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Supercomputing: the challenge of the incoming architectures

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I will present examples of numerical computations in the field of formation and evolution of cosmic structures, from galaxies to galaxy clusters. To overcome their current limitations, we will need to be able to fully exploit next generation supercomputing facilities. I will describe our statring experience with the european network ExaNest, whose aim is to produce an European exascale machine together with the fellow network ExaNode. I will focus on the need to move from a pioneeristic phase, in which scientists produced their own numerical codes, to a mature one: scientists should focus on physics algorithms and physics modelling, leaving to computer experts the task to implement them inside a professionally devised code architecture.

Presenter: MURANTE, Giuseppe