



Vienna School
of Mathematics

PhD Colloquium

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Finite Volumes in a Nutshell

(or "one way to teach your computer to produce (hopefully) nice graphics for your partial differential equation")

When it comes to the analysis of (nonlinear) partial differential equations ((N)PDEs), there are many things of interest one can try to understand and prove: Existence and (maybe) uniqueness of solutions, large time behaviour of solutions, conservation or dissipation of certain energy functionals (entropies), parameter dependency, etc. The list is long, it's a buffet offering something for everyone. Yet, there is something that in most cases is either impossible or extremely hard to do: explicitly writing down a solution.

This is the point where we turn to our computer for some support. The good news is: the computer does exactly what we tell it to do. The bad news is: the computer does exactly what we tell it to do.

Therefore in this talk I will introduce the concept of finite volumes – one way to make your computer draw pictures of (approximate) solutions to a given (N)PDE. I will present the ingredients necessary to build a (working) finite volume scheme and, since we all like pictures, demonstrate its application to some simpler example(s) as well as my current research.

26. January

16:00 - 16:45

Seminarraum DA Grün 03 A

TU Wien, Freihaus