PAUL SCHERRER INSTITUT

PSI

CONDENSED MATTER THEORY SEMINAR

From quantum spin ice to quantum Kagome ice

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WHGA/121 (PSI-West)

Abstract:

Finding new phases of matter is a problem of fundamental importance in condensed matter physics. This search motivates in part the exploration of new classes of materials, where novel parameter regimes can lead to phases not realized elsewhere, and other new phenomena. In this talk, I will briefly review the idea of quantum spin ice in dipolar-octupolar doublets. When the external magnetic field is applied along [111] direction, an intriguing disordered phase is discovered in the quantum Monte Carlo simulation. I will discuss our recent results on the study of this disordered phase. We found the previously reported disordered phase is due to a competition between ring exchange and nontrivial diagonal terms induced by quantum fluctuation which make the true ground state still undetermined.

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