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Coupled nematic-magnetic quantum phase transitions in the presence of isotropic quenched disorder: a renormalization-group study LAIMEI NIE, Stanford University, JIAN KANG, RAFAEL FERNANDES, University of Minnesota — Recent elastoresistance measurements in iron-based superconductors revealed a puzzling interplay between disorder and nematic quantum criticality. Theoretically, in the case in which nematic order is promoted by magnetic fluctuations in an itinerant system, renormalization group calculations of the appropriate low-energy model predict a simultaneous first-order nematic-magnetic quantum phase transition, and, consequently, the absence of a nematic quantum critical point. Here, we investigate how these results are affected by the presence of isotropic quenched disorder, which is manifested as a random-mass term in the low-energy model. By combining the replica trick and the renormalization group approach, we investigate the existence of nematic fixed points, and discuss whether disorder can promote a second-order nematic quantum phase transition that is split from the magnetic quantum phase transition.

Laimei Nie
Stanford University

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