Universität Hamburg
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CHAMPP
CENTER IN HAMBURG FOR ASTRO-, MATHEMATICAL AND PARTICLE PHYSICS

LECTURE COURSE IN THE QUANTUM UNIVERSE RESEARCH SCHOOL

Summer Term 2024

Knot Homology and Categorification

Paul Wedrich

Course Description:

This course gives an extended introduction to knot homology theories and, more broadly, categorification in quantum topology. Topics of the course include:

- Basic knot theory
- Review of quantum invariants of knots, links and tangles
- The categorification toolkit
- Introduction to Khovanov homology and its generalizations
- Introduction to triply-graded link homology
- Applications in low-dimensional topology
- Towards topological quantum field theories

Prerequisites:

Familiarity with at least 2/3 of the following:

- Algebra (incl. homological): groups, rings, modules, chain complexes, homotopy equivalence, homology, Ext, Tor
- Topology (differential and algebraic): point-set topology, manifolds, orientations, fundamental group, homology, cohomology
- Category theory: limits, colimits, monoidal structures, enriched categories

Further details can be found at: `https://www.math.uni-hamburg.de/home/wedrich/KnotHom24.html`

Date and Place:	Wed, 16:15–17:45, Hörsaal H1, Geomatikum Fri, 12:15–13:45, Hörsaal H4, Geomatikum
Problem Classes:	Fri, 16:15–17:45, SemRm 434, Geomatikum
Starting on:	3 April 2024