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Simulating galaxy populations within clusters

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Simulations of galaxy clusters have become significantly more realistic over time, and can now reliably reproduce many observable quantities outside of the cluster core. Unfortunately, however, many observables cannot be reproduced by the current generation due to challenges relating to numerical resolution or lack of physics. One set of such observables pertains around cluster galaxies - given the dynamic range required in space and in mass, it is very hard to accurately simulate both the properties of galaxies within clusters and the cluster itself. In this talk, I discuss our efforts to bridge this gap using "galaxy particles" within the Enzo code. These galaxy particles combine cosmological hydrodynamical simulations of the intracluster medium with semi-analytic models for galaxy formation and evolution, and can be used to study the cluster galaxies as well as their interactions with, and effects upon, the intracluster medium. I will present our early results using this technique, and discuss some of the possibilities for the future.

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