CEA - Saclay 91191 Gif-sur-yvette Cedex
Service de Physique de l'Etat Condensé
SÉMINAIRE

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Lundi 15 septembre 16h00

Orme des Merisiers SPEC Salle Itzykson, Bât.774

Chiral order in spin glasses

Hikaru Kawamura (Osaka Univ.)

In 1972, it was discovered experimentally by Canella and Mydosh that certain dilute magnetic alloys, now called spin glasses (SGs), quite unexpectedly show a sharp magnetic transition. Since then, the issue of the spin-glass order has been studied quite extensively either experimentally, theoretically, or numerically, and continued to give an impact on surrounding areas. Although most of numerical works have concentrated on Ising spins, the original laboratory spin glasses have vectorial Heisenberg spins. Systems of this type are technically more difficult to study numerically and only recently have reliable large scale simulations become possible.

In 1992, I suggested that the 3D Heisenberg SG might exhibit a finite-temperature transition of "chiral" origin, exhibiting an intriguing "spin-chirality decoupling" phenomena. Real SG transition of weakly anisotropic SG magnets is then a disguised chiral-glass transition, where the chirality is mixed into the spin sector via a weak random magnetic anisotropy.

This chirality scenario, the occurrence of the spin-chirality decoupling in particular, has been contested on the basis of numerical simulations. Recently, we performed a large scale simulation providing the data covering large sizes to low temperatures with high quality statistics. The data demonstrate rather conclusively that the 3D Heisenberg SG exhibits the spin-chirality decoupling. I will then argue that the chiral picture can naturally explain some of the long-standing puzzles of experimental SG transition.

ATTENTION : Séminaire du service avec jour et horaire exceptionnels

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