Q-ball

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A Q-ball is a non-topological soliton solution which exists in theories of scalar field with global U(1) symmetry. As the name indicates, it is a spherical object with some conserved charge Q. The Q-ball has attracted much attention since it was found in the late 1990s that Q-balls exist in the supersymmetric standard model of particle physics and they can be produced in abundance in the early universe. In this case, Q-balls have a baryon and/or lepton number, as conserved charge, and are closely related to the matter-antimatter asymmetry of the universe. Q-balls can also account for the dark matter of our universe.