1067-AB-1446   **Alexander E Holroyd*** (`holroyd@microsoft.com`). *Random Sorting.*
See http://research.microsoft.com/ holroyd/sort/ for pictures.

Sorting a list of items is among the most celebrated of algorithmic problems. If one must do this by swapping neighboring pairs, the worst initial condition is when the n items are in reverse order, in which case n choose 2 swaps are needed. A sorting network is any sequence of n choose 2 swaps which achieves this.

This seemingly simple concept reveals amazing new structure when an element of randomness in introduced. Specifically, choose an n-item sorting network uniformly at random. It is conjectured that, in limit n -> infinity, the trajectories of individual items are random Sine curves, while the half-time permutation matrix concentrates in a cricular disc. These conjectures are overwhelmingly supported by simulation evidence, consistent (but weaker) rigorous results, and an extremely plausible geometric picture. I will explain all this with the help of visual demonstrations. No prior knowledge will be assumed.