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Gravitationally trapped axions and quark nugget dark matter model

Monday 3 June 2019 15:20 (20 minutes)

I overview the dark matter model offering a very natural explanation of a number (naively unrelated) problems in cosmology: the observed relation $\Omega_{\rm DM} \sim \Omega_{\rm visible}$, the observed asymmetry between matter and antimatter in the Universe, known as the baryogenesis" problem, the so called "Solar Corona Mystery", thePrimordial Lithium Puzzle" to name just a few. In this framework, both types of matter (dark and visible) have the same QCD origin, form at the same QCD epoch, and both proportional to one and the same dimensional parameter of the system, $\Lambda_{\rm QCD}$, which explains how these, naively distinct, problems could be intimately related, and could be solved simultaneously within the same framework.

The talk is based on two recent papers:

1. "Gravitationally bound axions and how one can discover them", PRD-2019

2."New mechanism producing axions in the AQN model and how the CAST can discover them", PRD-2018

Primary author: Prof. ZHITNITSKY, Ariel (University of British Columbia)

Presenter: Prof. ZHITNITSKY, Ariel (University of British Columbia)

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