

HABILITATION

Fachbereich Mathematik und Informatik

EINLADUNG

zum Habilitationsvortrag

Im Rahmen seines Habilitationsverfahrens wird

Herr Dr. Robert Lasarzik

am Montag, d. 13. Oktober 2025

um 17:00 Uhr im Seminarraum 19, Arnimallee 3, 14195 Berlin

einen Vortrag über das Thema:

Binormal Curvature flow

halten.

Der Vortrag wird ca. 45 Minuten dauern (Zusammenfassung s.u.).

Die Universitätsöffentlichkeit ist dazu herzlich eingeladen.

gez. Prof. Dr.-Ing. Rupert Klein

Dekan des FB Mathematik und Informatik

Abstract: The binormal curvature flow, also known as the vortex filament equation, describes the evolution of curves in three dimensions driven by their curvature and binormal direction. It arises in fluid dynamics as a model for the motion of vortex filaments and exhibits striking geometric and analytic features. While the classical formulation applies to smooth curves, real-world vortex filaments often develop singularities such as corners, self-intersections, or reconnections. To address these, geometric measure theory provides natural weak frameworks. In particular, the theory of integral 1-currents and varifolds allows one to extend the notion of binormal curvature flow to generalized curves with multiplicities, accommodating highly irregular dynamics while preserving key conservation laws. In this talk I will introduce the classical binormal curvature flow, explain its geometric and physical background, and then motivate and present the varifold/current-based approach to weak solutions. The main existence results and the role of energy conservation will be highlighted. Furthermore, some open questions about uniqueness, stability, and the relation to vortex dynamics in fluids will be discussed.