Quantum Distance and the Classification of Topological States of Matter JIAHUA GU, KAI SUN, Univ of Michigan - Ann Arbor — In this talk, we provide a generic geometrical classification for topological states of matter, which is applicable for all topologically nontrivial band insulators (with or without symmetry protections), as well as certain strongly-correlated topological states (e.g. the fractional quantum Hall effect and the fractional Chern insulators). We prove that generically, quantum distance measurement contains direct information about the topology of a quantum wavefunction. Specific examples will be provided to demonstrate this principle. The experimental implications will also be discussed.

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