Quasi-stationary distributions: existence uniqueness and characterization

Abstract: Quasi-stationary distributions (QSDs) can be loosely described as limits of the distributions of Markov chains conditioned to avoid some prescribed set up to some time, as the time tends to infinity. In this talk I will review the notion of QSDs and known results on QSDs, with focus on existence and uniqueness. I will then present results we recently obtained which provide complete characterization of the (possibly infinite- dimensional convex cone of) QSDs for a given process. I will highlight connections with the Perron-Frobenius theorem (both in the finite and infinite dimensional setting) and with Martin boundary theory. I will also provide examples of all the main results. Joint work with my PhD student Ningwei Jiang.