

Abstract Submitted
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Excitonic Phases from Weyl Semi-Metals with short range interaction¹ SUNG-PO CHAO, National Tsing Hua University, HUAZHOU WEI, VIVEK AJI, UC Riverside — Weyl semimetal, possibly realized in Pyrochlore irridates or supperlattice of 3D topological-normal insulators system, has strong spin orbit interactions leading to effective low energy described by massless linearly dispersing fermions. In the absence of interactions chirality is a conserved quantum number, protecting the semi-metallic physics against perturbations that are translationally invariant. We show that the interplay between short range repulsive interaction and topology yields a novel chiral excitonic insulator. The state is characterized by a complex vectorial order parameter leading to a gapping out of the Weyl nodes. An interesting feature is that it is ferromagnetic, with the phase of the order parameter determining the direction of the induced magnetic moment. The case of Coulomb interaction will be discussed by Huazhou Wei in his report.

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