UNIVERSITÄT DES SAARLANDES
Fakultät für Mathematik und Informatik
Fachrichtung Mathematik

Mathematisches Kolloquium

Am **Freitag**, dem 16. January 2026, spricht um **14 Uhr c.t.** im Hörsal IV der Fachrichtung Mathematik, Gebäude E2.4, Teams-Link,

Prof. Dr. Angela Stevens
Universität Münster

über das Thema:

A Mathematical Analysis for the Notch Pathway

Abstract:
The so-called Notch pathway is one of the highly conserved cellular signaling pathways in metazoan organisms and present also in humans. It controls several fundamental differentiation processes and regulates binary cell fate decisions. Thus its proper functioning is of utmost importance. Nevertheless, the precise mechanisms on how neighboring and seemingly similar cells can finally become different w.r.t. the expression of Notch receptors are not fully understood. The outcome of such a dynamical process may not be robust in the selection of specific cells among a few, but it has at least to be robust in some sense, e.g., w.r.t. the percentage and spatial patterning of differently expressing cells in a given tissue.
In order to contribute to a better understanding of such dynamics, we set up and analyze a mathematical model for two cells only, which are initially identical. We then identify mathematically the most relevant features within our model which can give rise to symmetry breaking and thus pattern formation, i.e. making two different cell types out of one. Some formalisms for parameter rich reaction network kinetics are discussed, instability motives identified, and minimal mechanisms mathematically derived.
The talk is based on joint work with Nicola Vassena of the University of Leipzig.

Alle Interessenten und Interessentinnen sind zum Vortrag herzlich eingeladen. Der Vortrag findet im **hybriden Format** statt.

Die Dozenten der Mathematik