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Fractional Chiral metal from the wire construction ADOLFO GRUSHIN, Univ of California - Berkeley, TOBIAS MENG, Technical University Dresden, KIRILL SHTENGEL, Univ of California - Riverside, JENS BARDARSON, Max Planck Institute for the Physics of Complex Systems — In this work we use the wire construction to build integer and fractional phases of the 4+1 dimensional quantum Hall effect by coupling 3+1 dimensional Weyl semimetals in an extra dimension. In the presence of an external magnetic field, each Weyl species reduces to a (degenerate) chiral wire, the zeroth Landau level, which, upon coupling, delivers a consistent response to an external electromagnetic field in terms of a 4+1 dimensional Chern Simons field theory. Going one step beyond, we show that the theory at the boundary is gapless and explicitly write the quantum field theory that represents and defines this novel state of matter, the fractional chiral metal. We end by discussing the construction in the absence of external magnetic fields.

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