

**Massachusetts Institute of Technology**  
**Department of Physics**

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**Condensed Matter Theory Seminar**

"Scrambling, Locality, and Quantum Fluctuations"

**Brian Swingle**, University of Maryland

**Abstract:** This talk will be about the physics of information scrambling in strongly interacting quantum many-body systems and quantum gravity. I will propose a new universal structure for the spread of information in generic interacting systems, and discuss evidence for it from tensor network calculations and a random circuit model that mimics AdS/CFT. I will also comment on applications to many-body localization and the relation to quantum chaos. Finally, I will argue that quantum gravity also exhibits this universal structure and show how it manifests in unusually strong quantum fluctuations of spacetime.

**12:00pm noon**  
**Tuesday, October 30, 2018**  
**Duboc Room (4-331)**

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Host: Debanjan Chowdhury