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Strategies for Designing Magnetic Weyl Semimetals GUOQING CHANG, Natl Univ of Singapore, SU-YANG XU, HAO ZHENG, Princeton Univ, BAHADUR SINGH, CHUANG-HAN HSU, Natl Univ of Singapore, SHIN-MING HUANG, Natl Sun Yat-Sen Uni, GUANG BIAN, ILYA BELOPOLSKI, DANIEL S. SANCHEZ, NASSER ALIDOUST, Princeton Univ, TAY-RONG CHANG, Natl Tsing Hua Univ, HONG LU, XIAO ZHANG, YI BIAN, Peking Univ, ZHI-MING YU, SHENGYUAN A. YANG, Singapore Univ of Technology and Design, HORNG-TAY JENG, Natl Tsing Hua Univ, TITUS NEUPERT, Princeton Univ, SHUANG JIA, Peking Univ, ARUN BANSIL, Northeastern Univ, HSIN LIN, Natl Univ of Singapore, M. ZAHID HASAN, Princeton Univ — Weyl semimetals are novel topological conductors that host Weyl fermions as emergent quasiparticles. Weyl quasiparticles can arise through the breaking of either the inversion or time-reversal symmetry. Although the first inversion-breaking Weyl semimetal was discovered recently in TaAs, its magnetic counterpart has remained elusive. The time-reversal breaking Weyl phase is predicted to exhibit exotic properties distinct from the inversion-breaking phases. Here we propose and compare different strategies for designing Weyl semimetals, and identify a large class of magnetic Weyl semimetals in RAlGe[1 2] and Co2TiX[3] families. We will also illustrate our approach for generating magnetic Weyl nodes from Nexus fermions[4].
1 S-Y. Xu et al, arXiv: 1603.07318
2 G. Chang et al, arXiv: 1604.02124
3 G. Chang et al, arXiv: 1603.01255
4 G. Chang et al, arXiv: 1605.06831

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