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Spin Routes in Organic Semiconductors

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Organic semiconductors are characterized by a very low spin-orbit interaction, which, together with their chemical flexibility and relatively low production costs, makes them an ideal materials system for spintronics applications. The first experiments on spin injection and transport occurred only a few years ago, and since then considerable progress has been made in improving performance as well as in understanding the mechanisms affecting spin-related phenomena. Nevertheless, several challenges remain in both device performance and fundamental understanding before organic semiconductors can compete with inorganic semiconductors or metals in the development of realistic spintronics applications. In this presentation I summarize the main experimental results and their connections with devices such as light-emitting diodes and electronic memory devices, and outline the scientific and technological issues that make organic spintronics a young but exciting field.