1127-46-339 **Terry A Loring*** (loring@math.unm.edu), Department of Mathematics & Statistics, MSC01 1115, Albuquerque, NM 87131-0001. *Emergent topology for insulators.* Preliminary report.

Many insulators can be modeled by a Hamiltonian that allows local hopping between lattice sites in $\mathbb{R}^d$. Typically these lattice sites form a crystalline lattice, but more recently models have involved quasicrystalline lattices or random points. In all cases, the essential information is in the d position observables, which are unbounded and commute pairwise, and the bounded, self-adjoint Hamiltonian that almost commutes with position and is gapped.

The joint Clifford spectrum of these $d+1$ observables is a closed subset of $\mathbb{R}^{d+1}$. Experience with commuting matrices and the much-studied pseudosectrum of a non-normal matrix will tend to suggest that this joint Clifford spectrum will have uninteresting topology. In the case of topological insulators, however, K-theory arises naturally and forces the joint Clifford spectrum to have homology at least as rich as that of a d-sphere.

The mathematics here is closely recent to work on emergent geometry in string theory. (Received February 06, 2017)