DIMITRI PETRITIS, Université de Rennes 1, France
Heavy-tailed random walks in the critical regime

Many important phenomena in Physics are governed, modelled, or controlled by heavy-tailed processes (eg. Lévy flights in atom cooling, distributions of thermodynamic functions of systems in random environments, etc.). Heavy-tailed processes are also ubiquitous in other disciplines (extreme value theory in mathematics, traffic modelling or small world effects in networks, wealth distribution in social economy, reliability theory, population dynamics, etc.).

We shall review sharp classification results [1, 3, 2] of the asymptotic behaviour of random walks whose increments are heavy-tailed; these results are obtained by use of Lyapunov functions methods transforming the studied Markov processes into semi-martingales.

References

[1] Vladimir Belitsky, Mikhail Menshikov, Dimitri Petritis, and Marina Vachkovskaia. Random dynamical systems with systematic drift competing with heavy-tailed randomness. *Markov Proc. Rel. Fields*, 22:629–652, 2016.

[2] Nicholas Georgiou, Mikhail Menshikov, Dimitri Petritis, and Andrew Wade. Lamperti's problem for heavy-tailed random walks. in preparation, 2018.

[3] Mikhail V. Menshikov, Dimitri Petritis, and Andrew R. Wade. Heavy-tailed random walks on complexes of half-lines. *Journal of Theoretical Probability*, pages 1–41, 2017.