

**Special Time**

**Center For Neutrino Physics Seminar**

**Christopher Eling**

University of Oxford

**The Anomalous Scaling Exponents of Turbulence in General Dimension from Random Geometry**

**Wednesday, April 12th, 2017**

**2:30pm - 3:30pm**

**304 Robeson Hall**

Understanding fluid turbulence is a major challenge of physics. Despite much research, we still lack a theoretical model that can yield an analytical description of fluid flows in the highly non-linear regime. In 1941 Kolmogorov proposed that the statistics of turbulent flows in the inertial range of scales is scale invariant. However, experiments and numerical simulations indicate clearly that this is incorrect in direct cascades. Inspired by the link between fluids and black holes, we propose that turbulent statistics in any number of space dimensions can be described by a scale invariant statistics coupled to a random measure. Our analytical formula for the turbulent structure function exponents has one free parameter. It satisfies the theoretical constraints and shows excellent agreement with experimental and numerical data in 3 and 4 space dimensions.