# Einladung zum

# Würzburger Mathematischen Kolloquium

Julius-Maximilians-Universität Würzburg • Fakultät für Mathematik und Informatik

## Prof. Dr. Gabriella Puppo

Universitá degli Studi dell'Insubria, Como, Italien;
Giovanni-Prodi-Professorin in diesem Semester

# Entropy - or How to Successful Find Numerical Solutions to Conservation Laws

Mittwoch, 4. Nov. 2015 • 16:15 Uhr
Raum SE 40, Mathematik Ost, Emil-Fischer-Str. 40, Campus Hubland-Nord

**Inhaltsangabe**

In this lecture we shall address partial differential equations that describe a non-linear evolution, so-called hyperbolic conservation laws. Their solution may not be unique unless further constraints are imposed. There are several strategies to ensure unique solutions to some hyperbolic systems, although the problem is not yet solved in the general case. One strategy is to add a constraint called an entropy inequality. Solutions are then accepted provided they satisfy the entropy inequality. Many systems of conservation laws which arise from mathematical physics can be shown to possess an entropy inequality. For instance, this is the case of gas dynamics, or magnetohydrodynamics.

In this talk I will discuss how this idea, which is essential to the analysis of hyperbolic equations, is also very useful as a numerical tool to monitor the quality of the numerical solution, obtained with a finite volume scheme. I will discuss the notion of a posteriori error indicators, and how to use the entropy production to drive a mesh adaptive strategy. Also, numerical diffusion can be controlled by introducing entropy stable and entropy conservative schemes.

www.mathematik.uni-wuerzburg.de/kolloquium.html

Zu diesem Vortrag laden wir Sie herzlich ein.
Im Anschluss an die Vorträge stehen Kaffee und Tee im Foyer vor dem SE 40 bereit.

Die Dozentinnen und Dozenten der Mathematik