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High Temperature Proximity Effect in Topological Insulators

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Producing new effects through the combination of different materials has a long history in science and technology. One of the most intriguing recent ideas is the emergence of Majorana fermions when a topological insulator is placed in proximity with a superconductor. Towards this goal, we produced high-temperature superconductivity in topological insulators via the proximity to a high temperature superconductor. In this talk I will describe the simple mechanism to achieve this. In addition I will present our extensive tunnelling spectroscopy studies that confirm the existence of the proximity effect. Lastly I will discuss some potential future directions this technique offers for novel optical devices.

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