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Cooling & the Origins of Cluster Atmospheres (via Zoom)

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The conditions leading to large reservoirs of molecular clouds and star formation in central cluster galaxies are determined by atmospheric conditions on large scales. The thermodynamic properties of cooling core and non-cooling core cluster atmospheres diverge at radii approaching R_2500, or roughly 400 kpc radius in a 10E14 solar mass cluster. These conditions are driven
by an excess of 10E12 solar masses of atmospheric gas in a 10E14 solar mass cool core cluster with respect to a non-cool core cluster of similar mass. The high pressure environment in the inner one hundred kpc or so promotes thermally unstable cooling that leads to cloud condensation and star formation. We will discuss how these conditions may have arisen.

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