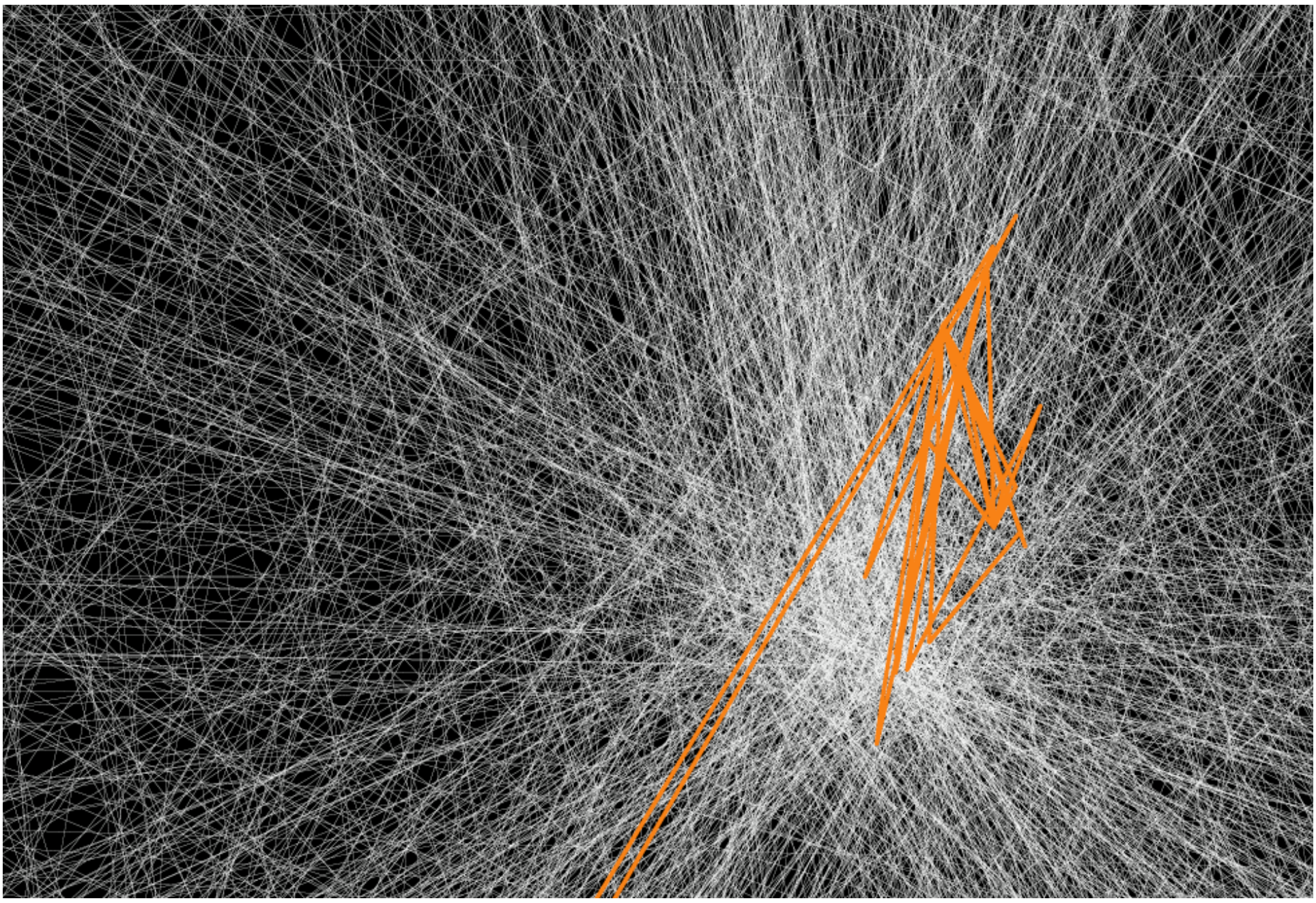
Boston University Physics Colloquium



The Physics of Human Mobility

and What It Tells Us About Cell Phone Viruses

Despite their importance for the formation of social networks, urban planning, traffic forecasting and the spread of biological and mobile viruses, our understanding of the basic laws governing human mobility is limited owing to the lack of tools to monitor the time-resolved location of individuals. I will discuss a study that explores the trajectory of anonymized mobile phone users, finding that in contrast with the random trajectories predicted by the prevailing Le´vy flight and random walk models, human trajectories show a high degree of temporal and spatial regularity, each individual being characterized by a time independent characteristic travel distance and a significant probability to return to a few highly frequented locations. After correcting for differences in travel distances and the inherent anisotropy of each trajectory, the individual travel patterns collapse into a single spatial probability distribution, indicating that, despite the diversity of their travel history, humans follow simple reproducible patterns. I will also discuss an important application of this work, predicting the potential impact of mobile viruses.

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February 3, 2009 (Tuesday) at 3:30pm (Refreshments at 3:15pm)

SCI 107, Metcalf Science Center, Boston University

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