

## Modeling of Nanowires with Superconducting Cladding

A. E. Antipov, G. W. Winkler, R. M. Lutchyn

*Station Q, Microsoft Research, Santa Barbara, California 93106-6105, USA*

*andrey.antipov@microsoft.com*

The initial theoretical proposal for the realization of Majorana bound states in a condensed matter setup requires three simple ingredients: superconductivity, spin-orbit coupling and magnetic field. While this proposal is simple, the experiments are not, as they involve material science, fabrication steps, cooling, electrostatic control and actual measurements. The results of experiments are not unambiguous and allow for multiple interpretation by simple theoretical models. In order to bridge the gap one has to include peculiarities of experimental setup and engineer the modelling of systems supporting Majorana zero modes. In this talk I will show how the next generation of numerical models captures the effects of electric fields, disorder, orbital effects and how it can feedback and guide the ongoing experimental effort in the field.

[1] A.E. Antipov et al., Phys. Rev. X 8, 031041 (2018).

[2] arXiv:1902.07804

[3] arXiv:1810.04180