

ÉCOLE D'ÉTÉ « MÉCANIQUE STATISTIQUE DE NON-ÉQUILIBRE »  
01–29 JUILLET 2011

SUMMER SCHOOL ON “NON-EQUILIBRIUM STATISTICAL MECHANICS”  
JULY 01–29, 2011

## Automorphic equivalence within gapped phases of quantum spin systems

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In this talk, I will review recent results aimed at a general, qualitative understanding of the notion of a quantum phases. Two gapped ground states of a quantum lattice system have been defined to be in the same quantum phase if there exists either an interpolating family of gapped Hamiltonians, or a local dynamics relating them. I will first define both views precisely and show that they are in fact equivalent. Given a path of uniformly gapped Hamiltonians, I will construct explicitly a family of unitaries mapping their ground states onto each other. What is more, this map can be extended to a strongly continuous automorphism of the quasi-local observable algebra in the thermodynamic limit. Qualitative properties of the ground state subspace, such as symmetries, are preserved under the flow.

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