

Allgemeines Physikalisches Kolloquium

Donnerstag, 02.12.2021 um 16 Uhr c.t.

Prof. Dr. Volker Springel

Max Planck Institute for Astrophysics



Supercomputer Simulations of Galaxy Formation

Numerical calculations of cosmic structure formation have become a powerful tool in theoretical astrophysics. Starting right after the Big Bang, they are not only able to accurately predict the dark matter backbone of the cosmic web far into the non-linear regime, but are also capable of following the baryonic sector with rapidly improving physical fidelity. In my talk, I will review the methodology and selected results of recent hydrodynamical galaxy formation simulations, such as the IllustrisTNG project. I will discuss some of the primary challenges in modelling strong, scale-dependent feedback processes that regulate star formation, and highlight the important role played by supermassive black holes in galaxy formation.