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(I) Statistical Physics & Human Mobility in COVID-19

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In the past 20 years, large-scale datasets of cell phone traces have emerged as a key proxy to study human movement patterns, and how those patterns change in response to exogenous events such as natural disasters or terrorist attacks. These data have proven especially useful to understand the effects of public policy in the current COVID-19 pandemic, where "lockdowns" and other mobility-based restrictions have served as the main intervention deployed by governments in the absence of a vaccine. In this talk, I will give an overview of how tools from information theory and statistical physics have been applied to high-resolution mobile phone data to understand the (in)effectiveness of physical distancing measures in reducing human mobility over the past year. In particular, I will discuss our own efforts to quantify heterogenity in human contact patterns and so-called "superspreading events"–both outsize drivers of epidemic spread.

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