

Multilevel architectures in natural materials

Abstract

Nature's materials are structured at multiple length-scales, allowing organisms to adapt to external stimuli for given (even multiple) functions. Hierarchical structuring, which is a simple consequence of (adaptive) growth, is illustrated by four examples from nature: wood, bone, the skeleton of a glass sponge and lobster cuticle. All of these use material architecture to combine simple building blocks into complex functional structures. In addition to helping understand biological function, such systems are studied to inspire development of novel synthetic materials.

