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# Giant leaps and long excursions: rare events in non-Markovian systems

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## Abstract

I will discuss the unusual fluctuation behaviour which characterizes rare events in systems with long-range memory. In particular, I will explain two generic mechanisms which reveal how such memory can lead to large-deviation principles with reduced speeds and to nonanalytic rate functions. I aim to elucidate the distinction between these mechanisms with simple examples (the so-called "elephant random walk" and a Gaussian variant of it), as well as making some connections to applications in more complex models. [Based on R. L. Jack and R. J. Harris, Phys. Rev. E 102, 012154 (2020).]

**Keywords:** large deviations, non, Markovian dynamics

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