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*The Archimedean limit of random sorting networks*

Consider a list of n particles labelled in increasing order. A sorting network is a way of sorting this list into decreasing order by swapping adjacent particles, using as few swaps as possible. Simulations of large-n uniform random sorting networks reveal a surprising and beautiful global structure involving sinusoidal particle trajectories, a semicircle law, connections to fluid dynamics, and a theorem of Archimedes.

Based on these simulations, Angel, Holroyd, Romik, and Virag made a series of conjectures about the limiting behaviour of sorting networks. In this talk, I will discuss how to use the local structure and combinatorics of random sorting networks to prove these conjectures.