Cold and Hot Baryons in the Most Distant Galaxy Clusters

Piero Rosati
ESO, Garching

I will review recent observations of the baryonic content of very distant galaxy clusters in their cold (galaxies) and hot (intra-cluster medium) phases, whose formation and evolution are closely linked to each other. New constraints on the evolutionary state of the early type galaxies in clusters at $z > 1$, their stellar masses, ages and star formation histories are obtained by a combination of studies with HST-ACS, VLT and Spitzer. Chandra and XMM observations of distant and nearby clusters are giving new insights on the evolution of the thermodynamical state of the X-ray emitting intra-cluster medium and its metallicity. The interpretation of these multi-wavelength observations is providing the first clues on the interaction between galaxy formation processes and intra-cluster medium, a vital input for theoretical models and simulations which try to reconstruct the evolutionary history of cosmic baryons.