Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Flat Chern Band in a Two-Dimensional Organometallic Framework[1] ZHENG LIU, ZHENG-FEI WANG, University of Utah, JIA-WEI MEI, ETH Zurich, YONG-SHI WU, FENG LIU, University of Utah — By combining exotic band dispersion with nontrivial band topology, an interesting type of band, namely the flat chern band (FCB), has recently been proposed, in which carriers experience strong Coulomb interaction as well as topological frustration that in together spawn unprecedented topological strongly-correlated electronic states, such as high-temperature fractional quantum hall state. Despite the proposal of several theoretical lattice models, however, it remains a doubt whether such a "romance of flatland" could exist in a real material. Here, we present a first-principles design to realize a nearly FCB right around the Fermi level in a two-dimensional (2D) Indium-Phenylene Organometallic Framework (IPOF). Our design in addition provides a general strategy to synthesize topologically nontrivial materials in virtue of organic chemistry and nanotechnology.

[1]Supported by DOE-BES and ARL

Zheng Liu
University of Utah

Date submitted: 30 Oct 2012 Electronic form version 1.4