

Can a slime mould help us with cosmological tensions?

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Modern cosmology is confronted with persistent observational tensions that challenge the standard cosmological model. While most proposed solutions rely on extending existing theoretical frameworks, we are developing an alternative, model-independent approach inspired by the collective dynamics of biological systems. We present the motivation, methodology, and current status of a proof-of-concept project aimed at investigating whether a slime-mould-inspired algorithm can extract cosmological information directly from the large-scale distribution of matter without assuming a specific theory of gravity. The ongoing work focuses on transforming this algorithm from an interpolation tool into a predictive framework through systematic calibration against numerical cosmological simulations, followed by its application to observational data. We will discuss the planned validation strategy, including tests of its ability to reproduce cosmic structures, generate realistic mock observations, and infer statistically robust information about the underlying cosmological model. By introducing this research programme and its first developments, we aim to open a novel avenue for model-independent studies of gravity and the origin of current cosmological tensions.

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Clasificación de la sesión : Afternoon Session (Thursday)