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Quantum glassiness in clean strongly correlated systems: an example of topological overprotection CLAUDIO CHAMON, Boston University — Describing matter at near absolute zero temperature requires understanding a system's quantum ground state and the low energy excitations around it, the quasiparticles, which are thermally populated by the system's contact to a heat bath. However, this paradigm breaks down if thermal equilibration is obstructed. I present solvable examples of quantum many-body Hamiltonians of systems that are unable to reach their ground states as the environment temperature is lowered to absolute zero. These examples, three dimensional generalizations of quantum Hamiltonians proposed for topological quantum computing, 1) have no quenched disorder, 2) have solely local interactions, 3) have an exactly solvable spectrum, 4) have topologically ordered ground states, and 5) have slow dynamical relaxation rates akin to those of strong structural glasses.

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