PD Dr. S. Heinze
Raum 631
Tel.: 3052
E-mail steffen.heinze@math.uni-dortmund.de

Dortmund, den 10.11.05

Vortragsankündigung

Im Rahmen des Oberseminars über Analysis und Partielle Differentialgleichungen hält

Herr Dr. Jens Starke,
Universität Heidelberg

einen Vortrag mit dem Titel

Stochastic Modelling and Deterministic Limit of Catalytic Surface Processes for the CO Oxidation on Pt

Zeit: **Dienstag, den 29.11.05, 14 Uhr c. t.**

Ort: **Raum 614 (im Mathematikgebäude)**

Tee: **13.45 Uhr im Raum 645, Mathematikgebäude**

Abstract:

Three levels of modelling, the microscopic, the mesoscopic and the macroscopic level are discussed for the CO oxidation on low-index platinum single crystal surfaces. The introduced models on the microscopic and mesoscopic level are stochastic while the model on the macroscopic level is deterministic and can be derived rigorously for low pressure conditions as limit of the stochastic many particle model for large particle numbers. This is in correspondence with the successful description of experiments under low pressure conditions by deterministic reaction-diffusion equations while for intermediate pressures phenomena of stochastic origin can be observed in experiments. The introduced models include a new approach for the platinum phase transition which allows for a unification of existing models for Pt(100) and Pt(110). The rich nonlinear dynamical behaviour of the macroscopic reaction kinetics is investigated and shows good agreement with low pressure experiments. Furthermore, for intermediate pressures, noise-induced pattern formation, not captured by earlier models, can be reproduced and are shown in simulations.
This is joint work with M. Eiswirth, K. Oelschlaeger and C. Reichert.