History of Modern Physics 1880-1930

Physicist	Nat.	date	Type	Description
Thomas Young	🇬🇧	1801	🔎	Demonstrated the wave nature of light using the double-slit experiment
Amedeo Avogadro	🇮🇹	1811	✏️	Molecular theory of gasses. Gasses at the same temperature and volume contain the same number of molecules.
Robert Brown	🇬🇧	1827	🔎	Observed jittery motion of minute particles inside pollen grains (now called Brownian motion but previously observed by Jan Ingenhouse in 1784)
James Maxwell	🇬🇧	1873	✏️	Developed concise equations describing electricity and magnetism (Maxwell's equations). Predicts electromagnetic waves that travel at the speed of light.
Albert Michelson	🇺🇸	1887	🔎	Conducted the Michelson-Morely experiment in which he and Morley used an interferometer to show the ether does not exist.
Johannes Rydberg	🇸🇪	1888	🔎	Found an empirical formula describing the wavelengths of spectral lines produced by hydrogen. Rydberg constant is named for him.
Wilhelm Röntgen	🇩🇪	1895	🔎	Produced and detected x-rays (also called Röntgen rays), a new form of electromagnetic radiation. 1901 Nobel Prize.
Pieter Zeeman	🇳🇱	1896	🔎	Discovery of Zeeman effect. Many spectral lines can be sllit into multiple lines in the presence of a magnetic field. 1902 Nobel Prize.
Henri Becquerel	🇫🇷	1896	🔎	Discovery of radioactivity. 1903 Nobel Prize (shared with Marie and Pierre Curie).
J.J. Thomson	🇬🇧	1897	🔎	Discovery of the electron. Cathode ray experiments showed the rays are made of particles (electrons) ejected from atoms in the electrodes. 1906 Nobel Prize.
Marie Curie	🇵🇱	1898	🔎	Discovery of radioactive elements Polonium and Radium. 1903 Nobel Prize (shared withe Becquerel and Pierre Curie).
Ernest Rutherford	🇬🇧	1899	🔎	Discovery of alpha and beta rays. Showed that uranium gives off two kinds of radiation.
Paul Villard	🇫🇷	1900	🔎	Discovery of gamma rays. Showed that this form of radiation from radioactive decay was not electrically charged, but could not penetrate as far as x-rays.
Lord Rayleigh	🇬🇧	1900	✏️	Derivation of Rayleigh-Jeans law of radiation from a blackbody using thermo-dynamics. Extension to short wavelengths led to the "ultraviolet catastrophe"
Max Planck	🇩🇪	1900	✏️	Blackbody radiation formula. Assumed quantized energies for light waves $E = hf$, where h is Planck's constant. Resolved ultraviolet catastrophe
Hendrick Lorentz	🇳🇱	1904	✏️	Derived the Lorentz transformation to relating observers' measurements of space and time (later becomes part of Special Relativity). 1902 Nobel Prize.
Albert Einstein	🇨🇭	1905	✏️	Theory of Brownian motion: random motions are due to collisions with molecules
Albert Einstein	🇨🇭	1905	✏️	Theory of photoelectric effect: electromagnetic waves act like particles. 1921 Nobel Prize.
Albert Einstein	🇨🇭	1905	✏️	Special theory of relativity. One's measurements of space and time depend on one's relative motion to another observer. Equivalence of mass and energy
Robert Millikan	🇺🇸	1909	🔎	Millikan oil drop experiment. Measurement of the charge of the electron using falling oil drops in electric field. 1923 Nobel Prize.

Charles Wilson	🇬🇧	1911	🔎	Invention of the cloud chamber. Photographed particle tracks for α and β particles. 1927 Nobel Prize (shared with Compton).
Ernest Rutherford	🇬🇧	1911	🔎	Rutherford scattering of alpha particles from a gold foil. Evidence for atomic nucleus and the proton.
William L. Bragg	🇦🇺	1912	🔎	Bragg diffraction. Showed that x-rays exhibit diffraction patterns when they pass through crystal lattices. Analyzed crystal structure. 1915 Nobel Prize.
Niels Bohr	🇩🇰	1913	✏️	Bohr-Rutherford model of the atom. Electrons orbit central nucleus with quantized angular momenta. Reproduces Balmer spectrum. 1922 Nobel Prize.
Albert Einstein	🇨🇭	1916	✏️	General theory of relativity. Extends special relativity to include gravity and accelerating reference frames.
Arthur Compton	🇺🇸	1922	🔎	Compton effect. Showed that x-rays act like particles when they scatter off free electrons. 1927 Nobel Prize (shared with Wilson).
Luis de Broglie	🇫🇷	1922	✏️	Proposed wave nature of matter, thus creating field of wave mechanics.
Wolfgang Pauli	🇦🇹	1925	✏️	Formulated the Pauli exclusion principle, which says that no two electrons can exist in the same quantum state.
Werner Heisenberg	🇩🇪	1925	✏️	Development of matrix mechanics, which was the first formalization of quantum mechanics. 1932 Nobel Prize.
Erwin Schrödinger	🇦🇹	1926	✏️	Wave mechanics approach to quantum physics. Schrödinger equation. Wave functions for hydrogen atom, harmonic oscillator. 1933 Nobel Prize.
Max Born	🇩🇪	1926	✏️	Probabilistic interpretation of wave function. 1954 Nobel Prize.
George Thomson	🇬🇧	1927	🔎	Demonstrated wave nature of electrons by diffracting them through gold foil. 1937 Nobel Prize.
George Uhlenbeck	🇳🇱	1927	✏️	Theoretical discovery of electron spin (with Samuel Goudsmit 🇩🇰). Provided explanation of doublets in spectral lines.
Werner Heisenberg	🇩🇪	1927	✏️	Uncertainty principle. Measurement of one paired physical quantity (e.g. position) introduces uncertainty in the other (e.g. momentum).
Paul Dirac	🇬🇧	1928	✏️	Dirac equation: extension of Schrödinger equation to includes special relativity. Explanation of electron spin and predicts antimatter. 1933 Nobel Prize.
Carl Anderson	🇺🇸	1932	🔎	Experimental discovery of antimatter (positron). Found particle tracks of positrons (produced by cosmic rays) in a cloud chamber. 1936 Nobel Prize.
James Chadwick	🇬🇧	1932	🔎	Discovery of the neutron. 1935 Nobel Prize.
Otto Stern	🇵🇱	1933	🔎	Stern-Gerlach experiment. Measured magnetic moment of the proton. Experimental verification of space quantization. 1943 Nobel Prize.

Nationality:

🇦🇺 Australia
🇦🇹 Austria
🇩🇰 Denmark
🇫🇷 France
🇩🇪 Germany
🇭🇺 Hungary
🇮🇪 Ireland
🇮🇱 Israel
🇮🇹 Italy
🇮🇳 India
🇳🇱 Netherlands
🇵🇱 Poland
🇨🇭 Switzerland
🇬🇧 United Kingdom
🇺🇸 United States

Type of discovery:

✏️ Theoretical discovery
🔎 Experimental discovery