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Complex magnetic orders and the emergent topological Hall effect in the kagome metal ErMn6Sn6

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Following the discovery of a quantum-limit magnetic Chern phase in TbMn6Sn6, the magnetic topological metal series RMn6Sn6 (R=Gd-Yb, and Y, Lu, etc.), that possesses an ideal kagome lattice of Mn, has emerged as a new platform to explore exotic states and novel functionalities. We have recently carried out the growth of high-quality single crystals of the magnetic kagome metal ErMn6Sn6, and the physical properties characterizations via the magnetic susceptibility, heat capacity, and Hall conductivity measurements. We have also undertaken comprehensive neutron diffraction experiments on both single-crystal and powder samples at the WISH diffractometer at ISIS. Our study has clearly hinted a fascinating interplay between topologically non-trivial electronic band structures, magnetism and electronic correlations in ErMn6Sn6.

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