

# Ferroelectricity in frustrated magnets with spiral ordering

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In recently discovered multiferroics  $\text{RMnO}_3$  ( $R = \text{Tb, Dy, Gd}$ ),  $\text{RMn}_2\text{O}_5$  ( $R = \text{Tb, Ho, Dy}$ ), and  $\text{Ni}_3\text{V}_2\text{O}_8$  the electrical polarization is induced by an incommensurate magnetic ordering, which gives rise to a strong interplay between ferroelectricity and magnetism. I will discuss a microscopic mechanism of the spontaneous polarization in these magnetic ferroelectrics and present a simple phenomenological theory, which explains their main properties. In particular, I will discuss the orientation of the electrical polarization vector in spin-density-wave states and domain walls, the small temperature shift between the ferroelectric and first magnetic transition, the dielectric susceptibility anomalies, and the dependence of the electrical polarization on magnetic field.