

For the Condensed Matter Theory Group at PSI we are looking for a

PhD Student

in the

Theory of non-linear response and many-body localization in localized quantum magnets

Your tasks

This work investigates the emergence of quantum coherent degrees of freedom in complex quantum magnets, and the associated phenomenon of many-body localization - i.e., the disorder-induced suppression of thermalisation in a thermodynamically big system, despite of interactions. The specific goals of the project consist in:

1. A thorough analysis of spectral hole burning in random quantum magnets and establishing a precise relation between its features and many-body localisation
2. Modelling and explaining the strong dependence of low temperature states on the applied annealing protocol - an intriguing, out-of-equilibrium feature.
3. Designing and analysing toy Hamiltonians that can be simulated in analog fashion on a D-wave processor (quantum annealer), so as to study specific new aspects of quantum annealing.

This theoretical Ph.D. thesis is part of a project which combines experiment and theory. Close contact with a parallel experimental thesis (at PSI) on hole burning and annealing in quantum magnets will thus be ensured.

Your profile

You hold a Master degree in theoretical physics and have particular interest in quantum physics and condensed matter theory. As an enthusiastic researcher you are dedicated and like working on technically and conceptually challenging problems.

You will be registered as a PhD Student at ETH Zürich or EPFL Lausanne, your main working place will be at the Paul Scherrer Institute in Villigen. Your PhD thesis will be supervised by Dr. Markus Müller (CMT, PSI) and co-supervised by Prof. Gabriel Aeppli (Head of SLS, PSI).

We offer

Our institution is based on an interdisciplinary, innovative and dynamic collaboration. You will profit from a systematic training on the job, in addition to personal development possibilities and our pronounced vocational training culture. If you wish to optimally combine work and family life or other personal interests, we are able to support you with our modern employment conditions and the on-site infrastructure.

For expression of interest or further information please contact Dr Markus Müller, phone +41 56 310 44 30, email: Markus.Mueller@psi.ch.