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Gravitational collapse with torsion and nonsingular Universe in a black hole

We consider gravitational collapse of a fluid sphere with torsion generated by spin, which forms a black hole. We use the Tolman metric and the Einstein-Cartan field equations with a relativistic spin fluid as a source. We show that gravitational repulsion of torsion prevents a singularity, replacing it with a nonsingular bounce. Quantum particle creation during contraction prevents shear from overcoming torsion. Particle creation during expansion can generate a finite period of inflation and produce large amounts of matter. The resulting closed universe on the other side of the event horizon may have several bounces. Such a universe is oscillatory, with each cycle larger than the preceding cycle, until it reaches a size at which dark energy dominates and expands indefinitely. Our universe might have therefore originated from a black hole existing in another universe.

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