

Science in the 1600s and 1700s

The **1600s** are known as the century of the 'scientific revolution'. The revolution is thought to have begun in the late Renaissance with the Copernican Revolution (1540s) and to have ended with the discoveries of Sir Isaac Newton (1680s), although its repercussions continue throughout the 1600s and 1700s. Innovation occurred across the fields of mathematics, physics, astronomy and biology. Central to the revolution was the work of Galileo Galilei and Johannes Kepler, who developed the Copernican model and established its credibility. Kepler used detailed calculations to prove that the planets move around the Sun and not in circular orbits, but in elliptical ones. Galileo carefully constructed a solid case for heliocentrism. He also made significant contributions toward the understanding of Jupiter and its moons, of Venus, sunspots and Earth's moon, as well as laws concerning motion.

In Britain, in 1620, Sir Francis Bacon published his key work *Novum Organum* in which he expressed the idea that by understanding and following the laws of nature, man could dominate his environment. He wrote extensively on empirical scientific method – in order to test hypotheses, scientists should set up experiments to manipulate nature and attempt to prove their hypotheses wrong.

In 1660, a group of talented scientists and amateur enthusiasts in Britain founded the Royal Society, which pledged to research and innovate in all fields of technology. Founding and early members of the Society included the architect Christopher Wren and the chemist Robert Boyle. The presence of many amateurs amongst the members did leave it open to ridicule at times, however the notion of scientific research based on group of activity, meticulous documentation, corroboration of results and public dissemination of outcomes was to become respected and standard practice. The Society's periodical "*Philosophical Transactions of the Royal Society*" is generally considered the first scientific journal.

The year 1675 saw the establishment of the Royal Observatory at Greenwich (London). John Flamsteed was appointed the first Astronomer Royal with the task of discovering how to measure longitude at sea. Over the following years the telescopes and instruments at Greenwich would assist great astronomers and mathematicians such as Edmond Halley and Sir Isaac Newton. Newton published his ground-breaking *Mathematical Principles of Natural Philosophy* on the laws governing gravity and motion in 1687. Newton's *Principles* formulated the first set of unified scientific laws of motion and universal gravitation, which would dominate views of the physical universe for the next three hundred years.

In Europe, major advances were made in the fields of optics and electricity. The **1700s** saw tightening of the relationship between commerce, industry and science. The result was the beginning of a rapid technological development, which would flower into the Industrial Revolution.

(taken from the textbook *White Spaces 1* by D. Ellis, Loescher editore, 2017)