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“Forming the Milky Way Galaxy on a Supercomputer”

Dark matter is the dominant form of matter in the Universe, yet its physical nature is still unknown. Even more mysterious is the cosmic dark energy, which dominates today's energy content and has begun to drive an accelerated expansion of the Universe. High-resolution simulations of cosmic structure formation have become a primary theoretical tool for understanding galaxy formation in such a dark universe, from the Big Bang to the present epoch. Modern numerical techniques allow a faithful treatment of the baryonic sector in such calculations, directly predicting the distribution of stars and supermassive black holes that make up galaxies. Successes and challenges of such simulations, as well as implications for the standard model of cosmology, will be highlighted.