

Abstract Submitted
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Fluctuation-induced pair density wave state in itinerant ferromagnets near to quantum criticality ANDREW G. GREEN, London Centre for Nanotechnology, GARETH CONDUIT, TCM, Cavendish Laboratory, University of Cambridge, CHRISTOPHER P. PEDDER, London Centre for Nanotechnology — Magnetic fluctuations near to itinerant ferromagnetic quantum criticality can have profound effects. It has long been realised - since the understanding of superfluidity in helium-3 - that ferromagnetic fluctuations can drive p-wave superconductivity. Near to quantum criticality, fluctuations lead to characteristic scaling with temperature and, ultimately, to a reconstruction of the phase diagram by the fluctuation-driven formation of spatially modulated magnetic order. Here, we show that near to the putative quantum critical point, these two effects become intertwined leading to a fluctuation-driven pair density wave. Moreover, describing this physics from the quantum order-by-disorder perspective reveals a fundamentally common origin of the two effects.

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