Contribution ID: **229** Type: **not specified**

Evaporating black holes: how the burden of their memory stabilizes them

Thursday 4 December 2025 14:00 (30 minutes)

The memory burden effect describes how an object's stored information resists its own decay. This mechanism is especially pronounced in saturons—systems that saturate unitarity bounds on entropy—with black holes providing the prime example. I will show how memory burden can halt Hawking evaporation and dynamically stabilize black holes against complete decay. Crucially, this phenomenon is not exclusive to gravity: it arises naturally in generic quantum many-body systems and renormalizable field theories, underscoring its broader theoretical relevance. I will then discuss the phenomenological consequences, focusing on potential signatures in the early Universe and today. In particular, memory-stabilized black holes can produce distinctive high-energy cosmic-ray signals and leave characteristic imprints on the CMB, offering correlated cosmological and astrophysical probes of this peculiar form of dark matter.

Presenter: ZANTEDESCHI, Michael

Session Classification: Plenaries 10-11: Michael Zantedeschi and Haibo Yu