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Quantum Order by Disorder Driven Phase Reconstruction at Itinerant Electron Quantum Critical Points UNA KARAHASANOVIC, ANDREW GREEN, University of St Andrews, GARETH CONDUIT, Weizmann Institute of Science — Phase reconstruction at itinerant electron quantum critical points is driven by quantum fluctuations lowering the energy of certain deformations of the Fermi surface through second and higher order perturbation theory, i.e. quantum order by disorder. This approach was previously shown to predict a fluctuation-driven spatially modulated phase near to the ferromagnet to paramagnet quantum critical point [1]; a phase that had previously been predicted from diagrammatic evaluation of non-analytic corrections to Moriya-Hertz-Millis theory. We extend our analysis to include several other phases which may be stabilized at the ferromagnetic quantum critical point, including nematic order and superconductivity. The itinerant quantum critical point is unstable to the formation of multiple phases.

[1] G. J. Conduit, A. G. Green and B. D. Simons, Phys. Rev. Lett. **103**, 207201 (2009)

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