his theory of natural selection Although he discussed his ideas with several naturalists, he needed time for extensive research, and his geological work had priority. He was writing up his theory in 1858 when Alfred Russel Wallace sent him an essay that described the same idea, prompting immediate joint publication of [both their theories](https://en.wikipedia.org/wiki/On_the_Tendency_of_Species_to_form_Varieties;_and_on_the_Perpetuation_of_Varieties_and_Species_by_Natural_Means_of_Selection). Darwin's work established evolutionary descent with modification as the dominant scientific explanation of diversification in nature. In 1871 he examined [human evolution](https://en.wikipedia.org/wiki/Human_evolution) and [sexual selection](https://en.wikipedia.org/wiki/Sexual_selection) in [*The Descent of Man, and Selection in Relation to Sex*](https://en.wikipedia.org/wiki/The_Descent_of_Man,_and_Selection_in_Relation_to_Sex), followed by [*The Expression of the Emotions in Man and Animals*](https://en.wikipedia.org/wiki/The_Expression_of_the_Emotions_in_Man_and_Animals) (1872). His research on plants was published in a series of books, and in his final book, [*The Formation of Vegetable Mould, through the Actions of Worms*](https://en.wikipedia.org/wiki/The_Formation_of_Vegetable_Mould_through_the_Action_of_Worms) (1881), he examined [earthworms](https://en.wikipedia.org/wiki/Earthworm) and their effect on soil.

**Dian Fossey** (January 16, 1932 – c. December 26, 1985) was an American [primatologist](https://en.wikipedia.org/wiki/Primatologist) and [conservationist](https://en.wikipedia.org/wiki/Conservationist_movement) known for undertaking an extensive study of [mountain gorilla](https://en.wikipedia.org/wiki/Mountain_gorilla) groups from 1966 until her 1985 murder. She studied them daily in the mountain forests of [Rwanda](https://en.wikipedia.org/wiki/Rwanda), initially encouraged to work there by [paleoanthropologist](https://en.wikipedia.org/wiki/Paleoanthropologist) [Louis Leakey](https://en.wikipedia.org/wiki/Louis_Leakey). *Gorillas in the Mist*, a book published two years before her death, is Fossey's account of her scientific study of the [gorillas](https://en.wikipedia.org/wiki/Gorilla) at [Karisoke Research Center](https://en.wikipedia.org/wiki/Karisoke_Research_Center) and prior career. It was adapted into a [1988 film of the same name](https://en.wikipedia.org/wiki/Gorillas_in_the_Mist).

Fossey was a leading primatologist, and a member of the ["Trimates"](https://en.wikipedia.org/wiki/The_Trimates), a group of female scientists recruited by Leakey to study great apes in their natural environments, along with [Jane Goodall](https://en.wikipedia.org/wiki/Jane_Goodall) who studies [chimpanzees](https://en.wikipedia.org/wiki/Chimpanzee), and [Biruté Galdikas](https://en.wikipedia.org/wiki/Birut%C3%A9_Galdikas" \o "Biruté Galdikas), who studies [orangutans](https://en.wikipedia.org/wiki/Orangutan).

Fossey spent 20 years in Rwanda, where she supported conservation efforts, strongly opposed poaching and tourism in wildlife habitats, and made more people acknowledge the sapience of gorillas. Following the killing of a gorilla and subsequent tensions, she was murdered in her cabin at a remote camp in [Rwanda](https://en.wikipedia.org/wiki/Rwanda) in December 1985. Although Fossey's American research assistant was convicted *in absentia*, there is no consensus as to who killed her.

Her research and conservation work helped reduce the downward population trend in mountain gorillas.

**George Washington Carver** (c. 1864 – January 5, 1943) was an American [agricultural scientist](https://en.wikipedia.org/wiki/Agricultural_science) and inventor who promoted alternative crops to cotton and methods to prevent [soil depletion](https://en.wikipedia.org/wiki/Soil_depletion). He was the most prominent black scientist of the early 20th century.

While a professor at [Tuskegee Institute](https://en.wikipedia.org/wiki/Tuskegee_Institute), Carver developed techniques to improve soils depleted by repeated plantings of cotton. He wanted poor farmers to grow other crops, such as [peanuts](https://en.wikipedia.org/wiki/Peanut) and [sweet potatoes](https://en.wikipedia.org/wiki/Sweet_potatoes), as a source of their own food and to improve their quality of life. The most popular of his 44 practical bulletins for farmers contained 105 food recipes using peanuts. Although he spent years developing and promoting numerous products made from peanuts, none became commercially successful. Apart from his work to improve the lives of farmers, Carver was also a leader in promoting [environmentalism](https://en.wikipedia.org/wiki/Environmentalism).[[4]](https://en.wikipedia.org/wiki/George_Washington_Carver#cite_note-4) He received numerous honours for his work, including the [Spingarn Medal](https://en.wikipedia.org/wiki/Spingarn_Medal) of the [NAACP](https://en.wikipedia.org/wiki/NAACP). In an era of high racial polarization, his fame reached beyond the black community. He was widely recognized and praised in the white community for his many achievements and talents. In 1941, [*Time*](https://en.wikipedia.org/wiki/Time_(magazine)) magazine dubbed Carver a "Black [Leonardo](https://en.wikipedia.org/wiki/Leonardo_da_Vinci)".

Colour film of Carver shot in 1937 at the Tuskegee Institute by African American surgeon Allen Alexander was added to the [National Film Registry](https://en.wikipedia.org/wiki/National_Film_Registry) of the [Library of Congress](https://en.wikipedia.org/wiki/Library_of_Congress) in 2019. The 12 minutes of footage includes Carver in his apartment, office and laboratory, as well as images of him tending flowers and displaying his paintings. The film was digitized by The National Archives as part of its multi-year effort to preserve and make available the historically significant film collections of the National Park Service.

**Albert Einstein** (14 March 1879 – 18 April 1955) was a German-born [theoretical physicist](https://en.wikipedia.org/wiki/Theoretical_physics), widely acknowledged to be one of the greatest physicists of all time. Einstein is best known for developing the [theory of relativity](https://en.wikipedia.org/wiki/Theory_of_relativity), but he also made important contributions to the development of the theory of [quantum mechanics](https://en.wikipedia.org/wiki/Quantum_mechanics). Relativity and quantum mechanics are together the two pillars of [modern physics](https://en.wikipedia.org/wiki/Modern_physics). His [mass–energy equivalence](https://en.wikipedia.org/wiki/Mass%E2%80%93energy_equivalence) formula [*E* = *mc*2](https://en.wikipedia.org/wiki/Mass%E2%80%93energy_equivalence#Mass%E2%80%93velocity_relationship), which arises from relativity theory, has been dubbed "the world's most famous equation". His work is also known for its influence on the [philosophy of science](https://en.wikipedia.org/wiki/Philosophy_of_science). He received the 1921 [Nobel Prize in Physics](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physics) "for his services to theoretical physics, and especially for his discovery of the law of the [photoelectric effect](https://en.wikipedia.org/wiki/Photoelectric_effect)", a pivotal step in the development of quantum theory. His intellectual achievements and originality resulted in "Einstein" becoming synonymous with "genius"

In 1905, a year sometimes described as his [*annus mirabilis*](https://en.wikipedia.org/wiki/Annus_mirabilis) ('miracle year'), Einstein published [four groundbreaking papers](https://en.wikipedia.org/wiki/Annus_Mirabilis_papers). These outlined the theory of the photoelectric effect, explained [Brownian motion](https://en.wikipedia.org/wiki/Brownian_motion), introduced [special relativity](https://en.wikipedia.org/wiki/Special_relativity), and demonstrated mass-energy equivalence. Einstein thought that the laws of [classical mechanics](https://en.wikipedia.org/wiki/Classical_mechanics) could no longer be reconciled with those of the [electromagnetic field](https://en.wikipedia.org/wiki/Electromagnetic_field), which led him to develop his special theory of relativity. He then extended the theory to gravitational fields; he published a paper on [general relativity](https://en.wikipedia.org/wiki/General_relativity) in 1916, introducing his theory of gravitation. In 1917, he applied the general theory of relativity to model the structure of the universe. He continued to deal with problems of [statistical mechanics](https://en.wikipedia.org/wiki/Statistical_mechanics) and quantum theory, which led to his explanations of particle theory and the [motion of molecules](https://en.wikipedia.org/wiki/Brownian_motion). He also investigated the thermal properties of light and the quantum theory of radiation, which laid the foundation of the [photon](https://en.wikipedia.org/wiki/Photon) theory of light. However, for much of the later part of his career, he worked on two ultimately unsuccessful endeavours. First, despite his great contributions to quantum mechanics, he opposed what it evolved into, objecting that nature "does not play dice". Second, he attempted to devise a [unified field theory](https://en.wikipedia.org/wiki/Unified_field_theory) by generalizing his geometric theory of gravitation to include electromagnetism. As a result, he became increasingly isolated from the mainstream of modern physics.

Einstein was born in the [German Empire](https://en.wikipedia.org/wiki/German_Empire), but moved to Switzerland in 1895, forsaking his German citizenship (as a subject of the [Kingdom of Württemberg](https://en.wikipedia.org/wiki/Kingdom_of_W%C3%BCrttemberg)) the following year. In 1897, at the age of 17, he enrolled in the mathematics and physics teaching diploma program at the Swiss [Federal polytechnic school](https://en.wikipedia.org/wiki/ETH_Zurich) in [Zürich](https://en.wikipedia.org/wiki/Z%C3%BCrich), graduating in 1900. In 1901, he acquired Swiss citizenship, which he kept for the rest of his life, and in 1903 he secured a permanent position at the [Swiss Patent Office](https://en.wikipedia.org/wiki/Swiss_Federal_Institute_of_Intellectual_Property) in Bern. In 1905, he was awarded a PhD by the [University of Zurich](https://en.wikipedia.org/wiki/University_of_Zurich). In 1914, Einstein moved to [Berlin](https://en.wikipedia.org/wiki/Berlin) in order to join the [Prussian Academy of Sciences](https://en.wikipedia.org/wiki/Prussian_Academy_of_Sciences) and the [Humboldt University of Berlin](https://en.wikipedia.org/wiki/Humboldt_University_of_Berlin). In 1917, Einstein became director of the [Kaiser Wilhelm Institute for Physics](https://en.wikipedia.org/wiki/Kaiser_Wilhelm_Institute_for_Physics); he also became a German citizen again, this time Prussian. In 1933, while Einstein was visiting the United States, [Adolf Hitler](https://en.wikipedia.org/wiki/Adolf_Hitler) came to power in Germany. Einstein, of Jewish origin, objected to the policies of the newly elected [Nazi government](https://en.wikipedia.org/wiki/Nazi_Germany); he settled in the United States and became an American citizen in 1940. On the eve of [World War II](https://en.wikipedia.org/wiki/World_War_II), he endorsed [a letter](https://en.wikipedia.org/wiki/Einstein%E2%80%93Szil%C3%A1rd_letter) to President [Franklin D. Roosevelt](https://en.wikipedia.org/wiki/Franklin_D._Roosevelt) alerting him to the potential [German nuclear weapons program](https://en.wikipedia.org/wiki/German_nuclear_weapons_program) and recommending that the US begin [similar research](https://en.wikipedia.org/wiki/Manhattan_Project). Einstein supported the [Allies](https://en.wikipedia.org/wiki/Allies_of_World_War_II) but generally denounced the idea of [nuclear weapons](https://en.wikipedia.org/wiki/Nuclear_weapons).

**Dr. Alexa Irene Canady** (born November 7, 1950) is a retired American [medical doctor](https://en.wikipedia.org/wiki/Medical_doctor) specializing in [pediatric neurosurgery](https://en.wikipedia.org/wiki/Pediatric_neurosurgery" \o "Pediatric neurosurgery). She was born in [Lansing, Michigan](https://en.wikipedia.org/wiki/Lansing,_Michigan) and earned both her bachelors and medical degree from the [University of Michigan](https://en.wikipedia.org/wiki/University_of_Michigan). After completing her residency at the [University of Minnesota](https://en.wikipedia.org/wiki/University_of_Minnesota) in 1981, she became the first [black woman](https://en.wikipedia.org/wiki/Black_people) to become a neurosurgeon. This came after [Ruth Kerr Jakoby](https://en.wikipedia.org/wiki/Ruth_Kerr_Jakoby) became the first American woman to be board certified in neurosurgery in 1961.

Canady specialized in [pediatric neurosurgery](https://en.wikipedia.org/wiki/Pediatric_neurosurgery" \o "Pediatric neurosurgery) and was the chief of neurosurgery at the Children's Hospital in Michigan from 1987 until her partial retirement in 2001. In addition to surgery, she also conducted research and was a professor of neurosurgery at [Wayne State University](https://en.wikipedia.org/wiki/Wayne_State_University). After her retirement, she moved to Florida and maintained a part-time practice at Pensacola's [Sacred Heart Hospital](https://en.wikipedia.org/w/index.php?title=Sacred_Heart_Hospital_(Pensacola)&action=edit&redlink=1) until her full retirement in January 2012. In 1989, Canady was inducted into the [Michigan Women's Hall of Fame](https://en.wikipedia.org/wiki/Michigan_Women%27s_Hall_of_Fame), and in 1993 she also received the [American Medical Women's Association](https://en.wikipedia.org/wiki/American_Medical_Women%27s_Association) President's Award. Dr. Canady was known amongst her peers as a patient-focused surgeon who cared deeply about each of her patients.

**Alexander Graham Bell** (born **Alexander Bell**; March 3, 1847 – August 2, 1922) was a Scottish-born inventor, scientist, and engineer who is credited with patenting the first practical [telephone](https://en.wikipedia.org/wiki/Telephone). He also co-founded the [American Telephone and Telegraph Company](https://en.wikipedia.org/wiki/AT%26T_Corporation) (AT&T) in 1885.

[Bell's father](https://en.wikipedia.org/wiki/Alexander_Melville_Bell), grandfather, and brother had all been associated with work on [elocution](https://en.wikipedia.org/wiki/Elocution) and speech and both his mother and wife were deaf; profoundly influencing Bell's life's work. His research on hearing and speech further led him to experiment with hearing devices which eventually culminated in Bell being awarded the first [U.S. patent](https://en.wikipedia.org/wiki/United_States_patent_law) for the telephone, on March 7, 1876. Bell considered his invention an intrusion on his real work as a scientist and refused to have a telephone in his study.

Many other inventions marked Bell's later life, including groundbreaking work in [optical telecommunications](https://en.wikipedia.org/wiki/Free-space_optical_communication), [hydrofoils](https://en.wikipedia.org/wiki/Hydrofoil), and [aeronautics](https://en.wikipedia.org/wiki/Aeronautics). Although Bell was not one of the 33 founders of the [National Geographic Society](https://en.wikipedia.org/wiki/National_Geographic_Society), he had a strong influence on the magazine while serving as the second president from January 7, 1898, until 1903.

Beyond his work in engineering, Bell had a deep interest in the emerging science of heredity.

**Leonardo di ser Piero da Vinci** (15 April 1452 – 2 May 1519) was an Italian [polymath](https://en.wikipedia.org/wiki/Polymath) of the [High Renaissance](https://en.wikipedia.org/wiki/High_Renaissance) who was active as a painter, [draughtsman](https://en.wikipedia.org/wiki/Drawing), engineer, scientist, theorist, sculptor and architect. While his fame initially rested on his achievements as a painter, he also became known for [his notebooks](https://en.wikipedia.org/wiki/Leonardo_da_Vinci#Journals_and_notes), in which he made drawings and notes on a variety of subjects, including anatomy, astronomy, botany, cartography, painting, and [paleontology](https://en.wikipedia.org/wiki/Paleontology" \o "Paleontology). Leonardo's [genius](https://en.wikipedia.org/wiki/Genius) epitomized the [Renaissance humanist](https://en.wikipedia.org/wiki/Renaissance_humanism) ideal, and his [collective works](https://en.wikipedia.org/wiki/List_of_works_by_Leonardo_da_Vinci) compose a contribution to later generations of artists matched only by that of his younger contemporary, [Michelangelo](https://en.wikipedia.org/wiki/Michelangelo).

Born [out of wedlock](https://en.wikipedia.org/wiki/Legitimacy_(family_law)) to a successful [notary](https://en.wikipedia.org/wiki/Civil_law_notary) and a lower-class woman in, or near, [Vinci](https://en.wikipedia.org/wiki/Vinci,_Tuscany), he was educated in Florence by the Italian painter and sculptor [Andrea del Verrocchio](https://en.wikipedia.org/wiki/Andrea_del_Verrocchio). He began his career in the city, but then spent much time in the service of [Ludovico Sforza](https://en.wikipedia.org/wiki/Ludovico_Sforza) in Milan. Later, he worked in Florence and Milan again, as well as briefly in [Rome](https://en.wikipedia.org/wiki/Rome), all while attracting a [large following](https://en.wikipedia.org/wiki/Leonardeschi) of imitators and students. Upon the invitation of [Francis I](https://en.wikipedia.org/wiki/Francis_I_of_France), he spent his last three years in France, where he died in 1519. Since his death, there has not been a time where his achievements, diverse interests, [personal life](https://en.wikipedia.org/wiki/Personal_life_of_Leonardo_da_Vinci), and empirical thinking have failed to incite interest and admiration, making him a frequent [namesake](https://en.wikipedia.org/wiki/List_of_things_named_after_Leonardo_da_Vinci) and [subject in culture](https://en.wikipedia.org/wiki/Cultural_references_to_Leonardo_da_Vinci).

Leonardo is among the greatest painters in the [history of art](https://en.wikipedia.org/wiki/History_of_art) and is often credited as the founder of the High Renaissance.[[3]](https://en.wikipedia.org/wiki/Leonardo_da_Vinci#cite_note-FOOTNOTEKemp2003-5) Despite having many [lost works](https://en.wikipedia.org/wiki/Lost_artworks) and [less than 25 attributed major works](https://en.wikipedia.org/wiki/List_of_works_by_Leonardo_da_Vinci#Major_extant_works)—including numerous [unfinished works](https://en.wikipedia.org/wiki/Unfinished_creative_work)—he created some of the most influential paintings in [Western art](https://en.wikipedia.org/wiki/Western_art). His [magnum opus](https://en.wikipedia.org/wiki/Magnum_opus), the [*Mona Lisa*](https://en.wikipedia.org/wiki/Mona_Lisa), is his best known work and often regarded as the world's most famous painting. [*The Last Supper*](https://en.wikipedia.org/wiki/The_Last_Supper_(Leonardo)) is the most reproduced religious painting of all time and his [*Vitruvian Man*](https://en.wikipedia.org/wiki/Vitruvian_Man) drawing is also regarded as a [cultural icon](https://en.wikipedia.org/wiki/Cultural_icon). In 2017, *[Salvator Mundi](https://en.wikipedia.org/wiki/Salvator_Mundi_(Leonardo)" \o "Salvator Mundi (Leonardo))*, attributed in whole or part to Leonardo, was sold at auction for US$450.3 million, setting a new record for the [most expensive painting ever sold](https://en.wikipedia.org/wiki/List_of_most_expensive_paintings) at public auction.

Revered for his [technological ingenuity](https://en.wikipedia.org/wiki/Science_and_inventions_of_Leonardo_da_Vinci), he conceptualized flying machines, a type of [armored fighting vehicle](https://en.wikipedia.org/wiki/Leonardo%27s_fighting_vehicle" \o "Leonardo's fighting vehicle), concentrated solar power, an adding machine, and the double hull. Relatively few of his designs were constructed or even feasible during his lifetime, as the modern scientific approaches to metallurgy and engineering were only in their infancy during the [Renaissance](https://en.wikipedia.org/wiki/Italian_Renaissance). Some of his smaller inventions, however, entered the world of manufacturing unheralded, such as an automated bobbin winder and a machine for testing the tensile strength of wire. He made substantial discoveries in [anatomy](https://en.wikipedia.org/wiki/Anatomy), [civil engineering](https://en.wikipedia.org/wiki/Civil_engineering), [hydrodynamics](https://en.wikipedia.org/wiki/Fluid_dynamics), [geology](https://en.wikipedia.org/wiki/Geology), [optics](https://en.wikipedia.org/wiki/Optics), and [tribology](https://en.wikipedia.org/wiki/Tribology), but he did not publish his findings and they had little to no direct influence on subsequent science.