



### Seminar

## The operator Levy flight: light cones in chaotic long range interacting systems

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**Time: 10: 00 am, Dec. 30, 2019 (Monday)**

**时间: 2019年12月30日 (周一) 上午10:00**

**Venue: Room W563, Physics building, Peking University**

**地点: 北京大学物理楼, 西563会议室**

### Abstract

Long-range interactions are common in many laboratory settings, including Rydberg atoms and systems with dipolar interactions. In this work, we study the emergent speed limit for information spreading in generic power-law long-range interacting systems. Assuming the dephasing nature of quantum chaos, we map the dynamics of the out-of-time ordered correlation function to a classical stochastic process and obtain an exact phase diagram of the light cone shape in terms of the exponent  $\alpha$  defining the power-law interactions. In particular, in  $d$ -dimension a linear light cone results when  $\alpha \geq d + 1/2$ . We provide a simple Levy flight interpretation of the phase diagram and show consistent numerical data for 1d long-range spin models with 200 sites.

### About the speaker

Ph.D. University of Illinois, at Urbana-Champaign, 2012-2018, Advisor: Michael Stone; Postdoc, Kavli Institute for Theoretical Physics, 2018-2021, Advisor: Leon Balents; Research interest: dynamics of quantum information, critical behaviors out of equilibrium.