

Suppression of superconductivity in the heavy fermion system CeCoIn_5

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CeCoIn_5 belongs to a family of superconductors where the quasi-particles have an effective mass, which is of the order of 1000 that of the electrons in a normal metal like copper. These heavy fermion superconductors are unconventional as superconductivity appears close to magnetic phase boundaries suggesting that magnetic fluctuations are responsible for this phenomenon. Doping CeCoIn_5 with Sn, which substitutes the In atom, or applying pressure in this system can suppress superconductivity bringing it to the normal state. This occurs at a superconductor quantum critical point (SQCP) where quantum fluctuations of the Cooper pairs dominate the thermodynamic and transport behavior. We will discuss in this seminar the nature of the SQCP in CeCoIn_5 . We will show that the increase in hybridization between the heavy quasi-particles and the conduction electrons due to doping or pressure gives an accurate description of their phase diagram.