The doped lanthanum manganites are strongly correlated complex oxides that exhibit a strong interplay between charge, spin, and lattice effects. This coupling leads to a variety of electronic and magnetic properties, including magnetic and charge ordered states, “colossal” magnetoresistance (CMR), and a range of electron transport behavior.

The possibility of integrating this multifunctional behavior with other types of functionalities has motivated the development of new, artificially structured oxide-based materials systems, such as multiferroic composite heterostructures. In this talk, we describe results on obtaining a charge-driven, magnetoelectric coupling in epitaxial La$_{1-x}$Sr$_x$MnO$_3$/PbZrTi$_{1-x}$O$_3$ (LSMO/PZT) multiferroic heterostructures. Magnetization and magneto-optic Kerr effect magnetometry measurements show a large change in the magnetic critical temperature and magnetic moment of the LSMO layer for the two polarization states of the PZT layer, which modulates the charge-carrier concentration at the LSMO interface. This magnetoelectric coupling is electronic in origin, corresponding to changes in the Mn valency. We also observe directly the change in Mn valency directly using near-edge x-ray absorption spectroscopy. The magnetoelectric effect demonstrated here results from the sensitivity of the electronic states of these materials to charge, a hallmark of this class of strongly correlated metal oxide systems.