



Weekly Seminar

Disordered superconductors near $T=0$

Prof. Dan Shahar

The Weizmann Institute, Israel



Time: 4: 00 pm, Nov. 13, 2019 (Wednesday)

时间: 2019年11月13日 (周三) 下午4:00

Venue: Room W563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

It turns out that, surprisingly, superconductors have not been studied extensively near $T=0$. This is mainly because the experimentally accessible and technologically interesting range is usually closer to T_c . With disorder superconductors one obtains the advantage that measurements can be performed down to the mK range. But there, the weak coupling of the Cooper-pair condensate to the thermal phonon system impose severe limitations on reaching equilibrium conditions.

There are two different but related manifestations of this that we will discuss. The first is the ubiquitous observation that thin-film superconductors exhibit distinct saturation of the resistance as T approaches zero. We had shown that it can be a result of strenuous electrical noise impinging on the sample. The second is related to the critical current that we measure at low temperatures. We demonstrate that the critical current is a result of non-equilibrium, bi-stable condition that the electronic system develops. Using this approach we are able to predict the critical current in our films to within 1%.

About the speaker

1990—1995 Ph. D. Physics, Princeton University, Princeton, NJ, USA
1995—1997 Postdoctoral Research Assistant, Princeton University
1997-date Professor of Physics, The Weizmann Institute, Israel