

# SALZBURG MATHEMATICS COLLOQUIUM

Winter 2022/2023

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## „Modeling and Simulation of Energy Transport Networks“

Jänner 26, 2023

### Abstract:

The energy transition places new demands on energy transport. Grids must be adapted to new energy sources as well as new supply and demand positions. Furthermore, the higher time variations for available resources and needed demands cause challenges for the operation of energy transport grids. We present a hierarchical modeling for the flow of energy transport networks (gas networks, water networks, power networks) by coupled systems of partial differential equations with algebraic constraints. The numerical simulation of such systems is associated with several stability issues. We demonstrate how the interplay of spatial discretizations and the network topology can influence the numerical stability. Additionally, we show that the simulation of coupled constrained networks may lead to unstable numerical results. Finally, we present modeling criteria for coupled systems that allow convergent numerical co-simulations.

Thursday, **15:00-15:45**  
Hörsaal 414, 1. Stock