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Exotic topological states near a quantum metal-insulator transition in pyrochlore iridates[1]

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Pyrochlore iridates have attracted great interest as prime candidates that may host topologically nontrivial states, spin ice ordering and quantum spin liquid states, in particular through the interplay between different degrees of freedom, such as local moments and mobile electrons. Based on our extensive study using our high quality single crystals, we will discuss such examples, i.e. chiral spin liquid in a quadratic band touching state, Weyl semimetallic state and chiral domain wall transport nearby a quantum insulator-semimetal transition in pyrochlore iridates. References: [1] D. E. MacLaughlin et al Phys. Rev. B 92,054432 (2015) [2] Y. Machida et al, Nature 463 210 (2010) [3] T. Kondo et al, unpublished. [4] Z. Tian et al unpublished. [5] A. Sushkov et al. arXiv1507.01038 (2015) [6] Y. Yamaji et al, arXiv 1507.04153v1 (2015)

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