

DAMOP17-2017-020139

Abstract for an Invited Paper
for the DAMOP17 Meeting of
the American Physical Society

A fermionic simulator with ultracold atoms in engineered optical potentials

JULIO BARREIRO, University of California, San Diego

In this talk I will show how our ultra-cold atom experiment will eventually simulate paradigmatic topological matter (fractional Chern insulators), black holes, and the electronic structure of molecules. Our experiment employs fermionic strontium atoms in engineered optical potentials, specifically optical lattices and tweezers. This system offers single-atom imaging and manipulation, fermionic statistics, as well as the same exquisite control of the internal electronic states of the atoms offered by trapped ions, used as a quantum computing architecture.

Reference: “Quantum Computing with Alkaline-Earth-Metal Atoms,” A. Daley, M. Boyd, J. Ye and P. Zoller, Phys. Rev. Lett. 101, 170504 (2008)