1163-92-667 **Chuang Xu*** (chuang.xu@ma.tum.de). *Criteria for dynamics of one-dimensional continuous time Markov chains with applications.*

I will talk about our recent results on the dynamics of continuous time Markov chains (CTMCs) of possibly unbounded jumps on non-negative integers with polynomial transition rate functions. These dynamics include explosivity, transience, recurrence, certain absorption, positive recurrence as well as ergodicity of quasi-stationary distributions. Sharp criteria for these dynamics are provided in terms of at most four easily computable parameters of the CTMC. To demonstrate the wide applicability, we apply our main results to stochastic reaction networks, extended branching processes, a gene expression model, as well as a bursty population process. This is a joint work with Mads Christian Hansen and Carsten Wiuf. (Received September 11, 2020)