



# Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

**Structure preserving numerical methods for hyperbolic equations**

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## Well-balanced high-order finite difference methods for systems of balance laws

*Abstract:*

In this talk, a general methodology to design well-balanced high-order finite difference methods for systems of balance laws will be presented. The methods are based in the use of high-order reconstructions of the fluxes for the space discretization (like WENO) and TVD-RK methods for the temporal one. They are well-balanced in the sense that they preserve every smooth stationary solution or a prescribed set of them. This methodology is inspired by the one followed in [1] for finite-volume methods: the similarities and differences between them will be discussed. Applications to different systems including the shallow-water model will be presented.

[1] M.J. Castro, C. Parès. Well-balanced high-order finite volume methods for systems of balance laws. *Journal of Scientific Computing* 82 (2), 48, 2020.

[2] C. Pars, C. Parès-Pulido. Well-balanced high-order finite difference methods for systems of balance laws. arXiv preprint arXiv:2001.10074, 2020.

via Zoom video conference (request the Zoom link from [klingen@mathematik.uni-wuerzburg.de](mailto:klingen@mathematik.uni-wuerzburg.de))

Thursday, Dec.. 3 at 9:30 am

Zu diesem Vortrag sind Sie herzlich eingeladen.

*gez. Christian Klingenberg*