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From Luttinger liquid to non-Abelian quantum Hall states[1] JEFFREY C.Y. TEO, University of Illinois at Urbana-Champaign, C.L. KANE, University of Pennsylvania — We formulate a theory of non-Abelian fractional quantum Hall states by considering an array of coupled interacting one dimensional wires, each described by a Luttinger liquid theory. This coupled wire construction provides a solvable Hamiltonian formulated in terms of electronic degrees of freedom, and provides a direct route to characterizing the quasiparticles and edge states in terms of conformal field theory. It also leads to a simple interpretation of the coset construction of conformal field theory, which is a powerful method for describing non-Abelian states. The level-k Read-Rezayi state at filling $\nu = k/(2 + qk)$ is constructed by an uneven but periodic magnetic field configuration that organizes the wires into bundles. Gapless degrees of freedom in each bundle are decomposed into conformal sectors, which acuire energy gaps independently by intra-bundle and time reversal breaking inter-bundle interactions.

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