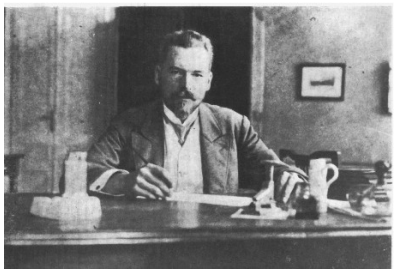

Contribution ID: **29** Type: **talk**

Anomalous diffusion, ergodicity, ageing, and non-gaussianity

Tuesday, 4 September 2018 09:00 (45 minutes)

A surging amount of experimental and simulations studies reveals persistent anomalous diffusion in the membranes and volume of living biological cells as well as other complex fluids [1]. This anomalous diffusion is observed for micron-sized objects down to labelled single molecules such as green fluorescent proteins [2].

In this talk I will present results from large scale computer simulations and stochastic analysis of the motion of lipids and embedded proteins in lipid bilayer model membranes [3], indicating that increased disorder leads to longer and longer lasting anomalous diffusion. In particular, the motion of lipids and proteins can become non-Gaussian [3]. In the membranes of living cells anomalous diffusion of embedded protein channels can last over several hundreds of seconds [4].

Anomalous diffusion inside the volume of cells will be discussed, as well. In particular, the emergence of non-Gaussian diffusion patterns for both Fickian and non-Fickian diffusion will be addressed within the framework of diffusing diffusivities [5].

The observed stochastic dynamics may be ergodic or not, depending on the exact physical mechanisms governing the motion of the test particle. The talk will discuss how non-ergodic behaviour needs to be taken into account when interpreting data from stochastic systems. In addition effects of ageing will be explained [6].

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