

Analysis of Multicomponent Diffusion Systems with Incomplete Diffusion (TU Wien, Supervisor: A. Jüngel)

The successful candidate is supposed to work in the project “Analysis of multicomponent diffusion systems with incomplete diffusion” of the Austrian Science Foundation. We are looking for an excellent, ambitious PhD candidate with a very good knowledge of nonlinear partial differential equations, like diffusion systems and equations from fluid dynamics. One of the aims of the project is the existence analysis for diffusive, viscous fluid mixtures and of population mixtures, the qualitative behavior of the solutions, and optional: the numerical approximation of the diffusion systems. A particular feature of the equations is that the diffusion is incomplete (the diffusion matrix may have zero eigenvalues) such that they are partially of parabolic and partially of hyperbolic type. Mathematical techniques include variational methods, entropy methods, Sobolev space theory, hyperbolic conservation laws, etc. The diffusion systems describe multicomponent systems, like fluid mixtures, animal populations, ion transport through biological membranes, etc.

Applications have to be sent online to: katharina.pauschenwein@tuwien.ac.at; see [TU Wien University Gazette 02/2020, 23.2.3](#). The deadline for application is **February 20, 2020**.