CHAPTER OVERVIEW

9: Spin Angular Momentum

Broadly speaking, a classical extended object (e.g., the Earth) can possess two different types of angular momentum. The first type is due to the rotation of the object's center of mass about some fixed external point (e.g., the Sun)—this is generally known as *orbital angular momentum*. The second type is due to the object's internal motion—this is generally known as *spin angular momentum* (because, for a rigid object, the internal motion consists of spinning about an axis passing through the center of mass). By analogy, quantum particles can possess both orbital angular momentum due to their motion through space (see Chapter [sorb]), and spin angular momentum due to their internal motion. Actually, the analogy with classical extended objects is not entirely accurate, because electrons, for instance, are structureless point particles. In fact, in quantum mechanics, it is best to think of spin angular momentum as a kind of intrinsic angular momentum possessed by particles. It turns out that each type of elementary particle has a characteristic spin angular momentum, just as each type has a characteristic charge and mass.

Contributors and Attributions

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