Lothar-Collatz-Kolloquium für Angewandte Mathematik

Donnerstag, den 09. November 2023, um 17:15 Uhr, im Hörsaal 5

Prof. Dr. Helmut Abels*
(Universität Regensburg, Fakultät für Mathematik)

"Diffuse Interface Models and their Sharp Interface Limit"

Zusammenfassung/Abstract:

Interfaces separating two or more species or components of a material are omnipresent in applications in the sciences. Nowadays there two main classes of models to describe interfaces, both from a theoretical and practical point of view: In classical so-called "sharp interface models" the species or components under consideration fill disjoint domains that are separated by lower dimensional surfaces of a certain regularity. On the other hand in "diffuse interface models" a partial mixing of the species or components on a small length scale is taken into account, which leads to an interfacial layer of small but positive thickness. This has the advantage that the interfaces do not need to be resolved explicitly and singularities in the interfaces can be described consistently. In this talk we will give an overview of some basic diffuse interface models with applications to material sciences and fluid mechanics. Moreover, we will discuss some analytic results on the relation between diffuse and sharp interface models, when the interfacial thickness of the diffuse interface tends to zero.

Kontakt:
Prof. Dr. Jens Rademacher
Angewandte Mathematik
Raum 140, Tel.: 040 42838-5122
E-Mail: jens.rademacher@uni-hamburg.de
Web: https://www.math.uni-hamburg.de/forschung/bereiche/am/ang-dynamische-systeme/personen/ rademacher-jens.html

* Prof. Dr. Helmut Abels
Universität Regensburg, Fakultät für Mathematik
Universitätsstraße 31, 93053 Regensburg
E-Mail: helmut.abels@mathematik.uni-regensburg.de
Web: https://www.uni-regensburg.de/mathematics/mathematics-abels/homepage/index.html

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