ID de Contribution: **4** Type: **Non spécifié**

From Bossut to Rayleigh-Plesset : how classical mechanics (including hydrodynamics) can shed light on cosmology.

mercredi 8 novembre 2023 11:15 (45 minutes)

In this talk, we introduce several analogies between classical mechanics (including hydrodynamics) and cosmology. In particular, we show that the Friedman-Lemaître set of equations at the theoretical roots of the description of the Universe Expansion can be written in a mathematical form akin to the Rayleigh-Plesset equation which rules the dynamics of a bubble in a liquid. Hence the ratio between the speed of the bubble interface to its radius can be considered as an analogue of the Lemaître-Hubble expansion rate parameter. We discussed its interpretation by recalling the example of the varying length pendulum by the Bossut Abbot whose relative rate of lengthening is also an analogue of the (Bossut)-Lemaître-Hubble parameter. We discussed possible implementation of these ideas in laboratory systems for future experiments.

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