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Majorana fermions in few-layer NbSe₂/nanowires heterostructures BENJAMIN T. ZHOU, YINGMING XIE, KAM TUEN LAW, Hong Kong Univ of Sci Tech, PROF. K. T. LAW'S RESEARCH GROUP TEAM — Recently, the novel Ising superconductivity has been discovered in NbSe₂ atomic layers with strongly enhanced in-plane upper critical fields. This arises from the strong Ising spin-orbit coupling (SOC) in NbSe₂ which protects electron spins from being aligned by in-plane fields. In this work, we show that the Ising SOC generates spin-triplet Cooper pairs in superconducting few-layer NbSe₂. By placing paramagnetic nanowires in proximity to superconducting NbSe₂, spin-triplet pairings can be induced in the nanowires, and the system becomes a topological superconductor supporting Majorana fermions (MFs) upon application of in-plane magnetic fields. Advantages of our proposal in the experimental realization of MFs and their braiding scheme in 1D wire networks are discussed.

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