

Colloquium Notice

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Manipulating the transport statistics in disordered media: From enhanced transmission to entanglement propagation

The concepts of open and closed channels are useful to understand transport properties in disordered open media. We will review the physics of open channels and introduce a new random matrix ensemble that allows to predict the values of transmission or reflection achievable with wavefront shaping techniques in lossless or weakly absorbing media. This ensemble is parameterized by an effective fraction of controlled channels that we calculate microscopically. Its expression depends on the geometry (waveguide or slab), the illumination protocol (numerical aperture, size and shape of the illumination profile), and the long-range mesoscopic correlations of the medium. We will report measurements of the transmission eigenvalue density and of the total transmission in agreement with theoretical predictions. Finally, we will show that the same theoretical formalism can be used to predict the classical information capacity of a disordered medium as well as the effect of the disorder on the entanglement properties of a given input state of light.

Monday
November 25, 2013
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326