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$CeCu_2Ge_2$: Challenging our understanding of quantum criticality[1] BIN ZENG, QIU ZHANG, DANIEL RHODES, National High Magnetic Field Lab, YASUYUKI SHIMURA, Institute for Solid State Physics, University of Tokyo, Kashiwa, Japan, DAIKI WATANABE, Department of Physics, Kyoto University, Kyoto, Japan, RYAN BAUMBACH, National High Magnetic Field Lab, PEDRO SCHLOTTMANN, Department of Physics, Florida State University, Tallahassee, Florida, TAKAO EBIHARA, Department of Physics, Graduate School of Science, Shizuoka University, Shizuoka, Japan, LUIS BALICAS, National High Magnetic Field Lab — Here, we unveil evidence for a quantum phase transition in $CeCu_2Ge_2$. For the H//c-axis, no experimental evidence for QC. But as H is rotated towards the a-axis, these μ's increase considerably becoming undetectable for θ >56°. Around H$\sim$ 30 T the resistivity becomes $\propto$T which, coupled to the divergence of μ, indicates the existence of a field-induced QC point(T = 0 K). This observation, suggesting FS hot spots associated with the SDW nesting vector, is at odds with current QC scenarios for which the continuous suppression of all relevant energy scales at $H_p(\theta,T)$ should lead to a line of quantum-critical points in the H-θ plane. Finally, we show that the complexity of its magnetic phase diagram(s) makes $CeCu_2Ge_2$ an ideal system to explore field-induced quantum tricritical and QC end points.

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