
CHRISTOPHER ESSEX, Applied Mathematics, University of Western Ontario
The Entropy Production Paradox: The Mysterious World Between Diffusion and Waves.

The diffusion and wave equations are iconic symbols of irreversible and reversible processes (i.e. “not undoable” and “undoable” respectively). These physical properties are reflected in their intrinsic mathematical structures. But what happens if one finds a way to smoothly bridge the gap between these dichotomous extremes? With fractional calculus one can! Many strange things emerge, not the least of which is “the entropy production paradox,” which works contrary to fundamental intuitions.