

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Fractional Topological Phases in Generalized Hofstadter Bands with Arbitrary Chern Numbers**<sup>1</sup> KAI SUN, University of Michigan, YINGHAI WU, JAINENDRA JAIN, The Pennsylvania State University — We examine similarities and differences between topological flat bands with Chern numbers  $C > 1$  and conventional quantum Hall multi-layers. By constructing generalized Hofstadter models that possess “color-entangled” flat bands, we provide an intuitive understanding of certain puzzling properties of  $C > 1$  flat bands, which can effectively be mapped either to a single-layer or to a multi-layer model depending on the lattice configuration. We identify interacting systems in which the ground state degeneracy depends on whether the system consists of an even or odd number of unit cells along one particular direction, and discuss the relation between these observations and the previously proposed “topological nematic states.” Our study also provides a systematic way of stabilizing various fractional topological states in  $C > 1$  flat bands.

<sup>1</sup>Supported in part by NSF under Grant No. ECCS-1307744 and the MCubed program at University of Michigan and by DOE under Grant No. DE-SC0005042 at Penn State

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Date submitted: 10 Nov 2013

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