

DY 40: Talk R. Metzler

Time: Thursday 9:30–10:00

Location: H3

Invited Talk

DY 40.1 Thu 9:30 H3

Non-Brownian diffusion: from disorder to physical insights

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More than a hundred years ago Einstein, Smoluchowski, and Langevin formulated the laws of diffusion, and Perrin presented his systematic experiments tracking single, microscopic diffusing particles. Following several technological revolutions such as superresolution microscopy, experimentalists now measure the passive and active motion of sub-

micron tracers and single molecules in complex systems such as living biological cells at unprecedented precision. Quite typically the measured motion significantly deviates from the laws of normal Brownian motion. Instead, anomalous diffusion is observed, in the form of non-Gaussian, long-range correlated, non-ergodic, or ageing dynamics. Based on state-of-the-art data from single particle tracking experiments and in silico systems this talk will elucidate the precise features unveiled in the data and established new theoretical approaches needed to understand the physical mechanisms behind the measured dynamics.