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MMQ08 : Surfaces and Interfaces: Emergence of New Magnetic and Electronic Properties

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Content:

Surfaces and interfaces play a crucial role on the properties of systems, particularly influencing the performance of electronic and spintronic devices. Whether composed of metallic, ferromagnetic, oxide, or molecular materials, these interfaces provide a fertile playground for the emergence of novel magnetic and electronic properties. Several key questions arise: How do molecules and substrates mutually influence each other through **molecule-substrate interactions**? What strategies enable the **manipulation of molecule-magnets** at the surface scale? How can the **growth of 2D thin films** be controlled to master their fabrication and properties?

Another crucial aspect lies in the role of **interface chirality**. The deposition of magnetic layers on non-magnetic substrates induces chiral magnetic interactions via spin-orbit coupling—specifically, the Dzyaloshinskii-Moriya interaction, which gives rise to chiral magnetic structures such as skyrmions. Using chiral surfaces as templates for the growth of metallic or ferromagnetic films paves the way for original properties that remain largely unexplored. Additionally, depositing chiral molecules on substrates can induce spin selectivity in electronic transport known as CISS effect (Chiral Induced Spin Selectivity), the mechanisms of which continue to spark intense debate.

This mini-colloquium aims to **bring together a multidisciplinary community**—both experimentalists and theorists—to discuss surfaces and interfaces. The exchanges will cover the full range of scientific challenges, from the **growth and structural characterization** of these systems to the detailed analysis of their **magnetic and electronic properties**, including current theoretical and experimental challenges.