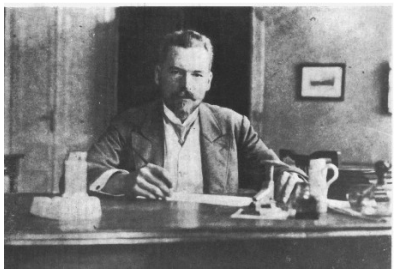

Contribution ID: **71** Type: **20 minute talk**

Lévy Noise, Time-Reversal Symmetry, Nonequilibrium Stochastic Thermodynamics, and Bak's Sandpile

Thursday, 3 December 2020 17:00 (20 minutes)

The Brownian noise in nonequilibrium systems commonly contains more outliers. In that case the noise is best described with a Levy distribution. Many systems in which there are fluctuations around a steady-state throughput can be modeled as a Levy-noise-subjected particle in a parabolic potential. We consider an overdamped Brownian particle in a parabolic potential. If the noise is Levy, time-reversal symmetry for the particle's trajectory is violated. We formulate a parameter, r, to express and detect this violation. With solar flare data it is shown how r can be readily obtained and next used to obtain a good estimate of the stability index, α, of the underlying noise. Self-organized-criticality, i.e. the famous avalanching sandpiles of Per Bak et al, can also be modeled with a Levy-noise-subjected particle on a potential. Preliminary results from such an approach are shown.

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