Dynamically Emergent Correlations

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The goal of this talk is to show that strong correlations between particles may emerge dynamically due to a common stochastically fluctuating environment, even when there is no direct built-in interaction between particles. These correlations grow with time, eventually driving the system into a `strongly correlated' nonequilibrium stationary state with nontrivial properties. I will demonstrate this in an exactly solvable model of noninteracting Brownian particles in a harmonic trap whose stiffness switches between two values at a constant rate. This model has been recently realized experimentally in optically trapped colloidal particle systems. Experimental results agree very well with theoretical predictions.

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Correlated by Resetting",Phys. Rev. Lett. 130, 207101 (2023)

[2] *M. Biroli, M. Kulkarni, S. N. Majumdar, G. Schehr,*
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[3] *M. Biroli, S. Ciliberto, M. Kulkarni, S.N. Majumdar, A. Petrosyan, G. Schehr,*
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[5] *S. N. Majumdar, G. Schehr, ``Dynamically Emergent Correlations”, arXiv: 2603.03162*