1142-76-197 **Ethan T. Vishniac*** (evishni1@jhu.edu), Dept of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218. *Topology and the Large Scale Turbulent Dynamo.*

Astrophysical objects, such stars, planets, galaxies, and accretion disks, all show evidence for magnetic fields with a significant amount of power on the scale of the object. These fields seem to arise from a combination of rotation and turbulence in highly conducting fluids. I will discuss how the generation of these fields can be understood from the conservation of magnetic helicity in ideal magnetohydrodynamics. Magnetic helicity is the only classical example of a Chern-Simons symmetry and has the rare trait of being robustly conserved in systems that are not exactly ideal. I will show how scaling arguments derived from these arguments can explain the dependence of stellar magnetic fields on rotation rates. Finally, I note that these same arguments can be used to show that kinematic dynamo theory does not play a significant role in the generation of large scale magnetic fields. (Received September 03, 2018)