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## **【667】 Spiral spin-liquid and the emergence of a skyrmion-like state in MnSc<sub>2</sub>S<sub>4</sub>**

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Neutron scattering was used to study frustrated MnSc<sub>2</sub>S<sub>4</sub> spinel with magnetic Mn<sup>2+</sup> ions forming the diamond lattice [1]. We present direct experimental evidence for the existence of the spiral spin liquid, which was predicted to occur within the J<sub>1</sub>-J<sub>2</sub> model, when the ratio between the first and second neighbour couplings is  $|J_2/J_1| > 0.125$ , unravel three long-range ordered phases supplanting each other on temperature lowering and disclose the triple-q state in applied magnetic fields.

With Monte Carlo simulations we scrutinize further details of the spin Hamiltonian, ie. the 3rd neighbour coupling, single ion anisotropy and exchange anisotropy and establish that this set of parameters stabilizes the lattice of dense topological objects akin to skyrmions.

[1] S.Gao, O.Zaharko, V.Tsurkan, et al. Nature Physics,13,157–161(2016).

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