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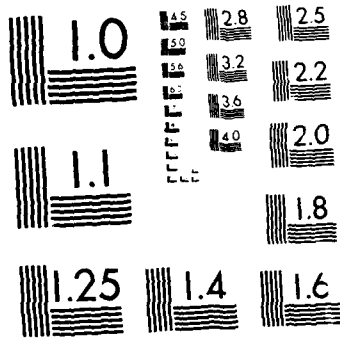
THEORY OF SUPERCONDUCTIVITY IN OXIDES(U) PRINCETON UNIV 1/1
NJ DEPT OF PHYSICS P W ANDERSON 18 MAY 88
AFOSR-TR-88-0633 AFOSR-87-0392

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<p>It was during this period that I feel we made our greatest progress towards a final theory of high Tc superconductivity. The work is best summarized in my conference talk given at the Interlaken meeting on the 29th of February, 1988. The key elements are the work by Zou and myself on normal state properties, and by Hsu, Wheatley and myself on the actual mechanism for Tc.</p>							
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FINAL TECHNICAL REPORT
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I enclose a list of some of the papers prepared, submitted or given by our group in the period of the above grant.

It was during this period that I feel we made our greatest progress towards a final theory of high T_c superconductivity. The work is best summarized in my conference talk given at the Interlaken meeting on the 29th of February, 1988. The key elements are the work by Zou and myself on normal state properties, and by Hsu, Wheatley and myself on the actual mechanism for T_c .

With the understanding (ZA) of the large anisotropy and other transport properties in the normal state, the model is uniquely determined: one must have one version or another of a holon-spinon quantum fluid state, which is not a normal fermi liquid. And with the recognition (HWA) of the large repulsion holon-holon interactions, we have the first way of thinking quantitatively about the superconducting state.

Meantime Doucot, Liang and Shastry as well as myself, John, et al were doing very interesting work on the pure Heisenberg system, which is related but not necessarily crucial to understanding the superconducting properties. This is described in the various papers by these authors.

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CMT GROUP PUBLICATION LIST

P.W. Anderson

1. P.W. Anderson, Phys. Rev. Lett **59**, 2497 (1987)
Comment on "Two Dimensional Antiferromagnetic Quantum Fluid State in La_2CuO_4 " by Shirane, et al
2. P.W. Anderson, Z. Zou, Phys. Rev. Lett, **60**, 132 (1988)
"Normal" Tunneling and "Normal" Transport: Diagnostics for the Resonating-Valence-Bond State
3. P.W. Anderson, Proceedings of Nature Conference *Perspectives in the new Superconductivity*, Boston, November 9-11, 1987
The Theory of High T_c Superconductors
4. P.W. Anderson, Proceedings of the International Conference on *High-Temperature Superconductors and Materials and Mechanisms of Superconductivity*, Interlaken, Switzerland, Feb. 29-March 4, 1988 (J. Müller, J.L. Olsen, eds.), to be published in Physica B.
The Theory of High T_c Superconductors
5. J.M. Wheatley, T.C. Hsu, P.W. Anderson, Phys. Rev. B1 **37**, (1988) Rapid Communications.
Interlayer Pair Hopping: Superconductivity from the RVB State
6. P.W. Anderson, Talk given at AAAS Annual Meeting, *The New Superconductivity*, Boston, Feb. 11-55, 1987
A Theory of the New Superconductors: "Popular" version for AAAS
7. P.W. Anderson, S. John, B. Doucot, S. Liang, submitted to Phys. Rev. Lett.
Fermions and Topology in the Two-Dimensional Antiferromagnet: Topological Stability of "Merons"
8. S. Liang, B. Doucot, P.W. Anderson, Submitted to Phys. Rev. Lett.
Some New Variational RVB-type Wave Functions for the Spin 1/2 Antiferromagnetic Heisenberg Model on a Square Lattice

J. Wheatley

1. J. Wheatley *Fermi Condensate: a Saddle Point View of RVB*, to be submitted to Physica C
2. J. Wheatley, *Does the Two-dimensional Large-U Hubbard Model Ever Show Fermi Liquid Behavior?*, to be submitted to Journal of Physics C.

Z. Zou

1. Z. Zou and P.W. Anderson, *Neutral Fermion, Charge e Boson Excitations in the RVB State and Superconductivity in La_2CuO_4 -Based Compounds*, Phys. Rev. Lett. **B 37**, 627 (1988)
2. Z. Zou, *$SU(2)$ Gauge Symmetry and Anomaly of $S = 1/2$ Antiferromagnetic Heisenberg Model in $2+1$ Dimension*, Submitted to Phys. Rev. Lett., (1987)

B. Sriram Shastry

1. Exact Solution of a $S = 1/2$ Heisenberg Antiferromagnetic Chain with long Range interactions, Phys. Rev. Lett. **60**, 639 (1988)

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