

Foreword

Free loop spaces play a central rôle in two recent advances in algebraic topology. The first one is string topology, a subject born with the seminal work of Chas and Sullivan in 1999, who uncovered new algebraic structure in the homology of free loop spaces on manifolds. The second one is topological cyclic homology, a topological version of Connes' cyclic homology introduced in 1993 by Bökstedt, Hsiang, and Madsen.

A summer school was held in Almería from September 16 to 20, 2003, to cover topics in this new and exciting field.

The first part of this book consists of the joint account of the two lecture series which focused on string topology (Cohen and Voronov). It discusses the loop product from the original point of view of Chas and Sullivan, from the Cohen-Jones stable point of view, as well as Voronov's operadic point of view.

The second part is essentially an account of the course devoted to the construction of algebraic models for computing topological cyclic homology (Hess). Starting with the study of free loop spaces and their algebraic models, it continues with homotopy orbit spaces of circle actions, and culminates in the Hess-Rognes construction of a model for computing spectrum cohomology of topological cyclic homology.

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