

**Wednesday 06/09, Pavel Kos**

Title: Hierarchical generalization of dual unitarity

Abstract: Quantum dynamics with local interactions in lattice models display rich physics, but is notoriously hard to study. Dual-unitary circuits allow for exact answers to interesting physical questions in clean or disordered one- and higher-dimensional quantum systems. However, this family of models shows some non-universal features, like vanishing correlations inside the light-cone and instantaneous thermalization of local observables. In this talk, I will discuss a generalization of dual-unitary circuits where the exactly calculable spatial-temporal correlation functions display richer behavior and have non-trivial thermalization of local observables. This is achieved by generalizing the single-gate condition to a hierarchy of multi-gate conditions, where the first level recovers dual-unitary models, and the second level exhibits these new interesting features. I will discuss the exact solutions of these models and their exhaustive parametrizations for qubit cases. Moreover, I will mention a new parametrization of a new family of models for local dimensions larger than two, which also provides a new family of dual-unitary models. If time permits, I will also mention the generalization of dual-unitarity to open systems.