

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Two types of superconducting domes in unconventional superconductors TANMOY DAS, Indian Institute of Science, Bangalore, CHRISTOS PANAGOPOULOS, Nanyang Technological University, Singapore — In this talk, we present a comprehensive analysis of the SC properties and phase diagrams across several families of unconventional superconductors within the copper-oxides, heavy-fermions, organics, and the recently discovered iron-pnictides, iron-chalcogenides, and oxybismuthides. We find that there are two types of SC domes present in all families of SC materials, arising sometimes as completely isolated, or merged into one, or in some materials only any one of them appears. One of the SC dome appearing at or near a possible QCP usually possesses a lower transition temperature (T_c). The other SC dome appearing at a different value of the tuning parameter around a non-Fermi liquid (NFL) state often has higher T_c . Both SC domes are not necessarily linked to each other, and so does the QCP and NFL state. In materials, where both domes are present, they can be isolated by multiple tuning (such as disorder, or pressure, or magnetic field in addition to doping, and vice versa), giving a unique opportunity to decouple the relationship between QCP, NFL, and their role on superconductivity. The systematic study the NFL state might be a generic route to higher- T_c superconductivity.

Tanmoy Das
Indian Institute of Science, Bangalore, India

Date submitted: 27 Oct 2015

Electronic form version 1.4