Leonhard Euler

Born: 15 April 1707 in Basel, Switzerland
Died: 18 Sept 1783 in St Petersburg, Russia

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Euler's father wanted his son to follow him into the church and sent him to the University of Basel to prepare for the ministry. However geometry soon became his favourite subject. Euler obtained his father's consent to change to mathematics after Johann Bernoulli had used his persuasion. Bernoulli became his teacher.

He joined the St. Petersburg Academy of Science in 1727, two years after it was founded by Catherine I the wife of Peter the Great. Euler served as a medical lieutenant in the Russian navy from 1727 to 1730. In St Petersburg he lived with Daniel Bernoulli. He became professor of physics at the academy in 1730 and professor of mathematics in 1733. He married and left Bernoulli's house in 1733. He had 13 children altogether of which 5 survived their infancy. He claimed that he made some of his greatest discoveries while holding a baby on his arm with other children playing round his feet.

The publication of many articles and his book mechanica (1736-37), which extensively presented Newtonian dynamics in the form of mathematical analysis for the first time, started Euler on the way to major mathematical work.

In 1741, at the invitation of Frederick the Great, Euler joined the Berlin Academy of Science, where he remained

for 25 years. Even while in Berlin he received part of his salary from Russia and never got on well with Frederick. During his time in Berlin, he wrote over 200 articles, three books on mathematical analysis, and a popular scientific publication Letters to a Princess of Germany (3 vols., 1768-72).

In 1766 Euler returned to Russia. He had been arguing with Frederick the Great over academic freedom and Frederick was greatly angered at his departure. Euler lost the sight of his right eye at the age of 31 and soon after his return to St Petersburg he became almost entirely blind after a cataract operation. Because of his remarkable memory was able to continue with his work on optics, algebra, and lunar motion. Amazingly after 1765 (when Euler was 58) he produced almost half his works despite being totally blind.

After his death in 1783 the St. Petersburg Academy continued to publish Euler's unpublished work for nearly 50 more years. Euler made large bounds in modern analytic geometry and trigonometry. He made decisive and formative contributions to geometry, calculus and number theory. In number theory he did much work in correspondence with Goldbach. He integrated Leibniz's differential calculus and Newton's method of fluxions into mathematical analysis. In number theory he stated the prime number theorem and the law of biquadratic reciprocity.

He was the most prolific writer of mathematics of all time. His complete works contains 886 books and papers.

We owe to him the notations f(x) (1734), e for the base of natural logs (1727), i for the square root of -1 (1777), the usual symbol for pi, (Sigma) for summation (1755) etc. He also introduced beta and gamma functions, integrating factors for differential equations etc.

He studied continuum mechanics, lunar theory with Clairaut, the three body problem, elasticity, acoustics, the wave theory of light, hydraulics, music etc. He laid the foundation of analytical mechanics, especially in his Theory of the Motions of Rigid Bodies (1765).
