

Superconductor sandwiches

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Multilayers of doped Silicon are the heart of the diodes and transistors which form the basis for virtually all modern electronics. With a rapidly impending need for more energy efficient computers, it is interesting to see what can be done with multilayers of more exotic starting materials. The superconductor sandwiches we study are thin-film multi-layers of the high temperature superconductor $\text{YBa}_2\text{Cu}_3\text{O}_7$ and the perovskite manganite $\text{Nd}_{0.65}(\text{Ca}_{0.7}\text{Sr}_{0.3})_{0.35}\text{MnO}_3$. We discovered that a highly unusual superconducting state could be induced in the $\text{YBa}_2\text{Cu}_3\text{O}_7$ by tuning the properties of the manganite. It remains to be determined precisely how the manganite can so radically effect the superconducting state in the adjacent layer. Here, we discuss our current polarised neutron reflectivity (PLATAPUS) and Bragg scattering (TAIPAN) work to investigate the role of the manganite's magnetism and magnetic ordering in causing the unusual properties of the superconductor sandwiches.

Level of Expertise

Experienced Research

Speakers Gender

Male

Do you wish to take part in the poster slam

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