MAR05-2004-005277

Abstract for an Invited Paper
for the MAR05 Meeting of
the American Physical Society

The Dynamical Cluster Approximation[1]

MARK JARRELL, University of Cincinnati

The DCA is a general approach for the theory of correlated and disordered lattice systems which maps the lattice onto a self consistently embedded periodic cluster. When the cluster size is one the mean field solution is recovered (DMFT or CPA), and as the cluster size increases non-local corrections are systematically incorporated. A variety of methods may be used to solve the cluster problem. The DCA has been used to study a variety of systems, including the cuprates, dilute magnetic semiconductors and carbon nanotubes. The DCA formalism, comparison with other cluster methods, and these applications will be reviewed.

[1]Supported by the NSF: DMR-0312680 and DMR-0113574