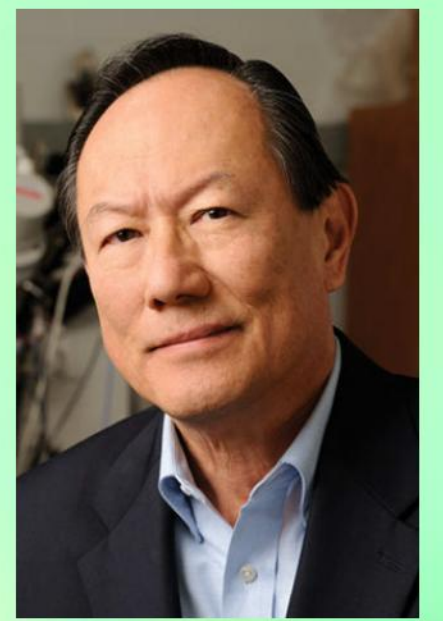


Special Seminar

Prof. Chia-Ling Chien

Dept. of Physics & Astronomy, The Johns Hopkins University, USA



Date: May 30, 2014 (Friday)

Time: 2:20 PM - 3:30 PM

Location: R833, CCMS & New Physics Bldg., NTU

Topic:

Broken Symmetry, Helix, and Skyrmion in B20 Chiral Magnets

Abstract:

Broken symmetry, a fundamental concept in many branches of physics, is consequential in crystalline solids. In cubic B20 magnets (e.g., MnSi, FeGe, Cu₂OSeO₃), the broken inversion symmetry leads to the Dzyaloshinskii-Moriya (D-M) interaction, which gives rise to the helical ground state and the exotic Skyrmion state as previously revealed by small angle neutron scattering (SANS)¹ in the reciprocal space and Lorentz transmission electron microscopy (TEM)² in the real space. We use magnetometry and transport measurements to capture the signature of the broken rotation symmetry, the non-collinear spin structures³, and the intrinsic resistance of spin helix⁴.

¹) S. Mühlbauer *et al.*, *Science* **323**, 915 (2009).

²) X. Z. Yu, *et al.*, *Nature* **465**, 901 (2010).

³) S. X. Huang and C. L. Chien, *Phys. Rev. Lett.* **108**, 267201 (2012).

⁴) S. X. Huang *et al.*, (submitted).

Education:

◆ Ph.D. in Carnegie-Mellon University (Physics), 1972

Current research interests:

fabrication of nanostructured materials and the studies of their electronic, magnetic, and superconducting properties; highly spin polarized materials, skyrmion thin films, pure spin current phenomena, and magnetoelectronics.

Experience:

◆ 1983-present : Professor of Physics, The Johns Hopkins University

◆ 1995 : Program Co-Chairman, 40th Conference on Magnetism and Magnetic Materials

◆ 1996-2003 : Advisory Committee, Hong Kong University of Science and Technology

◆ 1996-2002 : Associate Editor, "Methods in Materials Research : A Current Protocols Publication" (Wiley)

◆ 1997-present : Director, Materials Research Science and Engineering Center (MRSEC) at Johns Hopkins University

◆ 2002 : General Chairman, Conference on Magnetism and Magnetic Materials

◆ 2002-present : Member, Advisory Committee, Institute of Physics, Academia Sinica, Taiwan

◆ 2003 : Chair, Advisory Committee, Conference on Magnetism and Magnetic Materials

◆ 2007 : Member, Department of Physics and Astronomy Academic Performance Evaluation Committee, National Tsinghua University, Taiwan

◆ 2010 : Associate Editor, "Methods in Materials Research: A Current Protocols Publication" (Wiley)

◆ 2011(1-8) : Distinguished Visiting Research Fellow, Institute of Physics, Academia Sinica

◆ 2011(1-8) : Visiting Professor, Center for Condensed Matter Sciences, NTU

Honors and Distinction:

◆ Jacob L. Hain Professor of Physics

◆ 1996- Honorary Professor, Nanjing University, Nanjing, China

◆ 1996- Honorary Professor, Lanzhou University, Lanzhou, China

◆ 1998- Advisory Professor, Fudan University, Shanghai, China

◆ 2004 David Adler Award of American Physical Society

◆ 2005 IEEE Magnetics Society Distinguished Lecturer

◆ 2006- Honorary Chair Professor, National Tsinghua University, Taiwan

◆ 2007 Tunghai University Distinguished Alumnus Award

◆ 2010 Fellow of the American Association for the Advancement of Sciences (AAAS)

◆ 2012 First recipient of AUMS (Asian Union of Magnetics Societies) Award

Professional Activities :

◆ Fellow : American Physical Society (1989)

Sponsors:



◆ 國立台灣大學應用物理研究所 Institute of Applied Physics, National Taiwan University

◆ 國立台灣大學量子科學與工程研究中心 CQSE, National Taiwan University

◆ 科技部 Ministry of Science and Technology

◆ 美國物理學會 American Physical Society