Institut für
Angewandte Mathematik

Leibniz
Universität
Hannover

Institut für Angewandte Mathematik
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Oberseminar
Analysis und Theoretische Physik

Prof. Dr. Daniel Matthes
Technische Universität München

"Entropy methods for degenerate parabolic equations of higher order"

Abstract:

In the context of parabolic evolution equations, the entropy method is an analytical machinery that uses Lyapunov functionals to establish the existence of weak solutions and to extract relatively precise information on their speed of convergence to equilibrium.
In this talk, we first recall the basic ideas behind the entropy method by reviewing the classical results on self-similar asymptotics for second order porous medium equations. Then we apply the machinery to a family of degenerate parabolic equations of fourth order, in particular to the Quantum Drift Diffusion model for semiconductors, and to the Thin Film equation with linear mobility. Finally, we discuss the entropy approach to a degenerate equation of sixth order, which is related to a diffusive model for quantum systems.
In the considered situations, we are able to prove the existence of global weak solutions (that are classical solutions "locally in time"), and to calculate a bound on the rate of equilibration.
The part on fourth order equations is a collaborative work with Giuseppe Savare and Stefano Lisini from Pavia; the part on sixth order equation is joint work with Ansgar Juengel and Mario Bukal from Vienna.

Dienstag, 14.01.2014, 15:00 Uhr, Raum g005
Hauptgebäude der Universität

Über Ihren Besuch würden sich freuen:

Prof. Dr. Joachim Escher
Prof. Dr. Olaf Lechtenfeld
Prof. Dr. Elmar Schrohe
Prof. Dr. Christoph Walker