Magnetic domain walls are nanometer-sized regions where magnetization reorients from one aligned region to another. Many exciting spintronic applications utilize domain walls, including logic schemes, data storage and lab-on-a-chip devices. I will detail an analytic calculation that determines the domain wall structure in nanowires that are around 3nm thick and 40-100nm wide. The analytic results match experiment and simulations extremely well and allow predictions to be made for the best size to make nanowires for domain wall applications. At the end of the talk, I will discuss how domain walls are altered by the Dzyaloshinskii-Moriya interaction. This asymmetric interaction is currently a hot topic in magnetism research and produces surprising results.

Bio: Karen Livesey received BSc (2005) and PhD (2010) degrees from the University of Western Australia. After postdoc work in Colorado and Australia, she joined the University of Colorado at Colorado Springs in 2012 as an Assistant Professor in Physics. Her theoretical work covers many areas of magnetism including microwave dynamics, nonlinear effects, thermodynamics, and nanoparticles in fluids. She referees for 11 journals, judges IEEE Magnetics Society student awards, and teaches undergraduate and graduate students both in the classroom and in research.