Lecture 24: Ginzburg Landau free energy, Meissner effect and flux quantization

We continue to discuss the physical implications of the quasiparticles. The way they are measured in tunnelling is briefly discussed. We then write down the Ginzburg Landau free energy and the expression for the current. For constant $|\Psi|$ we recover the London equation which explains the Meissner effect. The phenomenon of flux quantization is also predicted. We emphasize that persistent current is a consequence of topological winding of the phase ϕ around a superconducting ring.

Reading: Marder 27.2.3, 27.2.4, 27.2.5