

Abstract Submitted  
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**Magnetic excitations in heavy fermion materials: Superconductivity and hidden magnetic quantum critical fluctuations**<sup>1</sup> YI-FENG YANG, Los Alamos National Laboratory, RICARDO URBANO, National High Magnetic Field Laboratory, NICHOLAS CURRO, DAVID PINES, University of California, Davis, ERIC BAUER, Los Alamos National Laboratory — We report Knight shift experiments on the superconducting heavy electron material CeCoIn<sub>5</sub> that allow one to track with some precision the behavior of the heavy electron Kondo liquid in the superconducting state with results in agreement with BCS theory. An analysis of the <sup>115</sup>In nuclear quadrupole resonance spin-lattice relaxation rate  $T_1^{-1}$  measurements under pressure reveals the presence of  $2d$  magnetic quantum critical fluctuations in the heavy electron component that are a promising candidate for the pairing mechanism in this material. Our results are consistent with an antiferromagnetic quantum critical point located at slightly negative pressure in CeCoIn<sub>5</sub> and provide additional evidence for significant similarities between the heavy electron materials and the high  $T_c$  cuprates.

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Yi-feng Yang  
Los Alamos National Laboratory

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