

Abstract Submitted
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**Conservation of Writhe Helicity Under
Anti-Parallel Reconnection**¹ DE WITT SUMNERS, Retired — Reconnection is a fundamental event in many areas of science, from the interaction of vortices in classical and quantum fluids, and magnetic flux tubes in magnetohydrodynamics and plasma physics, to site-specific recombination in DNA. The helicity of a collection of flux tubes can be calculated in terms of writhe, twist and linking among tubes. We prove that the writhe helicity is conserved under anti-parallel reconnection [1]. We will discuss the mathematical similarities between reconnection events in biology and physics, and the relationship between iterated reconnection and curve topology. We will discuss helicity and reconnection in a tangle of confined vortex circles in a superfluid. Support from a Simons Foundation Collaboration Grant for Mathematicians is gratefully acknowledged. [1] Laing C.E., Ricca R.L. & Sumners D.W. (2015) Conservation of writhe helicity under anti-parallel reconnection, Nature Scientific Reports 5:9224 |DOI: 10.1038/srep09224.

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