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Dark Matter via inverse phase transition

Tuesday, April 6, 2021 3:00 PM (1 hour)

I will discuss a novel mechanism of Dark Matter production through an inverse phase transition. I will focus on a simple Z_2 -symmetric model of Dark Matter composed of a scalar singlet. Due to couplings to other matter fields, Z_2 -symmetry is spontaneously broken at very early times, and the Dark Matter field is offset from zero. As the Universe expands, Z_2 -symmetry is restored, and the Dark Matter field starts oscillating around zero contributing to the pressureless fluid of the Universe. This simple picture of Dark Matter production admits multiple realisations depending on the nature of symmetry breaking couplings: purely gravitational, magnetic, or due to the interaction with the thermal bath. I will discuss phenomenological consequences in each of these cases.

Presenter: Prof. RAMAZANOV, Sabir (Prague, Inst. Phys.)