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Title: A Parisi formula for quantum spin glasses

In this talk I will explain three equivalent versions of a Parisi formula for the free energy of mean-field spin glasses in a transversal magnetic field. These results are derived from available results for classical vector spin glasses by an approximation method using the functional integral representation of the partition function.

In this approach, the order parameter is a non-decreasing function with values in the non-negative, real hermitian Hilbert-Schmidt operators. For the quantum Sherrington-Kirkpatrick model, I will demonstrate how under the assumption of self-averaging of the self-overlap, the optimizing Parisi order parameter is found within a two-dimensional subspace spanned by the self-overlap and the fully stationary overlap.