**MATHEMATICS IN THE 18th. CENTURY-SELECTIVE CHRONOLOGY**

1707- Leonhard **Euler** born near Basel, Switzerland- his father was a pastor.

1713-Posthumous publication of *Ars Conjectandi*, by Jakob **Bernouilli** (1654-1705), a treatise on probability.

1714- Brooke **Taylor** (1685-1731), of `Taylor's formula' fame (published 1715) publishes a paper dealing with the motion of a taut vibrating string.

1721- Euler studies at the University of Basel, and is advised in his studies by Johann Bernouilli (1667-1748). He earns a master's degree in philosophy and enters divinity school, but quits in favor of math.

1725-**Daniel Bernouilli** (1700-1782, Johann's son) assumes the chair in mathematics at the new Academy of Sciences in St. Petersburg (Russia).

1727-Euler arrives in St. Petersburg, initially to occupy the chair in physiology/medicine. In 1733 Daniel Bernouilli gets a position in Switzerland, and Euler is named to the mathematics chair.

1730- Euler's paper on the factorial function

1733.-Euler marries Katharina Gesell, daughter of a Swiss painter living in Russia. They would be together until her death in 1773, and have 13 children (only 5 survived to adolescence, 3 survived their parents.)

1733- Abraham **de Moivre** (1667-1754) publishes a version of the `central limit theorem', as well as an approximation to the factorial equivalent to `Stirling's formula', published by James **Stirling** (1693-1770) in 1730.

1734- Bishop George Berkeley publishes *The Analyst,* which includes an attack on the foundations of calculus (infinitesimals.)

1735- Euler solves the `Basel Problem' (sum of reciprocals of squares.)

1736- Euler's textbook *Mechanica;* analytical development of Newton's dynamics of a point mass.

1737-Euler product formula, and the divergence of the series of prime reciprocals.

1736-37- Expedition to northern Sweden, led by Pierre de **Maupertuis** (1698-1759), with the goal of measuring a degree of longitude; together with an expedition to Peru the previous year, verifies Newton's `oblate sphere' claim.

1738-Euler loses vision in his right eye. Daniel Bernouilli publishes *Hydrodynamica,* a treatise on fluid mechanics and the kinetic theory of gases.

1741-Euler accepts offer from Frederick the Great to join the Berlin Academy.

1743-Jean **d'Alembert** (1717-1783) publishes *Traité de Dynamique.*

1743- Alexis **Clairaut** (1713-1765), *Theorie de la figure de la terre… principes de l'hydrodynamique.*

1744-Euler publishes *A method for discovering curved lines having a maximum or minimum property, or the solution of the isoperimetric problem in its widest sense-* treatise on the calculus of variations.

1744- Maupertuis publishes a paper containing a `least action principle'; the principle had been previously stated by Euler in an appendix to his treatise, but Maupertuis claims priority.

1746-Maupertuis appointed president of the Berlin Academy. D'Alembert named co-editor (with Diderot) of the *Encyclopédie,* which began to appear in 1751. In the entry `Différentiel' (1754), the derivative is defined as a limit of difference quotients explicitly for the first time.

1747- Jean d'Alembert publishes *Investigations on the curve formed by a vibrating string.* This would give rise to a series of papers by Euler (1749, 1753), d'Alembert ( 1750) and D. Bernouilli (1753), including a discussion of how wide the class of `curves' that can be represented by an infinite trigonometric series is.

1748- Publication of Euler's textbook *introduction to Analysis of the Infinite.*

1751- The book *Produzione matematiche* by Count **Fagnano** (1682-1766), including an addition theorem for elliptic integrals, reaches the Berlin Academy; Euler is asked to comment on it.

1752-Voltaire (also a member of the Berlin Academy) attacks Maupertuis in his *Diatribe du Docteur Akakia, médecin du pape.* This effectively ends Maupertuis' career at the Academy.

1752- Euler derives the equations of fluid mechanics, including use of the `Laplace operator'.

1754-D'Alembert appointed *sécretaire perpetuel* of the French Academy.

1755-Joseph-Louis **Lagrange** (1736-1813) writes to Euler with results on the calculus of variations. His first paper on the subject would appear in 1760. Euler's *Institutiones calculi differentialis* published.

1757- Euler publishes *Remarks on comparing arcs of elliptical curves,* his first paper on elliptic integrals.

1765-Euler's treatise *Teoria motus,* on the dynamics of rigid bodies.

1766- Euler leaves Berlin to return to his position at the St. Petersburg Academy. He is succeeded (as Director of mathematics in Berlin) by Lagrange. From 1768-74, the three-volume text *Institutiones calculi integralis* was published. By 1771 Euler was virtually blind.

1770- Lagrange, *Réflexions sur la resolution algébrique des equations.* Unified treatment of the algebra involved in the known algorithms for solving polynomial equations of degree up to 4.

1773-Pierre-Simon **Laplace** (1749-1827) elected to the French Academy. From the mid-1770s to the mid 1780s he would develop work on celestial mechanics, probability (central limit theorem, published 1812)

1777- Carl Friedrich **Gauss** born in Brunswick (Duchy of Brunswick-Wolfenbüttel).

1783- Euler dies (September 18) of a massive stroke, and is laid to rest in St. Petersburg.

1784-Lagrange, *Mécanique Analytique*.- first unified, completely analytical approach to classical mechanics, emphasizing variational principles. It includes Lagrange's formulation of fluid mechanics.

1787- Lagrange appointed to a position at the Paris Academy; leaves Berlin.

1796- Entry in Gauss's mathematical diary recording his discovery that the heptadecagon is constructible.

1796- Laplace's nature-philosophical paper *Exposition du système du monde* (`nebular hypothesis').

1797-Lagrange's *Théorie des fonctions analytiques* published- it includes an algebraic approach to calculus, with power series expansions as the basic object.

1799- Publication of the first of five volumes of Laplace's treatise *Mécanique Celeste.*