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Title:	Mesoscopic superconductivity and high spin polarization coexisting at metallic point contacts on Weyl semimetal TaAs
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Keywords:	Weyl semimetal topologically non-trivial phase mass-less Weyl fermions
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Abstract:	A Weyl semimetal is a topologically non-trivial phase of matter that hosts mass-less Weyl fermions, the particles that remained elusive for more than 80 years since their theoretical discovery. The Weyl semimetals exhibit unique transport properties and remarkably high surface spin polarization. Here we show that a mesoscopic superconducting phase with critical temperature $T_c=7$ K can be realized by forming metallic point contacts with silver (Ag) on single crystals of TaAs, while neither Ag nor TaAs are superconductors. Andreev reflection spectroscopy of such point contacts reveals a superconducting gap of 1.2 meV that coexists with a high transport spin polarization of 60% indicating a highly spin-polarized supercurrent flowing through the point contacts on TaAs. Therefore, apart from the discovery of a novel mesoscopic superconducting phase, our results also show that the point contacts on Weyl semimetals are potentially important for applications in spintronics
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