

Einladung zum Doppeltermin Kolloquium

Tobias Kaiser, Moritz Müller

May 21, 2026

Dienstag 26. Mai

16:15, Professoren lounge: *Gemeinsamer Kaffee mit den Vortragenden*

17:00, IM HS 11: *Vortrag von Raf Cluckers (Université de Lille)*

Integration in Relation to Real Geometry, Analysis, and Number Theory

I will sketch a panorama of themes and results related to real integrals and their connections to geometry, analysis, and number theory. Using real geometry and in particular real semi-algebraic sets, I will sketch classes of functions which are stable under (parametric) integration, Fourier transform, Mellin transform, and Laplace transform (Laplace still being work in progress). This has connections to classes of distributions and their properties (like holonomicity), to periods and exponential periods and families thereof, and questions around (functional) transcendence. The directions I will focus most on comprise work by many people, in particular by Aizenbud, (my PhD student) Buggenhout, Comte, Kaiser, Lion, Miller, Raibaut, Rolin, Servi, Stout, (my PhD student) Vandebrouck, and myself.

Mittwoch 27. Mai

17:00, IM HS 11: *Vortrag von Radek Honzik (Karls-Universität Prag)*

Higher-order Compactness in Mathematics

In this talk, we will survey several well-known compactness principles that generalize first-order compactness. These principles postulate that if all "substructures" of a given uncountable structure possess a certain higher-order property, then the entire structure must also possess this property. We will focus on classical mathematical structures, such as abelian groups (specifically, whether or not they are free) and graphs (examining whether their chromatic number depends solely on the chromatic numbers of their small subgraphs). Furthermore, we will discuss the assumptions under which these principles are consistent, and for which cardinalities.

In the second part of the talk, we will explore the impact of these principles on classical problems in mathematics and present original results in this area. In particular, we will discuss Whitehead's Conjecture in abelian group theory; the Suslin Hypothesis (whether the separability of the reals may be weakened to the countable chain condition and still characterize the reals); and Baumgartner's Axiom (a generalization of Cantor's theorem - which states that all countable dense linearly ordered sets without least and greatest elements are isomorphic - to ω_1 -dense subsets of the reals).