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**Ising Superconductivity and Majorana Fermions in Transition Metal Dichalcogenides** TONG ZHOU, HONG-LIANG JIANG, NOAH, FANQI YUAN, KAM TUEN LAW, Physics Department, the Hong Kong University of Science and Technology — In monolayer transition metal dichalcogenides (TMDs), electrons in opposite K valleys are subject to opposite effective Zeeman fields, which are referred to as Ising spin-orbit coupling (SOC) fields. The Ising SOC, originated from in-plane mirror symmetry breaking, pins the electron spins in out-of-plane directions, and results in the newly discovered Ising superconducting states with strongly enhanced upper critical fields. In this work, we show that the Ising SOC generates equal-spin triplet Cooper pairs with spin polarization in the in-plane directions. Importantly, the spin-triplet Cooper pairs can induce superconducting pairings in a half-metal wire placed on top of the TMD and result in a topological superconductor with Majorana end states. Direct ways to detect equal-spin triplet Cooper pairs and the differences between Ising superconductors and Rashba superconductors are discussed.

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