

Key Milestones in History of Science and Philosophy

The traditional "World View" was that the universe followed the principles of these three people.

335 BC	Aristotle	"publishes"	"Organon" (including Logic)
"Tertium non datur" - law of excluded middle, $p \vee \neg p$ is always true even when p indeterminate			
300 BC	Euclid	"publishes"	"Elements"
Foundations of geometric and axiomatic proof			
1704	Newton	publishes	"Opticks"
Light is corpuscular - the photon.			

These principles start to crumble from 1800 onwards

1800	Young	lectures	"On the Theory of Light and Colours"
Light exhibits an interference pattern - it's a wave. A direct challenge to Newton			
1848	Fizeau	conducts	terrestrial experiments on speed of light
Determines around 313 000 meters/sec - too high. Later refined by others.			
1854	Riemann	publishes	"on the hypotheses on which geometry is based"
Establishes alternatives to Euclidean geometry. Purely theoretical. Maths theory usually precedes the application			
1865	Maxwell	publishes	"A dynamical theory of the Electromagnetic Field"
Four equations summarising all that was known about magnetism and electricity. Establishes light as an electromagnetic wave travelling at a predicted 300 000 metres/sec			
1887	Michelson and Morley	conducts	experiments on "c" when the observer is moving
The speed seems unaffected by relative motion - always constant. Light is not obeying Newtonian principles.			
1900	Planck	publishes	Planck's law for Black Body radiation
"Solves" the "ultraviolet collapse" problem by introducing the concept of the "quantum". A mathematical "fix" later emerges as a fundamental principle of the sub-atomic world.			
1905	Einstein	publishes	"On electrodynamics of moving bodies"
Special Theory indicating there is no universal Newtonian "time".			
1916	Einstein	publishes	General Theory of Relativity
The Universe is not Euclidean . Space is curved. Uses Riemann's geometries.			
1924	de Broglie	Ph.D. Thesis	All matter has wave properties
The "world" does not follow Aristotlian principles. Specifically photons appear to have properties of both particles and waves.			
1926	Schrödinger	Derives the wave equation for matter ψ (psi) (at age 39)	
Later it is established ψ^2 is a probability density function.			
1927	Heisenberg	introduces	The Uncertainty Principle
For certain pairs of physical properties the more accurately one, the more indeterminate the other This is the death-knell to the Newtonian view of science and philosophy.			

Modern Quantum Mechanics - particles are

either	bosons , integer spin, symmetric, gregarious, glue, attract
examples	photons and gluons - they have even wave functions
features	probability of being close together is higher than being separated
or	fermions , half integer "spin", antisymmetric, antisocial, repel
examples	protons, neutrons, electrons - they have odd wave functions
features	probability of occupying same space is zero.

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