

Title: Perturbation theory of disordered metals

The problem of quantum localization of a particle in a random potential first raised by Anderson has proven to be surprisingly rich. In spite of considerable studies associated with Anderson localization the subject continues to generate new ideas. As a result of past developments there are now several theoretical constructions and a good understanding of certain experimental aspects of the problem. At the same time there remain a number of outstanding problems. In these lectures after a short introduction to the basic concepts I will present one of the theoretical frameworks, the perturbation theory of disordered metals, using a formal diagrammatic approach and its application in developing the scaling theory of localization. I will also discuss some cases where the scaling theory needs to be restated.