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Understanding Cosmic Acceleration: A Question of Life, the Universe and Everything?

Tuesday, September 7, 2021 3:00 PM (1h 20m)

The cosmological constant provides a simple explanation for the observed late-time accelerated expansion of our Universe. Our lack of understanding of it, however, motivates the exploration of alternative explanations such as a modification of General Relativity at cosmological scales. I will first discuss how gravitational wave observations have severely challenged that concept. I will then present a new self-tuning mechanism that provides a simple toy model to simultaneously solve both the old and new aspects of the cosmological constant problem. A possible signature of this mechanism is the variation of fundamental constants across different spacetime regions. I will briefly present new tools that can be used with forthcoming nonlinear cosmological data in the search for New Physics. Finally, I will explore the Emergence of Life across a potential multiverse as an approach to a deeper understanding of the fundamental parameters and laws of our own observable Universe.

Presenter: LOMBRISER, Lucas (University of Geneva)