Time: Tuesday May 3rd, 2011 2:30pm
Location: Buchanan A203

Modelling the Effects of Surface Geometries on Superconductors

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One of the defining properties of a superconductor is its ability to block a magnetic field from penetrating inside. Until very recently this behavior was believed to be well-understood, but experiments at the Paul Scherrer Institute have found results that appear to contradict the well-known theory. Through a mix of analytical approximations and numerical schemes, we explore one of the potential causes for the surprising results: small imperfections on the superconductors surface. Our analysis uncovers previously unknown theoretical behaviours of superconductors, and we find evidence that the surface imperfections alone cannot cause the experimental anomalies.