

# Thematic area: Nanooptics and nanophotonics

## Metamaterial with high optical absorbtion

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Absorbers of electromagnetic radiation have wide applications in modern day science, e.g. spectroscopy, solar cell enhancement, thermal imaging etc [1-3]. Metamaterials composed of nanoscale resonators with adjustable electromagnetic response can become good optical wavelength absorbers [4]. Their advantage is the possibility to construct broadband optical absorbers with advanced functionalities.

The extent of electromagnetic losses in the constituent material depends on its capability to convert electromagnetic energy into heat. We can consider the entire metamaterial to be an effective medium and use nanoscale resonators to add large imaginary parts into the effective permittivity/permeability dispersion of the homogenous medium. This imaginary parts result in high absorption over certain band around resonance of the passing wave. Creating the nanostructure that broadens this band is challenging and complex.

Idea of this work is to optimize the construction of such absorbing metamaterial, and making it more straightforward.

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2. *Wang C., Yu S., Chen W., Sun C.* Highly Efficient Light-Trapping Structure Design Inspired by Natural Evolution // *Sci. Rep.*-2013.-Vol 3.-P. 1025.
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