Dr. Angela Stevens

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Angela Stevens is Full Professor of Mathematics at the University of Münster, Germany (since 2011), and Honorary Professor at the University of Leipzig (since 2006). Her main research interests are nonlinear partial differential equations, applications in the life sciences and stochastic interacting many particles systems. She finished her studies of mathematics at the University of Cologne with a Master thesis in analytical number theory. She received her Ph.D. in 1992 from the University of Heidelberg where she also was Postdoctoral Research Associate. She held positions as Visiting Scholar at Standford University (1997-1998), Project Leader and Associate Professor at the Max-Planck-Institute for Mathematics in the Sciences (1999-2007), and Full Professor at the University of Heidelberg (20072011). She was Visiting Professor at RIMS, Kyoto (2001), at the University of CergyPontoise (2003), at Hokkaido University (2004), and at the University of Minnesota
(2023). She received offers for Professorships from the Georgia Institute of Technology in Atlanta and the University of Cologne. Among others, she served as a member of the Expert Panel for ERC Starting Grants in mathematics (2018, 2020, 2022, 2024), she is Co-Founder and Co-Editor of the Springer Lecture Note Series on Mathematical Modelling in the Life Sciences. She has been PI of the Cluster of Excellence: Cells in Motion (2012-2019) and the Cluster of Excellence: Mathematics Münster; Dynamics - Geometry - Structure (2019-2025) and is member of the Cluster's Executive Board. She is also PI of this Cluster's second funding period (2026-2033).

Title: Cross-diffusion systems

Abstract:
Cross-diffusion systems play a major role in many applied contexts.
One of the many interesting challenges is to classify parameter regimes for global existence or blow-up of their solutions.
In order to prove global existence of solutions we introduce a new engergy functional,

which is motivated by the transformation matrix given by Oelschläger in 1989, and which he used to rigorously derive cross-diffusion systems from moderately interacting stochastic many
particle systems under the condition that the limiting PDE-system has regular solutions.
We compare our findings with more recent results on the existence of solutions for cross-diffusion systems.
(Joint work with Kyungeun Kang)