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Topological crystalline insulators in photonic systems[1] JIANXIAO ZHANG, MIKAEL RECHTSMAN, CHAO-XING LIU, Pennsylvania State Univ — Topological crystalline insulators are a class of materials with a bulk energy gap and edge or surface modes, which are protected by crystalline symmetry, at their boundaries. They have been realized in electronic systems: in particular, in SnTe. In this work, we propose a mechanism to realize photonic boundary states topologically protected by crystalline symmetry. We map this one-dimensional system to a two-dimensional lattice model with opposite magnetic fields, as well as opposite Chern numbers, in its even and odd mirror parity subspaces, thus corresponding to a topological mirror insulator. Furthermore, we test how sensitive and robust edge modes depend on their mirror parity by performing time dependent evolution simulation of edge modes in a photonic setting with realistic experimental parameters.

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