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Nematic susceptibility and quantum criticality in Fe-pnictide superconductors

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The concept of broken symmetry is ubiquitous in condensed matter physics because it allows us to write the proper Hamiltonian description of an electron in a solid. Determining which symmetry is broken and how it is broken is therefore crucial. I will present results from transport and magnetization experiments on both underdoped and overdoped pnictide superconductors of the "122" structural motif that help reveal the intrinsic symmetry of the electronic ground state. We reveal the nature of the nematic susceptibility as optimal doping is approached on the underdoped side, and the breakdown of Fermi liquid like quasiparticles from the overdoped side. We discuss the universality of these properties to other pnictides.