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Itinerant Kagome Ice: an Anomalous Quantum Hall Liquid¹ ARMIN RAHMANI, GIA-WEI CHERN, IVAR MARTIN, CRISTIAN BATISTA, LANL — We show that all magnetic-charge-ordered kagome ice configurations, i.e., a highly disordered energetically stable manifold of Ising spins on the kagome lattice, support a quantized anomalous quantum Hall effect when coupled to itinerant electrons. Despite the strong disorder experienced by the electrons, the Hall effect is robust for almost all canting angles of the Ising spins. Due to the absence of magnetic long-range order, this phase of matter is characterized by the coexistence of a (classical) chiral spin liquid and an anomalous integer quantum Hall one. We further demonstrate that the magnetic monopole defects in this ice-like manifold bind a fluctuating electric dipole.

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