

**Title:** Local large deviation in the absence of the classical central limit theorem and some applications

**Abstract:** Local large deviations (LLD) for one dimensional i.i.d. random variables that do not satisfy the classical central limit theorem (with the standard normalisation) but are in the domain of a stable law are subject of recent progress (Caravenna & Doney, 2019 and Berger, 2019) In recent work with Melbourne (2021) we provided a new proof of such LLDs for i.i.d. random variables, which allowed us an easy generalization to Gibbs Markov maps. In very recent work with Melbourne and Pène (2021+), we obtained LLD for the periodic infinite horizon Lorentz gas. In work in progress with Melbourne and Pène we aim to use this LLD to obtain a Mixing Local Central Limit Theorem for the periodic infinite horizon Lorentz gas.