

Mean-field derivation of cross-diffusion population models

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In the field of population dynamics, cross-diffusion partial differential equations have gained more impact, see for instance the SKT-model by Shigesada–Kawasaki–Teramoto. However, a rigorous derivation starting from a stochastic many-particle system was still missing in the literature.

In this talk, I will show how the approach of moderately interacting particles in the meanfield limit can be used in order to derive cross-diffusion models of SKT-type starting from a stochastic interacting many-particle system.

As a byproduct of the mean-field derivation, we also study a non-local version of the underlying PDE models. These non-local PDEs represent an intermediate level between the particle dynamics and the final cross-diffusion partial differential equation.

This talk is based on the joint work with Li Chen, Esther Daus and Ansgar Jungel “Rigorous derivation of population cross-diffusion systems from moderately interacting particle systems”, *Journal of Nonlinear Science*, 31(6), 1-38 (2021).

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