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Topological mirror insulators in one dimension ALEXANDER LAU, JEROEN VAN DEN BRINK, CARMINE ORTIX, Institute for Theoretical Solid State Physics, IFW Dresden — In the context of novel topological states of matter protected by crystalline symmetries, we show that the presence of mirror symmetry leads to a new class of time-reversal invariant topological insulators in one dimension. These *topological mirror insulators* are characterized by a nontrivial Z_2 topological invariant defined in terms of the partial polarization, which we show to be quantized in the presence of a 1D mirror point. Their hallmark is an odd number of electronic integer end charges at the mirror-symmetric boundaries of the system. We check our findings against spin-orbit coupled Aubry-André-Harper models which realize this novel topological state of matter. In particular, we determine the phase diagram, calculate energy spectra, and compute the values of the end charges. We also study the effect of weak on-site disorder to demonstrate the stability of the topolgical features. Furthermore, we draw conclusions for topological states in the two-dimensional Hofstadter model with spin-orbit coupling. The presented models could be realized, for instance, with cold-atomic Fermi gases loaded in periodic optical lattices.

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