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**From cosmology to cold atoms: observation of Sakharov acoustic oscillations
in quenched atomic superfluids**

Sakharov acoustic oscillation, conventionally discussed in the context of early universe evolution and the anisotropy of cosmic microwave background radiation, is the manifestation of interfering acoustic waves generated in an ideal fluid. We report a laboratory simulation of Sakharov oscillations in an atomic superfluid by quenching the interactions between atoms and monitoring the subsequent density fluctuations. Sakharov oscillations are identified as the multi-peak structure in the density fluctuations, resembling that of the cosmic microwave background radiation. New perspectives to extend quantum simulation to other intriguing cosmological and gravitational phenomena will be discussed.