Topology bounds the energy of knots and links

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ABSTRACT

In this talk we review some recent progress in topological fluid mechanics and present new results on the energy of magnetic knots and links. By using classical results by Arnold, Moffatt and Freedman & He, we show how the topology of a magnetic system of knots and links controls the magnetic energy minima, and present new results on the relationship between the groundstate energy spectrum of knots and links and minimum crossing number.

These results may find useful applications in astrophysical flows, and provide further ground to establish a mathematical foundation for the classification of physical knots and links based on a one-to-one correspondence between energy and topology.

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