

Multiscale Dynamical Systems near Instability (Continuation)

Initiative: Lichtenberg - Professuren

Bewilligung: 18.04.2021

Laufzeit: 3 Jahre

The main theme of the professorship is to design, study and implement mathematical methods for nonlinear multiscale dynamical systems. At the interfaces of various mathematical disciplines linking analysis, computing, dynamics, geometry, modelling, numerics and stochastics better quantitative methods will be developed to provide insight into complex systems arising in the natural sciences and engineering. The recent strong emergence of fields such as neuroscience, systems biology, climate science, sustainability, network science, econophysics and many others has demonstrated that future mathematical techniques should aim to link the viewpoint of well-controlled small-scale models to complex systems. The approach via multiscale structures and perturbation techniques has a tremendous potential to yield key results and novel techniques. The goal is to contribute at the interface of (1) rigorous analysis of multiscale methods, (2) design of numerical algorithms and (3) transfer to and from applications. The main research focus will be to study dynamical systems near instability, where drastic changes of the system occur. In this regime, various nominally small effects, such as time scale separation, noise or nonlocality, are in crucial interaction with each other. For further information on the professorship: <http://www.multiscale.systems/research.html>

Projektbeteiligte

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