Abstract Submitted
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Theory of Strongly Correlated Superconductivity[1] WILLIAM PUTIKKA, Ohio State University — Superfluid behavior is relatively common in strongly correlated fermion systems. This suggests there is a common reason for this behavior rooted in the strong correlations. I propose such a mechanism, developed in the context of the 2D t-J model, where $d_{x^2-y^2}$ superconducting fluctuations have recently been observed[1]. The $d_{x^2-y^2}$ fluctuations are *not* due to antiferromagnetic spin fluctuations; the AF fluctuations compete with superconducting fluctuations. Pairing fluctuations have their own origin based on strong correlations. The key to understanding how this comes about is the high temperature entropy. Strong correlations not only create order at low temperatures, they also reduce the entropy at high temperatures. The response of the system is to rearrange the degrees of freedom into separate spin and charge excitations. These excitations have very different energy scales, allowing the charges to develop pairing correlations before the spin degrees of freedom become coherent. At lower temperatures where the spins become coherent they determine the symmetry of the electronic pair wavefunction in a manner to best *avoid* the magnetic fluctuations in the system.
1. WO Putikka and MU Luchini, PRL**96**, 247001 (2006).

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