

Abstract Submitted
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Study of Mini-Gap Regime in Au Nanowires¹ BRIAN COOPER,
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sity — The inducement of superconductivity in 70nm single crystal Au nanowires
(AuNWs) via the Proximity Effect was reported in 2009 [Wang, J. et al. *Phys.*
Rev. Lett. **2009**, 102, 247003]. This study, carried out on 3 AuNWs of different
lengths (1.0, 1.2 and 1.9 μm), showed a precipitous drop in the resistance to a fully
superconducting state of the 1.0 μm wire; while the 1.2 μm wire made the transition
in 2 steps, and the 1.9 μm wire never fully transitioned to a zero resistance state.
This behaviour lead to the coinage of the so-called “mini-gap” phase in proximity
induced superconducting nanowires. We are currently investigating the robustness
of this “mini-gap” regime by parametric variations to the gold nanowire system.
Looking at features such as crystallinity, AuNW diameter, electrode material, and
directional magnetic field dependence, we are attempting to further illuminate the
nature of this new “mini-gap” state.

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