Quantum topology: an introduction

Sergey Galkin

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Introdução a Topologia Quântica

(MAT2725 - Tópicos de Topologia)

Público-alvo: alunos de pós.

Program

- Idea and examples of topological invariants of quantum nature.
- Topological and conformal quantum field theory.
- Alexander, Jones and HOMFLY-PT polynomials of knots and links.
- Vassiliev knot invariants and Kontsevich integral.
- Chern–Simons and Wess–Zumino–Novikov–Witten theories.
- Witten–Reshetikhin–Turaev invariants.
- Khovanov homology, categorification.
- Loops on surface: Goldman bracket and Turaev cobracket.
- Mapping class group, monodromy of Knizhnik–Zamolodchikov connection.

Bibliography:

- L. Kauffman, R. Baadhio: Quantum Topology. 1993. ISBN 981-02-1544-4.
- B. Bakalov, A. Kirillov: Lectures on tensor categories and modular functors, https://www.ams.org/books/ulect/021,
- N. Carqueville, I. Runkel: Introductory lectures on topological quantum field theory, arXiv:1705.05734
- S. Simon: Topological Quantum. https://www-thphys.physics.ox.ac.uk/people/SteveSimon/topological2016/TopoBook.pdf