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Astrophysical magnetic fields and role of magnetic helicity in turbulent dynamos

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Nearly all astrophysical bodies exhibit magnetic fields at multiple scales and are often conveniently described by small-scale and large-scale dynamos, depending on the coherence scales of the magnetic fields. Origin of these magnetic fields is thought be the turbulent dynamo action, which uses the available fluid energy to generate and maintain the magnetic field. Magnetic helicity being a topological invariant remains conserved during the evolution of the magnetic fields, and therefore it poses severe constraints on the dynamo solutions. Having introduced the fundamental processes involved, I will discuss the importance of removing the accumulated small-scale magnetic helicity for maintaining the large-scale magnetic fields.