Flat Universe Encyclopedia Article

Flat Universe

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Flat Universe

Flat **universe** is the term used to describe a universe that is expanding and will continue to expand forever, albeit at a rate that will eventually approach zero. The solution of Einstein's general relativistic equations for the entire universe predicts one of three possibilities: the universe can start out expanding, but eventually stop expanding and begin to contract; it can be flat; or it can expand forever at an ever-increasing rate. The case of a flat universe is special, because unless the universe is very close to being flat, its lifetime is calculated to be much shorter than the observed age of the universe.

There is a critical **energy density** required for the universe to be flat; the ratio of the actual energy density to the critical density is a parameter called Omega (). For a flat universe, is exactly one. Until recently, it was believed that the universe was flat, but recent evidence shows that the universal expansion may actually be accelerating, leading us to believe that the universe is not completely flat.