Controlling Light Generation in Disordered Fractal Networks of Nanostructures

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Abstract

The use of light as a way to communicate and process information to and from the nanoscale is one of the technological milestones that is advancing innovation in modern times across many areas, from computer sciences and renewable energies to personalized healthcare and sensing technologies. While, to date, control of light flow at the nanoscale has mainly been achieved with periodically structured materials, disordered photonic nanostructures are slowly emerging as suitable easy-to-fabricate designs that can lead to performances superior to those offered by conventional photonic structures in, e.g., imaging and photovoltaics. Here, I will present recent experimental results where disordered fractal nanostructures allow us to generate and control light at the nanoscale. These novel disordered arrays of nanostructures can play a key role in controlling the light transport properties of complex photonic systems and, thus, in controlling their final optical properties, which are ultimately of interest to develop next generation optical devices.

References

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Figures

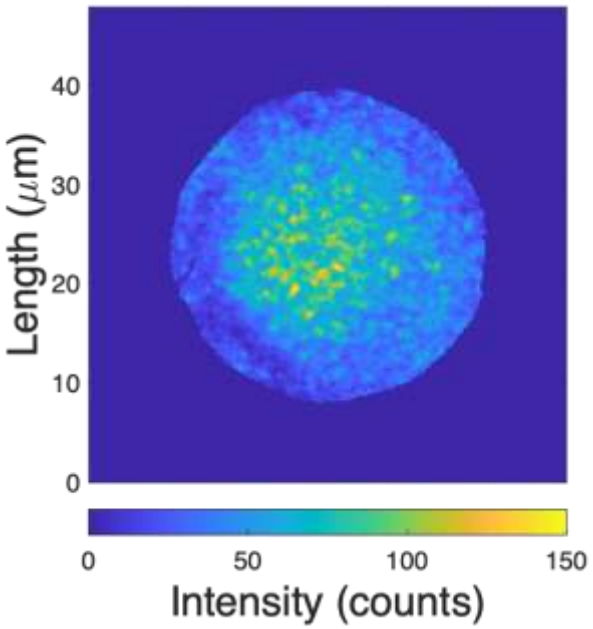

Figure 1: Optical microscopy image of the intensity of inelastic light generated by a fractal network of silicon nanostructures.