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## Magnetisation of radio relics

Galaxy clusters host tangled magnetic fields, shaped by primordial seeds and amplified through cosmic dynamo action. While these fields stabilize over time, merger-driven shock waves can trigger magnetic amplification, sustained over the shock lifetime. Diffuse non-thermal emission and polarization measurements from radio relics indicate a magnetisation of the intracluster medium due to merger shocks in addition to particle acceleration at the shock site. I show the growth and saturation of such magnetic fields and demonstrate how they contribute to novel astrophysical search strategy of light dark matter species and gravitational waves.

### Collaboration(s)

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