Coherent backscattering effect: The case of ultracold matter waves

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In this talk, I will briefly review recent developments concerning the coherent backscattering (CBS) effect, a well-known precursor of Anderson localization in disordered systems. I will then focus on the particular and important case of CBS of ultracold matter waves in random (optical) potentials, and explain how this effect manifests itself in the momentum distribution of the matter wave. A detailed theoretical analysis of this distribution shows that the CBS effect can be used to prove that transport occurs in the phase-coherent regime, and that measuring its time dependence permits monitoring the transition from classical diffusion to Anderson localization.