

## A Reflection on Mesoscopic Superconductivity

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It has been recently observed that certain novel phases of matter, like superconductivity, emerge at mesoscopic interfaces between elemental metals and topologically nontrivial systems like topological insulators and topological Dirac and Weyl semimetals. In this talk, I will review some of the published results on such mesoscopic superconducting phases with special emphasis on tip-induced superconductivity (TISC). A TISC phase is known to emerge under the point of contact between a sharp tip of a (non-superconducting) normal metal and a material with topologically non-trivial band structures. Since the superconducting volume fraction in a TISC is extremely small, traditional bulk characterization tools like regular transport and magnetization measurements fail to detect such a phase. I will highlight how probing Andreev reflection at such mesoscopic point contacts, a quantum process through which a normal current is converted into a supercurrent in a normal metal-superconductor interface, can be useful in detecting TISC and understanding the nature of TISC.

### References

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