Abstract: Multiferroic spin systems and topological insulators (TI) both exhibit the magnetoelectric effect (MEE) in the presence of external electric and magnetic fields. While the MEE in multiferroics can arise due to a variety of mechanisms, the MEE in TI is topological in origin. In the first part of the talk, we discuss the magnetoelectric response due to localized current distributions on the surface of a 3D TI using electromagnetic duality symmetry. As an application we show that the topological MEE manifest itself as persistent Hall voltages across thin planar charged quantum rings on the surface of a TI. In the second part, we discuss the interplay of electric and magnetic order in the spin 1/2 Heisenberg chain in the presence of external electric and magnetic fields. We also show that certain kinds of three spin interactions can lead to spontaneous magnetoelectric order.