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【16】 Amorphous photonic networks in insects

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Photonic nanostructures can vary in their degree of local order and their optical appearance is the result of light interacting with these materials. Insects are interesting due to their large diversity of colored displays and associated nanostructures. Here, we will show recent results focussing on weevils and longhorn beetles that all display vivid colors and rely on varying degrees of (dis)order combined with pigments. Using light microscopy, FIB-SEM tomography and FDTD simulations, we examined the mechanisms underlying the angle-independent color patterns and highlight the contributions of disorder to the appearance. This work illustrates the interplay of structural and pigmentary color and shows pathways to their use in synthesizing novel materials.

Theoretical Work

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