

Simulating galaxy clusters: ICM, galaxy populations and intra-cluster stars

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Cosmological Λ CDM TreeSPH simulations of the formation and evolution of galaxy groups and clusters have been performed. The simulations include: star formation, chemical evolution with non-instantaneous recycling, metal dependent radiative cooling, strong star burst and (optionally) AGN driven galactic super winds, effects of a meta-galactic UV field and thermal conduction. We report results on the temperature and entropy profiles of the ICM, the X-ray luminosity, cold fraction, M/L and IMLR ratios in gas and stars, metal abundances and gradients. Besides, the properties of the galaxy populations in the two richest clusters are discussed: global star formation rates of the cluster galaxies, the total K-band luminosity, the galaxy luminosity functions at $z = 0$ and their redshift evolution, the colour-magnitude relation ("red sequence") as resulting from metallicity effects, and the role of the IMF in reproducing colours and abundances of the stellar populations. Finally the contribute (20 - 40%) to cluster light from the intra-cluster stars and the cD galaxy has been investigated: surface brightness profiles, mean colours and chemical abundances, kinematics (velocity dispersion and distributions) of the IC stellar populations.

*BDMH 2004 – Baryons in Dark Matter Halos
5–9 October 2004
Novigrad (Croatia)*

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