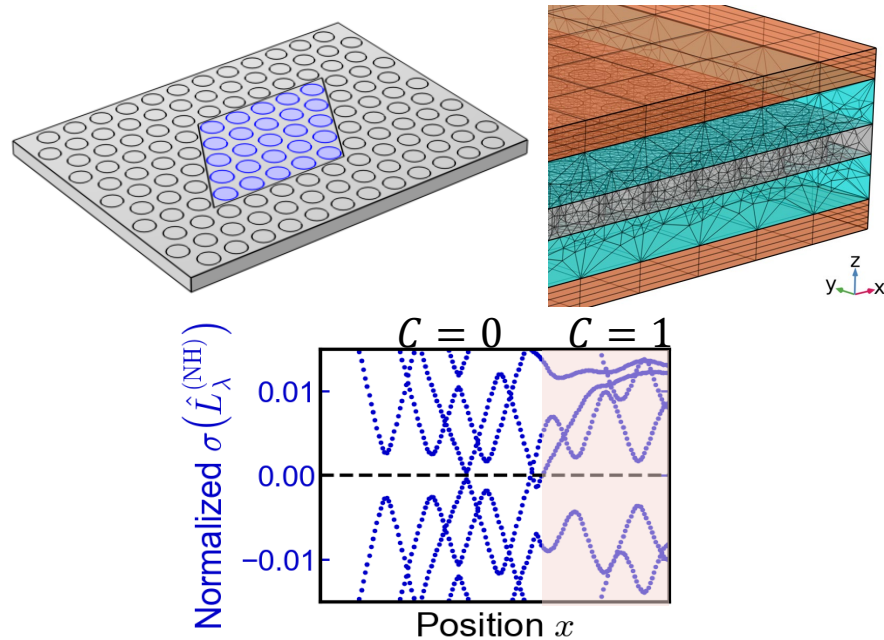


Classifying Topology in Metasurfaces and Photonic Crystals



Schematic of a topological photonic slab heterostructure (top left) and its associated finite element mesh (top right). The system's local Chern marker identifies that the heterostructure's center is topological (bottom).

Scientific Achievement

Development of a new theoretical framework that enables the efficient identification of topological phenomena in optical systems.

Significance and Impact

Topological photonic systems may be useful for building lightweight isolators and circulators for communications devices, but their development has been hindered by an inability to find such systems. Here, we use a new mathematical framework to efficiently find such systems.

Research Details

- Used a technique called the spectral localizer, which is based on new mathematics discoveries in C^* -algebras.

Wong, S.; Loring, T. A.; Cerjan, A. Classifying Topology in Photonic Crystal Slabs with Radiative Environments. *npj Nanophotonics* 2024, 1 (1). DOI:10.1038/s44310-024-00021-w.

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