

Abstract Submitted  
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**Topological phases in polar-molecule quantum magnets** ALEXEY GORSHKOV, California Institute of Technology, SALVATORE MANMANA, Georg-August-University Goettingen, E.M. STOUDENMIRE, University of California, Irvine, KADEN HAZZARD, ANA MARIA REY, University of Colorado, Boulder, NORMAN YAO, CHRIS LAUMANN, STEVEN BENNETT, Harvard University, ANDREAS LAUCHLI, PETER ZOLLER, University of Innsbruck, JUN YE, University of Colorado, Boulder, EUGENE DEMLER, MIKHAIL LUKIN, Harvard University — We 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 can be used to realize, for example, fractional Chern insulators, symmetry protected topological phases, the bilinear-biquadratic spin-1 Hamiltonian, and the Kitaev honeycomb model. [References for some of the results: arXiv:1207.4479, arXiv:1210.5518]

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