

Physikalisches Kolloquium

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Chiralitronics: Exploring the interplay between spin and chirality

Chirality is omnipresent in nature, bridging magnetic and molecular spin phenomena. At the core of this connection lies the chiral-induced spin selectivity (CISS) effect, describing the highly efficient generation of spin polarized currents in chiral molecules. Despite extensive experimental evidence, the underlying mechanisms of CISS remain debated. Here, we explore how chirality is directly linked to the intrinsic magnetic moments in molecules and how molecular design can be harnessed to control spin phenomena at hybrid chiral molecule magnetic interfaces. Our findings pave a pathway towards functional "chiralitronic" devices – turning a fundamental puzzle into a technological opportunity.

