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What is electrodynamics, and how does it fit into the general scheme of physics?

Four Realms of Mechanics

In the diagram below I have sketched out the four great realms of mechanics:

Classical Mechanics (Newton)	Quantum Mechanics (Bohr, Heisenberg, Schrödinger, <i>et al.</i>)
Special Relativity (Einstein)	Quantum Field Theory (Dirac, Pauli, Feynman, Schwinger, <i>et al.</i>)

Newtonian mechanics was found to be inadequate in the early years of this century—it's all right in "everyday life," but for objects moving at high speeds (near the speed of light) it is incorrect, and must be replaced by special relativity (introduced by Einstein in 1905); for objects that are extremely small (near the size of atoms) it fails for different reasons, and is superseded by quantum mechanics (developed by Bohr, Schrödinger, Heisenberg, and many others, in the twenties, mostly). For objects that are both very fast *and* very small (as is common in modern particle physics), a mechanics that combines relativity and quantum principles is in order: this relativistic quantum mechanics is known as quantum field theory—it was worked out in the thirties and forties, but even today it cannot claim to be a completely satisfactory system. In this book, save for the last chapter, we shall work exclusively in the domain of classical mechanics, although electrodynamics extends with unique simplicity to the other three realms. (In fact, the theory is in most respects *automatically* consistent with special relativity, for which it was, historically, the main stimulus.)