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Synthesis and Characterization of Novel Multiferroic Magnetoelectric Materials and Composites

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Message from the Guest Editor

It is now more than two decades since the concept of multiferroic materials came to the attention of the scientific community. In those times, the incompatibility between the d*0*-ness needed for ferroelectricity and d*n*-ness needed for ferromagnetism seemed to be a major obstacle to the discovery of multiferroic compounds. However, in a few years, several mechanisms leading to the breaking of space-inversion symmetry in magnetic materials were observed, such as “lone pair” ferroelectricity (as in $BiFeO_3$ and other analogues perovskites), charge ordering (the debated case of $LuFe_2O_4$) or magneto-electric coupling in non-collinear spin orderings (via Dzyaloshinskii–Morya interactions as in $TbMnO_3$ and other spiral magnets). Furthermore, the ability to realize composite materials joining ferroelectric and magnetic components has enormously enlarged the possible playground. Along with the obvious scientific interest, steadily increasing attention has been drawn by the conceivable future applications, particularly

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