

Wandering range of robust symmetries

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A powerful way to study quantum systems is through their symmetries, or equivalently, the conserved quantities associated with the Hamiltonian. Standard quantum mechanics tells us that these correspond to operators commuting with the Hamiltonian. Once the Hamiltonian is known, its conserved quantities can, at least in principle, be identified.

However, only those symmetries that persist under perturbations are physically observable. If a symmetry survives —perhaps slightly deformed but still effective —we call it robust; if it fails under even small changes of the Hamiltonian, it is fragile.

In this talk, I will focus on robust symmetries and introduce the notion of their wandering range: a quantitative measure of how much a robust symmetry can drift under a perturbation. I will show that this drift admits a bound that depends explicitly on the spectral properties of the Hamiltonian, but which is independent on the size of the system.

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