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Education:

1996-2000: B. Sc., Department of Physics, Nanjing University
2000-2005: M. Sc & Ph. D., Department of Physics, Nanjing University

Professional Employment:

2016 – present:	Professor, Institute of Physics, Chinese Academy of Sciences
2010 – 2016:	Associate Professor, Institute of Physics, Chinese Academy of Sciences
2007 – 2010:	Assistant Professor, Japan Advanced Institute of Sciences and Technology
2005 – 2007:	Postdoctor, Institute for Materials Research, Tohoku University

Research interests:

First-principles calculation; Transition-metal Oxide; Topological Materials; Magneto-optics

Selected Publications:

1. *Weyl Semimetal Phase in Noncentrosymmetric Transition-Metal Monophosphides*
   Hongming Weng*, C. Fang, Z. Fang, B. A. Bernevig, X. Dai
   Phys. Rev. X 5, 011029 (2015)
2. *Topological node-line semimetal in three-dimensional graphene networks*
   Hongming Weng*; Liang Y.; Xu Q.; Yu R.; Fang Z.; Dai X.; Kawazoe, Y.
   Phys. Rev. B 92, 045108 (2015)
3. *Dirac semimetal and topological phase transitions in A_3Bi (A = Na, K, Rb)*
   Wang Zhijun, Sun Yan, Chen Xing-Qiu, Franchini Cesare, Xu Gang, **Hongming Weng***, Xi Dai, Zhong Fang*
   Phys. Rev. B 85, 195320 (2012)
4. *Topological Crystalline Kondo Insulator in Mixed Valence Ytterbium Borides*
   Hongming Weng, JZ Zhao, ZJ Wang, X. Dai, Z. Fang
   Phys. Rev. Lett. 112 , 016403 (2014)
5. *Transition-Metal Pentatelluride $ZrTe_5$ and $HfTe_5$: a Paradigm for Large-gap Quantum Spin Hall Insulators*
   Hongming Weng, X. Dai*, Z. Fang*
   Phys. Rev. X 4 , 011002 (2014)

6. *Topological semimetals with triply degenerate nodal points in θ-phase tantalum nitride*
   Hongming Weng*, Chen Fang*, Zhong Fang, and Xi Dai
   Phys. Rev. B 93, 241202(R) (2016)
7. *Topological semimetals predicted from first-principles calculations*

   Hongming Weng *, Xi Dai* and Zhong Fang*

   J. Phys.: Condens. Matter 28, 303001 (2016)

Prediction of Topological Semimetals

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Abstract. Topological semimetals (TSMs), characterized by Weyl/Dirac nodes in the bulk and Fermi arcs on their surfaces, are new states of three-dimensional quantum matters. They represent the extension of the topological classification of matters from insulator to metal. The low energy excitation in Dirac/Weyl semimetals (WSM) behaves in the similar way as the massless Dirac/Weyl fermions described by Dirac/Weyl equation. The Weyl fermions have certain chirality and have not been discovered since Hermann Weyl proposed them nearly 88 years ago. The recent discovery of their quasiparticles in solids has inspired broad and intensive studies in the field of TSMs. Notably, the Lorentz invariance assumed in high-energy field theory is broken in solids, which leads to more unconventional quasiparticles beyond the traditional classification of Dirac-Weyl-Majorana fermions. This greatly enriches the quantum states of TSM family, including Node-Line semimetal, type-II WSM, multiple-degenerate nodal point semimetal, etc. The precise prediction of materials hosting these novel quantum states is highly needed for further studies, while it is also very challenge when facing countless materials. In this talk, I will introduce our theoretical predictions of them to show the physical pictures, experimental features and practical design. These successful stories have led to the first time realization of several TSM family members. Each of them and their relationship with each other are discussed and summarized.