

Abstract Submitted  
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**A generic new platform for topological quantum computation using semiconductor heterostructures**<sup>1</sup> JAY SAU, ROMAN LUTCHYN, Condensed Matter Theory Center and Joint Quantum Institute, Department of Physics, University of Maryland, College Park, Maryland, USA, SUMANTA TEWARI, Department of Physics and Astronomy, Clemson University, Clemson, SC , SANKAR DAS SARMA, Condensed Matter Theory Center and Joint Quantum Institute, Department of Physics, University of Maryland, College Park, Maryland, USA — We show that a film of a semiconductor in which *s*-wave superconductivity and a Zeeman splitting are induced by proximity effect, supports zero-energy Majorana fermion modes in the ordinary vortex excitations. Since time reversal symmetry is explicitly broken, the edge of the film constitutes a chiral Majorana wire. The heterostructure we propose – a semiconducting thin film sandwiched between an *s*-wave superconductor and a magnetic insulator – is a generic system which can be used as the platform for topological quantum computation by virtue of the existence of non-Abelian Majorana fermions.

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