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Two dimensional artificial spin ice: experiment and simulation

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Abstract
The ability to pattern magnetic systems using electron-beam lithography allows for the creation of interacting sub-micron Ising-like degrees-of-freedom for lattice geometries where there may or may not be a microscopic analogue. It has now become possible to build these materials such that they are thermally active within the time frame of a typical experiment allowing for the study of both their equilibrium and non-equilibrium properties. The present talk details the work done on two dimensional artificial spin ice systems (which are an analogue to the three dimensional pyrochlore spin ice system) including the production route to their creation, the measurement of their magnetic degrees of freedom via XMCD/PEEM and muon-spectroscopy, and their comparison to theoretical predictions.