A key driver of modern information technology is the quest for “smaller and faster” information processing and storage. The ultimate speed limit is the speed of light. Therefore, the idea to probe, change and control properties of materials with the help of light has long intrigued researchers in materials science. Of particular interest are magnetic materials which in nanostructured form are used for data storage, memory and processing. This research direction became especially appealing after the development of femtosecond lasers that represent the shortest stimuli in contemporary experimental physics, and the question arose whether they can be used for the optical control of the magnetic “bits” of information [1-4]. Femtosecond soft x-ray pulses from the Linac Coherent Light Source, the world's first x-ray free electron laser, offer the unique opportunity to image in realtime the ultrafast spin dynamics that leads to magnetization reversal [4]. Hard x-rays or electrons enable first glimpses at the laser-induced lattice motion. Understanding the evolving spin-lattice motion on the fs time and nm length scales opens new possibilities of engineering energy and angular momentum relaxation channels in magnetic systems.


HOST: Dr. Barry Zink, (303) 871-3025, barry.zink@du.edu