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## The case for AGN feedback in clusters of galaxies

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Clusters of galaxies are fantastic laboratories for understanding the physics of AGN feedback. They play a pivotal role in our understanding of jet-mode feedback by demonstrating that AGN-driven jets can inject profound amounts of energy into their surroundings via shock fronts, sound waves and turbulence, in addition to driving powerful molecular outflows and metals out of galaxies. In this talk, I will review the current state of this field. I will also present new state-of-the-art VLA observations of the Perseus cluster of galaxies, as well as a detailed study that focusses on the statistical properties of large scale radio emission in clusters (known as mini-halos). Both these studies reveal new physics about the nature and properties of non-thermal particles in clusters of galaxies.

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