

Lecture 18: Band Magnetism and Stoner Theory

Lecture 19: Mean Field Theory and Spin Density Waves

The itinerant theory of magnetism is discussed starting from a heuristic argument that short range repulsion between electrons favor spin splitting of the energy band. This is discussed from the point of view of the linear response theory. A self consistent field method is introduced to take care of the instability encountered in the linear response theory.

We briefly discuss the concept of a paramagnon for a system near the magnetic instability. We then describe the spin density wave and the itinerant form of antiferromagnetism.

Reading: Doniach and Sondheimer, *Green's Function for Solid State Physics*, Chapter 7.7