

PRSE Magnetism Seminar

11:00 AM – 12:00 PM on May 17 (Thursday)

Physics Conference Room

Magnetism Dynamics Measured at the Linac Coherent Light Source

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Since 2009 the Linac Coherent Light Source (LCLS) has delivered coherent X-ray pulses of unprecedented brightness and energy with femtosecond durations to a diverse array of user experiments. The development of the LCLS has allowed experimental access to magnetism in the femtosecond–nanometer domain. Using techniques such as time-resolved XMCD, time-resolved magnetic scattering and time-resolved imaging, the behavior of few-nanometer scale magnetic phenomena can be accessed on a ~ 100 fs timescale. I will give a personal perspective on some of the highlights of \sim eight years of magnetic experiments at the LCLS, with a focus on the soft x-ray SXR instrument. In particular, I will discuss work on all-optical switching in GdFeCo alloys, and recent efforts to explore the dynamics of magnetization in FePt nanoparticles. I will further discuss the techniques available for use at soft x-ray FELs, the science enabled by these techniques and the challenges encountered. Finally I will give an outlook towards the upgraded source, LCLS-II, which will come online for user experiment in late 2020.

Alexander Reid received a D.Phil in Condensed Matter Physics from the University of Oxford, United Kingdom, in 2009. Between 2009 and 2011 he worked as a postdoctoral researcher on ultrafast magnetization dynamics in the group of Theo Rasing in Nijmegen, The Netherlands. In 2011 he joined SLAC National Accelerator Laboratory in the group of Hermann Dürr and Jo Stöhr as a Research Associate. In 2015, he joined the Linac Coherent Light Source Soft X-ray Department as an Associate Staff Scientist. Dr. Reid received the 2016 SLAC National Accelerator Laboratory Director's award for "outstanding achievement" for his work on Ultrafast Electron Diffraction. He has been involved in more than 34 user experiments at LCLS. As of April 2018 Dr. Reid has over 27 peer reviewed publications, with over 900 citations.