

716th ASRC Seminar

Date: 13:30~15:00 Thu., April 19

Location: 103 Meeting Room, ASRC Bldg.

Speaker: Dr. Valentin Taufour
(University of California, Davis)

Title: Quantum tricritical points, quantum wing critical points and more in the phase diagram of metallic quantum ferromagnets

Abstract:

Studies of the temperature-pressure (T-p) phase diagram of metallic quantum ferromagnets have revealed that ferromagnetic quantum criticality is avoided in two ways [1]: either the transition becomes of the first-order at a tricritical point before being suppressed such as in UGe_2 [2,3], or a transition to modulated magnetic phases appear such as in $LaCrGe_3$ [4]. We have shown that the addition of a magnetic field (H) can restore quantum criticality at the end of “wings” in the T-p-H phase diagram in both UGe_2 and $LaCrGe_3$ [5]. Our careful study of the “wings” near the tricritical point reveal new rules that apply to the T-p-H phase diagram [6]. We discuss our experimental T-p-H phase diagrams of UGe_2 , $LaCrGe_3$, and $CeTiGe_3$ and how these compounds illustrate different strength of quantum fluctuations based on recent theoretical results [7].

[1] M. Brando et al. *Rev. Mod. Phys.*, 88, 025006 (2016).[2] V. Taufour et al. *Phys. Rev. Lett.* 105, 217201 (2010).[3] H. Kotegawa et al. *J. Phys. Soc. Jpn.*, 80, 8, 083703 (2011).[4] V. Taufour et al. *Phys. Rev. Lett.* 117, 037207 (2016).[5] U. S. Kaluarachchi et al. *Nature Communications* 8, 546 (2017).[6] V. Taufour et al. *Phys. Rev. B* 94 060410 (2016).[7] Belitz et al. *Phys. Rev. Lett.* 119, 267202 (2017)

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