Abstract Submitted
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Knots and Coils in Superfluid Vortices[1] DUSTIN KLECKNER, University of Chicago, James Franck Institute, DAVIDE PROMENT, University of East Anglia, MARTIN SCHEELER, WILLIAM T.M. IRVINE, University of Chicago, James Franck Institute — Recent work has demonstrated that linked and knotted vortices will spontaneously unknot or untie in both classical fluids and superfluids. This effect would appear to jeopardize any notion of conservation of fluid topology (helicity), but this need not be the case: vortices can transfer their knottedness to helical coils, preserving some measure of the original topology. By simulating superfluid vortices in the Gross-Pitaevskii equation, we find a geometric mechanism for efficiently transferring helicity in exactly this manner. Remarkably, the same transfer of topology to geometry also appears in viscous fluid vortices, suggesting it is a generic feature of non-ideal fluids.

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Dustin Kleckner
University of Chicago, James Franck Institute

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