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## Review talk

*Tuesday, 16 May 2023 12:00 (30 minutes)*

Numerical simulations arguably represent nowadays the most advanced instruments to capture the complexity of the physical processes driving the formation of astrophysical and cosmological structures over wide dynamic ranges. In my talk I will review recent results, with a focus on computational cosmology, obtained by using massively parallel codes on modern infrastructures for High Performance Computing (HPC). I will highlight how such simulations are both unique to understand the astrophysics of structure formation, and of invaluable support for the exploitation of ongoing and forthcoming cosmological surveys. I will finally discuss the perspectives of HPC in Astrophysics for the Italian community, both in terms of access to large computing infrastructures, and of specific expertise for the development of innovative algorithmic solutions.

**Presenter:** BORGANI, Stefano (Istituto Nazionale di Astrofisica (INAF))

**Session Classification:** Astronomia Computazionale