

STAVROS NIARCHOS FOUNDATION – FORTH SEMINAR SERIES

Tuesday 12 March 2019

16:00 – 17:00

A. Payatakes Seminar Room

**" Metamaterial modification of optical chirality with bilayer chiral
metasurfaces and sensing evaluation "**

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Abstract

Chirality is a ubiquitous property of materials providing unique functionalities on a molecular basis. This results in a wide variety of applications from image display and data storage to biomolecular chiral sensing and enantioselective catalysis. However, the inherently weak light-matter interaction leads to weak chiroptical signals, a term that is known as optical chirality. Here, the metamaterial modification of optical chirality with bilayer metasurfaces under single polarization excitation is examined. It is shown that the designed bilayer metasurfaces provide more than an order of magnitude higher optical chirality compared to single layer counterparts and the overall enhancement of superchiral fields is found to be more efficient when the inner bilayer distance is in the 200-300 nm range. Furthermore, the linear connection of the change of transmittance with the mean optical chirality, directly connects these two components allowing the determination of the near-field behavior by measuring the far-field response. The present results would allow the design and fabrication of large-scale and cheap chiral bilayers at the nanoscale, which could be applied for a plethora of applications such as ultra-efficient chiral sensing, enantioselective catalysis or stereoscopic displays among others.