

# Bethe Colloquium

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## The Tameness of Quantum Physics

While physicists have learned to accept the many wild phenomena of quantum theories, one might hope that at least the mathematical structure of these theories is more tame and inherently geometric in nature. The aim of this colloquium is to introduce a general tameness principle, using o-minimal structures originating in mathematical logic, and argue that it is common to many well-defined quantum theories. We will discuss quantum field theories and the tameness of perturbative scattering amplitudes. At the non-perturbative level, tameness depends on the high-energy definition of the physical theory and might be seen as a condition that arises from consistency with quantum gravity. In fact, all well-understood effective theories derived from string theory are tame. This fact was key in the mathematical proof of an almost 20-year-old finiteness conjecture for string theory vacua.

**Lecture Hall I** - Physikalisches Institut - Nussallee 12 - 53115 Bonn

**Thursday, January 19, 2023, at 4:15 p.m.**

Hybrid talk - for the Zoom link please contact [theory@physik.uni-bonn.de](mailto:theory@physik.uni-bonn.de)

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