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## Decoding AGN/ICM Structures and Emissions: Probes of Cluster Dynamics and History

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As they penetrate tens to hundreds of kpc through ICMs, AGN jets and their back-flows often can highlight distinct ICM structures encountered along the way. Those ICM structures frequently represent important, “tell-tale” signatures of that cluster’s environment and dynamical history, so of its formation and evolution. Consequently, characterizing such AGN distortions and, especially the physical properties of the associated ICM structures encountered and their relationships to a cluster’s dynamical history can provide unique and valuable probes of cluster formation and ICM physics. In this talk I will summarize some of the MHD simulations by our group that are designed to refine understanding of these relationships. The simulations include energy-dependent transport of cosmic ray electrons (CRE) and their emissions needed to clearly establish unique and diagnostic signatures of these interactions.

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