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Particle acceleration and non-thermal emission from galaxy clusters and large scale structure

Friday 19 August 2022 09:00 (25 minutes)

Cluster scale radio emission traces relativistic particles and magnetic fields in the ICM, the origin of these non-thermal components is a long-standing problem. More recent observations with LOFAR have revealed synchrotron emission extending beyond the central, Mpc, regions of galaxy clusters, in cluster outskirts or in cosmic filaments that connect pairs of massive clusters.
Addressing the mechanisms at the origin of these phenomena and their interplay with the ICM is important to constrain magneto-genesis in LSS, and to explore the physics of particle acceleration in novel regimes and the collisionless processes that govern ICM (micro-)physics.
In this talk I will briefly review the most important observational findings obtained with modern radio telescopes and their impact on our theoretical understanding of these phenomena. In particular I will focus on the role of turbulence in the (re)acceleration of particles and amplification of magnetic fields in clusters and LSS.

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