



Habilitationsvortrag und -kolloquium im Fachbereich Physik

Dr. Christian Krüger

**am 21. Mai 2025 um 14:15 Uhr
im Hörsaal N3
Hörsaalzentrum Morgenstelle**

Traffic Flow as Fluid Dynamics: Mathematical Models and Real-World Applications

Traffic flow shares remarkable parallels with computational fluid dynamics (CFD), where the motion of vehicles on a road can be compared to the flow of a compressible fluid through a channel. In this talk, I will discuss the mathematical foundations of traffic flow modeling, addressing macroscopic models such as the Lighthill-Whitham-Richards model and some of its refinements, which are commonly used in CFD, as well as microscopic models such as car-following dynamics. Furthermore, I am going to present mesoscopic approaches that bridge individual and aggregate behaviours and challenges such as multi-lane networks.