



SFB/TRR 21 - Colloquium

25. April 2014, Tübingen

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Breaking of time-reversal symmetry during coherent transport in disordered media

Coherent transport in disordered media has been a thriving topic for many decades, both in theoretical and experimental research. Interest in the subject started with the seminal paper by Anderson in 1958, where it was postulated that disorder can completely stop the propagation of a wave. Since then, many experiments have been carried out on this and related phenomena using electromagnetic, acoustic, matter, and seismic waves. Ultracold atoms are a recent addition to this mix, and offer very good control over several important parameters. In the last years our group was able to observe Anderson Localisation (in 1D and 3D) and Coherent Backscattering, the latter being a first manifestation as well as a telltale sign of coherent transport in disordered media. Paramount to the understanding of Coherent Backscattering is that the system must be symmetric with respect to the reversal of time. I will present our latest experiments where we deliberately break this symmetry in a precise way, enabling us to observe the destruction, and an echo-like revival of the coherent signal when time reversal symmetry is briefly reestablished.

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SFB/TRR 21 Control of quantum correlations in tailored matter
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