

Abstract

Oberwolfach Workshop:

Higher Structures from Symmetries in Quantum Field Theory

Dates:

15 Mar - 20 Mar 2026 (Code: 2612)

Organizers:

David Reutter, Hamburg
Sakura Schäfer-Nameki, Oxford
Christoph Schweigert, Hamburg

As witnessed for example by Lie theory and mirror symmetry, symmetries and dualities in physics have always been an important source of mathematical structures and problems. With the advent of higher generalized symmetries 10 years ago, a radical rethinking of what comprises a global symmetry in physics has unfolded. The relevant mathematical concepts go far beyond groups and lead to higher structures, mathematically encapsulated in the theory of higher categories. This development is a rich source of mathematical problems: Applications in physics require new mathematical tools to handle such higher structures, both conceptually and in computations. On the other hand, insights gained from quantum field theory inspire and inform the mathematics of higher structures. This provides the need and the opportunity for interdisciplinary interaction between mathematicians and physicists, to focus on these recent developments and to identify new mathematical challenges and structures arising from the study of generalized symmetries in mathematical physics.