Physics AT QUEENS COLLEGE

Colloquium Notice

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Optimal states of light in disordered media: information-retrieval and scattering-invariance

In my talk I will present recent advances in designing tailor-made states of light with optimal properties in scattering across highly disordered media. First, I will discuss how the concept of Fisher information allows us to distill from the measurable scattering matrix of a system the unique state of light, which delivers the maximum amount of information about a desired system parameter of interest to an external observer [1]. In a second part, I will discuss so-called "scattering-invariant modes"; these light fields have the unique property that they are transmitted across a disordered medium with the same output profile as when travelling through free space [2]. Both of these concepts were recently implemented together with the group of Allard Mosk in Utrecht using optical wave-front shaping tools.

[1] D. Bouchet, S. Rotter, and A. P. Mosk, Nature Physics 17, 564 (2021)
[2] P. Pai, J. Bosch, M. Kühmayer, S. Rotter, and A. P. Mosk, Nature Photonics 15, 431 (2021)

Monday
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