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# The causal origin of angular momentum in galaxies

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## Abstract

One long-standing problem in galaxy formation theory is the origin of angular momentum, which in turn controls the spin, spatial extent or morphology of galaxies. Our best theory to explain its origin is the tidal torque theory, according to which angular momentum originates from torques in the early, linear Universe. In this talk, I will show that the theory can be tested at the level of individual halos and galaxies by "genetically modifying" the initial conditions to either increase or decrease the angular momentum. I will first present results obtained for dark matter that confirm that angular momentum indeed originates from torques in the early Universe. In the second part, I will present preliminary results about galaxy angular momentum using an ongoing suite of hydrodynamical zoom-in simulations that employ the same technique.

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