

# ~3 Major Opportunities

Challenge	Existing Research Capabilities	Gaps	Opportunities
Extrapolation of experiments to astrophysical disks.	<ul style="list-style-type: none"> <li>•Liquid metal expts.</li> <li>•MHD codes</li> </ul>	<ul style="list-style-type: none"> <li>•No data (yet!)</li> <li>•Simulations with same parameter values and BCs.</li> </ul>	Centrifuge plasma & liquid metal expts.
Angular momentum transport in turbulent convection.	<ul style="list-style-type: none"> <li>•Helioseismology</li> <li>•Kepler data</li> <li>•Simulations</li> </ul>	<ul style="list-style-type: none"> <li>•Full analysis of Kepler data</li> <li>•Experimental verification sim. predictions</li> </ul>	<ul style="list-style-type: none"> <li>•Upcoming plasma experiments</li> <li>•New data from SDO</li> </ul>
Modeling accretion flow around BH at Galactic center and in M87	<ul style="list-style-type: none"> <li>•VLBI will soon resolve event horizon</li> <li>•GRMHD codes</li> </ul>	<ul style="list-style-type: none"> <li>•GR kinetic MHD</li> <li>•Relativistic radiation transport</li> <li>•HE radiative processes</li> </ul>	<ul style="list-style-type: none"> <li>•Plasma models will be strongly constrained by observations.</li> <li>•Enormous public interest.</li> </ul>