Hourglass Fermions and Cohomological Insulators B ANDREI BERNEVIG, Princeton university, ARIS ALEXANDRADINATA, Yale University, ZHIJUN WANG, ROBERT CAVA, Princeton university — We present a new fermion, the Hourglass fermions, which extends the currently known Dirac, Weyl and Majorana classification. We further present a set of materials which host this particle as a surface state. The materials already exist in nature and have a large gap. The topological index involves group cohomology, and, in our particular material example, a group-extension of an already non-symmorphic group.

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