

Graz Advanced School of Science
PHYSICS COLLOQUIUM OF THE UNIVERSITY OF GRAZ AND
THE GRAZ UNIVERSITY OF TECHNOLOGY

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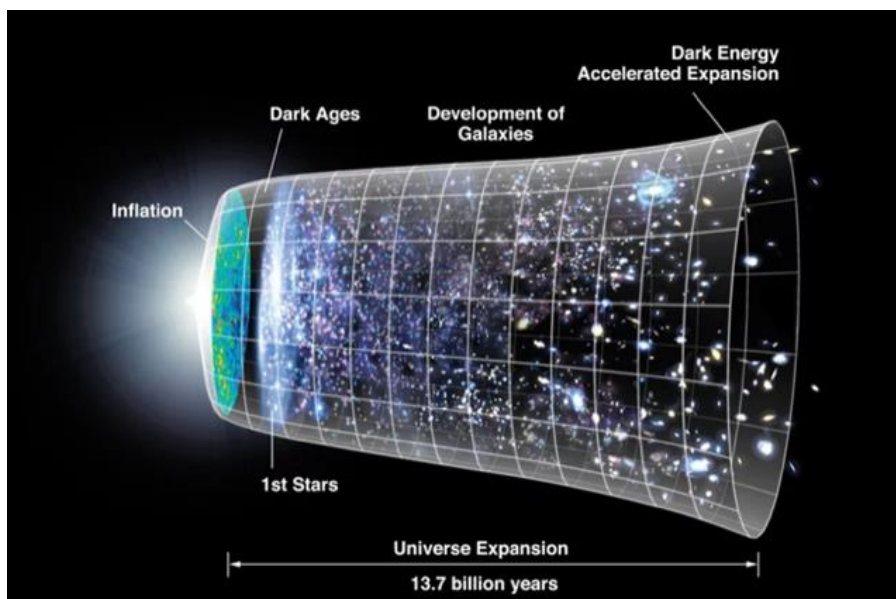
The Cosmological Constant Puzzle

Abstract:

Within Einstein's theory of General Relativity, the cosmological constant drives the accelerating expansion of the Universe. The cosmological constant is interpreted as the vacuum energy density perceived by gravitation.

Experimentally, it corresponds to an energy scale 0.002 eV. On the other hand, vacuum energy is expected to be sensitive to quantum fluctuations and potentials in the vacuum (e.g. associated with the QCD and Higgs condensates).

These quantum fluctuations are characterized by energy scales typically 200 MeV and 246 GeV respectively. Why then is the cosmological constant so small? Here we give an introduction to the cosmological constant (or dark energy) puzzle and how it might be resolved in the context of an emergent particle physics Standard Model where the gauge symmetries describing our interactions "dissolve" in the extreme ultraviolet, in contrast to ideas involving grand unification of fundamental forces.



Date: Tuesday, December 5, 2023, 16:15

Location: Lecture Hall 05.01, Institute of Physics, University of Graz, Universitaetsplatz 5

Host: Willibald Plessas

For a regularly updated colloquium program see: <https://www.if.tugraz.at/workshops/abstracts.php?267>