

## **Internal Webinar**

### **Molecular Metal Assemblies as Single-Molecule Magnets and Molecular Ferroelectrics**

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The field of molecular magnetism, especially single-molecule magnets (SMMs) has witnessed considerable development in recent decades for their potential applications in high-density data storage devices, spintronics, and magnetocaloric materials. Molecular complexes, particularly those of  $\text{Mn}^{\text{III}}$ ,  $\text{Co}^{\text{II}}$ ,  $\text{Dy}^{\text{III}}$ ,  $\text{Tb}^{\text{III}}$ , and  $\text{Er}^{\text{III}}$ , have been extensively studied for single-molecule magnet (SMM) behaviour in diverse nuclearities and structural topologies.

In this talk, I will present our recent work on the synthesis and structural characterisation of lanthanide and transition-metal complexes based on rationally designed ligands. Detailed magnetic studies and theoretical studies have enabled us to establish their structure–property relationships that govern SMM behaviour. I will also highlight our efforts toward multifunctional molecular materials that integrate single-molecule magnetism with ferroelectricity through judicious molecular design. The coexistence of these properties in a molecular system not only has importance for fundamental studies but also has potential technological applications in data storage, sensors, and energy harvesting. These aspects will be presented in this talk.

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***14:30 Hrs***

