



Seminar

Nanomaterials Playground: Magnetic Skyrmions, Magneto-Ionics and Metal Foams

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Time: 10:00am, Dec. 19, 2017 (Tuesday)

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10:00

Venue: Room W563, Physics building, Peking University

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Nanomaterials offer an exciting platform to address grand challenges in the post-law era. In this talk I will illustrate some of our current efforts. For example, in recently discovered magnetic skyrmions, mostly at low temperatures, the unique spin texture and the topologically protected quantum state offer great potentials for low dissipation magnetic information storage. We have demonstrated the realization of artificial Bloch skyrmion lattices, as well as planar skyrmion lattices, in their ground state at room temperature [1]. In a second area, we have demonstrated effective magneto-ionic manipulation of metal/oxide interfaces due to a redox-driven oxygen migration, manifested through the interface-sensitive exchange bias effect [2] and controllable under an electric field [3]. Similar effects are also found in getter-metal/perovskites, where the ferromagnetism is sensitively moderated by O-migration [4]. More recently, we have achieved ultra-lightweight palladium nanowire foams that exhibit highly attractive characteristics for hydrogen storage [5].

1. *Nature Communications* **6**, 8462, (2015).
2. *Nature Communications* **7**, 11050 (2016).
3. *Nature Communications* **7**, 12264 (2016).
4. *Appl. Phys. Lett.* **108**, 082405 (2016).
5. *Chem. Mater.* **29**, 9814 (2017).

Prof. Kai Liu received his Ph.D. in Physics from the Johns Hopkins University in 2005. He then worked as a postdoctoral fellow at the University of California, San Diego, and as an assistant professor at the University of California, Berkeley. He joined the University of California, San Diego, as an associate professor in 2010. His research interests are in the physics of low-dimensional magnetic systems, including skyrmions, magneto-ionic systems, and metal foams.