universität wien

Fakultät für Mathematik

EINLADUNG

zum

HABILITATIONSVORTRAG

Dr. Jan Haskovec

(King Abdullah University of Science and Technology)

"Emergent Phenomena in Models of Mathematical Biology and Life Sciences"

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Abstract: I shall present several models of mathematical biology describing the emergence of nontrivial patterns via collective actions of many individual entities. They are motivated, for instance, by observations of marching locust nymphs, aggregating cockroaches, or self-organizing phenomena in biological transportation networks. The models are formulated in terms of systems of ordinary or stochastic differential equations, capturing the (typically simple) rules of individual behavior. A prototypical example is the Cucker-Smale model of flocking behavior. In the limits of large populations (also called mean field limits), systems of partial differential equations are derived. I shall explain how mathematical analysis of the respective models contributes to the understanding of how the individual rules generate and influence the patterns observed on the global scale. For example, I shall demonstrate how the presence of noise or delay influences the flocking dynamics in the Cucker-Smale type models, or how the topology of optimal transportation networks (loops/trees) depends on the properties of the underlying medium

**Mittwoch, 19. September 2018,
10:00 Uhr – 10:45 Uhr,**

**Fakultät für Mathematik,
HS 07, 1. OG.
Oskar-Morgenstern-Platz 1
1090 Wien**

Christian Schmeiser
Christian Krattenthaler