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Tip-induced superconductivity in the topological crystalline insulator $\text{Pb}_{0.6}\text{Sn}_{0.4}\text{Te}$ SHEKHAR DAS, LEENA AGGARWAL, IISER Mohali, India, SUBHAJIT ROYCHOWDHURY, JNCASR Bangalore, India, MOHAMMAD ASLAM, SIRSHENDU GAYEN, IISER Mohali, India, KANISHKA BISWAS, JNCASR Bangalore, India, GOUTAM SHEET, IISER Mohali, India — Materials exhibiting nontrivial topological properties are in the focus of contemporary condensed matter physics and the emergence of exotic phases of matter from these materials is an outstanding issue. $\text{Pb}_{0.6}\text{Sn}_{0.4}\text{Te}$ was recently known to be a topological crystalline insulator. In this talk, I will show that by forming a mesoscopic point-contact between a normal, non-superconducting elemental metal as a tip and $\text{Pb}_{0.6}\text{Sn}_{0.4}\text{Te}$ as a sample, a superconducting phase is induced locally in a confined region under the point-contact. Interestingly, neither the tip nor the sample is a superconductor, but a prominent superconducting phase appears only under the point-contact at a high transition temperature T_c that falls in a range between 3.7 K and 6.5 K. From experiments under different conditions with tips made up of different materials, both magnetic and non-magnetic, I will also discuss the nature of superconductivity.

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