Title:	Mesoscopic superconductivity above 10 K in silicon point contacts
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Abstract:	Silicon, perhaps the most ubiquitously used material in the digital age of today, has also been a material of choice for testing the fundamental differences between various electronic ground states, e.g., metals and insulators. This is mainly because ultimate control has been achieved in growing extremely pure silicon crystals and doping them with varying concentrations of charge carriers and their mobility. Here, we show that by forming mesoscopic point contacts with non-superconducting metals on insulating (doped) silicon, it is possible to obtain a superconducting phase with a remarkably high critical temperature above 10 K and an average superconducting energy gap of 2 meV. Apart from its importance in advancing the understanding of nanoscale superconductivity, this discovery is also expected to boost the efforts to realize silicon based superconducting devices with far reaching application potential. We thank Dr. Yogesh Singh for providing access to a PPMS system where Hall effect studies were done. We acknowledge the support of Mr. Shekhar Das, Ms. Leena Aggarwal, Mr. Avtar Singh, Mr. Ritesh Kumar, and Mr. Anzar Ali during various stages of this work. G.S. would like to acknowledge the partial financial support from the research grant of Ramanujan fellowship awarded by the Department of Science and Technology (DST), Government of India under the Grant No. SR/S2/RJN-99/2011 and the research grant from DST-Nanomission under the Grant No. SR/NM/NS-1249/2013.
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