Cohomology Theory

This volume introduces equivariant homotopy, homology, and cohomology theory, along with various related topics in modern algebraic topology. It explains the main ideas behind some of the most striking recent advances in the subject. The book begins with a development of the equivariant algebraic topology of spaces culminating in a discussion of the Sullivan conjecture that emphasizes its relationship with classical Smith theory. It then introduces equivariant stable homotopy theory, the equivariant stable homotopy category, and the most important examples of equivariant cohomology theories. The basic machinery that is needed to make serious use of equivariant stable homotopy theory is presented next, along with discussions of the Segal conjecture and generalized Tate cohomology.Finally, the book gives an introduction to 'brave new algebra', the study of point-set level algebraic structures on spectra and its equivariant applications. Emphasis is placed on equivariant complex cobordism, and related results on that topic are presented in detail. It introduces many of the fundamental ideas and concepts of modern algebraic topology. It presents comprehensive material not found in any other book on the subject. It provides a coherent overview of

many areas of current interest in algebraic topology. It surveys a great deal of material, explaining main ideas without getting bogged down in details.
This textbook on homology and cohomology theory is geared towards the beginning graduate student. Singular homology theory is developed systematically, avoiding all unnecessary definitions, terminology, and technical machinery. Wherever possible, the geometric motivation behind various algebraic concepts is emphasized. The only formal prerequisites are knowledge of the basic facts of abelian groups and point set topology. Singular Homology Theory is a continuation of t he author's earlier book, Algebraic Topology: An Introduction, which presents such important supplementary material as the theory of the fundamental group and a thorough discussion of 2-dimensional manifolds. However, this earlier book is not a prerequisite for understanding Singular Homology Theory.
Aimed at second year graduate students, this text introduces them to cohomology theory (involving a rich interplay between algebra and topology) with a minimum of prerequisites. No homological algebra is assumed beyond what is normally learned in a first course in algebraic topology, and the basics of the subject, as well as exercises, are given prior to discussion of more specialized topics.

Cohomology Theory of Groups
Elliptic Cohomology
An Extraordinary Cohomology Theory
Intersection Cohomology
Cohomology of Groups and Algebraic K-theory

A generalized etale cohomology theory is a theory which is represented by a presheaf of spectra on an etale site for an algebraic variety, in analogy with the way an ordinary spectrum represents a cohomology theory for spaces. Examples include etale cohomology and etale K-theory. This book gives new and complete proofs of both Thomason's descent theorem for Bott periodic K-theory and the Nisnevich descent theorem. In doing so, it exposes most of the major ideas of the homotopy theory of presheaves of spectra, and generalized etale homology theories in particular. The treatment includes, for the purpose of adequately dealing with cup product structures, a development of stable homotopy theory for n-fold spectra, which is then promoted to the level of presheaves of n-fold spectra. This book should be of interest to all researchers working in fields related to algebraic K-theory. The techniques presented here are essentially combinatorial, and hence algebraic. An extensive background in traditional stable homotopy theory is not assumed. ------ Reviews (...) in developing the techniques of the subject, introduces the reader to the

stable homotopy category of simplicial presheaves. (...) This book provides the user with the first complete account which is sensitive enough to be compatible with the sort of closed model category necessary in K-theory applications (...). As an application of the techniques the author gives proofs of the descent theorems of R. W. Thomason and Y. A. Nisnevich. (...) The book concludes with a discussion of the Lichtenbaum-Quillen conjecture (an approximation to Thomason's theorem without Bott periodicity). The recent proof of this conjecture, by V. Voevodsky, (...) makes this volume compulsory reading for all who want to be au fait with current trends in algebraic K-theory! - Zentralblatt MATH The presentation of these topics is highly original. The book will be very useful for any researcher interested in subjects related to algebraic K-theory. - Matematica

Based on several recent courses given to mathematical physics students, this volume is an introduction to bundle theory. It aims to provide newcomers to the field with solid foundations in topological K-theory. A fundamental theme, emphasized in the book, centers around the gluing of local bundle data related to bundles into a global object. One renewed motivation for studying this subject, comes from quantum field theory, where topological invariants play an important role.

&Quot;The standard invariant, homology, of topological spaces was generalized in the 1950s and 1960s to similar invariants into abelian

groups. K. Theory, cobordism, and stable homotopy, and such theories were automatized under the name generalized cohomology theories, as having properties like exact sequences, homotopy invariance, and excision. If there is a map f from X to Y of topological spaces, there is an induced map on homology, H (X) to H (Y) (or backwards in cohomology). Transfer is a mapping in the reverse direction which exists for covering maps (and some other maps), special kinds of locally one to one maps. It is important in studying coverings and actions of finite groups. In this book after the necessary background on generalized cohomology and related topics, it is proved that transfer exists and is unique in all generalized cohomology theories having the properties that one would expect."--BOOK JACKET.

Cohomological Theory of Dynamical Zeta Functions
Dedicated to the Memory of Robert J. Piacenza
Cohomology Theory of Topological Transformation Groups
Singular Homology Theory
Cohomology theory

These notes constitute a faithful record of a short course of lectures given in São Paulo, Brazil, in the summer of 1968. The audience was assumed to be familiar with the basic material of homology and homotopy theory, and the object of the course was to explain the methodology of general cohomology theory and to give applications of K-theory to familiar problems such as that of the existence of real division algebras. The audience

was not assumed to be sophisticated in homological algebra, so one chapter is devoted to an elementary exposition of exact couples and spectral sequences.
Historically, applications of algebraic topology to the study of topological transformation groups were originated in the work of L. E. 1. Brouwer on periodic transformations and, a little later, in the beautiful fixed point theorem ofP. A. Smith for prime periodic maps on homology spheres. Upon comparing the fixed point theorem of Smith with its predecessors, the fixed point theorems of Brouwer and Lefschetz, one finds that it is possible, at least for the case of homology spheres, to upgrade the conclusion of mere existence (or non-existence) to the actual determination of the homology type of the fixed point set, if the map is assumed to be prime periodic. The pioneer result of P. A. Smith clearly suggests a fruitful general direction of studying topological transformation groups in the framework of algebraic topology. Naturally, the immediate problems following the Smith fixed point theorem are to generalize it both in the direction of replacing the homology spheres by spaces of more general topological types and in the direction of replacing the group tl by more general compact groups.
Etale cohomology is an important branch in arithmetic geometry. This book covers the main materials in SGA 1, SGA 4, SGA 4 1/2 and SGA 5 on etale cohomology theory, which includes decent theory, etale fundamental groups, Galois cohomology, etale cohomology, derived categories, base change theorems, duality, and l-adic cohomology. The prerequisites for reading this book are basic algebraic geometry and advanced commutative algebra.
Transfer in Generalized Cohomology Theories

KSC*(X)
Cohomology Theory for General Spaces
Generalized Etale Cohomology Theories
Cohomology of Groups

Cohomology operations are at the center of a major area of activity in algebraic topology. This treatment explores the single most important variety of operations, the Steenrod squares. It constructs these operations, proves their major properties, and provides numerous applications, including several different techniques of homotopy theory useful for computation. 1968 edition.

Please note that the content of this book primarily consists of articles available from Wikipedia or other free sources online. Pages: 36. Chapters: Alexander-Spanier cohomology, Atiyah conjecture, Brown-Peterson cohomology, BRST quantization, ech cohomology, Cohomology with compact support, Crystalline cohomology, Deligne cohomology, De Rham cohomology, Dolbeault cohomology, Elliptic cohomology, Etale cohomology, Factor system, Galois cohomology, Good cover (algebraic topology), Group cohomology, Intersection homology, Lie algebra cohomology, List of cohomology theories, Local

cohomology, L cohomology, Monsky-Washnitzer cohomology, Morava K-theory, Motivic cohomology, Quantum cohomology, Rigid cohomology, Sheaf cohomology, Spencer cohomology, Steenrod homology, Topological modular forms, Weil cohomology theory.

Elliptic cohomology is an extremely beautiful theory with both geometric and arithmetic aspects. The former is explained by the fact that the theory is a quotient of oriented cobordism localised away from 2, the latter by the fact that the coefficients coincide with a ring of modular forms. The aim of the book is to construct this cohomology theory, and evaluate it on classifying spaces BG of finite groups G. This class of spaces is important, since (using ideas borrowed from `Monstrous Moonshine') it is possible to give a bundle-theoretic definition of EU-(BG). Concluding chapters also discuss variants, generalisations and potential applications.

Cohomology Theory of Lie Algebras

Remarks on the Cohomology Theory of Groups

Cohomology Theories

Homology and Cohomology Theory

Of all topological algebraic structures compact topological groups have perhaps the richest theory since 80 many different fields contribute to their study: Analysis enters through the representation theory and harmonic analysis; differential geo metry, the theory of real analytic functions and the theory of differential equations come into the play via Lie group theory; point set topology is used in describing the local geometric structure of compact groups via limit spaces; global topology and the theory of manifolds again playa role through Lie group theory; and, of course, algebra enters through the cohomology and homology theory. A particularly well understood subclass of compact groups is the class of com pact abelian groups. An added element of elegance is the duality theory, which states that the category of compact abelian groups is completely equivalent to the category of (discrete) abelian groups with all arrows reversed. This allows for a virtually complete algebraisation of any question concerning compact abelian groups. The subclass of compact abelian groups is not so special within the category of compact. groups as it may seem at first glance. As is very well known, the local geometric structure of a compact group may be extremely complicated, but all local complication happens to be "abelian". Indeed, via the duality theory, the complication in compact connected groups is faithfully reflected in the theory of torsion free discrete abelian groups whose notorious complexity has resisted all efforts of complete classification in ranks greater than two.

The notion of a motive is an elusive one, like its namesake "the motif" of Cezanne's impressionist method of painting. Its existence was first suggested by Grothendieck in 1964 as the underlying structure behind the myriad cohomology theories in Algebraic Geometry. We now know that there is a triangulated theory of motives, discovered by Vladimir Voevodsky, which suffices for the development of a satisfactory Motivic Cohomology theory. However, the existence of motives themselves remains conjectural. This book provides an account of the triangulated theory of motives. Its purpose is to introduce Motivic Cohomology, to develop its main properties, and finally to relate it to other known invariants of algebraic varieties and rings such as Milnor K-theory, etale cohomology, and Chow groups. The book is divided into lectures, grouped in six parts. The first part presents the definition of Motivic Cohomology, based upon the notion of presheaves with transfers. Some elementary comparison theorems are given in this part. The theory of (etale, Nisnevich, and Zariski) sheaves with transfers is developed in parts two, three, and six, respectively. The theoretical core of the book is the fourth part, presenting the triangulated category of motives. Finally, the comparison with higher Chow groups is developed in part five. The lecture notes format is designed for the book to be read by an advanced graduate student or an expert in a related field. The lectures roughly correspond to one-hour lectures given by Voevodsky during the course he gave at the Institute for Advanced Study in Princeton on this subject in 1999-2000. In addition, many of the original proofs have been simplified and improved so that this book will also be a useful tool for research mathematicians. Information for our distributors: Titles in this series are copublished with the Clay Mathematics Institute (Cambridge, MA).

This graduate textbook offers an introduction to modern methods in number theory. It gives a complete account of the main results of class field theory as well as the Poitou-Tate duality theorems, considered crowning achievements of modern number theory. Assuming a first graduate course in algebra and number theory, the book begins with an introduction to group and Galois cohomology. Local fields and local class field theory, including Lubin-Tate formal group laws, are covered next, followed by global class field theory and the description of abelian extensions of global fields. The final part of the book gives an accessible yet complete exposition of the Poitou-Tate duality theorems. Two appendices cover the necessary background in homological algebra and the analytic theory of Dirichlet L-series, including the Čebotarev density theorem. Based on several advanced courses given by the author, this textbook has been written for graduate students. Including complete proofs and numerous exercises, the book will also appeal to more experienced mathematicians, either as a text to learn the subject or as a reference.

General Cohomology Theory and K-theory

Etale Cohomology Theory

A New Cohomology Theory

Cohomology Theories for Compact Abelian Groups

Operations in Connective K-theory and Associated Cohomology Theories

This book is a publication in Swiss Seminars, a subseries of Progress in Mathematics. It is an expanded version of the notes from a seminar on intersection cohomology theory, which met at the University of Bern, Switzerland, in the spring of 1983. This volume supplies an introduction to the piecewise linear and sheaf-theoretic versions of that theory as developed by M. Goresky and R. MacPherson in Topology 19 (1980), and in Inventiones Mathematicae 72 (1983). Some familiarity with algebraic topology and sheaf theory is assumed.

ALM Published jointly by International Press and by Higher Education Press of China, the Advanced Lectures in Mathematics (ALM) series brings the latest mathematical developments worldwide to both researchers and students. Each volume consists of either an expository monograph or a collection of significant introductions to important topics. The ALM series emphasizes discussion of the history and significance of each topic discussed, with an overview of the current status of research, and presentation of the newest cutting-edge results.
Cohomology of Groups and Algebraic K-theory Cohomology of groups is a fundamental tool in many subjects of modern mathematics. One important generalized cohomology theory is the algebraic K-theory. Indeed, algebraic K-groups of rings are important invariants of the rings and have played important roles in algebra, topology, number theory, etc. This volume consists of expanded lecture notes from a 2007 seminar at Zhejiang University in China, at which several leading experts presented introductions, to and surveys of, many aspects of cohomology of groups and algebraic K-theory, along with their broad applications. Two foundational papers on algebraic K-theory by Daniel Quillen are also included.

Etale Cohomology TheoryWorld Scientific

An Approach Based on Alexander-Spanier Cochains

Cohomology Operations and Applications in Homotopy Theory

Course Given at the University of São Paolo in the Summer of 1968 Under the Auspices of the Instituto de Pesquisas Matemáticas, Universidade de São Paolo

A General Cohomology Theory of Sheaves

Equivariant Homotopy and Cohomology Theory

This volume introduces equivariant homotopy, homology, and cohomology theory, along with various related topics in modern algebraic topology. It explains the main ideas behind some of the most striking recent advances in the subject. The works begins with a development of the equivariant algebraic topology of spaces culminating in a discussion of the Sullivan conjecture that emphasizes its relationship with classical Smith theory. The book then introduces equivariant stable homotopy theory, the equivariant stable homotopy category, and the most important examples of equivariant cohomology theories. The basic machinery that is needed to make serious use of equivariant stable homotopy theory is presented next, along with discussions of the Segal conjecture and generalized Tate cohomology. Finally, the book gives an introduction to "brave new algebra", the study of point-set level algebraic structures on spectra and its equivariant applications. Emphasis is placed on equivariant complex cobordism, and related results on that topic are presented in detail.

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theorems, duality, and ℓ-adic cohomology. The prerequisites for reading this book are basic algebraic geometry and advanced commutative algebra.
Dynamical zeta functions are associated to dynamical systems with a countable set of periodic orbits. The dynamical zeta functions of the geodesic flow of lo cally symmetric spaces of rank one are known also as the generalized Selberg zeta functions. The present book is concerned with these zeta functions from a cohomological point of view. Originally, the Selberg zeta function appeared in the spectral theory of automorphic forms and were suggested by an analogy between Weil's explicit formula for the Riemann zeta function and Selberg's trace formula ([261]). The purpose of the cohomological theory is to understand the analytical properties of the zeta functions on the basis of suitable analogs of the Lefschetz fixed point formula in which periodic orbits of the geodesic flow take the place of fixed points. This approach is parallel to Weil's idea to analyze the zeta functions of pro jective algebraic varieties over finite fields on the basis of suitable versions of the Lefschetz fixed point formula. The Lefschetz formula formalism shows that the divisors of the rational Hassc-Wcil zeta functions are determined by the spectra of Frobenius operators on l-adic cohomology.
Etale Cohomology Theory (Revised Edition)
Cohomology Theory

Alexander-Spanier Cohomology, Atiyah Conjecture, Brown-Peterson Cohomology, Brst Quantization, Cech Cohomology, Cohomology with C
Cohomology Theory and Algebraic Correspondences
Galois Cohomology and Class Field Theory