

Abstract Submitted  
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**Topological superconductivity and Majorana fermions in half-metal / superconductor heterostructure**<sup>1</sup> SUK BUM CHUNG, HAI-JUN ZHANG, XIAO-LIANG QI, SHOUCHEG ZHANG, Stanford University — A half-metal is by definition spin-polarized at its Fermi level and therefore was conventionally thought to have little proximity effect to an *s*-wave superconductor. Here we show that if there is spin-orbit coupling at the interface between a single-band half-metal and an *s*-wave superconductor,  $p_x + ip_y$  superconductivity would be induced on the half-metal. This can give us topological superconductor with a single chiral Majorana edge state. We show that two atomic layers of CrO<sub>2</sub> or CrTe gives us the single-band half-metal and is thus a candidate material for realizing this physics.

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