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Witnessing the ongoing growth of nearby clusters of galaxies

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Over the past several years, the comparatively low background of the Suzaku satellite has enabled measurements of the thermodynamic properties of the faint cluster outskirts, opening a new window for the exploration of the ongoing virialization and equilibration processes that occur as part of large-scale structure formation. This has been complemented by several subsequent studies with Chandra, XMM-Newton, and Sunyaev-Zel'dovich experiments such as Planck. I will briefly summarize the highlights from recently finalized Key/Large programs with the Suzaku satellite on the Perseus and Coma clusters, before discussing new results from the Key Project targeting the Virgo Cluster. These nearest, brightest clusters of galaxies are ideal targets for studying in detail the physics of the hot X-ray emitting plasma near their virial radii. I will compare and contrast the results from these different projects in order to shed light on how the thermodynamic properties in the cluster outskirts depend upon the cluster mass, dynamical state, and large-scale structure environment.

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