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Disorder effects in topological quantum wires, and alternative platforms for Majorana Fermion realization

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Spinless p-wave superconducting wires can be in a topological phase in which they harbor Majorana bound states at their ends. Although there are no known spinless p-wave superconductors in nature, several routes to the artificial creation of such systems have been proposed. In this talk, I will discuss how non-idealities in some of the proposed routes, such as potential disorder and deviations from a strict one-dimensional limit, affect the topological phase. In particular, I'll discuss how the topological phase can persist at weak disorder or for multichannel wires, although some of the signatures of the presence of Majorana fermions are obscured.