PROCEEDINGS OF SCIENCE

The Influence of Stellar Feedback on the Formation of Galactic Systems

F. Governato
INAF, UW, Milano

We present results from a new set of high resolution simulations of galaxy formation in a cosmological context. Number of particles and spatial resolution are among the highest ever presented and allow significant insight on the internal structure of galactic disks. The simulations include gas cooling, star formation and a physically motivated feedback recipe that regulates the efficiency of star formation, the amount of gas affected and the amount of energy dumped into the ICM by SNe I & II. Our treatment included also mass loss from stellar winds and a uniform UV background. Feedback, that acts by injecting energy into gas nearby star formation events and delaying its subsequent cooling has been tuned to reproduce the observed star formation rates and ICM properties like turbulence and porosity in isolated models of a Milky Way galaxy and a gas rich dwarf. Our results show that a gentle feedback that causes blowaways only in galaxies with a circular velocity below 30 km/s is able to create realistic galaxy disks in terms of size, angular momentum and mass. This feedback also reproduced the correct order of magnitude number of satellites with a stellar component around Milky Way sized halos. We show that the addition of physically motivated feedback naturally reproduces the observed trend of more massive galaxies having older stellar populations compared to less massive dwarfs. Finally we discuss the influence of gas turbulence and halo triaxiality on the amplitude and shape of galaxy rotation curves. Animations will illustrate some of the above simulations.

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

Published by SISSA

http://pos.sissa.it