

## **Multiferroics: controlling magnetism with electric fields**

*Friday, 17 November 2023 10:40 (30 minutes)*

Multiferroic materials, which exhibit multiple ferroic orders simultaneously, have garnered significant scientific interest thanks to their potential for electric-field control of magnetism. These materials present unique domain formations and poling behavior under external fields. Here, we will showcase a remarkable reversible transfer of domain patterns between magnetization and electric-polarization spaces in  $\text{Dy}_{0.7}\text{Tb}_{0.3}\text{FeO}_3$  (DTFO) – the ideal multiferroic material. A magnetic field can impress a ferromagnetic domain pattern onto an identical ferroelectric domain pattern, effectively erasing the original magnetic domain. The process can be reversed, completing a cycle of domain transfer. This attribute of DTFO extends our understanding of domain coupling in multiferroics and opens up new possibilities for their application.

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### **Topics**

Session A. Physics of condensed matter and spectroscopy

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