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Teaching with Neutrons: Labs, Courses, and Student Research Projects at the McMaster Nuclear Reactor

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The McMaster Nuclear Reactor (MNR) is a 5 MW multipurpose research reactor, located on campus at McMaster University in Hamilton, Ontario. As one of the three most powerful university-based reactors in North America, and the only major neutron source in Canada, the MNR offers unique opportunities for teaching and learning, especially for physicists. We are currently developing a series of undergraduate and graduate level demonstration experiments, which are primarily focused on neutron scattering techniques (i.e. the study of materials using neutron diffraction and neutron spectroscopy). These experiments are designed to either be incorporated as “stand-alone” additions to existing lab courses, or combined to form a short experimental techniques or special topics course. In this talk, we will describe the McMaster Alignment Diffractometer (MAD), our primary instrument for educational and teaching purposes. We will also present several examples and potential options for incorporating neutron scattering into your courses and student research projects.

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