Coexistence of magnetism and the FFLO superconductivity

Marcin Mierzejewski, Andrzej Ptok and Maciej M. Maśka

Institute of Physics, University of Silesia, 40-007 Katowice, Poland

Recent experiments on $CeCoIn_5$ suggest an unusual interplay between superconducting and magnetic orders that gives rise to a multicomponent (magneto-superconducting) phase [1]. Although a non-trivial interplay between superconductivity and magnetism has been expected in strongly correlated systems, long-range superconducting and magnetic orders are usually recognized as competing phenomena. However, in the case of $CeCoIn_5$, the antiferromagnetic order occurs only inside the boundaries of the superconducting phase indicating that instead of competition one observes a mutual stabilization of these phases. A possible scenario will be discussed during the presentation.

[1] M. Kenzelmann, et al., Science 321, 1652 (2008).