

Flatband photonic lattices: from light localization to topological physics

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Flat-band systems have attracted considerable interest in many different branches of physics in the past decade, providing a flexible platform for studying a variety of fundamental phenomena. Engineered flat-band structures have now been realized in different material systems, and in particular, in the realm of photonics. In this talk, I will report our recent work on flat-band localization and associated topological phenomena in photonic lattices, including momentum-to-real-space mapping of topological singularities, unconventional localized flatband states arising from real-space topology, and exponential scaling of topological states in fractal-like structures. Our results from flat-band photonic lattices may provide inspiration for exploring fundamentals and applications of flat-band physics in other materials or complex systems beyond photonics.