Design of a keV-scale Neutron source for calibration of low threshold Dark Matter detectors. PRATYUSH PATEL, LUKE CHAPLINSKY, SCOTT HERTEL, DOUG PINCKEY, ALESSANDRO SERAFIN, University of Massachusetts, Amherst, ETHAN BERNARD, ANDREAS BIEKERT, JUNSONG LIN, DANIEL MCKINSEY, ROYAN ROMANI, RYAN SMITH, BURKHANT SUERFU, VETRI VELAN, University of California, Berkeley, MAURICE GARCIA-SCIVERES, Lawrence Berkeley National Laboratory, Berkeley, WESLEY FREY, University of California, Davis — Direct detection dark matter searches are extending their reach to lower (sub-GeV) dark matter masses, requiring new detector technologies with low thresholds and new low-energy calibration methods. For many detectors (when the signal is a recoiling nucleus or atom), the ideal calibration source is a neutron beam of order-keV energy. We will discuss recent progress in making such neutron-based calibrations practical in a university lab environment. First, we will describe a SbBe (gamma,n) neutron source in which a novel shielding method suppresses the outgoing gamma flux while allowing the unmoderated escape of the neutron flux. Second, we will describe a method to moderate and then filter a pulsed Deuterium-Tritium (DT) generator, turning it into a pulsed keV-scale neutron source. And lastly, we will describe work towards large area neutron capture based backing detectors required for a neutron scattering calibration of dark matter experiment targets.