



Professor Jean Philippe Uzan
IAP, Paris, France

Fundamental constants, gravitation and cosmology

Fundamental constants are a cornerstone of the physical laws. Any constant varying in space and/or time would reflect a violation of Einstein equivalence principle. Thus, it is of importance for our understanding of gravity and of the domain of validity of general relativity to test for their constancy. I will first recall the relations between the constants, the tests of the local position invariance and of the universality of free fall.

I will then sketch the main theoretical frameworks in which the low-energy constants may actually be varying. Many experimental and observational constraints have been obtained from atomic clocks, the Oklo phenomenon, solar system observations, meteorite dating, quasar absorption spectra, stellar physics, pulsar timing, the cosmic microwave background and big bang nucleosynthesis. I will provide a summary of these observations and of the recent developments of the field.

Tuesday 7 November 2017 at 4.00 P.M.

COFFEE AND TEA WILL BE SERVED AT 3.45 P.M. IN FRONT OF THE SOLVAY ROOM

SOLVAY ROOM

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