

## Pattern formation during social contagions: epidemics, infodemics and civil unrest

*Sunday 3 December 2023 12:50 (45 minutes)*

Social contagions unfolding over time and affecting large populations show intricate spatiotemporal dynamics which are driven by complex human behaviours and population mobility. These contagions may vary in their type, ranging from pandemics to infodemics, and from opinion polarisation to civil unrest. We will examine the impact of behavior-dependent mobility on the contagion spread within a unifying framework which is based on the Maximum Entropy Principle, Lotka-Volterra dynamics and methods of percolation theory. Complex patterns formed by the contagion spread will be mapped into Turing patterns typically observed in reaction-diffusion systems. We will characterise the resulting pattern formation in terms of phase dynamics, highlighting phase transitions between distinct configurations, and argue that the identified critical regimes imply that small changes in individual risk perception could lead to abrupt changes in the spatial morphology of the contagion phenomena.

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