TECHNISCHE UNIVERSITÄT
IN DER KULTURHAUPTSTADT EUROPAS
CHEMNITZ

Fakultät für Mathematik
Chemnitzer Mathematisches Colloquium

E i n l a d u n g

In der Reihe „Chemnitzer Mathematisches Colloquium“ der Fakultät für Mathematik der TU Chemnitz spricht

Herr Prof. Dr. Marc Timme (TU Dresden)

über das Thema

From Tipping Points to System Inference – Nonequilibrium Nonlinear Dynamics of Complex Systems and Networks.

Der Vortrag findet am

Donnerstag, dem 23. Mai 2024, um 16:00 Uhr, im Raum C25.014 (alt: 2/W014)

statt.

Ich möchte Sie hiermit recht herzlich zu dieser Veranstaltung einladen. Das Kolloquium wird von Herrn Prof. Dr. Martin Stoll geleitet.

Abstract:
The dynamics of networks enables the function of a variety of systems we rely on every day, from gene regulation and metabolism in the cell to the distribution of electric power and communication of information. Understanding, steering and predicting the function of interacting nonlinear dynamical systems, in particular if they are externally driven out of equilibrium, relies on obtaining and evaluating suitable models, posing at least two major challenges. First, how can we extract key structural system features of networks if only time series data provide information about the dynamics of (some) units? Second, how can we characterize nonlinear responses of nonlinear multi-dimensional systems externally driven by fluctuations, and consequently, predict tipping points at which normal operational states may be lost? Here we report recent progress on nonlinear response theory extended to predict tipping points and on model-free inference of network structural features from observed dynamics.

Prof. Dr. Daniel Potts
Dekan