Universität Münster

FACHBEREICH 10
MATHEMATIK UND INFORMATIK
Prof. Dr. Arthur Bartels
Dekan

25.06.2025

Einladung

**zu der am Mittwoch, den 2. Juli 2025,
um 11:15 Uhr im Hörsaal M4 stattfindenden**

Antrittsvorlesung

von Frau Prof.'in Dr. Franziska Jahnke

über das Thema

„Transfer Theorems between Fields of Different Characteristic — A Model-theoretic Approach"

Kurzfassung:
How much does modular arithmetic (i.e., calculating modulo p) tell us about the integers and the rational numbers? Under which circumstances can we use insights about fields of positive characteristic (e.g., finite fields, function fields over finite fields, or power series fields over finite fields) to understand fields of characteristic o (and conversely)?

Classical methods to transfer results between fields of different characteristics are the Lefshetz principle and the Ax Kochen/Ershov Theorem which states that asymptotically, the theory of the p-adic numbers $\mathbb{Q}_p$ and of power series fields $\mathbb{F}_p((t))$ coincide. Tilting perfectoid fields gives a transfer principle between certain henselian fields of mixed characteristic and their positive characteristic counterparts and vice versa. In this talk, we survey various transfer principles and present a model-theoretic approach to tilting via ultraproducts, which allows us to transfer many first-order properties between a perfectoid field and its tilt. A key ingredient in our approach is an Ax-Kochen/Ershov principle for perfectoid fields (and generalizations thereof).

gez. Arthur Bartels, Dekan