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**Simple Heuristics for Quantum Entanglement Growth** ADAM NAHUM, JONATHAN RUHMAN, SAGAR VIJAY, Massachusetts Institute of Technology, JEONGWAN HAAH, Microsoft Research — A quantum many-body system, prepared initially in a state with low entanglement, will entangle distant regions dynamically. How does this happen? I will discuss entanglement entropy growth for quantum systems subject to random unitary dynamics – i.e. Hamiltonian evolution with time-dependent noise, or a random quantum circuit. I will show how entanglement growth in this noisy situation exhibits universal structure, which in 1D is related to the Kardar-Parisi-Zhang equation. I will also argue that understanding entanglement growth for random dynamics leads to heuristic pictures that apply to more general (i.e. non-noisy) dynamics, both in 1D and in higher dimensions.

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