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Abstract for an Invited Paper
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Fractional Topological Insulators in 2 and 3 dimensions

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I will present a family of exactly solvable models whose low energy physics is that of a 3D topological band insulator of fractionally charged fermions. When time reversal is broken at the surface, these insulators display a fractional magnetoelectric effect, leading to fractional quantum Hall surface states. Further, some – but not all – of them can be shown to be genuine topological insulators, whose gapless surface states are protected by time reversal. This gives an explicit construction of fractional topological insulators in 3D. This work has been done in collaboration with Michael Levin (University of Maryland), Maciej Koch-Janusz (Weizmann Institute), and Ady Stern (Weizmann Institute).