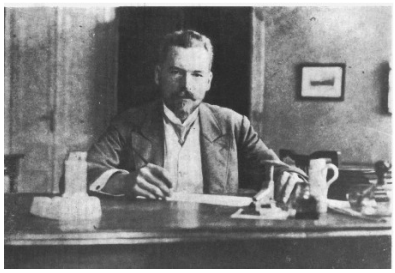

Contribution ID: **13** Type: **Contributed talk**

Geometric Brownian Motion under Stochastic Resetting: A Stationary yet Non-ergodic Process

Tuesday, 28 September 2021 16:30 (20 minutes)

We study the effects of stochastic resetting on geometric Brownian motion (GBM), a canonical stochastic multiplicative process for non-stationary and non-ergodic dynamics. Resetting is a sudden interruption of a process, which consecutively renews its dynamics. We show that, although resetting renders GBM stationary, the resulting process remains non-ergodic. Quite surprisingly, the effect of resetting is pivotal in manifesting the non-ergodic behavior. In particular, we observe three different long-time regimes: a quenched state, an unstable and a stable annealed state depending on the resetting strength. Notably, in the last regime, the system is self-averaging and thus the sample average will always mimic ergodic behavior establishing a stand alone feature for GBM under resetting. Crucially, the above-mentioned regimes are well separated by a self-averaging time period which can be minimized by an optimal resetting rate. Our results can be useful to interpret data emanating from stock market collapse or reconstitution of investment portfolios.

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Session Classification: S6