

# Perovskite oxide materials for electronics and spintronics

## tutorial

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### Abstract

More than 99% of the minerals constituting the Earth's crust contain oxygen, so oxides are literally everywhere. One particularly interesting family of compounds is the perovskite family (general formula  $ABO_3$ ) that can accommodate most elements from the periodic tables at its A or B sites. As a result, perovskites span a very broad range of physical properties, from superconductivity to magnetism and ferroelectricity, which has puzzled the scientific community for decades and offers immense opportunities for applications.

However, the unique potential of perovskites is only embraced in full when different compounds are combined into epitaxial heterostructures and at their interfaces. There, novel phenomena absent in the bulk can arise, broadening further the scope of perovskites for condensed matter physics and novel devices.

In this talk, I will present the world of perovskite oxide materials and their unique properties. I will then highlight a few recent results from our research in the design of electronic synapses based of ferroelectric tunnel junctions, the control of magnetism by electric fields in multiferroic architectures, and the interconversion of charge and spin currents at oxide interfaces.

### Speaker

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