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“Extraordinary electronic transport in topological semimetals”

Initiated by the discovery of topological insulators, comprehensive studies of various materials bearing topologically non-trivial electronic structures have emerged as a new frontier in the field of quantum materials. In recent years, the main focus has been put at topological semimetals (TSM). The presence of nearly massless quasiparticles near chemical potential gives rise to unique transport properties of TSMs, like ultra-high charge carriers mobility, huge magnetoresistance, anomalous Hall effect or/and chiral magnetic anomaly. The intriguing physical phenomena found in TSMs not only provide excellent tests for fundamental theories, but also promise a wide range of possible applications in low-power spintronics, optoelectronics, quantum computing and green energy harvesting.

Here, we first briefly recall some basic concepts in the field of TSMs, and then present a few examples of our own accomplishments in that blooming research area. In particular, we account for some results of our experimental studies on the anomalous electronic transport in various topological materials.

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