

Physics Colloquium

Prof. Brian Swingle

“Entangled Butterflies: Chaos in Complex Quantum Systems”

I will describe recent progress in the study of chaos in complex and highly entangled quantum systems. Building on the rich history of quantum chaos, this recent activity is driven by new experimental possibilities and by a remarkable convergence of ideas in many-body physics, quantum information, and gravity. The focus will be on the quantum butterfly effect and its relation to the spreading of entanglement and to emergent speed limits. I will also describe how this physics is being probed in experiments, specifically focusing on nuclear magnetic resonance experiments.

Brian Swingle received his Ph.D. from Massachusetts Institute of Technology in 2011. He did postdoctoral work at Harvard and Stanford before joining UMD in 2017 as an assistant professor of physics. He was a visiting professor at the Institute for Advanced Study in Princeton in 2018. He studies the physics of quantum information especially in the context of quantum many-body systems and quantum gravity. Current interests include the emergence of gravity from entanglement, the efficient simulation of quantum many-body systems using entanglement-based methods, and the out-of-equilibrium dynamics of quantum information.

Thursday September 10th at 4:25 via Zoom

<https://lehigh.zoom.us/j/94966769900>

Please email Marina Long (mal516@lehigh.edu) for a password if you are outside of the Lehigh Physics Department