



Seminar

Colloquium Mathematical Physics

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An Invitation to Quantum Spin Glasses

Quantum spin glass models of mean-field type are prototypes of quantum systems exhibiting phase transitions related to the spread of the eigenstates in configuration space. Originally motivated by spin glass physics and as complex model systems to test quantum adiabatic algorithms, they are also discussed in relation to many-body localisation phenomena. In this talk, I will introduce a class of hierarchical quantum glasses for which this assertion can be proven at least on the level of the specific free energy. This class constitutes the quantum version of Derrida's generalised random energy models. The quantum nature is thereby incorporated through a transversal magnetic field. By proving a quantum Parisi formula for their free energy the full phase diagram is established: the model exhibits spin glass phases as well as mixed and quantum paramagnetic phases.

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Zoom Konferenzschaltung— Please contact Gernot Akemann
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