We will show that ultracold polar molecules pinned in an optical lattice and interacting via dipolar interactions can be used to implement a huge variety of exotic quantum magnets. These magnets can exhibit striking behavior that is determined and controlled by topology. In particular, they can be used to realize fractional Chern insulators, symmetry protected topological phases, the bilinear-biquadratic spin-1 Hamiltonian, and the Kitaev honeycomb model [1–3].