

# Magnetic field dynamics in isolated neutron stars: insights from GRMHD simulations

*Tuesday, 6 May 2025 12:30 (15 minutes)*

The internal magnetic field topology and equilibrium configurations of neutron stars are thought to play a fundamental role in determining the nature and strength of astrophysical phenomena. We model the development of the super strong magnetic fields in neutron stars using the General Relativistic MagnetoHydroDynamic (GRMHD) code AthenaK. In this talk, I will present the long-term evolutions of isolated neutron stars with an outer dipole-like field and various initial internal magnetic-field configurations, exploring the growth times of the various instability-driven oscillation modes and turbulence. I will highlight how resolution impacts the magnetic field evolution due to instabilities that arise from small-scale effects and discuss future developments.

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