

GTP Workshop on
**Modeling MHD Turbulence; Applications to
Planetary and Stellar dynamos**
at NCAR, 27-30 June, 2006, Boulder, CO, USA

Building laboratory models of planetary cores

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We probe aspects of the dynamics of fluid flows in planetary cores using experiments in liquid sodium, liquid helium, liquid nitrogen or water (not of course mixed together!). Key to these several experimental devices is exploring how turbulence is effected by rotation, magnetic fields or both. As both add some measure of elasticity to the flows, several types of oscillatory behavior are observed depending on the force balances involved. Ordering the Coriolis, Lorentz, and Inertial forces is key to understanding the complicated states observed. While these experiments are undertaken in part to understand the geodynamo, they have led to a number of different first observations, including the magnetorotational instability, and inertial waves in both spherical Couette flow and decaying turbulence in cryogenic flows. These different approaches to using laboratory experiments are opening up a new direction to understanding the dynamics of the Earth's outer core and other Planetary interiors.