



Graduate Physics Seminar

9.4.2018 at 2.00 PM

University of Nova Gorica - Ajdovščina Campus - Amphitheatre  
Vipavska 11, Ajdovščina

## **Simulating the Universe**

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N-body simulations are a standard tool that is treated half way between a tool for theory and a numerical experiment. I will review the techniques used to simulate cosmological volumes, both to follow the pure gravitational evolution of collisionless matter (dark matter) and to model the formation of structures like galaxies. Collisionless simulations are routinely used in cosmology to make accurate predictions of the clustering of matter and galaxies, and I will outline their use in the preparation of the Euclid mission. Hydro simulations of galaxy formation are much more complex, in that a pure numerical, brute force approach to the resolution of structure inside a galaxy in a cosmological context is out of the question, so several pieces of physics must be inserted with "sub-grid" models. This is one of the most competitive fields in numerical astrophysics, where much progress has been made in the last 10 years.