Abstract

Oberwolfach Workshop:

Algebraic K-theory

Dates:

10 Aug - 15 Aug 2025 (Code: 2533)

Organizers:

Hélène Esnault, Berlin
Thomas Geisser, Tokyo
Lars Hesselholt, Copenhagen
Moritz Kerz, Regensburg

Algebraic K-theory is a generalization of linear algebra to rings and to geometric objects, leading to numerous applications across various mathematical fields. It plays a crucial role in number theory, algebraic and geometric topology, algebraic geometry, and analysis. Moreover, algebraic K-theory is intimately connected with motivic cohomology and motivic homotopy theory, which provide a deeper structural understanding of algebraic K-groups.

Recent advancements in the field have been significantly driven by the algebraic calculus of infinity-categories. This abstract framework has yielded substantial benefits, including applications to p-adic Hodge theory through the computation of p-adic K-theory and the utilization of trace methods, which effectively linearize algebraic K-theory. The perspective of stable infinity-categories has also enhanced our understanding of algebraic K-theory with respect to various localization constructions.

Furthermore, algebraic K-theory has made remarkable contributions to stable homotopy theory, notably in relation to the telescope conjecture. These advances and their implications will be thoroughly explored at the upcoming workshop. The event will feature several presentations on the applications of algebraic K-theory to neighboring areas of mathematics, showcasing the field's broad impact and ongoing developments.