UNIVERSITÄT DUISBURG ESSEN

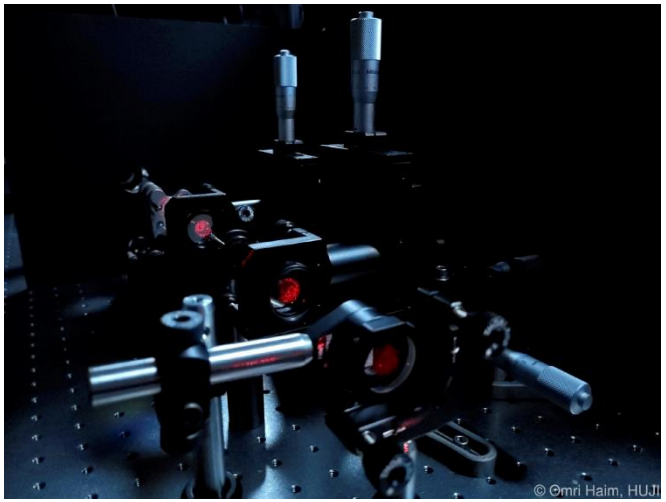
PHYSIK E=

Physikalisches Kolloquium

Mittwoch, 18.10.2023
13:00 Uhr
MC 122

Coherent perfect absorption and transmission of light

Prof. Dr. Stefan Rotter, University of Vienna



In my talk I will present two recent works focused on the perfect absorption and transmission of waves through interferometric cancellation of backscattering. In the first case [1], we demonstrate that even a weakly absorbing film can be turned into a “coherent perfect absorber” by building a degenerate cavity around it. This special cavity perfectly couples incoming light fields with arbitrary wavefronts into the absorber – even for the case that light is a dynamically varying speckle pattern. In the second case [2], we demonstrate how to construct an anti-reflection structure for a complex scattering system like a disordered medium. Similar to an anti-reflection coating for conventional eye-glasses, this structure leads to perfect transmission across the scattering system by suppressing back-scattering for any incoming wavefront. Successful experimental implementations of these concepts will be discussed in both cases.

[1] Y. Slobodkin, G. Weinberg, H. Hörner, K. Pichler, S. Rotter, and O. Katz, Science 377, 995 (2022)
[2] M. Horodynski, M. Kühmayer, C. Ferise, S. Rotter, and M. Davy, Nature 607, 281 (2022)