

Abstract Submitted
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Why Is There More Matter Than Antimatter In The Universe?

LIONEL D. HEWETT, Texas A&M University-Kingsville — One of the most fundamental laws of particle physics is the conservation of baryon number in essentially all of the interactions of the Standard Model. In other words, the amount of matter in the universe minus the amount of antimatter must remain forever a constant. Since this difference currently is a positive quantity, it must have always been positive. But there appears to be a perfect symmetry between matter and antimatter, so logic tells us that there should have been equal amounts during the creation process, thereby rendering a baryonic excess equal to zero. Several theories have been proposed to explain why this excess is positive. Such theories generally go beyond the Standard Model into a Grand Unified Theory that utilizes the chiral anomaly to predict such things as proton decay. The Time-Symmetric Model of Cosmology utilizes the fact that black hole absorption violates the conservation of baryon number to explain the current baryonic excess. More specifically it predicts that the Hawking radiation of evaporating primordial black holes violate the conservation of baryon number sufficiently to renders the baryonic excess of matter over antimatter as observed today.

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