1176-92-287   **Naoki Masuda*** (`naokimas@gmail.com`). *A state-dynamics view of bursts in contact networks, with applications to epidemic processes and metapopulation models.*

Empirical data show that inter-contact times for a pair of human or animal individuals very often obeys heavy-tailed distributions, creating bursts of contact events. This empirical fact has a large impact on dynamical processes occurring on networks and populations, such as epidemic processes. In this presentation, we introduce a two-state modeling approach in which each individual switches between a high-activity and low-activity states over time in a Markovian manner. This assumption facilitates theoretical analyses and also provides models that mimic heavy-tailed distributions of inter-contact times because a mixture of two (or a few) exponential distributions phenomenologically look similar to heavy-tailed distributions. We further analyze the susceptible-infected-susceptible/recovered (SIS/R) models when each individual flips between two states and also discuss the celebrated metapopulation models within the same analytical framework. (Received January 25, 2022)