

## **Mathematical modeling and simulation of crowded transport**

M.-T. Wolfram

Crowded transport can be observed in various applications in life and social sciences, like the transport of ions through biological pores, the collective behavior of animals like fish and birds or the motion of large crowds. These very different phenomena have one thing in common: the size of each particle matters.

In this talk we present mathematical modeling approaches to include finite size effects in transportation models. We start on the microscopical level, using lattice based models or Newton laws of motion, and discuss the mean field limit of these models as the number of particles tends to infinity. The resulting macroscopic models are usually highly nonlinear partial differential equations or systems thereof. Hence we focus on different numerical approaches for particular problems and the occurring numerical challenges in the second part.