



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Institut für Physik Physikalisches Kolloquium



Mittwoch, 14.12.2016, um 16:00 Uhr

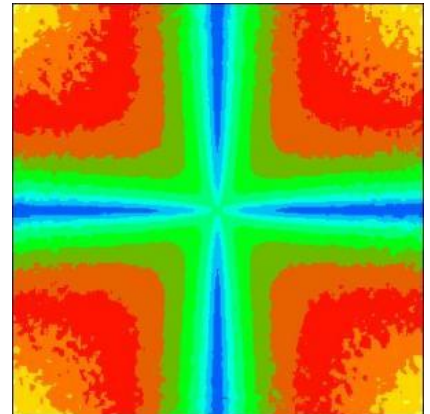
Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum 2/N013

Prof. Dr. Christian Beck

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Complex systems in a heterogeneous environment

Many complex driven nonequilibrium systems are effectively described by a superposition of several statistics on different time scales, in short a 'superstatistics' [1-3]. A simple example is a Brownian particle moving in a spatially inhomogeneous medium with temperature fluctuations on a large scale, but the concept is much more general. Superstatistical systems typically have marginal distributions that exhibit fat tails, for example power law tails or stretched exponentials. In most applications one finds three relevant universality classes: Lognormal superstatistics, chi-square superstatistics and inverse chi-square superstatistics. These can be effectively described by methods borrowed from nonequilibrium statistical mechanics. In this talk I will provide an easy-going introduction to these types of statistical mechanics methods relevant for heterogeneous environments, and discuss some recent examples of applications for turbulent flows, financial markets, diffusion processes of cancerous cells and magnetic flux noise [4-6].



- [1] C. Beck and E.G.D. Cohen, Physica A 322, 267 (2003)
- [2] C. Beck, E.G.D. Cohen, and H.L. Swinney, Phys. Rev. E 72, 056133 (2005)
- [3] C. Beck, Phys. Rev. Lett. 98, 064502 (2007)
- [4] C. Beck and S. Miah, Phys. Rev. E 87, 031002(R) (2013)
- [5] S. Miah and C. Beck, EPL 108, 40004 (2014)
- [6] C. Beck, Scientific Rep. 6, 28275 (2016)

Alle Zuhörer sind ab 15:45 zu Kaffee und Tee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:
Prof. Dr. Günter Radons, Tel. 0371 531-21870



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