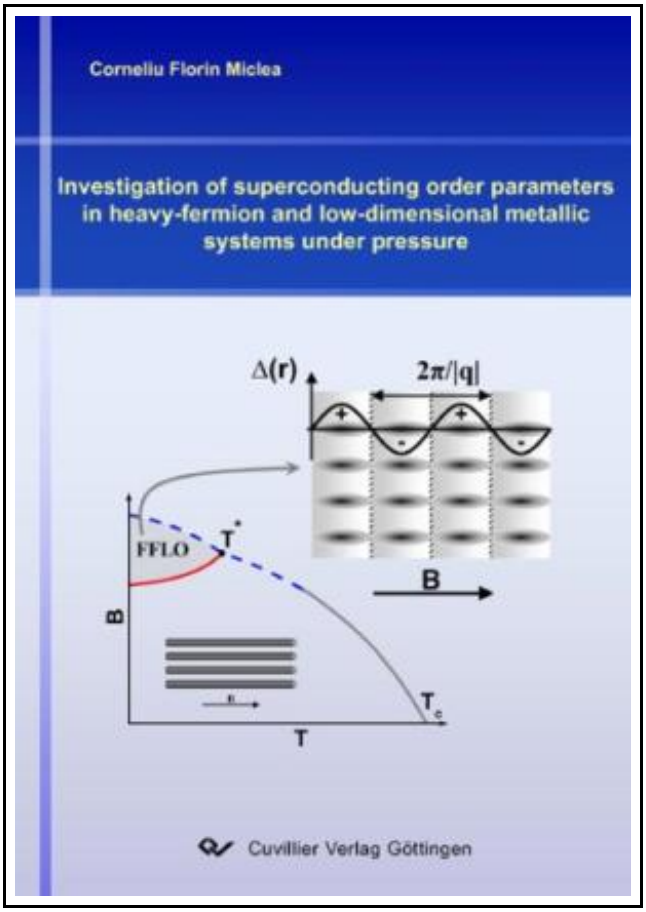
# Investigation of superconducting order parameters in heavy-fermion and low-dimensional metallic systems under pressure

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# INVESTIGATION OF SUPERCONDUCTING ORDER PARAMETERS IN HEAVY-FERMION AND LOW-DIMENSIONAL METALLIC SYSTEMS UNDER PRESSURE



Cuvillier Verlag Aug 2008, 2008. Taschenbuch. Book Condition: Neu. 211x147x12 mm. Neuware - The understanding of new emerging unconventional ground states is a great challenge for experimental and theoretical solid-state physicists. New ground states are developing, where different energy scales compete, leading to a high sensitivity of the system to external tuning parameters like doping, pressure or magnetic field. The exploration of superconductivity proved to be a fascinating and challenging scientific undertaking. Discovered by H. Kammerlingh Onnes in 1911, prior to the development of the quantum theory of matter, superconductivity was defying a microscopic theory for more than four decades until the BCS theory was formulated in 1957 by J. Bardeen, L. N. Cooper and J. R. Schrieffer. Superconductivity of most of the simple metals or metallic alloys is well described within the frame of the BCS scenario, however, in the last thirty years numerous new superconducting materials were found to exhibit exotic properties not accounted for by the BCS theory. Among them are included the high-Tc compounds, the heavy-fermion superconductors and as well the organic superconductors. It was the purpose of this work to probe different facets of superconductivity in heavy-fermion and in low-dimensional metallic compounds. This dissertation is divided into six chapters. In Chapter 1 are outlined the basic theoretical concepts later needed for the analysis of the experimental results. Chapter 2 briefly introduces the experimental techniques with a special focus on the new pressure cells developed during this study and used for the measurements presented in Chapters 3 to 5. In Chapter 3 the possible realization of the inhomogeneous superconducting FFLO state in CeCoIn5 is studied by specific heat measurements under hydrostatic pressure, while in Chapter 4 the results of ac specific heat experiments on UBe13 under uniaxial pressure are presented. The ambient pressure properties as well...

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