



# 570<sup>th</sup> ASRC Seminar



Date: 11:00 ~ 12:00, 30 October

Location: Meeting room 103, ASRC Building

Speaker: Dr. Hiroaki Ikeda  
(Ritsumeikan University)

Title: First-principles approach  
in heavy-fermion superconductors

Heavy-fermion superconductor  $\text{CeCu}_2\text{Si}_2$  is a prototype of non-BCS superconductors in strongly correlated electron systems. Despite intensive studies, the superconducting mechanism and even superconducting gap structure still remains unsolved [1]. We here investigate possible superconductivity on the basis of a recent advanced first-principles approach. We find that the promising candidate is an  $s_{\pm}$ -wave state, like in the iron-based superconductors [2]. This  $s$ -wave pairing state is in sharp contrast to the widely believed line-nodal  $d$ -wave state. We will show the present situation of microscopic studies in heavy-fermion superconductors, together with our recent work in Ce115 systems [3].

[1] S. Kittaka, et al. Phys. Rev. Lett. 112, 067002 (2014).

[2] H. Ikeda, et al. preprint.

[3] T. Nomoto and H. Ikeda, Phys. Rev. B, in press.



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