



Contribution ID: 110

Type: plenary

Fundamental constants, gravitation and cosmology – recent developments

Monday 12 September 2016 09:10 (55 minutes)

Fundamental constants play a central role in the laws of physics. Any detection of the variation of these constant would signal a violation of the Einstein equivalence principle, and thus the need to go beyond general relativity. After recalling the links between fundamental constants and theories of gravity, I will focus on recent developments to constrain their time variation, mostly concentrating on big-bang and stellar nucleosynthesis as well as the analysis of the observations by the Planck satellite. The connection with cosmology, in particular the physics of the dark sector and fine tuning issues will be discussed.

Summary

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Session Classification: Plenary session I