

Prof. Hendrik Ranocha (Universität Mainz)

Hyperbolic approximations of partial differential equations

Partial differential equations (PDEs) are typically classified as elliptic, parabolic, or hyperbolic (with exceptions that need to be treated individually). While the close connections between elliptic and parabolic PDEs are well known, hyperbolic PDEs often stand apart and are approached with distinctly different techniques, both analytically and numerically. Recently, there has been growing interest in first-order hyperbolic approximations of PDEs, including classical elliptic equations like Poisson problems, parabolic problems such as the (fourth-order parabolic) Cahn-Hilliard equation, and dispersive water wave models like the Serre-Green-Naghdi equations. This talk offers a brief overview of some of these developments.