

PRIN2015 METAMATERIALS WEBINARS

Venerdì 11 Giugno, ore 17:00

ELASTIC METAMATERIALS FOR MULTISCALE APPLICATIONS, FROM SEISMIC SHIELDS TO NON-DESTRUCTIVE TESTING

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Abstract

Natural biological materials display remarkable physical and mechanical properties, despite being made up of a limited number of widely occurring basic elements. It is generally accepted that their characteristics are mainly due to their structural organization, rather than to their specific constituents. Hierarchical structure, in particular, is a recurring universal feature in natural systems, giving rise to optimized or unexpected physical properties. Bioinspired approaches have been proposed to transfer the advantages of these structures to synthetic materials. However, these have mainly been limited to features like strength/toughness optimization or smart adhesion. On the other hand, artificial materials that are not found in nature, like elastic metamaterials, can also display remarkable structure-related properties, like wave control, band gaps, cloaking or focusing. In this case, since general design criteria are missing, a bioinspired approach can also be adopted: natural structures providing vibration control or impact damping, like shells, bone, spider webs, can serve as models to design novel architectures for improved vibration damping. I will discuss some examples of bioinspired metamaterials, and their application over various size scales, from damage sensing to seismic shields.

Link: <https://www.gotomeet.me/VirtualRoom-8/prin2015-metamaterials-webinars>