# Abstract

Oberwolfach Workshop:

**Subfactors and Applications**

Dates:

**27 July - 1 August 2025** (Code: 2531)

Organizers:

**Dietmar Bisch, Nashville**
**Terry Gannon, Edmonton**
**Yasuyuki Kawahigashi, Tokyo**
**Yoshiko Ogata, Tokyo/Kyoto**

Subfactors of von Neumann factors play an important role in the discovery and the analysis of quantum symmetries that seem to be ubiquitous in mathematics and physics. These symmetries appear naturally in knot theory, quantum spin systems, topological quantum computing, vertex operator algebras and conformal field theory. New fusion and modular tensor categories naturally emerge from subfactors and ideas from algebraic quantum field theory led to a first-principles, operator algebra approach to these structures. The highly successful classification program of subfactors with small Jones index triggered the construction of several "exotic" subfactors, including the Haagerup and Extended Haagerup subfactors. The latter provides the first example of a "strange", non-quadratic fusion category. There are many deep links between subfactor theory and topological quantum computing via topological phases, a hypothetical state of matter that might play a crucial role in the actual construction of topological quantum computers. The workshop aims at bringing experts in these areas together to discuss problems and new ideas at the frontier of these exciting developments.