Isaac Newton

Great Physicist

# About Newton

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"). 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.

Newton built the first practical reflecting telescope and developed a sophisticated theory of color based on the observation that a prism separates white light into the colors 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.

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. He refused to take holy orders in the Church of England, unlike most members of the Cambridge faculty of the day. 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much of his time to the study of alchemy and biblical chronology, but most of his work in those areas remained unpublished until long after his death.

# His Works

Newton's work has been said "to distinctly advance every branch of mathematics then studied". His work on the subject, usually referred to as fluxions or calculus, seen in a manuscript of October 1666, is now published among Newton's mathematical papers. His work De analysi per aequationes numero terminorum infinitas, sent by Isaac Barrow to John Collins in June 1669, was identified by Barrow in a letter sent to Collins that August as the work "of an extraordinary genius and proficiency in these things".

He showed that colored light does not change its properties by separating out a colored beam and shining it on various objects, and that regardless of whether reflected, scattered, or transmitted, the light remains the same color. Thus, he observed that color is the result of objects interacting with already-colored light rather than objects generating the color themselves. This is known as Newton's theory of color.

The Principia was published on 5 July 1687 with encouragement and financial help from Halley. In this work, Newton stated the three universal laws of motion. Together, these laws describe the relationship between any object, the forces acting upon it and the resulting motion, laying the foundation for classical mechanics. They contributed to many advances during the Industrial Revolution which soon followed and were not improved upon for more than 200 years. Many of these advances continue to be the underpinnings of non-relativistic technologies in the modern world. He used the Latin word gravitas (weight) for the effect that would become known as gravity, and defined the law of universal gravitation.

# His Later Life

Newton moved to London to take up the post of warden of the Royal Mint in 1696, a position that he had obtained through the patronage of Charles Montagu, 1st Earl of Halifax, then Chancellor of the Exchequer. He took charge of England's great recoining, trod on the toes of Lord Lucas, Governor of the Tower, and secured the job of deputy comptroller of the temporary Chester branch for Edmond Halley. Newton became perhaps the best-known Master of the Mint upon the death of Thomas Neale in 1699, a position Newton held for the last 30 years of his life. These appointments were intended as sinecures, but Newton took them seriously. He retired from his Cambridge duties in 1701, and exercised his authority to reform the currency and punish clippers and counterfeiters.

As a result of a report written by Newton on 21 September 1717 to the Lords Commissioners of His Majesty's Treasury, the bimetallic relationship between gold coins and silver coins was changed by royal proclamation on 22 December 1717, forbidding the exchange of gold guineas for more than 21 silver shillings. This inadvertently resulted in a silver shortage as silver coins were used to pay for imports, while exports were paid for in gold, effectively moving Britain from the silver standard to its first gold standard. It is a matter of debate as to whether he intended to do this or not. It has been argued that Newton conceived of his work at the Mint as a continuation of his alchemical work.

Newton died in his sleep in London on 20 March 1727 (OS 20 March 1726; NS 31 March 1727). He was given a ceremonial funeral, attended by nobles, scientists, and philosophers, and was buried in Westminster Abbey among kings and queens. He is also the first scientist to be buried in the abbey. Voltaire may have been present at his funeral. A bachelor, he had divested much of his estate to relatives during his last years, and died intestate. His papers went to John Conduitt and Catherine Barton. After his death, Newton's hair was examined and found to contain mercury, probably resulting from his alchemical pursuits. Mercury poisoning could explain Newton's eccentricity in late life.

# His Publishes

His publishes , including the ones that posted posthumously (in a different list), is listed in this section .

### Published in his lifetime

* *De analysi per aequationes numero terminorum infinitas* (1669, published 1711)
* *Of Natures Obvious Laws & Processes in Vegetation* (unpublished, c. 1671–75)
* *De motu corporum in gyrum* (1684)
* *Philosophiæ Naturalis Principia Mathematica* (1687)
* *Scala graduum Caloris. Calorum Descriptiones & signa* (1701)
* *Opticks* (1704)
* *Reports as Master of the Mint* (1701–1725)
* *Arithmetica Universalis* (1707)

### Published posthumously

* *De mundi systemate* (*The System of the World*) (1728)
* *Optical Lectures* (1728)
* *The Chronology of Ancient Kingdoms Amended* (1728)
* *Observations on Daniel and The Apocalypse of St. John* (1733)
* *Method of Fluxions* (1671, published 1736)
* *An Historical Account of Two Notable Corruptions of Scripture* (1754)
* et cetera

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# Sources

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