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**Edges, Bubbles, Ripples and Shocks: Observational Signatures of a Dynamic ICM**

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High angular resolution X-ray observations with Chandra and XMM have allowed us to map the temperature, density, entropy, and abundances in the intracluster gas (ICM) of galaxy clusters with unprecedented precision. Deep X-ray images of many of these clusters show edges, cavities, buoyant bubbles, shocks and ripples that chronicle the motions, heating and chemical enrichment of the cluster gas. In this talk I will review recent X-ray observations of these features in groups and clusters, and show how, when combined with radio and optical data, these observations place important constraints on the 3-dimensional motions of the gas in the underlying dark matter potential, and on microphysical processes, such as turbulence, magnetic forces, particle acceleration, and thermal conduction, that affect the transport of matter and energy throughout the ICM.