



Physics research talks 2016-17

Ever wondered what goes on behind the lab doors? Come and find out!

Binoy Sobnack *Phase slips and critical currents*

Wed 17 May, 13.00, SMB0.17

We study the effect of phase slips in a quasi 2D superconducting channel along which a current flows. We describe a new phenomenon where an avalanche of phase slips occurs and which we call a phase slip catastrophe. This limits the critical current in thin films and wires and drives the system to a topological phase transition at a temperature lower than the bulk critical temperature. We describe the mechanism of such a catastrophic phase slip avalanche and, following Kosterlitz and Thouless, we use renormalization group techniques to derive an analytical expression for the critical current as a function of film width and temperature. We compare our results with available experimental data on superconducting MgB_2 thin films.

all welcome!

Please let John Samson know if you would like to offer a talk in next year's series.