Vortices are among the simplest topological structures and occur whenever a flow field ‘whirls’ around a one-dimensional core. Although ubiquitous elsewhere, vortex formation in crystals is very rare. I will discuss the observation by X-ray photoelectron emission microscopy of antiferromagnetic vortices and antivortices in α-Fe₂O₃ epitaxial films. Remarkably, vortices imprint as merons (half skyrmions) onto an ultra-thin ferromagnetic cobalt layer, hinting at a new information storage paradigm.