Coupled cluster theory of matter and radiation

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Coupled-cluster theory is well rehearsed in molecular quantum chemistry, where the quantum mechanical particles are electrons. Obviously there is no real problem with different types of fermions, and here we will discuss the precise conditions that lead to a neat and tidy coupled-cluster framework. One unconventional example, which the talk will mostly focus on, is the situation of a system of coupled electrons and photons. It will be seen that there is a broad class of problems where coupled-cluster theories might offer useful insights.