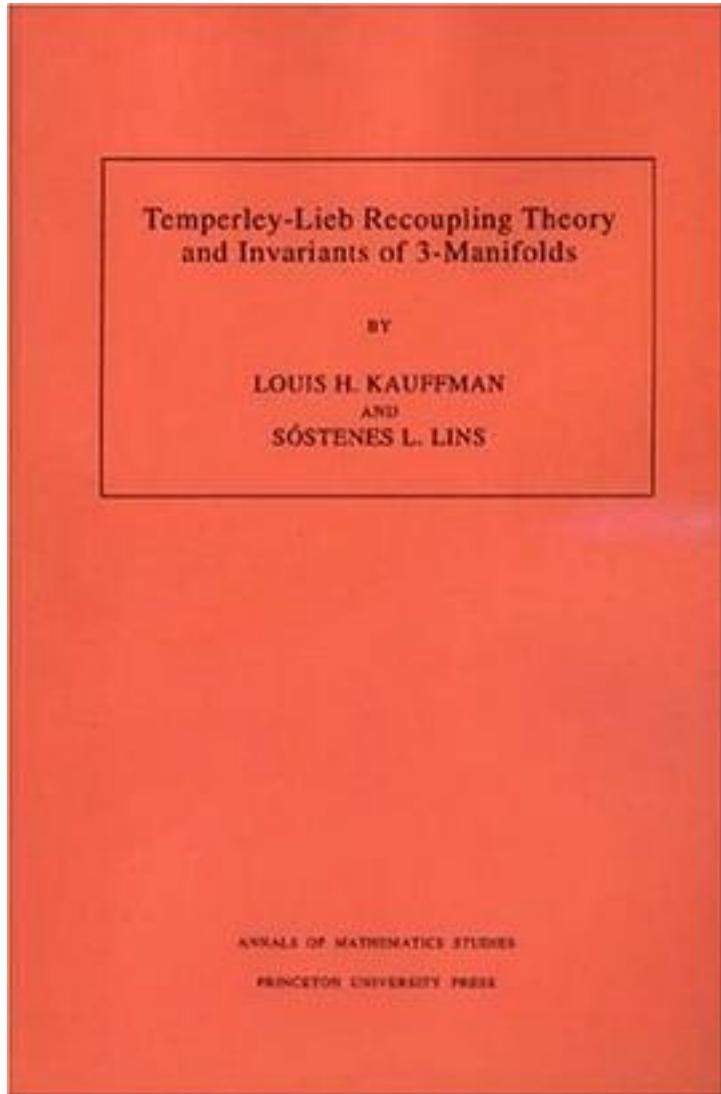


# Temperley-Lieb Recoupling Theory and Invariants of 3-Manifolds



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This book offers a self-contained account of the 3-manifold invariants arising from the original Jones polynomial. These are the Witten-Reshetikhin-Turaev and the Turaev-Viro invariants. Starting from the Kauffman bracket model for the Jones polynomial and the diagrammatic Temperley-Lieb algebra, higher-order polynomial invariants of links are constructed and combined to form the 3-manifold invariants. The methods in this book are based on a recoupling theory for the Temperley-Lieb algebra. This recoupling theory is a  $q$ -deformation of the  $SU(2)$  spin networks of Roger Penrose. The recoupling theory is developed in a purely combinatorial and elementary manner. Calculations are based on a reformulation of the Kirillov-Reshetikhin shadow world, leading to expressions for all the invariants in terms of state summations on 2-cell complexes. Extensive tables of the invariants are included. Manifolds in these tables are recognized by surgery presentations and by means of 3-gems (graph encoded 3-manifolds) in an approach pioneered by Sostenes Lins. The appendices include information about gems, examples of distinct manifolds with the same invariants, and applications to the Turaev-Viro invariant and to the Crane-Yetter invariant of 4-manifolds.

作者介绍:

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