


# Gemeinsames Physikalisches Kolloquium der Universität, des MPI für Chemie und des MPI für Polymerforschung

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## Physikalisches Kolloquium Mainz

Institut für Kernphysik, JGU

Dienstag, den 02.06.2015 um 16 Uhr c.t. im HS KPH  
Tee ab 15:45 Uhr

### Topological Spintronics: From Dirac Monopoles to Magnetic Recording

Dr. Yuriy Mokrousov, Forschungszentrum Jülich

Currently, solid state physics experiences a revolution associated with the advent of novel topological concepts. It was realized that, as by magic, many of the well-known phenomena can suddenly be intuitively understood following abstract mathematical ideas which tell us that the dynamics of electrons in solids is directly related to topology of the spaces in which they live. This revolution has completely changed the landscape of spintronics, which deals with the interplay between spin and charge of electrons, leading to predictions of novel, topological states of matter such as topological insulators and magnetic skyrmions. In my talk, on simple but important examples, I will explain how the topological standpoint can be utilized for the prediction of novel effects related to electron dynamics, and lead to quantitative description of these effects in most complex materials.

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